2010 LANDFILL MANAGEMENT EXCELLENCE AWARD

NOMINATION FORM

Program/Facility Nominated:
South Kent Landfill

Contact Person Name & Title: Douglas G. Wood, Director Kent County Department of Public Works

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Nomination submitted by (if different than information listed above):

Name:  Phone #:  Email:

If selected for an award, how would you like the name of the organization to read on the award (limit of 50 characters)?

Kent County Department of Public Works

2010 Applications must be submitted to SWANA no later than Friday, April 2, 2010

*** PLEASE NOTE THAT ENTRY REQUIREMENTS HAVE RECENTLY CHANGED ***

See the attached Entry & Eligibility Requirements sheet for further information

Application Checklist (Please make sure the following items are included in your submittal packet):
- Completed nomination form with signed release statement (this page), to be scanned and included in digital submission
- 1 copy of your award submittal on a CD-ROM OR via the SWANANET FTP site.
- Executive Summary of your nomination (NO more than 200 words)
- At least 2 pictures of your operation (may be included in nomination text)
- Check or credit card payment (made payable to SWANA) for nomination fee (in U.S. dollars)

Please mail all application packages to:

SWANA
ATTN: Technical Programs Department
1100 Wayne Avenue, Suite 700
Silver Spring, MD 20910

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

Signature: Date: 3/18/10
South Kent Landfill

Kent County Department of Public Works

Caterpillar 3520C engine generator

Landfill gas-to-energy building
Executive Summary

Owned and operated by the Kent County Department of Public Works (DPW), South Kent Landfill sits on 299 acres in the shadow of the country’s Green Building leader, Grand Rapids. As Kent County’s only active municipal solid waste landfill, South Kent serves a diverse and environmentally progressive community.

Seeing the opportunity for environmental benefit and cost savings, landfill managers took voluntary, proactive measures to assure that the performance of South Kent Landfill exceeds the expectations of regulators and citizens alike. Landfill-specific and department-wide programs that include voluntary landfill gas-to-energy generation, converting trash to electricity at a state-of-the-art waste-to-energy (WTE) facility, extensive public education programs, hazardous waste disposal and ever-expanding recycling services integral to a integrated solid waste management plan designed to reduce the amount of waste generated and properly process that which enters the South Kent Landfill. In addition to these broad services, the Landfill undergoes extensive voluntary monitoring and is one of a handful of landfills across the country with an Environmental Management System (EMS) registered with the ISO 14001:2004 standard. Utilizing unique programs and proactive decision making, the DPW is proud to watch the South Kent Landfill stand as a model for other landfills to follow.
Design & Construction

The upland site at 300 100th Street in Byron Center proved an ideal location for many reasons including geology, soil types, hydrology, topography, and proximity to a major freeway within the county. Soils at the 300 100th Street location are composed of sand, silt and an abundance of low-permeability clay. The high clay content in the soils makes it an ideal location for a landfill. Water infiltration within clay soil is much slower due to the structure of clay particles. At the 300 100th Street site, laterally continuous clay isolates the underlying regional aquifer and isolates it from rapid infiltration of precipitation and snow melt water on the site.

The hydrology of the site indicates a regional sand and gravel aquifer underlying a laterally continuous clay layer. The recharge area for the aquifer lies in higher ground to the east and northeast of the site.

Regionally, groundwater flows to the west and southwest until it reaches lakes, streams and tributaries of the Buck Creek watershed. Buck Creek is a tributary for the Grand River, Michigan’s longest river.

During cell construction activities, Kent County engineering staff complete all engineering, design, surveying and construction supervision as well as the construction quality assurance (CQA) on the excavation and placement of the soil material. A third party consultant provides CQA and certification for the liner system. In preparation for cell construction, soils are excavated and used to provide daily, intermediate and final cover from the property.

Testing is performed prior to cell construction to examine soils and demonstrate that there is a minimum of 10 feet of clay below newly constructed cells. The top two feet of clay are excavated and re-compacted to eliminate cracks in the clay, increase bulk density (mass per unit volume of soil) and reduce infiltration and percolation within the soil. The depth of the water table below the cells is also measured to ensure adequate separation between groundwater and the cell bottom.

