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Annual SJR report 5

The SJRWMD released its third annual state of the river report for the lower St. Johns River Basin. The project characterizes geography, ecology and human influence on the lower St. Johns River.

Mining halt 6

A federal judge sided with environmental groups in August and temporarily stopped The Mosaic Co. from mining wetlands within its 10,885-acre South Fort Meade mine. The mine is located near the Peace River in northern Hardee County.

Brownfield program 7

2009 was a down year for the state's brownfield program, as only 10 new sites were designated as brownfield sites. However, 2010 is shaping up to be a better year according to the 2009 annual report on the program just released.

Koppers cleanup 13

Federal officials unveiled a new cleanup plan for a Superfund site in Gainesville, but county environmental officials expressed concerns about the plan to encapsulate much of the contamination on-site.

Jax sewer truce 13

Three years ago, environmental groups sued JEA over more than 200 instances of sewer overflows since 2001. Now, Jacksonville utility officials say they will cooperate with environmental activists on ways to improve their operation.

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Got a story lead?

Got an idea for a story? Let us know. Like to submit a column for consideration? Fire away. And don't forget to fill us in on your organization's new people and programs, projects and technologies—anything of interest to environmental professionals around the state. Send to P.O. Box 2175, Goldenrod, FL 32733. Call us at (407) 671-7777; fax us at (407) 671-7757, or email us at info@enviro-net.com

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CHANGE SERVICE REQUESTED

DEP top leadership shifts as Sole leaves, Drew steps in

By MELORA GRATTAN

With a new governor and administration right around the corner, the winds of change are blowing at many state agencies. At the Florida Department of Environmental Protection, the currents of transition reached gale force levels as Secretary Michael W. Sole decided to take leave from the helm.

Sole, who has been with the DEP for almost two decades including the last three as top gun, told Gov. Charlie Crist in a letter last month that it was time for him to pursue other career opportunities.

"Now that the Deepwater Horizon well has been capped, and Florida is on the way to recovery, it is necessary for me to announce my departure date of Sept. 10, 2010," he wrote in the letter.

Sole thanked Gov. Crist for allowing him to lead one of the state's most diverse, professional agencies. "It is something I will cherish for a lifetime."

"Mike is going to be missed," said Mimi Drew, a 30-year DEP veteran who will move from her position as deputy secretary of regulatory programs into the interim secretary slot. "He is loved

by many...I will miss him personally. We have worked for each other, and share a lot in terms of commitment to the environment."

Sole's positions within the agency

started with environmental specialist III and progressed to bureau chief, assistant division director, division director and chief of staff before being named to

DEP

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Photo courtesy of Algae Collection Technology Inc.

Clark Giangarra, president of Algae Collection Technology Inc. of Melbourne, collects drift algae along the Indian River. His concept may help meet numeric nutrient standards as well as supply biomass resource. See story on Page 6.

State evaluates technologies to cleanup beach oil

By MELORA GRATTAN

While the scope of the impact that the Deepwater Horizon/BP oil spill had on Florida shores may not be known for years, regulators aren't waiting around to address those impacts. They are busy sifting through hundreds of possible technologies to find the most promising solutions available.

After forming a workgroup to review innovative technologies, the state Department of Environmental Protection recently hosted an event to evaluate some of the technologies in action on Pensacola Beach.

Held in July, the event allowed 17 different beach cleaning devices to be demonstrated for DEP waste management officials who rated them on factors such as cleanup effectiveness and efficiency, ease of deployment, efficiency of disposal and scalability.

The technologies included absorbent powder, beach screening devices and surfactants, substances that reduce the thickness of liquid products to enable an easier cleanup.

While many of the products demonstrated did not show great potential, there were a few that caught the eyes of DEP officials and will be investigated further.

For instance, one product was said to remove tar balls and mats without removing sand. "Material smaller than screen size not removed," said the written evaluations released by DEP. "Product should be evaluated for use by manual beach remediation crews."

Another product was said to show promise for being able to screen large area quickly. This product did not remove material smaller than the screen size and evaluators recommended a self-propelled model instead of one pulled by a tractor.

Having the event on the beach was a great way to evaluate the technologies on the actual impacts, said Michael W. Sole, the agency's outgoing secretary. "We will continue to exhaust every tool to ensure the best possible outcome for Florida's environment, economy and quality of life."

Since the workgroup was established in May, DEP has received more than 1,100 e-mails and more than 400 submissions of innovative products.

Another event is in the works that will concentrate on testing bioremediation products, which include microbes.

"Florida's focus has been and continues to be on maximizing response efforts and minimizing impacts on Florida's shoreline," said Jennifer L. Jones, a DEP spokesperson.

She added that anything the agency received related to capping the well head was referred directly to BP representatives.

Panhandle solar plant introduces new technologies, environmental benefits

By PRAKASH GANDHI

Solar energy in Florida is taking another big step forward. Energy Farm Inc., based in Santa Rosa Beach, is planning the largest solar photovoltaic power plant ever built in Florida and one of the largest in the country.

Planned for Walton County in Florida's Panhandle, Energy Farm's 74 megawatt photovoltaic plant will produce enough electricity to supply power to 12,000 homes. The company is finalizing agreements to sell the electricity to Florida utilities.

Shelton Stone, co-founder and CEO of Energy Farm Inc., said in August that officials are still negotiating the final contract with a utility. "We expect that to be wrapped up within 30 days," said Stone. "It's a long-term agreement whereby the utility agrees to purchase power from us."

He said the new plant is unique because it will use technology that has not been used before. In its first phase, it will have a capacity of 42 MW, which will increase to 74 MW within three years, he said.

Requiring a site of about 550 acres,

the new plant will cost around \$300 million, he added. "This facility is going to fill a big void. Environmentally, it will be a very nice way to develop an alternative source of energy."

Stone said the plant will also have some major environmental benefits. "We don't have any emissions associated with this facility," he said. "We have no carbon emissions at all."

"We are also doing our part to make sure the location of this plant is environmentally friendly. There is very little stormwater management needed. The native vegetation will also remain in place."

The plant will use next-generation thin film solar modules to produce power during peak demand times. The firm's ultimate goal is to generate power from the sun all day and night by storing a portion of the plant's energy for use after sunset.

The company is co-developing advanced hydrogen fuel cell technologies that use hydrogen produced at the plant and stored on site. The stored hydrogen can be used in fuel cells to produce

SOLAR

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Oil spill update: EPA releases dispersant toxicity testing results

Staff report

During the first months of the Deep Horizon/BP oil spill, the U.S. Environmental Protection Agency ordered BP to reduce its use of dispersants and to conduct toxicity testing to verify that Corexit 9500A was, in fact, an acceptable choice of dispersants based on its toxicity.

BP consistently defended the use of Corexit 9500A on the basis of its availability and low toxicity level.

In early August, EPA released the results of its second phase of toxicity testing of eight oil dispersants used alone or mixed with water-accommodated fractions of Louisiana sweet crude oil.

The toxicity testing results indicate that Corexit 9500A is similar in toxicity to any of the seven other available oil dispersants.

These conclusions are based on standard short term toxicity tests using mysid shrimp (*Americamysis bahi*) and young silverside minnows (*Menidia beryllina*)—species that occur in the Gulf estuaries.

Testing involved all approved oil dispersants available for use on any oil spill including Dispersit SPC 1000, Nokomis 3-F4, Nokomis 3-AA, ZI-400, SAFRON Gold, Sea Brat #4, Corexit 9500 A and JD 2000.

Toxicity was assessed with static acute toxicity tests. The static acute toxicity test

methods followed, with slight modification, EPA Test Method 821-R-02-012. Toxicity tests with mysid shrimp lasted 48 hours. Those with silverside minnows were 96-hour tests.

Toxicity results are expressed in a report to the EPA in numerical and narrative form. Comparison of numerical bioassay results between the two species is difficult because they were exposed for different lengths of time in order to calculate an LC50 value: two days for mysid and 5 days for silverside minnows.

The narrative characterization for Corexit 9500A indicates that for the silverside, the LC50 of Corexit alone is 130 parts per million. That is narratively characterized as “practically non-toxic.”

The oil spill was essentially capped during the last week of July and, since then, dispersant application has declined to just a few hundred gallons. However, debate about the toxicity of dispersant-oil mixtures will probably continue to flow freely for a while longer.

A summary of the test results is avail-

able at <http://www.epa.gov/bpspill/reports/phase2dispersant-toxtest.pdf>.

Gulf air quality. When oil from the Deep Horizon/BP oil spill floated onshore along the northern Gulf coast, many shore side residents complained of chemical odors they believed originated from the spilled oil. Some questioned whether breathing the air with its odor-causing volatiles posed a health risk.

In response, the EPA upgraded five of its air quality monitoring facilities in Mississippi, Alabama and along the Florida Panhandle.

The upgrades allowed the stations to test for volatile and semi-volatile organic compounds, including benzene and phenol that could have arisen from

the oil.

The result of the expanded sampling and testing, according to the agency, was that they could detect no air pollution in any of five sampling stations that likely originated from the spill.

An EPA spokesman acknowledged that the human sense of smell is more sensitive

to some chemicals, but that chemicals at a concentration that can be sensed are not necessarily a health risk.

The EPA posted air quality data at <http://www.epa.gov/bpspill/air.html>.

Sulfur pollutants from power plants.

In the midst of what may enter the record books as the second hottest summer ever recorded, the EPA proposed new rules to reduce sulfur dioxide emitted from coal-fired power plants.

The new rule primarily affects power plants in the eastern half of the country.

In 2005, A federal court ordered the agency to revise its Clean Air Interstate Rule. The proposed rule will attempt to satisfy the court's demand.

EPA says that emissions of SO₂ from power plants will have to drop by 71 percent compared to emissions in 2005.

To meet the new standards, utilities have a choice of either burning low sulfur fuel or installing scrubbers to remove sulfur from stack gases.

Sulfur dioxide in the air undergoes a series of reactions that yields ground-level ozone and fine particulates. By reducing SO₂ emissions from power plants, these other contaminants will also decrease. Acidification of rain water may also be reduced.

The EPA estimated that by 2014, compliance costs nationwide would amount to \$2.8 billion per year. That might increase electricity costs to the consumer by 2 percent.

The rule, proposed on July 6, has a 60-day public comment period.

More information is available at <http://www.epa.gov/airtransport/>.

Diesel grant program. Emissions from vehicles burning diesel fuel are a second significant source of aerosol particulates, and sulfur-containing air pollutants. The EPA estimates that diesel engines emit 7.3 million tons of nitrogen oxides and 333,000 tons of soot annually to the air.

At the end of July, the EPA awarded \$5.6 million to help companies develop emerging technology projects for diesel engines.

This grant program differs from others that the federal government operates. The Emerging Technology Program promotes deployment of innovative practices that are not verified or certified by the EPA. Providing grants to promising technologies enables them to undergo field testing that provides benefits in the areas where they are tested.

None of the grants were awarded to Florida communities.

The Emerging Technology Program grants are a small part of the EPA's Diesel Emissions Reduction Program. The other grant programs in DERA are the SmartWay Finance Program; the National Funding Assistance Program; Direct Grants to all States for Clean Diesel Programs; and Clean Diesel Tribal Grants.

These other programs received \$120 million in clean diesel grants.

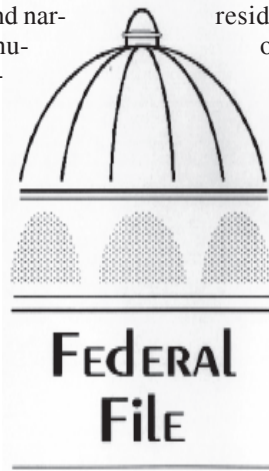
The EPA initiated a series of emission standards for highway and off-road diesel engines that will become effective in the next decade, and apply only to engines manufactured since 2007.

That may leave as many as 11 million diesel engines in use today that will have to use cleaner fuels, or newer technologies to reduce air emissions.

Rule-making guidance on environmental justice. The EPA has released its “Interim Guidance on Considering Environmental Justice during the Development of an Action.”

This document will help EPA staff incorporate environmental justice into its rulemaking process.

The agency says that the procedures and guidance in this new document will improve environmental justice and “provide new protection for the health and safety of communities that have borne the



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Hernando granted extension for contaminated site RAP

Staff report

Hernando County officials were granted an extension to submit a remedial action plan to state officials for a contaminated former public works site.

Originally, the county was scheduled to submit the RAP to the state Department of Environmental Protection in July, but county officials now have until October.

The plan will include information such as alternative remedial strategies for treating or removing the contaminants. Local officials said they want to make the five-acre site safe for redevelopment, possibly building a recreational facility of some sort there.

The original RAP was developed by Brooksville-based Creative Environmental Solutions. The county now wants to retain another engineering firm to make additions to the plan and to assist with supervising the bidding process to identify a contractor that can conduct the cleanup.

The project has cost the county more than \$3 million so far. About \$700,000 more has been included in their 2010-11 FY budget.

Miami cleanup starts. Excavation of thousands of cubic yards of contaminated soil is underway at the former Bicentennial Park in downtown Miami.

The \$2 million remediation of eight acres involves transporting the top soil to a disposal site and capping the ground with a concrete parking lot that may eventually be used for planned science and art museums.

The site formerly housed an oil terminal and gas stations. The contaminants of concern at the site include petroleum residue and arsenic.

The cleanup is slated for completion by early November. Miami officials plan to cleanup the rest of the site, which will be used as a 20-acre park, at a later time.

The redevelopment project was first envisioned about eight years ago, but it has taken some time to secure enough public funding and support to get it rolling.

Port project. Leaders in Broward County recently endorsed an agreement with state environmental officials that will allow an expansion at Port Everglades by doubling the amount of wetlands they will create.

Environmental groups initially opposed the port expansion because eight acres of mangrove wetlands would be lost when the southern turning notch was enlarged by about 950 feet.

However, the new agreement with DEP would result in the creation of 16 acres of similar wetlands within about two years. Plus, the existing wetlands would not be disturbed until the new mangroves have grown sufficiently.

The project will allow the port to process more and bigger ships, and will create additional berthing space adequate for super-freighters. The expansion will help with projected growth in cargo and will create new jobs.

The plan for the port expansion encompasses two decades and \$2 billion.

