Talking... TRASH

The Newsletter of the SWANA Florida Sunshine Chapter Fall/Winter 2020

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Letter from the President

December 2020

To say it has been a crazy year would be an understatement. Around August, I was looking for 2021 Fast-Passes but couldn't find a one except from unscrupulous vendors on eBay. This time of year brings two things – 1) a time to celebrate with family during the holiday season and 2) the return of snowbirds, tourists and other visitors. Yet, with everything going on, I'd expect this year to be a little different. Gatherings with family have become Zoom events and we're all waiting to see if what is typically the start of the busy season will materialize. Solid waste systems have seen a redistribution of waste from commercial to residential and in some areas back again. Solid waste professionals have had to be nimble to adjust to new safety protocols while trying to maintain high levels of service expected of ratepayers and commercial customers.

Another thing this time of year brings is a time of reflection. We review the past year's performance and look at what was accomplished and what work is still to be done. While the look ahead is cautious, I think everyone can be proud of the accomplishments of staff and service providers that have continued to perform. I've mentioned in the past how impressive solid waste staff are in responding to adversity, whether it be disaster recovery, regulatory changes or budget constraints - they always find a way to get the job done.

SWANA has struggled this year on a National level and we've struggled locally. The industry has adapted by focusing on virtual delivery of information and training. Conferences have gone completely virtual with mixed results. The Florida Chapter is watching the landscape and looking for new ways to engage our membership and provide value. The recent Hinkley Center Webinar Series was a success with timely research information delivered by some of the prominent researchers in the state. We thank John Schert and his organization and Jason Timmons for organizing such an esteemed online event.

We are keeping an eye on changes on the national landscape during this pandemic and talking with members to gauge when we might be able to meet again in person. On the National level, the SOAR event (formerly SWANApalooza) has been moved to June 2021 and WasteCon is still on the books for November 2021. At the local level, we are being patient, but I don't want that to stop us from engaging and continuing to promote best practices and share ideas. Hopefully, we'll get back together soon but until then stay safe and Happy Holidays.

Sincerely,

Keith Howard
SWANA FL President

In This Issue

What's in your Groundwater Monitoring Plan?

How reevaluating your groundwater monitoring projects can save money.

David Atteberry, Project Director, SCS Engineers

The events of 2020 have affected the economy, the way we conduct business and even our social interactions. Now, more than ever, streamlining costs is key for public and private sector clients across the country. Enter groundwater monitoring projects. Often overlooked as an opportunity to reduce costs, it's an excellent place to start when examining costly operational processes of a solid waste facility. Groundwater monitoring is often thought as necessary for compliance requirements and overlooked when ways to reduce spending are considered. However, the proactive review of all monitoring projects may offer opportunities to propose monitoring reduction or even cessation.

Have you considered the following questions?

- When you evaluate monitoring data, are you also evaluating the adequacy of your monitoring program? Are the well locations, number of samples, sampling frequency and the monitored constituents approved during the site closure appropriate for current conditions (possibly 10 to 15 years into post-closure monitoring)? Ask yourself if it still makes sense.
- Have you completed a deep dive into the data to look at trends? Have you looked at naturally occurring conditions as potentially skewing constituent concentrations in groundwater? Have you completed statistical analyses of monitoring data to justify reducing the frequency or scope of monitoring?
- Compare how many years you are into post-closure care with the original required monitoring period. Is there a way to shorten this? Can the zone of discharge or point of compliance be modified? Are there receptors nearby? Can you demonstrate either waste mass stability or stable/shrinking groundwater contamination?

The SCS Team has successfully employed these strategies at several Florida landfills. For instance, In Marion County, Florida, the team worked to get a cessation in landfill gas and groundwater monitoring at the Martel Closed Landfill. They were hired to conduct routine post-closure monitoring. They observed obvious trends in the data that were favorable to the county. If you consider that monitoring costs average $10,000 to $50,000 per year, the potential cost savings over 10 years is $100,000 to 500,000.

Is it worthwhile to take a fresh look at your monitoring program? Absolutely. Here's why:

- Potentially significant cost savings can be recognized by early cessation of monitoring. If you have a contaminated site, you could potentially reduce your environmental liability and decrease environmental reserves. For sites requiring financial assurance, the cost estimates that are the basis for the amount of financial assurance required could be decreased, thus decreasing the costs to maintain financial assurance.
- Ending/closing out a consent order requirement also allows for redevelopment of a site, thus turning a liability into an asset and who wouldn't want that?
- By investing a relatively small amount in evaluating your monitoring programs, you could realize a return on investment within one to two years by reducing or ceasing monitoring.

Bottom line: you should take the initiative to ask a few simple questions to see if further examination is warranted. What if contaminants are naturally occurring? Is the data in the technical reports supporting conclusions that include reduction or cessation when appropriate? Are you simply meeting the minimum requirements of the permit without an eye on the future? So, finally, what's in your groundwater monitoring plan?

David Atteberry is Project Director at SCS Engineers. He can be reached at (904) 431-6901 or e-mail datteberry@scsengineers.com.

Managing Waste in the Time of COVID

Kari Hodgson, Director of Solid Waste, Collier County

Most people don't think about their garbage; they put it at the curb and when they look again it is gone, like magic. In the cases when it doesn't disappear, garbage becomes *trash talk*. Solid waste is a silent essential and that's the way it should be. The magic behind the scenes is pragmatic to those in the industry and it is the essence of what drives us to serve our constituents.

Fiscal Year 2020 brought new challenges with the introduction of COVID early in the year, bringing a fearful ideology of *unknowns*, captivating well-functioning people, and disrupting polished routines. This uncertainty left our families, well-being, and essential processes vulnerable and business principles at risk. Leaders across the nation faced dynamic adaptability preparing to lead organizations with a fluid notion.

The solid waste industry has not been exempt from the COVID impact. While some counties experienced suspended operations or disruption to collection service, Collier County continued its continuity of service, with *zero* closures and disruptions, as well as *zero* work-related exposure cases.

Collier County Solid Waste (CCSW) instituted principles and altered practices to protect staff and the public, and continue essential services.

Industry and Operational Challenges

Through franchised collection contracts, CCSW indirectly manages an additional 173 employees. Implementing daily reports that included safety measures, collection issues, staffing, waste volumes, and any other challenges encountered enabled the franchisees and county to address challenges encountered with effective communication.

Further, Collier County's curbside service is an automated system for waste, recycling and most bulk collection. The franchisees—Waste Management of Florida, Inc. (WMIF) and Waste Connections, Inc. (WC)—overcame internal Return to Work policies and cross-trained their drivers to serve on multiple collection routes. This substitute driver concept assured continuity of service.

