Application for SWANA Excellence Award 2013

Landfill Gas Utilization

Renewable Fuels Facility
Seminole Road Landfill
DeKalb County, Georgia

Submitted to:
Solid Waste Association of North America (SWANA)

Prepared by:
Geosyntec
consultants
# TABLE OF CONTENTS

**RELEASE FORM**

**DESCRIPTIVE SECTIONS**

- EXECUTIVE SUMMARY ........................................................................................................... 2
- Background and Overview ................................................................................................. 2
- Site Design and Construction ............................................................................................ 4
- Health, Safety, and Environmental Controls and Sustainability ................................... 5
- Regulatory Compliance ...................................................................................................... 7
- Planning, Operations and Financial Management ......................................................... 7
- Utilization of Equipment/Systems and Technologies ..................................................... 8
  - LFG-to-RNG Facility ......................................................................................................... 9
  - $H_2S$ Removal .................................................................................................................. 9
  - VOC Removal ................................................................................................................... 9
  - $CO_2$, $N_2$, and $O_2$ Removal ........................................................................................ 10
  - RNG Usage ....................................................................................................................... 10
- RCNG Fueling Station ........................................................................................................ 11
  - Site Layout ....................................................................................................................... 11
  - Fuel Sources .................................................................................................................... 11
  - RCNG Fueling Station Process ....................................................................................... 11
- Innovation and Creativity .................................................................................................. 12
- Public Acceptance, Appearance, and Aesthetics ............................................................. 13

**DESCRIPTIVE SECTIONS**

- PRESS RELEASES, ARTICLES, & ACKNOWLEDGEMENTS ............................................. 16
RELEASE FORM
2013 LANDFILL GAS UTILIZATION EXCELLENCE AWARD

RELEASE FORM

Release Statement: I certify that the information provided in this 2013 Excellence Award application is accurate and correct to the best of my knowledge. I understand that nominations become the property of SWANA. SWANA reserves the right to publish any or all of my application. My signature gives SWANA the right to reprint or make available for purchase any portion of this application.

Printed Name of Representative: Billy Malone

Organization Name: Dekalb County Sanitation

Signature: [Signature]

Date: 5/20/13
DESCRIPTIVE SECTIONS
EXECUTIVE SUMMARY

The DeKalb County, Georgia, Renewable Fuels Facility at the Seminole Road Landfill consists of a landfill gas (LFG) to renewable natural gas (RNG) utilization facility and a renewable compressed natural gas (RCNG) fueling station. With this project, the DeKalb County Landfill is the first in the nation to generate electricity, RNG, and RCNG from LFG at one site. The served community benefits both environmentally and economically from the publicly-accessible RCNG fueling station, with fuel produced from a renewable resource (i.e., LFG) replacing 15 million gallons of diesel or gasoline consumption each year. The project also results in 500 million cubic feet less LFG emissions annually, equivalent to annual reduced greenhouse gas (GHG) emissions of approximately 6.3 billion cubic feet CO$_2$e. With this project, DeKalb County continues its ongoing commitment to being the “Greenest Urban County in America.”

Background and Overview

DeKalb County (DeKalb) is located in the Atlanta Metropolitan Area and, with a population of 750,000, is the second most populous county in Georgia. The DeKalb County Sanitation Department was formed in 1937 and has the exclusive rights to collect, transport, and dispose of all solid waste generated in unincorporated areas of the County. The County provides 171,000 single-family residences with twice per week garbage, yard debris, and recycling pickup services, and also provides service to approximately 8,000 commercial customers. It owns and operates three municipal solid waste (MSW) transfer stations, one citizen convenience center, one MSW landfill, one construction and demolition (C&D) landfill, one yard debris composting facility, and one animal crematory.

The DeKalb Seminole Road MSW Landfill (Landfill; Figure 1) began receiving waste in 1977. It has more than eight million tons of MSW in place and receives 1,800 tons per operating day. The Landfill has approximately 50 million cubic yards of airspace capacity remaining and is expected to reach fill capacity around 2110. The Landfill has an active gas collection and control system (GCCS), which consists of 148 vertical wells and a candlestick flare. The GCCS currently collects approximately 2,200 standard cubic feet per minute (scfm) of landfill gas (LFG), with methane concentration of approximately 54 percent by volume.
Less than a decade ago, with the goal to make beneficial use of collected LFG, DeKalb started researching the options to generate various types of energy from LFG. Two LFG-burning generators were installed and became operational in 2006, utilizing approximately 1,000 scfm LFG and generating approximately 3.2 megawatt (MW) of electricity per year (the Green Energy Facility; Figure 2). However, more than 1,000 scfm of excess LFG collected from the Landfill was being flared in accordance with the New Source Performance Standards for MSW Landfills (Figure 2). With this additional raw LFG available, and considering stringent air permitting limitations and new, strict diesel engine emission standards, DeKalb turned to an LFG to renewable natural gas (RNG) conversion. This approach was implemented to utilize the extra landfill gas, lower emissions from the Landfill, and provide renewable compressed natural gas (RCNG) to both the general public and the County’s sanitation vehicle fleet.