As required for the Michigan Department of Natural Resources and Environment (MDNR-E) landfill operating permit, staff maintain and continue to develop an end use plan that will be implemented once the...
landfill closes. At the current disposal rate, estimated closure will take place in 2029 with the ash monofill closing around year 2017. Utilizing internal partnership opportunities with the Kent County Parks Department, the DPW will develop a well-suited land use project that may include a park/green space or greenhouse area.

As a municipally owned and operated site, the South Kent Landfill managers have the obligation to make decisions based on criteria beyond basic legal requirements. Department managers strive to operate on the cutting edge of industry standards. Several aspects that support this decision are the voluntary Environmental Management System registration in the ISO 14001:2004 standard; the voluntary installation of a landfill gas-to-energy system; the segregation of ash from the WTE facility into a dedicated monofill; an augmented groundwater monitoring schedule for quality assurance; and advanced liner system.

**Environmental Controls**

The management of a landfill requires extensive environmental monitoring. South Kent Landfill goes beyond legal requirements to ensure environmental protection and safety of neighboring residents and businesses.

As a tool to extend the life of the landfill, the DPW developed plans for a Waste-to-Energy (WTE) facility that has been operational since 1990. The addition of this facility in a metropolitan area of Kent County doubled the life of South Kent Landfill. After trash is incinerated at the WTE, the ferrous metals are recovered and the leftover ash (a mere 10% of the volume the bulky trash used to be) is hauled to South Kent for disposal. To date, 104,280 tons of ferrous metals have been recovered and recycled. In 1990, landfill permitting required a segregated ash monofill to be constructed separate from the municipal solid waste (MSW) cells. The first ash monofill was constructed on the southern end of the landfill property beginning in 1991 and was closed in 1995. A second ash monofill was then constructed on the northeastern corner of the landfill property. The ash monofills are constructed to the same or higher standards as MSW cells, including 10 feet of clay and a 60 mil HDPE liner. Additionally, the ash monofill has a layer of strip drains and a one-foot protective sand layer. This style of leachate collection was the first to be permitted in Michigan and increases efficiency by conserving landfill space and cutting costs. Ash landfill rules were modified, allowing for commingling of municipal solid waste and ash. Instead of combining the ash with
South Kent Landfill
Kent County Department of Public Works

MSW, the segregation of ash and MSW continued, a decision that has proven invaluable to the complex issues of leachate management.

Approximately 70,000 gallons of leachate per day (two million gallons per month) is discharged from the landfill to a sanitary sewer line where it is conveyed to the Wyoming Wastewater Treatment Plant. Leachate is tested monthly to ensure compliance with the publically owned wastewater treatment facility requirements.

Beneath the leachate collection drains within each landfill cell is a synthetic liner made of either 40 mil PVC or 60 mil HDPE plastic. PVC was used before the HDPE liner was developed. Since 1995, all new liners use the HDPE plastic. The liner is laid on top of two feet of re-compacted clay or a geosynthetic clay liner. Twelve feet of naturally occurring clay extends below the HDPE liner system which is tested to assure it meets or exceeds compaction and permeability requirements of the landfill operating license.

Screening of waste prior to acceptance for disposal is a critical point in the established Waste Screening and Detection Plan. Waste is screened at least three different ways as it is processed. First, the scale house attendant asks specific questions to rule out hazardous or liquid waste, illegal wastes, or other unacceptable materials. After the waste enters the landfill, random load inspections are performed by the landfill Site Supervisor at the tipping face. Any unacceptable wastes are rejected and taken off-site by the hauler. As waste is being placed and compacted on the landfill working face, equipment operators are continually surveying the waste for unacceptable or significant recyclable material that can safely be recovered.