While Collier County was served with Force Majeure notices, the only observed impact was realized when the materials collection center that processes a portion of the county's recyclable materials was forced to close for a short period of time due to a staffing shortage and the franchisee was forced to find an alternative location for recyclable material processing.

Remote work shifted waste volumes disproportionally, especially in April, where residential or curbside waste volumes increased by an additional 1,000 tons/week—that is an additional three days' worth of waste that had to be collected during the six day per week operation. To accommodate, the landfill stayed open late on Tuesdays and commercial collection resources were reallocated to residential collection. Many residents used this opportunity to clean out their homes, setting out a substantial quantity of bulk waste (e.g. mattresses, couches, etc.).

Typically, a 2% increase is observed due to growth in Collier County, however, Graph 1, page 7, displays the effect of the remote work (beginning in April) coupled with sustained growth on residential waste volumes.

As opposed to residential volumes, commercial volumes decreased during the months of March, April and May. Engaging with our local businesses, WMIF offered commercial customers temporarily reduced services to minimize economic impact on local businesses.

Interestingly, when businesses were permitted to operate at 25% capacity, the commercial waste volume rebounded to previous observed volumes. In addition, residential volumes continued to stay elevated. COVID's requirement to discard materials, such as menus, utensils, and remove tabletop containers, resulted in a notable waste increase, even with the business operating at only a quarter of their capacity.

Similar to residential waste, curbside recycling increased from 29,000 to 36,000 tons in FY20. Considering the light weight of recyclable materials, this was quite an increase. Evidence of "ship to home" as a new norm.

Continued on page 6

Continued from page 5

Luckily, there was demand in the paper industry, thereby creating a viable market.

Recycling Drop-off Centers and Community Events
Like most businesses and convenience centers, CCSW recycling centers experienced a decrease in guests during March and April. Expected service levels continued with the implementation of safety measures to ensure the health, safety, and wellness of staff and members of the community. Staff adapted with minor operational adjustments. Similar to the curbside bulk set-out observations, the recycling centers received a notable increase in electronics and latex paint.

Events such as Hurricane Roundups and Neighborhood Cleanups were canceled, attributing to the increase in guests that visited the recycling centers and the decrease in household hazardous waste collected. All suspended events are planned to resume in April 2021 in order to honor and celebrate Earth Day.

Employee Safety
To ensure the solid waste service facilities remained open, employee and guest safety became the first order of business. The solid waste facilities serve mission-critical functions for waste to *disappear*. Adding to the pandemic theme, without someone to operate the collection vehicles, the waste cannot be collected; without a scale house, the waste cannot be landfilled; without proper hazardous waste disposal means, the risk of fire potential and increased environmental liability are highly probable.

When someone is sick, typically a diagnosis is sought. It is the lack of a named diagnosis that invokes fear, consuming productivity. *"I have bronchitis, the doctor says I should feel better soon"* versus *"I have been to the doctor three times for this annoying cough and they still don't know what it is"*. This implores fear, alters perspective, consumes productivity, and drives the need for closure. Therefore, it was crucial to limit this anxiety and provide closure through timeframes. Terms like "indefinitely" or "until further notice" were avoided and operations were assessed on a weekly basis.

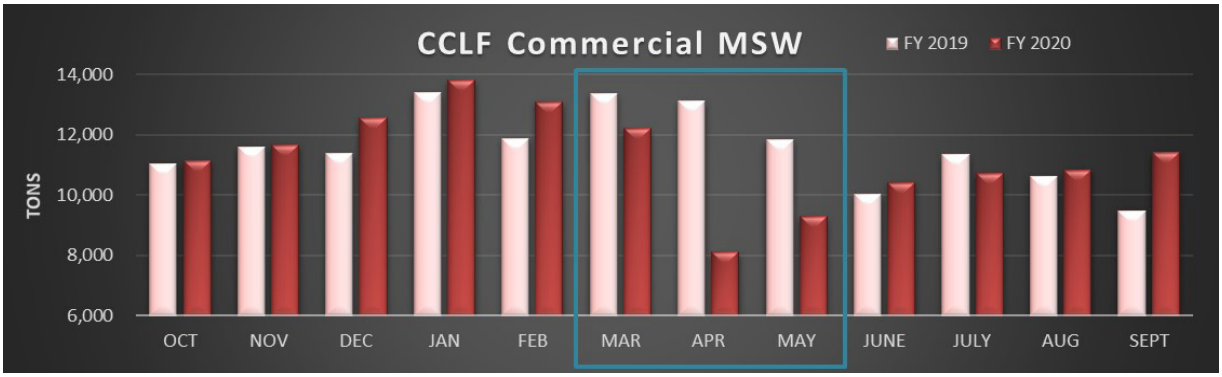
*Solid waste services are essential***.** Even in a pandemic, waste is produced, and waste must be collected. Losing sight of this critical need, would leave COVID as only *one* human health concern. Mechanisms were employed as preparation to adapt while providing essential services with employee safeguard in the forefront. As public service provides, *obligations to the public* displaced any other *core value*.

Priorities to safeguard employees by maintaining a 45-day stock of PPE, adjusting workflows and schedules to limit exposure, and employing tactics to avoid workplace hysteria were daily discussions. Albeit, there were struggles; the many *unknowns* and *chances* interfered with the purpose of employing clear protocols. While change can be met with peril, anxiety can not only cloud the ability to recognize alternative solutions, but also interfere with communication. Nonetheless, the commitment to public service stood profound.

Just as crucial was support from leadership. With this support, time was dedicated to reinforcing cultural values surrounding our mission as essential service providers. Engagement with staff to develop and implement policies to address the health and safety of the public and staff was just as critical as listening to concerns from staff. COVID didn't discriminate. It was crucial to inquire how staff felt working during COVID, how families were coping and how the public was treating them.

Other measures included restricting access to solid waste buildings. Supply tracking and communication flows were established to ensure metrics for safeguarding staff. Other policies included additional cleaning measures, such as contact points (e.g. door handles, cash and/or card handling), requiring gloves, hand sanitizing, and/or disinfectant wiping, and a new welcome message incorporating safeguard measures to assist new team members to feel safe and welcomed to the Solid Waste Division.