FEHA award. The Florida Environmental Health Association recognized Volusia County Health Department Environmental Specialist Albert Royster as their 2010 Outstanding Environmental Professional of the Year.

FEHA bestows the award to professionals that exemplify the best in environmental health—individuals whose efforts have made a collective difference in their communities.

Royster has 25 years experience working for the Department of Health with 16 years at the Marion County Health Department and nine years at the Volusia County Health Department.

Energy-efficiency research funded. Two Florida universities will receive millions of dollars in federal funding to develop new ways for homes in America to

become more energy efficient.

The University of Central Florida will lead the Building America Partnership for Improved Residential Construction research team. This team will concentrate on creating strategies for homes in hot and marine climates.

The University of Florida and the University of Nebraska-Lincoln are spearheading the Building Energy Efficient Homes for America team.

The collaboration will examine engineered systems for homes.

The universities are part of partnerships that will divide \$30 million the first year, with the possibility of another \$20 million annually for three additional years.

Acquisition news. Houston-based SouthWaste Services LLC now owns a waste processing facility near Orlando.

Central Florida Disposal Interests has the capacity for handling 15.3 million gallons of waste material annually. SouthWaste also has a liquid waste collection facility in Orlando.

The company has made nine acquisitions

in the past five years.

Stantec recently acquired WilsonMiller, a design, engineering and planning firm based in Naples. Stantec is a design firm with offices throughout North America. WilsonMiller has 10 offices in Florida with a staff of more than 260 that focuses on environmental projects and services related to transportation and land management.

Florida-based PBSJ has entered into a definitive merger agreement in which London-based WS Atkins PLC will acquire the firm. The deal is expected to close this fall and is subject to approval by PBSJ's shareholders.

Corps contract awarded. The Jacksonville District of the U.S. Army Corps of Engineers selected Natural Systems Analysts Inc. of Winter Park for a \$2 million contract to map seagrass in the southern part of the state.

NSA will monitor submerged aquatic vegetation in estuaries that feed the Everglades. The firm will collect data from 22 sites from Fort Pierce to Fort Myers and produce longitudinal data and scientific analysis on the vegetation.

Florida Notes



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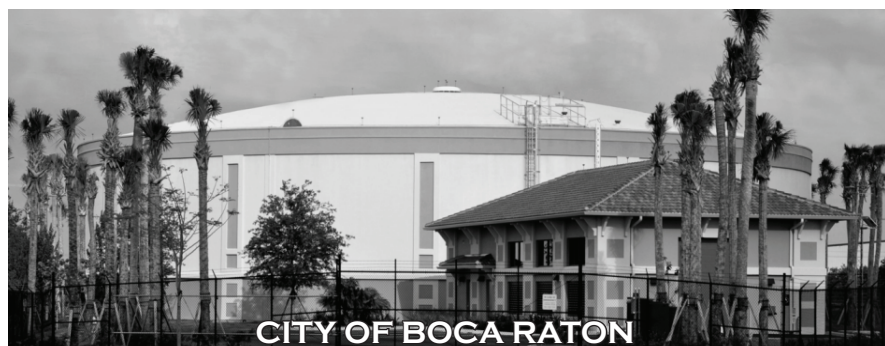
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Federal program invests heavily in Everglades restoration with land purchase

Staff report

The state is not the only one spending millions of dollars on Florida land to help restore and protect the Everglades. As part of its Wetlands Reserve Program, the federal government will shell out \$89 million to preserve wetlands within the Fisheating Creek watershed located in the northern portion of the Glades.

The purchase is one of the largest expenditures of its kind and will form one of the most extensive contiguous easement purchases for the federal program.

A conservation corridor will stretch from the central part of the state into Everglades National Park. The watershed feeds into Lake Okeechobee and the southern Glades area, which makes it crucial for restoration and protection efforts.

An estimated 19 different species of wildlife will benefit from the purchase.

The rural 26,000 acres in Highland County is owned by four families and companies, including the H.L. Clark family, the Doyle Carlton family, the family of state senator J.D. Alexander and Westby Corp. These landowners will keep their titles to the land, but will have to acquire permits to graze cattle.

The federal wetlands program usually

buys around 1,700 acres annually in Florida and 250 acres in other states to retire agricultural land and promote the health of wetlands.

Florida denied more water. Florida did not provide proof that federal wildlife officials discounted evidence when making decisions on how much water should be released from upstream dams in Georgia. As a result, U.S. District Judge Paul Magnuson turned down the state's request for additional water to be released to benefit endangered or threatened species that include the gulf sturgeon and several mussel species.

However, the ruling does not alter a previous decision made by Magnuson that the metropolitan Atlanta area does not possess the legal standing to claim the water in Lake Lanier as its drinking water supply without congressional approval.

Atlanta's use of the reservoir will be curtailed in two years if leaders in Florida,

Georgia and Alabama do not find a mutually agreeable way to share water and resolve the tri-state water dispute that spans decades.

St. Johns tributary study. State environmental officials are working with local municipalities to monitor and cleanup tributaries that connect to the Intracoastal Waterway and the St. Johns River.

The state Department of Environmental Protection Basin Management Action Plan focuses on pollution from fecal coliform in 15

coastal tributaries.

Jacksonville Beach is supporting the state efforts in Hopkins Creek, while Atlantic Beach has agreed to help with sampling and review pollution control measures in Sherman Creek and a northern fork of Hopkins Creek.

Allowable state limits are 400 parts of bacteria for 100 milliliters of water. Levels in Hopkins Creek have been reported at three times the limit during seven years of sampling ending in the summer 2008 at four different places.

While Sherman Creek has shown elevated levels of fecal coliform in the past, recent samplings found concentrations to be below state standards.

Sampling of Ponte Vedra waterways and creeks is now underway. This sampling will be evaluated next year to find out if those waterways need more help.

A separate effort for Duval County is also in the works.

Amended permit requirements. Leaders of the St. Johns River Water Management District recently changed some of the district's rules related to its Environmental Resource Permitting program.

The changes include water conservation requirements or plans for projects such as golf courses, recreational areas or irrigated landscape elements. More specifically, irrigation systems will need to be more efficient and use sources such as stormwater or reclaimed water whenever possible. These plans will be enforced by property owners' associations.

The changes will consolidate the process for projects requiring both an environmental resource permit and one for consumptive use for irrigation.

Dike work continues. The U.S. Army Corps of Engineers' Jacksonville District awarded a \$24 million task order to the Bauer Foundation Corp. of Odessa to finish a 2.7-mile portion of a partially penetrating cutoff wall in the Herbert Hoover Dike.

About two- to three-feet thick, the wall is designed to function as a barrier to water pathways. It spans the top to an average of about 60 feet below the crest of the dike.

So far, 17 miles of a 22-mile section of cutoff wall have been completed. A task order for another 3.4 miles of the wall will be awarded later this year.

In addition, H&R of Belle Glade is almost done clearing and filling the quarry to stabilize the dike's base. This work involved a \$6-million contract. At the same time, project officials are resolving issues related to area pipes and seepage.

Stormwater fee overhaul. Officials in Palm Coast have agreed to revise their stormwater fee rates after property owners said the rates were unfair, refused to pay them and threatened to sue.

The property owners said there was no credit for land with a stormwater retention pond, and that owners of unplatted land did not pay any fee.

Another issue raised was that the majority of the current budget for stormwater spending went to swales versus other

structures such as canals. These changes will not impact the rates of homeowners.

Nitrogen removal funds. Leaders in Atlantic Beach agreed to buy equipment to remove nitrogen to decrease river pollution. The required expenditures for a nitrogen removal system will result in higher fees including those for stormwater, said city officials.

Biosolids PO continued. The Tohopekaliga Water Authority extended a purchase order for N-Viro International Corp. to transport and treat biosolids product from its TWA South Bermuda Wastewater facility.

The biosolids are taken to N-Viro's facility in Daytona Beach, where they are converted to Class AA materials and sold.

N-Viro is an environmental technology company that markets an alternative fuel manufacturing process and agricultural products.

Water work green-lighted. Arcadia leaders awarded a contract to Censtate Contractors to finish a project that will connect the city to the water supply of DeSoto County. The interconnection project will cost more than \$97,000, and will provide a temporary solution to Arcadia's water needs.

While approving the interconnect, city leaders also approved hiring Hazen and Sawyer to provide services such as the design and permitting of a new water treatment facility.

DEP officials previously told the city it would have to make repairs to its existing 40-year-old treatment plant. More specifically, it would have to change how it disposes of materials such as lime into ponds without liners.

Instead of upgrading the outdated facility, the city decided to build a new one.

Department realignments. Due to growth in its utilities, Marco Island recently reorganized its public works division and created a separate Marco Island Water and Sewer Utility. Headed by the former director of public works, Rony Joel, the utility will oversee all water and wastewater plant operations at four plants.

The public works side, headed by Tim Pinter, will include collection and distribution operations for water and wastewater, utility field operations and right-of-way issues.

Reclaim project. The St. Johns River Water Management District agreed to provide \$5.7 million in cost-share funding for reclaimed water infrastructure projects to help nutrient reduction standards for the St. Johns River and cut down on groundwater consumption.

The district is sharing costs with the St. Johns County Utility Department and the Clay County Utility Authority.

The St. Johns County Utility Department is building 6.5 miles of reclaimed water transmission line. Next year, the utility will begin building an advanced wastewater treatment plant that will provide 100 percent reclaimed water when finished in 2014. It will supply .75 million gallons a day of new reclaimed water initially, expanded to 1 mgd in 2020 and 2 mgd in 2025.

The CUA is planning to build reuse infrastructure to connect service areas between two wastewater treatment facilities. This will help meet reclaimed water demand by transferring reclaimed water from existing plants discharging to the lower St. Johns River.

SFWMD recognized. For the 18th consecutive year, the Government Finance Officers Association of the United States and Canada recognized the South Florida Water Management District with its Distinguished Budget Presentation Award for the agency's 2009-2010 annual budget.

The award is the highest form of professional recognition in governmental budgeting and the highest honor bestowed by the GFOA.



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Rhonda Moll, a pioneer in the South Florida environmental testing industry, has joined our Miramar staff as the Client Services Manager. Rhonda will supervise all functions of customer interactions including project management, sample custody and field services, and will support the sales department in business development. She has 21 years in the environmental lab business (as organic chemist, QA director, project manager, and sales for last 12 years). Rhonda also has worked as a County Pretreatment Director and in quality control for a pharmaceutical manufacturer.

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St. Johns River Water Management District releases annual report

By ROY LAUGHLIN

The SJRWMD released its third annual "State of the River Report for the Lower St. Johns River Basin, Florida: Water Quality, Fisheries, Aquatic Life & Contaminants 2010," an ongoing project to characterize geography, ecology and human influence on the lower St. Johns River.

The data sets presented are from federal, state and water management district sources. The data are not new, but they are up-to-date through 2009. It is the presentation, including the completeness of data, that makes this report so useful.

Data plotted over time includes means, standard deviations and confidence intervals. Since 1990, data collection has been consistent and densely populated within

time intervals such as years or seasons.

The report includes a significant number of conclusions about the state of the river, along with data to back it up.

The report concludes that dissolved oxygen concentrations in the main stem of the St. Johns River are usually acceptable for aquatic life throughout the year. Many sub-basins, however, do not show sufficient oxygen levels for fish and shellfish year-round.

Nutrients throughout the river system are above EPA criteria values and, with the new lower numeric nutrient criteria standards, will be even further beyond acceptable levels.

As a result of increased nutrients, algal blooms are an increasingly common occurrence throughout the lower St. Johns basin.

The report notes that fin fisheries are over-fished and notes that the data do not present a clear picture for invertebrate fisheries. In addition, submerged aquatic vegetation has decreased in coverage in the area of the river around the city of Jacksonville.

This is further evidence of significant and extensive habitat degradation in the lower St. Johns River basin. Further upstream, submerged aquatic vegetation remains a significant component of the river's primary productivity engine.

The report characterizes the pollutant profile for the lower St. Johns as one typical of urban industrial rivers.

Of five categories of pollutants considered, metals and polycyclic aromatic hydrocarbons are of greatest concern. They are responsible for much of the sediment toxicity observed.

In the water column, copper, nickel and silver occasionally spike to levels above standard values.

The report was underwritten by the city of Jacksonville's Environmental Protection Board. It was prepared jointly by the University of North Florida and Jacksonville University.

The author list includes nine investigators from these two institutions, and one from Valdosta State University.

The report's preface says that it is intended for a general audience, and attempts to bring to the public in a readable way, data and informed scientific conclusions about the current ecological structure and function of the lower St. Johns River.

It is worth a quick read by anyone who needs a characterization of the St. Johns River's status and characterization of recent trends in water quality, fisheries and pollutants.

For environmental professionals, this report serves as a useful background source of information, especially for time interval from 1990-2009. The report is available at <http://www.sjrreport.com/>.

NRDC report:

Risk of water shortages high by 2050

By BLANCHE HARDY, PG

Florida is among the states facing the greatest shortage of water by mid-century, according to a recently released study conducted by Tetra Tech on the behalf of the Natural Resources Defense Council.

Tetra Tech reports that one third of the counties in the contiguous U.S. will experience a higher risk of water shortage by 2050 as a result of climate change. More than 400 of these counties, including numerous counties within peninsular Florida, face an extremely high risk of not being able to achieve water sustainability within the same time frame.

Soujay Roy, PhD, principal engineer and lead author of the Tetra Tech report said the NRDC sought the report to evaluate what climate change impacts might do to water sustainability.

The NRDC does not intend the report to serve as a prediction of where water shortages will occur. The data was assessed and compiled to indicate where shortages are more likely to occur when comparing renewable water supply with growth in demand. Renewable water supply is based on available precipitation, or the portion of precipitation not lost to evapotranspiration.

In addition to providing the most current analysis of future renewable water supply, NRDC considers the effort to be "the most comprehensive qualitative assessment of water supply and demand under future climate scenarios performed to date."

The Tetra Tech team "looked at the most recent available information on water demand at the county level," said Roy. They utilized the U.S. Geological Survey's 2005 data as published in December 2009 as part of the Survey's National Water-Use Information Program.