The ISO 14001:2004 program was registered at South Kent Landfill in 2007 and was renewed in March 2010. An Environmental Management System meeting the requirements of ISO 14001:2004 enables landfill staff and managers to identify and control the environmental impact of our activities, products or services; improve our environmental performance continually; and implement a systematic approach to setting environmental objectives and targets, to achieving these and to demonstrate that they have been achieved. Implementing the ISO 14001:2004 program ensures that the landfill is committed to protection of the environment and conservation of natural resources through compliance with laws, prevention of pollution and continuous improvement.
system at South Kent Landfill has proven to be an excellent means to monitor environmental performance while always looking for opportunities for improvement.

Overall, extensive monitoring and safety programs at and around the site are essential to the protection of human health, environmental quality and resource conservation.

**Human Health and Resource Conservation**

While the South Kent Landfill operates with environmental controls in place, its effectiveness in protecting the environment begins before waste even reaches the landfill. In the late 1980s, Kent County’s Board of Public Works committed to a pioneering vision. They researched and determined that Kent County had the opportunity to manage solid waste in ways no other county in Michigan ever had. With that vision in mind, Kent County took responsibility and ownership of a struggling Materials Recovery Facility that processed residential and small business recyclables from all over west Michigan. Since then, the facility has been upgraded, and more than 214,835 tons of recyclables have been recycled instead of sent to a landfill.

Having found success as the only significant MRF in west Michigan, the Board of Public Works recently authorized construction of a new single-stream recycling facility to keep Kent County progressive in the recycling industry. The new facility will be able to process a greater volume of material as the center will serve as a regional recycling hub and the expansion to single stream recycling will bring an anticipated increase in participation.

Around the same time that Kent County took over responsibility for recycling, the second waste-to-energy (WTE) facility in Michigan was constructed. This County-owned, state-of-the-art facility proved to be an innovative way to marry the objectives of recycling, waste reduction and energy development, providing many more years of useful life to the South Kent Landfill. An average of 625 tons of solid waste are incinerated at the Kent County WTE facility each day, generating up to 18 megawatts of electricity per hour. Through incineration, the volume is reduced by 90% and the weight reduced by 77%. The residual ash is hauled to the ash monofill at South Kent Landfill.
From a household perspective, the trash can serves as a catch-all for all things unneeded. Kent County’s goal is to provide other outlets for many of the wastes that do not belong in the trash and to prevent these wastes from entering the South Kent Landfill. County-operated off-site programs, including household hazardous waste and battery collections, serve to divert potentially hazardous materials away from the landfill and to prevent landfill and environmental emergencies. The household hazardous waste program operates four locations around the County with hours available on a weekly basis year-round. Saturday collections rotate between the four locations during the summer months. Since its inception in 1985, the Kent County Household Hazardous Waste Program has collected 1,511,704 pounds of household hazardous material from 27,654 homes with an investment of nearly $1.5 million in disposal costs. This waste would likely have been put in the trash and found its way to South Kent Landfill or another area landfill.

On-site resource recovery programs collect tires, propane tanks, scrap metal, appliances and electronic devices at the Customer Service Center at South Kent. Tires are banned from disposal in landfills in Michigan. Instead of turning customers away who have tires, the South Kent Landfill became one of only two registered commercial scrap tire collection sites in West Michigan. Since becoming a registered collection site in 2007, over 194 tons of tires have been collected to be recycled into synthetic sports fields, rubberized asphalt, tire turf and tire derived fuel. Propane tanks have the potential to cause significant damage if disposed of in the trash so they are accepted at South Kent for proper removal of residual gas and recovery of the metal. Refrigerant gas is removed from appliances by a licensed contractor on-site to prevent atmospheric damage from gas releases. Since 2006 more than 1,300 appliance units have been recycled for scrap metal recovery, many of which contained refrigerant gas that was properly removed. Metal, plastic and glass from electronic devices are recovered through electronics recycling provided free to residents.

Computer equipment, televisions, cell phones and other
small electronic devices are collected at South Kent, two other county facilities and at special collection events with more than 2,166 tons collected for recycling since 2001.