Cross -Training
Cross-training allows other staff members to meet the public need, should one critical function be compromised. Job functions for cross training were prioritized by risk assessment. If an outbreak was



Graph 1

experienced what service was affected? Realizing intangible benefits, Qualtrics, the county's survey program, was used to seek employee feedback on the cross-training program. Cross-training served to create a cohesive, engaging work environment, offering employees an opportunity to learn about other sections of the division. Some found aspects in one operation directly correlated to their job duties, offering a holistic approach to the division's purpose and mission. Qualtrics also offered recommendations for process improvements and highlighted mentoring opportunities.

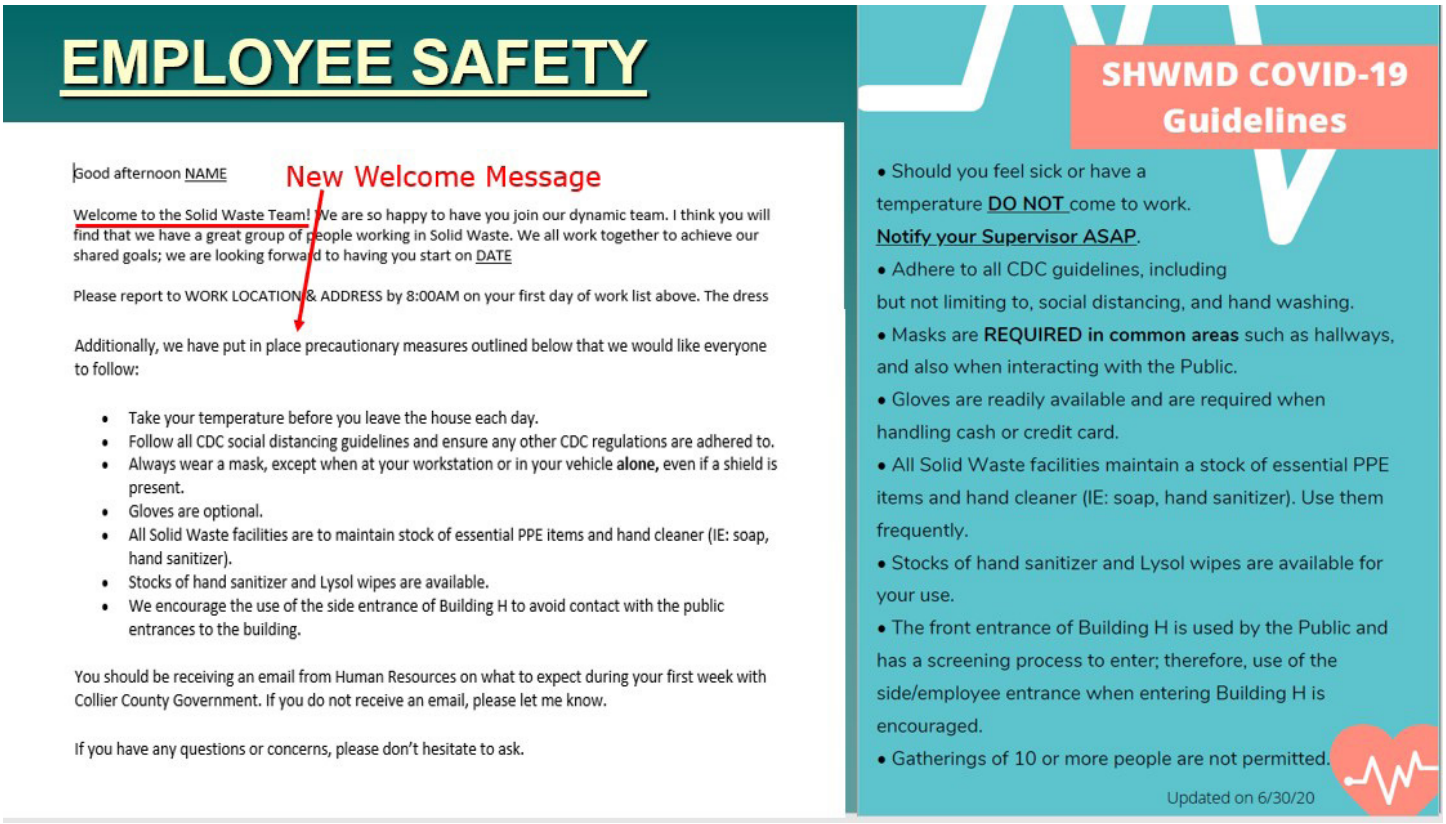
Benchmarking

To gauge the level of service impact, CCSW surveyed Florida counties. Of those that responded, 42% experienced some type of service disruption. Mostly, disruptions in collection were due to staff shortages or suspension of point of contact services, such as yard waste collection, to limit employee risk and exposure. Many counties closed their drop-off facilities, and most were served with Force Majeures.

Conclusion

While Collier County was notified of Force Majeure potential, it was never acted upon. Collier County *did not experience any service level disruptions or closures* and continues to operate with zero work-related COVID cases. During the major COVID months, March through July, Collier County continued to remain in operation with altered protocols.

Kari Hodgson is Director of Solid Waste for Collier County.



EMPLOYEE SAFETY

Good afternoon NAME

New Welcome Message

Welcome to the Solid Waste Team! We are so happy to have you join our dynamic team. I think you will find that we have a great group of people working in Solid Waste. We all work together to achieve our shared goals; we are looking forward to having you start on DATE

Please report to WORK LOCATION & ADDRESS by 8:00AM on your first day of work list above. The dress

Additionally, we have put in place precautionary measures outlined below that we would like everyone to follow:

- Take your temperature before you leave the house each day.
- Follow all CDC social distancing guidelines and ensure any other CDC regulations are adhered to.
- Always wear a mask, except when at your workstation or in your vehicle **alone,** even if a shield is present.
- Gloves are optional.
- All Solid Waste facilities are to maintain stock of essential PPE items and hand cleaner (IE: soap, hand sanitizer).
- Stocks of hand sanitizer and Lysol wipes are available.
- We encourage the use of the side entrance of Building H to avoid contact with the public entrances to the building.

You should be receiving an email from Human Resources on what to expect during your first week with Collier County Government. If you do not receive an email, please let me know.

If you have any questions or concerns, please don't hesitate to ask.

SHWMD COVID-19 Guidelines

- Should you feel sick or have a temperature DO NOT come to work. Notify your Supervisor ASAP.
- Adhere to all CDC guidelines, including but not limiting to, social distancing, and hand washing.
- Masks are **REQUIRED in common areas** such as hallways, and also when interacting with the Public.
- Gloves are readily available and are required when handling cash or credit card.
- All Solid Waste facilities maintain a stock of essential PPE items and hand cleaner (IE: soap, hand sanitizer). Use them frequently.
- Stocks of hand sanitizer and Lysol wipes are available for your use.
- The front entrance of Building H is used by the Public and has a screening process to enter; therefore, use of the side/employee entrance when entering Building H is encouraged.
- Gatherings of 10 or more people are not permitted.

