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Lab directory 6

Our annual directory of environmental laboratories serving environmental professionals in the state of Florida appears on Pages 6 and 7.

Pensacola landfill 8

An Escambia County Circuit Court judge ruled in favor of the Florida Department of Environmental Protection and Escambia County—and against South Palafox Properties—over cleanup at the now defunct Rolling Hills Construction and Demolition Recycling Center in Pensacola.

Septic-to-sewer project 10

Officials in the city of Vero Beach are working to transition 1,500 property owners from septic tanks to a new lower cost, lower impact centralized sewer collection system.

Fracking bans 13

Dozens of Florida local governments have passed hydraulic fracturing bans within their jurisdictions. We look into what's behind the move to stop fracking before it gets started.

Septic tank waste 19

New rules have eliminated land application of septic tank waste at Florida Department of Health-approved sites. The prohibition went into effect on June 30.

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Got a story lead?

Got an idea for a story? Like to submit a column for consideration? Fire when ready. 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 in Florida. Send to P.O. Box 2175, Goldenrod, FL 32733. Call us at (407) 671-7777; fax us at (407) 671-7757, or email mreast@enviro-net.com.

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Photo by Robert Bolton, city of Vero Beach

Staff from Meeks Plumbing in Vero Beach place a 100-gallon tank in the ground for the city's new STEP system, part of their new pressurized sewage collection system. They are attempting to convert homes and businesses in older neighborhoods from septic tanks to centralized sewer collection by offering incentives. See story on Page 10.

Environmental laboratory sector stable despite pricing pressures, cost increases

By **BLANCHE HARDY, PG**

The market for environmental laboratory services retained its stability and continued to grow this year in step with Florida's overall economic recovery.

Business is increasing at a modest rate for many. But some, like Walter Kronz, vice president of Advanced Environmental Laboratories Inc. in Jacksonville, reported their operations achieved solid increases in revenue this past year. Jennifer Sagan, manager with AMEC Foster Wheeler in Newberry, likewise reported a respectable revenue uptick.

But although the market continued to improve, Florida's environmental labs face uncertainty in a number of areas critical to achieving business success.

The downward—sometimes below-cost—pricing for analytical services and the growing expense of maintaining certification remain the two most significant issues facing labs.

Existing, unadjusted fixed rates for public sector work, a reduction in the required number of analyses for some types of regulatory monitoring, and increases in general operating expenses such as rent and utilities continue to impact lab profitability.

"It's hard to turn a profit," said Diana Magierowski, owner and manager of Palm Beach Environmental Laboratories Inc. in West Palm Beach. "Costs for everything are going up...chemicals, certifications, electricity, site specific QC samples—four are required now. It can be tough."

Pricing pressure

Although most of those interviewed agreed that prices have stabilized, the most frequently expressed complaint of lab officials is price erosion.

"Pricing continues to be highly competitive in most markets and pressure to lower prices continues," said Jefferson Flowers, PhD, president of Flowers Chemical Laboratories Inc. in Altamonte Spring.

"There is still price pressure," agreed Henry Mason, president of Sanders Laboratories in Nokomis. "Af-

ter five, six slow years there should be some comeback. Some of these prices are fifteen years old."

The larger labs persist in being able to operate at a lower cost per sample due to the advantage of high volume turnover.

Ease of access to the fee structures of competing labs, either through the Internet or public records, continues to be a leveling agent for industry pricing.

LABS
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Institute study focuses on impacts of high nitrate levels in aquifer

By **BLANCHE HARDY, PG**

The Howard T. Odum Florida Springs Institute headquartered in Gainesville is collecting, analyzing and publishing nitrate data from a variety of potable groundwater supplies.

The institute is concerned about elevated levels of nitrate in the Floridan Aquifer, the source of more than 1,000 artesian springs in North Florida and principal supply of potable water for the region.

The institute embarked on the water assessment program citing the growing body of medical literature indicating that there may be chronic effects of nitrate at levels at or below those commonly found in community drinking water supplies, including municipalities and in bottled drinking water.

"The Florida Springs Institute is

conducting limited sampling and analysis for nitrate in drinking water, one county at a time," said Robert Knight, PhD, an environmental scientist and founder of the institute.

"In Alachua County, we sampled water from about eight municipal suppliers and from a similar number of bottled spring waters for sale in the county," he said. "We have just completed similar sampling in Marion County and samples are at the laboratory for analysis."

He said testing is lined up for Columbia, Gilchrist, Levy, Suwannee, Citrus and Dixie counties.

"The Florida Department of Environmental Protection keeps a database of nitrate levels in all potable supplies in Florida. We have accessed their his-

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Federal mercury and air toxics rule to remain in effect during court challenge

Staff report

The U.S. Environmental Protection Agency updated its Mercury and Air Toxics Standards rule in late 2014 and since then has faced a stream of legal challenges.

In one of those cases, the Supreme Court required the agency to recalculate risk-to-benefit compliance costs, which were to be reviewed by the U.S. Court of Appeals for the District of Columbia Circuit.

EPA completed the recalculation and submitted results on Apr. 14, 2016.

In the meantime, plaintiffs—a consortium that included 20 states—asked the Supreme Court to overrule the Court of Appeals that refused to issue an enforcement stay until the circuit court rendered its verdict.

Chief Justice Roberts alone made the decision to refuse the appeal without a hearing before the Supreme Court. This leaves the district court's decision not to issue a stay in place while it completes the case review.

The plaintiffs were emboldened to appeal for a stay because the Supreme Court issued such a stay for another of the Obama administration's key air regulations, the Clean Power Plan, which limits greenhouse gas emissions from coal burning power

plants.

The decision, court observers opined, suggests that the Supreme Court intends to stay rules under legal challenge only under very limited circumstances.

The Clean Power Plan rule stay, they suggest, is not a precedent for routinely putting the brakes on EPA regulations under limited review.

In addition, most power plants that would be affected by the MATS rule have already made efforts to comply with it or have switched from coal to other fuels.

The MATS rule will primarily affect coal-burning power plants.

Clean energy program. In related news, the Obama administration's Clean Power Plan is under court review and subject to an unusual enforcement stay following the Supreme Court decision in March.

Nevertheless, the EPA is pushing forward with a voluntary section of the plan, the Clean Energy Incentive Program, or CEIP.

Under CEIP, the agency encourages early investments in zero-emitting renew-

able energy generation and the removal of barriers to investment in energy efficiency in low income communities.

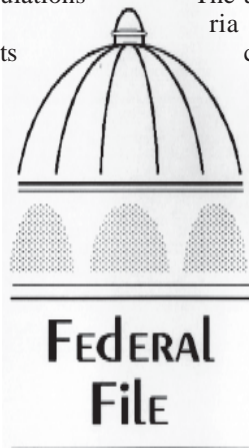
The initial CEIP proposed cost-sharing formulas and energy credit programs as part of the financial incentives to increase voluntary participation.

The updated proposals include criteria for eligible CEIP low income community projects, demand-side energy-efficiency, solar projects, and geothermal and hydropower in low income communities.

The CEIP revision includes a flexible approach for defining low income communities.

The EPA also explained how a matching pool of allowances and emission rate credits equivalent to 300 million short tons of CO2 emissions will be made available to states and tribes that voluntarily participate in the CEIP.

The agency also clarified project eligibility schedules. CEIP renewable energy projects will be eligible for benefits when they begin commercial operation, or when they begin providing power to low income communities on or after Sept. 6, 2018.



The revision clarified the definition of "low-income community." The EPA now allows one of several definitions currently in use by local, state or federal programs that provide assistance to low income communities.

Financial award benefits MICC. The EPA and the U.S. Endowment for Forestry and Communities awarded \$156,000 to the Conservation Foundation of the Gulf Coast for the Myakka Island Conservation Corridor.

The Myakka Island CC is a 110,000-acre assemblage of conservation lands along the central section of the Myakka River. The current grant will help conserve over 8,000 acres that are currently parts of ranches.

The ranches include the Triangle Ranch in Manatee County, the Murphy Marsh adjacent to the Triangle Ranch, the Sheps Island Ranch along the Myakka and the Orange Hammock Ranch, about 75 percent of which is wetlands or within the 100-year floodplain.

These properties will not be purchased, but they will support a funding arrangement that promotes conservation as well as agricultural use of the land.

The grant is part of the Healthy Watershed Consortium Grant made available by the EPA's Office of Water and the endowment.

The Myakka Island Conservation Corridor spans territory between the Myakka River and the Peace River near their mouths into Charlotte Harbor.

Air emissions from Port Everglades. The EPA and Port Everglades in Broward County will team up to study air emissions from port operations.

The EPA's Ports Initiative program will coordinate research and modeling to characterize all port-related operations, technologies and growth scenarios.

The study will also develop separate emission estimates for areas outside the port's jurisdictional boundaries including highways and railways used by port customers.

The purpose of the study is to "inform sustainable development."

Future emission inventories will characterize the port's progress towards the goals developed by the planned collaborative exercise.

The study will also evaluate the effectiveness of technology and operational strategies to reduce emissions at the port and surrounding areas.

Over the past several years of its Port Initiative, EPA has focused on reducing diesel particulate emissions from all sources within the ports' operations and reducing sulfur emissions from ships, whose fuel had high sulfur content until recent regulations specified lower sulfur content.

Port Everglades is one of the top three busiest cruise ports in the world. It is also one of the leading container ports in the country and South Florida's primary seaport for handling petroleum products including gasoline, jet fuel and alternative fuels.

Fracking contamination includes inorganics. An environmental contamination study recently conducted by Duke University investigators characterized persistent and serious contamination from fracking operations.

The research focused primarily on contaminants in flowback water that comes from leaking pipes or on-site holding containers in North Dakota's Bakken Field region.

This water is brine that includes some unrecovered petroleum, as well as a host of other salts that contain radium, selenium, thallium, lead and other contaminants.

In the Bakken Field, more than 9,700 wells have been drilled in the past 10 years and 3,900 brine spills have been reported.

FEDFILE
Continued on Page 19

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Contributing writers and columnists

PRAKASH GANDHI
Senior Environmental Correspondent
Orlando, FL

BLANCHE HARDY, PG
Environmental Correspondent
Sanford, FL

ROY LAUGHLIN
Environmental Correspondent
Rockledge, FL

1,000 Friends seeks to stop express lanes in Tampa Bay

Staff report

1,000 Friends of Florida, a statewide nonprofit organization, asked transportation officials to reject the Tampa Bay Express plan—a system of express toll lanes that would be built alongside existing interstate routes.

Express toll lanes are currently in use elsewhere in the country where they are purported to reduce commute times and relieve traffic congestion.

1,000 Friends sent a letter to the Hillsborough County Metropolitan Planning Organization urging the group to eliminate the plan from its list of annual priorities.

The group is concerned about harm to existing neighborhoods, more sprawl and ineffective reductions in traffic congestion.

The plan is expected to require the demolition of about 100 homes and potentially more than 30 businesses.

FPL plant to be shuttered. Another coal-fired power plant is being phased out by Florida Power & Light.

The 330-megawatt Indiantown Cogeneration Facility is well equipped and well run, but emits high levels of carbon dioxide, according to company officials.

The Florida Public Service Commission approved a power purchase agreement between FPL and the cogeneration facility in 1991 that does not expire until 2025.

FPL said the proposed phase-out may prevent more than 657,000 tons of carbon dioxide emissions annually. The company may run the facility minimally through the end of 2018 as needed.

But utility officials said the plant will no longer be economically viable after a new natural gas pipeline system is built in Florida next year and FPL's natural gas-fired Okeechobee Clean Energy Center starts up in 2019.

The utility has no plans for future use of the Indiantown site.

In August 2015, the company received approval from the PSC to acquire and phase out the 250-megawatt Cedar Bay power plant.

Hotel site contamination. Plans for a new hotel in downtown Bradenton were put on hold when contamination was discovered in the northwest section of the half-acre site.

Officials said the pollution issue will cause only minor delays to the proposal to build a new \$17 million Marriott-owned Spring Hill Suites hotel.

Even though the city is 100 percent responsible for the cleanup, the developer, North Star Lodging and Development, has agreed to provide half the cleanup cost.

Levy nuclear. Duke Energy is set to obtain a federal license to build a new nuclear power plant in Levy County.

In June, the federal Nuclear Regulatory Commission said it had completed a final safety evaluation report for the plant, which could lead to a vote on issuing the license.

Opponents thought they had won the battle against the plant when Duke Energy announced in 2013 it was terminating a construction contract for the plant.

In 2013, Duke announced a revised settlement agreement with the PSC dealing with both the closed nuclear generating unit at the Crystal River power plant and the coal units there, and the proposed nuclear plant in Levy County.

The agreement said that Duke would terminate an engineering and construction contract for the Levy nuclear plant and write-off \$65 million already spent on the project.

But while Duke ended its construction plans at the Levy site, it had not completely dismissed the idea of ever building there.

Duke officials said they expect to receive the license in October. If Duke gets the license, it could pursue construction of the plant any time in the next 20 years.

Duke owns the Levy County site and another site in Cherokee County, SC, and is pursuing licenses at both locations.

Controversial development grinds forward. Orange County officials are moving ahead with a development project despite opposition from dozens of residents.

The 2,800-acre development at Lake Pickett in East Orange County will bring more than 4,000 homes to the area as well as commercial space.

Residents fear it will increase traffic and destroy their rural lifestyle. But those supporting the project said the housing is needed to meet the needs of the growing population.

The developers would be required to contribute millions of dollars for road improvements.

The county still has to adopt the final plans. The next meeting is scheduled for September.

DEP, NAS Jax runway agreement. Florida's environment is benefiting from a partnership between two leading government agencies.

Officials said a partnership agreement between the Florida Department of Environmental Protection and Naval Air Sta-

tion Jacksonville will streamline the regulatory process.

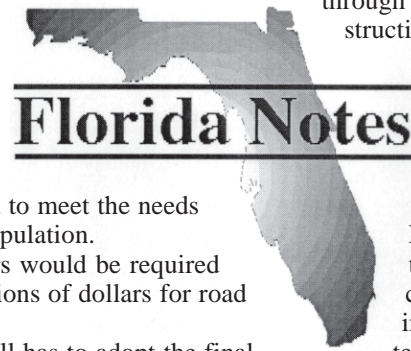
NAS Jacksonville has completed two fixed-wing runways between the St. Johns River and Roosevelt Boulevard.

The Florida Department of Environmental Protection's Northeast District air permitting team worked closely with NAS officials in pre-application meetings through the project's design and construction phases to ensure regulatory compliance and minimize environmental impacts.


This is not the first time the two organizations have worked closely together.

In October 2015, DEP's Northeast District took part in the NAS Jax ribbon-cutting ceremony to mark the state's improvements to its wastewater treatment plant.


Since 2002, the Northeast District has been an active member of the Navy Compliance Partnering Team that meets quarterly to develop and maintain a proactive partnership and find ways to improve compliance, protect public health and improve Florida's environment.




NOTES
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Armstrong promoted to top job at Southwest Florida water district

Staff report

Brian Armstrong, PG, was promoted to executive director of the Southwest Florida Water Management District by its governing board.

Since 2014, Armstrong served as assistant executive director. In this position, he was responsible for the district's operations, maintenance and construction, regulation and resource management divisions.

Prior to his work at the district, he was assistant director for the Florida Department of Environmental Protection, Southwest District. Before that, he was Swiftmud's water supply and resource development manager.

Altogether, he brings 15 years of resource management experience to his new position as executive director.

He holds a bachelor's degree in geology and a master's degree in hydrogeology, both from the University of South Florida. He is a licensed professional geologist.

Armstrong replaces Robert Beltran, who resigned in early June.

Beltran remained with the district for a few weeks following Armstrong's appointment to assist with a smooth transition. He plans to return to private sector employment.

Sarasota water, sewer upgrades. City of Sarasota Utilities Director Mitt Tidwell announced that \$15 million was budgeted to fund more than 20 capital improvement projects for water and sewer systems as well as six new hires within their utilities department.

At the top of the capital improvements list is the problematic Lift Station 87 project. That project, already five years underway, was intended to install a new sewer main to carry about one third of Sarasota's wastewater flow under the Hudson Bayou.

The original tunneling operation ran into unanticipated problems that stalled progress. Later this summer, a new micro-tunneling operation will begin.

The micro-tunneling project will follow the original pipeline path, while intending to avoid the technical difficulties that plagued the first contractor.

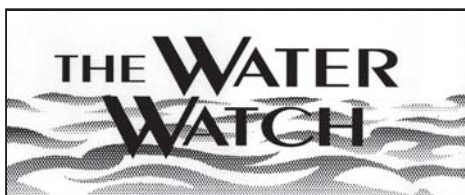
This latest attempt to complete the tunneling project is expected to take 12 to 18 months to complete. Osprey Avenue bridge near U.S. 41 will be closed during the work.

The next phase, which will require at least another two years, involves renovation of the lift station.

The city hopes to begin lift station contractor selection during the first phase, possibly shortening the timeline for the entire project, which may be completed by 2020.

Costs of the revised project are expected to reach \$42 million including the \$10 million already spent on construction that was largely unproductive.

Funding for the new capital improvement projects will come from a contract to sell treated water to the Braden River Utilities in Lakewood Ranch generating \$677,000 in additional annual revenue for Sarasota Utilities.



Batten Island salt marsh restoration. In early July, the Batten Island salt marsh restoration project got underway in North Jacksonville.

Dredge spoil will be removed from six acres of what had once been a salt marsh south of Fort George but was filled several decades ago.

Up to six feet of spoil removal, about 19,000 cubic yards, will lower land elevation to a point where inundation will allow marsh grasses to regrow.