The Kent County Department of Public Works partnered with Granger Electric to install a gas-to-energy facility at the South Kent Landfill in late 2008. Twenty-four gas wells, between 55 and 110 feet deep, power two 20-cylinder generator units. Two miles of pipe underneath the landfill connect the wells together. Methane gas is extracted from the wells and pumped through the pipeline into the generators, producing up to 3.2 megawatts of power - enough to power approximately 2,500 homes through a partnership with Consumers Energy. The methane captured is converted into water and CO₂, which is much less potent as a greenhouse gas. This ensures environmental protection and resource conservation by generating power from the anaerobic decomposition of MSW within the landfill, a form of industrial symbiosis.

The landfill is also involved in the cap-and-trade carbon credit system because of the installation of the gas-to-energy system that diverts methane from entering the atmosphere. The amount of non-methane organic compounds (NMOC) the landfill produces falls below the standard for mandatory implementation of a landfill gas management system, so the carbon credits are sold and profits are returned to fund other landfill programs. To date, over 120,000 tons of carbon equivalent will not enter the atmosphere because of this program.

In 2010, South Kent Landfill was awarded the Landfill Methane Outreach Program Community Partner Award from the United States Environmental Protection Agency. This award recognized the landfill for its innovative partnership, expedient implementation and overall management of a gas-to-energy system.

Regulatory Compliance

The South Kent Landfill is a critical component of an extensive, integrated solid waste management system administered by the Kent County Department of Public Works. As the only licensed type II landfill in Kent County, South Kent is relied upon by hundreds of thousands of people and its continued operation is essential.
South Kent Landfill has consistently met and exceeded all regulatory compliance requirements:

The landfill operating permit, issued by the Michigan Department of Natural Resources and Environment, requires gas probes surrounding the landfill to be tested quarterly to ensure that methane is not escaping the landfill site through the soil. Additional voluntary methane monitoring is done through mounted detectors with alarms inside buildings on-site. These detectors monitor for gas intrusion into the building.

In addition to monitoring methane, the operating permit requires groundwater monitoring on and around the landfill property. Groundwater samples from 16 monitoring wells are collected and analyzed by a contract laboratory on a quarterly basis. In addition to the required primary and secondary parameters, groundwater is also tested for potassium, an indicator that leachate leaked from an ash cell. Five leachate indicator criteria are tested in total. As a voluntary public service, drinking water from neighboring homes is sampled and tested once per year. South Kent Landfill continues to show no threat to the groundwater.

The South Kent Landfill generates approximately two million gallons of leachate per month that is either hauled or discharged directly to the City of Wyoming Clean Water Plant under an Industrial User Permit. Strict permit limits for primary pollutants, including BOD (biological oxygen demand), TSS (total suspended solids), total phosphorus, oil & grease, arsenic, PCBs, cyanide and several heavy metals are monitored by the Plant. Leachate is tested for the same parameters before leaving South Kent Landfill and by the City of Wyoming. Leachate is also statistically analyzed for potassium, beyond the state requirements, to ensure the concentration is not increasing faster than it should.

RE: Kent County South Kent Landfill, Waste Data Number 436182 Solid Waste Inspection

This correspondence will serve to confirm the compliance status of the South Kent Landfill (Facility) solid waste disposal area, located at 300 100th Street, Byron Center, Michigan. Pursuant to a recent file review it has been determined your facility has been operated in compliance with Part 115, Solid Waste Management, Michigan Compiled Law 324.11501 et seq, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, (Part 115), and any administrative rules promulgated pursuant to this act for the past three years.

If you have any questions, please feel free to contact me.

Terrance A. Hartman, R.S
Environmental Sanitarian
Waste and Hazardous Materials Division
Michigan Department of Natural Resources and Environment
Kent County holds a renewable operating permit (ROP) for air quality at the landfill. Under the ROP, the Landfill Air Emissions Estimation Model is used to estimate fugitive carbon dioxide, non-methane organic compounds, volatile organic compounds, NOX, SOX, particulate matter (PM10 and PM2.5) and various organic hazardous air pollutants from the flare, turbine generators, landfilled waste and the haul roads.