Updated on 6/30/20

Cost Saving Approach to Redeveloping on Old Landfills or Dumps

Somshekhar Kundral, P.E. and Manuel J. Hernandez, P.E., BCEE

As large tracts of geographically desirable vacant land become scarcer, residential and commercial property developers are increasingly turning to old landfills or former dumps. However, such redevelopment is complex and rife with uncertainties. When compared to greenfield development, the land acquisition costs are lower, but any savings are typically offset by greater environmental and infrastructure costs associated with the foundation, landfill gas management, stormwater management, groundwater impacts, meeting closure requirements and multiple regulatory agency coordination. Therefore, it is important to maximize developable area while providing engineering solutions to make the project economically feasible. In this article, we identify some options to beneficially reuse challenging sites and lessons learned that have contributed to successful redevelopment projects.

Deep Dynamic Compaction

Old landfills or dumps present some unique soil stability challenges. Deep dynamic compaction (DDC) is one of the ground improvement techniques that has gained popularity in recent years to improve subsurface soil conditions. DDC involves dropping 6 to 30-ton weights from a height between 30 and 75 feet

to achieve the desired soil compaction. DDC can be effectively applied to a range of subsurface materials including former C&D debris or decomposed municipal solid waste dumps.

DDC provides a stable foundation to support future development, minimizes differential settlement while leaving the landfill waste in place and eliminates the costs associated with removing, transporting and disposing of buried waste, which can cost millions of dollars. For simplicity sake, let's consider a 1-acre old landfill or a dump site with an average of 15 feet waste. If the waste were excavated and replaced with clean fill, the cost for disposal fees for the excavated waste alone could exceed $400,000. Alternatively, the cost of DDC ranges from $1.50 to $2.00 per square foot or $65,000 to $87,120 per acre, excluding mobilization, which costs around $30,000. DDC presents significant savings over traditional waste excavation and other ground improvement alternatives and, as a result, is gaining favor with developers.

Gas Mitigation Systems

Constructing buildings on top of dynamically compacted areas generally requires a landfill gas barrier layer below the building foundation to manage subsurface combustible gases (typically methane). This is required because the waste remains in place. In its simplified form, gas mitigation systems include a subsurface ventilation layer with perforated pipe to capture and divert gas to the atmosphere; an impervious gas barrier

(spray applied or HDPE) to prevent gas migration into the occupied space, and compliance monitoring through horizontal gas probes or methane sensors to detect methane intrusion. These gas mitigation systems can either be a passive or an active system with blower. The cost of such systems varies depending on the size of building, location and type of liner system used. Typical capital cost for passive systems are in the range of $7 to $9 per square foot for spray-applied liner and $3 to $4 per square foot for HDPE liner. For active systems using blowers, add $3 to $4 per square foot. Several configurations of these systems can be designed to address the client's risk preference and in consideration of future tenant preferences.

Through the use of innovative approaches, impaired lands are increasingly attractive to developers. Beyond the cost-saving benefits to developers realized through DDC and an appropriate gas mitigation system, such projects also create local jobs, increase the tax base, while at the same time are protective of public health and environment.

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Advertising Opportunities Available

It's not too late to reserve a space in the Spring issue of Talking Trash.

Job Openings

Post an employment notice on the SWANA FL website for FREE!

Email info@swanafl.org or visit www.swanafl.org for more information.

Technologies for Removing VOC/Siloxane from RNG

Ramon Rivera, Diamond Scientific

VOC and siloxane removal from biogas captured on landfills forms an essential part of the purification process when landfill gas is used as a vehicle fuel or injected into a natural gas pipeline. Since the presence of siloxanes, even at very low levels can be destructive to engines, compressors and turbines, they need to be removed from natural gas used for these applications. While VOCs, which are considered an atmospheric pollutant, are likely to be destroyed when combusted in a turbine or engine, since they closely resemble siloxanes in term of their molecular structure, they are automatically captured (along with the siloxane) during the siloxane removal process.

Siloxane levels in biogas tend to vary greatly, depending on the source of the biogas (e.g. landfill, wastewater treatment plant, livestock farm, etc.), as well as the site. According to a report released by the California Biogas Collaborative in 2017, siloxane levels in raw biogas can vary as follows:

- Wastewater Treatment Facilities: 0-400 mg/m^3
- Landfills: 0-50 mg/m^3
- Livestock Farms: 0.2 mg/m^3
- Municipal Solid Waste Biodigesters: no information available

These figures show that the risk of siloxane contamination is greatest at wastewater treatment facilities and landfill gas projects. The reason for this is that siloxanes are common in many health, beauty and personal care products that are typically either flushed down the drain or disposed of in landfills.

VOC/Siloxane removal from biogas is approached in one of two ways. For smaller projects with lower gas flows or projects with larger gas flows but where VOC/siloxane levels are relatively low, a disposable carbon medium is generally used to remove these compounds. A company that specializes in VOC/siloxane removal from biogas will be able to analyze samples of the biogas and produce a carbon-based medium that is specifically tailored for removing these contaminants at this particular site. The quality of the biogas is routinely monitored in order to determine when the carbon medium needs to be replaced. The saturated carbon media can safely be sent to a landfill, with no further handling or special treatment required.

For projects where gas flows are higher or that have high levels of VOCs/siloxane, the disposable carbon media can quickly become saturated, making it a non-viable option. In these cases, a regenerative process is needed for VOC/Siloxane removal from biogas. The principle is similar to the non-regenerative disposable systems above, but instead of using a non-regenerative disposable medium to capture VOCs/siloxane, a medium that can be regenerated via a pressure swing adsorption (PSA) or temperature process is used. A change in temperature or pressure causes VOCs/siloxanes to de-absorb and they are sent to a flare where they are combusted with the aid of a pilot gas (supplementary fuel) in the form of biogas, fossil natural gas or propane.

Ramon Rivera is CEO of Diamond Scientific (Cocoa, FL). He can be reached at (321) 223-7500 or e-mail info@diamondsci.com.