Sixteen leading climate models and water demand projections based on current growth trends were evaluated in the study, which assumes water consumption rates for electricity production and domestic use will remain consistent with current practices. Potential water saving plans and

conservation practices were not taken into account.

In order to perform the analysis, Tetra Tech normalized volume withdrawal to the sum area of each county, subsequently representing volume use in inches per year in order to compare use to available precipitation. Results of the study indicate freshwater water demand in most regions will increase by 0.1 inches per year; however demands may increase up to 3 inches per year in a few regions.

Expressed as percent increase, many regions in the U.S. including Florida, the populated areas of the South Atlantic region, the Mississippi River basin, the Arizona/New Mexico region and Washington, DC, and its surrounding area may have growth in water withdrawals as great as 25 percent.

In addition to stresses brought on by climate change, increases in ground and surface water withdrawals from both natural systems and man-made sources such as dammed reservoirs are anticipated in order to meet the needs of a growing population.

Tetra Tech reports that demand under current use scenarios may require an increase in water supply as great as 12.3 percent between 2000 and 2050.

In some arid regions and large agricultural areas, demand is greater than 100 percent of the available precipitation. In this case, water demand already exceeds supply and the supply currently being used is generated elsewhere.

Overall, the report indicates climate change impacts will significantly increase the number of areas where the renewable water supply will be less than the supply available for withdrawal.

This is particularly significant in areas such as Texas and the Great Plains where increases in temperature and decreases in precipitation result in evapotranspiration exceeding precipitation leaving nothing available for supply.

The NRDC feels the report's conclusions have significant implications for future water management and climate change planning efforts.

Pesticide found in more Miami-Dade wells

Staff report

As more private wells are found with elevated levels of pesticide, officials in Miami-Dade County are pushing hard to connect residents to the county water system and establish a database of properties with wells.

As of August, an estimated 70 homes in two southern neighborhoods were found to have levels of the pesticide dieldrin that were above acceptable health standards.

The Falls neighborhood had 34 out of 41 homes where wells tested above standards. This translates to about 80 percent.

A project has already begun to connect these residents to the county's potable water system with financial assistance from


the state Department of Environmental Protection, said Carlos Espinosa, PE, director of Miami-Dade's Department of Environmental Resources Management.

This project was recently accelerated and could be completed by early spring.

The other neighborhood is Continental Park, where 36 out of 71 wells had elevated levels of dieldrin. Although this neighborhood only has about half of its wells affected, some of them are showing levels above state and federal standards.

In addition, there are a few homes in the Pinecrest neighborhood showing some contamination. The county is working with health officials to determine if other nearby

PESTICIDE
Continued on Page 16



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Innovations in Water Monitoring

Harvesting drift algae may help meet NNC standards, supply biomass resource

By ROY LAUGHLIN

Clark Giangarra, president of Algae Collection Technology Inc. of Melbourne, has been working on both a technology and a concept based on harvesting drift algae, primarily *gracillaria*, from the Indian River.

The technology involves a shallow draft boat fitted with a harvester to collect the dense and extensive drift algae laying on the surface of the Indian River. Harvesting must not excessively disturb sediments and must allow bycatch—fish and invertebrates such as shrimp and crabs—to escape from the harvester unharmed.

“I’m looking to be in the biomass business,” Giangarra explained. That means he wants to put the algal biomass to use.

In 2010, the most lucrative use might be as feedstock for methane from fermentation, and use of the remaining liquor from the fermenter as a source of trace nutrients and inorganic nutrients as a soil amendment, fertilizer or animal feed.

Giangarra noted that in North Carolina, the remainder from algal fermentation is being given to hogs as a nutraceutical to enhance disease resistance. The FDA recently proposed a rule, likely to be approved, limiting antibiotic use on farm animals in concentrated animal feeding opera-

tions.

Gracillaria is eaten by people in Asia to the extent that it has been overfished out of existence in some areas. It is also a source of complex carrageenans and other classes of complex carbohydrates that are used in commodity quantities of food, cosmetics and pharmaceuticals. That market is well served by current sources, but low price producers could make inroads.

All of these examples show that algae has a market, but matching a market with algae harvest from the Indian River remains as elusive now as it has been for the past 30 years.

The current development of numeric nutrient criteria for phosphorus and nitrogen in Florida waters may be a game changer for algae harvesting, according to Giangarra.

“We’re trying to get this (algal biomass harvesting) accepted as a means of reducing nitrogen and phosphorus where there is no other alternative,” he said.

Gracillaria, like many algae species, is capable of soaking up nutrients like a sponge during its growth phase. But the benefit to water quality is temporary. When the algae die, its decay releases nutrients back into the ecosystem, in this case the Indian River Lagoon.

Harvesting algae short circuits the re-

cycling loop by physically removing nutrients in the algae from the aquatic ecosystem.

Giangarra has a prototype hand-operated harvester that can remove 2000 pounds of wet algae per day. A full scale harvester could harvest multiples of that amount.

He has been talking with state Department of Environmental Protection officials about his plans. “I’ve been told they’re going to help me through the permitting process to see if it’s feasible.”

The permitting process is anything but clear. After the experimental work is completed, the state Fish and Wildlife Conservation Commission will be the permitting agency. If there’s a commercial product from the algae, then the Florida Department of Agriculture becomes the responsible permitting agency.

Giangarra says that it would take harvesting a billion pounds per year for several years to reduce drift algae biomass to its historical proportion to sea grass, the IRL’s other primary productivity driver.

“Eighteen to twenty full size harvesters would be needed to harvest that much,”

Giangarra said. He noted that his goal was not to harvest all the algae, but to “irrigate” by removing excess algae from the dense beds to allow oxygen and nutrients access to what remained after harvesting.

He noted that a standing algal crop would always be needed to continue nutrient sequestration and provide habitat and other ecological benefits.

Giangarra has been pitching his work to investors to underwrite biomass utilization. This perspective rests on a belief that no one will pay to have *gracillaria* harvested solely to reduce nutrients in the Indian River. His efforts to find algal biomass users has so far found listeners, but no investors.

When asked how long it would take to develop a biomass harvesting and utilization effort without specifying the use, he said “about 18 - 24 months.”

In summarizing prospects for algal biomass, Giangarra’s said he believe there’s enough algae to sustain an industry without over utilizing it. “I believe it has potential for biomass to syngas. It’s a renewable resource. You wouldn’t pay to grow it. You’d have to pay to remove it.”

Judge temporarily halts wetlands mining in northern Hardee County

By PRAKASH GANDHI

Environmental groups have won a major victory in their efforts to stop a mining company from mining wetlands in Florida. A federal judge sided with environmental groups and temporarily stopped The Mosaic Co. from mining wetlands within its 10,885-acre South Fort Meade mine. The mine is located near the Peace River in northern Hardee County.

A lawsuit filed by the environmental groups challenged a June 14 permit the U.S. Army Corps of Engineers gave Mosaic to strip-mine 10,750 acres in Hardee County at the southern edge of an existing mine. The judge sent the wetlands impact permit back to the corps.

“This is a very important decision,” said Thomas Reese, an attorney representing The Sierra Club and other environmental groups. “I think Mosaic and the Army Corps of Engineers definitely need to look at limiting their mining to the uplands.”

U.S. District Judge Henry Lee Adams Jr. ruled that Mosaic failed to properly look at alternatives to mining hundreds of acres of wetlands in the proposed mining area. Adams said the Clean Water Act and the National Environmental Policy Act require this.

The judge also ordered the corps to conduct a public hearing on the project because of concerns that the mine could harm the Peace River.

Environmental groups challenged the permit because they believe the corps hadn’t properly examined the mine’s impacts or looked into alternatives to avoid wetland impacts.

Under the permit, Mosaic was allowed to excavate 534 acres of wetlands and ten miles of streams. To mitigate the impacts, Mosaic agreed to replace the wetlands and streams, and place about 2,500 acres into conservation easements.

Since the mid-1970s, there has been a loss of about 31,000 acres of wetlands in the Peace River, Reese said. Much of it is due to mining, he said. “The Peace River has suffered from the loss of wetlands.

“The phosphate mining industry has been mining the headwaters of the Peace River in Polk County and they are now moving south to Hardee County.”

The Peace River is a vital waterbody. “It provides drinking water to a lot of people and it is one of the major sources of productivity and water flow in Charlotte Harbor, which is one of the major estuaries in Florida,” he said.

Reese noted that the corps and EPA will now conduct an Environmental Impact Statement to look at impacts on the river from mining, agriculture and urban development. This process, he said, is long over-

due.

Russell Schweiss, a spokesman for The Mosaic Co., said the firm is appealing the ruling.

“Our ability to mine around the wetlands without causing harm to the wetlands is not realistic,” he said. “And if we were to go in and mine in the uplands, we would be in violation of state and local permits.

“These wetlands were in poor condition prior to mining and will be in better condition with reclamation,” he said.

The environmental groups’ claims have been dismissed repeatedly in court, Schweiss said. “These claims have been tried in four separate cases where there has been expert testimony,” he said.

“Every single judge has determined that current mining practices do not have an adverse impact on the Peace River—either on water quality or water quantity. The environmentalists have made these claims based on anecdotal evidence. But the science does not support their views.”

Schweiss said the current mine does not have enough phosphate rock to continue mining operations at its current level.

Besides the appeal, the company has filed a motion for the district court to grant a partial stay of the injunction. “Otherwise, we will have to shut down the mine altogether,” he said. “It is not economically feasible to keep that mine open.”

CSX agrees to cleanup plan for creosote plant

Staff report

After several years of negotiations and initial remedial action measures, CSX Corp. and the U.S. Environmental Protection Agency have agreed on a remediation action plan for the Nacatee Hull creosote plant site in Desoto County.

Details are contained in a consent agreement. CSX will implement a remediation plan selected by EPA and will pay the agency for all past costs, and all future oversight costs, including interest.

The site was once operated as a creosote treatment plant for wood but has not been in operation since 1952. CSX owns the property now but never operated the plant. However, as the current property owner, CSX is deemed a potentially responsible party under Superfund law and has financial responsibility for its cleanup.

CSX has already taken some actions at the site, including fencing the property off and building structures to prevent stormwater runoff contaminated with creosote to flow into the Peace River. It has also

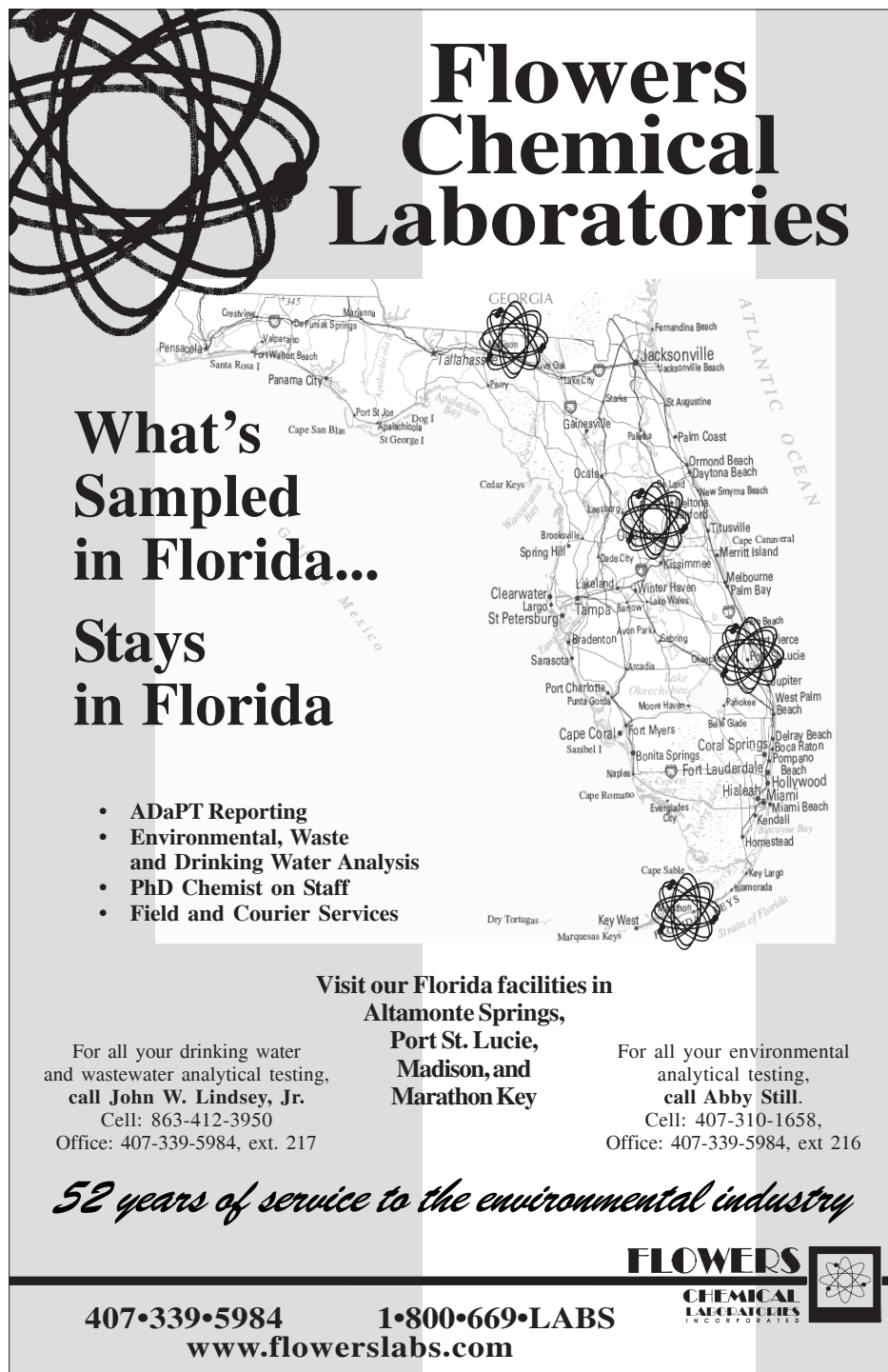
CREOSOTE
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Annual brownfields report shows weak participation in 2009; improvement expected in 2010

By MELORA GRATAN

Big changes can take place over one short year. This certainly seems to be the case with the state Brownfields Redevelopment Program.