On behalf of DeKalb, Geosyntec Consultants, Inc. (Geosyntec) researched funding options and identified a Department of Energy (DOE) and American Recovery and Reinvestment Act (ARRA) “stimulus” grant opportunity under the Clean Cities Transportation Sector Petroleum Reduction Technologies Program. Geosyntec developed the application for this competitive grant for DeKalb County and several partners (including Coca Cola, UPS, Hartsfield-Jackson Atlanta International Airport, and others).

DeKalb County and partners were awarded approximately $15 million in funding to develop an LFG-to-RNG utilization facility and two CNG fueling stations, and to purchase CNG fuel vehicles. This Project was one of 25 recipients (out of a total 110 projects) selected for award of grant funding, and was the only one that included utilizing LFG to RNG/RCNG. Approximately $7 million in grant funds were awarded to DeKalb in 2010 and were allocated to build the new Renewable Fuels Facility (i.e., LFG-to-RNG facility and RCNG fueling station) at the Landfill, as well as to replace 40 old diesel-burning
vehicles with new CNG-burning waste collection vehicles. As a result of this exciting project, over 500 million cubic feet of LFG can potentially be utilized to RNG annually and over 250 million cubic feet of RCNG can be provided as vehicle fuel to the DeKalb County and public vehicles.

**Site Design and Construction**

The Renewable Fuels Facility is located on the east side of the DeKalb Landfill, with a separate entrance to Clevemont Road for convenient public access. The facilities were strategically located on the Landfill to optimize piping of collected LFG to the utilization facility and piping of utilized RNG to the adjacent Atlanta Gas Light (AGL) natural gas pipeline.

In addition to the primary goal of utilizing LFG for renewable energy production, the Renewable Fuels Facility building was designed with the specific intention that it would serve as an educational tool and accommodate public visits and technical tours. The building has large viewing windows that provide an unobstructed view of the LFG-to-RNG utilization system area for convenient and safe touring of the facility.

Design and construction of the LFG-to-RNG facility and RCNG fueling station started in June 2011 (Figure 3) and were substantially completed by mid-2012 (Figure 4). Both construction projects were awarded as turnkey design, build, and operation and maintenance (O&M) contracts to well-established and qualified contractors (Energy Systems Group (ESG) and Winter Construction). Geosyntec assisted DeKalb with preparation and administration of Invitation to Bid (ITB) documents; solid waste and air permitting applications; and submittal of required project progress, financial, and operational reports.

The DeKalb County community benefits both environmentally and economically from the publicly-accessible RCNG fueling station, with utilized LFG as the main source of supply. The project results in 500 million cubic feet less LFG emissions annually, equivalent to annual reduced greenhouse gas (GHG) emissions of approximately 6.3 billion cubic feet CO₂e. Furthermore, RCNG fuel produced from a renewable resource (i.e., LFG) replaces approximately 15 million gallons of diesel or gasoline consumption each year with operation of the Renewable Fuels Facility. With this project, DeKalb County continues its ongoing commitment to being the “Greenest Urban County in America.”
**Health, Safety, and Environmental Controls and Sustainability**

The Renewable Fuels Facility process is designed to avoid fugitive gas emissions. Utilized LFG from the LFG-to-RNG facility is piped directly to the RCNG fueling station or the adjacent AGL natural gas pipeline. Any excess and/or waste gas (tail-gas) is piped to the on-site candlestick flare and destructed with excess raw LFG from the Landfill. An automated monitoring system monitors the quality and quantity of raw LFG to the LFG-to-RNG facility, product gas to the RCNG fueling station and AGL pipeline, and tail-gas going to the flare.

