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www.wasteadvantagemag.com February 2012 Vol.3, No.2

WasteAdvantage

magazine

The Advantage in the Waste Industry

**180° Turnaround
for a Solid Waste
Management System:**

THE GUAM STORY AND LESSONS LEARNED

**Bluewater Recycling
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PUTTING POWER IN THE COMMUNITY'S HANDS

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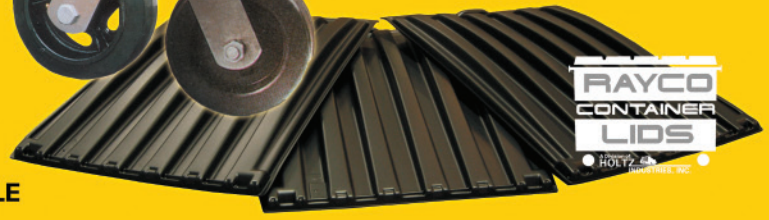
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Editor's Note



WE'VE ALMOST MADE IT OUT OF WINTER AND SOME OF US HAVE EVEN SEEN

warmer days than usual. It's a great sign to the beginning of an exciting year for the industry and *Waste Advantage Magazine*. We have already received some great ideas and comments from readers and plan on covering the developments on the continuous debate over whether or not the EPA is helping or hurting with their regulations and policies. It will be a fascinating topic to watch unfold, especially since it is an election year and the presidential campaigns are already underway. By the end of 2012, it will be interesting to see where we stand.

This month's issue features a spotlight (page 14) on the Bluewater Recycling Association in Huron Park, ON, an organization that has focused on not only increasing their waste diversion rates, but also educating the public about its benefits. In turn, consistently reaching its recycling goals. In addition, "Refurbished Containers As a Cost-Effective, Alternative Solution" (page 22) discusses the option of reconditioned containers as opposed to purchasing new ones, especially when it comes to saving money. And be sure to read "180° Turnaround for a Solid Waste Management System," (page 26), a great story about how Guam completely revamped their waste management operations as well as opened a new state-of-the-art landfill. Other terrific articles cover automated voice and text messaging (page 24), recognizing on-the-job dangers (page 32) and enhancing fleet operations (page 36).

As we head into trade show season, we'll be on the lookout for innovative ideas, technologies and ideas in order to stay on top of the industry's next big things. I look forward to preparing for this time of year and seeing what will be on display this year. I hope to see many of you in the coming months. As always, feel free to contact me with any comments, questions or just to chat. I appreciate your feedback.

Best Regards,
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The first trash trucks deliver waste to the new Layon Landfill in Guam on September 1, 2011.

Photo courtesy of Gershman, Brickner & Bratton, Inc.

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Trash Talk



Universal Recycling & Scrap Iron Corp. Acquires Scrap Yard in NJ

UNIVERSAL RECYCLING & SCRAP IRON CORP. (URSI) (Tom's River, NJ) a subsidiary of Universal Wrecking Corp., recently took over ownership and operation of the former Cosmos Green Acres scrap yard located in Bayville, NJ. URSI plans to transform the 16-acre site into a state-of-the-art scrap recycling facility that accepts non-ferrous and ferrous scrap metals as well as scrap autos, trucks, trailers and heavy equipment. It is the largest and most conveniently located scrap recycling facility in central and southern New Jersey. URSI has installed two 70 foot, 100 ton certified truck scales and two smaller platform scales. The facility now also boasts an armada of recycling machinery and equipment including, grapples, material handlers, shears, skid steers, loaders, forklifts, various hopper, containers and support equipment. The scrap recycling equipment quickly sorts, processes and packages the metals for shipment to domestic and export markets.

For more information, call (877) SCRAP-80 or visit www.universalrecyclinggroup.com.

Waste Pro Acquires Acadian Waste Disposal Service

WASTE PRO USA, INC. (Longwood, FL) has acquired Acadian Waste Disposal Service located in Ascension parish, near the city of Gonzales, LA. In operation since 1992, Acadian Waste specializes in residential, commercial and industrial waste disposal. Situated conveniently between the major metropolitan areas

of Baton Rouge and New Orleans along the I-10 corridor, Acadian Waste has been geographically poised to serve many parishes and cities, including the City of Gonzales. Included in the purchase were administrative offices, containers and front and rear load service vehicles. "This recent acquisition will compliment Waste Pro's current operation in Kenner, LA and allow for greater service flexibility in surrounding parishes," stated John Jennings, President and CEO of Waste Pro.

For more information, call (407) 869-8800 or visit www.wastepro.com.

Labrie Environmental Group Enters Into a Partnership with Myers Power Products

LABRIE ENVIRONMENTAL GROUP (Saint-Nicolas, QC) has entered into a partnership with a group consisting of Myers Power Products Inc., EnviroQuip LLC and Pendpac Products. Recognized for its strong and qualified engineering team, Labrie Environmental Group will keep the research and development activities at its corporate office in Saint-Nicolas, while some of EnviroQuip LLC's activities will be transferred to the head office. The customer support center located in Oshkosh, WI will continue servicing all Labrie products in addition to the newly added line of EnviroQuip and Pendpac products. Among the synergies that will be created, this new partnership will allow Labrie to expand its production on the east coast as well as on the west coast, allowing them to be more effective with the distribution of their products.

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Orlando, FL
www.lfg.swana.org

20 – 21: Plastics Recycling Conference

Hyatt Regency Atlanta
Atlanta, GA
www.plasticsrecycling.com

22 – 24: Mid-America Trucking Show

Kentucky Fair and Exposition Center
Louisville, KY
www.truckingshow.com

APRIL 2012

15 – 19: 2012 ISRI Convention and Exposition

Mandalay Bay Resort
Las Vegas, NV
www.isriconvention.org

23 – 25: 20th Annual North American Waste-to-Energy Conference

Holiday Inn by the Bay
Portland, ME
www.nawtec.org

25 – 27: 41st Environmental Show of the South

Gatlinburg Convention Center
Gatlinburg, TN
www.tn.gov/environment/swm/conference

30 – May 3: WASTE EXPO 2012

Las Vegas Convention Center
Las Vegas, NV
www.wasteexpo.com

MAY 2012

20 – 23: 2012 Federation of New York Solid Waste & Recycling Conference with Trade Show

The Sagamore
Lake George, NY
<http://nyfederation.org>

JUNE 2012

3 – 6: Safety 2012

Colorado Convention Center
Denver, CO
www.asse.org

4 – 6: Illinois Recycling and Waste Management Conference and Trade Show

Clock Tower Hotel and Conference Center
Rockford, IL
www.illinoisjointconference.com

21 – 24: Air & Waste Management Association 105th Annual Conference and Exhibition

San Antonio Convention Center
San Antonio, TX
www.fivesenses.com/ee6/

24 – 26: 2012 Summer Conference

Sawgrass Marriott
Ponte Verde Beach, FL
www.swanafl.org

JULY 2012

13 – 17: National Association of Counties (NACo) Annual Conference and Exposition

David L. Lawrence Convention Center
Pittsburgh, PA
www.naco.org

25 – 27: Pennsylvania State Recycling Association's 22nd Annual Conference

Lancaster Convention Center
Lancaster, PA
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SWANA Releases White Paper Highlighting Economic Benefits of Waste-to-Energy

SWANA released a white paper titled “Waste-to-Energy Facilities Provide Significant Economic Benefits.” The purpose of this white paper is to illustrate the financial success of waste-to-energy operations throughout the U.S. Waste-to-energy is a reliable and renewable form of energy that has become the basis for many of the most successful solid waste management systems in North America. More than 80 waste-to-energy plants throughout the U.S. have allowed municipalities to reduce their greenhouse gas emissions and waste to landfills, while providing significant financial benefits to their communities. The paper highlights a number of economic benefits communities achieve by investing in waste-to-energy, such as additional revenues generated from the sale of recovered metals and renewable energy. These revenue streams have been used to fund other solid waste activities as well as loan re-payment. In conjunction with the release of this white paper, SWANA’s Applied Research Foundation will be releasing a report entitled, “The Economic Development Benefits of Waste-to-Energy Facilities.” This report surveys the solid waste systems in Honolulu, HI and Lancaster, PA, and concludes that properly managed waste-to-energy facilities offer an array of financial benefits to the communities that use them.

For more information, visit www.swana.org.

Solid Wastes Industry Announces New Policy on Product Stewardship

NSWMA announces a new policy on product stewardship, expressing the recycling and solid waste industry’s position that product stewardship may increase the safe management of some products, in particular those with toxic constituents such as mercury. Product stewardship laws require manufacturers to be responsible for end-of-life management of their products. These laws aim to increase recycling while also establishing a new way to fund recycling programs. Thirty-two states currently have product stewardship laws, most of which cover mercury-containing and electronics products. Some newer laws cover harder to recycle materials such as paint and carpet.

In its new policy, NSWMA expresses its position that a successful product stewardship system will be a shared responsibility among manufacturers, retailers, government, consumers, and the private and public sector recycling and solid waste industry. The new NSWMA policy recommends the following:

- That any proposed product stewardship legislation be designed carefully to ensure that recycling and waste management systems continue to be cost-effective, innovative, efficient and result in enhanced environmental protection at no additional cost to taxpayers or consumers
- That legislators conduct a comprehensive lifecycle analysis before designating products for mandated product stewardship
- That new programs should take place in a fully competitive marketplace with no anti-trust immunity for product stewardship organizations

For more information, contact Chaz Miller, NSWMA Director of State Programs, at (202) 364-3742 or cmiller@envasns.org.

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Regulation of Fuels and Fuel Additives: 2012 Renewable Fuel Standards

Under the Clean Air Act Section 211(o), the EPA is required to set the renewable fuel standards each November for the following year. In general the standards are designed to ensure that the applicable volumes of renewable fuel specified in the statute are used. However, the statute specifies that EPA is to project the volume of cellulosic biofuel production for the upcoming year and must base the cellulosic biofuel standard on that projected volume if it is less than the applicable volume set forth in the Act. EPA is finalizing a projected cellulosic biofuel volume for 2012 and annual percentage standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and renewable fuels that will apply to all gasoline and diesel produced or imported for domestic use in year 2012.

In the NPRM EPA also proposed an applicable volume of 1.28 billion gallons for biomass-based diesel for 2013. The statute specifies that the minimum volume of biomass-based diesel for years 2013 and beyond must be at least 1.0 billion gallons. EPA is continuing to evaluate the many comments on the NPRM from stakeholders, and will issue a final rule setting the applicable biomass-based diesel volume for calendar year 2013 as expeditiously as practicable. This action also presents a number of changes to the RFS2 regulations that are designed to clarify existing provisions and to address several unique circumstances that have come to light since the RFS2 program became effective on July 1, 2010. Finally, the rule also makes a minor amendment to the gasoline benzene regulations regarding inclusion of transferred blendstocks in a refinery’s early benzene credit generation calculations.

For more information, contact Julia MacAllister, Office of Transportation and Air Quality, Assessment and Standards Division, EPA at (734) 214-4131 or via e-mail at macallister.julia@epa.gov.

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Bluewater Recycling Association: Putting Power in the Community's Hands

Because Bluewater Recycling Association households currently GENERATE 77 PERCENT LESS WASTE TODAY THAN THEY DID 25 YEARS AGO, THE ORGANIZATION HAS STEPPED UP ITS GAME AND FOCUSED ON THE ADOPTION OF HIGHER RECYCLING GOALS.

ESTABLISHED IN 1989, THE BLUEWATER RECYCLING Association (Huron Park, ON) is a rural-based, non-profit organization developing and maintaining facilities on behalf of, and in cooperation with, the municipal sector. The Association owns a state-of-the-art, single-stream, 50,000 tons-per-year material recovery facility (MRF) and a fleet of 42 collection vehicles. The 68 people employed by the Association handle more than 29,000 tons of material annually, which represents a substantial portion of the overall waste stream. The Association services approximately 160,000 people in 70,000 households from 22 municipalities in four counties in Southwestern Ontario, Canada, covering approximately 3,300 square miles—about

the size of the State of Delaware and Rhode Island combined.

The Association's primary focus has always been waste diversion since the organization does not own or operate any disposal facilities. Given the rural nature of the service area, most of the materials are generated by residential properties with some small commercial, industrial and institutional sources. Recyclables accepted in the program include: newsprint and paper, corrugated cardboard, LDPE, aluminum containers, ferrous containers and plastic bottles (see **Accepted Recyclables sidebar, page 20**). There are also special programs for electronic waste and organics materials (see **Special Programs sidebar, page 16**)



Automated collection is a clean, safe and efficient way to collect recyclables.
Photos courtesy of the Bluewater Recycling Association.

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Electronics

The Association collects electronic waste through permanent depots and special events held at different smaller locations. The same wide variety of electronic waste accepted by the permanent depot was accepted during those events. The electronic waste ranges from old televisions to radios, cell phones, computers, telephones, fax machines and all kinds of unique electronics. Nearly 750,000 pounds of electronic waste have been recovered to date.

Organics

The best way to manage organics is close to home. The Association provides two solutions for its residents to manage organics—a backyard composter (Garden Gourmet) and a food digester (Green Cone). They each sell for \$50 and \$90 respectively. Since most municipalities charge for waste by the bag, they can save each household up to \$50 a year in waste management fees.

Transitioning the Sorting Process

According to Francis Veilleux, President of the Bluewater Recycling Association, the local economy has been good in the last couple of years. However, they were severely impacted in 2009 when commodity prices collapsed, causing a \$1 million shortfall in revenue. “Nobody escaped that one,” he says. Veilleux pointed out that they did understand that the collapse was temporary and took the opportunity to make a \$5 million investment in their MRF. “We had been working on a single-stream design using a different approach and the economic slow down was the perfect time to implement it.”

Veilleux explains that the traditional approach to material sorting has been mainly driven by people lined around conveyors manually separating different commodities to meet market demands. “This approach was rudimentary and effective when only five materials were collected curbside. However, applying this approach to today’s material mix is accepting that material quality is not important, high sorting costs are acceptable and repetitive strain injuries are normal. We do not support this approach to processing,” says Veilleux. “While the Association is proud of its past developments in the material recovery facility, the future of our industry demands higher throughput and a higher quality standard with a broader mix of materials. The ever-changing packaging stream

makes it a necessity to use technology to assist in the sorting activity, as our people cannot physically and mentally process what is presented to them today in a speed necessary to be effective. You cannot expect any sorter to know that a specific shampoo bottle may be made in any of three different resins and expect quality commodities.”

