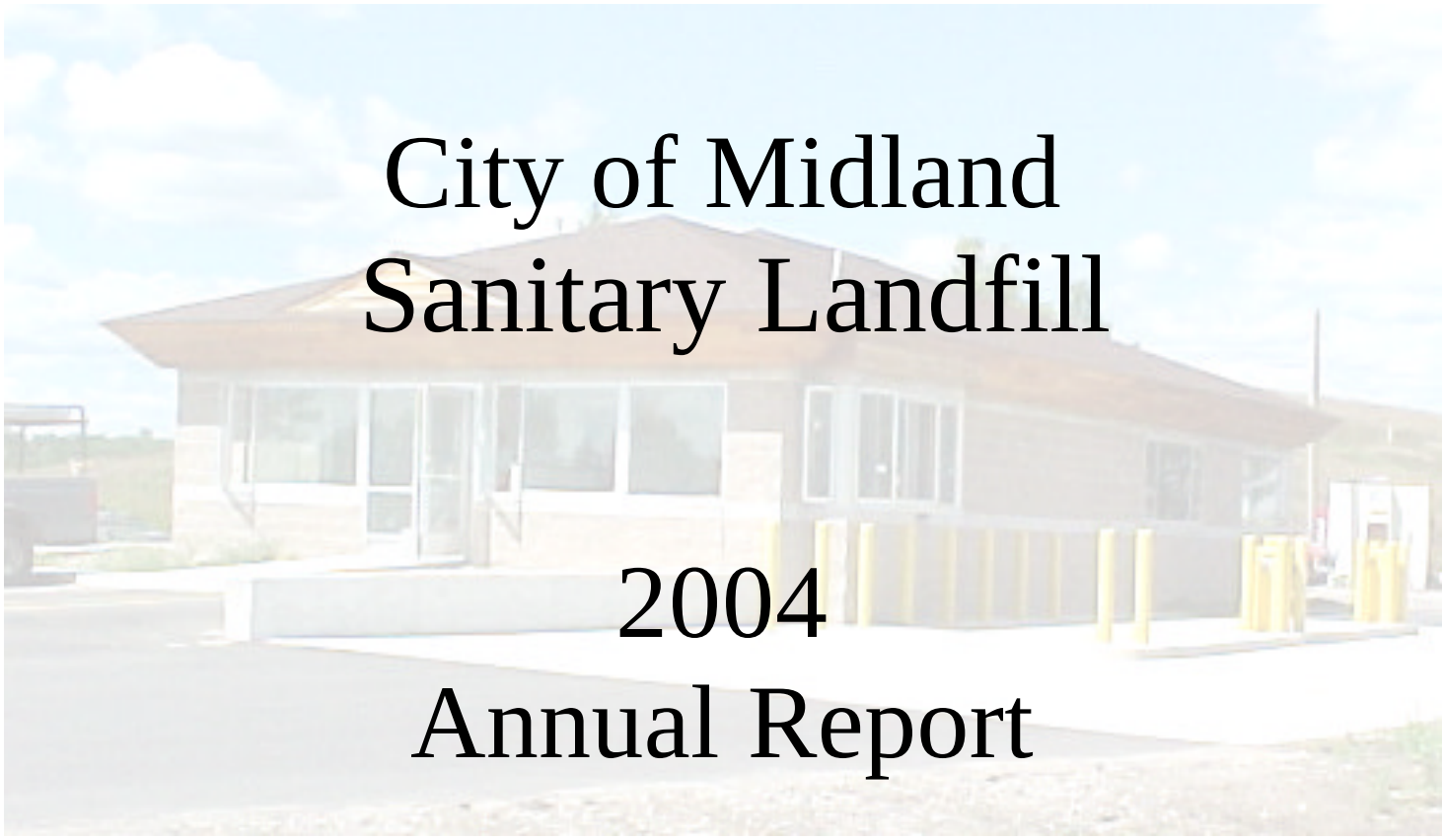


City of Midland
Sanitary Landfill

2004
Annual Report

Facility Type: *Municipal Solid Waste Landfill*

License Number: 9029

Facility ID Number: *470453*

Prepared by: *Joseph Sova, Budget Analyst;*
Scott O'Laughlin, Landfill Superintendent