In 2008, the program had 60 sites designated as brownfield areas, an all-time high since the program started in 1997. Last year, however, that number dropped to 10, the lowest number of designated areas since the six recorded in 2001.

While the reason for the decline in participation is not certain, program officials believe it can be attributed to the economic downturn.

"The decline in 2009 was tied to the economy by connecting the dots with folks such as real estate professionals in the state who said there was no money moving anywhere," said Kim Walker, brownfields liaison for the state Department of Environmental Protection.

As far as why 2008 had so many designated sites, Walker said that one of the reasons is that Miami-Dade designated many new areas and made changes in other areas they designated. It also turned out to be a big year overall, said Walker.

2010 is shaping up to be a better year according to the 2009 annual report on the program just released, which includes data through June of 2010. During the first six months of 2010, there have been 14 designated areas.

"The program is already ahead in terms of brownfield areas through June (2010) in comparison to all of 2009," Walker said.

Though Walker cannot point to a concrete reason for the current upswing, she believes that increased awareness may play a role. "I get more phone calls now than in past years from people looking for resources, so I suspect that they are finding out that this is another resource that may suit their community."

She cites benefits such as job creation. In fact, the program has created 30,000 new direct and indirect jobs and resulted in \$1.68 billion in capital investment during the last 11 years, according to the report.

During the 18-month period from January 2009 to June 2010, an estimated 2,336 new direct jobs, 3,392 new indirect jobs and almost \$387 million in new capital investment have been attributed to the program.

Other statistics during this time period include the execution of 18 brownfield site rehabilitation agreements and the completion of remedial activities at 10 sites. These latest figures bring program totals up to 252 designated areas statewide, 146 rehabilitation agreements and 35 cleaned up sites.

While Walker feels the program has been a success, she acknowledges a problem area in terms of the voluntary cleanup tax credits as an incentive for participation. The Florida Legislature has been capping funding levels for VCTC at \$2 million annually, which has created an increasing backlog or carryover of funds each year since 1997.

The carryover is projected to reach more than \$12 million in 2010. As a result, "presently approved tax credit awards will not all be issued until July 2014," said the

CREOSOTE

From Page 6

defined the areas of contamination.

A residential neighborhood adjacent to the site has been hooked up to public drinking water, replacing its residents' private wells as a source of drinking water.

Under the agreement, CSX will collect heavily contaminated soil and bury it in a lined trench. Where creosote levels are lower, air will be injected into the groundwater to enhance the rate of creosote's natural attenuation. Monitoring will assure that natural attenuation is occurring and that creosote in groundwater does not migrate beyond the site boundaries.

The U.S. Department of Justice filed the consent agreement on July 1, 2010, in federal district court in Ft. Myers. A 30-day public comment period will close on Aug. 1, 2010.

report.

This delay weakens the incentive, said Walker. Although industry associations have lobbied legislators heavily for more funding in past years, the amount has remained static.

In 2010, the agency received 43 tax applications and approved a total of almost \$5 million credits for site rehabilitation work completed at sites in 2009.

The report puts it like this: "If VCTC application rates remain at current levels, the backlog of tax credit awards and the time it takes for an applicant to receive its tax credit certificate will continue to increase. This will weaken the value of the strongest incentive in the program."

Even with this funding issue, the program is a "wonderful tool in the right set of circumstances for economic redevelopment and continued site cleanup," Walker said.

Other officials tout the program's usefulness. "The Florida Brownfields Program empowers communities, local governments and other stakeholders to work together to assess, clean up and reuse brownfields," said Mimi Drew, recently appointed interim

secretary of DEP and past deputy secretary for regulatory programs, in a statement.

The report used a former industrial site between the Port of Tampa and Ybor City as an example of success. The site housed a cannery until 1981 and had environmental issues that were addressed when Panattoni Development entered the brownfields program in 2007.

The remediation included removing un-

derground storage tanks and contaminated soil, and implementing engineering and institutional controls.

By 2009, IKEA had purchased the property and opened a 353,000-square-foot store, a restaurant with seating for 350 and a parking lot with 1,700 spaces. About 500 construction jobs were created as well as 400 new, in-store jobs.

"The presence of the IKEA store is expected to be a catalyst for additional redevelopment in the area," said the report.

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Thursday, October 14

8:00 **Opening Remarks from the Chair**
Nick Albergo, PE, DEE, Principal
HSA Engineers & Scientists, Tampa, FL

8:30 **Non-Linear Relationship between Site Assessment, Source Identification Remedial Design and O&M Optimization**
Jim Langenbach, PE, Associate/Senior Remediation Engineer
Geosyntec Consultants, Titusville, FL

Standard methodologies assume that the remedial process is linear, e.g. assess the site, prepare a design, implement remedial measures (often involving O&M), and close the site. Our presentation will explore the nonlinear relationship between site assessment, source identification, and O&M optimization, and the "value added" of utilizing appropriate tools and techniques to implement detailed source assessments. Through a series of case studies, we will present lessons learned, how innovative source characterization techniques significantly altered conceptual site models, and the importance of constantly evaluating and refining the conceptual site model during the entire remedial process. For example, one of our non-program case studies will summarize a project where careful review of the O&M data recognized anomalies that facilitated the identification of the actual (previously unidentified) source area. The case study sites will demonstrate to stakeholders and environmental professionals that while just meeting regulatory requirements and understanding the distribution of a dissolved plume is important, remedial success and cost ultimately hinge on understanding the source and optimization of the in-place remedy.

9:00 **The Use of Incremental Sampling Methodology in Florida as an Alternative to Traditional Discrete Soil Sampling Methods**

Brian Moore, PE, Environmental Program Manager
HSA Engineers & Scientists, Tampa, FL
Gordon Walters, PE, Environmental Department Manager
HSA Engineers & Scientists, Tampa, FL

9:30 **Diffusion and Desorption of Contaminant in Heterogeneous Media**

Guannan Jiang, Department of Biology
Clarkston University, Postdam, NY
Environmental scientists have been striving to treat and eliminate organic contaminants in soil and groundwater for a long time but the efficiency is not satisfying. The reason lies in the contaminants' complex diffusion and sorption/desorption processes within the site media. Both interparticle and intraparticle diffusion

kinetics contribute to the difficulty of precise site assessment. Adsorption process can sequester the contaminants from treatment, and the desorption process over a long time period leads to contaminants releasing from storage and may cause contaminant rebound after site treatment. Research has recently been conducted to improve the understanding of contaminants' diffusion and sorption/desorption processes and several models are proposed to predict the contaminants' response to site treatment. However, most previous research conducted has been based on homogeneous media. Little research has combined the study of interparticle and intraparticle diffusion and sorption/desorption together. Laboratory studies are ongoing to address these fundamental gaps in understanding and to assess key processes contributing to contaminant storage. This research employs a 2-D experimental system to evaluate interparticle/intraparticle diffusion processes of trichloroethylene in heterogeneous media. Results of the research will improve the understanding of contaminant behavior in heterogeneous media, provide evaluation of the impact of contaminant mass transport from within low permeability media and can support the development of mathematical tools/models combining interparticle/intraparticle diffusion and sorption/desorption with indication of key parameters for each process for better site assessment and prediction of remedial design.

10:00 Morning break

10:30 **Bioremediation of a High Concentration Chlorinated Solvents Mixture with Groundwater Circulation: Establishing Optimal Conditions and Addressing Low pH**

Brendan Brown, Environmental Scientist
CDM, Maitland, FL
CDM designed and constructed an enhanced anaerobic bioremediation system at a former industrial manufacturing facility in Orlando, FL. The site is characterized by high concentrations of a mixture of chlorinated solvents in the surficial aquifer. Source zone contamination is being remediated using EAB with potassium lactate to biostimulate indigenous *Dehalococcoides* spp. bacteria. The EAB system consists of horizontal extraction wells, a vertical injection well network, and a groundwater treatment plant. Groundwater is circulated between horizontal well segments and injection well networks, with lactate being metered into the injection lines. Distribution of the electron donor has been achieved throughout the surficial aquifer and complete reductive dechlorination is occurring. After two years of EAB activities, TVOC concentrations decreased by greater than 98 percent throughout much of the surficial aquifer. Wells in the southeastern portion of the plume are now at natural attenuation levels. The system has been expanded to treat additional source areas underneath the former manufacturing facility. Remediation in this area is confounded by the presence of low pH values that are not optimal for reductive dechlorination. Additional injection wells were installed in this area to inject potassium bicarbonate and potassium lactate and establish conditions favorable for reductive dechlorination. To date, the electron donor has been distributed to this area and concentrations of parent products have started to decrease. To ensure that EAB activities are not creating indoor air quality issues, vapor and air monitoring is conducted in this area.

11:00 **Enhanced Bioremediation of a Former Dry Cleaner Using HRC®, HRC-X® and 3DME® with Passive Venting**

Jesse Brown, PE, Associate/Senior Engineer
Golder Associates Inc., Jacksonville, FL
The former dry cleaner located in Orlando operated until 2000. Chlorinated solvents were released to the surficial groundwater underneath the building and through the sanitary sewer behind the building. The initial assessment showed a groundwater plume consisting of tetrachloroethene and trichloroethene extending over an area of approximately one half acre. An initial remedial solution included enhanced biodegradation using Hydrogen Release Compound, HRC®, with injections in October, 2002, and in December, 2002, along with the operation of shallow horizontal vapor extraction wells. The initial HRC injections were able to effectively augment the groundwater formation for approximately two and half years resulting in reduced groundwater concentrations. As groundwater concentrations began to rebound three years after the HRC injections, Golder conducted a modified active gas sampling investigation to identify any residual unsaturated soil source areas remaining at the site. Traditional soil sampling methods typically provide samples that are poor statistical representatives of the total assessment area. MAGS were developed to overcome the limitations of traditional sampling techniques and provide a more statistically significant assessment of impacted soils. Based on the MAGS data and rebound in groundwater concentrations it was determined that additional carbon source was needed along with the installation of vertical passive venting wells. In September, 2008, Golder began the injection of HRC-X and 3-D Micro Emulsion at 19 injection points across the site. A total of 2,280 pounds of HRC-X and 3-D Micro Emulsion were injected into the subsurface of the site. During the carbon injections, Golder installed two vertical passive venting wells to address the residual soil impacts identified during the MAGS study. We will present the site results and discuss the advantages of using varied delivery methods, mobile versus non-mobile carbon products, and the combination of passive venting as a low cost effective venting system to enhance the anaerobic reductive dechlorination of chlorinated solvent constituents in groundwater and the volatilization of the residual impacted soil below the building.

11:30 **Performance of Enhanced Anaerobic Dechlorination via Groundwater Recirculation at Two Florida Sites**

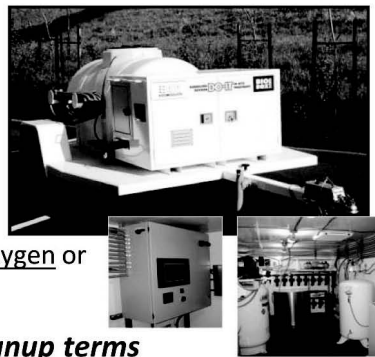
Brian Timmins, Principal
ETEC LLC, Portland, OR
Matt McDonald, PG, Program Manager
Apex Companies LLC, Jacksonville, FL
Two enhanced anaerobic dechlorination remediation projects were conducted in Florida from December, 2009, until the present. EAD using a groundwater extraction and recirculation approach was selected for both sites. This recirculation approach uses a low-cost, soluble, nutrient-amended substrate to stimulate EAD across large areas in short time frames, while maintaining a high degree of hydraulic control in the saturated zone. Chemicals of concern for each site include tetrachloroethene and trichloroethene and their associated dechlorination daughter products; cis-1,2-dichloroethene, and vinyl chloride. The first project, in Daytona Beach, treated an area measuring 60 feet wide by 140 feet long with a portion of the plume beneath a large building. At system start-up, total chlorinated solvent concentrations in the target monitoring wells exceeded 350 ppb. After 45 days of substrate addition and active recirculation, significant daughter product formation was apparent, while overall solvent concentrations were reduced by over 50 percent. Groundwater data after 90 days of recirculation is pending, and data after 150 days of recirculation will also be available for

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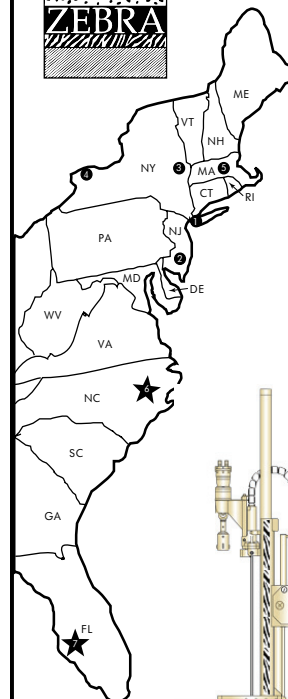
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presentation. Substrate and recirculation equipment costs will also be presented. The second project, in Fort Myers, treated an area measuring 125 feet wide by 300 feet long, with the source area residing beneath an active strip mall. Horizontal injection wells were installed to actively remediate under the building without disturbing the businesses. Baseline conditions showed groundwater concentrations of total chlorinated solvents as high as 12 mg/L. After three months of substrate addition and active recirculation, site-wide dechlorination was observed, as well as contaminant migration from beneath the building. Groundwater data collected from six and nine months after system start-up are pending and will be made available for the presentation. The results show that both sites successfully stimulated an indigenous microbial consortium capable of complete dechlorination and maintained a high degree of hydraulic control/capture to prevent contaminant migration during treatment. The results from both of these projects demonstrate that, even with differing site lithologies, contaminant concentrations and plume size, EAD using groundwater recirculation is a fast, complete and cost-effective approach when compared to other alternatives.