He goes on to explain that in the early 1990s, a PET bottle was essentially a 2L soft drink container. They were easy to identify and quantities were manageable to manually sort after some basic screening. After a local water contamination incident killed seven people in 2000, single-serve PET water bottles proliferated the market place. The impact at the MRF was an increase in bottles managed from 500,000 per year to more than 25 million. As a result, the use of people to manually sort materials, resulting in repetitive strain injuries, was not sustainable. The average human hand can effectively pick 1,500 pieces an hour. It is impossible to manually sort a much higher volume and maintain quality without mechanical assistance. So, in 2008 the Association made the decision to invest in an optical sorter that can process in excess of 500,000 pieces per hour. Employees were naturally concerned about the changes initially, but quickly embraced the improvement in working conditions. It is much more interesting to manually fix the 2 to 5 percent mistakes the machine does, than to attempt



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- Office Paper
- Phone Books

Caution, Notice, & Danger Decals Size: 5 X 7" Price: .38 each

<p>WDDAN103</p> <p>DANGER</p> <p>STAND CLEAR WHEN TAILGATE IS OPEN</p>	<p>WDDAN102</p> <p>DANGER</p> <p>STAND CLEAR WHEN CONTAINER IS OFF GROUND</p>	<p>WDDAN104</p> <p>DANGER</p> <p>FREQUENT STOPS AND BACKING</p>	<p>WDDAN105</p> <p>DANGER</p> <p>DO NOT ENTER</p>	<p>WDDAN107</p> <p>DANGER</p> <p>DO NOT PARK IN FRONT OF THIS CONTAINER</p>	<p>WDDAN112</p> <p>DANGER</p> <p>STAND CLEAR WHEN REAR DOORS ARE OPENED</p>	<p>WDDAN115</p> <p>DANGER</p> <p>220 VOLTS</p>
<p>WDCAU101</p> <p>CAUTION</p> <p>DO NOT PLAY IN, ON OR AROUND OR OCCUPY THIS CONTAINER FOR ANY PURPOSE</p>	<p>WDCAU106</p> <p>CAUTION</p> <p>KEEP HANDS CLEAR OF THE HOPPER</p>	<p>WDCAU111</p> <p>CAUTION</p> <p>KEEP OUT</p>	<p>WDCAU114</p> <p>CAUTION</p> <p>THIS COMPACTOR STARTS AUTOMATICALLY</p>	<p>WDCAU115</p> <p>CAUTION</p> <p>BEFORE OPENING DOOR TURN CONTROL PANEL KEY SWITCH TO OFF POSITION. REMOVE KEY AND BLOCK OFF TRASH CHUTE</p>	<p>WDCAU116</p> <p>CAUTION</p> <p>THIS BALER STARTS AUTOMATICALLY</p>	<p>WDCAU122</p> <p>CAUTION</p> <p>DO NOT PLAY IN OR AROUND</p>
<p>WDCAU109</p> <p>NOTICE</p> <p>NO RECYCLABLES ALLOWED</p>	<p>WDCAU110</p> <p>NOTICE</p> <p>CONTAINER MUST BE PLACED ON HARD, LEVEL SURFACE LOAD UNIFORMLY</p>	<p>WDCAU112</p> <p>NOTICE</p> <p>IT IS AGAINST THE LAW TO PUT HAZARDOUS OR TOXIC WASTE IN THIS CONTAINER</p>	<p>WDCAU113</p> <p>NOTICE</p> <p>ALL TRASH MUST BE PUT IN THE CONTAINER</p>	<p>WDCAU106</p> <p>NOTICE</p> <p>PLEASE CLOSE COVERS</p>	<p>WDCAU116</p> <p>NOTICE</p> <p>NOT FOR PUBLIC USE VIOLATORS WILL BE PROSECUTED</p>	
<p>WDCAU101</p> <p>NOTICE</p> <p>DO NOT FILL ABOVE TOP OF CONTAINER</p>						

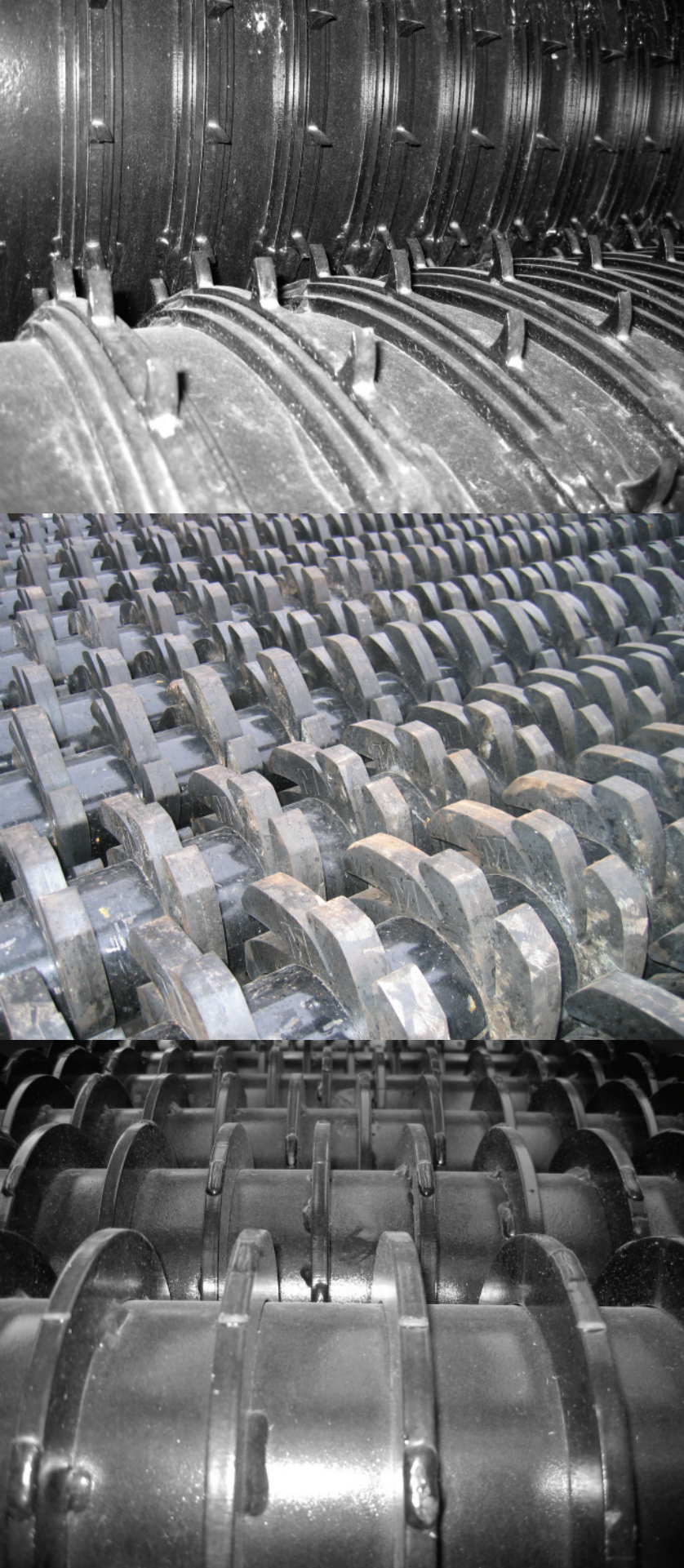
Recycling Message Decals Size: 3 X 18" Price: .49 each

<p>WD318107</p> <p>ALUMINUM CANS ONLY</p>	<p>WD318117</p> <p>CANS, PLASTICS & BOTTLES ONLY</p>	<p>WD318118</p> <p>CARDBOARD ONLY</p>	<p>WD318131</p> <p>FLATTEN BOXES</p>
<p>WD318132</p> <p>GARBAGE ONLY</p>	<p>WD318133</p> <p>GLASS ONLY</p>	<p>WD318134</p> <p>GLASS, PLASTIC, ALUMINUM</p>	<p>WD318140</p> <p>MIXED PAPER ONLY</p>
<p>WD318150</p> <p>PAPER ONLY</p>	<p>WD318159</p> <p>PLASTICS ONLY</p>	<p>WD318160</p> <p>RECYCLE</p>	<p>WD318165</p> <p>TRASH ONLY</p>

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Bluewater Recycling Association: Putting Power in the Community's Hands

to do 100 percent of the workload. “The latest technological advances in our industry have enabled us to effectively change the treatment approach of recyclables where technology does the sorting and our people focus on quality,” says Veilleux.

Challenges and Achievements

Different times have provided different challenges. Veilleux points out that in the early days of the Association, getting the financing they needed to even get the organization started and later fuel its growth was extremely difficult.



Average Ontario Household Waste Produced in 1987

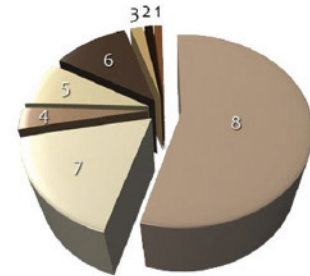


Average Ontario Rural Household Waste Produced in 2008



Bluewater Recycling

Waste diversion accomplishment by the Bluewater Recycling Association.



1	Glass:	2.75kg/yr	1% of your garbage bag
2	HSW:	2.65kg/yr	1% of your garbage bag
3	Metals:	4.12kg/yr	2% of your garbage bag
4	Paper:	7.93kg/yr	4% of your garbage bag
5	Packaging:	16.89kg/yr	8% of your garbage bag
6	Plastics:	24.21kg/yr	11% of your garbage bag
7	Other:	38.46kg/yr	18% of your garbage bag
8	Organics:	118.40kg/yr	55% of your garbage bag

Current waste composition of the average household at Bluewater (waste bag only).

“Bankers don’t like the word non-profit. We kept looking until we found one that saw beyond those two words and we have been doing business ever since.”

Veilleux explains that the Association was created in 1989 to divert materials from landfill and this remains their primary focus today. “In fact, our operational license restricts the residue rate to less than 10 percent. The Association does not own or operate any landfills and, as such, any disposal is a

Top: Perforator used to remove liquids from containers and crush glass.
Middle: Rubber disks used in a finishing screen to separate containers from paper.
Bottom: Disk screen to remove small fraction.

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QUALITY ASSURANCE

The Association's MRF is one of the few in the industry that maintains a quality assurance program. Their program is an integral part of the overall system. Quality assurance entails every part of the program, including:

- Easily accessible and user-friendly educational materials on acceptable materials and proper material preparation for users. The Association can assist in the development of educational materials and can do their own desktop publishing and manages their Web site with more than 1,500 pages.
- Enforced program rules by the driver responsible for collecting the materials.
- Effective vehicle design to keep materials intact to facilitate separation.
- Predictable materials flow design in the recovery facility.
- Optimum materials separation methodology using the latest technology to handle the commodities.
- Use material handlers to ensure material quality throughout the process.
- Perform secondary quality inspection prior to baling.
- Inspect materials prior to storage for shipment approval or rejection
- Collect samples and test against industry standards.
- Review external quality control tests against internal sample and resolve discrepancies.

Bluwater Recycling Association: Putting Power in the Community's Hands

cost to us. Over the last five years, our average residue rate has been 3.38 percent. The current residue rate is less than 2.7 percent, while our commodities average a purity rate better than 98 percent."

Veilleux also understands that markets have always had ups and downs and always will, including the supply and demand cycle of commodities. The Association tries to insulate itself as much as possible by becoming premium suppliers to few buyers with their consistent quality commodities. "We value our relationships more than the odd dollar found on spot markets in good times. We also do not believe in status quo. There is always room for improvement. We are continuously evaluating new technologies and methodologies to improve what we do today. When trying something new, we know that if it doesn't work, we can always do it the old way," he says.

Managing Recyclables

The Association uses a systematic approach to material management. Despite operating a single-stream system, Veilleux points out that curbside preparation and collection methodology are equally important factors in achieving the best quality while minimizing residue. "Once in the MRF, we use four treatment methods to extract the most materials while achieving the most value through quality management. The facility processes single-stream materials using equipment such as five screens, five air classifiers, two optical sorters, two overhead magnets and two eddy currents to separate the materials with the assistance of personnel in a quality control role only." While the changes have improved the efficiency of the systems, they have also enhanced the quality of the jobs and the safety of the employees.

The Association has researched and experimented with numerous technologies and processes over the last

two decades to come up with a combined package that maximizes throughput, flexibility and quality while minimizing labor and capital costs. Some of the unique and innovative components of the system include:

- A glass cleaning system that removes the glass early in the system with an overhead magnet, an eddy current and uses a cyclone-based vacuum system applied to selective particle sizes generated by a trommel for maximum efficiency and ensures that clean glass is generated without relying on failure prone rotary valves or expensive optical systems.
 - The container sort area uses the widest optical system in North America, measuring more than 9 feet across, and is the first triple pass optical system in Ontario on one machine. Three separate passes are used to separate the material stream into up to seven categories. The three passes offer a greater flexibility of material selection for sorting as the mix changes. The best part is the third pass. After achieving a 95 percent purity level on the first and second pass, the PET and HDPE are batched processed on the third pass to achieve a 99 percent material purity right out of the machine. The QC sorter can concentrate on non-bottle contamination until such time as end markets can accept them.
 - Another innovative design in this single-stream facility is the mixed fiber process. An optical separator is used to remove non-fiber contamination (plastic, metal) from the mixed fiber. Any paper removed with the containers is easily recovered with a strategically placed low-pressure air classifier effectively separating the paper from the containers. All plastics and metals removed are redirected to the "container" line after being cleaned by the air classifier.
 - Using this approach, the Association has not recorded a single rejection or downgrade since 2006.
- Although the Association does not make any end products, the materials collected are sold to buyers for

ACCEPTABLE RECYCLABLES



NEWSPRINT AND PAPER

- Newspapers, flyers
- Bond, white and colored
- Shredded paper (bagged)
- Books (removed hardcover)
- Computer paper
- Envelopes
- Glossy paper
- Junk mail
- Magazines and catalogs
- Writing paper



CORRUGATED CARDBOARD

- Clean, unwaxed, flattened and bundled, no larger than 3' X 3' X 1'

BOXBOARD

- Single layer board, unwaxed, uncoated, free of metal or plastic attachments
- Cereal, cookie, shoe boxes, etc.