Reference

https://cwec.ucdavis.edu/wp-content/uploads/03-16-2017-CEC-500-2017-007.pdf

Case Study: Public/Private Partners Team Up to Pilot Book Recycling Project

Paul Hurst, City of Tallahassee Recycle Coordinator and Gene Jones, Southern Waste Information eXchange, Inc. (SWIX)

Since 2000, the City of Tallahassee, in a collaborative effort with the Florida Bar, the Southern Waste Information eXchange, Inc. (SWIX) and Greif Recycling, have offered an annual Book Collection and Recycling event in Tallahassee. The event is held for several weeks around Earth Day and provides a large, covered drop off container which is staged in the parking lot of the Florida Bar. The event is advertised to local law firms as a convenient means for them to recycle their out-of-date law books. To-date approximately 238,881 pounds of hardbound out-of-date Florida Statutes have been collected and recycled.

A successful take-off of that event is underway and is being run as a pilot to expand hardbound book recycling in Florida. The pilot is funded by the Florida Department of Environmental Protection (DEP) through a grant agreement DEP has with SWIX. Currently, hardbound books are not accepted in the curbside recycling program for the City of Tallahassee and Leon County. This is true in most communities in Florida.

This project is piloting a hardbound book regional recycling facility for the community. This task involves collecting and recycling out-of-date Florida Statutes but also out-of-date educational books and other hardbound books in the region.

A great opportunity to run a pilot project to assess the viability of hardbound book recycling presented itself when the Florida Supreme Court reached out to SWIX. The Supreme Court wanted to purge out-of-date Legal Statutes and assorted other hardbound books that had accumulated in their building over the years. SWIX organized a team of partners and an efficient process to "upcycle" the hardbound books.

The City of Tallahassee provided a roll-off container to the Courthouse and transportation of the books to the processing destination. Florida State University's Recycle Program provided a processing location for the book de-binder which was procured by SWIX. FSU also provided personnel to assist with the entire process. SWIX personnel were onsite during the de-binding process and assisted FSU staff with the operation of the equipment. One of the many beauties of this project has been the seamless, and frankly enjoyable, cooperation of multiple agencies and organizations to facilitate a successful project.

Costs—you're asking about costs? Yeah, we know what you're thinking. The numbers work out well for this project when you consider current commodity prices. The de-binding process upgraded the books from being sold as Mixed Paper (MP) for $12.50 per ton to being sold to Greif, Inc. as Sorted Office Paper (SOP) for $200 per ton. Not a bad value, huh? So even after paying for transportation of 12 roll-off containers holding over 46 tons of hardbound books and the personnel to de-bind, shred and bale the pages, there was still net revenue left at the end of the day. And we are not finished yet.

For more information, contact Eugene B. Jones, CEO of Southern Waste Information eXchange, Inc. (SWIX) at (850) 386-6280 or e-mail gene@swixusa.org.

Images courtesy of Eugene B. Jones.

Landfill Final Cover Design and Planning for Long Term Performance

Ali Khatami, Ph.D., P.E., SCS Engineers

Chapter 62-701 of the Florida Administrative Code (FAC) requires the final cover for Class I and Class III landfills to include a barrier layer with hydraulic conductivity that is substantially equivalent to, or less than, the hydraulic conductivity of the bottom liner. Rule 62-701.400(3)(d), FAC, requires Class I and Class III landfills to be lined with polyvinyl chloride (PVC), high-density polyethylene (HDPE), or linear low-density polyethylene (LLDPE) liners. The final cover barrier layer must be PVC, HDPE, or LLDPE as well.

There are more than 60 active Class I landfills and over 35 active Class III landfills in Florida. Many of these landfills are anticipated to remain active for decades to come, and Chapter 62-701, FAC, requires slopes reaching permitted final elevations to be closed within 180 days. This means partial closure of slopes is part of the operational requirements of Class I and Class III landfills.

Figure 2 - Final cover geomembrane installation in progress.

Maintaining Landfills Beyond Closure

According to Chapter 62-701, FAC, following the completion and closure of Class I or Class III landfill, the facility's owner must maintain the landfill for a minimum of 30 years beyond the final closure date. Extension of the long-term care period beyond the 30-year long-term care period depends on meeting certain conditions that must be reviewed and approved by the Florida Department of Environmental Protection (FDEP). Even if FDEP approves completion of the long term care period for a specific landfill, the final cover system of the landfill is anticipated to perform for many years to come; otherwise, environmental issues associated the final cover with not properly performing may force FDEP to spend money that is no longer available.

Figure 1 - LTDS under construction at the toe of the landfill slope.

Designing for Long-Term Performance

For the past two decades, the author has designed and permitted final cover systems with special features to prolong the system's performance beyond the long-term care period of the landfill. The final cover systems are designed to:

- Maximize available airspace in the landfill
- Simplify waste placement in the vicinity of the exterior landfill slopes
- Simplify stormwater management components over landfill slopes
- Effectively collect and remove rainwater percolating through the final cover soils, collect lateral leachate seeps below the final cover barrier layer

- Effectively encapsulate landfill gas at the landfill perimeter

Real World Implementation

The first partial final cover with the aforementioned features was constructed in 1998. Since then, more than 20 other partial closures with these features have been built in Florida under the author's direct supervision. All partial closures are performing satisfactorily without failure. Regular maintenance of the final cover vegetation and occasional cleaning of drainage swales have been the only measures taken by the facilities' operators. The special features that were incorporated into the final cover systems were:

- Straight 3H:1V slopes to the top of the landfill with no benches or terraces, providing benefits such as maximizing airspace; eliminating complications during filling of the landfill near exterior slopes; allowing final surface water drainage swales to be constructed during the construction of the final cover, which provides flexibility for the swale locations, swale slopes, drainage points of swales on the slopes; and downchute pipes that do not require complicated geometric features at the point of connection to drainage swales on the slope (Figures 2 and 4).
- A leachate toe drain system (LTDS) (Figure 1) collecting and disposing of leachate seeps below the final cover geomembrane reaching the bottom of landfill slope.
- A rainwater toe drain system (RTDS) (Figure 3) collecting and draining out of the final cover the rainwater that percolates through the final cover reaching the cover system geocomposite drainage layer.

Figure 3 - RTDS completed near the toe of the landfill slope.

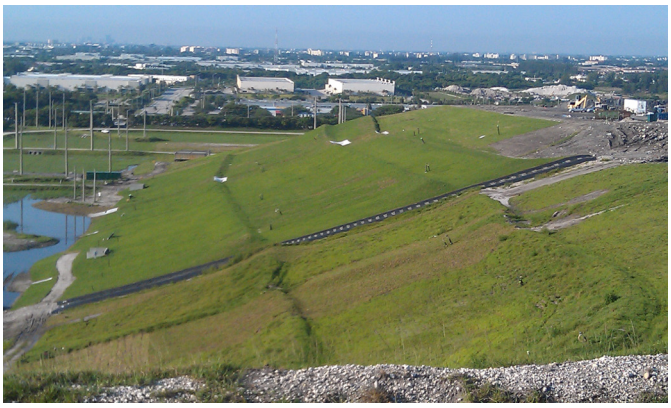

Figure 4 - Final condition with drainage swales and downchutes.