A Storm Water Pollution Prevention Plan (SWPPP) for South Kent Landfill has been developed as required under Part 1.B of Michigan’s National Pollutant Discharge Elimination System (NPDES) general permit for stormwater discharges. The SWPPP describes the facility and its operations, identifies potential stormwater discharges at the facility, recommends appropriate best management practices (BMPs) or pollution control measures to reduce the discharge of pollutants in stormwater runoff, and provides for periodic review of the SWPPP. Preventive maintenance involves the regular inspection, testing and cleaning of landfill equipment, ditches and the maintenance facility. Comprehensive inspections of the site BMPs are conducted at least two times per year by the Stormwater Operator. Daily inspections are conducted by the site supervisor to ensure the integrity of the system. Effectiveness of the SWPPP is comprehensively reviewed annually.

While not a regulatory requirement, Kent County felt that the listed goals and objectives outlined in the 1989 Kent County Solid Waste Management Plan required reassessment. In 2009, Kent County voluntarily underwent a year-long planning process to update the County Solid Waste Plan. Kent County’s integrated solid waste management system effectively addresses all aspects of the solid waste generated in the region and corresponds with the State of Michigan goal of utilizing 50% of the solid waste in Kent County.

A voluntary permit to act as a scrap tire collection site was granted in 2007 and is renewed annually. Disposing of whole tires in landfills is banned in the State of Michigan and, as one of only two such facilities in all of west Michigan, this service is important to landfill customers and to minimizing improper disposal of tires in the environment.

**Planning, Operations & Financial Management**

The Kent County Solid Waste Management Plan is the guiding document that assists the Department of Public Works Directors in planning and implementing programs and services that serve all of Kent County’s 660,000 residents as well as the surrounding region. Long-range goals and objectives outlined in this document help determine expenses that will be incurred from public service programs like the Household Hazardous Waste Program, residential recycling services and other public and environmental safety initiatives. Because the Department of Public Works
operates in the public interest, any revenues at South Kent Landfill are directed toward continuing existing services and expanding to provide new services.

To this end, the 2009 revenues from South Kent Landfill were $5.7 million and total expenses were $5.3 million. 2010 estimates of revenue are $5.8 million with $5.2 million in expenses. Revenues from South Kent Landfill are used to fund other programs, including household hazardous waste, electronics recycling, solid waste planning and some operations at the Materials Recovery Facility. Revenues also contribute to the management of closed landfills under Kent County’s supervision.

Looking ahead to the future, programs that may be implemented at South Kent Landfill or will impact the volume of waste entering South Kent Landfill include:

- **Expansion of the ash monofill and landfill.** Scheduled for closure in 2017, the ash monofill is a unique aspect of the South Kent Landfill that has enabled the DPW to track characteristics of leachate coming from ash. Keeping the ash separate from the municipal solid waste has proven to be an important decision for leachate conveyance and expansion of the ash area is scheduled to begin in the next 3-5 years. To enable expansion of the ash monofill and future expansion of the landfill, a partnership with an adjacent county was formed. In this agreement, South Kent Landfill will be expanded across the Kent/Allegan County border. In preparation for this, more than 300 acres have been purchased.

- **Expanded household hazardous waste services.** Since 1985, household hazardous wastes (HHW) have been collected in various ways from residents of Kent County. As awareness of the environment grows, so will participation in programs like the HHW collections. As such, expansion of the program will be necessary and is being planned. A permanent center with open hours will be added to make dropping off hazardous wastes more convenient. An additional appointment-based center will also be added to the South Kent Landfill to enable residents to dispose of all their wastes at the same facility.

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South Kent Landfill
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- **Expanded recyclables and additional recycling centers.** With its location at the extreme southern end of the county, the availability of recycling services in the area is limited. Adding a recycling drop-off center at South Kent Landfill would encourage participation in recycling activities and also bring attention to the other programs available for resource conservation at the facility. The new single-stream recycling facility, 15 miles north of the landfill scheduled to open fall of 2010, will also enable additional quantities and types of recyclables to be processed.