OTHER PAPER

- Paper egg cartons
- Paper toilet and towel rolls
- White and brown paper bags



LDPE

- Plastic grocery and retail bags with a #2 or #4 mobius loop (Bagged)

ALUMINUM CONTAINERS

- Pop, beer, juice
- Pie plates and trays
- Clean foil
- Empty aerosol cans

FERROUS CONTAINERS

- Juice, food, dog/cat food, tuna containers
- Empty aerosol cans
- Empty metal paint cans
- Metal lids



PLASTIC BOTTLES AND CONTAINERS

- PET #1 pop, water, liquor bottles, etc.
- HDPE #2 laundry detergent, bleach, fabric softener, dish liquid, hand soap, bottles, containers and packaging
- Tubs and lids, #1, #2, #3, #4, #5, #7 yogurt, margarine, ice cream containers, etc.
- Any household post-consumer rigid (i.e. no foam) plastic container or bottle designated #1 - #7, including thermoforms, packaging, trays, clamshells, food tubs/lids and all non-bottle containers

which they have established long-term relationships. These buyers have usually visited their facility, observed the material process and identified a useful end product being manufactured. In order to encourage a “local” economy and reduce their carbon footprint, preference is given to Ontario-based markets. In the absence of reasonable “local” markets, they sell to other Canadian or U.S. buyers to ensure that the highest value for their quality recyclables is received. The export of materials overseas is generally not a preferred option.

Educating the Public

Part of the Association’s mission is to ensure that consumers make informed decisions and as a result, not only have they developed a Web site with hundreds of pages dedicated to accomplish just that, but they have also published a number of publications to educate everyone about waste management activities. “Education is what makes us different. We are much more than the company collecting and processing your recyclables. Whether it’s our award winning newsletter or some of the 800 pages of school curriculum we have published, we have information for everyone,” points out Veilleux.

Although the Association does not operate under the pressure of meeting shareholder’s return on investment targets and the bottom line is not a priority, they do respect the need to be fiscally responsible while providing the best service achieving the highest level of diversion. “Since we don’t own or operate any disposal facilities, our focus remains on waste diversion initiatives and education is an important component of our offering. We act as the waste diversion department for each of our member municipalities enabling them to focus on other important issues in your community,” says Veilleux. “We provide the tools to maximize waste diversion, whether it is the free replacement recycling bins, award winning newsletters, an informative Web site with locally relevant information, our toll free number with knowledgeable staff, composters, digesters, Christmas tree chippings and so much more.”

The Association also lobbies on behalf of the municipalities, reports to authorities waste initiatives, reports to members their progress to meet their environmental commitments and provides the most innovative, effective and efficient programs available. The Association also sends people out into the community to make presentations, attend fairs and participate in parades.

Moving Forward

The adoption of higher recycling goals has caused communities to target more materials for collection, exacerbating the problems associated with curb-sort collection systems (e.g., limited number and size of compartments, limited bin capacity, etc.). Veilleux says, “In the last 20 years or so, there has been significant growth in the use of automated refuse collection vehicles for both refuse and recyclables collection. The growth of this market has resulted in design improvements that have increased the reliability and reduced the maintenance costs of automated collection equipment, as well as lowered equipment prices.”

The traditional collection system was manual-based. Residents set out their waste in bags with bag tags and the recyclables were set out in 18 gallon blue boxes. The materials were then collected with a split side loader with one driver/operator manually loading the contents into the vehicle. Now, the Association is currently in the process to convert 90 percent of its customers to a fully automated collection system to reduce collection costs because:

- Each driver is more productive since there is less sorting to do at the curb. A single-stream vehicle can collect up to 180 households per hour whereas a dual stream truck can only collect 80 to 120 households per hour.

- Each vehicle can fully use its capacity and avoid the typical compartment “cube-out” issues associated with multiple sorts. Routes can be larger with fewer vehicles.
- With the larger containers provided to the residents, even collection frequency can be reduced to save even more.
- Residents benefit with having bins that are up to six times the capacity of the blue box that facilitates and encourages more recycling. There has been a 17 to 33 percent increase where implemented.
- The fixed wheels make hauling them to the curb a lot less work than before.
- Using bins with lids helps to keep water, ice, and snow from set-outs, which helps to control the water contamination and helps the sorting process.
- Discourages scavenging of valuable materials.
- Using bins can improve neighborhood aesthetics—uniform containers often eliminate unsightly set-outs.
- Blowing litter can be reduced because containers with lids are more resistant to being tipped over or torn apart by dogs, raccoons, crows, etc.
- Ability to use standardized collection trucks.
- High public approval because it’s so easy and convenient.
- Reduced health and safety risks to workers.
- Wider range of workers qualifying for the automated collection jobs.
- Greater efficiency and productivity.
- Lower costs, including cost savings on worker compensation.

Although items such as styrofoam packaging, milk cartons and tetra pak juice boxes are often cited as materials missing from the Association’s program, they only make up less than 1 percent of the waste disposed and have limited or no markets available on top of having enormous costs associated with them. On the other hand, the results clearly show that organic materials (food, etc.) make up the majority of the average garbage bag, with developing markets and a cost to manage set slightly higher than waste disposal. Therefore, it is more than likely that the Association’s next major focus on waste reduction will be centered on organics recycling. Despite their best efforts to reduce, reuse and recycle as much as possible, organics still remain the largest fraction in the waste bags. The technologies to manage this stream are readily available, but disposal costs are still too low to make it economically viable. “Until our governments use policies such as landfill taxes like in Europe, it will be difficult to make any headway in this direction,” says Veilleux.

However, on a positive note, the average Association household currently generates 77 percent less waste today than it did in 1987. The amount of waste generated by the average household in 1987 was nearly 1 ton. In 2008, the average rural household in Ontario disposed about 1,200 lbs. “We are now proud to report that our average households are disposing a mere 472 lbs. per year. These numbers are not only impressive, but some of the best in Ontario and Canada, exceeding all goals,” says Veilleux. “The main reason we were able to reach this goal is because our members implemented pay-as-you-throw programs that provided the incentive for residents to use the waste diversion tools available to them.” The current Ontario government goal was to reduce the amount of waste disposed by households by 60 percent (811 lbs.) by 2008. Says Veilleux, “The Association is far beyond that goal, and aims to push the envelope even further.” | **WA**

For more information, contact Francis Veilleux, President of the Bluewater Recycling Association, at (519) 228-6678, e-mail bluebox@bra.org or visit www.bra.org.

Refurbished Containers As a Cost-Effective, Alternative Solution

Ryan Gawthrop

Many haulers in today's economy just don't have the extra capital to purchase new containers. By considering RECONDITIONED CONTAINERS, HAULERS CAN STILL MAINTAIN A CONTAINER'S APPEARANCE AND VALUE, while spending less for necessary replacement units.

ANOTHER NEW YEAR IS UPON US, AND WITH EVERY

New Year comes decisions regarding your containers that are in need of repairs. There will be the containers that just require minor repairs such as lid and lid rod replacement, and these repairs can normally be done right on the route. Then there are the containers that need to just be re-painted—these are classified as medium repairs because they have to be taken off the route and require time grinding/sand blasting and painting of the units to make them look their best. Then there are all the remaining containers in need of major steel work, the re-flooring of the containers, which will require the container to be re-painted as well. Whatever your container may require as far as repairs go, don't hesitate to get them fixed as all those containers are costly assets to replace. Shouldn't you get the longest life out of them as possible?

The Benefits of Refurbished Containers

In order to determine if used containers should be repaired into reconditioned units, first determine how much total labor and material are going to cost

on an individual container basis. Can you repair the unit and still stay under what it would cost to buy the same unit reconditioned at 30 percent less than new or would it be more beneficial to scrap or trade in the unit requiring repair?

The number one main benefit to a reconditioned container is the cost. Cost seems to be most important to haulers today as it relates to cash flow, and will always be the most important part of any successful small business. When a reconditioned container costs roughly 30 percent less than a new container, the decision is generally an easy one to make. Reconditioned containers do the same thing as new containers—they house refuse at particular locations. With good paint jobs associated with the reconditioned units, they are just as suitable for the job as new units would be.

The Repair Process

When it has been decided to repair a container rather than scrapping it in order to save costs, the first step in the process is to take the lids off so that there isn't any further damage to those items. The container



A used 8-yard front load-low profile style.



The same 8yd front load-low profile style as reconditioned. Photos courtesy of Conte Equipment Sales.

is then flipped over to get the bottom of the unit, which is most likely why the repair unit is to be repaired in the first place. The bottom surround is tested in order to see just how far up the side of the can the repairs must go—usually 8" up from the floor is solid. Then the old floor and surrounding metal is cut out and 8" side patches are tacked on completely around the bottom container. After solid welding the entire outside tying the top of the patches into the container, a floor sheet is tacked and welded. Runners and casters can be added to the bottom of the floor as needed. As the lids/assemblies are put back on, the bad lids or rods are replaced as necessary.

Under the repair process, lids and rods need only to be replaced when they are broken or damaged. For instance in the winter, lids will crack and some will start to fill with water, and freeze, thus making the lids heavier and more difficult to lift. The lid rods may bend over time, affecting the lids ability to open or close properly. When either of these things happen, the container can't be filled properly or the container can't be dumped properly, and the lids and rods must be serviced accordingly.

Cleaning and removing the old dirt and rust to prepare the metal for paint is the next step. This is accomplished with wire wheel grinders and laquer thinner applied to the areas to be painted.

Long-Term Maintenance

Any metal that is protected by paint (or other top coat) will last

longer. However, if rust starts to show through the paint either on the interior or exterior, taking care of it in a timely manner will literally make any container last longer. Only when the rust continues to spread over time and is neglected, does the metal eventually begin to thin out and fatigue. Like anything that is broken, fixing it earlier rather than later can save additional more costly repairs. Good preventative maintenance includes keeping the floors painted or lubricated with oil, so that it will maximize the life of the container bottom.

A Viable Solution

All reconditioned containers are suitable for each refuse and recycling application. Reconditioned units may suit the majority of haulers everywhere, however they are not for everyone. For example, a reconditioned unit might not be suitable in a high profile location where you would want to project the best possible image of your company, since it may have some dings and dents. Even though buyers can save money by purchasing reconditioned units, the cost savings may not justify having a new container at a specific location. It boils down to everyone's individual preferences and cash flow situations. By considering reconditioned containers, haulers can still keep a container's look and value, while saving money in the long run. | **WA**

Ryan D. Gawthrop is General Manager at Conte Equipment Sales (Bristol, IN) and has been in the refuse industry for about 10 years. He can be reached at (800) 693-5001 or e-mail ryan@contesales.com castbiz.net.

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Using Automated Voice and Text Messaging To Save Time and Money in Your Operations

Pat Reimers

Streamlining repetitive call events is A GREAT WAY TO SAVE TIME AND MONEY while allowing you to be greener.



Automated Messaging in Action

Allied Waste's Claude Duran uses Call-Em-All to notify his customers for all major holiday route changes. He is seeing more of his customers requesting notification by a text message. Automated voice and text messaging has been a fast and cost-effective way of communication for Duran. For any broadcast that is a reoccurring message, he is able to set up his calls and texts in advance using Call-Em-All's convenient scheduler, saving even more time.

A large waste company in Pennsylvania has found using automated voice messaging a no brainer to contact their customers for paste due notices. Contacting thousands of customers in a month warranted searching for a different avenue of communication. Call-Em-All took care of getting these paste due notices out to their customers in minutes, for pennies a call. This waste company saw an immediate decrease in disconnects. Not only were they saving money on contacting their customers, but they were also saving on expenses involved in reconnects.

IN THE EVERYDAY ECONOMIC STRUGGLE TO STAY

profitable, we are all looking at more streamlined, cost-effective ways to take care of tasks that in the past have been time intensive and costly. Informing your customers of past due reminders, shut off notices and route changes are some of the tasks that use up your employees valuable time and affects your bottom line profit. With automated voice or text messaging, your employees can focus on more important projects.

A Slower Method

In the past, calling people individually was tedious and time consuming. This was especially true if the call was an emergency. Using a manual "phone tree" process usually resulted in the message being skewed by the time everyone was contacted. As technology advanced, it seemed only natural to refine this old process. In-office equipment came along which did the auto dialing, but the calls had to be generated from the hardware and there had to be phone lines to support the calls going out. The next step was Web-based automated calling.

Communicating in Seconds

Automated voice and text broadcast is an affordable, unique technology to get notifications to customers fast. Setting up a mass message broadcast is as easy as uploading a list of phone numbers and recording a voicemail message. With Web-based applications, sending out a message consists of three simple steps: 1) select the numbers you want called, 2) pick a time for the call to go out and 3) record your message over the phone. The message is then sent to all your phone numbers at once. For those customers that prefer getting their notifications by text, there are similar text messaging features. Your text message can be typed using your phone or over the Internet

and any cell phone number that has opted in to your company's unique keyword, gets the text message within seconds.

Automated voice and text messaging is beneficial to haulers in many situations. For example, traditionally, collection calls are an inefficient investment of time, unnecessarily consuming man-hours spent manually dialing clients to collect payments. With automated calling, this task is roughly a two-minute process. In addition, coordinating field personnel can be accomplished with voice or text in a matter of minutes. A single text broadcast can alert all drivers and other offsite employees with updates and last minute essentials. Using automated voice broadcasts to reach out to your customers also saves money on postage, employees' time and making phone calls, allowing your company to be greener.

An Indispensable Tool

Automated message broadcasting has become indispensable for many waste companies to take care of mundane tasks like:

- Calling past due accounts
- Holiday route change notifications
- Updating field personnel

Streamlining these repetitive call events is a great way to save time and money while allowing you to be greener. | **WA**

Pat Reimers is Customer Service Manager with Call-Em-All (Frisco, TX). Call-Em-All, LLC is a fortune 500 company that has been successfully taking care of automated messaging for customers for more than six years. With the ability to send out 2,500 voice or text messages per minute, Call-Em-All can easily address the notification needs of their 20,000 customers. Pat can be reached by phone at (877)226-3080, ext. 1060 or visit www.call-em-all.com.