The City of Midland Landfill functions as the final disposal site for all of Midland County's household, commercial, and non-hazardous industrial waste. The Landfill must efficiently handle the daily inflow of refuse, while maintaining customer satisfaction and safety and meeting or exceeding state and federal environmental regulations concerning landfill operations. Landfill operations are separated into the following areas: Landfill refuse handling, Composting, Recycling, Capital Improvements, Maintenance of Existing Facilities, Environmental Monitoring and Regulations Compliance, and Public Education.

LANDFILL REFUSE HANDLING OPERATIONS

In 1996 the Landfill completed a master plan outlining future expansion and development of six new engineered cells. The first of these cells constructed was Cell 14. With an approximate size of 12 acres, Cell 14 was designed to accept 2,475,000 loose cubic yards of waste and has nearly reached full capacity.

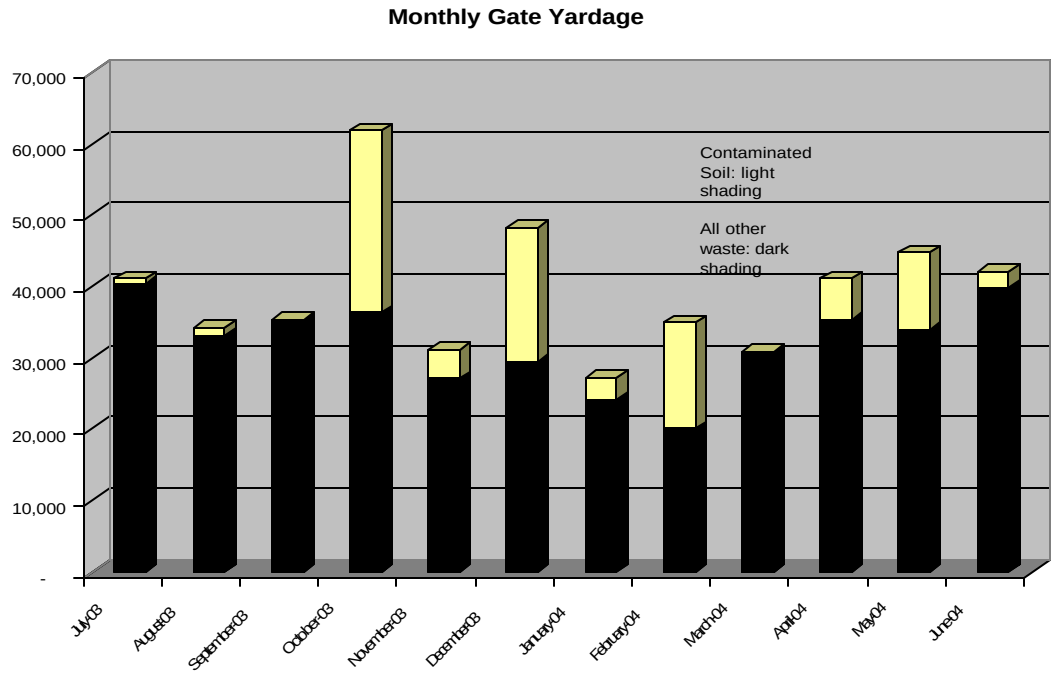
Cell 15 received final certification approval from the Michigan Department of Environmental Quality (MDEQ) in November 2003 and in December of that year began accepting waste in conjunction with Cell 14. The two cells were simultaneously operated until summer 2004, when Cell 14 was covered with interim cover soils. Cell 15 is 11 acres in size and has a design capacity of 4,880,000 loose cubic yards, nearly double Cell 14's volume. Cell 15 will accept waste for seven (7) years at current fill rates.

The entire area of Cells 14 through 19 will have a capacity of 33,750,000 loose cubic yards of waste, with a final closed landfill height of 150 feet above ground level. At current fill rates the site will meet the needs of Midland County for approximately 50 years.