- **Ensuring environmental services are available to everyone in the region.** South Kent Landfill and the Kent County Department of Public Works offers many services to residents that most private landfills do not provide. Proper disposal of household hazardous waste is a critical service to provide to further protect the landfill and the environment around it. The DPW believes that other landfills should offer these services as well. As written in the 2009 Amended Solid Waste Management Plan, any new solid waste facility in Kent County is required to make household hazardous waste disposal and recycling services available to its customers.

- **Utilize excess property for green energy.** Fortunate to have room to expand and a potential energy source, plans to incorporate 24 acres of greenhouses across the street from the landfill are possible in the future. Waste heat generated from the gas-to-energy operations would be harnessed to heat greenhouses on excess property surrounding the landfill.

- **Increase usage of recycled materials for landfill projects.** South Kent Landfill will continue to utilize recycled products in construction and improvement projects. An upcoming project will use recycled asphalt shingles to pave access roads around the landfill.

- **Begin an unwanted pharmaceutical collection program with area wastewater treatment facilities.** Studies have shown that prescription drugs that are disposed of in landfills pose a threat to surface and groundwater supplies. Leachate that goes to wastewater treatment plants cannot treat for pharmaceuticals and the treated wastewater is discharged into the environment still containing prescription drugs, like antidepressants, antibiotics, steroids, hormones, heart and asthma medications, and pain medications. The DPW hosted a meeting in March 2010 with area POTW managers to discuss partnering to implement a permanent and collaborative unwanted pharmaceutical collection program.
Employee Training

All employees go through extensive health and safety training classes based on OSHA requirements and job performance safety standards. Twelve of these classes are completed every year; 25 additional classes are completed every three years; and three classes are repeated every five years. Some of the classes include: Asbestos Awareness; Accident Prevention; Compressed Gases; Confined Spaces; Eye Protection; Fire Prevention and Fire Extinguisher Use; First Aid and CPR; Front End Loader, Fork Lift, and Roll-off Operation; Hazards Communication; Landfill Safety; Lockout/Tagout; and Waste Screening. A combination of hands-on, classroom, video and written training sessions assure that employees are fully trained for their respective position. Many employees are also cross-trained to ensure that a knowledgeable person is available at each position in case of an emergency.

Environmental Industry Associations recognizes and honors waste industry drivers nationally for safety, quality and service. Jeff Velthouse, a roll-off truck driver at South Kent Landfill and the Materials Recovery Facility, was a semi-finalist for the 2007 Driver of the Year award. Jeff has been employed with the DPW for nine years and has a perfect driving record.

In 2009, Sandy Cihak, a 20 year employee of the DPW, was given a 2009 Essential Service Award from the Economic Club of Grand Rapids. Not only does Sandy perform all functions of her job as a scale house attendant, but she “has the respect of the drivers”.

Utilization of Equipment/Systems and Technologies

Managing 500 tons of waste per day requires reliable equipment to handle a variety of conditions. From high heat and humidity to freezing temperatures and several feet of snow, the on-site equipment must be durable and rugged.
The following list summarizes the equipment owned and operated at South Kent Landfill by the Kent County Department of Public Works:

**Dozers:** Dozers are used to place solid waste in lifts for compacting and for small on-site construction projects.

- A certified rebuilt 2002 Caterpillar D8 Dozer
- A certified rebuilt 1999 Caterpillar D8 Dozer (backup equipment to ensure minimal downtime)

**Loaders:** Two loaders assist in landfill maintenance, clean up and small on-site construction projects.

- 2009 Komatsu WA470 Front End Loader
- 2004 Komatsu WA450 Front End Loader

**Compactors:** Compactors play a critical role in the life of the landfill and the employees that operate these machines have a direct impact on the effectiveness of the impressive compaction rate goal of 90%. Compactors are used to push and compact the solid waste to a predetermined density to maximize airspace in the landfill and provide solid roads for commercial haulers to drive over.

