Talking... TRASH

The Newsletter of the SWANA Florida Sunshine Chapter Spring 2015

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Letter from the President

March 2015

2015 is off to a great start and we have a big year ahead! Our Winter Conference in Clearwater was a tremendous success with over 160 attendees and 20 exhibitors. We received extremely positive feedback, including "Enjoyed two day format and out of state presentations" and "Excellent conference." We want to thank everyone who helped make the conference enjoyable, informative and productive. Please remember that this midyear meeting is policy focused and the summer meeting is technical focused.

Our next event will be the always popular Road-E-O, which will be held on April 10-11 at the Ramada Venice Resort and will be hosted by the City of North Port and Sarasota County.

Exciting event this year – WasteCon® is coming to Florida!! The SWANA National Conference will be hosted this year by the Florida Sunshine Chapter at the Gaylord Palms hotel in Orlando August 24-27. There will be thousands of industry professionals in attendance with informative and relevant technical sessions. You can look forward to hundreds of exhibits and endless networking opportunities. In addition, there will be a golf tournament, a 5K fun run and a casino night to benefit Give Kids The World. SWANA Florida will hold our Annual Chapter Meeting during WasteCon – so even more reason to attend! Register now at www.swana.org.

I hope you enjoy this issue of Talking Trash and I look forward to seeing you all soon!

Mitch Kessler
President, SWANA FL

In This Issue

City of Tampa Drives Forward with CNG Fleet Conversion and Portable Filling Station

Written By Travis Barnes, MPA, LEED AP, City of Tampa Recycling Specialist

Over the past few years the solid waste industry has increasingly embraced the emergence of compressed natural gas (CNG) as a reliable alternative fuel source for hauling and collection fleets. CNG vehicles are an attractive alternative when compared to traditional diesel engines because they emit less greenhouse gases, offer extended engine life, and are often cheaper to maintain. Beginning in 2013, the City of Tampa was an early adopter of this trend when the Department of Solid Waste & Environmental Program Management held the inaugural fueling of the first five of the city's CNG solid waste vehicles by Tampa Mayor Bob Buckhorn. "Replacing our older, diesel-powered garbage trucks with CNG trucks is good business. They will save taxpayers' money, and are environmentally-friendly and more efficient," said Mayor Bob Buckhorn in 2013. "This is just the beginning for our fleet of CNG vehicles."

In 2015, Tampa will continue to drive forward with purchasing an additional 13 collection vehicles as part of a plan to replace 65 aging diesel trucks in its fleet by 2017. The new vehicles consist of diverse models and makes that will operate across the department's various business units. By the end of 2015, the department will have a total of 35 CNG vehicles, which will comprise 26% of the City's solid waste management fleet. In addition to the cost savings and environmental benefits of CNG vehicles, customers and drivers appreciate the reduced noise experienced while servicing residential neighborhoods as the CNG engines run much quieter than traditional diesel engines.

In order to secure a cheaper fuel cost and reduce the current distance needed to travel to private CNG refueling stations for some of the CNG fleet, the City of Tampa is also installing a TruStar Portable Fuel System in March of 2015. The TruStar system includes 10 slots for slow-fill refueling. This turnkey portable fuel system offers numerous advantages when compared to a permanent fueling system including a decreased permitting and installation timeline and the convenience and flexibility of enabling the City to quickly relocate the fuel system in the future if needed. The portable fuel system is projected to save the City $0.82 per gallon equivalent in addition to reduced travel time needed to reach private fueling stations. As part of this commitment towards sustainability, the City of Tampa has also become an active member and supporter of the Tampa Bay Clean Cities Coalition with the mission of advancing the energy, economic, and environmental security of the United States through its efforts to reduce petroleum use in transportation within the region. As the scientific evidence confirming global climate change continues to grow, the City of Tampa looks forward to doing its part to help reduce emissions while also saving money in the process.

New River Regional Landfill Provides Testing Site for New Cat Landfill Compactor

Written by Sue Miller, Senior Vice President, Marketing and Public Relations Director, Ring Power Corporation

The New River Solid Waste Association (NRSWA), a publicly owned waste enterprise, was formed to serve the citizens of Baker, Bradford and Union Counties in Florida and to handle contracted waste from out-of-region locations. Located in Union County and operated by the NRSWA, New River Regional Landfill (NRRL) is Florida's first multi-county, regional facility. NRRL is an integrated solid waste management system, operating disposal facilities for Class I solid wastes – including special substances such as tires and white goods – as well as 19 rural collection and recycling sites throughout the tri-county region.

Caterpillar Waste Industry Equipment Specialist Mark Welch found New River while looking for a landfill in North America with the right amount of tonnage to conduct a weeklong compaction test with a prototype Tier 4 landfill compactor. NRRL, located in the town of Raiford, was determined to be the perfect site to put the new Cat® 826K through its paces to validate the Tier 4 design features and product improvements before releasing it for full factory production and new product introduction.

The landfill was already utilizing two Cat 826H Landfill Compactors – a 2012 and a 2013 – predecessors to the 826K, which enabled the Cat waste equipment specialists to run a side-by-side comparison of the production rate, fuel burn and compaction measurements.