Condensate in the raw LFG is collected by means of an engineered knock-out tank and is pumped to the Landfill’s leachate collection tank. The quantity of collected condensate is monitored by a flow meter on the pump to the leachate tank. An engineered surface water collection system directs all runoff water to the Landfill’s permitted sewer system. Both the LFG-to-RNG facility and CNG fueling station incorporate engineered erosion and sediment control systems.

During the construction, contractors implemented their standard health and safety programs, with program oversight and enforcement by on site construction management. Project contractors also had internal (corporate office) and outside (hired consultant) safety officers perform safety practice audits and reviews on a regular basis. Regular safety tailgate meetings were held with on-site workers and with groups visiting the construction site. As a result of these practices, there were zero lost time accidents and zero accidents during the construction.
The Renewable Fuels Facility was designed and constructed to high sustainable building and development standards and is currently in the application process for a LEED Gold certificate. Several LEED factors were implemented in the facility, including use of a commissioning agent on the heating, ventilation, and air conditioning (HVAC) system; minimum efficiency reporting value (MERV) filters in the building; and separate controls for temperature and lighting in different spaces.

To aid in conveying the sustainability concept to the general public, DeKalb County commissioned an artist to create a wall-sized mural (Figure 5), which was unveiled during the grand opening ceremonies, that illustrates the County’s integrated solid waste management system. The mural clearly illustrates the full process cycle of residents and businesses placing garbage for collection, to landfill operations, to landfill gas generation, to gas utilization, to providing electricity and fuel to the same residential homes and businesses.

In addition to applying LEED processes, a comprehensive erosion control and environmental protection program was designed and developed by the contractor’s design teams and implemented as part of the construction. Regular inspections of the environmental controls were made throughout the site work to ensure compliance with design plans. Designed landscaping using all Georgia native plants was put in around the Renewable Fuels Facility and is routinely maintained by the O&M contractor.
Regulatory Compliance

One of the motivations for DeKalb County to invest in the Renewable Fuels Facility was the stringent air permitting limitations within the Atlanta ozone nonattainment zone. In addition, strict diesel engine emission standards were taking effect. To be proactive relative to air regulatory compliance, DeKalb implemented innovative technology to re-route the tail gas emissions from the new facility to the existing, already permitted LFG destruction flare. Since no significant new emissions sources were added, regulatory permitting with the Georgia Department of Natural Resources Environmental Protection Division (Georgia EPD) was greatly simplified. With this facility, methane from the raw LFG is utilized as a renewable fuel and not burnt to the atmosphere, thus reducing LFG emissions from the Landfill by 500 million cubic feet annually. This is a significant environmental benefit to the local community. The DeKalb Sanitation Department has demonstrated a high level of commitment to regulatory requirements related to all operations at the Landfill and has an excellent record of compliance.

A Monitoring Plan, consisting of procedures to monitor the filtering, compression, and dewatering of the treatment system on a weekly basis, was submitted to and approved by Georgia EPD for the LFG-to-RNG facility and is implemented by the O&M contractor. A detailed Startup/Shutdown/Malfunction (SSM) Plan was prepared per requirements of Title 40 Code of Federal Regulations Section 63.6(e)(3) (40 CFR 63.6(e)(3)), as this facility is subject to 40 CFR Part 63, Subpart AAAAA, the National Emission Standard for Hazardous Air Pollutants (NESHAPs) for MSW landfills; this Plan is also implemented by the O&M contractor. Required permits such as the CNG Dispensing Permit were obtained for operation of the RCNG fueling station.

Planning, Operations and Financial Management

Accelerated construction schedule/management techniques were applied during construction of this project. For example, the LFG-to-RNG project was completed using a 4-day/10-hour per day work schedule. With this schedule there was no time lost during weeks with one holiday and 30 hours of work was accomplished during weeks with two holidays. This schedule also afforded 2 days per week to either make up for a lost work day due to weather or to accelerate a critical item of work.

For better management of the project development activities, DeKalb and Geosyntec conducted weekly meetings with the contractors. Progress of work during the previous week and short- and long-term plans were constantly reviewed between the DeKalb, Geosyntec, and contractors to optimize operations and achieve project goals within the
planned time frames. Geosyntec provided continued oversight throughout the design and construction phases via weekly progress meetings, monitoring of project schedules and milestones, control of project budgets and expenditures, and monthly project progress reports. These applied project management practices resulted in substantial completion of the Renewable Fuels Facility within the initial concept construction schedule.