Officials with the Florida Department of Transportation and Department of Environmental Protection hope to restore the acreage to its original condition, improving the local salt marsh ecosystem and bolstering coastal storm surge resiliency in Talbot Island State Park.

A soil-tracking prevention device will be used to restrict spoil migration from the site during the dredging operation. Barriers will be set up to keep gopher tortoises from moving into areas where spoil is being removed.

Project completion is expected this fall. The marsh reconstruction project will cost \$293,000.

Tri-State Water War, continued. For decades, Florida officials have accused the state of Georgia of over consuming water from the Apalachicola-Chattahoochee-Flint River Basin.

In the latest skirmish of the battle, Florida filed suit in U.S. District Court in the District of Columbia hoping to get a settlement that increases water flows into Florida.

That trial was recently scheduled to begin Oct. 31 and could last several weeks.

The case could be settled out of court before the trial begins.

Officials from both states claim they are actively engaged in mediation efforts to avoid a potentially lengthy court hearing and additional legal expenses.

Collier asbestos, iron pipe replacement. This summer, Collier County's water utility began a water pipe replacement project in East Naples, just north of Rattlesnake Hammock Road.

The pipes to be replaced, about 10,000 feet of which contain asbestos, were installed in the 1970s. They have developed leaks sufficient enough to create ongoing problems for more than 100 homes.

Currently, water in the pipeline is tested for asbestos on a monthly basis but none has been detected. Activities associated with repairing or lining asbestos pipes risks releasing asbestos into the water.

Rather than risk asbestos release or do repairs on a case-by-case basis, the county chose to replace the asbestos and iron pipes. This project is expected to cost \$1.4 million.

The Rattlesnake Hammock Road pipe replacement project is part of decades-long effort to replace up to 93 miles of asbestos and iron pipes—about 10 percent of the total Collier County water distribution system—with PVC pipe. PVC has an expected useful life of two to three decades.

The asbestos pipe replacement project began in 2011, when pipes in Naples Park and the Isles of Capri were replaced. Pipe replacement projects in other areas will occur as money is available.

The utility hopes to remove 75 percent of the asbestos-containing pipes over the next decade.

SJRWMD water projects. In mid-June, the St. Johns River Water Management District funded 59 cost-share projects for alternate water supply, water quality improvements, surface water treatment and enhancement, water conservation and flood protection across the district.

The district's governing board approved more than \$30 million in funding for the projects.

The two largest grants in this funding cycle totaled more than \$2,740,000. The smallest was for \$5,000. Most ranged from \$100,000 to \$300,000.

These figures represent only the district's portion of the cost-share. Several of the projects have multimillion dollar total funding costs, including Eustis's Eastern Wastewater Treatment Plant expansion with a total cost of more than \$8,300,000.

In aggregate, the projects are expected to conserve approximately two million gallons of water daily, develop eight million gallons a day of alternate water supplies, and reduce nutrient loading by 151,200 pounds of total nitrogen and 22,400 pounds of total phosphorus per year.

The flood control projects will protect approximately 800 at-risk acres.

The district received 78 applications requesting a total of almost \$40 million. The district ranked the proposals based on core mission benefits, cost-effectiveness, prospects of successful and timely completion, and application quality and completeness.

The funded projects may span a maximum of two years and must begin by June 30, 2017.

St. Johns County reclaim. St. Johns County began operation of its Northwest Water Reclamation Facility West of I-95 on International Golf Parkway.

The new facility can treat up to three million gallons a day of sewage, yielding disinfected water suitable for landscape irrigation. The plant can be expanded in the future to treat up to six mgd.

The plant uses ultraviolet light disinfection instead of the more commonly used chlorine treatment.

Many of this plant's functions are automated, so that it requires only a lead op-

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WATCH
Continued on Page 5

DEP orders FPL to implement solutions to water issues at Turkey Point plant

By **BLANCHE HARDY, PG**

Florida Power and Light estimates their Turkey Point nuclear power generation facility is dumping 600,000 pounds of salt per day from the plant's cooling canals into Florida waters—a condition Administrative Law Judge Bram Canter found untenable and a threat to the potable water supplies of the Florida Keys and Miami-Dade County.

The judge demanded that the Florida Department of Environmental Protection take action to address FPL's contamination earlier this year.

"In June, DEP executed a comprehensive and stringent consent order that requires FPL to implement a range of comprehensive solutions to improve the opera-

WATCH From Page 4

erator and four assistants.

CDM Smith designed the project. Total costs were about \$32 million.

Funding came from DEP's state revolving fund and matching grants from the St. Johns River Water Management District and St. Johns County.

The project was designed in 2008 but construction didn't begin until 2013. Before 2008, several large housing projects were approved but not built before the recession. If and when development returns to Northwest St. Johns County, some of the necessary infrastructure will be now in place.

The new wastewater treatment plant is part of Florida's expanding portfolio of alternative water supply projects.

Sewage overflows in St. Pete. During Tropical Storm Colin's heavy rains, about 10 million gallons of untreated or incompletely treated wastewater from St. Petersburg spilled into Tampa Bay. Last summer, heavy rains caused a spill of 31.5 million gallons of untreated wastewater into the bay.

The problems' cause, according to city officials, is that stormwater infiltration and leakage into the aging sewage collection system during high rains overwhelms the system's treatment capacity, creating the need to release overflow.

In 2011, St. Petersburg also closed one of its four wastewater treatment plants, which may have played a role in the current overflows.

Since the spills last summer, the city began projects to increase pumping capacity into a deep disposal well at its Southwest Wastewater Reclamation Plant near Eckerd College. That well could be used during heavy rainfall events.

Earlier this year, the city announced plans to begin extensive sewage collection system upgrades intended to address infiltration and leakage. The city has also earmarked a million dollars from BP Deepwater Horizon oil spill recovery funds for sewer improvements.

In mid-June, Claude Tankersley, St. Petersburg's public works administrator, received a letter from Mary Yeagan, DEP Southwest District director, requesting a meeting to discuss the discharges and what the city has been doing to resolve the issue. That meeting occurred on June 17.

"DEP is working closely with representatives from the city to resolve the issues that resulted in bypass discharges from their wastewater treatment facilities," said Shannon Herbon, a spokesperson with DEP's Southwest District.

"The city is investing millions of dollars into its sewer lines and overall infrastructure, but these repairs take time," she said, "DEP will continue to work with the city to help avoid these discharges."

St. Petersburg was one of eight cities that reported sewage overflows into Tampa Bay during TS Colin, according to local news reports. Last year, DEP did not investigate any of the spills.

Wastewater treatment plant permits allow overflow spilling to protect human health, Herbon noted.

Capital improvement projects, when

tion of the cooling canals, halt and retract the hypersaline plume caused by the canals, update and expand its monitoring network and perform restoration projects, as well as monitor for and prevent impacts to Biscayne Bay," DEP Spokesperson Dee Ann Miller said.

DEP issued a notice of violation and warning letter to FPL this spring addressing the utility's non-compliance with their National Pollutant Discharge Elimination System permit and the resulting groundwater impacts associated with Turkey Point's cooling canal system.

The FPL permit prohibits violation of minimum water quality standards for groundwater in association with cooling canal discharges.

"This consent order goes above and beyond any of FPL's existing permits or agreements, requiring a suite of actions to occur within specific timeframes," Miller said. "It also includes checkpoints and additional requirements, if necessary, to ensure appropriate progress is being made."

The consent order requires FPL to halt the hypersaline plume caused by its cooling canal system within three years and to retract the plume within 10 years.

The utility is currently constructing a surface water augmentation system designed to withdraw and discharge up to 14 million gallons a day of Floridan Aquifer water into the canals to keep salinity levels in balance with Biscayne Bay.

In addition, as part of a 2015 settlement with Miami Dade County, FPL will drill deep injection wells to discharge hypersaline water into the subsurface.

"The requirement to improve the operation and efficiency of the cooling canal system will benefit groundwater in all directions, including the east," Miller said. "Furthermore, the consent order contains

they are completed, should reduce spillage during high rainfall events.

SJRWMD donates Gemini Springs Addition. In mid-June, the St. Johns River Water Management District's Governing Board approved the donation of the Gemini Springs Addition to Volusia County.

The 947-acre tract, which the district acquired in 1999, is on the northwest corner of Lake Monroe. A multiuse trail connects it with Volusia County's Lake Monroe Park.

The donation comes with prohibitions and restrictions on the use of the property, along with a conservation easement to protect conservation values and to comply with mitigation permit requirements.

Alachua County obtains grants. The Florida Fish and Wildlife Conservation Commission granted \$9,000 to the Alachua County Environmental Protection Department to support the purchase of broadcast television time for a commercial that encourages low water and fertilizer use in landscapes.

The outreach effort also includes social media marketing.

A second grant came from the Florida Department of Environmental Protection and will provide \$105,000 for incentives to participate in the voluntary Florida Water Star Certification Program.

The program pays builders up to \$700 for new residential and commercial properties to get certified by using certain construction practices and water saving appliances.

A third grant came from the Suwannee River and St. Johns River water management districts to fund a rebate program to the tune of \$300,000.

It will provide property owners with a 50-cents-per-square-foot rebate to switch from irrigated turf grass to non-irrigated "Florida friendly" landscaping.

Homeowners who switch to landscaping with correctly installed micro irrigation may receive up to 35-cents-per-square-foot rebates.

The rebates will be available to both residential and commercial properties, with no single rebate to exceed \$2,000. The rebates are expected to be available by the end of this year.

Blue Origin facility gets district approval. The St. Johns River Water Management District gave regulatory staff approval to Blue Origin to build a \$200-million facility for building and launching commercial rockets on a 139-acre property at the Kennedy Space Center.

The permit application outlined 11.76 acres of wetland and surface water impacts.

In its application, Blue Origin provided a 53-acre wetlands mitigation area for the Phase 1 construction plan and for future phases.

Wetland mitigation will provide protection and enhancement of existing wetlands and the creation of compensatory wetland areas.

Blue Origin builds and launches commercial rockets that carry orbital cargo and astronaut missions.

beyond any of FPL's existing permits or agreements, requiring a suite of actions to occur within specific timeframes," Miller said. "It also includes checkpoints and additional requirements, if necessary, to ensure appropriate progress is being made."

The consent order requires FPL to halt the hypersaline plume caused by its cooling canal system within three years and to retract the plume within 10 years.

The utility is currently constructing a surface water augmentation system designed to withdraw and discharge up to 14 million gallons a day of Floridan Aquifer water into the canals to keep salinity levels in balance with Biscayne Bay.

In addition, as part of a 2015 settlement with Miami Dade County, FPL will drill deep injection wells to discharge hypersaline water into the subsurface.

"The requirement to improve the operation and efficiency of the cooling canal system will benefit groundwater in all directions, including the east," Miller said. "Furthermore, the consent order contains

additional monitoring to the east in Biscayne Bay as well as comprehensive analyses of nutrients in and the physical integrity of the canal system.

"These are all designed to ensure that DEP and other agencies possess the information necessary to make informed regulatory decisions and prevent any harm to groundwater and adjacent surface waters, including Biscayne Bay."

The projects include restoring Turtle Point to its previous natural state in order to encourage the viability of marine and plant life in the area.

Some advocates are concerned that the consent order is insufficient or may not produce adequate results within a successful time frame.

"We continue to work with our agency partners including the South Florida Water Management District and Miami-Dade County's Division of Regulatory and Economic Resources to review the effectiveness of proposed technical solutions needed to meet the objectives and requirements of this order," said Miller.

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Environmental Laboratories Serving Florida - 2016

Lab name and contact information	1) Capabilities/specialties, 2) Sample types, 3) FL personnel info, 4) State of incorporation	1) Certs., 2) Add. services, 3) Years in bus., 4) Other locations
Advanced Environmental Laboratories Inc. 6681 Southpoint Parkway Jacksonville, FL 32216 (904) 363-9350 • Fax: (904) 363-9354 Walter Kronz, Vice President wkronz@aellab.com www.aellab.com	1) Six labs across Florida providing a full range of inorganic and organic testing. In-house and in Florida analysis of EPH, VPH, low level mercury and dissolved gases by RSK-175. Ability to run FL-PRO and PAHs in water from one 250 ml bottle. 2) Drinking water, groundwater, wastewater, surface water, soil, sediment, industrial waste, hazardous waste and air 3) Total: 100 Engineers/Scientists: 56 Technicians: 30 4) FL	1) TNI/NELAP, DoD ELAP and ISO 17025 2) SELECT AEL software enabling you to compare lab results to FDEP 62-777 limits, and generate FDEP petroleum summary forms and benzo(a)pyrene conversion tables. Various deliverables including CLP reports, ADR, EQUIS and ADaPT EDDs. Permit to import foreign soils. Courier services throughout Florida. 3) 22 years 4) Altamonte Springs, Gainesville, Miramar, Tallahassee, Tampa
ALS 9143 Philips Hwy., Suite 200 Jacksonville, FL 32256 (904) 739-2277 • Fax: (904) 739-2011 Donna Jackson, Technical Sales Representative donna.jackson@alsglobal.com www.alsglobal.com	1) Environmental testing, NPDES, RCRA, CERCLA, process control, product certification, field sampling, customized electronic data deliverables, CLP like deliverables 2) All matrixes 3) Total: 31 (Jax) Engineers/Scientists: 14 Technicians: 17 4) TX	1) NELAC, DoD ELAP, most SE states 2) Project review and validation, data reviews, method development, information (data) management consulting 3) 29 years
AMEC Foster Wheeler Biology-Toxicology Laboratory 404 S.W. 140th Terrace Newberry, FL 32669 (352) 332-3318 • Fax: (352) 333-6622 Suzy Baird, Laboratory Project Manager suzy.baird@amecfw.com www.amec.com	1) NPDES effluent toxicity testing (chronic and acute); hazardous site sample testing; dredged materials testing; bioaccumulation studies; long term biological oxygen demand (LTBOD) tests; TIEs/TREs; nutrient limitation; macroinvertebrate, ichthyoplankton and algal taxonomy; statistical analyses 2) Salt and fresh water, sediments, soils, biota, polymers 3) Total: 90 Engineers/Scientists: 80 Technicians: 10 (Laboratory technicians, taxonomists, lab QA officer, scientists/engineers) 4) GA	1) NELAC, SC DHEC for taxonomy 2) Ecological and lake management studies, stream condition index assessment, wetlands (restoration, delineation, mitigation) and T&E studies 3) 51 years
BCS Laboratories 4609 NW 6th St., Bldg. A Gainesville, FL 32609 (352) 377-9272 • Fax: (352) 377-5630 Bonnie Mull, MPH, Operations Manager info@microbioservices.com www.microbioservices.com	1) BCS offers a wide range of services including pathogen analysis, detection and enumeration, biosolids pathogen compliance, fecal contamination sourcing, and pathogen reduction and control. 2) All water matrices, wastewater, biosolids, soil and air 3) Total: 10	1) ISO 17025:2005, FLDOH, NELAC/NELAP, TNI, U.S. EPA ERLN, P526 from Animal Health and Plant Inspection Service, CDC ELITE, NELAP IN LA, PA, PR, TX and VA 2) BCS conducts testing to validate filtration process, filter media and pathogen purifier removal efficacy of point-of-use devices under EPA test protocol, Standard NSF 42, NSF 53, NSF P231 and NSF P248 3) 16 years
Benchmark EnviroAnalytical Inc. 1711 12th St. East Palmetto, FL 34221 (941) 723-9986 • Fax: (941) 723-6061 Dr. Dale Dixon, Laboratory Director dale.dixon@benchmarkea.net www.benchmarkea.com	1) Full analytical and sampling services are provided for government agencies, industrial operations and engineering firms 2) Surface water, marine water, groundwater, drinking water, wastewater, sediment and soil 3) Total: 31 Engineers/Scientists: 8 Technicians: 14 4) FL	1) NELAP, MBE, DBE, SBE 2) Courier, field sampling, DIEL studies, project management, custom spreadsheet reporting, ADaPT and STORET reporting 3) 24 years 4) Northport
COLUMBIA Technologies Cocoa Beach, FL (888) 344-2704 • Fax (410) 536-0222 Robert George, Lab Director info@columbiatechnologies.com www.columbiatechnologies.com	1) Certified mobile laboratories specializing in GC/MS 8260 volatiles, 8021 volatiles, BTEX, gas and diesel screening, FLPRO, UVF TPH, XFR, field screening 2) Soil, water, soil gas 3) Total: 12 Engineers/Scientists: 9 Technicians: 1 4) MD	1) Certified: NELAC, DoD ELAP certification, FL, NC and VA. 2) Membrane interface probe (MIP), hydraulic profiling tool (HPT), MiHPT, LIF-UVOST® 3) 17 years 4) Raleigh, NC and Columbia, MD
Diversified Environmental Laboratories Inc. 3653 Regent Blvd., Suite 509 Jacksonville, FL 32224 (904) 807-9625 • Fax (904) 907-9627 Frank Risk, President/Laboratory Director frank.risk@delilab.com www.delilab.com	1) Inorganics, metals, microbiology, petroleum 2) Air, soil, petroleum, bulk, potable water, non-potable water, paint, ice 3) Total: 4 Technicians: 3 4) FL	1) NELAC, TNI 2) Field sampling services for permits, routine sampling or special project sampling 3) 20 years
ESC Lab Sciences 12065 Lebanon Road Mt. Juliet, TN 37122 (941) 525-8577 • Fax (615) 758-5859 Rick Pickett, Florida Sales Representative rpickett@esclabsciences.com www.esclabsciences.com	1) 100,000 sq. ft. facility. On-line web reporting and custom reporting tool allowing one to compare results to regulatory levels. Only Florida lab approved for 3511 (reduced volume sampling) 2) GW, SS, DW, RCRA, UST, air, micro, IH, radiochemistry 3) Total: 302 Engineers/Scientists: 130 Technicians: 75 4) TN	1) DoD-ELAP, NELAP, ISO 2) ESC will reprint COCs and labels, and deliver the kits to your office or site 3) 46 years 4) Lake Worth, Miami, Jacksonville, Orlando, Tampa, Tallahassee, Fort Walton Beach, Pensacola
Florida-Spectrum Env. Services Inc. 1460 W. McNab Rd. Ft. Lauderdale, FL 33309 (954) 978-6400 • Fax: (954) 978-2233 Katherine Kutil, Director of Sales & Marketing kkutil@flenviro.com www.flenviro.com	1) Chemical and biological analyses of a variety of matrices 2) Groundwater, surface water, drinking water, wastewater, saltwater, solid and hazardous wastes, soils, air and petroleum products 3) Total: 54 4) FL	1) NELAP certified, SFWMD SBE certificate 2) Field services, sampling supplies delivery, certified field technicians 3) 43 years 4) Ft. Lauderdale, Okeechobee, Ft. Meade and Lakeland
Flowers Chemical Laboratories Inc. PO Box 150597 Altamonte Springs, FL 32701-0597 (407) 339-5984 • Fax (407) 260-6110 John W. Lindsey, Jr., water/ww analytical June Flowers, environmental analytical Lew Denny, North Florida and Georgia www.flowerslabs.com	1) Full service laboratory analyzing environmental and drinking water parameters. Providing defendable data in organics, inorganics, metals, microbiology and nutrients. ADaPT reporting, field and courier services. PhD chemist on staff. 2) All water matrices, soil, sediment, waste, oil and SPLP/TCLP 3) Total: 49 Engineers/Scientists: 24 Technicians: 25 4) FL	1) Florida DOH NELAC in drinking water, non-potable water, solid and chemical materials categories. 2) EDDs, microbiologicals for routine water and wastewater at four labs in Florida 3) 59 years 4) Port St. Lucie, Madison, Marathon in the Florida Keys
FTS Analytical Services dba XENCO Laboratories 5675 New Tampa Hwy Lakeland, FL 33815 (863) 646-8526 Eduardo Builes, PhD, CEO eb1@xenco.com www.xenco.com	1) All environmental analysis for water, drinking water, soil, hazardous waste and air 2) Water, soil, drinking water, waste and air 3) Total: 30 Engineers/Scientists: NA Technicians: NA 4) FL	1) NELAP, FL DOH, ELAP, MWBE. DOT, MWBE, DoD 2) Mobile on-site lab services 3) 25 years 4) NEW full service laboratory facility is now open, located at 1412 Tech Blvd., Tampa, FL 33619. Additional offices in Orlando, Jacksonville, Lakeland and Tallahassee
Jupiter Environmental Laboratories Inc. 150 Old Dixie Highway Jupiter, FL 33458 (561) 575-0030 • Fax (561) 575-4118 Kacia Baldwin, Client Services www.jupiterlabs.com	1) Full service lab specializing in advanced analytical analysis for both standard EPA methods and emerging research and development methods. Latest GC QQQ & LC MS MS instrumentation for detection of unusual compounds including Sucralose and Acetaminophen, hormones, PFOS, PFOAs, low level pesticides and explosives. Full custom EDD capabilities including ADaPT, Equis and SED. Data review, method development and auditing services available. Forensic analysis, fuel fingerprinting, melamine, food and flavor analysis. 2) Ground water, soil, sediment, waste water, drinking water, food and nutraceuticals 3) Total: 32 Engineers/Scientists: 22 Technicians: 10 4) FL	1) NELAP, DoD, WMBE : State of Florida, SFWMD, Palm Beach County, Tampa Bay 2) Full field capabilities, SW, GW, marina and lake sampling 3) 21 years 4) Tampa, Miami