Three transports delivered the Cat 826K to the NRRL site, where the installation of the wheels/blade and front striker bars was performed by Ring Power service technicians. To ensure the validity of the testing, Caterpillar hired a survey crew to gather accurate baseline and daily measurements of consumed airspace and final density compaction performance. Each truck bringing material to the landfill was weighed to ensure that each machine processed loads of equal weight. Measurements taken included: gallons per hour of fuel burned, productivity rate, airspace consumed, final density levels, and operator comfort.

The results of the testing were reviewed to see if additional modifications or adjustments were needed for Caterpillar's final production model. Initial comments from NRRL operators indicated the 826K has more power than the 826H model. Preliminary numbers showed the new compactor performs 17.7 times better in terms of tons per gallon with less fuel burned.

"New River Solid Waste Association is a top-notch, top-shelf operation and a great partner to work with on landfill compactor product testing," stated Welch. "As one of the few guys you'll ever meet who has been around the world and loves to talk trash, I can say their landfill workers' skill, knowledge and cooperation were invaluable to complete this product testing effectively."

Redesigning the 826 model Landfill Compactor for Tier 4 engine emissions technology also provided an opportunity to make other product design improvements. As a result, the new Cat 826K model features a larger, heavier body with a smoother bottom for better compaction; improved wheels and tips; a pressurized engine compartment to reduce dust and fiber intake; two pre-screeners to keep components cooler; less fuel burn for fuel savings; a larger cab to improve operator comfort; and VIMS technology, utilized on mining equipment, to provide more machine performance data.

Planning for Recycling and Solid Waste Cleanup Efforts after Special Events

Written By Lori Van Bemden, City of Tampa Recycling Coordinator

Every year the City of Tampa hosts over 250 special events that promote culture, outdoor activities, family fun, and an improved quality of life for the city's residents and tourists alike. These special events help create a sense of pride and provide a positive economic impact on the community, providing for recycling and solid waste cleanup efforts can pose unique challenges that are addressed with advanced planning, coordination across city departments, and a focus on safety.

Municipalities need to work with their staff or solid waste providers to coordinate event details and ensure that solid waste management is included in the early stages of the planning process. Collection staff members should be trained on aspects of event safety including the proper use of personal protection equipment, situational awareness with respect to handling large crowds and public security considerations, and be provided key contacts with other municipal departments such as police, fire, parking, and parks and recreation in order to ensure smooth communication and coordination throughout the event and post-event cleanup.

The City of Tampa's flagship event is the Gasparilla Pirate Fest, which has been a tradition in Tampa since 1905. This event is one of the city's most popular attractions and consists of a mock pirate invasion where members of Ye Mystic Krewe of Gasparilla hold the City hostage for a day and force the Mayor to surrender the keys to the City. Providing recycling service and solid waste cleanup can be a daunting task considering the event attracts over 300,000 people and includes a parade with over 100 floats, tossing more than 1,000,000 beads along the City's iconic Bayshore Boulevard adjacent to the waters of Tampa Bay.

Proper planning gets results, with the City of Tampa being able to clean the entire 5.5 mile Gasparilla parade route plus adjacent residential and commercial streets in record time with less staff members and no accidents or incidents despite extensive interaction with the public. One of the biggest challenges from the event is the small plastic bead bags. Having the parade route along the water, the bead bags are notorious for getting into the Bay.

The City continues to work with a non-profit environmental group and volunteers on the day after the parade to help clean the waterways, trees, and material that was missed from the night before. Over the past three years, the City has worked with the event organizers, Ye Mystic Krewe of Gasparilla and the Tampa Bay Green Consortium, to continually improve the event recycling and cleanup efforts. This year over 2.5 tons of recycled material was collected. Future plans are to add an additional recycling container for each float, volunteer assistants in staging to help the Krewe's unpack their bead bags, and host a bead collection event after the parades.

Resource Recovery from Organic Solid Waste through Solid-State Anaerobic Digestion

Written by Gregory R. Hinds, EI, George Dick, EI, Daniel Yeh, P.E., PhD., Sarina J. Ergas, P.E., PhD., Department of Civil & Environmental Engineering, University of South Florida

Solid-State Anaerobic Digestion (SS-AD) is a promising technology for producing biogas and soil amendment from organic solid waste (i.e., yard and food waste) without water addition or excess leachate production. Worldwide application of SS-AD has been rapidly increasing, especially in Europe where SS-AD accounts for 70% of the full-scale yard and food waste digestion capacity installed over the past five years. In the US, SS-AD has only recently begun to gain momentum, with new full-scale facilities operating in California (San Jose, Monterey, Sacramento, Davis) and Wisconsin (Oshkosh) and several others in the planning, permitting, or construction phases. Development of commercial SS-AD in Florida, however, has been slower to materialize, mainly due to the lack of legislative incentive and the relatively high cost of SS-AD

What is the state of SS-AD in Florida? One commercial digester was operated decades ago for a short while, but had little resemblance to the solid-state systems of today. Currently, Harvest Power operates an AD plant (wet, < 10% total solids) in the Orlando area in conjunction with the existing Reedy Creek Improvement District municipal wastewater treatment plant. The plant recovers energy and nutrients from biosolids and food waste from Disney World, restaurants, hotels, and schools. SS-AD would provide similar advantages but would not need to be co-located at a wastewater facility (for leachate treatment) and would reduce post-processing requirements for production of a marketable soil amendment. SS-AD research in Florida includes research to enhance biogas production rates from SS-AD of lignocellulosic yard waste through bioaugmentation and codigestion, which is being conducted at the University of South Florida (USF) with funding from the Hinkley Center for Solid and Hazardous Waste Management. Lignocellulosic wastes are abundantly available substrates for SS-AD but generally require expensive pretreatment or increased retention times, resulting in high digester volume requirements. Bench-scale studies have suggested that bioaugmentation strategies (with inocula containing microbial groups capable of hydrolyzing lignocellulosic compounds) can enhance methane yields from lignocellulosic substrates to a degree that is comparable to conventional pretreatment approaches. A pilot-scale digester is being constructed that will operate with yard and food waste collected from the USF campus and expand upon this research.