Design and construction work for the Renewable Fuels Facility started in June 2011 and was substantially completed by mid-2012, with a total expensed budget of over $12.2 million for design, construction, and project management. The design-build contractors are contracted to provide O&M services for the two facilities with an average annual expense of approximately $620,000 for the first 5 years of operation.

With the vision of increased LFG collection rates at the Landfill, both facilities were designed with plans for future expansion. The LFG-to-RNG facility currently consists of one process line with the potential to utilize up to 1,300 scfm of LFG. However, provisional construction (such as electrical conduits and stubs, and adequate sizing of LFG recovery line from the Landfill) and space in the process building have been provided to install the equipment necessary to double the capacity of the existing process system. Similarly, the CNG fueling station currently has two double-sided fuel dispensers. However, additional space was provided at the fueling islands and electrical conduits were laid below the concrete pavement with stub-outs at the islands to double the capacity of the fueling station to four double-sided dispensers. Based on projected airspace calculations, the Landfill has a remaining site life of about 100 years. With continued increase in LFG production and collection rates, it is likely that DeKalb will soon consider expanding the utilization and dispensing system.

**Utilization of Equipment/Systems and Technologies**

The DeKalb County Renewable Fuels Facility consist of two main facilities, the LFG-to-RNG facility and the RCNG fueling station, that utilize LFG to RNG, compress RNG to RCNG, and dispense CNG fuel to the public. A schematic of the operations is provided in Figure 6 and the technical details of each facility are described below.
LFG-to-RNG Facility

**H₂S Removal**

The LFG piped to the RNG facility is compressed to reach the required operating pressure and undergoes the first pre-treatment step. A biological scrubber (micro-organisms in an aqueous solution) is used to break down and remove the hydrogen sulfide (H₂S) in the LFG via oxidation. H₂S is an acidic and highly corrosive molecule that can damage the media used later in the gas separation system. The liquid waste from this step is directed to a leachate pumping station at the Landfill and is eventually disposed of, along with leachate from the Landfill, via a sewer line to the DeKalb Wastewater Treatment Plant. From the bio scrubber, the gas continues to a condensate knock-out tank to remove moisture added during this step.

**VOC Removal**

The second stage of pre-treatment removes contaminants, such as siloxanes and other volatile organic compounds (VOCs) from the LFG. Siloxane is a sand-like molecule found in gas due to deodorants, cosmetics, and toothpaste degrading in the landfill. When the gas experiences a drop in temperature, components with different physical characteristics separate. This separation removes contaminants as a condensate, an oil with a consistency similar to diesel or kerosene, from the gas. Removal of contaminants from
the gas is ensured with a final polishing stage from a desiccant and activated carbon combination. Now the gas consists only of N₂, O₂, CH₄, and CO₂.

**CO₂, N₂, and O₂ Removal**

The final pre-treatment stage allows separation of carbon dioxide, nitrogen, and oxygen from the methane through pressure swing absorption (PSA). The separation is based on the varying sizes of each of these molecules. Certain molecules under pressure are allowed to enter the separation media and remain there, while others are too large and continue traveling through the vessel. Media of various sizes are used to remove contaminants from the methane. Once the landfill gas is clean of the remaining contaminants, its British thermal unit (BTU) content has been increased, providing a significantly more flammable gas.

**RNG Usage**

The clean RNG is further compressed to produce RCNG, and then consumed primarily by commercial, industrial, and public users to fuel vehicles. Based on the demand and consumption of RCNG at the fueling station, the excess RNG produced is injected into a natural gas transmission line owned by AGL, which generates additional revenue. Construction of the LFG-to-RNG facility was substantially completed in April 2012 (Figures 7 and 8).

Figure 7. Completed LFG-to-RNG facility

Figure 8. Ribbon cutting ceremony for the LFG-to-RNG facility, with presence of the County CEO and Commissioners, April 2012
RCNG Fueling Station

Site Layout

The RCNG fueling station is located adjacent to the LFG-to-RNG facility. The RCNG fueling station is accessible to the public via a paved entrance drive from Clevemont Road, located to the east. The fueling station includes a CNG equipment compound and two dispenser islands, with two fast fill dispensers, four hoses, and a card reader, covered by a canopy. Construction of the RCNG fueling station was substantially completed in October 2012 (Figures 9 and 10).

![Figure 9. RCNG fueling station](image1)

![Figure 10. Ribbon cutting ceremony for the RCNG fueling station, with presence of the County CEO and Commissioners, October 2012](image2)

Fuel Sources

The primary fuel source for the RCNG fueling station is the RNG provided by the LFG-to-RNG facility. The RNG is delivered to the fueling station at 94 psi via a fuel supply line. Natural gas from the AGL line is used as a backup fuel source in the event that the LFG-to-RNG facility is offline. The natural gas from the AGL line is delivered at 90 psi.