These features provide financial, performance and stability benefits for the facility for many years to come. So far, such final covers have been constructed on 3H:1V slopes as long as 550 ft. in length with no terraces. Several completed final covers were partial closures on a 3H:1V slope, where the next phase was constructed directly above a previous phase with the two phases tied together at the phase boundary.

Proper design and planning for the construction of partial final covers are significantly important for the long-term performance of landfills during the active life and during the long-term care of the landfill.

Ali Khatami, Ph.D., P.E. *is Vice President of SCS Engineers. He has more than 30 years of experience in design, permitting, and construction of landfills. Dr. Khatami can be reached at akhatami@scsengineers.com or www.scsengineers.com.*

Member News

City of Orlando Works with NRDC to Implement Food Waste Reduction Strategies

The City of Orlando was recently chosen to participate in Natural Resources Defense Council's (NRDC) Food Matters Southeast Regional Cohort. This technical assistance grant will work with five cities in the Southeast to make meaningful reductions in food waste at the regional level by implementing NRDC-chosen food waste reduction strategies which include conducting food waste audits at government food service operations, implementing organics waste collection at city offices and city-leased properties, and including food waste prevention messaging in existing literature distribution, on the city website, and in public spaces.

Leading by example, this work will build upon the city's already robust set of food waste diversion programs and goal of zero waste to landfill by 2040. Audit plans include performing food waste audits at multiple types of government and government-owned facilities to not only look at how much food is being wasted, but also what types of food are being wasted, by whom, and for what reasons. This information will help to identify further opportunities for food waste prevention messaging, education, purchasing, and donation. After the audits, these facilities will receive training and begin to use the city's Commercial Food Waste Recycling Program, diverting food waste from the landfill to a commercial composting facility.

Following the EPA's Food Recovery Hierarchy, there will be a large focus on food waste prevention messaging to reduce the volume of surplus food generated and thrown away. This messaging will be showcased on city websites, social media, newsletters, in city facilities, in public spaces, and in the new Tiny Green Home Exhibit that will be housed outside of the Orlando Science Center.

The city currently offers multiple locations for residents to drop off their food waste to be recycled, including multiple farmers markets and one unmonitored station. The Food Matters grant will allow expansion of this program by using neighborhood centers as public drop offs. These sites are folded into the commercial food waste route for pickup, ensuring that resident food waste is turned into a usable end product instead of entering local landfills.

Building upon our goals with NRDC to reduce food waste, conduct food waste audits, and implement organics collection, the city wants to ensure that good food finds its highest and best use by making it into the hands of people who need it. This also strengthens the city's resiliency at a time when COVID has increased the need for donated meals and revealed the vulnerability of food supply chains. Currently, around 19% of people in Orange County are food insecure. The city plans to conduct a food recovery pilot using a food rescue organization to pick up quality, excess food from facilities and have it safely delivered to residents in the community.

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For more information, visit

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New River Regional Landfill: Florida's First Renewable Natural Gas Pipeline Project

Mark Hadlock, Carol Sawyer, Perry Kent and Joel Woolsey

The New River Solid Waste Association (NRSWA) recently signed an agreement with Fortistar to beneficially use landfill gas generated at the New River Regional Landfill (NRRL) in Raiford, FL. NRSWA has sought a gas-to-energy project for nearly 10 years, and this project represents the first of its kind in Florida. This project converts landfill gas into pipeline-quality natural gas that will be injected into a pipeline at the NRRL for distribution and sale as renewable natural gas.

NRSWA was created by the Florida Legislature in 1988 to provide small population counties in North Florida access to affordable and modern solid waste management facilities. NRSWA consists of Union, Baker, and Bradford Counties. These member counties own and operate the NRRL in Union County. NRRL accepts waste

from its member counties and non-member counties including Alachua, Levy, and Gilchrist Counties, totaling approximately 1,000 tons per day.

NRSWA has always operated with the mission of being good stewards of the environment while pushing the boundaries of design and operations through close ties to researchers at the University of Florida. To this end, NRSWA's leadership has always recognized the importance of converting their landfill gas into a renewable energy source.

Many proposals were evaluated that included traditional electrical generation and less traditional processes like methanol and diesel fuel formulation. Despite the best intentions, none of these projects proved viable for NRSWA for a variety of reasons. In 2018 NRSWA issued its third Request for Proposals for landfill gas development and received an innovative, complex and potentially highly lucrative proposal from Fortistar to convert NRRL's gas into a renewable natural gas (RNG) source that would be injected into a pipeline for distribution and sale. The key to the success of the project was the ability to gain access to a natural gas pipeline to transport the RNG from NRRL. Over the last two years and through extensive negotiations, Fortistar was able to secure access to the pipeline and meet the gas specifications; thus, the viability of the project.

In October 2020, NRSWA signed the final agreement with Fortistar that included $1 million in assistance for expansions and improvements to the wellfield and millions of dollars in revenue to NRSWA over the 20-year contract term. Fortistar will operate the high Btu gas conversation facility while NRSWA will maintain ownership of the wellfield. Landfill gas from the permitted and active 82-acre NRRL will be available for the project. The initial phase of the project will collect 1,500 to 2,000 scfm of landfill gas at an average methane concentration of 52%. Over the course of the 20-year project, the gas needed for the project will increase up to 2,500 scfm of landfill gas. Also, over the course of the contract term, an additional 17-acre landfill cell will be constructed that will, ultimately, provide additional landfill gas.

The project includes constructing a facility that will include landfill gas moisture removal, gas compression, and removal of trace contaminants to purify the gas to a pipeline-quality renewable natural gas. The renewable natural gas will then be injected directly into a newly constructed pipeline at the site. The construction schedule is estimated to be 16 months. According to the terms of the contract, NRSWA will continue to operate and maintain its gas collection and control systems while Fortistar will operate and maintain the landfill gas conversion system. This is the first project for Fortistar in Florida. Fortistar has contracted with SCS Energy and Jones Edmunds to develop the facility.

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Member News

Real Men (and Women) Drive Pink

They weren't intended as conversation pieces. But the Miami-Dade County Department of Solid Waste Management's (DSWM) mini-fleet of pink trucks sure has people talking. "People love our pink trucks; everyone is excited about them," said Michael Fernandez, DSWM Director. "They're a reminder not only of the important job we do to protect the public health and the environment, but that our employees are dedicated to raising funds for breast cancer research and finding a cure for it one day."