Figure 1: Aerial photo of the SS-AD facility in San Jose, California, including biogas storage bladders (on left and right roofs), circular biofilters for treating building air (lower left), and outdoor windrow composting pad (right). Image courtesy of Zero Waste Energy Development.

What is the outlook for SS-AD in Florida? For a waste management technology to be competitive, it must be reliable, expandable over time, and translate to competitive tipping fees,

which, for SS-AD, are a function of the following: quality, quantity, and proximity of feedstocks, markets for soil amendment, markets for biogas energy (e.g. electric power, vehicle fueling, pipeline gas), and legislative incentives (e.g. Renewable Energy Credits). In Florida, the low cost of landfilling and energy and lack of legislative incentive make it challenging for SS-AD to be competitive. House Bill 7135, which established a statewide recycling goal of 75% by 2020, does incentivize the recycling of food and yard wastes (2013 recycling rates were 5% and 51%, respectively), but additional regulatory drivers, as well as public-private partnerships, will likely be prerequisite to future development of SS-AD in Florida. Research at USF aims to contribute by decreasing pretreatment and digester volume requirements, thereby making SS-AD more competitive.

Figure 2: University of Wisconsin, Oshkosh Dry Fermentation anaerobic digester, "BDI" (top), and anaerobic digestion chambers (bottom). Image courtesy of BIOFerm™ Energy Systems.

Figure 3: Model of USF pilot-scale SS-AD unit.

Pass/Fail Criterion for HDPE Pipe Pressure Testing Using Incompressible Fluid

Written by Ali Khatami, Ph.D., P.E., Somshekhar Kundral, P.E., Keith VanGennip, SCS Engineers

HDPE pipe pressure testing seems to be a frequent occurrence on every landfill cell construction project. The leachate collection system in a disposal cell removes leachate from the cell and forces the leachate into a leachate force main to a final storage or disposal destination. The integrity of the leachate force main is evaluated using pressure testing following construction of each segment of the leachate force main. Pressure testing is normally carried out based on the pipe specifications in the facility permit. Pipe specifications may vary from one project to another and from one engineer to another. Normally, a test duration is defined for monitoring the pressure testing that could vary from one hour to a few hours. The engineer specifies the allowable pressure drop during the test duration. Some engineers allow no pressure drop during the test duration and some may allow a certain percentage of the startup pressure.

Generally, engineers do not address pressure drop due to temperature fluctuations during the test period. Significant ambient temperature changes may impact the pass/fail outcome of the test due to expansion of the pipe material. If the allowable pressure drop during the test period is set at a very low value in the pipe specification, the contractor performing the pressure testing may encounter problems justifying integrity of the welds performed on pipe segments. This matter can potentially lead to a serious issue during evaluation of work performed by the contractor.

A formula was developed for the case that incompressible liquid (e.g., water) is used to pressurize the pipe to check integrity of the welds. The formula uses the thermal expansion coefficient for the HDPE material used in the production of HDPE pipes. Ambient temperature change may cause expansion of the pipe material with increasing temperatures and contraction with decreasing temperatures. Expansion or contraction of pipe changes the inside volume of the pipe and the pressure inside the pipe. Contraction normally works to the benefit of the contractor since reducing internal volume of the pipe increases the pipe internal pressure and provides an extra buffer in calculating pressure drop due to any defect in the welds. Expansion works the other way around; it works against the contractor since internal pressure of the pipe reduces and as a result reduces the magnitude of pressure drop to the allowable limit due to any defects in the welds. The thermal expansion coefficient of the pipe material multiplied by the temperature difference provides the amount of strain in the pipe material. The amount of the strain multiplied by an original dimension (in longitudinal or circular direction) provides the expanded dimension. If the pipe is in a steady state condition (both ends restricted and no mass flow takes place through the pipe), an increase in temperature expands the pipe internal volume and the larger volume causes pressure drop. The relationship that maintains the balance between the pressure and volume from one state to another is defined as shown below:

$P_1 \times V_1 = P_2 \times V_2$

where:

P_1 = initial pressure

V_1 = initial volume

P_2 = final pressure due to temperature difference

V_2 = final volume due to temperature difference

The final pressure due to temperature difference may be calculated by:

$P_2 = P_1 \times V_1 / V_2$ (Equation 1)

The initial volume and final volume due to temperature difference are calculated using the following relationships:

$V_1 = L_1 \times p_1^2 / 4\pi$ (Equation 2)

$V_2 = L_2 \times p_2^2 / 4\pi$ (Equation 3)

where:

L_1 = initial length of pipe

p_1 = initial perimeter of pipe

L_2 = final diameter of pipe due to temperature difference

p_2 = final perimeter of pipe due to temperature difference

The final length and diameter of the pipe due to temperature difference may be calculated using:

$L_2 = L_1 \times \Delta T \times \alpha_l$ (Equation 4)

$p_2 = p_1 \times \Delta T \times \alpha_c$ (Equation 5)

where:

ΔT = temperature difference

α_l = thermal expansion coefficient in longitudinal direction of pipe

α_c = thermal expansion coefficient in circular direction of pipe

The relationship between the two thermal coefficient expansion coefficients may be expressed by the following ratio:

$\alpha_c = \alpha_l / m$ (Equation 6)

where:

m = defined by pipe manufacturer

By substituting Equations 2 through 6 in Equation 1 and assuming that the magnitude of the multiplication of the square of the thermal expansion coefficient by the square of the temperature difference is insignificantly small, the final pressure due to temperature difference in the pipe may be calculated using the following:

$P_2 = m P_1 / [m + (m+2) \times \alpha_l \times \Delta T]$ (Equation 7)

By knowing the temperature difference, the final pressure due

to temperature difference may be calculated using Equation 7. The difference between the initial pressure and final pressure due to temperature difference should be added to the allowable pressure difference for the test specified in the pipe specification to calculate the actual pass/fail criterion for the pressure test.

Numerical Example

The allowable pressure reduction specified in the pipe specification is 5 percent of the initial pressure over a two-hour period. Calculate the pass/fail pressure reduction criterion for the test if the initial pressure is 90 psi and pipe is exposed to 25 ℉ temperature increase during the test. The thermal expansion coefficient in the longitudinal direction of the pipe is 0.8×10^{-5} in/in/ ℉, and the thermal expansion coefficient in the circular direction of the pipe is one-third of the thermal expansion coefficient in the longitudinal direction of pipe.

Solution:

$\alpha_1 = 0.8 \times 10^{-5}$ in/in/ ℉
m = 3
$P_1 = 90$ psi
Allowable pressure reduction = 0.05 x 90 = 4.5 psi
$P_2 = 89.982$ psi
Pressure reduction due to temperature reduction = 90 – 89.982 = 0.018 psi
Pass/fail criterion for test = 4.5 + 0.018 = 4.518 psi

Conclusion

The pass/fail criterion should be calculated after completion of the pressure test based on temperature differences measured during the test. Since pipe exposure to temperature differences may be different from one side to the other side of the pipe, it is recommended that temperature be measured at the surface of the pipe zero, 90, and 180 degrees of the pipe cross section while the pipe is positioned on ground surface. The average value of these measurements should be used as the pipe temperature at the time of measurement. It should be noted that Equation 7 would not be applicable if the medium used for pressure testing is classified as compressible fluid (e.g., air).

Developing a Strategic Business Plan for Your Agency

Written by Marc J. Rogoff, Ph.D., Project Director, SCS Engineers

Getting a firm handle on your agency's operations is a tremendous challenge for any solid waste director, particularly in this era of "lean and mean" local government. Doing more with less is the watchword for most city or county commissions across the United States still reeling from the financial impacts of the Great Recession. While the discussion in this article will be primarily focused on solid waste operations, my experience across the variety of public works services suggests that many of the planning lessons learned mentioned in this article can be applied to most, if not all, solid waste and recycling functions.

WHY IS BUSINESS PLANNING IMPORTANT?

Oftentimes, the spotlight of public attention is focused on solid waste agencies because of the perceived high costs to provide collection, recycling, and disposal services. Demands from public decision-makers to keep local government operations efficient has oftentimes meant that agencies have not raised solid waste rates even while costs for critical cost items as labor, benefits, fuel, maintenance, and vehicles have increased dramatically in recent years. Many still have a portion of their revenues spent on unrelated activities or "free" services making full cost accounting difficult and adding to agency overhead. Lastly, competition from private sector vendors makes the threat of privatization intense and is used as a "hammer" by politicians seeking ways to keep rates and taxes low in their terms of office.

THE COMPETITIVENESS SCAN

What I call the Competitiveness Scan starts off with a structured planning method termed "SWOT" which includes an analysis of the strengths, weaknesses, opportunities, and threats involved in the agency's operations. Strengths simply mean the advantages of the agency's operations over its competitors. Weaknesses are the characteristics of the agency's operations that are at a disadvantage to other competitors. Opportunities are potential new markets or customer service areas that could provide additional revenues or provide enhance service satisfaction. Lastly, threats are elements in the wasteshed or service area that could provide opportunities to competitors.

SWOT analysis is a tool to help an agency consider its strengths and weaknesses in assessing potential opportunities for developing effective business strategies to achieve new market opportunities and respond to market threats. It is best conducted with the use of a varied group of agency staff (operations, finance, engineering, etc) and with a series of probing questions such as:

- What do we do best?
- What areas need improvement?
- Is the perception of your agency positive?
- What factors are beyond your agency's control?
- Has there been a change in pricing for essential agency resources (landfill space, price of diesel, etc).

As part of the threat analysis I have always found it important to benchmark the performance of the agency against competitors or similar agencies that seem to be "best in class". The objective is to answer the question: How does the agency stack up against similar agencies or departments in your region?

I would argue that benchmarking is a critical step in any business planning process. "Benchmarking" can be defined as the systematic process of searching for best practices, innovative ideas, and highly effective operating procedures that lead to superior performance – and then adapting those practices, ideas, and procedures to improve the performance of one's own organization. Benchmarking has been widely embraced by both the private and public sectors as an essential business practice for continuous performance improvement.