Yardage received per month at the landfill varies with the seasons and the economic climate. Community cleaning activity increases in the spring and fall, while construction activity is strong through the summer. Rainy and winter months typically result in less outdoor activity and, ultimately, less refuse received at the Landfill.

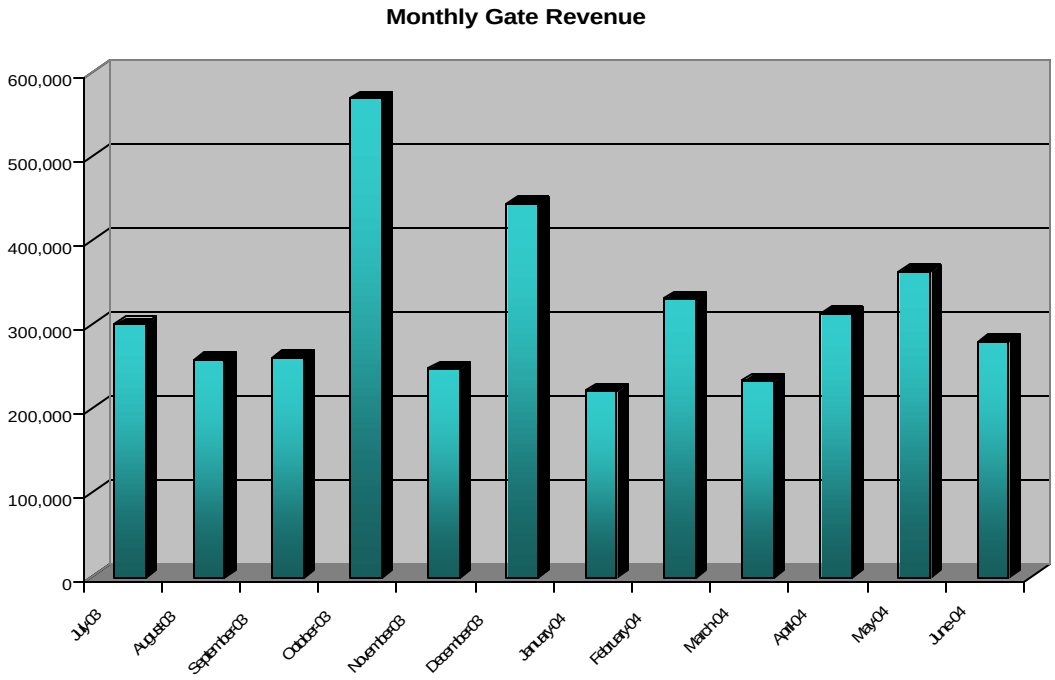
The total refuse received through the gate in fiscal year 2003-2004 amounted to 700,970 loose cubic yards. This volume was brought to the landfill by more than 36,000 vehicles over the course of the year. The comparable reported yardage was 602,335 in 2002-2003, hauled by 27,500 vehicles. On an average day over 500 tons of refuse is received at the landfill. Chart-1 shows a monthly distribution of refuse yardage received at the Landfill and indicates a general slowing in the months November through February, with the exception of contaminated soil variations.