DSWM plays a big role in Miami-Dade County's efforts to raise funds for the American Cancer Society's Making Strides Against Breast Cancer. Department employees have participated—both as fundraisers and as donors—for a number of years now. DSWM has hosted a wide variety of creative fundraisers throughout 2020, raising approximately $3,000 so far this fundraising season. The events have included a raffle for a new car, gift basket sales, sales of face masks, pop-up shops selling a variety of goods and much more.

This year, county-level fundraisers include a 5K fun run on the runway at Miami International Airport, circuit training classes through Zoom, and the annual Making Strides Against Breast Cancer walkathon, which took place as a "drive-by" parade this year at one of Miami-Dade's largest parks due to COVID-19.

"Although we missed doing the walk, an annual October tradition in Miami-Dade, the drive-by parade was a big success," said Mr. Fernandez. "We're proud to say that despite the pandemic, our department was well represented, with three of our six pink trucks present as well as a number of our employees."

"We plan to keep our pink trucks out in the community to remind residents that we're dedicated to fighting this awful disease that takes so many women's and men's lives each year," Mr. Fernandez said. "Hopefully, someday soon, we'll 'trash cancer,' as some of our pink trucks say, and the trucks can take a victory lap!"

Michael Fernandez is Director of the Miami-Dade County Department of Solid Waste Management. He can be reached at (305) 514-6626 or e-mail mfern@miamidade.gov.

ABC's of AD: Anaerobic Digestion (AD) and Organic Waste Co-Digestion

Chris Snow and David Hill

Recycle Florida Today, Inc. (RFT) recently hosted a webinar titled, *ABC's of AD: Anaerobic Digestion (AD) and Organic Waste Co-Digestion*. The goal of the webinar was to foster networking and information-sharing, relative to the advancement, understanding and use of anaerobic digestion. RFT believes AD is a vital tool for managing components of the organic waste stream in the State of Florida. AD is used to treat organic materials such as food waste, municipal wastewater biosolids, animal manures and various other organics to fuel renewable energy and produce multiple, beneficial, soil amendment byproducts. Organics co-digestion is an option for effective management of multiple waste products, which requires coordination across multiple stakeholder groups. This webinar features educational presentations from industry experts on the basics of organic waste co-digestion, recent research, use of biogas and soil amendments. Also included is information on how the Florida Department of Environmental Protection (FDEP) is changing its regulatory structure to encourage anaerobic digestion projects statewide and how EPA is helping expand anaerobic digester capacity and reducing food waste. Continuing education units for PE licenses will be available to participants.

Specifically, we discuss the basic concepts and mechanics of anaerobic digestion including the following, fascinating topics:

- *Welcome remarks and introduction of Recycle Florida Today, Inc.*—Chris Snow, Recycle Florida Today, Inc., Organics Recycling Committee and Consolidated Resource Recovery (CRR)
- *How AD and Co-Digestion Works to Solve Many Problems*—John Banks, Energy Systems Group
- *Recent Research on Co-Digestion of Organic Waste*—Dan Meeroff Ph.D., Director of Laboratories for Engineered Environmental Solutions, Florida Atlantic University
- *Utilization of AD Fuel Products and Contracting Process*—Bill Blake, TECO Energy
- *AD Digestate Composting*—David Hill, Recycle Florida Today, Inc., Organics Recycling Committee and CycleLogic
- *FDEP Involvement and 62-709 Changes*—Lauren O'Connor, FDEP – Division of Waste Management, David Read, FDEP – Air Division
- *Update from EPA both Nationally and Locally; How EPA is helping expand anaerobic digester capacity and reducing food waste*—Kim Charick, USEPA Region IV

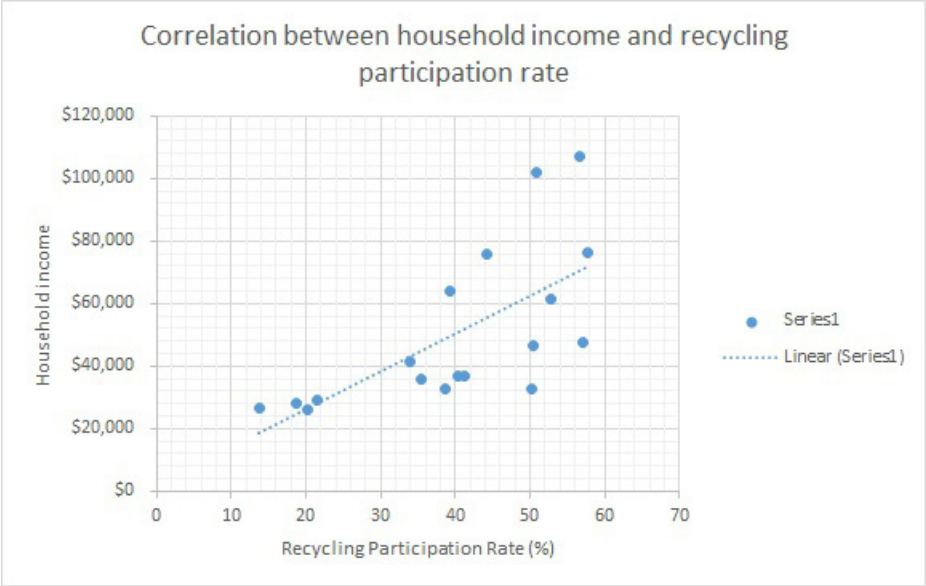
This webinar was developed by RFT, in conjunction with the Florida Department of Environmental Protection.

Information and an on-demand recording of this webinar has been made available at the Recycle Florida Today, Inc. website and can be viewed by visiting https://recyclefloridatoday.org/abcs-of-ad/.

Chris Snow, Consolidated Resource Recovery, Inc., and David Hill, CycleLogic are co-chairs of the Recycle Florida Today Organics Recycling Committee. Chris Snow can be reached at csnow@resourcerecovery.com. David Hill can be reached at hilldm@gmail.com.

Member News

Does Income Level, Education Attainment, and Racial/Ethnic Origin Influence Curbside Recycling Participation?