LABS

From Page 1

Brad Moravec, Gulf Coast region manager of ESC Lab Sciences headquartered in Mt. Juliet, TN, may have said it best when asked about lab prices.

“Yes, I don’t think they can go much lower,” he said.

“Pricing depends on the market segment,” said Dale Dixon, laboratory director for Benchmark EnviroAnalytical Inc. in Palmetto. “Competitive government bids have probably reached bottom, for example, metals analyses for \$30 to \$40.

“There has been some price increase for the most basic lab analyses such as wet chemistry where the reduction in Florida Department of Environmental Protection permit requirements has had the least impact and where some of the increased certification-related costs can be passed on.”

“Pricing seems to have stabilized, but at very aggressive price points,” said AEL’s Kronz. “We didn’t create this environment, but we are somewhat thriving in it.”

Cost increases

The day-to-day costs of running a lab operation continue to increase, primarily due to increases in reagents and expendables, and costs for audits and certifications have accelerated rapidly these past few years.

The laboratory accreditation process, now requiring audits by third party contractors, continues to be a universally criticized factor in running labs.

“The state Department of Health environmental lab certification operation, now located in the Division of Emergency Preparedness & Community Support, appears to have little oversight from the parent division regarding control of certification

fees,” said Dixon. “Certification fees remained constant—even when their inspection staff was eliminated and the inspection costs became (the responsibility of the labs.)”

Another indication of lack of oversight is the absence of economic impact studies for increased lab regulations now before the Florida Legislature.

The new regs will further increase lab costs for rules that may not benefit the clients being monitored, for example, the rule of diminishing returns on ever increasing quality control.

These costs ultimately must be passed on to the taxpayer.

In addition, the DOH lab certification division has been unable to create a cost-competitive third party inspection system.

There are nine approved third party inspection organizations—eight are out-of-

state; only one is in Florida.

In summary, the environmental lab certification process has taken on a life of its own with an overabundance of consultants waiting in the wings for their piece of the pie.

PRP’s influence

Many of the lab reps we interviewed said that they are not participating in the DEP’s Petroleum Restoration Program this year.

Among those who are participating is John Sohl, chief executive officer of Maryland-based COLUMBIA Technologies.

The company reentered to mobile laboratory market last summer through the asset purchases of the KB Labs Inc. in Florida and Sierra Mobile Labs Inc. in

LABS
Continued on Page 12



Environmental Laboratories Serving Florida - 2016

Lab name and contact information	1) Capabilities/specialties, 2) Sample types, 3) FL personnel info, 4) State of incorporation	1) Certs., 2) Add. services, 3) Years in bus., 4) Other locations
Marinco Bioassay Laboratory Inc. 4569 Samuel St. Sarasota, FL 34233 1-800-889-0384 • Fax (941) 922-3874 Jason Weeks, President weeks@biologylab.com www.toxtest.com	1) Acute and chronic NPDES toxicity testing, toxicity identification and reduction evaluations, ion imbalance toxicity studies (MSIIT) 2) Domestic and industrial treated effluents, remediation site discharges, storm-water discharges, reverse osmosis reject, product testing 3) Total: 10 Engineers/Scientists: 4 Technicians: 6	1) NELAP accredited 2) Toxicity consulting, supply high quality bioassay organisms for testing 3) 26 years
Microbial Insights 10515 Research Drive Knoxville, TN 37932 (865) 573-8188 • Fax (865) 573-8133 Dora Taggart, Director dtaggart@microbe.com www.microbe.com	1) Environmental microbiology/biotechnology laboratory specializing in molecular biological tools (DNA & PLFA) such as qPCR quantification of <i>Dehalococcoides</i> 2) Almost any matrix (soil, groundwater, sediment, biofilms, bio-trap samplers, filters) 3) Total: 19 Engineers/Scientists: 6 Technicians: 8 4) TN	1) NA 2) Innovative bio-trap samplers, consulting services and molecular biological analyses 3) 24 years
Pace Analytical Services Inc. 8 East Tower Circle Ormond Beach, FL 32174 (386) 672-5668 • Fax (386) 673-4001 David Chaffman, Sales Manager david.chaffman@pacelabs.com www.pacelabs.com	1) Full drinking water and environmental testing services. Monitoring for CERCLA, RCRA, NPDES, SDWA, UCMR3, RCRA/UST, PFOA, CCR and CWA 2) Drinking water, environmental water, groundwater, surface water, soil, sediment, air, biota 3) Total: 131 4) MN	1) NELAC, NAICS 541380 2) Field sampling, courier services 3) 41 years (six years under same ownership) 4) Labs in Tampa, Ormond Beach, Pompano Beach and Miami Lakes
Palm Beach Environmental Laboratories Inc. 1550 Latham Rd., Suite 2 West Palm Beach, FL 33409 (561) 689-6701 • Fax (561) 689-6702 Diana Magierowski, Marketing/Owner dianam@palmbeachlabs.net	1) Volatiles, semi-volatiles, pesticides, FL PRO, metals by ICP/MS and TCLP/SPLP on both water and soil samples, incremental sampling (ISM) 2) Water, soil 3) Total: 9 Engineers/Scientists: 5 Tech/Admin: 4 4) FL	1) NELAC certified; CSHA certified; SBE for SFWMD, Palm Beach County and city of West Palm Beach; and both SBE and WMBE for Palm Beach schools and the state of Florida Office of Supplier Diversity 2) Field sampling, brownfields, online reporting, ADaPT, custom EDDs 3) 11 years
Phoslabs Environmental Services Inc. 806 W. Beacon Rd. Lakeland, FL 33803 (863) 682-5897 • Fax (863) 683-3279 George A. Fernandez, Vice President georgeaf@phoslab.com www.phoslab.com	1) All environmental analysis - RCRA, NPDES, AdAPT, EDDs. Field/courier services. Inorganics, metals, microbiology and nutrients. Rapid TAT for organics (VOCs, SVOCs, FL PRO, pesticides, PAHs, BTEX, PCBs) and TCLP/SPLP analysis 2) All matrices 3) Total: 17 Engineers/Scientists: 6 Tech/Admin: 6 4) FL	1) NELAC, ISO 17025, MBE, DBS, State of Florida 2) Custom reporting via LIMS and rapid TAT for organics and TCLP/SPLP analysis 3) 50 years
Professional Environmental Testing and Consulting LLC 4650 SW 51st St., Suite 702 Davie, FL 33314 (954) 440-3537 • Fax (754) 223-3874 Carol Vassell Kreitner, Owner/Manager petc702@comcast.net www.petc702.com	1) Water testing (microbiology, wet chemistry) 2) Drinking water, wastewater, groundwater 3) Total: 5 Engineers/Scientists: 1 Tech/Admin: 2 4) FL	1) NELAP, FDOH #E861109, Minority business certification 2) Lab chemical sales - SE FL Coop Bid #14-57 3) 3 years
Sanders Laboratories Inc. 1050 Endeavor Ct. Nokomis, FL 34275 (941) 234-1000 • Fax (941) 484-6774 Jeff Walsh, Operations Manager jeff@sanderslabs.net www.sanderslabs.net	1) Surface water and groundwater monitoring, facility compliance and process control monitoring, ASR, injection well analysis and food microbiology 2) Drinking water, wastewater, groundwater, surface waters, soils and sediments; meat, juice/beverages, seafood, citrus, produce; materials testing; textiles 3) Total: 21 4) FL	1) NELAP: Drinking water, non-potable water, solid and chemical, ISO 17025 for food and mold testing 2) Full field sampling capabilities. Sanders Labs is the only lab in Florida with A2LA/FSMO sampling certification: Certification #3544.02 3) 25 years 4) Two locations: Sarasota and Fort Myers
SGS Accutest 4405 Vineland Rd., Suite C-15 Orlando, FL 32811 (407) 425-6700 • Fax: (407) 425-0702 Rick Watkins, Laboratory Director www.accutest.com	1) Full service laboratory specializing in organics and inorganics by SW-846 Methodology (VOCs, SVOCs, pesticides, herbicides, PCBs, metals, nutrients, etc.) in addition to incremental sample processing (ISM), explosives, perchlorate and PFOAs. 2) Water, soil, air, oil, sediments and wipes 3) Total: 80 4) NJ	1) NELAC, DoD/ISO 17025 and multiple state certifications 2) Electronic data deliverables including ADaPT, EQUIS, ERPIMS, and state forms. LC-QQQ and reduced sample volume via LVI 3) 21 years
TestAmerica Laboratories Inc. 6712 Benjamin Road, Suite 100 Tampa, FL 33634 (813) 885-7427 • Fax (813) 885-7049 Aaron Ben David, Account Executive aaron.bendavid@testamerica.com Rhonda Moll, Account Executive rhonda.moll@testamerica.com www.testamerica.com	1) ADaPT reporting, MADEP VPH/EPH, TPHCWG, ICP/MS, low level mercury, phosphated pesticides by GC/MS, low volume extractions, RSK 175, 1,4-dioxane, ISM protocols, microwave/microextractions, field sampling, 24/7 data access 2) Drinking water, wastewater, groundwater, surface water, stormwater, generic discharge, soil, sediment, solid and liquid wastes, and air testing; textiles 3) Total: 97 (FL) Engineers/Scientists: 35 (FL) Tech/Admin: 35 (FL) 4) DE	1) NELAC, A2LA, LAB, ISO/IEC 17025, DoD ELAP, USDOE, USDA Foreign Soil Permits, USF&W Import License as well as many private audits, approvals and certifications for various industrial oil, gas, chemical, waste and automotive companies 2) EMLabs P&K (a TA company) does asbestos, mold and bacteria analysis. Other TA labs perform radiological dioxins, PFOA/PFOS, Methyl Hg, ISM, LEAF methods, Coal Ash-CCR, air toxics (VI), As & Se speciation, ind. hygiene, explosives, GIS Key, EQUIS, CLP 3) 25 years 4) Labs: Pensacola and Tampa. Services centers: Fort Lauderdale, Orlando, Jacksonville and Tallahassee

Note: All information in this directory was provided by the labs.

Circuit Court judge orders Rolling Hills landfill owner to cleanup site

By PRAKASH GANDHI

State and county environmental officials won a major battle against the operator of a former Panhandle landfill in their efforts to cleanup pollution there.

An Escambia County Circuit Court judge ruled in favor of the Florida Department of Environmental Protection and Escambia County and against South Palafox Properties over cleanup at the now defunct Rolling Hills Construction and Demolition Recycling Center.

Circuit Court Judge John Miller ordered South Palafox to cleanup groundwater contamination at the site, complete construction of the remedial action system in accordance with a DEP-approved action plan, and remediate all surface water quality exceedances to regain compliance with surface water quality criteria.

The company was ordered to comply within 60 days in each case.

Judge Miller's ruling also ordered South Palafox to obtain financial assurances for the cost of the DEP corrective action proposal within 60 days.

DEP said that amount was \$566,325.85 in August, 2013.

The ruling also said that South Palafox must control objectionable odors and pay DEP \$38,000 for civil penalties and costs.

The company is also responsible for monitoring and maintaining the integrity of the facility and for maintaining the stormwater system for five years.

Escambia County officials said in July they are delighted with the outcome of the case.

"This ruling will have a very positive impact on the quality of life for the county residents near the Rolling Hills Landfill who have endured objectionable odors for many years," said Chips Kirschenfeld, director of the county's Natural Resources Management Department.

"The closure plan that will be implemented this fall will help alleviate the hydrogen sulfide odors and enable the local residents to enjoy their yards and outdoor activities once again."

Residents and environmental activists have complained for years about the odor that emanated from the landfill and the pollutants affecting the air and water in the

area.

The county set up air monitors at Rolling Hills that indicated elevated levels of hydrogen sulfide.

In June of 2014, Escambia County's Office of Environmental Enforcement cited the facility for failing to prevent odors and dust from spreading through local neighborhoods.

The following month, DEP revoked Rolling Hills' license, citing eight violations of Florida law.

South Palafox Properties appealed the decision and operated until this May when a special magistrate—acting on behalf of the county—ordered a halt to the flow of debris to the landfill.

DEP later announced that South Palafox chose not to move forward with closure of the landfill.

Kirschenfeld said the judge's ruling sends a strong message to other stakeholders that Escambia County and the state of Florida will pursue all legal avenues to ensure that environmental rules and regulations are followed.

He said the judge's ruling sends a signal that all businesses must operate under

the same rules and that cutting corners to save money at the public's expense is not acceptable.

He added that Escambia County is very optimistic that the judge's ruling will be carried out successfully.

"Working with our partners at the Florida Department of Environmental Protection, Escambia County has successfully pursued the corrective actions that are necessary for the community to prosper environmentally and economically," he said.

Construction should be completed this December to properly cover and close the Rolling Hills landfill.

"What a wonderful Christmas present for the Rolling Hills residents who have endured the environmental problems in their neighborhood for so many years," Kirschenfeld said.

DEP Spokesperson Dee Ann Miller said the department remains committed to upholding Florida's stringent environmental standards and protecting the environment and the health and safety of the state's residents.

"The ruling moves us another step closer to resolving the compliance issues at the Rolling Hills facility," Miller said. "We are focused on moving forward to implement the closure of this site as quickly and carefully as possible."

Fort Meade biosolids processor shuts down

By BLANCHE HARDY, PG

Sebring-based Biosolids Distribution Services announced the closure of their facility in Fort Meade.

The city of Fort Meade and the wastewater sludge processor have been at odds for years over odors and utility rates. Fort Meade billed BDS in excess of \$105,000 prior to the sludge processor's decision to close the plant.

BDS extracts liquid from treated wastewater to produce a material suitable for processing into fertilizer and other products. The residual wastewater is sent to Fort Meade's wastewater treatment plant for processing.