- 2010 Caterpillar 826H Landfill Compactor that features a GPS tracking system that monitors compaction, fuel use and idle time.
- 2006 Bomag 772 Landfill Compactor (backup equipment to ensure minimal downtime)

**Roll-Off Trucks:** Roll-off trucks transfer solid waste in 40 cubic yard open-top boxes from the throw-off wall at the Customer Service Center to the landfill working face and from our other facilities to the landfill.

- 2010 Freightliner Roll-Off truck
- 2005 Sterling Roll-Off truck
- 2001 Volvo Roll-Off Truck
Water Truck / Plow Truck: Utilizing a relationship with the Kent County Road Commission, the landfill staff acquired and retrofitted two Road Commission plow trucks with water tanks and use them continuously for road maintenance - in the summer for dust control and for plowing snow in the winter.

- 1991 International Conventional Dump Truck
- 1990 Ford Conventional Dump Truck

Containers: The county owns roll-off boxes used to temporarily store waste from the Customer Service Center area. Once filled, the boxes are hauled to the landfill working face for disposal of the contents.

- Six 40 cubic yard containers for residential customers to throw trash into over a concrete barrier wall
- One 40 cubic yard container for tire storage. Per Michigan law, tires cannot be disposed of in landfills and are collected separately for transport to a licensed tire recycler.

Unique Equipment

Extension Prod Attachment: Michigan winters provide interesting challenges for all industries, including landfills. To overcome the challenge of frozen waste loads, the landfill staff designed a 20 foot extension prod to attach to the loaders. This equipment has dramatically decreased unloading time for haulers with frozen loads to get them back on the road faster, making landfill staff and customers more efficient. The recent addition of a second loader has necessitated a second prod, planned for late 2010.

Stormwater Pump Cantilever: Seeing the same challenges every day, county staff decided to design and construct another innovative solution for the stormwater pumps. These cantilever pump hoists make operating and placing the pumps simple, ensuring that the pump motors will not burn out, thus increasing their life. The hoist allows the pumps to be placed quickly and ran at maximum efficiency to move the stormwater away from the cells faster, decreasing leachate production.
Scales: The county has a newly constructed scale house and two inbound 80 ft. Fairbanks scales with plans for a third outbound scale in Spring 2010.

**Equipment Maintenance & Training**

The DPW strictly tracks the hours of each machine to ensure that they are serviced accordingly at the recommended 250, 500, 1000, and 2000 hour intervals. The Caterpillar 826H and the Komatsu WA470 have a wireless equipment monitoring system that alerts both the DPW and the service company of machine hours and any alarms that sound. The monitoring system also tracks machine idle time which, when used in conjunction with the facility’s no-idling policy, has significantly reduced fuel consumption.

Training for the new equipment is conducted by the seller’s representative upon delivery of the equipment. The appropriate amount of time is set aside for training depending on the complexity of the equipment.

**Gas-To-Energy Equipment**

The Gas-to-Energy facility is equipped with two Caterpillar 3520C Engine Generators and was built with room to add one additional engine. It is staffed with one full-time associate who is on call 24/7. The facility is designed for automatic call-outs for both warning and alarm conditions. The warning and alarm conditions monitor the vacuum, temperature, gas pressure, flow, customer operating conditions, gas quality and equipment performance. The generating station is designed with a bypass system so if maintenance needs to be performed on any piece of equipment, it can be bypassed and the system will still generate electricity. There is also a landfill gas management system (flare) that can automatically compensate for variations in gas demand for electrical production. This ensures maximum environmental protection and gas utilization.
Public Acceptance, Appearance and Aesthetics

Most people driving on US-131 through the heart of Kent County are unaware that an operating landfill is just a few hundred feet from their car. Wooded property has been intentionally left to disguise the site and any litter that escapes the site is regularly picked up by court-ordered community service workers. Landscaping berms were created to improve appearance and a reconstructed wetland compensates for much of the land that required excavation during construction. Stormwater retention and sedimentation ponds were created to prevent stormwater from mingling with the leachate collection system. Reducing water usage, the modified water trucks pump stormwater out of ponds to keep dust on the roads to a minimum. A 2,500 foot long litter fence surrounds the working face and community service workers periodically pull trash from the fence area as well. The fence has made a tremendous impact on the amount of trash blown outside the landfill property.