Solid waste collection managers rely on benchmarking data to:

- Objectively measure the quality and levels of the services they provide.
- Identify and implement best practices that will enable them to reduce costs and improve services.
- The need for benchmarking residential solid waste collection services has long been recognized by solid waste collection system managers.

There have been a number of national and statewide benchmarking studies conducted by the Solid Waste Association of North America (SWANA) Applied Research Foundation and state public administration groups such

as the University of North Carolina-Chapel Hill, Institute of Government, *North Carolina Local Government Performance Measurement Project*. This benchmarking project has been collecting and analyzing solid waste collection benchmarking cost and performance data for 16 North Carolina jurisdictions for over a decade. SWANA published its benchmarking results for solid waste collection systems in 2008 in a book entitled, *SWANA Benchmark Project for Residential Solid Waste Collection Services*.

FINANCIAL ANALYSIS

Once you have gathered benchmarking data on other similar agencies, it is important to conduct a cost of service or rate study. A cost of service or rate study is an essential tool to help focus the critical and management issues facing your agency or department (Exhibit 1). These studies help focus on possible budget cost savings and revenue enhancements.

Typically, these start with the following major work elements:

- Cleary defined goals and objectives for the cost of service or rate study
- Evaluation of the agency's operating budget through examination of each budget line item and assumptions of future operating conditions and costs.
- Completion of a revenue sufficiency analysis that identifies the amount, timing, and financing source for required capital investments in the agency's long-term capital improvement plan.
- Analysis of current customer rate structures and development of alternative recommendations on rate modifications.

A pro forma model is typically constructed to help conduct various "what if" scenarios to analyze alternative customer rates and develop financial forecasts of the long-term outlook of the solid waste system. The very best models can seamlessly provide powerful representations of key financial indicators for decision-making.

PUTTING THE PLAN TOGETHER

Your agency's Strategic Business Plan should include all of the facets we discussed: the competitiveness scan and financial analysis. Unfortunately, most business plans prepared by both public and private sector organizations are static. That is, they exist as a document developed for a particular purpose, shared with its staff and decision-makers in print or electronic form, and then placed in a file cabinet or digital folder on the organization's intranet.

That being said, I urge my clients to develop a dynamic Strategic Business Plan that provides a highly and usable roadmap to everyone in the organization. That is, a Strategic Business Plan goes beyond one-way informing and also communicates the Plan by enabling a two-way, on-going dialog to everyone in the agency. The Plan should be shared with the agency's stakeholders such as its typical strategic partners such as other departments or divisions, major vendors, waste suppliers, and outside consultants. In this way, the Plan reaches beyond your agency's walls and enables your strategic partners to help you achieve your desired results.

Lastly, the Plan must continue to evolve and grow. By sharing it with your strategic partners and stakeholders, you are asking for dialogue and input. This kind of input enables the Plan to be continually updated, refined and improved. This is in contrast to a traditional static Strategic Business Plan, mentioned earlier, which is sent out annually to staff with the expectation that they'll adapt to the plan rather than the Plan adapting to them.

FINAL THOUGHTS

Strategic business planning takes a lot of hard work to develop a meaningful long-term game plan for your agency. Certainly business planning doesn't come free. It is a time consuming exercise, and any agency head has to weigh up the value that is generated from spending time writing a Plan versus simply going out there and performing daily operations. Based on my experience, however, these efforts are worthwhile and can provide excellent financial road maps that will empower your agency to respond to their opportunities and potential threats more strategically.

Controlling Methane Production in Groundwater Proximal to Landfill Settings

Written by Jim Mueller, PhD, Provectus Enviromental Products, Inc. and Ramon Rivera, Diamond Systems, LLC

Introduction

Over the past 25 years, various remedial amendments have been used to treat groundwater impacted by chlorinated solvents and other VOC, pesticides, and heavy metals that have, presumably, emanated from landfill sources. A very common problem, however, is that indigenous methanogens often bloom following the addition of the organic hydrogen donors thereby liberating large amounts of methane gas. This is because methanogens are the most ubiquitous indigenous microbes in anoxic aquifer settings. This problem can be greatly exacerbated by methane also being produced proximal to the landfill areas.

What is the Problem with Methane?

There are recognized benefits to methanogens and of limited methanogenesis. For example, methanogens play important roles in synergistic microbial ecology, and they support natural degradation of landfill contents and managed gas production. However, extended production of methane can result in elevated groundwater concentrations (as high as >100 ppm have been reported) which can lead to accumulation in soil gas subsequently impacting indoor air. While this is perhaps more relevant in urban settings where methane can accumulate in basements, under slabs/foundations and/or migrate along utility corridors, excessive methane production has also been observed in more rural settings and other open spaces.

Accordingly, elevated methane concentrations can exceed current and pending regulations of < 10 to <28 ppm in groundwater and/or 0.5% v/v methane in soil gas (*e.g.*, 10% of the LEL) and/or indoor air (methane is flammable between 5% and 15% v/v). Many remedial practitioners proactively design contingencies for implementation in the event that methane exceeds a threshold level ranging from 1 to 10 ppm groundwater. These contingencies often entail expensive and extensive systems for treating methane in soil gas/vapor captured via SVE systems.