Complaints about the facility's odor have been consistently leveled by citizens in the vicinity of the plant.

The disagreement between the city and BDS resulted in a 2014 lawsuit in which the company filed suit, attempting to prevent the city from closing the business.

The city counter-filed for violation of their land development regulations and for payment for sewer services. A settlement was subsequently negotiated under which BDS could operate at the existing facility until the end of 2016.

But that settlement was short-lived. City wastewater treatment plant operators reported that an increase in the thickness of BDS' wastewater was adversely impacting their treatment plant's operation.

The strain of processing the thicker wastewater was placing a financial burden on the city's wastewater operations. By law, municipal governments cannot operate at a loss in Florida.

To address the change in product and adequately fund the city's wastewater operations, the city commission approved Ordinance 16-06, Industrial Wastewater Rates, in March.

The ordinance created a new industrial waste processing category for customers with an excessive level of solids in their wastewater. BDS was the only customer in the new rate category.

Under the new rate, BDS's average monthly wastewater bill would increase to approximately \$52,000 a month, over three times the previous rate.

BDS sued.

Bartow-based Circuit Judge Keith Spoto ruled in June that the initial 2015 agreement between the city and BDS, which included a negotiated wastewater processing rate, did not assure BDS could hold the city to a locked-in rate.

The Fort Meade facility closure announcement came shortly thereafter.

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Mulligan packs are \$20. You may order these in advance. **The deadline for ordering tournament t-shirts is Sept. 1, 2016.**

Cleanup agreement moves work forward at Pensacola stormwater park

By ROY LAUGHLIN

In 2014, while constructing its 2.75-acre Government Street Regional Stormwater Pond in Corinne Jones Park, city of Pensacola officials discovered a plume of groundwater contamination.

Project engineers proposed dewatering operations prior to excavating to manage the plume that contained permethrin and methoprene contamination.

However when dewatering began, the concentration of these and other contaminants was found to be so high that more aggressive remediation than originally planned was necessary, driving up costs, requiring project redesign and delaying project completion.

The original source of the pesticides was the former site of the Escambia County Mosquito Control Facility on West Romana Street, a block away from the planned park.

The plume's chemicals originated from flooding of an adjacent wastewater treatment plant, since removed, and from flood

NITRATE

From Page 1

torical data to prepare more detailed maps of the distribution of elevated groundwater nitrate levels for a number of counties," he said.

According to the institute, a substantial amount of water in the Floridan Aquifer has been contaminated with nitrate by human activities, including the use fertilizers and wastewater released in areas where the aquifer is most vulnerable.

According to the group, the nitrate concentrations are well above the harmful threshold, 0.35 milligrams per liter, in most of Florida's natural springs.

"Elevated nitrate in drinking water is linked to blue baby syndrome, bladder cancer, thyroid cancer, ovarian cancer and birth defects," Knight said. "The most impacted areas we have observed so far are in regions of high aquifer vulnerability as mapped by the Florida Geological Survey and high agricultural or urban development served by septic tank treatment systems.

"Agricultural hot spots include dairies, chicken farms and intensive row crops but seasonally may also include fertilized pastures. Areas of high septic tank density and in the vicinity of municipal wastewater disposal sites such as rapid infiltration basins and sprayfields often have elevated groundwater nitrate concentrations."

Institute publications indicate elevated groundwater nitrate concentrations are acutely toxic to humans. According to their assessment, nitrate concentrations in drinking water wells are already above the safe drinking water standard of 10 mg/L in some areas of North Florida.

"Decisions about future development will hinge on the availability of water," said Dan Hilliard, president of the Florida Springs Council Inc. "In 2008, the DEP published their Integrated Water Quality Assessment, 305b/303d, for that review cycle and within it was found the assertion that water resources (inland and near shore coastal) contributed over \$600 billion annually to the state's gross product.

"That is not a trifling sum. There is growing evidence that nitrate levels well below EPA drinking water standards exhibit carcinogenic characteristics."

The institute intends to continue the project as long as they have financial support or until DEP or the state Department of Health take it over and make these data readily available to the public.

"It is clear that state regulation has failed us, if for no other reason than the population of impaired waters in the state exceeds 80 percentile," said Hilliard. "Our coastal estuaries are stunningly close to 100 percent impaired."

The data developed regarding the potential adverse impacts of nitrates, he said, is only one component of the process of educating the public and elected officials, and making informed determinations regarding our future.

"Vision is a word that comes to mind," he said.

damage from Hurricane Ivan in 2004.

Since 2005, the former WWTP site has been undergoing cleanup as a brownfield redevelopment site. That work has already cost more than \$1.4 million and is not expected to be completed until 2022.

Escambia County is expected to pay about \$500,000 more to see the project through to completion.

The county's remediation efforts did not extend to the Jones Park site. The new stormwater treatment pond, a block over, is a city of Pensacola project.

Pensacola asked Escambia County to provide \$316,000 to pay the full cost of cleaning up the pesticide plume so that the pond project could be completed. In mid-June, Escambia County commissioners agreed to provide \$200,000, leaving Pensacola with the remaining \$116,000.

Tonya Vaden, marketing coordinator for the city of Pensacola's Parks and Recreation Department, said the city has agreed to pay the \$116,000 and won't have a budget shortfall since the funding is already in place.

Pensacola initiated its pond project with \$2.1 million from a grant provided by the National Fish and Wildlife Foundation intended to improve habitat.

NFWF funded the project because it

will treat stormwater runoff from downtown to Escambia Bay, runoff that currently receives little or no treatment. In addition to that grant, Vaden said that Pensacola will use BP Deepwater Horizon oil spill recovery funds along with city stormwater utility fee revenue to cover the costs.

Initially, Pensacola officials hoped the NFWF would cover the project's entire cost. The city solicited bids three times because the bids received were considered too high.

On the third round, the city awarded the construction contract to Utility Service Company of Gulf Breeze based on a \$3.067 million bid.

When Utility Service discovered the plume's contaminant concentrations were

too high, Pensacola spent another \$375,000 redesigning the plan to reduce the plume's impact.

The Tanyard neighborhood around Pensacola's Corinne Jones Park is rapidly gentrifying. When this project is complete, Pensacola will have a new stormwater pond in a city park with a playground and other amenities.

As part of the park project, updated street drainage will be constructed after the stormwater pond's outfall pipes are put under Government Street to relieve flooding.

With the county agreeing to pay the majority of the remediation effort's cost, the pond project has moved closer to completion, expected to be April, 2017.

U.S. coral reefs facing warming waters

A new NOAA outlook shows that many coral reefs around the world will likely be exposed to higher-than-normal sea temperatures for an unprecedented third year in a row, leading to increased bleaching.

The bleaching event is global, but it will hit the U.S. hard, especially in Hawaii, Guam, the Commonwealth of the Northern Mariana Islands, Florida Keys, U.S. Virgin Islands and Puerto Rico.

NOAA is actively working with coastal resource managers and communities in coral reef areas to provide the best available science and tools to enhance the reef systems.

The agency and its partners are also developing methods to assess the potential resilience of reefs so management officials can target and prioritize local conservation actions.



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Accepted by FDEP for In Situ Application

Vero Beach septic-to-sewer conversion effort gaining traction

By ROY LAUGHLIN

The city of Vero Beach is in the midst of a septic tank-to-sewer conversion effort.

While the newer neighborhoods and subdivisions have central sewer hookups, no ordinance compelled homeowners in older neighborhoods to convert from septic tanks to sewer hookups.

Now, many septic tanks in those older neighborhoods are failing.

Vero Beach officials have installed a new lower cost and lower impact sewer system and, with financial incentives, hope

to convince up to 1,500 property owners to make the change.

Over the past 15 months, the city has installed a sewer system in four barrier island neighborhoods, and three on the mainland within a mile or two of Vero Beach's historic center.

They chose a modern sewage system design, the Septic Tank Effluent Pump, or STEP System, from Orenco, an Oregon-based company with patented technology.

The STEP system uses existing septic tanks if they are not leaking. Property owners need not remove drainfields to install STEP components.

This gives residents options. They can install STEP and keep the drainfield in place for use when prolonged power outages occur, for example, during hurricanes.

For a failed septic tank and drainfield, the property owner can make a complete conversion to STEP, installing a new 1,000-gallon polypropylene holding tank along with the STEP components.

Vero Beach Water and Sewer Director Robert Bolton said that many residents in the community decided to replace their septic system so that they had a whole new system from the start that they could expect would be largely problem-free for years into the future.

The pump in the STEP system is in a 100-300 gallon chamber at the outflow of the septic tank. The septic tank or polypropylene holding tank provides primary treatment of the household sewage, and the pump moves the resulting sewage effluent under pressure through a one-inch pipe into the sewage collection system at the street.

Installation involves pipes, the pump and a power supply to it. Property owners pay electricity charges to operate the pump that pushes effluent to the collection main. The city owns the pumps and is responsible for their maintenance.

The STEP's sewage collection system uses a two-inch pressurized pipe installed with horizontal drilling, a much less intrusive process than trenching to place eight-inch gravity mains.

The price of this system is one factor that makes it attractive. If a new 1,000-gallon septic tank is installed, the STEP system costs about \$7,000 per connection.

But recently-built homes with a usable septic tank incur a STEP installation cost of only \$5,600. That includes the STEP pump plus the plumbing to the collection line on the street.

Installing collection lines on the streets is less expensive for the utility, the biggest cost savings that makes this system so appealing.

Bolton calculated that it would cost less than \$600 per lot to install the pressurized two-inch main for the STEP system. The total cost for construction would be about \$885,000.

Expanding the city's gravity sewer sys-

tem to the same lots would be about \$12,000 per lot for a total of \$18 million for construction of the entire system.

Combining septic tank conversion on private property plus the collection system, the total cost of the conversion would be \$11 million, about half of an estimated \$22.5 million for a gravity system serving residents in those old neighborhoods.

Nevertheless, property owners are still looking at thousands of dollars in conversion costs. To ease sticker shock, Vero Beach offered incentives to convert.

The first, the "STEP Up and Save Credit," offered \$2,290 to offset the wastewater impact fee for new sewer customers. Florida law forbids waiving sewage impact fees, but subsidies are legal. It is a short time offer.

A "Wastewater Utility Extension Credit" of \$1,100 was given to homeowners who paid in full for their STEP package at the time they applied.

Residents also have an option for a 10-year no-interest credit plan that finances the equipment cost. But they don't get the Wastewater Utility Extension Credit if they choose the finance plan.

The city used two grants from the St. Johns River Water Management District to pay for the homeowner incentive programs for early adopters.

Although the city has been vague about the cutoff date, at some point connection to the sewer lines will no longer be subsidized, and residents with failed septic tanks will have to replace the tank and likely connect to sewer.

The city expects that its carrot-and-stick approach will convince many of the eligible 1,500 property owners to sign up.

Sharon Penrose, project coordinator for Vero Beach Sewer and Water, said that as of mid-July, 54 STEP systems have been installed and about 37 more residents have signed contracts with certified installers and are awaiting installation.

Finally, in terms of cost comparisons, Bolton estimated that operation and maintenance costs for the STEP sewer would be \$13.18 per month per connection.

For a traditional gravity sewer, it would be \$12.42 per month per residence, or slightly more per year for the STEP system.

Clean Power Plan could provide significant cost savings for Florida households

Staff report

Without any change in the way we produce and use electricity, Florida households can expect a 16.8 percent increase

in electricity bills over the next 15 years. An even higher increase of 18 percent is projected for households across the nation.

However, a new report by the Georgia Institute of Technology found that by implementing the Clean Power Plan, the average household here could save \$2,615 in electricity costs over the same period.

"I think the real takeaway is that there is a significant dividend for electricity consumers if states embrace energy efficiency and clean energy investments associated with state implementation of the Clean Power Plan," said Dr. Marilyn Brown, the study's author. "Energy efficiency is the key to low cost integration of cleaner energy and for reducing dirty energy sources that are fueling climate change, while significantly benefitting residential consumers, utilities and state policymakers alike."

If Florida's leaders adopt least-cost compliance scenarios, household power bills would see significant savings compared with the projected increases, while at the same time cutting CO2 emissions significantly, said the report.

Utilizing the least-cost compliance scenarios outlined in the study could generate cumulative electricity bill savings of \$23.7 billion in Florida and savings of \$248 billion nationwide.

The study examined the finalized August 2015 Clean Power Plan developed by the U.S. Environmental Protection Agency.

The plan establishes carbon pollution goals for each state, and is projected to achieve a 32 percent cut in U.S. carbon pollution from power plants by 2030 compared with 2005.



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Vanadium mobilization at Southwest Georgia landfill arouses scrutiny by Georgia regulators

By ROY LAUGHLIN

The Georgia Environmental Protection Division is looking closely at vanadium mobilization in the Chesser Island Landfill, near Folkston in Southeast Georgia.

Since about 2012, a single monitoring well on site has shown generally increasing vanadium levels in periodic reporting submitted to the agency.

Vanadium levels are now hovering around 10 parts per billion with recent semi-annual monitoring measurements in the range of 9.5-11 ppb.

The most recently submitted measurement in February of 2016 was 11 ppb. In August 2012, vanadium concentrations were considered background at 3 ppb.

The state of Georgia has no standard for vanadium in groundwater, but environmental watchdogs are concerned about the consistent trend of increasing levels of vanadium in the groundwater.

A letter from EPD Geologist Joshua Frizzell noted that since 2012, semiannual sampling showed "vanadium exhibited a statistically significant increase at a groundwater monitoring well."

The letter requested additional information about any alternative source for the vanadium unrelated to the landfill's disposal and handling practices, if it could be provided, to explain the vanadium in the groundwater.

In the letter, Frizzell rejected the landfill's explanation that vanadium was present at background levels.

However, in subsequent discussions, landfill operators and EPD staffers decided to continue semiannual groundwater and surface water monitoring for the present time.

Jeff Cown, chief of EPD's Land Protection Branch, said that the vanadium reported was in the detection system.

"We do not have any information it has gone off site," he said.

If EPD receives information in the future that vanadium is migrating to groundwater or surface water off-site, the division may prescribe assessment monitoring to determine the spatial profile of vanadium in groundwater at the landfill.

Vanadium's groundwater levels at the Chesser Island Landfill, between 9.5 and 13 ppb, do not raise a red flag with respect to acute toxicity.

Headaches, lung irritation and coughing have been attributed to breathing dust containing vanadium.

Vanadium's long-term sublethal toxicity is poorly characterized. It has no known biological role in human metabolism, yet it is often included in human mineral supplements at levels as high as 12.5 mg per tablet.

The Jacksonville Electric Authority's Northside Generating Station has been sending its coal ash to the Chesser Island Landfill since about 2010. The power plant burns coal and petroleum coke mixed with limestone.

Some of the waste was in a stabilized

form, EZBase, intended to be a topping stabilizer for unpaved roads.

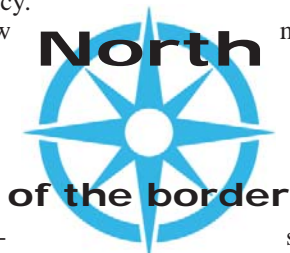
Charlton County had hardened about 20 miles of unpaved road before EPD notified county transportation officials that EZBase had not been permitted for use in Georgia.

Later, a University of Florida study showed that EZBase leached vanadium to wetlands. EZBase may be in use around the landfill. EZBase or the coal ash it is made from could be the landfill's vanadium source.

Cown said his office would like the landfill owners to provide a critical review of operating procedures and facilities at the landfill to determine if the vanadium releases could be due to processes such as gas generation or a leaking liquid waste solidification pit.

He suggested that modifying stormwater runoff diversion on the site may also reduce the groundwater vanadium that is occurring around a single monitoring well at the landfill.

"This is still in the detection and monitoring phase. We're not trying to get them to leave the site," he said.



Sabal Trail pipeline opponents look to Army Corps to stop project

By PRAKASH GANDHI

State environmental officials have again defended their decision to support a controversial natural gas pipeline project that has triggered strong opposition across three states.

Sabal Trail Transmission LLC wants to build and operate a nearly 500-mile-long natural gas pipeline that will run from Alabama through southwest Georgia and then head south to Orlando.

The pipeline would provide an estimated 1.1 billion cubic feet of natural gas daily to Florida markets and would lower energy costs for consumers, according to company officials.

The pipeline, they say, would create thousands of jobs and a new route to supply a steady flow of fuel.

But pipeline opponents fear there could be significant environmental damage from the project.

They note that there are thousands of sinkholes along the proposed route in North Florida and that the sinkholes could have a serious negative impact on pipeline integrity.

Opposition to the project has been led by the WWALS Watershed Coalition.

The Florida Department of Environmental Protection is responsible for reviewing and authorizing the permits necessary for pipeline construction within Florida, which include air construction permits, environmental resource permits and a National Pollutant Discharge Elimination System permit.

The air construction and environmental resource permits have been issued. The NPDES authorizations are in process, according to Florida environmental officials.

The project also requires a permit from the U.S. Army Corps of Engineers. Those opposing the project are asking the corps to investigate whether information about environmental hazards was properly considered during the regulatory process.

U.S. Rep. Sanford D. Bishop Jr., D-GA, urged the corps to perform a site inspection to determine the proximity of active sinkholes and other features of the aquifer and cave systems along the pro-

posed pipeline route.

Bishop is also concerned that the Federal Energy Regulatory Commission may have violated the Clean Water Act by approving the pipeline project before state water quality certifications were issued.

Sabal Trail claims that its examination of environmental risks was thorough and that no new information has been presented that would require additional site inspections.