Chart-1



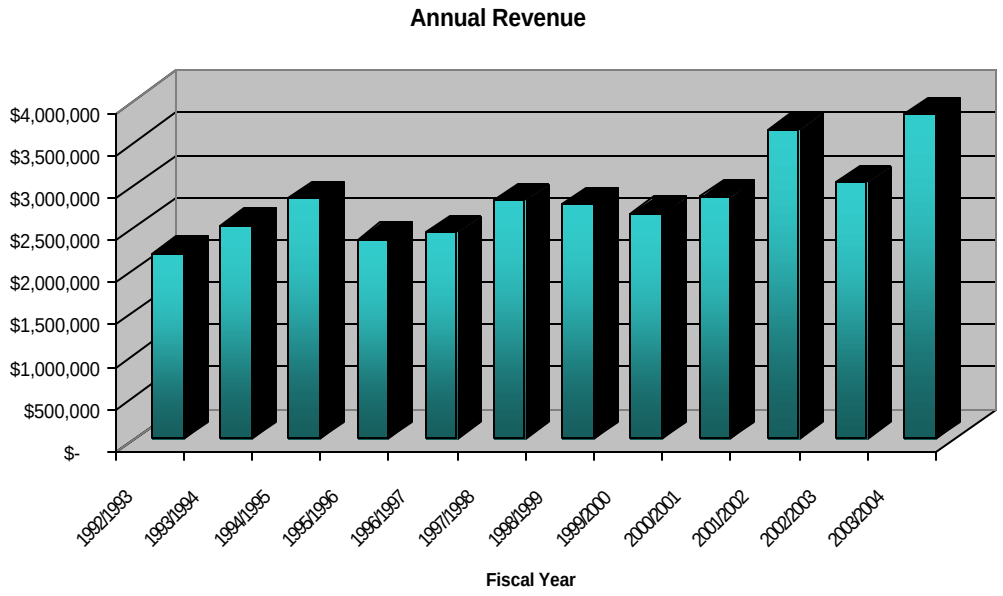
Total Revenue generated in 2003-2004 was $3,831,000 compared to $3,032,000 in 2002-2003. The increase of nearly $800,000 is essentially all attributed to an increase of contaminated soils received. Total monthly revenue generated from the yardage received in 2003-2004 is reflected in Chart-2.

Chart-2



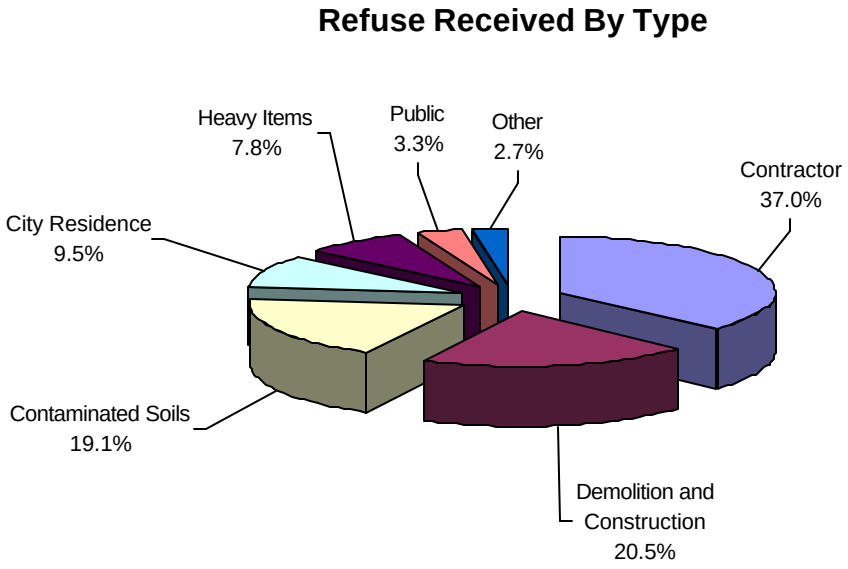
Yearly revenue generated from refuse received at the Landfill is shown in Chart-3, comparing the years 1992-1993 through 2003-2004. Revenue growth is difficult to forecast because a major portion of the annual landfill revenue is demolition material of existing structures and refuse generated from new construction. Each of these items is directly affected by the economy in Midland County. Contaminated soil volumes are also unpredictable and have a significant impact on revenue. Contaminated soil volume is the cause for abnormal revenue increases in 2001/2002 and 2003/2004 fiscal years.