A new scale house was constructed in spring 2009 to improve customer service and a new outbound scale will be added in spring 2010. Other facilities on the property include an office/maintenance building and the newer Granger Electric building that houses the generators and gas extraction equipment.

Community education is encouraged and dozens of landfill tours are given each year. Tours groups generally visit from elementary, middle and high schools within Kent County but those from outside the area are welcomed to tour as well. College classes, cub scouts, church groups, environmental groups, community leadership programs and teachers have also visited the site. In addition to the landfill, the materials recovery facility and waste-to-energy facility also welcome tour groups year-round.

To complement the field trip opportunities that are available at South Kent Landfill, educational kits and presentations are also available free of charge. Kits are available to loan to teachers or scout troops and include a crayon recycling kit, paper making kit, and a steel can lantern-making kit. The kits encourage reusing and recycling leftover materials instead of throwing them away. Staff are available to travel to classrooms to teach about waste reduction, landfill management and construction, and the benefits of using recycled and recyclable products.

We had a great day. All of the presentations were excellent and we had an excellent learning trip.

Amy Banfield
East Rockford Middle School
A new educational tool was recently added to the team - a robot raccoon driving a recycling truck! The raccoon robot will be used as an interactive tool for kids to learn about recycling in a fun way, helping to shape their future habits and also educate their parents.

A variety of printed materials are distributed to residents of Kent County at special events and through media outlets. A printed “Household Waste & Recycling Guide” is distributed annually to nearly 100,000 people through one of the state’s largest newspapers and more than 10,000 are delivered to municipalities to distribute around the county. The Guide assists people in finding proper outlets for their wastes and reminds them that the South Kent Landfill is nearby to handle many of their disposable goods.

**Innovation and Creativity**

Encouragement from landfill managers to develop innovative ideas to solve lingering problems gives all staff the motivation to think ‘outside-the-box’. Inventions by landfill staff, like the extension prod and cantilevered stormwater pump, have proven invaluable to the advancement of services. Having well-rounded employees and invested customers who are encouraged to provide suggestions enables the landfill to grow with the needs of the community and companies it serves. The gas-to-energy facility and ISO 14001:2004 registration are significant examples of voluntary investments and South Kent Landfill is committed to continuing to find new and innovative ways to reduce the environmental footprint, reduce operating costs and improve overall service to the community.

South Kent Landfill has many aspects that are different from a traditional landfill:

- As one of only a handful of landfills in the world with a Environmental Management System registered with the ISO 14001:2004 program, Kent County staff and both internal and outside auditors are continuously monitoring all aspects of the environment at South Kent Landfill. Short- and long-term goals to improve operations at the landfill will ensure continued success in preventing pollution of the environment.

- Utilizing the cap-and-trade system demonstrates a willingness to reduce greenhouse gas emissions.
The location of the site and the soils available are something many landfills desire but are unable to achieve. With so much naturally occurring clay in the area, the soils and remote location show that there can be an ideal place for a landfill.

Implementation of the landfill gas collection system is a form of “green energy” generation.

The drainage system for ash cells is an innovative strip drain that allowed a one foot vertical increase in airspace over the entire area of the cell.

A separate ash monofill makes monitoring more straightforward when challenges from the ash leachate arise.

A pump cantilever hoist demonstrates innovative methods to manage stormwater.

Ideas like these and the fully integrated solid waste management system make for an immensely successful program and state-of-the-art sanitary landfill.
1. Entrance
2. Scalehouse
3. Customer Convenience Center
4. Operations and Maintenance
5. Methane To Electricity Facility
6. Commercial Container Storage
7. Active Type II Landfill
8. Active Ash Monofill
9. Closed Ash Monofill
10. Landfill Excavation (Future)