Florida environmental officials said the project is safe and will not have a serious impact on Florida's fragile ecosystem.

DEP Spokesperson Dee Ann Miller said that, in February, Sabal Trail received

PIPELINE
Continued on Page 20



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Local governments pass fracking bans to protect surface, ground waters

By ROY LAUGHLIN

Dozens of Florida local governments have passed hydraulic fracturing bans over the past several years—somewhat odd because there are no fracked wells here, there have been no recent fracking-related disasters, the state hasn't cut a permit for any kind of an oil well in more than a year and there is no looming prospect of additional oil reserves inside the federal offshore Continental Shelf limits.

Yet in many cases, city and county

commissioners have unanimously passed strict ordinances prohibiting fracking wells, including acid fracking.

What might be behind such a widespread rejection of fracking by local governments? At the local level, where city and county utilities provide drinking water, treat wastewater and reap economic benefits from water-based recreation and agriculture, the prospect of water contamination seems to be the primary motive.

Florida is too dependent on water to risk damaging the aquifer or contaminating surface water resources.

A survey of recent newspaper articles reporting bans gives the impression that local officials and the public behind them are concerned with both aquifer and surface water contamination from fracking chemicals and production water.

Yet, not a single fracked production well now exists in Florida or offshore. The Florida Department of Environmental Protection has approved only one permit for an experimental fracked well. That well is in Collier County near Naples and that project has been abandoned, at least for the time being.

Although Florida's petroleum production potential is at most meager, commercial oil and gas production has been occurring in the state since the mid-1940s.

Florida's current petroleum production is limited to about 161 active wells, generally in two areas.

The Jay Field is in Escambia and Oka-

loosa counties in the far western Panhandle. In South Florida, the Sunniland Trend underlying parts of Collier, Miami-Dade and Broward counties also supports commercial petroleum production.

In the past decade, Florida's crude oil production has meandered between 150,000 to 200,000 barrels a month, with occasional months with much lower production and a few with higher output.

Proponents of oil and gas development point out that tourism in the Panhandle and Southwest Florida has not suffered from oil and gas development. On its own, oil and gas production in Florida is a \$23 billion industry, responsible for 300,000 jobs in the state.

In 2013, at the very end of the recent oil boomlet with the highest oil prices in a

FRACKING
Continued on Page 20

LABS
From Page 7
Ohio.

"Our primary market up to this point has been supporting site assessment and remediation design and optimization of sites impacted by chlorinated solvents," Sohl said. "This includes the state dry cleaning program."

Technology trends

Technology continues to be an essential element of the business and many labs upgraded software systems and added equipment this year including enhancements to their laboratory information management systems.

"We are revamping our LIMS, which will provide us with a more responsive, stable system," said Flowers. "But at the same time, any changes to this integral part of operations has been a big challenge to manage."

Flowers Labs also recently added analysis for fluorometric chlorophyll a, providing low level detection limits for surface water samples.

Sanders Labs also added a new LIMS system and, through the acquisition of Microbac Laboratories, has increased the volume of analyses performed by their food testing division over last year.

Dora Ogles-Taggart, president of Tennessee-based Microbial Insights, noted that their laboratory offers an interesting service twist.

"Most of our work involves using molecular techniques for the evaluation of bioremediation at sites," she said. "However, we have seen an increase in using these tools for the assessment of corrosion in oil and gas systems."

Microbial Insights now offers com-

pound specific isotope analysis and has added a GC-IRMS for use with the CSIA analysis.

AEL added three new GC/MS for volatiles, a new low level Hg analyzer, a new GC for VPH and GRO, and a new IC.

"We've also added RSK175 for dissolved gases, low level Hg, GRO and EPH/VPH," said Kronz. "We are the only lab running all three of these tests in-house in Florida."

"We've also begun running PAHs and FL-PRO from a single 250 ml bottle, so you don't have to fill up liter bottles anymore."

ESC Lab Sciences now does FL-PRO in 100 mL containers—no more 1 liter ambers for groundwater—and now handles radiochemistry. They have also increased their number of GC/MS and ICP-MS to help with demand.

Qualified personnel

While access to qualified personnel was one of last year's bright spots for environmental labs, the ability to find and retain qualified personnel has become an issue this year.

Many of the labs have hired and continue to do so, including AMEC Foster Wheeler which recently brought Morgan Edwards on board as their new laboratory director.

None of the laboratories reported decreases in staff levels and a few remained at a consistent size.

AEL increased its staff by six percent and is still looking for a few key people as is Microbial Insights, who also hired this past year.

"We have brought on approximately 40 new employees," said Moravec.

John Sohl, COLUMBIA Technologies, noted they have also been hiring.

The numbers

Various resources were reviewed to estimate the number and status of laboratories operating in the Florida market.

The Florida Department of Environmental Protection lists 195 fixed commercial NELAP laboratories this year and eight approved mobile laboratories.

A total of 211 commercial, environmental pollution control, utility, university/research, DOH CHD and other laboratories located within Florida are certified and doing business in the state as of July.

Of the 195 commercial labs, 75 are based in Florida, three fewer than last year. An increasing number are "big labs" with 50-100 employees, and a dozen are mid-sized labs.

According to the U.S. Bureau of Labor Statistics, approximately 2,180 chemists are employed within the lab profession in the state.

The lab execs interviewed for this story serve predominately Florida-based clients. A few continue to support federal agency clients, primarily the U.S. Department of Defense, that may provide samples from out of state for analysis.

These estimates provide some perspective on the economic activity associated with Florida's environmental laboratories, a typically overlooked part of Florida's high tech portfolio.

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Technical Session Agenda

Day One, Thursday, Oct. 6, 2016

Opening Session

9:00: **A Word from our Founder**
Nick Albergo, PE, DEE, Senior Engineer, GHD, Tampa

Keynote Address from the Conference Chair

Jim Langenbach, PE, BCEE, Sr. Principal, Geosyntec Consultants, Titusville

9:30: **Notes from the (Brown)Field: Limiting Consultant Exposure to Malpractice Risk at Contaminated Redevelopment Sites**
Michael Goldstein, Esq., Managing Partner
The Goldstein Environmental Law Firm PA, Miami

The dramatic expansion of the brownfields redevelopment marketplace is being driven by large, traditional developers who, even though historically risk averse, are increasingly forced to acquire contaminated sites as a result of a rapidly diminishing inventory of clean land in infill locations. While this creates more financial opportunity for environmental consultants, especially in Florida—one of the top brownfield markets in the country—it also carries significant malpractice risk for environmental professionals that are not familiar with the many ways in which development and construction activities at contaminated redevelopment sites can influence and alter traditional means and methods of conducting site investigations and cleanups. Michael Goldstein, one of the leading brownfield practitioners in the state and an environmental attorney for over 24 years, will analyze where specifically these malpractice risks exist, provide the legal basis for why they exist, present recommendations for minimizing such risk, and suggest strategies for converting such risk into a platform for creating new business opportunity. This presentation will specifically cover those assessment and remediation aspects of Chapter 62-780, Florida Administrative Code; Chapter 24, Miami-Dade County Code; and Chapter 27, Broward County Code, that most commonly impact and influence redevelopment activities at brownfield sites.

10:00 Break

Session 2: Sustained Release Technology Applications

10:30 **CSIA Evaluation of Slow Release Permanganant Cylinders**

Greg Smith, Technical Director, ERM

Yi Wang, PhD, Director

Pace CSIA Center of Excellence, Pittsburgh, PA

An automotive parts manufacturer located in Brazil had experienced releases of tetrachloroethene (PCE) and 1,1,1-trichloroethane to soil and groundwater beneath the plant. The presence of suites of daughter compounds indicated that both biotic and abiotic hydrogenolysis was actively breaking down the contaminants in groundwater. The manufacturing plant is located on saprolite soils overlying bedrock. In-situ permanganate oxidation was the remediation option of choice. Oxidation was applied as a series of injections at two locations between 2006 and 2010.

In 2012, the focus of the remediation changed from groundwater treatment through oxidation at the sources to one focusing on prevention of off-site migration. To this end, the permanganate injections were replaced by Slow Release Permanganate Cylinders. SRPC is $KMnO_4$ encased in paraffin, inserted into conventional monitoring wells. As the paraffin dissolves, $KMnO_4$ is slowly released into the groundwater to oxidize double carbon-bond organic compounds, such as PCE. However, $KMnO_4$ is not a suitable oxidant for single carbon-bond organic compounds, such as TCA. Thus, the breakdown of the ethane and ethene compounds would be the result of more than one mechanism.

Aerobic oxidation and anaerobic degradation can be differentiated by using compound specific isotope analysis for carbon. Helsen, et al., (2007) observed enrichment factors averaging approximately -28‰ for fractionation as a result of permanganate oxidation of PCE, while fractionation during reductive dehalogenation of PCE had been observed by Hunkeler, et al., (2008) to result in enrichment factors of -17.60‰ to -0.5‰.

At the subject industrial site, oxidation had much more negative enrichment factors ranged from -224.84‰ to -58.36‰, while dehalogenation to form TCE from PCE had enrichment factors of -30.21‰ to -4.77‰. With the greater than expected range of isotope enrichment factors, SRPC oxidation was readily discernible from reductive dehalogenation processes. Relict fracture features in the saprolite, representing preferential groundwater flow pathways, made it difficult to confidently determine rates of natural attenuation from the CSIA data set.

11:00 **Controlled Release Environmental Reactants – A Green and Sustainable Approach to In-Situ Remediation**

Lindsay Swearingen, PhD, Managing Partner, Specialty Earth Sciences, New Albany, IN

The environmental science community has a collective interest in identifying viable and sustainable remedial solutions for groundwater contaminant plumes that reduce carbon footprint, minimize waste generation, and limit energy inputs required for remediation implementation, operations and ongoing maintenance. DOE and DOD sites in particular could benefit from greener cleanup technologies, especially in light of future requirements to remediate vast dissolved phase plumes of emerging contaminants of concern such as 1,4-dioxane.

Sustained and controlled release reactant technology involves coating or encapsulating environmental reactant materials to facilitate more efficient and user-friendly in-situ remediation implementation. The result is a passive approach to ground water remediation that addresses the common challenges encountered with traditional liquid injection applications, such as contaminant rebound, plume migration and the need for multiple mobilizations. Rather than pressurized liquid injection, the energy of concentration gradient-driven diffusion as well as natural groundwater movement is used to deliver oxidants in the subsurface over long periods of time.

Sustained and controlled release reactant materials can be applied to the subsurface in a number of forms and methods. Multiple remediation practitioners have applied sustained and controlled-release reactants at sites across the U.S. and Canada. ESTCP Project ER-201324 is currently underway which is a slow-release chemical oxidant field demonstration

Day

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for the remediation of 1,4-dioxane plumes. Site examples will be presented including site selection, implementation design, cost and monitoring data.

11:30 **Highly Successful ERD Pilot via Simple Additive Delivery System Lead to Full-Scale Biostimulation Strategy for Destruction of Residual cVOCs**

Kent Armstrong, President, TerraStryke Products LLC, Andover, NH

A former dry cleaner site experienced chlorinated volatile organic compound impacts to soil and groundwater. Contaminants-of-concern included tetrachloroethylene (PCE) and associated daughter products at concentrations above Ministry of Environmental & Climate Change Table 3 Site Condition Standards.

In October 2011, the consultant of record completed a pilot study evaluating the efficacy of TerraStryke® biostimulant ERDenhanced™ to enhance reductive dechlorination by native microbials under actual biogeochemical conditions.

The amendment was applied via passive release sock deployment units suspended vertically in saturated screened interval of existing two-inch groundwater monitoring well. Four replacement events were performed during evaluation, the last at week 20 of a 26-week evaluation. Baseline monitoring and sampling/analytical testing was performed prior to additive deployment. Four post-deployment performance monitoring/testing events were completed, the final event in week 26.

Pilot results confirmed rapid electron acceptor scavenging, expedited residual mass solubilization, and enhanced cVOC reductive dechlorination by native dehalorespiring bacteria. Specifically, PCE decreased 46.9% by week 8, increased 233.3% in week 14 (additive enhanced co-solvent effect), then decreased 89.6% in week-26. Total cVOCs decreased 49.6%, increased 282.6%, then decreased 77.4%. Parent/parent-daughter molar ratio decreased from 100% to 29.1%, a 70.9% reduction.

Monitoring/geochemical data provided a secondary line of evidence for enhanced reductive dechlorination.

In July 2013, MOECC approved a full-scale strategy combining source and ERDenhanced™ biostimulation. An injection gallery was installed in the excavation footprint. March and July 2014, 990kg and 840kg ERDenhanced™ was gravity fed into gallery using 1,100 liters make-up water. Five rounds of groundwater monitoring/sampling were completed between March 2014 and October 2015. 19-months post deployment, additive influence was observed at MW-2, MW-3, MW-6—15-20 meters downgradient of gallery. PCE decreased 99.9% at MW-2, 95.0% at MW-3, and 97.9% at MW-6. Total cVOC decreased 89.7% at MW-2, 75.8% at MW-3, and 88.1% at MW-6. Molar parent fractions realized were 99.0% at MW-2, 87.7% at MW-3, and 90.0% at MW-6.

12:00 **Day One Luncheon**

Robert Knight, PhD, Director

Howard T. Odum Florida Springs Institute, High Springs

Luncheon Sponsor: **Advanced Environmental Laboratories**

Session 3: Combined Remedies for Enhanced Outcomes

1:30 **Large Diameter Auger Excavation and Enhanced Bioremediation using CHITOREM® at the former Dixie Cleaners in Jacksonville**

Jesse Brown, PE, Associate

Golder Associates Inc., Jacksonville, FL

The former Dixie Cleaners site is located at the north end of Lakeshore Plaza Shopping Center, northeast of the intersection of San Juan Avenue and Blanding Boulevard in Jacksonville, FL. The cleaners occupied the site from 1956 to 1995. Chlorinated solvents were released to the surficial groundwater underneath the dry cleaning building and through the sanitary sewer lift station. A groundwater plume consisting of high tetrachloroethene (PCE) and trichloroethene (TCE) concentrations extended over an area of approximately one acre. The most significant PCE impacts in soils and dense non-aqueous phase liquid were identified at a depth of approximately 18 feet below ground surface, following the contour of the stormwater drain along the northeast corner of the building. It appears that, historically, waste may have been disposed of outside the back door, where it then drained onto the asphalt and into a concrete culvert. The site lithology consists of silty fine grained sand from the surface to a depth of approximately 18 feet bgs, clayey fine grained sand from approximately 18 to 30 feet bgs, limestone from approximately 30 to 32 feet, and a stiff clay unit below 32 feet.

Previous remedial activities conducted at the site included the injection of Hydrogen Release Compound, HRC-X®, and Bio-Dechlor Inoculum. The initial HRC® and HRC-X® treatments were successful in achieving greater than 99 percent mass reduction in the shallow and the deep intervals. However, elevated PCE and TCE concentrations persisted in the intermediate interval located close to the sewer lift station. Golder used an edible oil carbon source, EOS®, below the building along with a shallow source removal to address this area. Golder also injected ammonium bicarbonate in 2006 to raise the pH of the intermediate aquifer. To address the increasing groundwater contaminant concentrations in the shallow and intermediate intervals, an additional injection of EOS® and AquaBupH™ was conducted in 2009. During the injection process an area of DNAPL was identified and further delineated in 2010 along the onsite storm drain at the back of the property. In 2011, Golder developed an interim source removal work plan to address the area of identified DNAPL upon available state funding.

To address the DNAPL source area present along the contour of the stormwater drain, Golder conducted a large diameter auger excavation in January 2016. A total of 18 LDA boreholes were drilled to depths ranging from 17 to 30 bgs. Each borehole was backfilled with flowable fill. Field screening using an organic vapor analyzer was used to assist in segregating excavated soils into roll-off containers for temporary storage. Composite soil samples were collected from each container and submitted to a laboratory for waste characterization purposes. Based on the lab results, a total of 345.19 tons of high level hazardous waste and 61.05 tons of low level hazardous waste was transported to U.S. Ecology's facility in Belleville, MI. A total of 125.15 tons of nonhazardous waste was transported to the Omni Waste facility in St. Cloud, FL.

Injection wells were constructed downgradient of the perimeter LDA boreholes. During their construction, a mixture of gravel and approximately 330 pounds of CHITOREM® was placed around the screened section of each well. CHITOREM® utilizes crushed crustacean shells as a carbon substrate that promotes anaerobic degradation. Following the LDA source removal, the storm drain was replaced and the site was restored to match pre-construction conditions.

Continued on Page 14

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1:50 **A Combined Remedy Approach to Address a Trichloroethene Source Zone at a Legacy Hydraulic Containment Site**

Joseph Bartlett, EI, Env. Engineer, Geosyntec Consultants, Titusville

Historic releases of trichloroethene, TCE, resulted in the contamination of the surficial aquifer at the Precision Fabricating & Cleaning Co. site in Cocoa, FL. Detailed investigations revealed the presence of onsite source areas and an associated downgradient dissolved plume. Remedial measures implemented at the site in 2002 included a hydraulic containment system to provide flux control at the PFC property line with downgradient dissolved plume monitoring.

After successfully operating and optimizing the system for over a decade, a combined remedies approach, which included an enhanced in-situ bioremediation strategy used in conjunction with the existing hydraulic containment system, was prepared with the goal of reducing the onsite TCE source zone and facilitating the accelerated shutdown of the hydraulic containment system.