RCNG Fueling Station Process

**Dryer Unit:** The natural gas delivered to the RCNG fueling station initially goes through a dryer unit designed to remove water vapor and other impurities present in the natural gas. Water vapor is removed by passing the natural gas through molecular sieve absorbent desiccant materials. This process is critical because moisture in the natural gas can cause corrosion in the downstream equipment, fuel lines, and storage vessels. Excess moisture can also cause vehicle engine performance and maintenance issues.
**Compression:** The dried RNG flows to the compressor stage where the gas is compressed using two 250 scfm reciprocating compressors that run on electricity. The RNG is compressed up to 3,600 psi to allow transfer to CNG vehicle fuel tanks.

**Storage:** The RCNG is transferred to horizontally mounted storage cylinders. The storage system consists of three cylindrical storage vessels that store the compressed gas at low, mid, and high pressure and have a combined capacity of 300 gallons. This type of arrangement is referred to as a buffered storage system. In this type of storage system, CNG is first dispensed from the low pressure cylinder. Once the pressure in the vehicle fuel cell reaches equilibrium with the low pressure cylinder, the middle pressure cylinder opens to continue filling the vehicle; once the pressure reaches equilibrium with the middle cylinder, the high pressure cylinder opens and fills the vehicle to a final pressure of 3,600 psi. As CNG is dispensed from the storage vessels, the computer control system starts the dryer and compressor units to refill the storage vessels.

**Priority Panel:** The CNG equipment is computer-controlled and includes a priority panel which regulates gas flow between the compressor and storage stages.

**Dispensers:** The RCNG is delivered to vehicles via two fast fill dispensers, each with two hoses. Fuel transactions are completed on a card reader system. The card reader is equipped to handle FuelMaster cards and fuel keys used by DeKalb County personnel, and credit cards used by the general public.

**Innovation and Creativity**

As indicated by the US Environmental Protection Agency Landfill Methane Outreach Program (USEPA LMOP), the DeKalb County Landfill is the first landfill in the Nation to generate electricity, RNG, and RCNG from landfill gas at one site. Typically, LFG-to-RNG systems require raw LFG to have a maximum oxygen and nitrogen content of 2 and 5 percent, respectively, to be economically viable. In the technology used at the DeKalb Landfill, the LFG-to-RNG system is capable of meeting the product gas specifications for RNG with oxygen and nitrogen contents up to 4 and 14 percent, respectively, in the raw LFG. This technology provides the advantage of potentially utilizing more of the methane in LFG as RNG with less methane having to be destructed in the tail-gas stream at the flare.

The LFG utilization system operates at a maximum pressure of approximately 100 pounds per square inch (psi) as opposed to other LFG processes with higher operating pressures, some up to 600 psi. This practice saves on the amount of energy required to process LFG, thus lowering the production cost. However, highest industry standards were considered
for the produced RNG. The system is designed to produce RNG that exceeds pipeline natural gas quality, and a mass spectrometer continuously monitors the quality of product gas.

Eventually, any raw LFG and/or tail-gas that is not used for electricity or RNG/RCNG production will be destroyed at an ultra-low-NOx flare, which will be the first of its kind at a landfill in the US. This component is scheduled to be installed at the Landfill by the end of 2013.

**Public Acceptance, Appearance, and Aesthetics**

One of the major objectives of the project was to provide a facility that would serve as a showcase to promote landfill gas energy projects and a resource to educate the public on sustainable solid waste management practices. The Seminole Road Landfill implements many innovative approaches to solid waste management and facility development, with the Renewable Fuels Facility as the newest component of the overall Landfill operations.

During project development, DeKalb conducted numerous meetings with the surrounding community, other County departments, and the Board of Commissioners for the purpose of explaining the project objectives, design features, and benefits to the community and the environment. These regular, informative meetings resulted in general awareness of the project schedule and end benefits to the community and, as a result, no neighbor or public complaints were reported throughout the construction work.