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180° Turnaround for a Solid Waste Management System: The Guam Story and Lessons Learned

Chace Anderson

Transforming a solid waste management system from dysfunctional procedures to efficient operations, including a state-of-the-art landfill that WILL SERVICE THE ISLAND FOR AT LEAST ANOTHER 40 YEARS.

ON AUGUST 31, 2011, AS EIGHT-YEAR-OLD ORDOT

resident Carina McCarthy and Guam Governor Eddie Calvo locked a gold chain to the gate to Guam's Ordot Dump, residents and public officials cheered and clapped. The celebration marking the closure of the dump's 341-foot mountain of trash continued the next day as the first trucks bringing waste arrived at the new Layon Landfill, a state-of-the-art, high-tech, environmentally sound landfill for non-hazardous municipal solid waste.

These two milestones marked a new beginning for the U.S. Territory of Guam. The island's 25-year history of dysfunctional, mismanaged and politically charged solid waste management had been turned around, not only with the closure of the Ordot Dump and the Layon Landfill's opening, but also with remarkable improvements and efficiencies in solid waste operations and financial management. How these changes occurred, and the lessons they offer for other islands and solid waste systems, is the focus of this article.

The Making of a Solid Waste Crisis

Since the 1940s, the Ordot Dump has been a dumping ground for Guam's industrial and municipal solid waste. Proper landfill operation procedures at the site, including placement of daily cover and proper waste compaction, were not followed. Used by both the Japanese and U.S. military forces during World War II and owned by the Government of Guam since the 1950s, the Ordot Dump has acted like a sponge, absorbing rainwater and discharging contaminated water into the nearby Lonfit River.

On July 24, 1990, in response to violations of the 1972 Clean Water Act, the U.S. EPA issued an administrative order directing the Guam Department of Public Works (DPW) to cease the discharge of pollutants from the dump. But for years, the discharges and violations of the Clean Water Act continued. On February 11, 2004, the U.S. District Court of Guam approved a Consent Decree (Civil Case No. 02-00022), in which the Government of Guam agreed, among



The first trash trucks deliver waste to the new Layon Landfill on September 1, 2011. Photos courtesy of Gershman, Brickner & Bratton, Inc.

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other provisions, to cease the discharge of pollutants from the Ordot Dump, close the Ordot Dump within 45 months and begin implementation of a post-closure plan. In addition, DPW agreed to site, obtain permits for, construct and begin operations of a new municipal sanitary waste landfill within 44 months.

Despite the Consent Decree, the stalemate continued for four more years. On March 17, 2008, Chief Judge Frances Tydingco-Gatewood of the District Court of Guam, noting lack of progress in complying with the 2004 Consent Decree, appointed Gershman, Brickner & Bratton, Inc. (GBB) (Fairfax, VA) as Receiver with full authority to manage, supervise and oversee the Solid Waste Management Division (SWMD) of DPW and bring Guam into compliance with the Consent Decree.

A Dysfunctional Solid Waste Management System

In April 2008, when GBB staff arrived to take over management of the SWMD, they found a solid waste management system plagued by serious operational, financial and administrative problems. The SWMD owned a fleet of trash trucks purchased in the early 1990s. Only one of the trucks was operational, working around the clock using three crew shifts to collect from 12,000 customers with unreliable

support from two rented trash trucks that were often sidelined with mechanical problems. Curbside trash collection was weeks behind schedule and customer



Guam residents now use 95-gallon trash carts with RFID tags and a black lid, instead of bags and old trash cans placed in cages. Recycling carts, used for the curbside recycling pilot project, have green lids.

complaints were very high. Faced with this situation, the Receiver knew that on-time collection was a high priority.

The working conditions for the 99 SWMD staff members were substandard. Staff had few tools with which to work, showers leaked, kitchen facilities were dirty and staff morale was at an all-time low. The SWMD was spending \$11,000 per day on rental equipment and contract operators. In addition, the SWMD's billing and account management systems were unreliable, and for years, the SWMD had been collecting trash from more than 4,000 non-paying customers. At the Ordot Dump, there was no scale to accurately calculate the tonnage of waste disposed there, and Ordot neighbors complained of odors and garbage fires at the dump. The island also had no recycling program, and no efforts were being

made to extend the dump's diminishing capacity.

Beyond meeting the everyday challenges of turning around the dysfunctional SWMD, the Receiver needed to work with the Government of Guam and its SWMD to achieve full compliance with the 2004 Consent Decree by closing

Operations reforms

- Improved trash collection services, which dramatically reduced customer complaints
- Repaired vehicles and purchased new equipment to support operational needs
- Reduced the number of SWMD employees by more than 25 percent as operations were reorganized and streamlined for more efficient organization and delivery of services
- Achieved significant savings as a result of dramatic reductions in leased equipment and personnel with only \$484 spent per day on leased equipment vs. \$11,000
- Dramatically improved working conditions for SWMD employees with functional equipment, working showers and clean kitchen facilities; provided safety shoes and uniforms
- Implemented a ban on vegetative waste, cardboard and wood at the Ordot Dump, which increased recycling and extended the capacity of the Ordot Dump
- Added recycling at the Ordot Dump and three transfer stations/convenience centers
- Completed plans for cart-based residential waste collection services and initiated procurement to implement the plans

Financing, capital funding and communications

- Recommended a method for financing the Consent Decree projects that was accepted by the District Court and subsequently used by the Government of Guam to successfully issue long-term bonds
- Established a Receiver Trustee account with an initial District Court-ordered deposit of \$25 million from the Government of Guam to allow the Consent Decree projects to go forward while the long-term bonding process was completed
- Put in place a District Court-approved process for controlling solid waste funds that ensured the money was used only for solid waste purposes.
- Engaged in discussions with the Naval Facilities Engineering Command to encourage military use of the Layon Landfill
- Established regular communications with the media and public via www.guamsolidwastereceiver.org and ongoing media relations

Consent Decree projects

- Prepared cost estimates for Consent Decree projects and established a construction schedule that was approved by the District Court of Guam
- Received approval of the required rezoning for the Layon Landfill site
- Completed the hydrogeologic assessment for the Layon Landfill, which was approved by Guam EPA
- Received approval for initial building permits for the Layon Landfill
- Developed a process to acquire all needed permits for the Layon Landfill
- Began construction of Layon Landfill



Trash trucks cross the weigh scales to deliver waste to the Layon Landfill. When the Receiver arrived, there were no scales at the Ordot Dump, which closed on August 31, 2011.

the Ordot Dump, implementing a post-closure plan at the Dump and obtaining permits for and building a new municipal solid waste landfill at a site already selected by the Government of Guam. The Receiver faced additional challenges, including obtaining zoning approval for the landfill site, dealing with the Government's inability to pass a workable funding plan for Consent Decree projects, the Guam Treasurer's unauthorized withdrawals from the SWMD bank account, and disruptions due to the discoveries of ancient remains within the right-of-way of the landfill access road and of a colony of the Guam Tree Snail, an endangered species that needed to be relocated. The Receivership was in a race against time: Could the new landfill be completed before the Ordot Dump reached capacity? Could the dysfunctional solid waste management system be turned around to become reliable, efficient and self-supporting?

The Turnaround

To develop the turnaround plan, the Receiver assembled a multi-disciplinary team of solid waste, procurement, landfill, engineering, financial and communications experts who, in April 2008, presented to the District Court of Guam a roadmap for accomplishing the Consent Decree projects and reforming Guam's solid waste management system. During the first year of the Receivership, with the District Court's approval of the plan, GBB staff placed priority on taking immediate steps to improve customer service and financial accountability, reduce costs through operational efficiencies,

preserve disposal space at the Ordot Dump until the new landfill could be built and address the long-term issues of financing Consent Decree projects—all while managing the design, permitting and construction of the Layon Landfill. Virtually no aspect of solid waste management remained untouched during the first year (see **Operations Reforms sidebar**).

Three and a half years after the appointment of the Receiver, a visit to Guam's neighborhoods on collection day reveals signs of the transformation that has taken place. The SWMD's 17,000 customers each have a 95-gallon trash cart, which has reduced litter and improved the appearance of neighborhoods compared to the unsightly metal cages that held trashcans and bags before the Receiver arrived.

Another sign of change and the new efficiencies is that 99.7 percent of trash collections now are made on time, thanks to new trucks and reliable equipment and a motivated work force. With the SWMD's new billing and customer service system, RFID tags on trash carts and policies to ensure that only paying customers receive service, the number of delinquent residential accounts declined from 15 percent in September 2010 to 3.9 percent in August 2011. Policies also are in place to encourage timely payment from commercial customers.

GBB has also implemented collection of bulky waste and a pilot curbside recycling project for 1,000 households, with plans to evaluate the feasibility of rolling out curbside

Lessons Learned

For island communities facing solid waste management challenges as well as for mainland solid management waste systems, the Guam story offers some valuable lessons:

- When major solid waste issues arise, avoid delays in taking action. If the Government of Guam had acted sooner when it first became evident that the Ordot Dump was polluting the groundwater and Lonfit River, the costs to remedy the problem would have been far lower. The problems were allowed to fester and costs to fix them escalated as time passed.
- A landfill is a limited resource so it is important to maximize diversion of material away from the landfill. In Guam, the Receiver moved quickly to ban vegetative waste, cardboard and wood from the landfill resulting in an immediate demand to process and provide new use for these materials.
- Understand the community, including its traditions and needs. In Guam, the Receiver conducted focus groups and met with the island's mayors and other leaders before implementing the cart-based trash collection program.
- Take into account travel time to the island and additional cost when ordering items from the continental U.S. In Guam, the Receiver needed to add time for delivery of new collection trucks, parts, IT equipment, scales, landfill equipment and construction materials.
- Consider starting small before making any significant change. In Guam, the postal address system is neither uniform nor up-to-date, which made registration for collection service and cart deliveries problematic. To work out any problems, the Receiver tested registration and cart delivery in several of the island's smaller villages before proceeding to the more populated villages. This strategy gave the Receiver the opportunity to fine-tune the rollout and resulted in a smooth transition island-wide. Currently, the Receiver is conducting a curbside recycling pilot program before making the decision about expanding the program to all of the system's customers.
- For any solid waste management system considering a major change, be sure to have an interdisciplinary team involved in planning and execution. The Receiver team included experts in operations, finance, engineering, procurement, landfills and communications as well as people with the political and media relations skills.
- Remember for whom you work. The strong support and constant guidance of the District Court enabled the Receiver to accomplish the turnaround. As the Receiver, keep the Court fully informed and listen carefully to its guidance.

180° Turnaround for a Solid Waste Management System: The Guam Story and Lessons Learned

recycling collection island-wide in the future. In a further sign of change, the SWMD, which has reduced staff from 99 to 54, in June 2011 became the Guam Solid Waste Authority (GSA), independent of the DPW. And in October 2011, the Receiver reached an agreement with the military to begin using the Layon Landfill for disposal of non-hazardous waste from its facilities on Guam.

All these accomplishments took place even as the SWMD, now GSA, was operating significantly below its approved budget—46 percent below budget in the most recent quarter. With the opening of the new landfill, costs will now increase to ensure that it is properly operated, debt service is paid on the bonds and reserves are set aside for future needs. To address the cost of the new system, new fees have been phased in for residential and commercial customers, helping to make the solid waste system self-supporting. In addition, capital savings in excess of \$37 million have been achieved, largely due to the careful management of the contracts for design, permitting and construction of the Layon Landfill and its supporting infrastructure.

The Receiver's Work Continues

The Receiver's work did not conclude with the ceremonies that closed the dump and opened the landfill. Staff will oversee procurement and contracts for the installation of an interim and final cap on the Ordot Dump, which will divert storm water that contributes to leachate, as well as additional remediation. In addition, GBB will provide technical and monitoring support to the operator of the Layon Landfill. In the operations area, there are plans

to build a new transfer station to replace the facility at the Ordot Dump, upgrade the existing three transfer stations to bring them into compliance with regulatory standards and implement a household hazardous waste program on the island. Once the curbside recycling pilot program concludes and collection data are analyzed, the decision will be made whether to proceed with island-wide recycling collection.

Although the work continues, Guam's residents now have a transformed solid waste management system that serves them well with a state-of-the-art landfill, with a capacity in excess of 15.8 million cubic yards, which will service the island for at least another 40 years. In a September 2, 2011 Court Order that was issued following the opening of the Layon Landfill, District Court Chief Judge Frances Tydingco-Gatewood noted that, "Despite [the] challenges, the Receiver has turned the formerly defunct SWMD into an efficient, reliable, and self-financing government entity. In addition to improvements at the SWMD, the Receiver has made significant strides in fulfilling the requirements of the Consent Decree." An August 30, 2011 *Pacific Daily News* editorial stated, "The federal Receiver, Gershman, Brickner & Bratton Inc., has the island's thanks for fixing and improving the government's solid waste program ... In short, the Receiver has transformed the way the island deals with waste." | **WA**

Chace Anderson is a vice president of Gershman, Brickner & Bratton, Inc. as well as Guam Solid Waste Receiver operations manager for the U.S. Territory of Guam. He can be reached at canderson@gbbinc.com or candersongbb@gmail.com.

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John Wayhart

With new exposures and risks routinely coming to fruition, IT IS IMPORTANT TO RECOGNIZE ON-THE-JOB DANGERS AND IMPLEMENT AN ACTION PLAN FOR SEVERE AND FATAL RISK MANAGEMENT. Severity Loss Evaluation and Elimination Plans are the key ingredients to removing fatalities altogether.

“AT LEAST ONE PERSON IN THIS ROOM WILL BE IN

a fatal accident and not return home to their families this year.” Shocking, but true. These are the exact words I spoke one Saturday morning to a group of 50 to 60 employees at a Midwest facility. I came in to evaluate their insurance program and was informed that in the last few years there had been three deaths due to severe risks prevalent on the job. Sadly enough, death was underwritten in their insurance program.

“What happened; what have we learned; what has been implemented,” were all questions I charged the employees and management with in the wake of the most recent death. I then went on to explain the power of S.L.E.E.P.—Severity Loss Evaluation and Elimination Plan—and the impact that evaluating and eliminating risks can have not only on financial costs, but also on employee morale.

Defining S.L.E.E.P.