12:00 Day One Luncheon

1:30 Remediation of High 1,4-Dioxane Concentrations Using In-Site Advanced Oxidation Process

Louis LeBrun, PE, Regional Manager
APTwater Inc., Ft. Lauderdale, FL
Travis McGuire, EIT, Project Manager
GSI Environmental Inc., Houston, TX
A Gulf Coast chemical manufacturing facility produces a very high concentration stream of 1,4-dioxane as a part of its production process. A release contaminated shallow soils and groundwater with up to 200 mg/l of 1,4-dioxane in some areas. Investigation of the release also revealed several areas of persistent VOC and SVOC contamination from previous site uses dating as far back as the 1930s. Complicating matters, the surficial geology/lithology of the active facility ranges from natural silty-sand deposits to some regions of heavy clay fill. This resulted in co-mingling of the 1,4-dioxane and VOC/SVOC contaminant plumes in several areas of the site. A pilot test was conducted to determine the feasibility of in-situ remediation using the ozone and hydrogen peroxide based PulseOx® Advanced Oxidation Process. Testing results for a moderately contaminated well showed destruction of 1,4-dioxane from over 19 mg/l to below 1 mg/l within 8 weeks of start-up. Results from other areas of the site showed consistent destruction of both VOCs and 1,4-dioxane to differing degrees depending on the localized geology/lithology. Based on the successful pilot test a full-scale remedial design was developed to achieve site closure within 12-18 months of expected August 2010 start-up. The project will employ two high-capacity AOP systems. Concurrently, regulatory negotiations are underway to revise treatment goals to more achievable levels. As available, data on the progress of the remediation effort will also be summarized and presented.

2:00 Managing a Significant Release of 1,4-Dioxane into a Complex Glacial Depositional Environment; The Integration of Hydrogeology, Remedial Engineering and Politics

Farsad Fotouhi, Corporate Vice President
Pall Corp., Ann Arbor, MI
Sultan Anjum, PE, MASCE, DWRE-ECS, Senior Engineer
Env. Compliance Services Inc., Tampa, FL
Aamer Soofi, CHMM, Director Environmental Compliance
Pall Corp., New Port Richey, FL
Starting in the 1960s, 1,4-dioxane was unintentionally released into the subsurface environment in a glacial depositional environment in Washtenaw County, MI, west of Ann Arbor. 1,4-dioxane was released into the ground primarily through a state-permitted unlined treatment pond used to treat and dispose of process wastes. This treatment pond was effective in treating most of the process organics generated at the site, but had limited effect on 1,4-dioxane. 1,4-dioxane migrated into a complex sequence of glacial outwash deposits which form highly transmissive aquifers. Once in these aquifer systems, the 1,4-dioxane was transported a considerable distance from the source areas in multiple plumes. At the time 1,4-dioxane was discovered at this facility, little was known about the compound's toxicology, treatability and behavior in the subsurface environment. Remedial actions were further complicated by the limited number of choices available for disposal of treated water generated during proposed groundwater purge and treat options. Concurrently, the site's visibility in the community grew due to the discovery of 1,4-dioxane in neighboring water supply wells, the physical size of the 1,4-dioxane plumes and ultimately the discovery of 1,4-dioxane in a city-owned supply well. There is now a 17-year history of navigating through intense technical, legal and political complications regarding this contaminated site. This presentation will focus on the hydrogeological conditions, remedial strategies, advance treatment technologies that were designed and built, and politics leading to the current remedial activities and discuss considerations for future actions. This presentation will also discuss our pilot test findings for a Florida site.

2:30 Real-time Treatment Optimization Utilizing In-Situ Chemical Oxidation

Dan Bryant, PhD, PG, Vice President/Senior Project Manager
Geo-Cleanse International Inc., Matawan, NJ
GCI was contracted by Hudson Environmental Services Inc. to design and implement an in-situ chemical oxidation treatment program at a southern NJ fertilizer facility. The property included a 77,700 ft² clay-lined lagoon, which was utilized for on-site storage of washwater from liquid fertilizer tanker trucks and spray trucks. Hudson was initially retained by the property owner to characterize the contents of the lagoon and complete an initial investigation of the property. Soil and groundwater investigations concluded that volatile organic compounds, metals, pesticides and herbicides were above NJ DEP remediation standards. The lagoon and surrounding unsaturated zone soil contamination was excavated and additional delineation was conducted to determine the extent of the groundwater plume. Hudson determined that on-site and off-site groundwater was impacted primarily with chlorobenzene. Several treatment technologies were considered, but due to the contaminant of concern, desired time frame to reach the cleanup goal, and the shallow groundwater table, in-situ chemical oxidation was determined to be the most appropriate remedial approach. Hudson contracted GCI to conduct bench-scale tests to evaluate two potential oxidants, sodium persulfate and catalyzed hydrogen peroxide. Based on bench test results, CHP was selected as the oxidant to remediate the chlorobenzene plume. Using direct push drill rigs, a total of 230 injection wells were installed to remediate the shallow aquifer, which existed between approximately 2 and 10 feet below grade. Vent wells were also installed to provide assurance that off-gases did not accumulate beneath the subsurface. A total of 690,000 pounds of 34 percent hydrogen peroxide was applied to the treatment area. The treatment program was completed in 56 days, which included active injection, mobilization and demobilization. Post-treatment results have confirmed reductions in chlorobenzene to below NJ DEP groundwater quality standards.

3:00 Study of Mechanisms and Conditions Impacting Metal Mobility with ISCO Remediation

Kawalpreet Kaur, Department of Environmental Sciences and Engineering
Clarkson University, Potsdam, NJ
In-situ chemical oxidation is increasingly being used to remediate hazardous waste sites contaminated by organic contaminants. At many of these sites, metals such as chromium, lead, cadmium and arsenic can be present naturally or as co-contaminants. Oxidants used for ISCO can change metals behavior in the subsurface via several mechanisms. Changes in porous media that affect the number and type of sorption sites available can occur through oxidation of natural organic matter or reduced mineral species. Such changes affect characteristics such as the media's point of zero charge pH and cation exchange capacity. Furthermore, the use of ISCO amendments, such as metal catalysts, chelating agents, and acid or base for pH adjustment, can have additional impacts on metals, due to both their direct and indirect influences. There has been very limited research to evaluate these influences. This presentation will highlight research conducted to evaluate the changes in metals sorption behavior as a function of the changes to porous media and groundwater resulting from ISCO. Sorption of the metals chromium, lead and arsenic onto well-characterized porous media with a range of organic carbon content and mineralogy is currently being evaluated. Next, porous media will be subjected to a range of concentrations of oxidants persulfate and hydrogen peroxide, as well as a range of concentrations of chelating agents EDTA and citrate. Porous media will be characterized before and after treatment, and sorption of metals will be reevaluated. Changes in sorption rates and capacities will be related to changes in porous media properties as a function of the ISCO conditions introduced. Experimental results will be supplemented with modeling evaluations to help verify mechanisms influencing metals behavior and to expand the ability to predict metals behavior under a broad range of conditions that may be anticipated at the field scale.

3:30 Afternoon Break

4:00 DARAMEND In-Situ Chemical Reduction Technology for Treatment of Soil and Sediment Impacted by Chlorinated Pesticides

Jim Mueller, PhD, President/Director of Remedial Solutions and Strategies
Adventus Americas Inc., Freeport, IL
The use of organochlorine pesticides such as DDT, dieldrin and toxaphene has resulted in long-term soil impacts at many agricultural sites. Thus, land being converted from agricultural to residential use may



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require soil treatment. The ISCR™ technology consists of adding DARAMEND® soil amendment composed of biodegradable carbon in the form of processed plant fibers and zero-valent iron. A case study will be presented, where 34 acres were impacted with OCPs, primarily DDT, DDD and DDE. The full-scale implementation phase was completed using an in-situ land treatment process in three months. Representative soil samples were taken after each cycle on each acre to determine if the remedial standards had been met. Approximately 60 percent of the areas were treated to the remedial standards after one cycle, while the remainder required a second cycle. All impacted areas were treated to the remedial standards after completion of the second cycle. For areas that were completed in one cycle, the average percentage removal for total pesticides ranged from 38 to 53 percent. For areas that required two treatment cycles, the average percentage removal was between 65 and 68 percent. Although DDD did not exceed the standards, it was reduced by an average of 57 percent in one treatment cycle. The guaranteed fixed price of this turn-key project was less than \$35,000 per acre, equivalent to less than \$21 per ton of soil treated which resulted in savings of over \$3 million compared to the "dig-and-dump" alternative and resulted in significant environmental benefits such as reduced energy use and reduced greenhouse gas production, without the need for significant amounts of new material use or harsh chemical production.

4:30 Chemical Oxidation and Biostimulation Achieves Significant Plume Reduction in Florida: A Klozur® CR and PermeOx® Plus Case Study

James Studer, PE, President/CEO
ChemRem International LLC, Albuquerque, NM
To achieve rapid site closure, a coupled chemical oxidation and biostimulation, or chem-bio, treatment was applied to an active petroleum service station site in the coastal plain of Florida. A historic release of gasoline affected a 16,686-square-foot area and a volume of 12,558 cubic yards of a sandy aquifer. A layer of non-aqueous phase liquid was present in a 603-square-foot area immediately beneath three active underground storage tanks. The chem-bio product Klozur® CR (11,845 pounds) was applied to the source area (4844 square feet) and PermeOx® Plus (5400 pounds) was applied to the balance of the plume as aqueous slurries using temporary direct push points to a maximum depth of 55 feet below ground surface. Significant treatment was achieved. Three months after amendment application, the size of the plume area was reduced by 70 percent and Florida groundwater target cleanup goals were achieved within the PermeOx® Plus application area and have been maintained through four consecutive quarterly monitoring events. Initial results in the Klozur® CR application area showed near complete treatment of lighter hydrocarbons, and higher concentrations of heavier hydrocarbons which is likely attributable to high-pH induced desorption from soils or dissolution from the NAPL. One year post-treatment data show the horizontal and vertical extent of affected groundwater to be limited to the LNAPL area, continued remedial progress via biodegradation, and abatement of temporarily elevated concentrations of dissolved inorganic chemicals related to application of these amendments. Advanced diagnostic tools were used to monitor contaminant destruction and to identify biologically mediated mechanisms responsible for contaminant destruction. Stable carbon isotope data including 13C:12C fractionation of benzene showed effects of desorption/dissolution rebound and confirm destructive bioattenuation of key petroleum constituents. Microbiological data, including DNA and mRNA qPCR evaluation, show an abundant population of native microbes capable of synthesizing key oxygenase genes, and track decreased mRNA expression of oxygenase synthesis as dominant terminal electron accepting processes transitioned from aerobic respiration to sulfate reduction.

5:00 Peroxide-Coated Ozone Nanobubble Generators for Saltwater TPH and VOC Treatment Before Reuse

William Kerfoot, PhD, Principal
Kerfoot Technologies Inc., Mashpee, MA
KTI has developed an ozone nanobubble system for treating soils and salty water contaminated by petroleum hydrocarbon spills. A special generator, Nanozox™, creates peroxide-coated ozone nanobubbles which can effectively treat long-chain petroleum hydrocarbons in salty water, emulsified or with surfactants. Common aromatics, like BTEX, are also rapidly removed. The system commonly operates behind oil water separators and can precipitate either transition or alkaline metals in front of activated carbon before return to seawater source for recycling. A mobile system that can recycle 60,000-80,000 gpd of saline flowback water from horizontal gas well development in Marcellus shales is discussed. The system meets Pennsylvania requirements for organic, metal, ammonia, barium and strontium removal and radioactivity (alpha and beta). The nanobubble generators can also be placed in certain piping for in-line treatment or turn the pipe run into a treatment facility if residence time is adequate.

5:30 Adjourn, Day One

5:50 - 6:30 FRC Reception

Continued on Page 14



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the top spot. He worked in the Beaches and Shores, Marine Resources, Water Resource Management and Waste Management divisions. Before his agency experience, he earned a bachelor's degree in marine biology, and served as a captain in the U.S. Marine Corps during the Gulf War.

He certainly brought the bearing and discipline of a former marine to the position of secretary, said Bill Preston, a longtime environmental attorney with William D. Preston PA in Tallahassee.

"I give him high grades for his job as I perceived it, and our interaction on projects," Preston said. "I am a kind of gar-

bage lawyer and he headed up waste management for almost four years. He is a bright, competent, personable person."

Sole was respected by pretty much everyone and handled interactions with federal regulators, state lawmakers, industrial and environmental groups equally well, Preston said. In addition to working around the clock to address the oil spill, one of Sole's most significant accomplishments was his ability to resolve conflicts, he said.

"He is able to cut those knots and try to identify a path forward to resolve a particular impasse," Preston said. "I've seen it happen certainly more than once on projects I have been involved with, and I'm sure many other times. He talks frankly

and directly to concerns and can also kick folks in the rump to get things moving."

Keyna Cory, senior lobbyist for Associated Industries of Florida, lauded Sole's listening skills. "He was good to work with because whether he was on your side or not, he had an open door policy," Cory said. "We really appreciated that he always listened to all the information before making a decision."

Sole wrote that he had every confidence that Mimi Drew would keep the agency on track and successful in the future, praising her knowledge, calm demeanor and organizational skills.

Drew has a bachelor's degree in English and a master's in environmental engineering and sciences from the University of Florida. Some of her past DEP positions include administrator of the original Clean Water Act's Nonpoint Source Management Program, deputy director of the Division of Water Facilities, division director of Technical Services and director of the Division of Water Resource Management.

Some of her accomplishments include supervising the development and adoption of the state's first statewide stormwater rule, planning and overseeing construction of a multi-million dollar analytical laboratory in Tallahassee, and working with legislators to develop state law to implement the total maximum daily load provisions of the Clean Water Act.

Drew is in a good position to step into Sole's shoes, said Preston. "Mike put her in just the right spot. She headed the water division and interacted with all the other administrators in that position, and when she came over regulatory and energy programs, she already had a good understanding of how that functioned and fit together."

Preston has known Drew for more than 30 years, stemming from when they worked together on a Senate committee. He complimented her demeanor, capabilities and intelligence. "She is very organized, unflappable and deliberative, and also has a good sense of humor, which is important."

However, Preston is doubtful that Drew will make it past the administrative changing of the guard. "This is going to be a hell of a transition year for that department. A new governor has the liberty to appoint all new agency heads and other changes roll down to non-career exempt positions. I think you will see a lot of that in the next changeover."

Preston pointed out that having Sole and Drew as career DEP employees that came up through the ranks to fill top administrative positions is rare (versus political appointments). The only other time it happened was in the 1990s with Vicki Tschinkel who also worked her way up through the agency to become its secretary.