The Renewable Fuels Facility was designed to serve as an educational tool and to accommodate public visits and technical tours. To date, the Renewable Fuels Facility and RCNG fueling station have been visited by international technical delegations from seventeen countries (Canada, China, Columbia, Georgia, Germany, Haiti, Indonesia, Japan, Kenya, Mexico, Nigeria, Puerto Rico, Serbia, South Africa, Ukraine, Venezuela, and Zimbabwe). Several national delegations and technical conference groups have also visited the Renewable Fuels Facility since initiation and after completion of construction activities, including technical teams from the 2012 Waste-to-Wheels Conference, the 7th Annual Southeast Diesel Collaborative Conference, and the 17th Solid Waste Association of North America (SWANA) Landfill Symposium. The Landfill has hosted groups of students from several middle and high schools in the Metro Atlanta area.

In order to improve the aesthetics and promote educational components, a wall-sized mural was designed that illustrates the complete process from waste collection, to landfill operations, to landfill gas generation, to gas utilization, to providing electricity and fuel to residential homes and businesses. Two large-screen LCD monitors installed in the office
building display the technical operations data of the LFG-to-RNG facility. Large viewing windows in the office building provide a full view of the utilization process to visitors at the facility. For the RCNG fueling station, a separate entrance was constructed for public access, with designed landscaping to minimize visibility of the Landfill from the main road. Other aesthetic components of the facilities include:

- exterior colors blending with the natural environment of the site;
- asphalt paved area with marked parking areas;
- special parking and ramp for use of those with disabilities;
- sustainable usage of stormwater runoff from roofs via rain barrels;
- green slated fence, sound-proofing for noise reduction; and
- block wall to limit view of equipment compound to general public using the RCNG fueling station.

In addition to applying LEED processes, a comprehensive erosion control and environmental protection program was designed and developed by the contractor’s design teams and implemented as part of the construction. Regular inspections of the environmental controls were made throughout the construction to ensure compliance with design plans. Designed landscaping using all Georgia native plants was put in around the Renewable Fuels Facility and is routinely maintained by the O&M contractor.
SUPPLEMENTAL MATERIALS
“Trash to Gas” Plant Begins Test Operations
The first dual facility saves county $3 million, and improves air quality
http://web.co.dekalb.ga.us/portals/news-room/a_release.asp?filePK=1444

DECATUR – Once it is fully operational, DeKalb County’s Renewable Energy Facility will have the environmental equivalent of taking 30,000 cars off the road every year. It will reduce carbon dioxide emissions by 17,000 tons, or what goes into the atmosphere from 17 million gallons of gasoline.

And that’s just the first year.

DeKalb County Chief Executive Officer Burrell Ellis, in conjunction with Energy Systems Group and the Clean Cities Atlanta Petroleum Reduction Program, officially opened the new renewable energy facility at the Seminole Road Landfill to begin the test phase of operations on April 16.

“Saving money is important, but the real payoff over the long term is being good stewards of our environment and the air we breathe,” said CEO Ellis. “We owe it to future generations to leave our county and planet better off than when we inherited it.”

The renewable energy facility is also a first in the nation. While there are landfills that make RNG for pipeline injection, this is the first landfill in the U.S. that will simultaneously provide Landfill Gas to convert landfill gas to produce both Compressed Natural Gas (CNG) for vehicles and Renewable Natural Gas (RNG) for high-BTU gas for pipeline injection. Furthermore, once the facility is completed, the county will have the capacity to process more landfill gas than any other county in Georgia.

To capitalize on the fuel savings, DeKalb County is starting with its own fleet. The first vehicles to be powered by CNG will be the ones that deliver the garbage to the landfill in the first place – the garbage trucks.

DeKalb County Sanitation Department is converting 70 vehicles from diesel fuel to CNG. As diesel is currently selling for more than $4 a gallon, DeKalb County is forecasting fuel savings of $3 million over the next 8 years. The county’s goal is to eventually replace or adapt its entire fleet of 306 sanitation vehicles with natural gas vehicles over the same time period.

“The current price for CNG is almost half the amount of diesel fuel. Of course, we can make it for even less right here at the Seminole landfill,” said Billy Malone, Assistant Director of Public Works/Sanitation Division.
The test phase of all the facility’s machinery will be underway for several weeks. The plant will be connected to the commercial pipeline in early summer, and the on-site fueling station for sanitation trucks will be completed this fall.

The plant was constructed by ESG, one of the nation’s premiere energy performance contractors. It was funded as part of President Barack Obama’s stimulus funds through the U.S. Department of Energy (DOE). The DOE awarded a grant to the Clean Cities Atlanta Petroleum Reduction Program of which DeKalb County received $7.8 million for this project.