The bioremediation design was implemented in October 2015 and included injection of Terra System's SRS-FRL® slow release electron donor and SiREM Laboratories KB-1® dechlorinating bacteria in the vicinity of a known release area which had been historically investigated by University of Guelph researchers. Immediately prior to injection activities the hydraulic containment system was shut down. Following an initial five-day shut-down period, the extraction system was restarted and operated for a three-day period with an objective of enhancing electron donor and microbial culture transport and distribution within the treatment area and toward the downgradient recovery wells. Following the transport period, the system was shut down for three months to promote biological degradation processes. The system was then restarted following this period in order to maintain hydraulic containment capabilities.

The combined remedy approach, utilizing the existing hydraulic containment system in conjunction with the focused bioremediation source zone reduction, has proven to be successful in documenting significant ongoing mass reductions. The presentation will provide up-to-date performance monitoring results associated with remedy implementation in addition to strategies and considerations for optimizing existing treatment trains using combined remedy approaches.

2:10 **Combining Adsorption and Bioremediation Technologies for In-Situ Groundwater Remediation**

David Alden, PE, Technical Assoc., Tersus Environmental, Wake Forest, NC

Laboratory studies have shown the potential to treat groundwater in situ by using a mixture of activated carbon, aluminum hydroxide and kaolin clay. This combination of materials can immobilize a range of amphoteric metals and organics, including petroleum hydrocarbon constituents. Combining this formulation with an appropriate mixture of amendments should minimize interventions by incorporating both adsorption and biostimulation techniques to manage groundwater plumes and destroy constituents of concern. Current activities include assessing pilot scale effects and implementation effectiveness.

The presentation will include results and lessons learned from laboratory work and the latest field implementation experiences. This dual function approach, which immediately binds contaminants and provides electron acceptors and micronutrients for biodegradation of organics, may provide both short term risk management and a remediation method for contaminated groundwater.

2:30 **Successfully Integrating Surfactants into ChemOx Technologies**

Dan Socci, CEO, EthicalChem, South Windsor, CT

Use of surfactants in remediation can significantly improve chemical oxidation results when optimally selected and applied based on site conditions. The idea of surfactant use in remediation however is often met with questions, uncertainty, and reluctance due to concerns of contaminant liberation and offsite contaminant mobilization. Drawing from experience optimizing and implementing surfactant enhanced in-situ technologies, Surfactant-enhanced In-Situ Chemical Oxidation® and Surfactant Enhanced Product Recovery™, with data points from a successful coal tar clean up in the New York City area and a petroleum LNAPL site in Texas as well as laboratory data, this presentation provides guidance on surfactant application, and addresses the most common concerns regarding this remedial option while also presenting its advantages. Information will be presented based on site experience as well as laboratory data that addresses many frequently asked questions about surfactant use with oxidants in remediation. Case studies will be presented, demonstrating S-ISCO remedies can achieve complete or near complete contamination removal, eliminating rebound and the need for follow-up treatments.

2:50 **A Multi-Site Performance Review of Slow Release Electron Donor and Bioaugmentation Co-Application Strategy**

Steven Sittler, PG, Senior Project Mgr., KERAMIDA Inc, Indianapolis, IN

This presentation will include performance data and cost analysis from multiple commercial sites throughout Indiana in which an electron donor and bioaugmentation co-application strategy was successfully implemented. As part of the multi-site review, a discussion on the consistent strategy for success which was implemented at these sites will be shared with the audience. Site challenges, conceptual site model development, baseline analysis and design and implementation of this electron donor/bioaugmentation co-application strategy will be discussed in detail. Site specific comparisons between the co-application strategy and separate injections will be presented. In a few examples, a combined remedies approach involving in-situ chemical oxidation followed by the electron donor/bioaugmentation strategy will be highlighted as well.

In recent years, technological advancements have allowed for a transition towards a co-application of controlled-release electron donors and bioaugmentation cultures of dehalococoides, DHC. These advancements, such as pH neutral electron donors and a better understanding of the viability of DHC in this environment have allowed many to move away from the old way of thinking of waiting to bioaugment. The result is a more aggressive approach with a significant increase in enhanced reductive dechlorination rates. Data suggests that this co-application approach can rapidly reduce PCE/TCE concentrations in groundwater followed by short-term increases in daughter products—cis-1, 2-dichloroethene, trans-1, 2-dichloroethene, and vinyl chloride. Sustained reductive dechlorination as a result of the slow release electron donor along with the increased degradation rates afforded by direct injection of a microbial culture are leading to complete degradation of the target constituents, thereby facilitating closure following the post-injection monitoring period.

The rapid success of this strategy will be highlighted in multiple data sets showing complete PCE/TCE reduction within three to 12 months with daughter products persisting for three to six months in most cases. Long term performance data showing sustained reduction of daughter products will also be presented. A lessons learned section will also be presented in which the need for small focused, supplemental injections was implemented quickly to minimize the time to cleanup goal attainment and avoid unnecessary monitoring. In conclusion, a comprehensive cost analysis with comparison to other traditional remediation technologies will be presented.

3:10 **Combining Technologies to Reach Site Closure**

Emily Crownover, PhD, R&D Engineer, TRS Group Inc., Longview, WA

Electrical resistance heating is a well-established, robust and rapid remediation technology. Primarily due to cost considerations, remediation practitioners generally apply ERH in the source zone to volatilize and treat volatile organic compounds. As ERH can maintain fairly uniform temperatures in the subsurface and as elevated temperatures increase reaction rates, there has been significant interest in applying ERH at a reduced cost to provide a plume-wide solution.

Moderately increasing temperature, 20-30 degrees Celsius, the subsurface matrix will increase biotic and abiotic reaction rates and will increase the dissolution rates of sorbed contaminants and non-aqueous phase liquids, making them bio-available. Field results, as

well as published research, elucidate the production of short-chain, volatile fatty acids from the naturally occurring organic, non-soluble carbon already distributed throughout the treatment volume. The newly formed, dissolved organic carbon provides electron donors, supporting the biodegradation of chlorinated volatile organic compounds. Further, elevated temperatures help create redox conditions appropriate for anaerobic biodegradation. Keeping temperatures below those that produce steam eliminates the need for vapor capture and treatment, substantially reducing costs.

This strategy is currently being applied at an EPA Superfund site and data will be presented along with the principals of heat enhanced plume attenuation.

3:30 Break

Concurrent Sessions

Session 4A: New for 2016 - "Speed Talks" New Products and New Approaches to Product Delivery

- 4:00 1) **Electrokinetic Enhanced Bioremediation to Effectively Deliver Amendments to Low Permeability Materials at a Florida DNAPL Site**
Jeff Roberts, Senior Manager, SiREM, Guelph, ON, Canada
- 2) **Replaceable Treatment Cartridges for Groundwater Remediation**
W. Joseph Alexander, PG, Principal, Ai-Remedial Systems LLC, Chapel Hill, NC
- 3) **Materials and Methods to Address Contaminated Ground Water to Surface Water Interaction: Case studies of sites with petroleum, PCBs, DNAPLs and LNAPLs, chlorinated solvents, arsenic and other contaminants.**
John Collins, COO/General Manager, AquaBlok, Toledo, OH
- 4) **Overburden and Bedrock Remediation Using BOS 200® at Former Retail Petroleum Sites**
Mike Mazzaresse, Senior Engineer, AST Environmental Inc., Golden, CO
- 5) **Combining In-Situ Remediation Technologies to Achieve Site-Specific Standards**
Stephanie Turkot, Asst. Proj. Mgr., Geo-Cleanse International Inc., Matawan, NJ
- 6) **Using Klozur® KP (Potassium Persulfate) as an Extended Release Oxidant and Permeable Reactive Barrier**
Brant Smith, PhD, Technical Applications Mgr., PeroxyChem, Philadelphia, PA
- 7) **Controlled Discrete Treatment Using Horizontal Well Systems Under Tanks, Roads, Utilities, Buildings and Non-Responsible Owner Properties**
Lance Robinson, PE, Principal Research and Design Eng., EN Rx Inc., Parrish, FL
- 8) **Horizontal Directional Drilling and Well Installation at Small Sites**
David Bardsley, PE, BD Manager, Directed Technologies Drilling, Bellefonte, PA

Session 4B: Petroleum Cleanup— When You Can't "Risk" it Away

4:00 Multi-Phase Extraction with Enhanced Biostimulation Demonstrates Contaminant Reduction at Petroleum Site

Matthew Crews, PE, Sr. Project Eng., Golder Associates Inc., Jacksonville

Multi-phase extraction with enhanced biostimulation using an oxygen injection system has been used to remediate a NAPL and dissolved-phase petroleum contaminant plume that has migrated offsite over 200 feet towards a residential area in Springer, NM. The MPE system was set to maximize NAPL recovery, minimize groundwater extraction and maintain the groundwater elevation during high vacuum MPE. The oxygen injection system is cycled to run concurrently with the MPE system, but within opposite areas of the site, such that oxygen has sufficient time to diffuse into the groundwater. Higher dissolved oxygen concentrations provide a concentration gradient to diffuse oxygen into small pore spaces. The result is the biodegradation of contaminant mass that would otherwise be unavailable for biodegradation or removal by extraction or volatilization methods. Because the resultant oxygen supply is greater than the total oxygen demand, this system creates the desired aerobic conditions for indigenous bacteria to break down hydrocarbons for a more efficient cleanup of the site.

After eight quarters of operation, approximately 54,000 pounds of petroleum contaminants have been removed, constituting approximately 97% of the mass in place Golder estimated prior to remedial action implementation. Enhanced biodegradation is estimated to account for approximately 53% of the total mass of hydrocarbons removed at the site to date. NAPL was effectively removed during the first six months of operation. Dissolved-phase contaminant concentrations have declined to levels near or below applicable cleanup target levels onsite and offsite, with the exception of residual contamination present below an active dispenser island.

4:20 From Injection to In-Situ Soil Blending; Switching Application Technology Mid-Remediation

Brantley Rudd, Vice President, Exo Tech Inc., Monroe, GA

Petroleum constituent contamination in groundwater was discovered at a state reimbursable site in Chatham County, GA, in 1995. Throughout the site history, a total of 12 monitoring wells were installed on site. Light non-aqueous phase liquid was discovered in only one well. The initial remedial approach was to perform an enhanced fluid recovery event to remove the free product and continue monitoring the remaining wells for free product. Following the extraction event, the LNAPL was removed and was not detected in the other wells. Exo Tech was contracted to reduce the dissolved BTEX that was present in four monitoring wells. Prior to the implementation of any remedial activities, the UST's were abandoned and removed from the site. The initial approach defined by Exo Tech consisted of installing 56 one-inch injection wells. Two subsequent injections would follow the installation of the wells. The first injection would consist of catalyzed hydrogen peroxide to desorb an LNAPL mass that was sorbed in the soil matrix. The second injection would consist of sodium persulfate to treat the dissolved phase over a longer period of time.

In February 2014, Exo Tech installed 56 injection wells. The injection wells were installed to an approximate depth of 15 feet bgs. During the installation of the injection wells, LNAPL was discovered in an area that has historically never exhibited LNAPL. It was determined to continue with the injection of CHP but to focus the efforts in the area of the LNAPL. Two consecutive injections of CHP occurred on-site. The CHP injections consisted of mixing a 7% solution and injecting it in the LNAPL area. After the second injection it appeared that there was more LNAPL sorbed in the soil matrix than anticipated. It was determined to evaluate our approach and find a more economical way to introduce the oxidant. With the amount of LNAPL that was assumed to be present and with the site availability, it was determined to perform in-situ blending to introduce the CHP. An area of approximately 1,950 square feet was delineated. This area covered the assumed LNAPL area and some areas of high dissolved. The blending was performed by first removing approximately five feet of overburden. After reaching the impacted zone, the iron activator was blended into the soils. While the iron was being introduced, the hydrogen peroxide was being prepared. The hydrogen peroxide was dissolved to an approximate ratio of 12.5% and pumped into the excavation where it was blended thoroughly until a complete homogenous mixture was achieved. Backfilling was performed concurrently and Exo Tech demobilized.

Following the CHP blending treatment, the site was allowed to rest and the groundwater was allowed to return to background elevation. Sampling events were performed on a quarterly basis. No presence of LNAPL was detected on site and a no further action was granted.

4:40 Life Cycle Risk Management: A Strategic Approach for Focused LNAPL Remediation

Manivannan Nagaiah, PE, Project Engineer, Langan, Fort Lauderdale

Remediation of light non-aqueous phase liquid to the "maximum extent practicable" at sites both large and small can often be associated with high costs and uncertain timelines.

Continued on Page 16

Calendar

August

AUG. 2-5 – Course: Water Class C Certification Review, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 2-4 – Course: Introduction to Electrical Maintenance, Ft. Walton Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 2-3 – Course: Pumping Systems Operation Maintenance, Ft. Walton Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 4 – Course: Introduction to Lift Station Maintenance, Ft. Walton Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 4-5 – Course: Backflow Prevention Recertification Exam, Jacksonville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 4-5 – Meeting: Annual Meeting of the Florida Section of the American Water Resources Association, Key Largo, FL. Visit www.awraflorida.org.

AUG. 4-6 – Conference: Florida Engineering Society Annual Conference, Ponte Vedra Beach, FL. Call (850) 224-7121 or visit www.fleng.org.

AUG. 5 – Course: Water Distribution Systems Pipes and Valves, Ft. Walton Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 6-7 – Course: Backflow Prevention Recertification Exam, Bradenton, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 8-11 – Course: Backflow Prevention Assembly Tester Training and Certification, Tallahassee, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 8-12 – Course: Backflow Prevention Assembly Tester Training and Certification, Destin, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 9 – Course: Asbestos Refresher: Inspector, Ft. Walton Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 9 – Course: Asbestos Refresher: Management Planner, Ft. Walton Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 10 – Course: Asbestos Refresher: Contractor/Supervisor, Ft. Walton Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 11-12 – Course: Backflow Prevention Recertification Exam, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 15-19 – Course: Water Class A Certification Review, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 16-17 – Course: Refresher Training for Experienced Solid Waste Operators- 16 Hour, Davie, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 16-18 – Course: Initial Training for Operators of Landfills and Waste Processing Facilities, Davie, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

AUG. 16 – Course: Refresher Training for Experienced Solid Waste Operators and Spotters- 4 Hour, Davie, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 16 – Course: Refresher Training for Experienced Solid Waste Operators -8 Hour, Davie, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 16 – Course: Initial Training Course for Spotters at Landfills, C&D Sites and Transfer Stations - 8 Hour, Davie, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 16-17 – Course: Initial Training for Transfer Station Operators and Materials Recovery Facilities, Davie, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

AUG. 16-18 – Course: Initial Training for Operators of Landfills and C&D Sites, Davie, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 16-19 – Course: Water Class B Certification Review, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 17-19 – Symposium: 2016 Summer Symposium of the Florida Local Environmental Regulators Association, St. Augustine, FL. Call (248) 933-1069 or visit www.flera.org.

AUG. 17-19 – Symposium: 2016 Summer Symposium of the Florida Local Environmental Regulators Association, St. Augustine, FL. Call (248) 933-1069 or visit www.flera.org.

AUG. 18 – Workshop: Conducting GPS Tree Inventories, Davie, FL. Presented by the Florida Urban Forestry Council and the South Florida Association of Environmental Professionals. Visit www.sfaep.org.

AUG. 20-21 – Course: Backflow Prevention Recertification Exam, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 22-25 – Conference: 54th Annual WASTECON Conference, Indianapolis, IN. Presented by the Solid Waste Association of North America. Call 1-800-467-9262 or visit www.swana.org.

AUG. 23-25 – Course: Microbiology of Activated Sludge, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 29 - SEPT. 1 – Course: Water Distribution Systems Operator Level 2 & 3 Training, Kissimmee, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

AUG. 30 - SEPT. 1 – Conference: The Resource Recycling Conference: Where the Industry Evolves, New Orleans, LA. Visit rrconference.com.

September

SEPT. 1-2 – Workshop: FL ADaPT 2-Day Training Workshop, Royal Palm Beach, FL. Presented by LDCFL Inc. Call (561) 753-0483, e-mail ckatsikis@ldcfl.com, or visit www.ldcfl.com.

SEPT. 6-9 – Conference: 2016 Annual Conference of the Florida Chapter of the American Planning Association, Tampa, FL. Call (850) 201-3272 or visit www.floridaplanning.org.

SEPT. 9 – Expo: Region V Ninth Annual Water & Wastewater Expo, Fort Myers, FL. Presented by the Florida Section of the American Water Works Association. Call (407) 957-8448 or visit www.fsawwa.org.

SEPT. 9-10 – Exam: Backflow Prevention Recertification Exam, Ft. Myers, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 10 – Meeting: Quarterly Membership Meeting of the Florida Ground Water Association, Jupiter, FL. Call (850) 205-5641 or visit www.fgwa.org.

SEPT. 10-18 – Course: Backflow Prevention Assembly Tester Training and Certification, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 10-11 – Exam: Backflow Prevention Recertification Exam, Bradenton, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 11-14 – Symposium: 31st Annual WaterReuse Symposium, Tampa, FL. Call (703) 548-0880 or visit waterreuse.org.

SEPT. 12-13 – Exam: Backflow Prevention Recertification Exam, Lake Buena Vista, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 10-18 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, Altamonte Springs, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 12 – Course: Asbestos Refresher: Project Design, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

SEPT. 12-16 – Course: Backflow Prevention Assembly Tester Training and Certification, Gainesville, FL.

Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 12-13 – Course: Pumping Systems Operation and Maintenance, Orlando, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

SEPT. 13 – Course: Asbestos Refresher: Inspector, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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SEPT. 14-16 – 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. 14 – 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. 19-23 – Course: Backflow Prevention Assembly Tester Training and Certification, West Palm Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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Sept. 12-13, 2016 - Lake Buena Vista

Backflow Prevention Assembly Tester Training & Certification (Two consecutive Fri. & Sat.)
Sept. 10-18, 2016 - Tampa (Sat. & Sun.)
Sept. 12-16, 2016 - Gainesville
Sept. 19-23, 2016 - West Palm Beach

Backflow Prevention Assembly Repair & Maintenance Training & Certification
Sept. 12-14, 2016 - Altamonte Springs
Sept. 14-16, 2016 - Lake Buena Vista
Sept. 16-17, 2016 - Venice
Sept. 19-21, 2016 - Gainesville

40-Hour OSHA HAZWOPER Training Course
Sept. 26-30, 2016 - Gainesville

24-Hour OSHA HAZWOPER Training Course
Sept. 28-30, 2016 - Gainesville

8-Hour OSHA HAZWOPER Annual Refresher
Sept. 28, 2016 - Gainesville

Initial and Refresher Solid Waste Courses
Sept. 20-22, 2016 - Plant City

Pumping Systems Operation & Maintenance
Sept. 12-13, 2016 - Orlando

Water Reclamation & Treatment Processes
Sept. 29-30, 2016 - Gainesville

Asbestos Refresher: Project Design
Sept. 12, 2016 - Gainesville

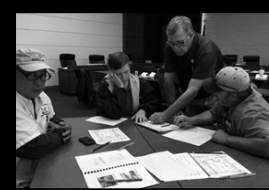
Asbestos Refresher: Inspector
Sept. 13, 2016 - Gainesville

Asbestos Refresher: Management Planner
Sept. 13, 2016 - Gainesville

Asbestos Refresher: Contractor/Supervisor
Sept. 14, 2016 - Gainesville

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This presentation describes the application of a risk-based, strategic approach for focused LNAPL recovery at a 70-acre asphalt refinery in Savannah, GA. This approach is centered on the development of a robust conceptual site model and recoverability analysis through testing and evaluation of LNAPL transmissivity. Site-wide LNAPL accumulations resulting from historical releases exist in a complex geologic setting adjoining the Savannah River.


We initially developed an LNAPL conceptual site model based on prior activities and in consideration of existing and potential sources, pathways and receptors. Our evaluation of the LCSM identified data gaps to be addressed and led to implementation of LNAPL recoverability testing utilizing vacuum extraction and baildown test methods. We subsequently conducted pilot testing to further evaluate remedial technologies including multi-phase extraction and LNAPL skimming.

Based on the investigation and testing findings, we defined priority areas for remediation on a site-wide basis that align with the refinery goals and objectives. We developed a focused and phased recovery program that provides flexibility for remediation of LNAPL toward attainable end-points and is consistent with the Georgia Environmental Protection Division Voluntary Remediation Program.

The program's streamlined approach allows for continuing operations and site redevelopment as well as a significant savings to the refinery. The LNAPL recovery program is designed to provide flexibility, efficiency and responsiveness to address existing product, and to re-assess recovery needs based on delineation, monitoring, data evaluation and performance assessments. The recovery approaches were proposed using available infrastructure and off-the-shelf equipment and systems, resulting in cost savings.

The proposed five-year program has been approved by the Georgia EPD, and recovery implementation efforts are ongoing. In describing the program components, we will also present a brief overview of the ongoing investigation and site remediation activities.

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FLORIDA REMEDIATION CONFERENCE

Day Two, Friday, Oct. 7, 2016

Day
2

Concurrent Sessions

Session 5A: Enhancing Your Foundation for Remedial Success

9:00 **Innovative Use of Technology at Former NAS Cecil Field, Jacksonville**
Kara F. Wimble, Project Manager EnSafe Inc., Jacksonville
EnSafe is conducting long-term monitoring at former NAS Cecil Field in Jacksonville and maximized multiple technological applications to optimize field and associated reporting activities. EnSafe's innovative use of technology minimized limitations on current property owners so they could further develop and manage the sites for reuse as an industrial park and aviation center.

We incorporated an innovative application of existing technology to setup a Microsoft Office365 SharePoint website for the geographically-dispersed Cecil Field Team to collaborate on documents and data, and managed field data by implementing ESRI's Collector for ArcGIS for use on smartphones and tablets to access geographical information system maps, collect data using electronic forms, and capture field photographs.

In addition, an application was created to automate the extraction of data from EQuIS to perform statistical analyses and trend graphing using customized macros within Microsoft Excel, reducing the labor effort by 90% over previous methods.

Finally, we introduced the Cecil Field web-based mapping tool originally built using ESRI's Flex Viewer and migrated to ESRI's new WebApp Builder for ArcGIS. This tool allowed non-GIS technical team members to present mapping information in real-time during team meetings to facilitate discussions and decision making.

The collective successes of the Cecil Field Partnering Team were recognized in 2014 by receiving the Fiscal Year 2013 Chief of Naval Operation, Secretary of Navy and Department of Defense Environmental Restoration Team Award, and in 2016 for the ACEC - Grand Award. EnSafe's innovative use of technology optimized the LTM program at former NAS Cecil Field in Jacksonville, FL, resulting in a cost savings of approximately \$1M.

9:30 **DNAPL Source Area Delineation Using MIP and HPT Technology at Space Launch Complex 16, Cape Canaveral Air Force Station, Florida**
Timothy Jellett, Senior Scientist, HydroGeoLogic Inc., Orlando
John Langett, GS-12, DAF, Project Manager, Patrick Installation Support Team
Brad Jackson, PG, CHMM, U.S. Army Corps of Engineers, Mobile, AL

The ability of dense non-aqueous phase liquid to migrate vertically and laterally makes subsurface delineation challenging and costly. Use of membrane interface probe and hydraulic profile tool technologies can reduce an 18- to 24-month field investigation to approximately 3 to 4 months and provide three-dimensional imagery of the source area.

This approach was used successfully for Space Launch Complex 16 at Cape Canaveral Air Force Station, FL. SLC-16 is an inactive missile launch site. Prior groundwater investigations had identified a DNAPL source area with trichloroethene concentrations as high as 1,000,000 micrograms per liter 1,200 feet west of SLC-16 and SLC-19.

MIP and HPT methodologies provided real-time data, qualitative information on variations in contaminant concentrations throughout the source area, and 3D images of the source area. The 3D images facilitated placement of the confirmation samples needed to delineate the contamination to the target concentration of 10,000 ug/L TCE.

10:00 **Design Verification Program: Lessons Learned from Pre-Application Assessments at In-Situ Remediation Sites**
Doug Davis, Technical Services Manager, Regenesys San Clemente, CA

This presentation will focus on pre-application design verification steps that directly improve existing design assumptions prior to field application. The goal of this program is to determine what "lower-cost" field-based methods might provide significant benefits into design and application method selection prior to in-situ application, thus resulting in improved remedial performance outcomes.

Over the past 20 years, application of remedial substrates has had an uneven track record in terms of performance. Generally speaking in-situ remedial performance is the result of multiple factors. This presentation will focus on the identification of aquifer characteristics that can be documented using traditional field methods and provide the most insight into the remedial design and application programs. Specifically this presentation will focus on those target treatment zone, TTZ, characteristics that directly affect application programs and ultimately remedial outcomes.

On most remediation sites, two of the more important TTZ characteristics are soil type and the positional relationship between the soil types. The deposition process of sediments has a critical bearing on COC mass storage and distribution as well as remedial reagent selection and application methods. To assist design and application teams, a set of routine pre-application "design verification" steps were developed and performed on select project sites. Using these steps to identify the relationship between COC mass storage and distribution units within TTZ has contributed to an overall improvement in application programs and is seen to be a key element in higher remedial success rates.

This presentation will discuss the use of a set of lower-cost traditional field-based logging techniques for remedial assessment that have been proven to provide information in design and application program prior to field mobilization. These steps were originally developed for in-house projects across the U.S. As part of this pre-application program, a series of design verification steps were performed to systematically identify TTZ characteristics that might either limit or enhance remedial performance. These characteristics often directly affect the application strategy and methods and, in some cases, remedial reagent selection. Included in these are the quantity of sand size particles present and the use of clear-water injection testing. This discussion will include a couple of case studies as well as data sets collected from over 30 sites across the US.

Understanding percentage of sand size particles present as well as the size sorting in the TTZ can drive application and performance results. As an example, consistent continuous core collection and use of soil particle settling tubes as part of the process of soil logging has assisted in better field accuracy in this area.

Monitoring aquifer response during pre-injection testing greatly increases the ability to predict a more accurate TTZ accommodation rate and volume. Monitoring aquifer response has provided valuable insight into TTZ limitations and improved the process of project infield adjustments.

Session 5B: Emerging Contaminants: Remediation of Perfluorinated Compounds

9:00 **Best Practices in Sample Collection, Sample Preparation and Analysis of Polyfluorinated Environmental Contaminants**
Tim Fitzpatrick, Bus. Dev. Manager, AXYS Analytical Services Ltd.

Per- and Polyfluorinated Alkyl Substances—PFAS or PFCs—such as perfluorooctanesulfonate and perfluorooctanoate are ubiquitous in the environment. The decades of PFAS use in aqueous film forming foams in airports and defense installations have led to groundwater and ecosystem contamination. They are thus targets of increased environmental monitoring, regulation and remediation.

The unique environmental and analytical behavior of these compounds and ever-decreasing action level concentrations necessitate the standardization of best practices for their quantitative analysis in multiple compartments including water, soil, sewage treatment

Continued on Page 17

plant discharges and biological matrices.

In this work, we present some of our best practices in the sampling and measurement of PFAS. Issues discussed include the role of isotope dilution and use of labeled standards for quantitation, mass spectrometry choices, role of benchmarking, reduction of laboratory background levels, sampling and sub-sampling techniques to avoid surfactant related heterogeneity, analyte stability and role of container materials, choices of whole water vs. filtered phase analysis, choice of analytes to monitor and more.

9:30 Treatment of Emerging Contaminants of Concern with Activated Ozone

William Kerfoot, PhD, Principal, Kerfoot Technologies Inc., Mashpee, MA

Perfluorinated compounds, for example PFOS and PFOA, and 1,4-dioxane have become emerging contaminants of concern in groundwater and soil. Numerous states have begun to develop desired not-to-exceed levels for the compounds in groundwater supplies foremost, and soil levels secondarily. The purpose of this talk is to present the developing regulatory guidance, present a brief overview of ozone chemistry to treat both compounds, and site examples of treatment.

Perfluorinated compounds have found broad use in fire-fighting foams, are persistent in soils and groundwater and have bioaccumulated, particularly in fish. Treatment of the compounds are difficult because the strong carbon-fluorine bond creates a thermally stable compound requiring an oxidation potential above 2.9 volts for successful attack. Nanobubble ozone coated with hydrogen peroxide as a Perozone[®]3.0 solution readily attacks and decomposes the perfluorooctanates. In permeable sandy soils, the ozone gas and liquid peroxide can be delivered through separate tubes to be combined below ground in special stainless steel laminar Spargepoints[®] that form coated nanobubble emulsions that are injected outwards through capillary pores. Kinetics of the reaction will be discussed, including production of fluorides and sulfate.

The compound 1,4 dioxane has been found with chlorinated solvent spill areas. Being highly water soluble, the associated plume may be larger than the initial TCA or related chlorinated compound plume. Twelve states have developed groundwater and/or soil target levels or remediation goals for the compound. It can be treated in-situ, or in-line treatment can be added to pump and treat systems.

10:00 Treatment of Perfluoroalkyl and Polyfluoroalkyl Substances in Groundwater

Gary M. Birk, PE, Managing Partner, Tersus Environmental, Wake Forest, NC

Per- and polyfluoroalkyl substances are surfactants and polymers that are widely distributed across the higher trophic levels and are found in air, soil and groundwater at sites across the U.S. Surfactant applications used heavily in the military include aqueous film-forming foams used to extinguish fires involving highly flammable liquids. The toxicity, mobility and bioaccumulation potential of PFASs pose potential adverse effects for the environment and human health. They are persistent in the environment, among the strongest organic compounds and thus considered non-degradable.

Practitioners have difficulty remediating these compounds at a reasonable cost because PFAS tends to be highly soluble, does not favorably partition into the vapor phase, and does not adsorb well to granular activated carbon. To date, GAC has been the only technically feasible method to treat PFAS-aqueous media.

This talk will present a treatment train for ex-situ treatments of aqueous film-forming foam impacted water. In the pretreatment phase, PFASs are precipitated by metering the liquid surface active compound into a stirring tank. The amount of reagent can be adjusted to varying concentrations. The precipitation products are separated from the water as micro-flocs by simple processes such as sedimentation and filtration. The precipitants can be concentrated to a very high degree, which allows for very economical disposal as compared to GAC. Post-treatment of the remaining residual contaminants is performed by a downstream activated carbon and activated carbon/aluminum hydroxide/kaolin filter. Due to the significant reduction in the PFAS-contaminated water in the initial precipitation stage—up to 90%—the PFAS contaminant load reaching the adsorbent filter is lowered, which leads to a significant extension of the adsorbent lifetime, again significantly lowering operating costs.

The presentation will also provide results of the effectiveness of an activated carbon/aluminum hydroxide/Kaolin mixture to treat PFASs. Studies have concluded that the adsorption capacity of the mixture for the smaller chain fluorinated substances PFBA and PFBS is vastly superior to that of GAC. This is likely due to the presence of the noncarbon components within the mixture creating unique physical chemical interactions with the smaller chain PFAS compounds.

10:30 Break

Concurrent Sessions

Session 6A: Plume Management Using Carbon Injectables

11:00 Multi-Site Performance Review of Liquid Activated Carbon for Groundwater Treatment

Chad Northington, Southeast District Technical Mgr., Regenesys, Tallahassee, FL

There is growing interest in the use of carbon injectables to expedite groundwater cleanup through coupling contaminant destruction with sorption. While an appreciation of the theoretical benefits of this approach is widespread, so is a natural caution among experienced remediation practitioners, as is understandable with any new technology. Among questions related to effective practical application of the technology are concerns regarding subsurface distribution in the field, applicability in low-permeability or heterogeneous formations, and short and long term performance.

This presentation will examine evidence from the field exploring these and other concerns. Data will be drawn from more than 20 field applications, variously addressing chlorinated solvent and hydrocarbon impacted sites and encompassing a variety of geological settings within both the United States and Europe. Contaminants investigated range from chlorinated ethenes and ethanes to aromatic and aliphatic hydrocarbons and PAHs. Sites considered include legacy MNA sites, drycleaners, industrial sites, post-industrial development sites and gas stations. Field data will be presented describing performance against remediation goals, performance validation and also lessons learned with regard to material placement, site characterization and the importance of application-feasibility pre-testing.

11:30 Activated Carbon: A Pilot Study and Full-Scale Application in South Carolina

Matthew Valentine, PG, LRS, Principal, Woodard & Curran, Pittsburgh, PA

A pilot study was conducted in two areas near the leading edge of a long, narrow chlorinated volatile organic compound plume located in south-central South Carolina. The pilot study included the application of an in-situ, liquid activated carbon solution that purports to accelerate biodegradation and shorten timeframes for achieving remedial objectives. The cVOC plume extends over 1,700 feet beyond its identified source. Approximately 80 percent of the contaminant mass is found in a Coastal Plain sediment aquifer that is comprised of a relatively low-permeability silt and very fine-grained sand. The impacted zone is present approximately 20 to 40 feet below ground surface. Both overlying and underlying zones are impacted to a lesser degree in the source area but unimpacted near the leading edge of the plume. A residential area is located less than 1,000 feet from the leading edge of the plume.

Enhanced biodegradation and monitored natural attenuation are effective, widely-used remediation tools, but the timeframe for treatment by these methods can be on the order of months to years. The results of a remedial alternatives evaluation recommended accelerated biodegradation using an innovative, in-situ LAC solution. The remediation agent consists of highly sorptive, micron scale activated carbon particles stabilized to transport widely through an aquifer upon injection. The stabilized colloids deposit on soil surfaces, forming a biomatrix that retains contaminants and accelerates their degradation.

Prior to implementing a full-scale remedial effort, two pilot studies were conducted to evaluate the effectiveness of the approach near monitoring wells with higher and lower total cVOC concentrations. The pilot-scale tests consisted of a remedy that coupled the LAC with

a controlled release electron donor and bioaugmentation culture to promote enhanced reductive dechlorination. The performance monitoring phase indicated that total cVOC concentrations decreased by 91 percent at the high concentration well and by 100 percent in the lower concentration well.

Based on the positive results of the pilot tests, the technology was implemented as the long-term remedial solution for the site at the downgradient portion of the contaminant plume. The full-scale application involved injecting the LAC solution in three passive-diffusion barriers that transect the downgradient plume. Combined with ongoing source-reduction activities, this remedial alternative should effectively prevent the plume from migrating further downgradient, which has been a concern of both the state and federal regulatory agencies. The protective effects of the remedial approach theorized to last many years will be evaluated through ongoing performance and long term groundwater monitoring. Results from the first six months of performance monitoring will be available prior to the conference and will be presented.

Session 6B: Modern Iron Applications

11:00 What Your Mother Never Told You About Iron

John Haselow, PhD, PE, President, Redox Tech, Cary, NC

Ever since researchers at the University of Waterloo observed differences in halocarbon concentrations in cast iron wells, zero valent iron has been used extensively in the soil and groundwater remediation business. Most of the early applications of ZVI employed

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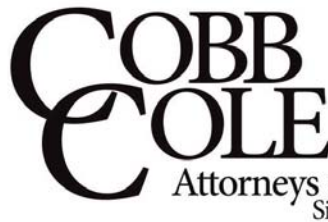
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recycled granular cast iron in barrier walls. This type of iron is known as "regrind" iron. The regrind iron was typically coarse and around 200 to 500 micron. Some regrind material was also known to have trace amount of grease and cutting oils, but more recently regrind suppliers have installed wash processes to minimize the amount of undesirable organic material. As the ZVI technology matured, different materials were tested and deployed.