Sleeping might be an inactive event, but S.L.E.E.P. is anything but. Severity Loss Evaluation and Elimination Plans are the key ingredients to removing fatalities all together. As the waste and recycling industries continue to lurk in the Top 10 of the most dangerous jobs according to the Bureau of Labor Statistics, deciphering ways to remove ourselves from this chart should be the largest task at hand. With new exposures and risks routinely coming to fruition, it is important to recognize on-the-job dangers and implement an action plan for severe and fatal risk management, which is the sole concept behind S.L.E.E.P.

The opportune time to start a Severity Loss Evaluation and Elimination Plan is the beginning of the year when company goals and communication protocols are set. While it may be hard to consult the ultimate nightmare for your organization—a fatality—asking the tough questions, such as “where is the most deadly or dangerous area?”, will ensure a plan that generates greater productivity within a safer environment. Asking these difficult questions and then objectively responding is a staple of the Zero Accident Culture and separates great companies from those just trying to get by. The following are steps to a proper S.L.E.E.P.:

- Identify exactly where severe disabling and fatal exposures exist
- Evaluate the degree of severe risk probability
- Eliminate these risks to prevent severe injury or death

By:

- Conducting a Job Safety Awareness profile around each severe exposure
- Creating employee awareness through various communication materials, supervision and employee performance evaluations
- Celebrating and rewarding success when severity loss exposure has been identified, eliminated and successfully implemented through the efforts of the organization

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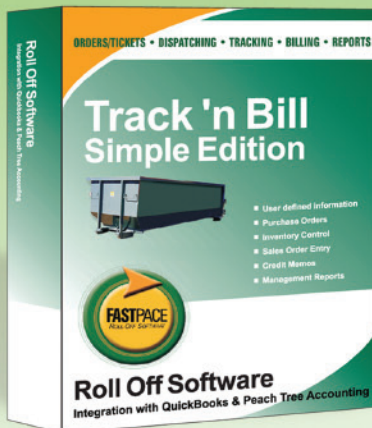
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What some mistakenly consider a mundane profession is extremely hazardous due to risks associated with operating heavy lifting and compacting equipment, as well as dangerous driving habits. Understanding and identifying both obvious and hidden risks is a central component to ZAC and the first area to explore when creating a plan. Areas within the industry that should be considered high risk include:

- Dangerous driving
- Fatigue, lack of stretching, conditioning
- Mobile phone use, including texting and Web surfing
- Eating and drinking
- Tailgating, speeding, reversing
- Route awareness
- Weather conditions
- Speed
- Public general liability
- Injury or death to the general public from a waste truck
- Lockout/Tagout
- Compactors
- Machinery and equipment
- Bailers
- Mechanical and maintenance
- Lift jacks
- Changing tires and tire pressure
- Tire treads
- Brakes
- Steering
- Mirrors

Evaluate

If there are other high risk areas that merit inclusion, add those onto the list. Once you determine the severe risks and exposures that spread across all job facets of waste and recycling management, evaluate the degree of risk probability to determine what areas need additional safety communication and supervision throughout the year. For instance, driving hazards, such as reversing on a dark street will be assessed higher than fixing mirrors. Include numerical values (1 lowest – 5 highest probability) and weigh incidents that have already occurred heavier.

Counting Your S heap

With a death rate of 25.2 per 100,000, the damaging cost and effects of a fatality in the waste and recycling industries can factor heavily on the progress and stability of your company, as well as the morale and performance of other employees. When it comes to life and death situations, many owners seek to avoid the actuality of severe or fatal incidents from happening. However, avoidance is never the answer. It's important that these tough questions get asked and thoroughly examined every day to eliminate fatal risks.

Eliminate

A few of the tough questions that put owners and their current risk management plan on the spot are:

- Where can someone die while working for your company?
- How can someone get trapped, crushed, burned or electrocuted while working on the job?
- Who is responsible for contacting emergency medical personnel?
- What lessons have been put into place from your past loss experience?
- What employee(s) have certain behaviors that strongly suggest they're putting themselves into harm's way?

Further steps to eliminate risk include actionable items, such as training and supervision, purchasing a GPS that measures driving speed, unplanned performance evaluations and Job Safety Awareness profiles.

Conducting a Job Safety Awareness Profile

Written by Human Resources, the VP of Operations or a Safety Director, Job Safety Awareness profiles assess every step of someone's work and then isolate exposures specific to that individual and his or her role. Meetings are set to review the profile and identify the actions and duties most relevant to the job at hand. This is the time to determine if there are discrepancies between what an employee should be doing versus what is actually taking place. Once discussed, the written agreement should be signed by both the employee and employer detailing proper responsibilities and precautions that will increase productivity and eliminate severe injuries and fatalities.

Training and Supervision: Creating Employee Awareness

It's never enough to just have a plan in place. The real value of S.L.E.E.P. lies in the commitment of owners to provide ongoing and adequate safety training for employees. Statistics reveal that new hires and aging veterans are typically more prone to injury and severe risks. Targeting these groups with a comprehensive Severity Loss Evaluation and Elimination Plan and training refreshers can aid in eliminating fatal risks. For example, conduct a driver observations training day and accompany individuals on their shift. During this time, communicate on areas you both feel have the largest potential for serious injuries and give any constructive criticism necessary to improve the safety of the employee, co-workers and the general public.

Along the lines of Job Safety Awareness Profiles, unexpected monthly employee performance evaluations will keep waste and recycling workers alert and consistently self-evaluating their own performance. Furthermore, providing a comprehensive safety manual, greeting employees before a shift starts and handing out communication pieces throughout the year are all great ways to keep the welfare of employees top of mind. Finally, the use of safety committees, in which senior level management, veterans and new employees all attend, is another valuable tool to eliminating risk.

Celebrating and Rewarding Success

I love praise ... everyone loves praise. Rewarding employees' successes is the driver to instilling a long-lasting Severity Loss Evaluation and Elimination Plan. If a team member positively demonstrates corporate values, make sure they are recognized. Celebrate company safety achievements each year and always look to the future when it comes to identifying, evaluating and eliminating severe risk.

Wake Up Refreshed

The S.L.E.E.P methodology is simple to administer, efficient in process and the ROI is extremely high financially and operationally. After reading this article, the biggest takeaway I can provide you with for a ZAC is as follows: the ultimate remedy for a complete and sound S.L.E.E.P. is getting over the fear of the nightmare and addressing it head on—before a disaster occurs. | **WA**

John Waybart is a Senior Vice President at Assurance (Schaumburg, IL). With more than 29 years in the insurance and risk management industry, his expertise lies in providing solutions for a wide range of businesses including the waste and recycling industry. In 1989, John trademarked the Zero Accident Culture® and continues to teach, coach and mentor this process to help drive down the cost of risk to improve operational effectiveness and financial results. This successful approach to insurance and risk advocacy is indeed a market differentiator. John can be reached at (847) 463-7161 or via e-mail at jwaybart@assuranceagency.com.

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Since 1975, Casella has been leading the solid waste industry with an innovative business strategy that seeks to create sustainable value beyond the traditional disposal model. Casella views waste as a resource for producing renewable energy and a raw material for manufacturing new products.

Challenge

Casella has a distinct vision for company-wide operational innovation and excellence, including fleet operations. It was therefore of utmost importance to them that a fleet management solution had to support the company's high standards for sustainability and service. "We wanted to invest in fleet management

technology to improve the quality of our customer experience, as well as deliver real environmental health benefits through the improved efficiency of our vehicles," said Bill Tavares, Vice President of Transportation.

Solution

After many months spent reviewing four fleet management system vendors, Casella selected FleetMind's (Montreal, QC) solution for waste and recycling organizations that includes tools for onboard computing, fleet mapping, reporting and analysis, driver direction, automated service verification, wireless communications and more. Casella selected FleetMind primarily for its driver interface and ease of use—a distinct advantage in terms of adoption rates and acceptance.

Casella started with a small pilot deployment in July 2008 to test the system. From June 2010 to present, Casella phased out the rollout of the FleetMind system to more than 150 Casella collection

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Casella Waste Systems Enhances Fleet Operations and Sustainability

vehicles and 11 sites. The implementation included both hardware and software installations in vehicles and offices, and back-office systems integration.

The FleetMind-Casella Advantage

Casella invested in the FleetMind fleet management system to help improve its operations and underscore its corporate commitment to innovation, service and responsibility. Most notably, Casella has seen measurable improvements to customer service updates, data accuracy and overall productivity. Casella's improvements as a result of the FleetMind system include the following.

Greener Fleets

Green fleets are focused on reducing fuel consumption, mileage and exhaust emissions, and on driving more safely and efficiently. With fleet management tools, Casella supports leaner and greener fleets by: a) optimizing each truck's routes to reduce time spent on the road and the number of engine hours per day, b) reducing the amount of fuel burned by using alarms to monitor and reduce idling (by an estimated five percent), and c) identifying inefficient driving patterns and vehicle maintenance issues for immediate resolution.

Safer Fleets

Fleet safety is about reducing risk and reinforcing safe driving behavior. With fleet-mapping and reporting capabilities, Casella has real-time visibility into driver activity and behavior to make sure that its managers have the tools and information they need to pro-actively implement fleet safety initiatives and mitigate associated risks.

More Responsive Services

Customer service excellence is one of Casella's core values. With its fleet management solution, Casella can now deliver real-time and fully automated service verification to track individual container and customer activity. Its new fleet management dashboard delivers a single-view interface into all fleet operations and performance to identify and respond to customer service requirements more efficiently and with a greater degree of accuracy.

On Top of its Fleet 24/7

To run an effective waste disposal operation, fleet managers need to know what's going on for every route, vehicle and container in real-time. Casella now has complete visibility into its entire fleet—every step of the way. This helps them to ensure optimal operational efficiencies, productivity, safety and customer service.

Optimizes Decision-Making

Casella can now view multiple items of vehicle information on the map simultaneously including the current vehicle location, alarm locations, vehicle activities, containers and the breadcrumb trail. This allows dispatch personnel to identify in real-time the current position of vehicles for quick and accurate dispatch decision-making.

Improves Billing Accuracies

With improved reporting capabilities, Casella is easily able to identify accounts that may have been inaccurately priced, as well as simplify driver and route comparisons for



FleetMind-provided flat screen in Casella vehicles features an on-board computer, touch screen display, and real-time video and audio functionality.

productions, time, miles, etc. Landfill invoice reconciliation is easier and faster as drivers are able to enter the dump location, commodity, tons and more.

"Customers will benefit from our enhanced ability to now provide real-time on-route information, while we can all breathe easier knowing that our FleetMind-equipped vehicles are helping us reduce vehicle mileage and fuel consumption, as well as overall greenhouse gas emissions," concluded Tavares. | **WA**

Martin Demers is a proven C-level technology executive with more than 20 years of experience in the technology and communications sectors. He joined FleetMind in 2007 as co-owner and became the company's CEO and has often been published and quoted in industry publications. Martin can be reached via e-mail at mdemers@fleetmind.com or visit www.fleetmind.com.

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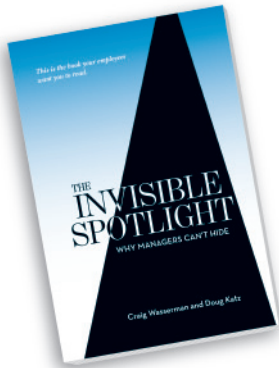


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Breakthroughs and Innovations



In their new book, *The Invisible Spotlight: Why Managers Can't Hide*, Craig Wasserman and Doug Katz make a compelling argument that all managers work in the ceaseless glare of an invisible spotlight where employees scrutinize their every word and deed. Remarkably, many managers are unaware of this reality. As a result, they underestimate the power they wield over their employees' dedication and output. For nearly 40 years, the authors have consulted to managers in a broad spectrum of professions and disciplines and have in-depth experience in the waste industry. Their book tells real stories about real managers' successes and misadventures in the unseen spotlight. Each story acts like a mirror, reflecting the reader's own

management challenges.

The *Invisible Spotlight* offers a fresh, common-sense perspective on building sound management relationships. Written in a practical, conversational style, the book makes it possible for managers to see the unseen. It makes them aware of how their every passing move can inspire employees or disenfranchise them. Short on gimmicks, long on sound management advice, the book has proved especially useful as a department-, division- or company-wide management development tool. *The Invisible Spotlight* is a hard look at the soft side of management that is receiving the highest praise from practicing managers and professional reviewers alike.

THE INVISIBLE SPOTLIGHT: WHY MANAGERS CAN'T HIDE IS AVAILABLE AT WWW.AMAZON.COM. FOR MORE INFORMATION, VISIT WWW.INVISIBLESPOTLIGHT.COM. TO REACH THE AUTHORS, E-MAIL CW@WASSERMANKATZ.COM OR DK@WASSERMANKATZ.COM.

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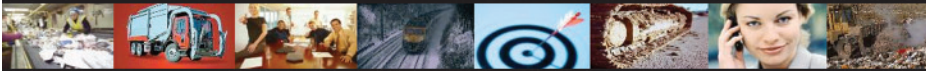
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Breakthroughs and Innovations

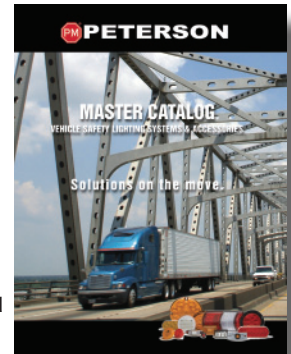
PETERSON MANUFACTURING (Grandview, MO) announces the release of its 2012 Master Catalog. Already on its way to customers, the new Catalog is brimming with Solutions On The Move—more than 276 pages of vehicle safety lighting products and accessories.

The Catalog's color-coded format and new quick-reference icons make it a snap for users to locate items and compare major features at a glance. Showcasing the widest, deepest product line in Peterson's history, the 2012 catalog boasts more than 700 brand new items, including:

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Also included in the catalog is Peterson's new Warranty Statement plus details of a new LED Limited Lifetime Warranty.

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The Curotto-CAN's (Sonoma, CA) new Rotary Autocover (RAC) closes a high strength, low weight fabric cover over the collected material as the operator starts a hopper dump. This prevents lighter material from being blown out of the Curotto-Can as it is raised and dumped into the hopper. As the can returns to the working position the Autocover flips forward for loading. The RAC is air-powered and is activated automatically. The innovated design features easy bolt-on installation that is fully integral with the windscreen, fully guarded components, heavy duty guarding and an extra durable rotary actuator.