“We are turning ‘Trash to Gas’ and ‘Gas to Cash’, saving $3 million by using it in DeKalb County vehicles,” said CEO Ellis. “We are, in fact, living up to our vision of being the Greenest Urban County in America and the place where your future lives.”

### Environmental and Energy Benefits of Emissions Reduced

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<th>After Plant Expansion for the Next 20 Years of Operation</th>
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* Useful life based upon 30-year expected service life of plant with full capacity reached after first 10 years
* Calculations thru LFGE Benefits Calculator and Greenhouse Gas Equivalencies Calculator provided by the EPA

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Earth Day’s ideals are evident in DeKalb County’s new renewable fuel facility at its Seminole landfill

Posted in David Pendered
http://saportareport.com/blog/2012/04/earth-days-ideals-are-evident-in-dekalb-countys-new-renewable-fuel-facility/
Date: April 16th, 2012, 7:19 pm
By David Pendered
Methane gas captured in a landfill in DeKalb County will be transformed into fuel for vehicles at a futuristic facility where the ceremonial ribbon was cut Monday.

This example of renewable bio-fuel is just the sort of technology that was hoped for by participants of the first Earth Day, in 1970. Sunday marks the 42nd celebration of an event that now involves millions of people in at least 192 countries.

DeKalb County CEO Burrell Ellis (center, with scissors) led the ceremonial ribbon cutting at the county’s new bio-fuel facility. Credit: David Pendered

DeKalb’s new facility, which will create compressed natural gas from the methane gas, joins another methane recovery operation at the county’s Seminole Road Landfill. The first recovery facility captures methane for use by Georgia Power, which burns it to drive turbines that create electricity.

Taken together, the two recovery facilities will help DeKalb reduce its carbon footprint and earn money for the county government. DeKalb CEO Burrell Ellis cast the tie-breaking vote in February, 2011 in favor of building the CNG plant.
In terms of the county’s carbon footprint, methane will be captured instead of emitted into the atmosphere; when burned as fuel by county vehicles, the gas will emit fewer wastes than the fuel it replaces. Secondly, the amount of methane that exceeds the needs of the county government will be sold to the public – making money for the county.

“Trash to gas, and gas to cash,” Ellis said, encouraging the audience of about 50 to join him in repeating a line Ellis said is one of his favorites.

The system works by piping methane gas from the landfill into the facility, where contaminants are removed in a cold oil process and the gas is compressed, said Jeff Photakis, a bio-gas specialist with Energy System Group, the private company that will operate the facility. The inside of the building consists of office space and a small work area filled with a couple dozen large cylinders that will contain the compressed gas.

Incidentally, this kind of gas is referred to as “Renewable Natural Gas,” which is a subset of the category of “Compressed Natural Gas,” Photakis said.

The workforce necessary to run the plant will have to be trained on the new equipment, said Deborah Scott, executive director of Stand Up Georgia. The task of helping to train those workers will be taken on by Trade
Up, a workforce development program affiliated with Stand Up and the North Georgia Building and Construction Trades Council. Ellis acknowledged the group during his speech.

The costs of the program are being covered by DeKalb County and a U.S. Department of Energy grant made to Clean Cities Atlanta through the American Recovery and Reinvestment Act of 2009, which was approved during the Obama administration. Many times during the program, Ellis commended Obama for funding ARRA and invited him to visit DeKalb County.

Former DeKalb District Attorney Gwendolyn Keyes Fleming also commended the ARRA program. Fleming, who was a Georgia delegate for Obama in his 2008 campaign, now serves as the Southeast regional director of the Environmental Protection Agency.

Burrell said the gas initially will be used to fuel 70 vehicles. Eventually, the county intends to convert its fleet of about 300 sanitation vehicles to run on the fuel.

Last year, the county bought 24 Freightliner CNG trucks for sanitation and maintenance operations. The county is supporting the shift to bio-fuel by building two fueling stations for CNG-powered cars and trucks.

The new facility has the capacity to replace 17 million gallons of fuel a year, said Ted Photakis, a senior account executive with Energy System Group.

The methane gas will be collected until at least 2091, when the operating permit expires, Ted Photakis said. He commended Billy Malone, DeKalb’s director of sanitation, for his vision in outlining the bio-fuel concept in 2005.

Former DeKalb CEO Vernon Jones started the recovery program that sells methane to Georgia Power. Jones, who did not attend Monday’s ceremony, said the initial investment of $4 million has been recovered and the program now earns money that helps pay for the county’s operations.