When asked if she would take the position on a permanent basis, Drew said she would have to think long and hard about the possibility. "But, I don't even want to predict that at this point."

Drew said one of her first priorities is to work through the administrative changes. "People are anxious about change and we want to present our best face, so that everyone recognizes our professionalism."

Drew also wants to examine the possibility of expanding some of the management models she used in regulatory programs agency-wide. For instance, she cited performance measures to track permit flow and reduce backlogs, as well as using smart technology to increase inspections in the waste program and speed up response to the public in terms of permitting. "I think there is an opportunity for the whole agency to adopt that kind of approach."

In terms of significant issues in the near future, Drew said the impending numeric nutrient criteria to be released by the U.S. Environmental Protection Agency in October are definitely high on the list.

"Our criteria are stringent and give people some concern, but we feel comfortable with TMDLs, and tried to have a gradual approach and help people get ready," Drew said. "We are watching to see what it looks like, and want to make sure they are something we, as a state, can implement."

The NNC, and water in general, is the number one issue, said Cory. "The NNC will cost an average of \$726 per resident per year on their water bill," she said. "We need DEP to work with EPA, the business and environmental communities to make sure we have clean water, but we have to make sure we are doing it in a way that will not bankrupt the state or produce results we aren't sure of. We don't want a number pulled out of the sky that will cause us more harm than good."

The scary aspect is not knowing how it will be implemented, Cory continued. Ultimately, DEP has to say what will and what won't work for Florida waters.

Another impending issue is passing refined stormwater regulations, hopefully within the next year. The changes are specifically related to making best management practices more stringent.

"We are working with the districts to make sure we have compensatory treatment and practices are similar, like low-impact design, and looking at green roofs, cisterns and stormwater harvesting," Drew said.

Another prominent issue for Drew, and anyone who may follow her, is the budget—providing the same level of service with fewer dollars. Drew said the agency is in the midst of making difficult cuts amounting to 5 percent. The possibility of finding additional cuts of up to 15 percent for next year has many at the agency anxious.

"We may have to look at whole programs," she said. "We have tried remote technologies and consolidating data center and electronic permitting, but we may have to make some hard decisions. That will be discussed in a couple of months."

When asked about how the agency is dealing with the issue of keeping the various local DEP district offices consistent with one another, Drew said she has addressed that with measures such as video conferencing to train people on enforcement and performance tracking. However, different industries, geographies, projects and people in different offices make a cookie-cutter type of consistency difficult—maybe even unrealistic.

She tells employees to pick up the phone to resolve a problem quickly and to try to have more human contact with both the applicants and their consultants. More specifically, if a project can't happen, give the applicants a heads up in the beginning versus accruing a lot of time going back and forth, she said.

One area that worries Preston about the agency as a whole is a loss of a large number of agency veterans in the last three or four years due to a retirement program created by the state Legislature.

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Calendar

September

SEPT. 7—Course: Asbestos Refresher: Project Design, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 8—Course: Asbestos Refresher: Inspector, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 8—Exposition: 3rd Annual Southwest Florida Water & Wastewater Exposition, Fort Myers, FL. Presented by FSAWWA Region V, FWPCOA Region 8 and FWEA Southwest Florida Chapter. Contact Cherie Wolter at (239) 278-7996.

SEPT. 8—Course: Asbestos Refresher: Management Planner, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 8-10—Symposium: International Greenhouse Gas Measurement Symposium, Washington, DC. Presented by the Air & Waste Management Association. Call (412) 904-6020 or visit www.awma.org.

SEPT. 9—Course: Asbestos Refresher: Contractor/Supervisor, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 9—Course: Lead: Renovation, Repair & Painting, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 10—Seminar: Complying with New Water Quality Criteria through LID and BMPs, Orlando, FL. Presented by the Florida Stormwater Association. Call 1-888-221-3124.

SEPT. 11-14—Symposium: 25th Annual WaterReuse Symposium, Phoenix, AZ. Presented by the WaterReuse Association. Call (703) 548-0880 or visit www.watereuse.org.

SEPT. 11-15—Conference: Joint AIPG 47th Annual Meeting & Conference and AGWT 10th ASR Conference, Orlando, FL. Presented by the American Institute of Professional Geologists and American Ground Water Trust. Call (303) 412-6205 or visit www.aipg.org.

SEPT. 11-19—Course: Backflow Prevention Assembly Tester Training and Certification, Jacksonville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 14—Course: 4-Hour Refresher Course for Spotters at Landfills, C&D Sites and Transfer Stations, Ft. Lauderdale, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 14—Course: Spotter Training for Solid Waste Facilities, Ft. Lauderdale, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 15—Meeting: Numeric Nutrient Criteria: Rulemaking for South Florida Waters, Coral Springs, FL. Presented by the South Florida Association of Environmental Professionals and the South Florida Hydrologic Society. Visit www.sfaep.org.

SEPT. 16-25—Course: Backflow Prevention Assembly Tester Training and Certification, Lake Worth, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 20-24—Course: Lead: Supervisor/Contractor, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 21-22—Course: Sequencing Batch Reactor Operation, Make it Work for You, Gainesville, FL. Presented by the University of Florida

TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 22-24—Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, Lake Buena Vista, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 22-25—Conference: 16th International Interdisciplinary Conference on the Environment, Tucson, AZ. Presented by the Interdisciplinary Environmental Association. Contact Kimberly Reiter, Stetson University, at (386) 822-7541.

SEPT. 23—Course: Understanding Florida's New Stormwater Quality Criteria, Lake Mary, FL. Presented by the Florida Engineering Society. Call (850) 224-7121 or visit www.fleng.org.

SEPT. 24—Conference: American Water Resources Association, Florida Section, Ft. Lauderdale, FL. Contact Kristin Bennett at (772) 781-3414 or visit www.awraflorida.org.

SEPT. 27—Course: 4-Hour Refresher Course for Spotters at Landfills, C&D Sites and Transfer Stations, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 27—Course: 8-Hour Training Course for Spotters at Landfills, C&D Sites and Transfer Stations, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 27—Course: Lift Station Maintenance, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

SEPT. 27-28—Course: Initial Training Course for Transfer Station Operators and Material Recovery Facilities - 16 Hour, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 28—OCT. 1— Course: Water Distribution Systems Operator Level 2 & 3 Training, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 29-30—Conference: Vapor Intrusion 2010, San Diego, CA. Presented by the Air & Waste Management Association. Call (412) 904-6020 or visit www.awma.org.

October

OCT. 4—Course: Heavy Equipment Safety, Temple Terrace, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

OCT. 4—Course: Health and Safety Training for Hazardous Materials Activities: 8-hour OSHA Refresher, Temple Terrace, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

OCT. 4—Course: Personal Protection Equipment (PPE) and Safety Procedures, Temple Terrace, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

OCT. 4-6—Course: Asbestos: Asbestos: Inspector, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

OCT. 5—Course: Hazardous Waste Regulations for Generators, Temple Terrace, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

OCT. 5—Course: Understanding Hazardous Waste in Solid Waste Operations, Temple Terrace, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

OCT. 5-6—Course: Water Reclamation and Treatment Processes, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

OCT. 10-11—Conference: 2010 Florida Section, Air & Waste Management Association Conference, Gulf Power Co. Auditorium, Crystal River, FL. Visit www.flawma.com.

OCT. 12—Course: Introduction to DEP SOP's for Surface Water, Wastewater, Drinking Water, Ultra-Trace Metals & Sediment Sampling/Calibration & Verification of Field Testing Meters, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

OCT. 13—Meeting: An Evening with Paul Humann, Wachovia Financial Center, Miami, FL. Presented by the South Florida Association of Environmental Professionals. E-mail Erik Neugaard at erik.neugaard@rsandh.com.

OCT. 14—Course: Lead: Renovation, Repair & Painting, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

OCT. 18-19—Course: Fundamentals & Tools: LEED for Existing Buildings: Operations and Maintenance, Orlando, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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FRC pre-conference workshop presented by LDCFL Inc.

ADaPT and Data Validation Workshop

Wednesday, Oct. 13, 2010

1:00 - 5:00 PM

Radisson Worldgate Resort, Kissimmee

This workshop is offered to environmental consultants, engineers, geologists, scientists, laboratory personnel, waste cleanup and hazardous waste personnel, and solid waste authority staff interested in—or in need of using—the Automated Data Processing Tool, ADaPT.

ADaPT was developed to comply with Florida Department Environmental Protection quality assurance requirements. Recently, the DEP Division of Waste Management advised of its intent to incorporate the use of ADaPT in its statewide quality assurance document. This will expand the use of ADaPT even more to include data submitted under programs administered by the Bureau of Waste Cleanup and the Bureau of Petroleum and Storage Systems.

ADaPT performs an error check for correctness and completeness of data, checks blank contamination rules, and checks accuracy and precision criteria for each method and sample matrix. In addition, ADaPT performs a data review that measures the integrity of sample results against associated laboratory quality control, holding times and method detection limits. ADaPT also checks the results for compliance with numerous user selectable criteria and standards.

In this four-hour workshop, we will discuss the latest regulatory requirements for ADaPT deliverables and data validation. We will also do a quick review of the software. However, this workshop will focus on the deliverable requirement, and how to review and validate the electronic data deliverables. Attendees are encouraged to bring in EDDs with any questions regarding completion, data review and validation.

Speakers: Cathy Katsikis, Senior Scientist, LDCFL Inc., Royal Palm Beach, FL
FL DEP Representative (*invited to participate*)

Registration fee: \$95

To register, click on "FRC 2010 Registration Form" under the FRC logo at www.enviro-net.com. For more information, contact Cathy Katsikis at (561) 753-0483 or ckatsikis@ldcfl.com.

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From Page 1

electricity after sunset.

Officials have been working on the plant for about 18 months. During construction, the facility will provide about 150 jobs. About 20 full-time workers will be employed once it is up and running.

Construction will start this year and the plant will start producing energy on a small scale next year, Stone said.

He said the costs of solar energy are coming down while efficiencies in manufacturing and energy production continue to increase.

Florida ranks sixth in the amount of to-

tal solar electricity generated, according to statistics provided by the Solar Energy Industries Association.

Officials say solar photovoltaic power plants provide major environmental benefits. They are carbon-free, use no water and produce no waste. One of solar energy's biggest advantages over fossil fuels is that its fuel—sunlight—is always free.

Florida's planned investment in solar energy crossed the \$1 billion mark recently with the announcement of Florida Power & Light Co.'s 75-megawatt Babcock Ranch project last year.

Small solar installations have tripled in

less than three years and Progress Energy customers surpassed one megawatt of solar projects have been announced statewide.

The state solar industry hopes to get a piece of the rapid expansion of solar nationwide. Solar power grew 17 percent, its third straight year of record growth last year, according to SEIA. The installation

DEP

From Page 10

senior managers voluntarily set a retirement date so lower paid employees can move up.

"I think it is resulting in a significant brain drain, where institutional knowledge and experience is falling out the windows," he said. "To my way of thinking, that is the biggest adverse impact the agency is facing right now and over the near term."

Drew acknowledged that a lot of the folks that have been dedicated to the environment, starting in the 1970s when the big federal acts were passed, are now retiring.

FED FILE

From Page 2

brunt of past pollution, and have often been overlooked by EPA's rulemaking."

The EPA acknowledges that these communities are typically low income, minority and indigenous communities, and tribal governments. They have been underrepresented historically in the EPA's regulatory decision-making process.

The new rules and guidance outlined several steps that every EPA program office can employ to assess and address needs "of overburdened neighborhoods" as part of the EPA's decision-making, scientific analysis and rule development. The EPA staff is the primary focal point for these regulations.

The EPA is seeking public comment on the proposed new rules. More information is available at <http://www.epa.gov/environmentaljustice>.

Green building practices. The EPA's Region 4 office has released "Sustainable Design and Green Building Toolkit for Local Governments."

It is an aid to local governments to help them incorporate green building practices into local municipal codes.

of grid-connected solar panels surged 81 percent.

In 2006, the state started offering a rebate of \$4 per watt for solar panels, cutting the cost of installation. Since then, the amount of solar on the state's grid grew to three megawatts. Unfortunately, state funds dried up and there remain thousands of backlogged applications to be paid out.

However, she said the agency has tried to make sure that successors are ready to step in when senior managers leave.

Drew said the agency also tries to reach out to younger people about the satisfaction of a career in public service.

"I can't think of anything else I would rather do with my career," she said. "I try to encourage youth to go into the service fields and talk about why it is so important to protect the planet we live on."

"We will never pay as much as the private sector, but people stay with it because they love what they do."

The toolkit contains an assessment tool, a resource guide and an action plan. These are primarily aimed at the permitting process.

The assessment tool will help local governments "identify barriers or resistance to sustainable design practices in their local building codes."

The resource guide includes links to organizations and documentation that will help local authorities and local governments learn more about each category in the assessment tool.

The action plan section provides information for planning and implementing sustainable design and green building practices through necessary regulatory and permitting changes in the municipal code.

Green building practices include the design, construction, renovation, and operation and maintenance of a building and its site.

Green building practices include controlling stormwater runoff, energy efficiency for climate control within the building, and selection and use of building materials that are both durable and allow ease of maintenance.

The tool is available at www.epa.gov/region4/recycle/green-building-toolkit.pdf.

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EPA approach to Koppers Superfund site cleanup raises issues with Alachua County officials

By PRAKASH GANDHI

Federal officials unveiled a major new cleanup plan for a large Superfund site near downtown Gainesville in their latest effort to rid the site of years of contamination. But already county environmental officials are expressing concerns about the cleanup effort at the Koppers Superfund site, saying it needs to be tweaked.

"We believe that the U.S. Environmental Protection Agency has made a good attempt at trying to meet the goals of protecting the environment," said Dr. John Mousa, PhD, pollution prevention manager with Alachua County. "But the plan needs some improvement as far as the on-site remedy is concerned."

The Koppers site covers about 140 acres near downtown Gainesville. For decades, the site was home to wood-treating and charcoal production plants.

The property is comprised of two sites: the Koppers portion which covers 90 acres on the western side, and the Cabot Carbon portion covering 50 acres on the eastern side.