The RAC is a recommended option for haulers doing single stream recycling or residential collection—whenever there is lighter material such as aluminum cans, loose paper or styrofoam. The RAC makes the most productive system now the cleanest. Find out how RAC and other options can help your operation deliver the highest customer service at the lowest cost.

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WasteAdvantage^{magazine}

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Waste Advantage Magazine's Recycling/Transfer Stations/Landfills (R/T/L) section has become a very important part of our readership. As a result, we have added timely, relevant editorial—products/services releases, statistics, short tips, etc.—to this section to provide you, our R/T/L professionals, with the useful information that you need when making that important purchasing decision.

By making this important move, Waste Advantage Magazine, provides something for everyone in the waste and recycling industry and makes it the most complete one-stop-shop publication available today. We look forward to expanding our coverage of this segment of the industry and hearing your feedback.

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Q&A

Organics Recycling as a Long-Term Sustainable Solution

Harvest Power, a leader in harnessing the maximum value from organic materials, discusses a hot topic: RECYCLING ORGANIC MATERIALS.

WHAT IS ORGANICS RECYCLING?: ORGANICS recycling is conventionally known as composting: it's a natural process in which micro-organisms and macro-organisms break down organic material, typically yard debris and food scraps, into a dark crumbly soil amendment. Examples of organics recycling occurring naturally are around us every day: leaves that fall from the trees break down and return to the soil; bananas beginning to turn brown on your counter have begun to compost. Compost happens everywhere.

Commercial composting operations take the natural process and gain efficiencies through monitoring airflow and moisture content. Organic materials get introduced to the system, get processed or composted, then they get returned to local farms and gardens. This process is often referred to as the "Organic Cycle"—it's a cycle of carbon, energy and nutrients.

A newly recognized, value-added component to organics recycling is anaerobic digestion. Like composting it's a naturally occurring process. In a gas tight vessel, naturally occurring bacteria turn the sugars, starches and fats into biogas, a renewable natural gas. The Organic Cycle stays intact with anaerobic digestion: after the digestion process the nutrients get returned

to soil through natural fertilizers or compost-based soil products. Liquid fertilizers can also serve as a source of nutrients for fields and crops.

WHAT ARE THE BENEFITS OF ORGANICS RECYCLING TO THOSE INVOLVED?: The benefits to composting are nearly endless. The process of organics recycling benefits each stakeholder. Haulers don't have to transport organic waste to distant landfills. This reduces greenhouse gas emissions associated with both transportation and landfill disposal. Communities are able to reach their recycling targets by sorting out the organic fraction of the waste stream. Farms, gardens, nurseries, public works and stormwater control projects then have access to high-quality, nutrient-rich soil and compost products. Residents and businesses benefit from generating less-stinky trash, and having fewer trips to the curb if they decide to backyard compost.

The products of organics recycling benefit the soil and surroundings. Compost improves soil structure and plant growth by:

- Replenishing and storing organic nutrients in forms available to plants
- Reducing erosion and water run-off



The "Organic Cycle" maximizes the value of the carbon, energy and nutrients in organic materials. Images courtesy of Harvest Power.

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LEARN

INTERESTED IN FOOD WASTE AND WASTE REDUCTION? Check out *American Wasteland: How America Throws Away Nearly Half Of Its Food* by Jonathan Bloom.

INTERESTED IN COMPOSTING? The EPA has valuable references at www.epa.gov/waste/conserve/rrr/composting/index.htm.

INTERESTED IN ANAEROBIC DIGESTION AND BIOGAS? The American Biogas Council's Web site is chock full of juicy information at www.americanbiogascouncil.org.

- Loosening clay soils for better root development
- Retaining moisture in sandy soils so plants need less water
- Supporting beneficial soil life which aids in feeding plants and discourages disease

Charles E Kellogg wrote in 1938, "Essentially all life depends on the soil... there can be no life without soil and no soil without life; they have evolved together." That still holds true today. One could claim that good soil is the foundation of a strong society.

YES, THEY'RE CONNECTED



Through organics recycling, interlocking challenges such as "Peak Soil" and "Peak Oil" can become sustainable solutions.

HOW IS ORGANICS RECYCLING A SUSTAINABLE SOLUTION?: Our society faces many interlocking issues in regards to waste management:

- Landfills have become more expensive, more distant, and are filling to capacity with organic waste that future generations will have to handle
- Communities are seeking sustainable alternatives to fossil fuels
- Farms, gardens, nurseries and stormwater control projects demand high-quality, nutrient-rich soil and compost products
- We need to meet recycling goals and greenhouse gas reduction targets



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Organics recycling sits at the intersection of these issues with an organics recycling solution. Charles Swindoll once wrote, “We are all faced with a series of great opportunities brilliantly disguised as impossible situations.” Organic “wastes” could be such an opportunity when we begin to view them instead as organic “resources.”

One interlocking intersection we’ve been exploring at Harvest is the overlap between Peak Oil and Peak Soil. Just as we’ve reached a peak in oil production, we have also tipped the scales with our limited access to fertile soil: the U.S. Department of Agriculture estimates that productive topsoil is being lost by erosion at a rate of 500,000 acres a year. By defining a new path for organics, we will find solutions to these interlocking challenges.

WHAT PERCENTAGE OF FOOD WASTE CAN BE DIVERTED FROM LANDFILLS BY IMPLEMENTING ORGANICS RECYCLING IN A COMMUNITY? WHAT ARE THE MAIN REASONS FOOD WASTE SHOULD BE DIVERTED FROM LANDFILLS?:

According to the EPA, 150 million tons of organic waste (food waste, paper and paperboard, wood and yard waste) are discarded into landfills each year.¹ About 14 percent of that municipal solid waste is food scraps. For the reasons listed above, food waste should be diverted from landfills. Food waste is full of valuable energy and nutrients that should be put to their highest and best use. These materials should not go to landfills because they contain energy and valuable nutrients.

HOW CAN A COMMUNITY BEGIN TO IMPLEMENT AN ORGANICS RECYCLING PROGRAM? HOW CAN IT BE MANAGED AND SUSTAINED OVERTIME?:

There’s no need to “reinvent the wheel”—many organic diversion programs have been launched successfully across North America. The key ingredients include:

- *Source Separated Organics (SSO)*—Residents and food waste generating businesses such as restaurants, supermarkets and food service industries sort their scraps the same way that they recycle cans, paper and bottles. Sorting out scraps from the municipal solid waste stream reduces the processing cost and improves the quality of the final soil product.
- *Organics Processors*—Composting or anaerobic digestion facilities need to be located within a reasonable distance.
- *A market for the resulting compost and soil products*—Landscapers, farms, fields, nurseries, gardens and parks all demand high-quality nutrient-rich natural fertilizer products.

WHAT TYPES OF TECHNOLOGIES ARE AVAILABLE TO HELP COMMUNITIES/HAULERS WITH THEIR ORGANICS RECYCLING PROGRAMS?:

Various types of technologies are available in different regions. Some markets are more developed than others depending on land use laws, policies, incentives and community buy-in. The best thing that people can do is contact their local municipality and ask, “What organics recycling options are available?” They may have tips on backyard composting, there may be a local greenwaste drop off center or there may be greenwaste collection. | **WA**

Harvest Power (Waltham, MA) harnesses the maximum value from organic materials by providing recycling solutions, generating clean, renewable energy and producing soils, mulches and natural fertilizers. For more information, visit www.harvestpower.com.

Note

1. www.epa.gov/waste/nonhaz/municipal/pubs/msw_2010_factsheet.pdf

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Recycling

Spending Your Outreach Dollar Wisely: Increasing Recycling Using Community-Based Social Marketing

Lisa A. Skumatz, Ph.D. and Juri Freeman

With a well-designed Community-Based Social Marketing program, not only can you MEET YOUR BUDGET, BUT YOU COULD ALSO REAP HIGHER TONNAGES OVER A LONGER PERIOD OF TIME.

HAULERS, RECYCLERS AND PROGRAM MANAGERS

certainly recognize that a well-planned outreach and education campaign can help improve the performance of a recycling program. Outreach can increase participation and tonnage, decrease contamination and help build stronger customer relationships. Yet, there are scores of ways to approach outreach and not all of them are built the same. How much money should you invest in outreach to realize noticeable gains and what will be the eventual return, if any, on that investment? How does “social marketing” compare to traditional outreach? Will the impact last long enough to be worth the investment? This article is based on our years of field experience and outreach programs, and walks through what we have learned about crafting successful—and cost-effective—outreach in the recycling and solid waste field. We put ourselves in the shoes of hauler or city clients, and we use an example of a campaign to increase recycling. Of course, the lessons are applicable to dozens of other waste management topics.

What is Community-Based Social Marketing (CBSM)?

First, “social marketing” is not social media. Creating a Facebook™ account and tweeting about your company’s recycling events may be part of your social marketing campaign, but, online social media sites are only one of the many tools at your disposal in a broader campaign.

Social marketing combines traditional marketing techniques with sociological and psychological tools to more effectively influence a target behavior. Examples over the years include campaigns related to teen drug use, drunk driving, obesity, energy efficiency and many others. On the recycling side, various published social marketing campaigns have claimed a 10 to 66 percent increase in curbside recycling rates. Notable differences between social marketing and a traditional outreach campaign include a focus on barriers and motivations, targeting a specific sector (as opposed to a more generic campaign), and the use of special tools to encourage and retain behavior change, including techniques called social norms, prompts and feedback.

Targeting a Specific Sector

Unlike a traditional broad-based outreach program, social marketing focuses on a specific sector of the community—the “target”. For a recycling program, your target audience may be the person in the household who most often undertakes the action you want to address. If your goal is to increase participation and frequency of recycling, knowing who in the household is responsible for bringing the cart to the curb would be needed. A parallel analysis would be needed for multifamily or business targets. Neighborhoods (business or residential) may also represent targets. Once the proper actor is identified, the outreach material can be designed to reach him or her by addressing the specific motivations to act and the barriers that prevent them from undertaking that action.

Barriers and Motivations

What makes it hard for customers to recycle—specifically the target actor? This is a core early question in social marketing strategizing—and it can’t be skipped. You may have your own guesses as to the barriers, but until you have identified the actual barrier(s) for your target audience, you should hold off on conducting your outreach. The barrier may be something obvious like residents are unaware of what day to recycle or that residents are unsure of what to recycle. However, the barrier may be something unexpected. In a recent energy efficiency program we worked on, the barrier to savings from programmable thermostats was the complexity of initially programming the devices. Despite success in getting the thermostats installed, we found that no energy was saved; in fact, more energy was used in some households due to a failure to program the thermostats. Once key barriers have been identified, the remainder of the outreach program should focus on ways to overcome that barrier. For example, if residents are unsure what day to set out recycling, your outreach might include a calendar showing recycling days and/or a catchy mnemonic for remembering days and/or other strategies you develop.

What motivates any recycling, more recycling, better recycling? How can one leverage motivating factors to



get more recycling? This is another core question that distinguishes a social marketing campaign. Along with identifying barriers, knowing what motivates your target audience to act is important. One of the hardest parts of any marketing campaign is getting people to actually act on the information they have been given—and CBSM works hard on this angle. An example of one of our client projects (this one in the Mountain West) illustrates this point. As any hauler in the region could tell you, with ample land available and tip fees in the area around \$15/ton, saving space in the landfill probably isn't a driving reason to recycling in the region. Local recycling coordinators suggested greenhouse gas reduction is very important. However, our research found that the main reason the ultimate target group for the outreach campaign wanted to recycle was to save landfill space. Thus, much of the outreach material in the campaign included language about how recycling reduces the amount of materials sent to the landfill. CBSM goes beyond the information-based approach of traditional outreach, and needs more specific information to create change. There are well-tested and defensible methods for drilling down on both barriers and motivations to get to what should be the focus of the CBSM campaign—and these first steps are at the core of an successful and cost-effective campaign.

Social Marketing Tools

CBSM borrows powerful tools from social psychology to increase a target audience's likelihood of adopting a desired behavior. This is one more place that CBSM differs from the "tell them and hope for the best" technique of traditional broad-based outreach. They include:

1. *Prompts:* Prompts remind actors to complete a certain action. While it may be relatively easy to get consumers to purchase reusable grocery bags, getting

consumers to remember to bring the bags is another story. An "A-frame" sign out front of the store might be a prompt. Recycling magnets "prompt" customers about what can be recycled and the collection days. A sign in a neighborhood can remind ("prompt") participants about the campaign's goals. Catchy designs and logos, personalization and effective placement are critical to success—and to ensuring prompts are not just thrown in the trash.

2. *Commitments:* People who publicly commit to an action and follow through are valued in our society. This can be leveraged for behavior change in your campaign. We distribute carefully worded commitment cards asking for a written commitment to undertake more recycling actions and publish the committed households' names on the project Web site (or in newsletters/local publications) to make the commitment public. Special window decals, yard signs, buttons/pins, invitations to special events, etc. are other examples of public ways to acknowledge valued changes in action—and, based on our experience (and the literature), they work.

3. *Norms:* People want to "belong" (so say the psychologists), and they tend to do things if their group does them. We can use this to motivate behavior change. People do not want to stand out from the crowd; they prefer to act and behave in a way that society deems as normal. In social marketing, we work on a campaign to make the desired (recycling) behavior the norm. This can be complicated in recycling, because recycling behaviors are personal and some are invisible (not seen by others); a proxy or some other symbol for participation is sometimes used to establish the norm.

These three elements distinguish CBSM from traditional outreach. Note that these factors imply your campaign isn't just a one-hit-wonder. A well-designed CBSM campaign engages customers more than once and in more than one way to motivate and maintain change.



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Lessons from A Case Study

A recent social marketing project involved a homeowners association neighborhood with 1,600 residences. Skumatz Economic Research Associates Inc. (SERA) partnered with a hauler, the city and the State to deliver—and carefully measure the impacts of—a social marketing program to increase recycling. They conducted careful measurement of behaviors and tonnage “before” the program, as well as during and after the social marketing outreach campaign delivered. SERA found cost-effective ways of conducting ongoing measurement, which allowed them to examine the impacts from various rounds of outreach (including reactions following prompts, commitments, challenges/contests, etc.). Coupled with detailed cost recording, SERA tracked the cost-per-ton of recycling attributable to the program. After comparing the results to “control” groups—households that only received “traditional” outreach—it was found that door-to-door outreach increased recycling by more than double the non-door-to-door approaches and almost five times the increase from traditional outreach campaign methods. While much more costly to conduct per house (door-to-door is obviously labor intensive), the authors’ computations showed that the door-to-door social marketing campaign was considerably less expensive per ton than using mail and cart hangers. In addition, our follow-up showed the behavior change lasted longer for the door-to-door outreach. Data like this, collected over the years, allows design and delivery of optimal and cost-effective city, county or hauler CBSM campaigns.