“What the technology was there, the resources were there, and it was just a matter of getting it done,” Jones said. “It was taking something nobody wants in their neighborhood, a landfill, and making money from it. That’s the epitome of taking resources that were being thrown away, and reusing them in ways that are safe, sound, environmentally effective, and profitable for the county.”

Georgia Trade Up plans to begin training workers who will become certified to work in the green industry.

Credit: David Pendered
DeKalb County, the third most populated county in Georgia, serves 700,000 residents with one of the most comprehensive and integrated solid waste management systems in the country. The County provides residential and commercial solid waste collection services, separate yard waste collection and composting, curbside recycling service, drop-off locations for materials recovery and recycling, and special collection services to 159,000 households, over 8,000 commercial businesses, and several thousand apartment complexes. The County's landfill has approximately 50 million cubic yards of airspace capacity remaining and is not expected to reach fill capacity until nearly 2090. It has more than nine million tons of waste in place and receives over 2,000 tons per operating day. The DeKalb Public Works Department has been successful in reducing waste going into the landfill through community outreach and a wide variety of waste reduction programs designed to promote source reduction, recycling and reuse of materials at the grassroots level. In addition, in recent years, the County has constructed a facility to convert landfill gas to electricity, and with funds from the 2009 Stimulus Act, the County is currently constructing a facility to convert landfill gas to compressed natural gas to fuel several dozen sanitation vehicles.

Because of this comprehensive, integrated waste management program, the County, in partnership with the U.S. Environmental Protection Agency (US EPA), the Georgia Environmental Protection Division (EPD), and the Georgia Center for International Visitors, has hosted several dozen visitors from places as diverse as Canada, China, Colombia, Haiti, Japan, Mexico, Serbia, South Africa, Ukraine and Venezuela. As many of these countries are experiencing increased urbanization, their visitors to DeKalb have enjoyed learning how an integrated waste management and waste-to-energy program is beneficial to public health, environmental protection, energy production and conservation, and economic development. The landfill has won awards from the US EPA Landfill Methane Outreach Program (LMOP), the National Solid Waste Association of North America (SWANA), the Georgia Chapter of SWANA, the National Association of Counties (NACo), the Association of County Commissioners of Georgia (ACCG) and the Atlanta Regional Commission (ARC) for its innovative and beneficial reuse projects.

Some examples of the integrated waste management approaches that the DeKalb Sanitation staff utilize include the following examples. First, the daily and intermediate cover used in landfill operations is primarily a finished compost produced by DeKalb’s own composting operation, with the balance of cover material coming from an onsite borrow source (under a state mining permit). The County produces over 80,000 tons of compost per year with 50% being
Trash becomes gas, saving cash in DeKalb

County station will pump compressed natural gas.

$1 million from sales projected annually.

Dodge Rams that run on CNG, there will be some bracing, too. The price for a gallon of the fuel at DeKalb’s station: $3.10.

“We took the environmental and financial savings together and it just made sense to go with a company that was already doing it,” said County Commissioner Ed Smith.

DeKalb has the contract with the Georgia CNG company to provide the fuel. DeKalb projects it will make $1 million a year selling the gas, known as CNG.

And for people able to fill up their vehicles nearby.

New kind of gas station

Gas to have at least 70 CNG-capable trucks. That will save $3 million or more over the eight-year life of the trucks, said Billy Maloney, the county’s assistant sanitation director.

“Our trucks only get 2 miles per gallon because they make 1,000 trips a week, but it’s a lot cheaper when you use CNG,” he said.

But DeKalb will put the savings into its sanitation fund, a separate account funded by fees that residents and businesses pay each year in addition to property taxes.

Smith said the purchase of CNG trucks “will help leave the air cleaner, even if it’s raised rates for the first time since 2007. Maloney said.

“This year’s rate increase is the second in a row, but it’s still lower than what we’ve seen in the past. We’ve been able to lower our rates over the past 10 years as well, as we’ve continued to improve our operations and reduce our costs.

For its part, Coca-Cola has deployed 30 CNG-compliant trucks in the city of DeKalb. The company’s fleet operations director, Chris Garey, said DeKalb’s CNG fleet is running smoothly and is benefiting the city and the environment.

“We are actively exploring new locations and new technologies,” Maloney said.

Maloney said DeKalb is ready to go – or expand – any trucks that make the switch. Even fewer county garbage truck runs use CNG, the county wants to encourage the use of alternative fuels.