A wood-treating operation on the Koppers portion of the site was active for many years. Cabot Carbon formerly operated a charcoal production operation on the Cabot Carbon portion. This part has been redeveloped and currently contains a commercial shopping mall, car dealership and a series of smaller stores and businesses.

In 1984, EPA designated the area as a Superfund site. EPA says that poor waste handling practices of the past contaminated groundwater, soil and, possibly, off-site surface water. Contaminants include arsenic, polycyclic aromatic hydrocarbons and creosote compounds.

Cleanup on the site began in 1985 and is still ongoing.

Two potentially responsible parties are funding the cleanup. Beazer East Inc. is the PRP for the Koppers portion of the site;

Cabot Corp. is the PRP for the Cabot Carbon portion. Both parties have conducted investigations and have completed several cleanup actions.

The latest plan calls for moving the contaminated soil into a containment area of roughly 32 acres. The soil would be contained by a concrete retaining wall eight to 10 feet high and sunk 65 feet into the ground. An impermeable cover would prevent rainfall from spreading the contaminants off site.

Between 190,000 and 290,000 cubic yards of contaminated soil found on and off the site would have to be contained in that area, according to a consultant for the EPA.

Under the plan, the on-site cleanup will cost Beazer East—the Pittsburgh-based company that owns the property—about \$43.7 million.

EPA says it has spent about \$4 million to date on the site. In 2001, the agency developed an amended remedial plan for the site in a draft record of decision that assumed that soil contamination at the site would be prevented from leaching into the Floridan Aquifer.

But later testing confirmed that significant levels of dissolved contaminants had migrated to the deeper zones of the intermediate Hawthorn Group formation and the Floridan Aquifer.

The Floridan serves as the source of drinking water for more than 175,000 people in Alachua County.

"This is a comprehensive remedy for the Koppers property and for the surrounding area," said Scott Miller, EPA's remedial project manager for the site. "It covers the cleanup for soils, sediments, groundwater and surface water. We are very confident this plan will address contamination at the site."

"We believe the plan they have submitted has some shortcomings and we believe it can be improved. We think it needs some additional work."

We are looking at formalizing the record of decision at the end of September."

Other cleanup options considered call for digging down 25 to 65 feet, treating the soil and returning it. That could cost between \$68 million and \$104 million.

John Mousa, PhD
Alachua County

Miller said it will take about a year to complete the remedial design. "After that, we believe it will be 18 months from September 2011 for the site remedial action to be operable."

Alachua County and other agencies have been involved in the plan over the past three years, Miller said.

The biggest issue is the site specific geologic characteristics relating to groundwater.

"We want to address the contamination and also want to preserve the site-specific characteristics," Miller said.

He said there are a number of other Superfund sites where similar cleanups are underway including the former Escambia Wood plant in Pensacola and the Brunswick Wood plant in Georgia.

Mousa said the plan has some parts that the county likes. "In particular, EPA is committed to cleaning up the off-site contamination issues," he said.

The county's main concern is the on-site surface soils mound. "This is of concern to the community, the city, the county and the neighboring residents," Mousa said.

He said the county would like to see more of the contaminated soil removed for off-site disposal rather than covered and left on the property. "We would like to see more of an attempt to take the contamination away from the site rather than consolidate the contaminated soil on-site."

"We believe the plan they have submitted has some shortcomings and we believe it can be improved. We think it needs some additional work," he said. "We believe that EPA's plan meets the requirements of Superfund, but we don't believe the details of the remedy are suitable to the community."

JEA, environmental groups agree to work together to improve sewer issues

By PRAKASH GANDHI

Jacksonville utility officials say they want to work closely with environmental groups to stem a rash of sewer overflows which have plagued the region in recent years. After complaints from the groups, the governing board at JEA has decided to cooperate with environmental activists on ways to improve its operation.

The utility's governing board approved an agreement which gives JEA 90 days to share its plan to reduce sewer overflows.

The utility will also pay up to \$100,000 for consultants to examine the plan closely and advise the activists about any problems.

"We want them to feel comfortable with our programs and we look forward to working with them," said Athena Mann, vice president of environmental services at JEA, whose 3,000 miles of sewer serve about 232,000 homes and businesses.

The settlement resulted from court-ordered mediation. The environmental groups agreed to work with JEA for two years on sewer issues. JEA will also pay \$270,000 to cover legal costs the two environmental groups incurred.

"As far as sanitary sewer overflows are concerned, we believe we have one of the best programs in the state," Mann said. "We have invested more than \$250 million on the rehabilitation of sanitary sewers. We also have a program to reduce nutrients to the St. Johns River."

Three years ago, St. Johns Riverkeeper and The Public Trust Environmental Legal Institute of Florida sued the utility over more than 200 instances of sewer overflows since 2001.

The groups alleged that JEA had repeatedly violated the Clean Water Act through

numerous sanitary sewer overflows from its Buckman and Arlington East wastewater treatment plants.

The groups said water escaping the sewers had polluted about 20 creeks, plus retention ponds and drainage canals around town, in addition to the St. Johns River.

The Riverkeeper's original suit said the releases were "gross violations of water quality standards and pose significant threats to human health, fish and wildlife populations."

The Florida Department of Environmental Protection had already fined JEA for many of the sewer failures listed in the suit.

JEA has stated that the sanitary sewer overflows cited in the lawsuit have been corrected, are not ongoing and have been subject to prior enforcement by DEP.

To date, the JEA has spent more than \$350,000 in legal fees and experts in its defense.

"We believe this agreement represents a mutual understanding with JEA that will help protect the waterways of Northeast Florida," Mann said. "We believe the settlement has a common understanding to continue to improve the health of the St. Johns River."

Scott Kelly, president of water and wastewater systems with JEA, said the utility has 1,270 wastewater pumping station and 3,400 miles of sanitary sewer piping.

"Our sanitary sewer overflow program has been very successful. We have a very comprehensive program," Kelly said. "There has been a dramatic decrease in the number of sanitary sewer overflows."

DEP spokeswoman Jodi Conway said the department was not a party to the law-

JEA
Continued on Page 16

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Friday, October 15

8:00 ASTM Sustainable Remediation Guidelines: A Status Report

Laura Gimpelson, PE, Principal
LG Environmental Engineering, Orlando, FL

Although sustainability is the new buzz word being used to show that businesses care about the environment, there is no single standard defining sustainable remediation practices. Due to public perception of the danger that any amount of a contaminant may present, clean up technologies have been designed and applied to remove the contamination as quickly as possible at any cost. In today's business and political climate, applying any technology to remediate an environmental problem is giving way to designing a sustainable treatment process that will destroy or immobilize the contamination on-site, at a reasonable cost, use minimal resources, and will have little or no adverse impact to the neighboring property owners and current occupants. As of yet, no regulatory agency or third party certifying body has created a set of guidelines defining sustainable remediation. To address this lack of standardization, the U.S. Environmental Protection Agency requested ASTM to develop the "ASTM Green and Sustainable Site Assessment and Cleanup Standard Guidelines". This presentation will cover the content and philosophy of the proposed guidelines, the areas of consensus and disagreements, and proposed time line for approval by ASTM members and the EPA.

8:30 Green Remediation: Performance, Cost and Carbon Footprint Analysis of Chemical Injection Strategies and Implementations in South Florida

Timothy Harman, PE, General Manager
Handex Consulting & Remediation LLC, Delray Beach, FL

Historically, approaches to contaminated site closure in Florida have not fully considered sustainability concepts. Federal, state and local governments are increasingly focusing on sustainability for environmental remediation in their initiatives and policy directives. In this presentation, several chemical injection implementations and case studies in South Florida will be profiled for remediation performance, cost effectiveness

and sustainability metrics. Prevailing contemporary guidance for sustainability metrics include, at a minimum, energy use, air emissions, water impacts, materials use, and land and ecosystem protection. Remediation strategies included chemical oxidation and biostimulation either in conjunction with, or independent of, reagent application for treatment of petroleum hydrocarbon contaminants. The chemical injections were performed within the last five years and in some cases were performed subsequent to conventional remediation strategies, such as air sparging and soil vapor extraction, thereby allowing for site specific comparison of metrics in relation to technology application and performance monitoring. With the benefit of hindsight, an increased awareness of sustainability concepts and the development of green remediation metrics, we can evaluate and quantify the benefits of less intrusive remediation strategies within the current context of overall environmental and economic impacts. While the remediation of contamination is inherently green, through the evaluation of these case studies we will explore just how green purported "green" remediation strategies really are in comparison with conventionally utilized technologies within the context of quantifiable metrics rather than generic qualitative assumptions.

9:00 Quantification of Greenhouse Gas Emissions and Energy Consumption from Remediation Systems

Nick Athens, Co-Founder/Owner
EcoVac Services, Woodstock, GA

Green practices and sustainability concerns are now part of the landscape of environmental remediation as a result of increasing federal mandates, stakeholder concerns and public awareness. Figuring prominently into this analysis are CO₂ emissions and energy consumption, both of which can widely vary among various remedial technologies. Remediation systems are facing increased scrutiny regarding their environmental footprint and the legacy they create. Remediation systems can easily emit millions of pounds of CO₂ while also consuming enormous quantities of natural resources during their life cycles. A calculator is presented allowing quantification of CO₂ emissions and energy consumption from several commonly employed remedial techniques (e.g. dual-phase/multi-phase extraction, air sparging, pump & treat, soil vapor extraction, excavation and three mobile technologies). This calculator differs from, and is intended to be a complement/alternative to, AFCEE's Sustainable Remediation Tool. CO₂ emissions and energy consumption are examined at one site in Newnan, GA, wherein CO₂ emissions were reduced by 60 percent through the deployment of a mobile remediation system. The cost of this mobile system was 40 percent less than the permanent remediation system design originally proposed for this site.

9:30 Maximizing Return on Investment by Implementing Sustainability Concepts in Site Cleanup

William Lais, PE, Senior Engineer
HSW Engineering Inc., Tampa, FL

Green building concepts and low impact development are proving to be successful at reducing construction costs, lowering long-term maintenance requirements and limiting impacts to the environment. These same principles are also proving effective at reducing costs and environmental impacts associated with cleanup activities. The goal for property owners and remedial planners is to select cleanup strategies that maximize the return-on-investment by incorporating sustainability concepts, especially for capital expenditures and power consumption. A decision-making tool that blends cost-saving sustainability concepts with remedial action objectives will be presented. The method is based on actual scenarios and existing guidance offered by various government and private entities on the topic of green and sustainable remediation. The discussion will also bring together practical scenarios encountered during planning and implementation of a project, with the goal of avoiding costly pitfalls associated with ineffective cleanup strategies.

10:00 Morning Break

10:30 A Multi-Pronged Approach to In-Situ Remediation: Distribution and Contact Using Pneumatic Fracturing and Combined Remedies

Scott Pittenger, Project Scientist
AECOM, Orlando, FL

A site near Ocala was the location of a gasoline station dating from the 1940s. Surface sands were found to depths of 30 feet below ground surface, underlain by interbedded clay, silty clay and silts from 30 to 60 feet bgs, with limestone below. Contaminants were locked in very dense clays and silts located at ~30 feet bgs. Baseline total BTEX concentrations were 21,000 ppb. In late 2007, five fracture borings were pre-drilled rotationally, through which pneumatic fracturing tooling was lowered. A total of 221 fractures were emplaced into the very dense clays in radial directions at 1.5 to 2 foot vertical intervals. Fractures were propped open with a uniform grade sand, to offset swelling response of clays. Stainless steel injection points were installed at each fracture boring location to intersect the fractured intervals. Dipotassium phosphate was injected to pre-condition the aquifer pH into an alkaline range and to treat dissolved lead, also present at the site. Alkaline-activated sodium persulfate was then injected into the fracture/injection wells. 34,823 pounds of sodium persulfate at 20 percent/wt solution strength and 9,000 pounds of DKP was applied to the site via the wells. An air sparge/passive soil venting system operated effectively in the underlying limestone unit. Three months post-injection, BTEX reductions range from 60 to 99 percent in nearly all wells following a single injection event. A spike in dissolved VOC concentrations in two wells was also observed. Over 1.5 years of monitoring, concentrations decreased 90 percent or more in all wells within the treatment area. Lead reductions ranged from 15 to 50 percent following DKP injection. This project was the first use of pneumatic soil fracturing in Florida approved for use on a Florida Department of Environmental Protection funded cleanup, and first combination of in-situ chemical oxidation with soil fracturing in Florida.

11:00 Full Scale In-Situ Thermal Remediation Treatment Using Electric Resistance Heating

William Heath, Chief Operating Officer
Current Environmental Solutions, Richland, WA

In-situ thermal treatment utilizing electric resistance heating was selected by the Florida Department of Environmental Protection to remediate volatile organic compounds at a former automotive property in Pensacola. Historically free product was found in association with underground storage tanks near the facility. The primary compounds of concern were benzene, toluene and xylene. According to preliminary data, an estimated 562 pounds of petroleum hydrocarbons were adsorbed or entrained in the soil. CES numerical modeling, based on CES Site Evaluation Test, estimated BTEX mass-in-place of approximately 9003 pounds. The site treatment area was 5,152 feet squared with a shallow treatment depth of 8 feet below grade surface and a deep treatment extent of 25 feet resulting in a treatment volume of 3,625 yard³. The thermal remedy included 29 multi-zone electrode/vent assemblies including provisions for dual-phase vapor extraction wells. Subsurface temperatures were monitored with temperature monitoring wells. Extracted vapors were treated with an electric regenerative thermal oxidizer. Atmospheric discharge was less than 13.7 pounds per day in accordance with Florida air permit requirements. Extracted process condensate was transferred to a granular activated carbon treatment system. An independent lab confirmed that all soil samples were below the cleanup target levels and that the remedial action had satisfied the requirements of the state. A total of 1.24 MW-hours of energy was input to the subsurface. A total of 10,874 pounds of BTEX had been removed from the site over a period of 315 operational days.