Door-to-Door and Other Outreach Delivery Options

Choice of delivery method for the message/material must suit the target recipient—and delivery is a key element of CBSM. Once you have designed your outreach materials (based on the target audience’s motivators and barriers), and decided which tools to incorporate in your campaign (prompts, norms, commitments, etc.), you will need to decide how to deliver the message and design/produce appropriate materials. Bill inserts and mail are some obvious choices. Bill inserts add virtually zero cost to deliver and are easily sent to all—or just targeted—customers. However, the target audience may or may not pay much attention to inserts in their bill. Traditional media are also options—radio, TV, newspapers, calls, flyers, etc.

CBSM prides itself on being creative about delivery methods. You are trying to leverage social commitments and norms. Some successful CBSM campaigns work to distribute materials in ways that add credibility and community; customers will better adopt behavior change if it comes from someone they respect. That might mean formally or informally partnering with Chambers of Commerce (for business targets), church or community groups or other social options.

Going door to door, providing information on how and why to recycle, and using social marketing tools such as commitments and prompts, might not seem like a cost-effective way to reach your customers. However, work for haulers and cities/counties by the authors has found otherwise. We have evaluated our CBSM projects to determine which outreach method(s) are cost-effective, and we have found that door-to-door outreach is certainly costly per household, but it is also quite a cost-effective method of delivering a social marketing campaign and causing behavior change. The authors found that (well-designed) door-to-door outreach, on a dollars per ton basis, can be several times more cost-effective than many of the other methods of message delivery. Of course, effective design is an important part of this result.

Conducting an Effective Campaign

Doing the same old outreach will get you the same old results. Based on work with hauler and city/county clients, designing an effective campaign does not have

to break the bank. Conducting an effective CBSM campaign can achieve more tons of recycling at lower cost per ton than a number of other outreach strategies (and even cheaper than many broader programmatic strategies, according to other research by the authors).

For an effective CBSM program, the message must be appropriate and designed to appeal to the specific target audience. It helps them to solve their problem/barrier, appeals to what motivates them, potentially “recognizes” them and makes them feel connected to a group they respect. It celebrates success.

The “community” part of CBSM can mean many different types of communities—certain household types, multi-family, commercial businesses (in whole, certain business types, those with certain waste streams), neighborhoods (residential or business), specific household streets that need to change setouts from alley to curb or many, many other potential targets. CBSM is especially well-suited to harder-to-reach groups because of the tailored focus.

CBSM can be used to modify a wide variety of behaviors—and is potentially more cost-effectively than traditional outreach. If your budget is limited, target a segment of your customers, and cycle through over a period of a couple years. With a well-designed CBSM program, you can still meet your budget, but you could very well reap higher tonnages over a longer period of time than using the same old mailers or calendars. | **WA**

Lisa A. Skumatz, Ph.D. is Principal of Skumatz Economic Research Associates (Superior, CO). An economist, she brings a numbers focus to assignments, blending real-world experience on performance of strategies with what will “fit” in the client’s specific situation. She maintains a database of programs and costs from more than 1,300 communities to identify successful options for clients. Lisa previously worked for a solid waste utility, government and consulting. She has more than 150 publications and she has given presentations at the major national and state recycling conferences.

Juri Freeman is a Senior Analyst with Skumatz Economic Research Associates. He works with cities, counties and states across the U.S. to assist in the design and implementation of a wide range of diversion activities.

Lisa and Juri’s work has been widely published. They can be reached at (303) 494-1178 or at skumatz@serainc.com or freeman@serainc.com.



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Resource Spotlight

The Association of Postconsumer Plastic Recyclers



MORE THAN 1,800 BUSINESSES IN NORTH AMERICA ARE INVOLVED IN recycling post-consumer plastics. That is triple the number of a few years ago. More and more people have access to curbside recycling, and consumer and community education programs continue to spread their message. The Association of Postconsumer Plastic Recyclers (APR) (Washington, DC), “the voice of Plastics Recycling”, is the national trade association representing companies who acquire, reprocess and sell the output of more than 90 percent of the post-consumer plastic processing capacity in U.S., Canada and Mexico. Membership includes numerous recycling companies, consumer product companies, equipment manufacturers and organizations committed to plastics recycling. APR strongly advocates the recycling of all post-consumer plastic packaging and promotes development of the plastics recycling industry by providing leadership for long-term industry growth and vitality.

Its goal is to increase the amount of plastic material that is recycled in North America. They do that by sponsoring education workshops and Webinars designed to help local and State solid waste officials learn more about the technology of plastics recycling and the markets for material; holding design for recyclability workshops for packaging professionals; working to assist legislators to make decisions that enhance the recycling of plastics; and numerous other market development and technical programs. APR strives to expand the post-consumer plastics recycling industry through a cooperative effort aimed at identifying and eliminating barriers to successful commercial recycling by:

- Developing protocols for the design of packaging for greater recyclability
- Improving the quality of post-consumer plastics entering the system
- Fostering a strong interface with end-user markets
- Promoting a cooperative testing program for new packaging
- Encouraging design for recyclability with guidelines and programs
- Using awards to recognize packages designed to be recycling-compatible and to recognize products made from recycled plastic material

APR has a Technical Committee that is active in establishing and updating guidelines for the design for recyclability and standards for good recycling practices along with researching new technologies. In addition, a Market Development Committee is active in promoting post-consumer plastic collection through seminars, as well as promoting recycled content to end-

use markets. APR also invests in developing relationships with other industry organizations such as the National Recycling Coalition, the American Plastics Council and the National Association for PET Container Resources. APR has committed to developing a collective and meaningful voice dedicated to enhancing the economic viability of post-consumer plastics recycling.

Market Development

The Market Development Committee of APR is the focal point for association activities designed to increase public awareness of plastics recycling and the plastic reclamation and processing industry, and to create more opportunities to recycle plastics. The committee strives to expand the recycling of plastic material by working with state and local solid waste management officials on methods to enhance their collection programs in order to increase the amount of material collected by those programs and add value to the bottom line. This is achieved via:

- Regional workshops
- Seminars
- Webinars

In addition, the committee works to educate legislators and other key audiences on how to get more from their plastic recycling programs, develops programs that demonstrate how to include plastic bottles in collection streams and demonstrates how recycling markets treat those collected materials. The committee strives to ensure that the general public understands how plastics can be recycled, and to encourage their participation in collection programs.

The Market Development Committee works to “get the word out” about plastics recycling by speaking and exhibiting at trade shows and conferences, implementing award programs designed to highlight and promote packaging and material changes, which enhance plastics recycling and enlisting sponsors for the annual Resource Recycling Plastics Recycling Conference. In addition, the committee strives to be a source of information to the general public. The committee meets during the regularly scheduled APR member meetings, as well as by conference calls periodically throughout the year. | **WA**

For more information, call (202) 316-3046 or visit www.plasticsrecycling.org to find out how you can work with APR to ensure the continued growth and development of the plastics recycling infrastructure to meet the demand for recycled material.

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Landfills

Turning Your Landfill Into a Solar Power Factory: New Technologies Provide More Opportunities

Bruce Clark, P.E. and Marc Rogoff, Ph.D.

LANDFILL ENERGY PROJECTS ARE STARTING TO ENTER A NEW ERA WHERE

in addition to producing energy from captured methane, they now also can produce energy from solar panel systems. Driven by new regulations mandating renewable energy sources, and in areas with higher power costs, older closed landfills with large unobstructed grassed areas are being considered. In addition, operating landfills that are planned to be capped can produce significant energy as well as a result of breakthroughs in liner and solar panel technology. There are around a dozen operational landfill solar projects in the U.S., and many more in the planning stage.

Landfill Caps

Landfills that have been closed and capped use a traditional rack-mounted, solar panel system (Figure 1). Typically, the panels are installed on metal frames that are “secured” to the landfill. Special care is needed to design the attachment so that the integrity of the landfill cap is not compromised and the panels do not slide. Drainage patterns on the landfill can be altered and

modifications must be made to maintain the soil and grass cap in areas around the panels. High wind loads that can result in uplift on the panels and should be addressed with supplemental anchor systems.

The other technology, the flexible solar panel, is laminated to a thermoplastic geomembrane that is used as an exposed cap (Figure 2). Exposed geomembrane caps (or EGCs) have been around for decades with a spotty record. However, the most recent projects use a new material, polyolefin, which is being offered with a 20-year manufacturer’s warranty. This material has a good record with the commercial roofing industry where it has been used for many years with the same laminated solar panel.

However, every State has their own regulations for EGCs, with some considering them experimental and subject to replacement with a conventional soil cap if they experience significant decay before the end of the closure period (30 years under Federal rules). The EGCs have some other challenges to address including increased runoff and uplift of the geomembrane. The flexible panel also does not generate as much power per unit area as the rack mounted system. Both types of systems have been installed in the U.S.

Figure 1: Rack mounted solar photovoltaic panels on landfill.
Photo courtesy of Pfister Energy, Hawthorne, NJ, www.pfisterenergy.com



Compatibility Issues

Landfill compatibility issues do arise when considering a solar panel project. An experienced landfill consultant can assist with addressing basic to more complex issues including:

- Feasibility studies, both economic and technical
- Cap integrity and attachment assessments
- Geotechnical/settlement effects on panels
- Maintaining existing engineering controls
- Regulatory permitting
- Full design and construction oversight

Usually, only the southern facing slopes of a landfill are used for solar panels. However, some panels can be placed on the southeast and southwest corners and still be effective. On closed, flat top landfills, rack panels can be placed across the entire area, if they face south. The angle (or tilt) of the panel at the sun is critical to effective power output and should ideally match the latitude of where the site is located. It turns out that for most landfills a 3:1 side slope is not that far off from the ideal tilt angle.

The major components of a typical solar system are shown in (Figure 3, page 54). A solar panel converts sunlight to direct current (DC) and that



Figure 2: Exposed geomembrane landfill cap with laminated solar photovoltaic panels provides power to serve 224 homes. Photo courtesy of Carlisle Energy Services, Carlisle, PA, www.carlisleenergy.com.

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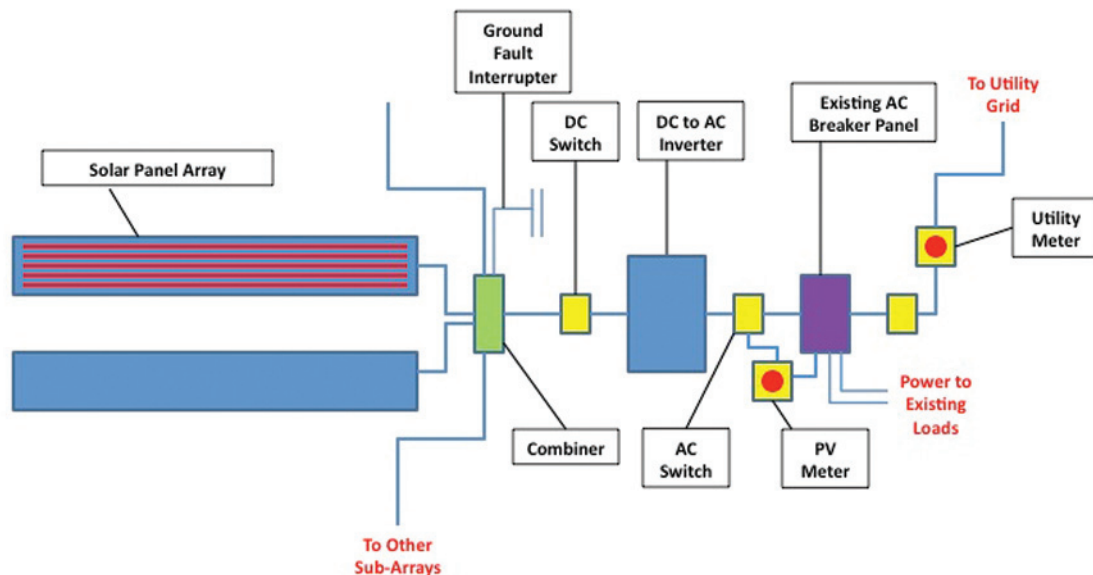


Figure 3: Typical grid-tied solar photovoltaic system. Image courtesy of SCS Engineers.

current is converted to alternating current (AC) in a device called an inverter. That AC current can then be channeled into the utility grid, or used to power onsite loads. Depending on the power output of a solar system, several inverters may be necessary. Manufacturers of solar panels are able to assist you with determining the correct size and number of inverters. Most experienced electrical engineering consultants can provide all of the other aspects to complete the “electrical-side” of actual design projects.

How much power can a system produce? A 1,000 kilowatt laminated panel system on approximately 10 acres of EGC in the south can produce power to meet the needs of roughly 160 average homes. Of course, home power consumption varies widely, and although a landfill system will not furnish power directly to homes, this number which could be higher or lower, is used by companies to promote the equivalent renewable energy benefit of the system.

Cost Considerations

The most recent Department of Energy study indicates that the 2011 installed cost of a rack-type solar panel system (i.e., panels, inverters and wiring) for a typical installation that one might see on a landfill was about \$5 per watt. If the system is rated to produce 1,000 kilowatts (i.e., a 1-megawatt system), that cost alone is \$5 million. There are other major costs including the specialized attachments, drainage modifications and connection to the utility grid, among others. However, the capital cost of an EGC with a modest, initial solar PV system is similar to the cost of a standard Subtitle D cover, in the range of \$150,000 per acre. One other possible advantage of the EGC and laminated panel system may be the opportunity to gain the revenue from waste disposal in the airspace that would have been formerly occupied by the 2-foot thick soil cap.