Moreover, from a sustainability perspective, it can be argued that controlling methane production has a positive impact on greenhouse gases. The comparative impact of CH4 on climate change is about 20x greater than that of CO2 when averaged over a 100-year period (US EPA, 2014).

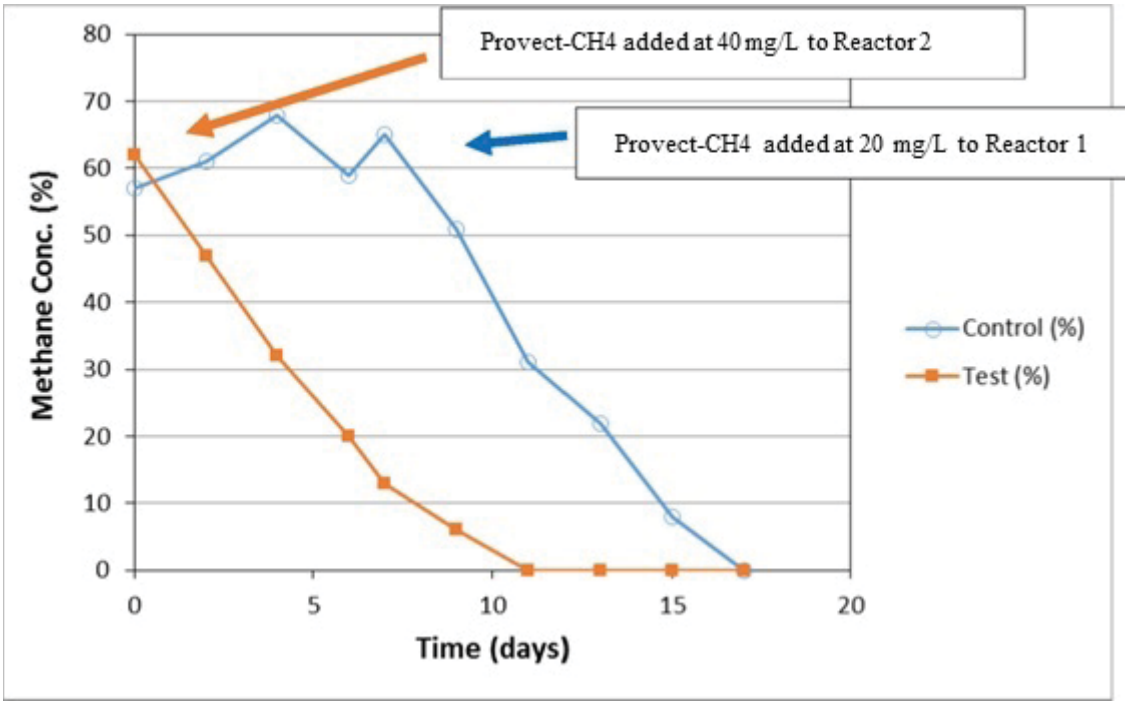

Figure 1. Changes in Methane Concentrations over Time

Technical Solution

An antimethanogenic reagent, which contains natural statin compounds, has the unique ability to block protein and enzyme systems specific to methanogens thereby controlling their growth and proliferation (Woese and Fox, 1977). The technology has been widely used in the cattle industry for many years to manage rumen microbiology (Henderson et al, 2010)), but is being newly applied to the environmental industry as a remedial supplement, a landfill gas management tool, *et cetera*. The methane inhibitor itself can be used as a stand-alone supplement, or it can be added to myriad amendments used during remedial actions to make them safer and to greatly improve their overall efficacy in a predictable manner (US Patent Office Scalzi *et al*, 2013, 2014).

Proof of Concept

There are at least two scenarios where methane inhibitors can be used: i) "preemptively", or in a proactive effort to prevent excesses methane production, or ii) "curatively", in an attempt to ameliorate a situation where excessive methanogenesis has been established. Laboratory work documented that the methane inhibitors (40 ppm) yielded rapid (within 2 to 3 days) and significant (>90%) reduction of methane production by an active, adapted culture of Archaea in a closed bioreactor system (**Figure 1**). Laboratory work using simulated aquifer microcosms (soil and groundwater) inoculated with an active culture of methanogens also demonstrated rapid (within 1 to 3 days) and significant (>90%) reduction of methane in the presence of ca. 100 ppm inhibitor (data not shown).

Field application of the methane inhibitors at a former dry cleaning site in Georgia showed that the presence of ca. 75 ppm methane inhibitor used to supplement a conventional amendment reduced dissolved methane in groundwater by >65% (from ca. 12 ppm to 4 ppm) and reduced methane in well head space gas >97% (from 35% vol to <1 % vol) after 6 weeks of application.