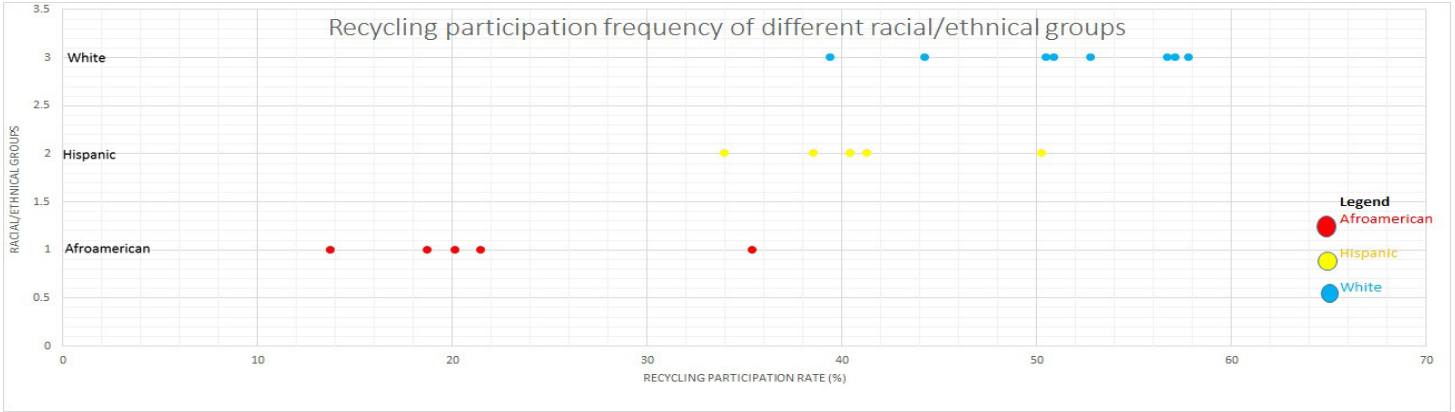
In the Summer Issue of *Talking Trash*, I wrote about "Recycling Participation/ Set-Out Rate Study in City of Orlando Neighborhoods: Relationship between Sociodemographic Factors and Recycling Participation, where I discussed the framework and the methodology for the recycling participation study. In this article, I present the results.

The most common indicators used to determine resident participation in recycling programs are set-out rate, participation rate, and amount of recycling found in the container. To calculate the participation ratio, the set-out rate is used, which is established as the percentage of residents who place their container outside at the curb on a single collection opportunity. To calculate the participation rate, the percentage of residents who removed their recycling bin at least once in three consecutive weeks of collection was recorded. Several studies have explored the factors that influence the frequency of participation of residents in recycling programs, suggesting that socio-economic and demographic profile of the neighborhood could be related to recycling participation. Still, more research is needed to support that assumption.

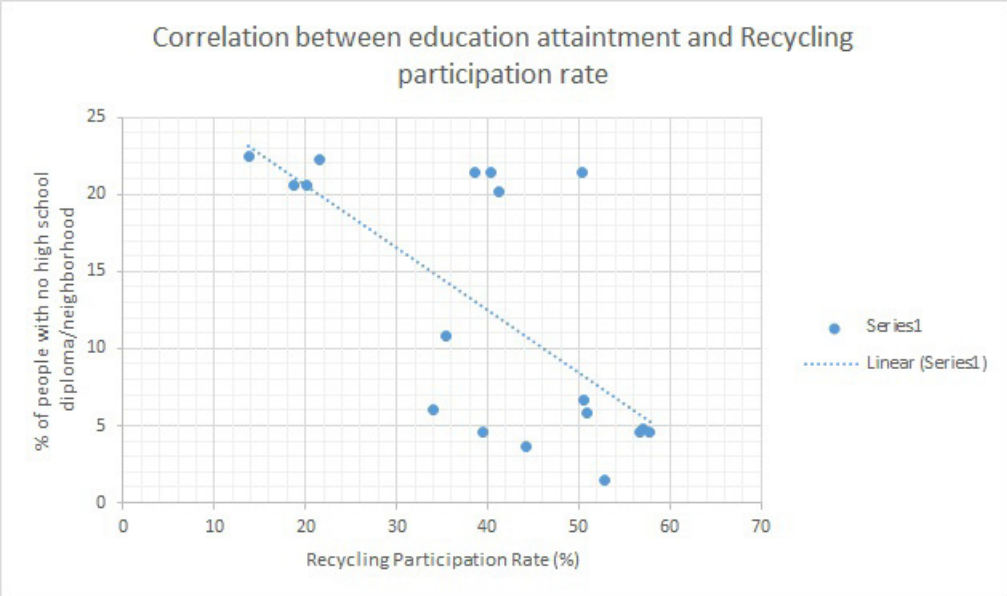
Study Results

To contribute filling out this scientific evidence gap, the City of Orlando conducted a study in which a random sample of 18 neighborhoods were selected from the city's six commissioner districts to establish whether there is a relationship between recycling participation/set-out rate and income level, education attainment, and racial/ethnic origin profile of the neighborhoods.

The set-out data was obtained by counting the carts that were at the curb on the day of recycling collection. The same procedure was carried out three weeks in a row for each neighborhood. The socio-economic and demographic data was obtained from the 2010 National Census. We found a positive correlation ($r = 0.67$) between household income and recycling participation, neighborhoods with the highest household income ($47,674 to $101,900) also had the highest recycling participation rate (50.51 to 57.81%) while those with



the lowest income ($26,509 to $29,227) had the lowest recycling participation (13.73 to 21.47%). On the other hand, we found a negative relationship (r = - 0.68) between educational attainment and recycling participation rate. Neighborhoods with a high %age of people with no high school diploma (20 to 22%/neighborhood) had the lowest recycling participation (13.73 to 21.47%), while those neighborhoods that had fewer people with no high school diploma (1.5 to 4.6%/neighborhood) had higher participation rates (50.51 to 57.81%). We also found three racial/ethnic groups that were the predominant in each one of the neighborhoods: Afro-American, Hispanic and White. Neighborhoods with high population of Afro-American people (99 to 85%/neighborhood) had the lowest recycling participation (13.73 to 21.47%), neighborhoods with mainly Hispanic people (50.8 to 60.7%/ neighborhood) had a mid-range recycling participation rate (38.56 to 50.28%), and neighborhoods with predominately white people (55.7 to 98.9%) had the highest recycling participation rate (50.51 to 57.81%).



Effective Messaging

The Solid Waste Division will use these results as a framework to plan effective educational campaigns with tailored, culturally-appropriate messages that rely on the socioeconomic and demographic profiles of the neighborhoods, in order to more efficiently spread the educational message and increase the neighborhoods' commitment to recycling. These results are also important because they allow us to identify the social inequalities that are potentially acting as barriers to increasing recycling rates.

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May 10-12, 2021
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