Combinations of federal, state and utility incentive programs are usually necessary to make the economic payback of a system work. A long-term agreement with a utility, typically for 20 years (i.e., power purchase agreements, PPAs) is usually necessary to obtain financing. States with renewable portfolio standards (RPS) often enable the electric utility to offer more attractive pricing and a market for renewable energy credits. A few areas with feed-in tariffs

provide guaranteed rates, which are significantly higher than retail prices for up to 20 years. The federal investment tax credit, which is 30 percent of the installed cost, is also still available through 2016.

Conclusions

Recent advancements in solar panel technology have opened up their use in applications on landfills of different configurations that were previously not actively considered. Although the use on landfills has its challenges, these are now well understood, and appropriate engineering controls can be included to maintain the integrity of the landfill operating systems, the final cap and the solar panels.

However, the biggest challenge to the increased development of solar panel systems still remains putting together a viable funding package. This requires the combined resources of the local utility, municipal government, federal and State agencies, and private investors. As they say, “success begets success”, and hopefully this holds true for the solar landfill sector of the industry. As more success stories unfold, we expect to see more organizations looking into putting an underused resource, their landfill, to work for them and the environment. | **WA**

Marc Rogoff, Ph.D. is a Project Director with SCS Engineers (Long Beach, CA). He has extensive experience in the development of waste-to-energy projects from the initial feasibility to commercial operations monitoring. He has conducted bond feasibility studies totaling \$1.2 billion in project financing, operations assessments and provided recommendation on key procurement issues. Marc has conducted technical feasibility studies on more than 50 waste-to-energy facilities worldwide and is co-author of a major waste-to-energy textbook, Waste-to-Energy Technologies and Project Implementation. Marc can be reached at (813) 621-0080 or mrogoff@scsengineers.com.

Bruce Clark, P.E. is a Project Director with SCS Engineers. He has completed several landfill solar photovoltaic feasibility studies and more than two-dozen economic and technical feasibility assessments for alternative waste-to-energy projects within the last few years for municipalities, investors, plant developers and others, and has spoken widely on the subject at many conferences and symposiums. Bruce can be reached at (813) 621-0080 or bclark@scsengineers.com.

Transfer Stations

Determining Transfer Station Size and Capacity

THE PHYSICAL SIZE OF A PLANNED TRANSFER STATION IS TYPICALLY determined based on the following factors:

- The definition of the service area. Sometimes this is relatively simple, such as “all waste generated by Anytown, USA,” or “all waste collected by Acme Hauling Company.” Other times, the service area is more difficult to define because of varying public and private roles in solid waste management and the changing availability of existing disposal facilities.
- The amount of waste generated within the service area, including projected changes such as population growth and recycling programs.
- The types of vehicles delivering waste (such as car or pickup truck versus a specially designed waste-hauling truck used by a waste collection company).
- The types of materials to be transferred (e.g., compacted versus loose MSW, yard waste, C&D), including seasonal variations.
- Daily and hourly arrival patterns of customers delivering waste. Hourly

arrivals tend to cluster in the middle of the day, with typical peaks just before and after lunchtime. Peak hourly arrivals tend to dictate a facility’s design more than average daily arrivals.

- The availability of transfer trailers, intermodal containers, barges or railcars, and how fast these can be loaded.
- Expected increases in tonnage delivered during the life of the facility. For example, in a region with annual population growth of 3 to 4 percent, a facility anticipating a 20-year operating life would typically be designed for about twice the capacity that it uses in its first year of operation.
- The relationship to other existing and proposed solid waste management facilities such as landfills, recycling facilities and waste-to-energy facilities.

The same factors are used to determine the size of the following transfer station features:

- The amount of off-street vehicle queuing (waiting) space. At peak times, vehicles must often wait to check in at a facility’s “gatehouse” or “scale



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house.” It is important that the queue (line) not block public streets or impede vehicular or pedestrian traffic.

- Number and size of unloading stalls, and corresponding number of transfer trailer loading positions.
- Short-term waste processing and storage areas (for holding waste until it can be reloaded into transfer vehicles).

Present and projected daily, weekly and annual waste volumes (including seasonal variations) are important in planning facility size to accommodate waste deliveries. The maximum rate at which waste is delivered is a crucial consideration as well. In general, it is best to build a facility to accommodate present and projected maximum volumes and peak flows, with a preplanned footprint for facility expansion. A useful exercise is calculating how much tipping floor space a facility would require to store a full day's waste in case of extreme emergency. One approach to estimating the required tipping floor space is to begin with a base area of 4,000 square feet and add to it 20 square feet for each ton of waste received in a day (assuming the waste will be temporarily piled 6 feet high on the tipping floor).¹ For example, if the facility receives 100 tons of waste per day, a tipping floor space of 6,000 square feet would be required (i.e., $4,000 \text{ ft}^2 + (100 \text{ TPD} \times 20 \text{ ft}^2/\text{ton}) = 6,000 \text{ ft}^2$). “Chapter 4: Collection and Transfer” in EPA's *Decision Maker's Guide to Solid Waste Management* also provides a series of formulas for helping determine transfer station capacity.

Number and Sizing of Transfer Stations

Design capacity is determined by the maximum distance from which waste can be economically delivered to the transfer station. The area that can efficiently reach the waste transfer station determines the volume of waste that must be managed, which is the facility's initial design capacity. Beyond a certain distance, another transfer station might be necessary, or it might become just as cost-effective to direct haul to the disposal facility.

Transfer stations serving rural or tribal areas tend to be small. They are optimally located within a reasonable driving time from the service area's largest concentration of homes and businesses. For example, a rural transfer station could be located near one of the service area's larger towns and sized to take waste from all waste generators within about 30 miles. As an example, two 50-ton-per-day transfer stations might each serve six small communities. Alternately, fewer transfer stations could be used, necessitating longer average travel distances. For example, one 100-ton-per-day transfer station could be used to serve the same 12 small communities, but it would be located farther from the outlying communities.

In urban or suburban areas, the same situations exist. For example, a midsize city (population 500,000) might decide that two 800-ton-per-day transfer stations would best serve its community. This same city could alternately decide that a single 1,600-ton-per-day transfer station is its best option, even when the longer driving distances are considered. When deciding which approach is best for a community, issues to consider include the impacts the transfer

station(s) will have on the surrounding area, siting complications, and the cost to build and operate the transfer station(s). Each approach offers advantages and disadvantages that must be reconciled with local needs.

The biggest advantage of constructing large transfer stations is the economies of scale that can significantly reduce capital and operational costs. Centralizing waste transfer operations allows communities to reduce equipment, construction, waste handling and transportation costs. The siting of a single facility may often prove easier than siting multiple facilities. Large facilities are also conducive to barge or rail operations that can further decrease traffic-related impacts on the community. However, along related lines, a major drawback to building a single large facility is locating a tract of land that adequately meets facility requirements. Large facilities also tend to concentrate impacts to a single area, which can create the perception of inequity, especially when one neighborhood is shouldering the burden for the entire city. A single facility can result in longer travel times, which leads to increased downtime for the collection crew and increased wear and tear on collection vehicles. Another consideration is that a single facility cannot divert waste to a backup facility if a need arises. The single facility must have additional equipment in case of equipment failure or other emergencies.

In other situations, multiple smaller sites might better address a community's waste management needs. Decentralizing waste transfer operations spreads lesser impacts over a wider area, which helps address equity issues. Although it is generally more expensive to build and operate several small transfer stations rather than one large station with the same total capacity, savings from reduced travel times might offset these capital costs and result in lower overall system costs. Multiple facilities also are better able to serve as backups for one another in case of scheduled or emergency shutdowns of facilities. The major disadvantage to building multiple facilities is that the difficulties encountered in siting a single facility can become multiplied.

Future Expansion

Transfer stations are frequently designed to accommodate future expansion. Often, this is accomplished by siting the facility on a larger parcel of land than would otherwise be necessary and preplanning the site and buildings so expansion can occur without negatively affecting other functions on the site or the surrounding community. Although expansion of effective capacity can sometimes be accomplished simply by expanding the hours of operation, this approach is not always effective because the transfer station must accommodate the collection schedules of vehicles delivering waste to the facility. In addition, increased operating hours might not be compatible with the surrounding community. | **WA**

—www.epa.gov/osw/nonhaz/municipal/pubs/r02002.pdf

Note

1. Solid Waste Association of North America. 2001. Transfer Systems Management Training Course. SWANA. Washington, DC.

As of December 2009, approximately 509 landfill-gas-to-energy projects delivered 304 million standard cubic meters per day (mmscfd) of landfill gas and 1,563 megawatts of electricity to corporate and government users—**enough renewable energy to power 1.6 million homes**. The environmental benefits are equivalent to cutting our oil consumption by 179 million barrels a year or not burning 400,000 railcars of coal [U.S. EPA, *Landfill Methane Outreach Program (LMOP)*, December 2009].



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NEXTLIFE (Boca Raton, FL) is proud to announce their newest processing line designed to meet today's and future recycling needs. The addition of their proprietary processing technology will help serve a broad spectrum of unique plastic recycling markets. The proprietary film-to-film processing line allows Nextlife to accommodate customer needs including film and rigid plastic waste. The new line was specifically designed by Nextlife, adding an additional 15 million pounds of production capacity to their Frankfort Kentucky facility.

Nextlife converts plastic waste into sustainable FDA approved resin and currently supplies sustainable resin to many global customers. This strategic proprietary expansion successfully positions Nextlife for future growth. As part of their strategic growth strategy, Nextlife plans on producing the cleanest postconsumer resins globally using their newest technology. This additional capacity allows Nextlife to process more material creating additional demand for plastic waste.

FOR MORE INFORMATION, CALL (561) 245-2600 OR VISIT WWW.NEXTLIFE.COM

WIH Resource Group
Waste Management & Logistical Solutions

WIH RESOURCE GROUP, INC. (WIH) (Phoenix, AZ) will offer subscription-based software, powered by RecycleMatch, as a platform for large manufacturers, as well as solid waste companies, municipalities and other major generators to maximize the economic value of their waste byproducts, recyclables, commodities and surplus equipment. The RecycleMatch platform was initially developed based on feedback from large corporate customers who were seeking tools to accelerate their zero waste efforts and to better manage the sale of their recyclables for fair market value and maximum economic returns.

The RecycleMatch subscription-based platform allows users to set up and manage their own online auctions, sealed bid sales, reverse auctions, RFPs and landfill diversion listings on their own private, Web-based marketplace with invitation only access. Multiple users within one company can use the tool to manage all waste byproduct-related transactions in one place. The platform can be also be configured for waste services providers who want to give their customers 24/7 online access to automated sustainability metrics related to waste.

FOR MORE INFORMATION, CALL (480) 241-9994 OR VISIT WWW.WIHRG.COM.

The BC472RB refuse compactor from **BOMAG** (Kewanee, IL) offers the performance and durability of the company's larger machines, but in a more compact package. Ideal for smaller landfills, the 52,900-pound compactor offers a sealed frame design, outstanding operator comfort, easy maintenance access and superior compaction capabilities. Featuring BOMAG's exclusive PAKALL wheel design, the BC472RB uses polygonal compaction rings. The front wheel contains 50 teeth, and the rear wheel has 40. The machine eliminates air voids by shredding and crushing waste, allowing landfill operators to achieve greater density, preserve valuable airspace and extend the lifespan of their landfills.

The BC472RB comes with a hydrostatic drive system for superior control and traction. Powered by a 255-horsepower Deutz water-cooled diesel engine, the hydrostatic drive efficiently transfers power and torque to the wheels, providing high pushing power while consuming low amounts of fuel. Like the larger compactors in the BOMAG line, the BC472RB features a sealed frame and hubs, which protect major drive components and prevent debris from entering the engine compartment. The compactor has 23.6 inches of ground clearance and an articulating/oscillating center joint, helping to maintain greater wheel contact, control and maneuverability. Adjustable scraper bars and wire cutters keep the wheels free of debris to maintain traction and allow maximum tooth penetration.

In addition to offering superior compaction to extend landfill lifespan, the BC472RB also reduces maintenance costs and labor. A central lubrication system automatically greases all major joints, eliminating the need for regular manual greasing. The vertically opening hood and lower access door provide complete access to all engine maintenance points. Operator comfort and ergonomics are also enhanced with the BC472RB. Joystick controls allow the operator to drive the machine from a natural position, thereby reducing fatigue, and cab noise is minimized for a quiet operating environment.

**FOR MORE INFORMATION, CALL
(800) 782-6624 OR VISIT WWW.GOBOMAG.COM/
REFUSE-COMPACTORS.**



WASTEQUIP (Charlotte, NC), a manufacturer of waste handling and recycling equipment, has launched its Organics2Go program for the safe and easy collection, storage and transport of organic waste. Key to the program's success is a waste audit. Through the audit, Wastequip can customize a solution to meet any customer's needs. Each program is designed based on the volume of organic waste typically generated at a site, as well as other customer priorities such as employee safety, product shrinkage, appearance and odor. Wastequip will then recommend a system that will help the customer reduce disposal costs, improve safety and meet sustainability objectives.

The Organics2Go line includes a wide range of products for the safe collection, storage and transport of organic waste including containers, carts, cart lifters, biofiltration systems and digesters in a variety sizes to nearly any organics recycling or disposal need.

Wastequip has introduced a series of specially designed containers to work in conjunction with the BiobiN[®] patented biofiltration system. The BiobiN system creates an aerobic environment for organic waste to minimize odors and the attraction of pests, allowing more time between pickups. Containers designed to complement the BiobiN system include a plastic organics front end load (FEL) container with a trap door lid for safe, easy loading. There are also several steel containers ranging in size from 3 to 20 cubic yards, including the backpack container designed to eliminate spillage when the container is emptied as well as a steel organics front-end load container and a steel roll-off container.

Wastequip also offers a full line of Toter brand stationary containers, two wheel carts and caster carts for collecting and transporting organics. These carts are manufactured using Toter's Advanced Rotational Molding process for maximum durability in handling heavy, wet organic waste. In addition, Toter lifters offer an easy method for container emptying, improving employees' safety and efficiency. Wastequip offers a food digester, a self-contained, continual feed organic waste disposal system for customers that wish to reduce the volume of their organic waste. The digester biologically converts food waste into compostable material, reducing food waste by 90 percent and dramatically lowering hauling costs.

FOR MORE INFORMATION, CALL (877) 468-9278 OR VISIT WWW.WASTEQUIP.COM.

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