Conclusions:

Methane control technology may be an effective part of an overall landfill management practice. When used to help manage or ameliorate impacted groundwater it can facilitate the rapid and complete destruction of targeted contaminants in a safer, more efficacious manner. More information can be found at: http://www.DiamondSci.com/

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Webinar Program

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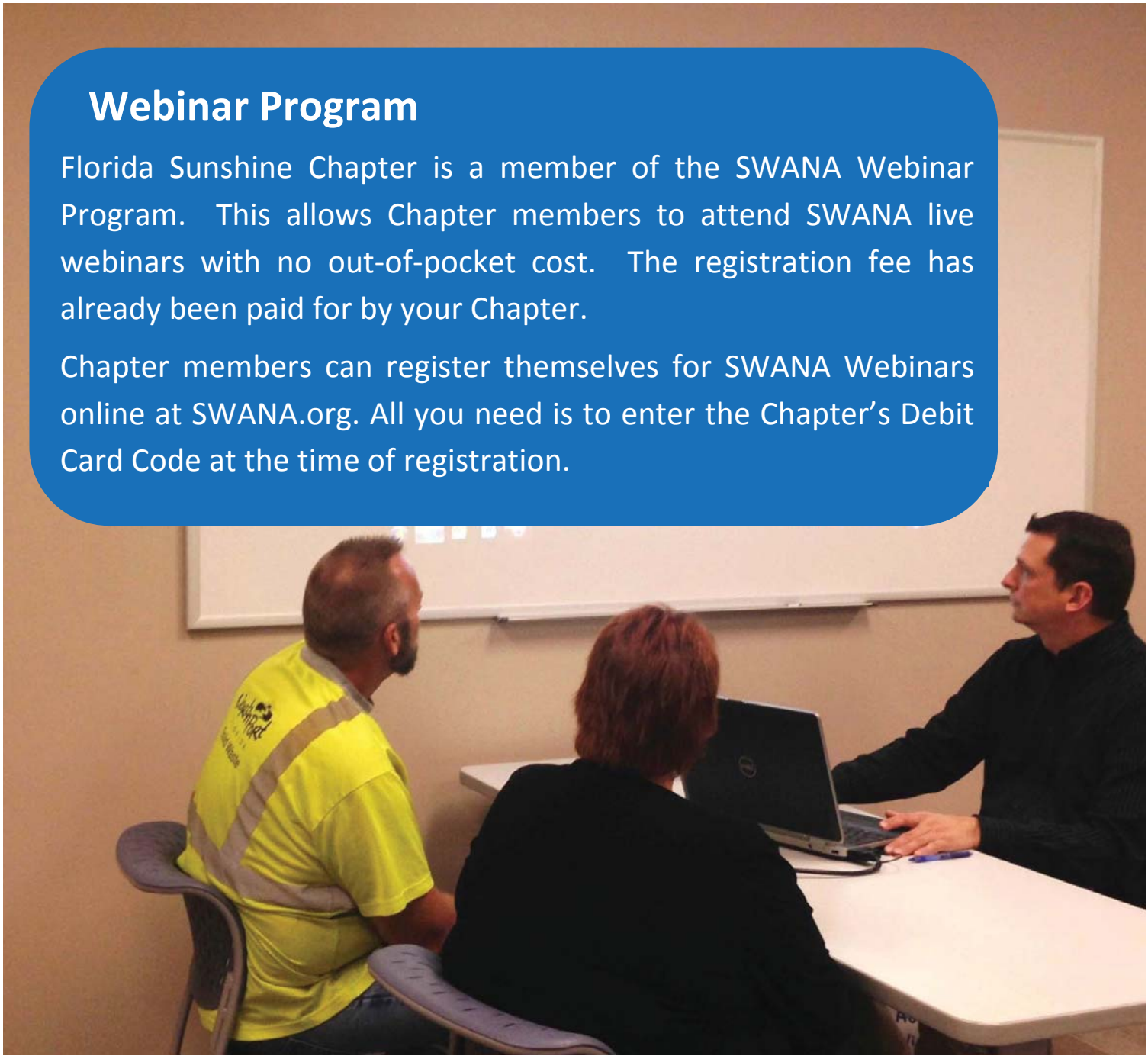
Chapter members can register themselves for SWANA Webinars online at SWANA.org. All you need is to enter the Chapter's Debit Card Code at the time of registration.



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empower

SWANA Florida Sunshine Chapter has purchased 50 credits/registrations in the SWANA Webinar Program for member use. To use, members need only:

- Select live webinar from SWANA's offerings.
- Register and enter Florida Chapter code listed below.

Visit https://swana.org/Education/eLearning/ChapterWebinarProgram.aspx for more information.

inspire

To allow as many members to benefit as possible:

- View the webinar in a large room and invite others from your agency to attend.
- Coordinate with other smaller agencies to host a webinar viewing. Dorothy Couch, Bridges BTC, will help with coordination: dcouch@mybridges.org, 321-494-6848.

educate

When a group views a SWANA Webinar through the Chapter Webinar Program, all attendees can receive Continuing Education Units (CEU's). To apply for CEU's:

- Provide a sign-in sheet to certification@swana.org.
- Include the webinar title and date, name of the person who registered to receive the logins, and the name and SWANA ID Number of each of the participants.

SWANA's Training Department will allocate CEU credits for SWANA Certified professionals who attended the webinar and are verified Chapter members.

Florida Chapter Webinar Program Debit Card Code is: FL140221

The SWANA Florida Sunshine Chapter proudly presents the

WASTECON 2015 GOLF TOURNAMENT

August 24, 2015 ~ Celebration Golf Club

Sponsor & Play!

SWANA's Florida Chapter invites you to join us for this year's WASTECON golf tournament on Monday, August 24, 2015 at the Celebration Golf Club—less than 3 miles from the Gaylord Palms, where WASTECON is being held.

Opened in 1996, Celebration Golf Club is the final collaboration between Robert Trent Jones Senior and Junior. The course radiates an atmosphere of beautiful tranquility and fun but challenging golf. The layout is protectively framed by borders of native trees and natural wetlands. With five sets of tees, the course stretches to a total yardage of 7,028.