Atomized ZVI, which is typically made from virgin iron ore, emerged as a cost-effective alternative to regrind ZVI. Injection applicators favored the atomized ZVI for greater reactivity and consistency. Atomized ZVI is available in wide range of particle sizes, but typical mean particles sizes for injection are around 50 to 100 micron

The next advancement in ZVI was nano-scale ZVI which is known for its high reactivity, but unfortunately, also its high price. There has been some use of nano-scale ZVI but it has not gained widespread acceptance. BASF has been producing carbonyl iron powder (CIP) since 1925 but it has only recently been touted for its perceived ease of injection. Some vendors are recommending CIP for injection through well screens, where ZVI has typically be "fracked" or jetted into formations. CIP is known for its high purity and small particle sizes with a narrow distribution. CIP particles are typically in the 1 to 5 micron range.

North American Höganäs recently began providing a very high surface area ZVI with high surface area and hydrogen generation capacity. Despite development of ZVI technology over the past two decades, data did not exist on the relationship between surface

area and hydrogen generation capacity as well as reaction rates with target contaminants. This presentation provides an overview of the evolution of ZVI technology as well as recent reactivity and hydrogen generation testing results.

11:30 The Effect of Emulsified Zero Valent Iron on Trichloroethene in the Presence of Chlorofluorocarbon 113

Les Porterfield, PE, Director of Florida Operations, TEA Inc., Santa Rosa Beach, FL
It has been widely reported that 1,1,2-trichloro-1,2,2-trifluoroethene, or CFC-113, in groundwater can be inhibitory to the anaerobic biodegradation of chlorinated ethenes. Emulsified Zero Valent Iron, EZVI, has been shown to be effective at degrading trichloroethene as dense nonaqueous phase liquids. A field evaluation was conducted on the effects of EZVI and other amendments on TCE degradation in the presence of CFC-113 in shallow groundwater.

The approach involved assessing post-remediation monitoring results from the implementation of a remediation injection scheme with multiple reagents that included EZVI for DNAPL treatment, vegetable oil and KB-1® bacteria culture as remediation amendments to enhance the biogeochemistry of the subsurface and accelerate the reductive dechlorination reactions. EZVI was injected to treat the residual DNAPL source in the subsurface; KB-1® bacteria culture was injected to bioaugment the existing dechlorinating bacteria, and vegetable oil was injected to provide additional carbon for the microbial populations. A detailed review of the groundwater monitoring system results was used to assess the effectiveness of the TCE treatment and to evaluate the potential inhibitory effects of CFC-113.

The results indicate that the inhibition of TCE dechlorination by CFC-113 when treated with EZVI in an anaerobic reductive environment did not occur. The EZVI treatment for the TCE DNAPL and the addition of the KB-1® bacteria culture was successful in treating the TCE with no perceived inhibition, and also resulted in the simultaneous reduction in CFC-113.

These results are being used in an ongoing laboratory treatability study with subsequent supporting field data using EZVI to remediate a DNAPL source, also containing free product levels of CFC-113, with KB-1® Plus culture capable of degrading CFC-113 and TCE. Results from the field application and laboratory evaluation will be presented and lessons learned discussed.

12:00 Day Two Luncheon

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Luncheon Sponsor: **The Goldstein Environmental Law Firm, Miami**

Session 7: Regulatory Panel Discussion:

1:30 Important Changes to Chapter 62.780, F.A.C., and Updates to the Petroleum Restoration Program

Moderator: Joe Applegate, Geosyntec Consultants, Tallahassee

Panelists: Steve Hilfiker, President
Environmental Risk Management Inc., Fort Myers

Florida Department of Environmental Protection representatives TBD

3:00 Break

Session 8: Management of Groundwater to Surface Water Discharges

3:30 A Novel Approach to Assess and Quantify Mass Flux of Groundwater Discharge into Surface Water

Paul Favara, PE, Global Practice Director, Vice President, CH2M, Gainesville, FL

Discharge of contaminated groundwater to surface water occurs at many project sites. Due to a lack of cost-effective tools and methods to quantify mass-flux, cleanup objectives for groundwater are typically very conservative resulting in unnecessary treatment costs. There is a need for more cost-effective tools to better assess the mass-flux of groundwater migrating into surface water boundaries and natural attenuation along the flow path of groundwater as it migrates through the groundwater transition zone. Over the past several years, a sediment-bed passive flux meter has been developed to provide cost effective and reliable mass-flux measurements.

The SBPFM builds off of the significant research on passive flux meters previously performed. The main design challenge in developing the SBPFM was converting the PFM, which measures horizontal flux in groundwater, to a vertical configuration to assess groundwater discharging through the groundwater transition zone into surface water. The SBPFM was designed to be capable of passively and directly measuring local contaminant and water fluxes and provide more accurate information on the temporal mass flux distribution through the sediments in order to better design site remedial and closure strategies. Once laboratory testing of the SBPFM was completed, the flux meter was deployed at several sites. The field deployments were designed to assess ease of deployment as well as information that could be used to determine how mass flux could be interpreted from the deployments.

This presentation will address the results of laboratory testing completed in designing the SBPFM, which led to the final configuration and field test results. The field deployments of the SBPFM showed that the flux meters could be easily deployed near shore and could provide results for both tidal and non-tidal waters. Additionally, it was found that both activated carbon and ion-exchange resins could be used to measure a broad range of contaminants. The deployment results demonstrate that higher quality flux measurements could be achieved since the SBPFM results represents an average flux over an approximate two-week period, as compared to "point-in-time" measurements typically used in the industry. An economic assessment of a flux meter deployment compared to other sophisticated sediment flux tools also demonstrate similar benefits and an approximate 50% cost savings.

4:00 Angled Injection of BOS 100® to Mitigate PCE Intrusion into a Stream

Mike Mazzaresse, Senior Engineer, AST Environmental Inc., Golden, CO

BOS 100® was injected adjacent to and beneath a stream using a direct push angle drilling technique to successfully create a PRB and limit PCE flux from the upgradient source area into the stream.

The Superfund site is a former textiles facility where tetrachloroethylene was used in drycleaning operations. Approximately one-half mile downgradient of the source, PCE was discharging into a stream through the saprolitic formation. Based upon stream bank and bed soil sampling and groundwater modeling, it was determined that the PCE was upwelling into the stream from partially weathered rock as deep as 65 feet below ground surface. The project objective was to determine if a Trap and Treat® BOS 100® permeable reactive barrier could be effectively angle drilled in the wooded and sloped area on the upgradient side of the stream to intersect the plume and reduce or eliminate the contaminant mass flux into the stream.

In the source areas, reductions of 90% to 98% have been observed. The observations made at micro wells and stream bed piezometers demonstrate that effective distribution of the BOS 100® was achieved during the pilot test injections. The analytical data from 12 of 15 micro wells installed in the PRB displayed significant contaminant mass reductions following the pilot test. The eight streambed piezometers located directly downgradient of the PRB have exhibited decreases ranging from 88% to 100% and have illustrated time-trends consistent with the expected mechanics of a PRB. The full scale angled injection was implemented in the fall of 2015. Data from the pilot test and full scale will be presented.

4:30 Column Studies for Design Optimization of Field Pilot and Full Scale Denitrifying Permeable Reactive Barriers

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New rules now in effect for land application of septic tank waste

By PRAKASH GANDHI

New rules regulating septic tank waste disposal have taken effect. The change bans land disposal at current Florida Department of Health-approved sites and urges septic service companies to either apply for a permit at a site regulated by the Florida Department of Environmental Protection or to dispose of the waste at a sewer plant or a landfill.

DEP spokesperson Dee Ann Miller said the prohibition of septage land application started June 30.

She said DEP and the state DOH have been working together to develop additional information and guidance to businesses affected by the prohibition and to identify alternatives to septage land application in a way that protects public health and the environment.

"One clarification is that the program is not transitioning from DOH to DEP," Miller said. "Current land application sites have a number of alternatives for the disposal of septage including—for facilities that meet the requirements—applying for a DEP permit."

FEDFILE From Page 2

The conventional view of fracking fluid spills is that the petroleum in the fluid is rapidly broken down by soil microorganisms and chemical processes, posing little environmental or human health risks.

That is not the case, however, for inorganic chemicals including metals and salts that do not biodegrade easily. Chemical processes do not render them less toxic either.

Radioactivity from persistent radium contamination is a notable inorganic contaminant risk from flowback water spills.

The authors characterized the problem as "widespread and persistent" and said their findings show that substances produced by fracking directly lead to water contamination.

Energy industry risk factors. A recent report, the 2016 Oil and Gas Risk Factor Report produced by BDO USA LLP, characterized perceptions about the leading risk factors during the U.S. energy industries' longest price downturn in recent years.

It noted that of the top 100 exploration and production companies operating in September, 2015, about 10 percent have declared bankruptcy, been acquired or were delisted from U.S. stock exchanges.

The report ranked the top 20 risk factors cited by the largest energy companies.

Number one, not surprisingly, was the downward price movement of oil, gas and energy commodities.

In terms of the environment, unexpected weather conditions or natural disasters ranked fourth. Environmental and health requirements, restrictions and regulations ranked fifth.

The impact of climate change and greenhouse gas legislation ranked eleventh for 85 percent of the companies. The risk of unfavorable climate protection measures increased from 82 percent in 2015 to 85 percent in 2016.

Methods to remove polyfluorinated compounds from water, wastewater. A recent study underwritten by the Water Research Foundation identified nanofiltration and reverse osmosis as the most effective water treatments to remove poly- and perfluoroalkyl substances.

The study demonstrated that activated carbon and anion exchange may remove many PFAS compounds, but are less effective at removing shorter chain PFAS.

Conventional technology used at wastewater and drinking water plants is ineffective at removing PFAS.

Poly- and perfluorinated alkyl substances may be made from alkane backbones consisting of four, five, six, seven, eight, nine or 10 carbon atoms. By far, those with eight carbons are the most widely synthesized PFAS compounds.

Perfluorooctanoic acid and perfluoro-

Miller said that if additional time is needed to transition to one of the available alternatives, businesses can apply for a temporary variance from DOH.

"The temporary variance allows affected businesses time to choose the best alternative to septage land application for their individual situation," Miller said.

State environmental officials are working on a study to examine the environmental impacts of septage land application.

DEP, DOH and the Florida Onsite Wastewater Association are evaluating the potential nutrient impacts to groundwater at typical septage land application sites with operating permits from the state.

The study's purpose is to provide useful information about the environmental impacts of the practice to inform future regulations, Miller said.

The study began in 2015 and currently includes 12 sites out of about 90 currently permitted septage land application sites.

The 12 sites are in Levy, Marion, Hernando, Putnam, Hillsborough and Polk counties.

The study is expected to take about 18 months and be completed by next spring.

octane sulfonate, are the most widely dispersed PFAS in the environment. They are used as flame retardants and are extremely persistent in the environment.

The compounds are completely soluble in water, one reason why methods that remove more hydrophobic compounds work less well with PFAS.

The sites being studied are of average size with average septage loading rates, and represent a variety of soil types. Groundwater monitoring parameters include nutrients, chloride, boron, bromide, and nitrogen isotopes.

The parameters were selected to help evaluate the influence of septage application on groundwater quality and to help distinguish between influence from septage and other potential nutrient sources in the sites' vicinity.

Each location has four monitoring wells installed along the site perimeter.

Each well monitors water quality in the shallow groundwater beneath the site.

One county earmarked for the study, Polk, is home to many septic tanks. Septic tanks are especially common in unincorporated areas of the county and in smaller cities and towns that never developed a central wastewater collection and treatment plant.

Polk officials said that septic service companies can apply for a temporary variance to continue current operations until July 1, 2017, to give them time to get a DEP permit or make other arrangements.

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Michael Lee, PhD, VP Research and Development, Terra Systems, Inc. Claymont, DE
Many of Florida's sensitive surface waters are impacted with nitrate from septic tank discharges and infiltration of urban and agricultural fertilizers. Sustainable technologies like permeable reactive barriers are being evaluated as non-traditional treatment alternatives for nitrate impacted groundwaters. Terra Systems Inc. has performed a column study to both evaluate the nitrate treatment capability of emulsified vegetable oil PRBs and determine critical PRB design parameters using nitrate-contaminated sandy soils and groundwater from a site on Cape Cod, MA.

The column study allowed for comparison of biological nitrate reduction effectiveness of different EVO formulations and EVO loadings. The columns were operated at groundwater flow rates of one foot per day which is representative of many areas in Florida.

The column study determined time to reach complete nitrate removal, removal mass and rate of primary and secondary contaminants, buffer requirements, initial radius of influence of the injected emulsion, and projected emulsion migration distance and rate. Complete nitrate reduction continued even as total organic carbon levels in column effluents fell to between 2.3 and 3.0 mg/L by day 298. Nitrate began to increase after about 340 days when TOC fell below 2 mg/L. The column study shows that EVO effectively stimulates naturally occurring denitrifying bacteria in septic tank-impacted soils and groundwater for sustained nitrate removal while providing multiple parameters for design optimization of field pilot and full scale EVO PRBs.

5:00: 2016 Conference adjourns

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FRACKING
From Page 12

century, average wages in gas production jobs averaged \$108,000 per year—well above Florida’s median income. The economic contribution of Florida’s oil and gas sector is not so rosy now, and may never return to peak oil price conditions.

During the past two legislative sessions, several Florida lawmakers filed bills to foster the economic fortunes of oil and gas production interests.

The agenda for the 2016 Florida Legislature included four filed bills regarding fracking. One was a fracking ban and the other three included provisions that restricted local authorities from banning the process.

The proposed bills also included provisions for stricter permit requirements for fracking, increased penalties for permit violations, and instructed DEP to complete a study of fracking’s environmental risks and regulations regarding mitigating adverse consequences.

Even though all the bills failed, as did one in 2015, local governments have apparently decided not to wait until the Legislature decides to ban local authority to stop fracking.

A brief prepared by the Florida League of Cities for its members statewide noted that local government’s current authority to regulate fracking is usually done through zoning ordinances and land development

codes.

Under current law, only DEP may issue permits for oil wells including fracked wells but not “within corporate limits of a municipality unless the municipality adopts a resolution approving the permit.”

The league has not taken a position on fracking. But with respect to legislative restrictions on local fracking ban authority, the league has staked out a strong position.

“Our position is always that cities should be able to decide for themselves,” said Erika Branchcomb, communication specialist with FLC.

David Mica, executive director of the Florida Petroleum Council, sees things differently.

“Industry supports local government involvement but also supports uniformity across the state,” he said. “We have tried not to preclude local government engagement.”

He said that only one or two local governments asked for (and received) industry input on local fracking ban ordinances. He noted that in those two cases, the bans were defeated.

To explain the vastly larger number of successful campaigns to ban fracking, he points to an environmental group.

“(The bans are) an unfortunate trend based on misinformation from an extreme environmental group,” he said.

Should another round of bills restrict-

ing fracking be filed for the 2017 session, FPC will be ready.

“We will oppose bans to fracking,” he said. “And we will be stakeholders in other efforts.”

Anti-fracking environmental advocates have played a large but not exclusive role so far in convincing local governments to ban fracking. Some of them are large, well funded organizations.

If the next Florida Legislature sees one

PIPELINE
From Page 11

approval from FERC to build the Sabal Trail interstate natural gas pipeline.

FERC is the agency with jurisdiction over U.S. interstate natural gas pipeline projects and will regulate Sabal Trail. It is the lead agency reviewing the project.

Miller said the department met with Sabal Trail multiple times and numerous changes were made to adjust the pipeline route in Florida to ensure minimal environmental impacts, to protect water quality and avoid potential impacts to springs.

In 2013, Florida Gov. Rick Scott signed bills designed to speed up permitting for the project. The same year, the Florida Public Service Commission approved construction of the pipeline.

But in March, the Georgia House stopped a measure to grant Sabal Trail the necessary easements to drill underneath rivers in Georgia.

or more filed bills that take away local governments’ authority to ban fracking, perhaps more cities and counties will join those that have already banned it.

The public can expect local fracking bans to prevail until large exploitable gas and oil reserves are identified in geological formation here. Should that happen, the oil well casinos will be back in business and local bans likely will be out on the street.

NOTES
From Page 3

People news. Joe Applegate, PG, Kevin Warner, PE, and Richard Tedder joined Geosyntec Consultants’ Tallahassee office, and will partner with Principal Toxicologist David Krause to expand Geosyntec’s service offerings.

Applegate brings 30 years of experience as a principal hydrogeologist managing remedial programs for private and public projects at petroleum, hazardous, and nonhazardous waste sites.

Warner has 26 years of experience evaluating, designing and implementing hundreds of groundwater and soil remediation systems using various remedial technologies.

Tedder has more than 30 years of experience with the Florida Department of Environmental Protection, most recently as the administrator for the Solid Waste Section in the Division of Waste Management.

He has been involved in rule development, guidance, and policy issues associated with all aspects of waste management for the state.

Company news. AIRVAC’s parent company, Bilfinger Water Technologies, was recently renamed Aqseptence Group. Pronounced like the word “acceptance,” the new company name combines the words “aqua”, “separation” and “competence,” which describes the group’s core businesses of water and separation technology.

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