11:30 Day Two Luncheon

1:00 Site Remediation Using Horizontal Air Sparge/Soil Vapor Extraction and Multi-Phase Extraction Wells

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Narayanan Raghupathi, PE, Project Manager/Senior Professional Engineer
 MACTEC, Tallahassee, FL
 George Losonsky, PhD, PG, Principal
 Losonsky & Associates Inc., Baton Rouge, LA

MACTEC installed an air sparge/soil vapor extraction and multiple phase extraction system at the Country Corner Shell site under the state Petroleum Preapproval Program. The remedial design called for four horizontal AS wells, paired up with four horizontal SVE wells, to address groundwater plumes migrating in opposite directions from a local groundwater divide beneath the subject site. The horizontal wells were designed to operate in conjunction with a vertical well system comprised of 24 MPE, 19 AS and three SVE wells. Chemicals of concern include included volatile organic compounds, polynuclear aromatic hydrocarbons and total recoverable petroleum hydrocarbons. The goals of the horizontal well design were to develop a complete zone of influence around the horizontal wells, and to remediate the large MTBE plume and prevent its further migration. The design achieves these goals by meeting a series of engineering challenges. It achieves even flow distribution along the entire length of the horizontal well screens, specifies optimal equipment sizing, and defines an appropriate operation and maintenance program. Horizontal AS and SVE were designed for flows from 140 to 250 scfm, and 300 to 600 scfm, respectively. Construction challenges included installing 600 to 800 foot long horizontal wells at depths of up to 49 feet. Concentrations of COCs have declined by 98 to 99 percent over the 42,722 sq. foot plume during the first five quarters of system operation, and they are expected to fall below regulatory limits within two years.

1:30 Case Study: Remediation via Multiple Technologies of Soil and Groundwater Impacted with Chlorinated Solvents

Matthew Gorman, PE, Senior Engineer
 Progressive Engineering & Construction Inc., Tampa, FL

This project included remedial alternatives evaluation, design, construction, O&M and monitoring to address chlorinated solvent impacts to soil and groundwater at a site in Paris, TN. We will discuss project inception to completion from an engineer's point of view, with focus on the successes and pitfalls of the technologies implemented. Confirmatory monitoring was performed to demonstrate compliance with cleanup objectives and we obtained regulatory approval for closure of more than 75 percent of the site in 2005. We then conducted air sparging and soil vapor extraction pilot tests in the remaining areas of concern at the site, and prepared a focused feasibility study and corrective action plan. We implemented the regulatory agency-approved plan on a design/build basis in 2006, at a total cost of \$205,000 including 46 wells, more than 6,000 feet HDPE piping, treatment building and equipment, baseline monitoring, remedy start-up and as-built documentation. The system includes programmable logic controllers and components to manage operation, remote start/stop, alarm notifications, etc. to comply with performance objectives and contingency plan requirements. In August 2008, remediation efforts were enhanced by the installation of 5 injection wells for a chemical oxidation pilot test using sodium permanganate. Additional chemical oxidation events were performed in February and June, 2009, and February, 2010. The design/build and operation of the chemical oxidation system totaled \$60,000. Initial results from post-chemical oxidation monitoring events show about 95 percent reduction in the concentration of contaminants of concern in site groundwater. Based on the success of the chemical oxidation efforts, in January, 2010, the regulatory agency approved shutdown of the AS/SVE systems in favor of implementation of monitored natural attenuation.

2:00 Design and Operation of a Large Air Sparge/Soil Vapor Extraction System in Shallow Soils at a Landfill Superfund Site

Dennis Keane, Project Manager
 XDD, Stratham, NH

An air sparge/soil vapor extraction system was pilot tested, designed, installed and is operating for a volatile organic compound hot-spot of 0.6 acres at a Superfund landfill site. The results of the pilot testing, design and operation relative to site remedial objectives will be presented. For implementation of the AS/SVE remedy, pilot testing and design tasks were completed to determine the distribution of COCs within low permeability refuse materials; the vertical extent treatment interval underlain by interbedded soils; the configuration of a barrier system to a surface drainage feature; a low permeability cap to optimize SVE well configuration; and air dispersion modeling for the SVE discharge design. A total of 134 AS locations were installed 15-foot on center. The main system is pulsed in four equally distributed groupings. Thirty-three SVE wells were installed 30-foot on center, below a low permeability soil cover to optimize treatment of the refuse and collection of sparge vapors. To incorporate sustainable practices the system is operated seasonally. The AS/SVE system removed over eight tons of VOCs in the first five months of operation. Groundwater performance monitoring a month after the first seasonal operation indicated concentration reductions were 75 percent on average with minimal rebound observed after an additional three months. Impacted low permeability materials within the refuse are expected to result in diffusion limited conditions during treatment resulting in a remedial objective to reduce the level of VOCs to concentrations measured in the remainder of the landfill.

2:30 Technical Bases for the ART Technology Success in Treating Petroleum and Chlorinated Compounds, MTBE and 1,4-Dioxane

Mohamed Odah, PhD, PE, Principal Engineer
 Accelerated Remediation Technologies, Inc., Overland Park, KS

Numerous remediation technologies have demonstrated mixed results at reducing contamination in soil and groundwater. A remediation technology that can comprehensively address contamination including BTEX, chlorinated compounds and recalcitrant constituents such as MTBE and 1,4 dioxane is what many sites need. The ART technology is based on verified and established concepts and combines in-situ air stripping, air sparging, soil vapor extraction, enhanced bioremediation/oxidation and subsurface circulation in an innovative wellhead system. The multiple remediation concepts employed by the technology are well suited for recalcitrant compounds because the synergistic systems are attacking contaminants on a number of fronts. The multiple, in-well stripping passes and high air to water ratio achieved in the well are integral to the physical removal of contamination. Concurrently, the subsurface circulation process actively flushes residual contamination from the soil matrix and mobilizes it back to the well for further treatment. In summary, as the physical technologies are flushing and moving contaminants back to the well for stripping, the DO boost is enhancing the bioactivity and oxidizing the contamination. The system is designed to accommodate a four-inch well and is cost effective when compared with other remediation technologies, both as a retrofit of new or existing remediation systems. Additionally, based on typical ART removal rates, long-term costs are expected to be significantly reduced. The in well air-sparging component results in decreased water density, mounding of the water table and a net negative gradient back towards the well and creates the in-well packer component between the lower and upper parts of the screen. Vacuum pressure is applied atop the well point to extract vapor from the unsaturated zone and the well annulus. The negative pressure from the vacuum extraction results in water suction that creates additional water mounding and compounds the net negative gradient towards the well. A submersible pump is placed at the bottom of the well to recirculate water to the top for downward discharge through a spray head. The stripped water cascades down the interior of the well and over the mounded water back in to the aquifer. Enhanced stripping via air sparging near the bottom of the well occurs simultaneously. The technology has been implemented at numerous sites nationwide including industrial laundry facilities, manufacturing plants and gasoline station sites. Dramatic, immediate reduction of contaminant concentrations has occurred at each installation where other, state-of-the-art remediation technologies had fallen short of desired results. Project summaries for the ART technologies performance at petroleum, chlorinated and recalcitrant compounds sites will be presented.

3:00 Afternoon Break

3:30 Passive Remediation: Quantifying Results Using Stochastic Modeling Techniques

Donald Thompson, PG, Principal
 Weibu LLC, Tampa, FL

Sustainability is generally defined as the capacity to endure and has become one of the latest catch-phrases of popular culture. Not surprisingly, the term has migrated into the practice of environmental restoration as it relates to remediation projects. There is little discussion regarding the true cost of sustainable projects and/or whether these projects are truly successful and as such, a quantitative approach was developed to determine the effectiveness of combining: (1) enhancements to a stormwater treatment system, and (2) a passive pump-and-treat groundwater isolation system. Quantitative results of Stochastic groundwater modeling simulations indicate the capture and isolation of a dissolved phase chlorinated solvent plume. These results are enhanced by the establishment of a control elevation for the stormwater pond outlet structures, as well as by consideration of the direct effects of increased evaporative stress within the pond itself. This enhanced evaporative rate is, by default, likely higher than localized evapotranspirative stresses. Therefore, the pond behaves as a groundwater pump-and-treat system that makes no energy demands to conventional power distribution systems. Results of the modeling efforts indicate that the theoretical design for a conjunctive-use treatment pond are successful in isolating the continued migration of a chlorinated solvent plume. To date, a single stormwater facility has been completed and the prescribed groundwater monitoring has been initiated. The goal of the environmental monitoring program is to track the effectiveness of the enhanced stormwater pond to isolate a large dissolved phase plume. These results will provide essential data for the future developments and/or enhancements to similar systems.

4:00 Ex-situ Remediation of MTBE and TBA in Groundwater Using a Fluidized Bed Bioreactor

Joseph O'Connell, ScD, PE, President
 Environmental Resolutions Inc., Lake Forest, CA
 Michael Speivack, PE, Project Manager
 Groundwater & Environmental Services Inc., Ft. Lauderdale, FL

An ex-situ biological treatment process for removing the fuel oxygenates tertiary-butyl alcohol and methyl tertiary-butyl ether from groundwater is being applied at over thirty sites in California, New Hampshire, Maryland and most recently in Florida. The fluidized bed bioreactor designed by ERI has been adapted for use across the country. In New Hampshire, accommodation had to be made for iron and manganese found in the incoming water. A bioreactor in Maryland has processed water containing 10,000 ppb of MTBE and TBA at a rate exceeding 25 gpm to obtain a stream containing less than 10 ppb of MTBE and less than 15 ppb of TBA which was suitable for discharge into a local stream. A bioreactor has been operating at a coastal gas station site in South Florida since 2008. Groundwater concentrations dropped from 300,000 ppb TBA and 1,000 ppb MTBE to monitoring only levels of less than 14,000 ppb TBA and less than 50 ppb MTBE. The concentrations of fuel oxygenates in water exiting the bioreactor have been ND<25 ppb for TBA and <10 ppb for MTBE, which were suitable for reinjection at the site. The presentation describes the bioreactor operating principles, process, equipment and field experiences. Analytical data for the water being treated at the various site are presented, and capital and operating costs are reviewed.

4:30 Case Study of New Dredging Techniques to Cleanup Waterways

Luis Prieto-Portar, PhD, PE, SE, Professor of Civil and Environmental Engineering
 Florida International University, Miami, FL

This paper presents emerging technologies and their application to clean surface waters during the course of maintenance dredging of Florida waterways. The maintenance of over 11,000 miles of rivers and waterways in Florida normally involves the dual tasks of dredging and disposal of the removed sediments. These sensitive environments merit adding a third task: cleansing the surface water and removal of contaminant solids. These solids include the recovery of clean sands, removal of heavy metals, rubbish and other contaminants. New techniques are converting dredging into a bioremediation strategy. A case study of some of these new techniques is presented through the dredging of eight canals of the city of Holmes Beach in Manatee County during the summer of 2009. Although not required by the city, the contractor included the third task of cleansing the surface water and extracting solids from the dredged 6,890 yd³ via a total cleansing system. The system consists of a portable three-stage cleaning process, that cyclones and sieves the influent. Each stage separates increasing finer solids down to particles 37 microns in size. Ninety-five percent of the solids were clean quartz sand, useful for local fills. The effluent was practically clean, with turbidities commonly 25 NTU below baseline. In the few sections that yielded higher turbidities, the effluent was directed to containers where the solids were recovered through flocculants. The paper discusses the use of a compact swinging-ladder dredge, GPS-based software to optimize the dredged profile, solids recovery systems and the flocculation of fines.

5:00 Adjourn Conference

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Study examines rising sea level impacts

Staff report

A new University of Central Florida study will examine how rising sea level could harm estuaries and coastal communities along the Florida Panhandle and Alabama and Mississippi coasts.

The research, led by Scott C. Hagen, associate professor of civil engineering, is a response to scientific studies that show sea level is rising along most of the U.S. coasts.

Hagen's research also could potentially be linked with models of how remaining oil from the Deepwater Horizon/BP oil spill would be expected to travel through and impact sensitive ecosystems.

The areas to be studied are part of the National Oceanic and Atmospheric Administration's National Estuarine Research Reserve System and overlap with the region most directly impacted from the spill.

The UCF-led team has received more than \$725,000 of an anticipated \$3 million, five-year grant funded by NOAA. The project will use computer modeling and simulation techniques to study the long-term impacts of rising sea level, which threatens barrier islands, beaches, wetlands and critical habitats for commercially valuable species such as oysters.

NOAA officials believe these coastal environments will be in jeopardy without changes in coastal resource management and land planning.

JEA

From Page 13
suit between JEA and the St. Johns Riverkeeper.

The department has actively engaged in discussions with JEA to resolve sanitary sewer overflow incidents on a quarterly basis, Conway said.

DEP has also been involved in discussions with JEA regarding their overall sanitary sewer overflow strategy such as the utility's response times during sewer overflow events and the proactive identification and correction of weak or suspect areas in their system.

"The department is optimistic that the utility will continue to make significant improvements to their sanitary sewer system in the future," she said.

PESTICIDE

From Page 5

areas should be tested as well.

While DEP provides homeowners with filters and assists with funding the county connections, the county is undertaking the establishment of a complete database of all properties in the county being served by wells and exactly where they are located.

"This is a GIS sort of undertaking with data crunching that we estimate should be done by September," Espinosa said.

After the database is finished, the county will cooperate with health officials to send informational materials to property owners regarding periodic testing.

The most logical source of the dieldrin contamination is believed to be an insecticide that was used for termite control until federal officials banned it in 1997, Espinosa said.

"When the homes were built back in the 1950s, the practice was to saturate the soil foundation to deal with the termites," he said. "It is a very persistent insecticide that doesn't degrade very well, if at all."

There is no feasible way to get it out of the soil. However, some experts do not believe it to be a significant health risk to residents at the levels that were found.

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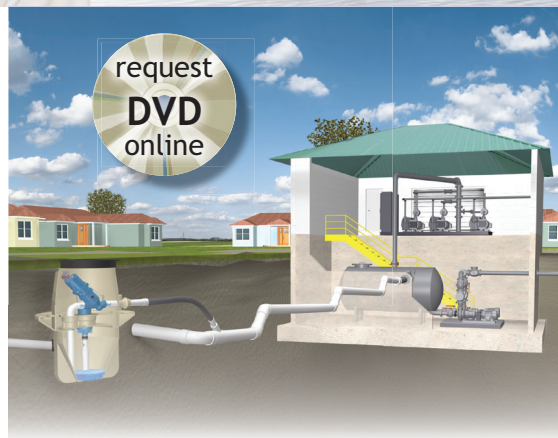
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