COURSE ACCOLADES

Designed by Robert Trent Jones Sr. and Jr.

Ranked in the "Top 25 Public Courses" by Golf World

Rated 4½ Stars by Golf Digest's "Best Places to Play"

Received 4.85 on a scale of 5 for "Overall Experience" by Tournament/Meeting Planners

Sponsorship Opportunities:

• Breakfast	$1,000
• Lunch	$2,500
• Beverage Cart	$1,000
• Grand Prize Hole – $10K Hole-in-One Contest	$ 500
• Contest Hole – Longest drive / Closest to the pin	$ 250
• General Hole	$ 100

All sponsors will be recognized on signage displayed at the club house and at the conference, as well as on the WASTECON and SWANA FL websites. Sponsors can also provide marketing materials to be included in a goodie bag giveaway to all golfers. Breakfast and lunch sponsorships include an opportunity to address the participants during lunch (2 minutes for breakfast sponsor/5 minutes for lunch sponsor). Beverage cart sponsorship also includes signage on the cart. All hole sponsorships also include signage at the tee box.

The SWANA Florida Chapter Invites You to

Play for a Cause at WASTECON 2015

Join us for a FUN-filled FUNdraising event at the Gaylord Palm's Emerald Bay Plaza on Wednesday, August 26th from 6-10 pm to benefit Give Kids The World—a 70-acre, nonprofit storybook resort in Kissimmee where children with life-threatening illnesses and their families are treated to weeklong, cost-free fantasy vacations (including Christmas every week and ice cream for breakfast). For more information, go to www.gktw.org.

The evening will include food, drinks, music, casino games, camaraderie, a 50/50 drawing, and more! Tickets are included with your full conference registration or can be purchased separately at www.wastecon.org. But don't stop there—consider sponsoring this worthwhile event!

Sponsorships Available:

- ☐ **$10,000 EXCLUSIVE Presenting Sponsor (1)** – Your logo prominently displayed during the event and on all promotional materials, WASTECON and FL SWANA websites, WASTECON program and attendee giveaways, plus 25 extra drink tickets at the event.
- ☐ **$5,000 Supporter** – Your logo prominently displayed during the event and on the WASTECON and FL SWANA websites, plus 10 extra drink tickets at the event.
- ☐ **$1,000 Helper** – Your logo displayed during the event and on the WASTECON and FL SWANA websites, plus the great feeling you get for helping such a worthy cause!
- ☐ **$500 Donation** – Your company name listed on signage at the event and on the WASTECON and FL SWANA websites, plus that same great feeling!

Total Due $_____ ☐ Check (Payable to SWANA FL) ☐ VISA ☐ MasterCard ☐ Discover ☐ American Express

Company Name: _____

Contact Person: _____

Phone: _____ Email: _____

Card Number: _____ Expiration Date: _____

Cardholders Name (if different): _____

Billing Address: _____

Submit Registration Form & Payment to: SWANA Florida Sunshine Chapter, 3724 Johnathon Ave., Palm Harbor, FL 34685 or FAX to (727) 231-0693. Questions? Call Crystal at (727) 940-3397 or email info@swanafl.org.

WASTECON NEEDS YOU!!!

This year, our chapter has a unique opportunity to shine with WASTECON 2015 being held in Florida. Mark your calendars now for August 24-27th at the Gaylord Palms in Kissimmee (outside of Orlando). Being the largest single chapter in SWANA, we have a lot to offer but we need all of our members to get involved so we can really show off! What can you to help?

- ✓ **VOLUNTEER** – We need lots of volunteers to help both before and during the conference. If you're interested, contact the appropriate chairperson below.
- ✓ **PROMOTE** – Help us promote this conference by getting the word out to your colleagues and others you work with in the solid waste industry. If you need any promotional materials, let us know and we'll get them to you as soon as they're available.
- ✓ **ATTEND** – Make sure you plan to attend and encourage your co-workers to do the same. If budget restrictions are tight, you can always volunteer to reduce costs or we can provide you with free show-only passes to attend the trade show. This is a great chance to attend a national conference without leaving the state!
- ✓ **SPONSOR** – Sponsorship opportunities are available for the Monday golf tournament and Wednesday evening event, which are both put on by the chapter.

Chapter Events

- ✓ **GOLF TOURNAMENT** – The WASTECON Golf Tournament is completely run by the chapter with all proceeds going back to the chapter so be sure to join in the fun! It will be held on Monday, August 24th at the Celebration Golf Club. $125 entry fee includes transportation from/to the hotel, breakfast, lunch, tournament play (greens fee and cart), prizes and more.
- ✓ **WEDNESDAY EVENING CASINO PARTY** – This year, the FL Chapter will donate all of the proceeds from this FUN-filled FUNdraising event to Give Kids The World www.gktw.org, a 70-acre, nonprofit storybook resort right in Kissimmee where children with life-threatening illnesses and their families are treated to weeklong, cost-free fantasy vacations. PLEASE buy a ticket for this worthwhile cause!
- ✓ **BOARD & BUSINESS MEETINGS** – In lieu of our usual summer conference, the FL Chapter will be holding these meetings during WASTECON. Arrangements are still being made but we will let you know the details as soon as they are scheduled.

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