Chart-3



There are many types of refuse received at the Landfill every day. General municipal solid waste (City Residence and Contractor) made up a total of 46.5% (9.5% and 37.0%, respectively) of all yardage received in 2003-2004. Demolition and construction waste made up 20.5% of the waste stream. Heavy item collection brought to the landfill by the City of Midland Department of Public Services accounted for 7.8% of waste received. As previously stated, the largest change in refuse volume and revenue was contaminated soils, which increased from 8,715 cubic yards in 2002-2003 to an atypical volume of 87,117 cubic yards in 2003-2004. These soils accounted for 19.1% of the annual yardage received, compared with 2% last year. The high volume of contaminated soils in 2003-2004 was from excavation of soils surrounding a closed crude oil well site in the county. The balance of refuse received included public (3%) and all others (Appliances, Asbestos, Clean Fill, Medical Waste, Street Dirt, Tires, Wastewater, Water) together making up approximately 3% of the total yardage for the year. Chart-4 shows a breakout of each major type of refuse and its associated percentage contribution to total yards received.

Chart-4



Much of the refuse received at the landfill is in the form of loose cubic yardage. It is estimated that the incoming refuse can be reduced to one-third of its original volume using a specialized compactor. The compactor is also designed to minimize airborne debris, which is a concern to property owners adjacent to the landfill property. In summer 2003 the landfill began a new lease on a larger compactor, which has provided a noticeable improvement in compaction efficiency and will extend the life of the landfill cell.

The MDEQ mandates that daily cover be placed on the new refuse each day. This cover must reduce odors, eliminate blowing debris, deter animals, and reduce risk of fires on the landfill surface. When available, foundry soils are used for daily cover, which reduces the need for periodic purchases of daily cover soils. In fall 2003, an alternate daily cover machine was purchased to reduce the need for foundry soils and reduce the volume of cover being buried each day.

Landfill staff is required each day to observe the refuse loads being brought to the landfill and care must be given to keep sharp items from puncturing the geosynthetic liner of the cell which could allow waste liquids to leach from the containment area. Continued special handling of contaminated soils, medical waste, and asbestos is also the responsibility of landfill staff.

Gates are open Monday through Friday 8 a.m. to 4 p.m. and from 8:30 a.m. to 12:00 p.m. on Saturdays during the months of March through November.

COMPOST OPERATIONS

Each year the landfill receives over 13,000 yards of yard waste, 40,000 yards of leaves, and 20,000 yards of brush. From this inflow the landfill is able to produce over 20,000 cubic yards of quality compost.

Over the past several years the compost operation at the landfill has been facilitated by the use of a grinder, as shown in the picture below. The grinder takes the yard waste, leaves, and brush and grinds them into small particles, which helps to speed up the decomposition of the material. The extra-long conveyor belt attached to the grinder allows the compost to be piled in taller mounds, saving compost pad space. The compost piles are turned and mixed when the temperature of the material falls below or rises above the desired temperature range of 110^{o} – 140^{o} Fahrenheit. The grinding, maintaining proper moisture, and periodic turning and mixing of the compost material allows the compost to be fully processed and ready for screening in a matter of two or three months.

Screening is accomplished using the Erin Starscreener purchased in 2002-2003 fiscal year. Finished, fine compost passes through the screen while larger impurities and brush which has not fully decomposed are separated for further composting. In the past all compost generated at the landfill had been used on site as vegetative and topsoil cover for the capping project of cells 1-13, a multi-year project. Compost has also been used to add nutrients to landfill-owned grounds whose topsoil was removed for use in construction projects such as closure of cells 1-13 and the Waste Water Treatment Plant retention basin. Other internal uses are being explored for City parks, golf courses, landscaping of municipal buildings, and outlawn repairs.

RECYCLING OPERATIONS

The City of Midland Landfill continues to promote the recycling of as many materials as possible on site. Appliances are received daily from residents and many of them contain freon, which has to be removed before the items can be recycled. In 2003-2004 over 1,000 appliances were received, had the freon removed, and the scrap metal recycled. Scrap metal from other sources is also separated at the landfill's scrap metal collection pad and recycled. In addition to scrap metal the landfill receives and recycles car batteries, clean concrete and asphalt, grass, leaves and brush.

Tires continue to be accepted at the landfill for disposal. In 2003-2004 the landfill received 3,145 tires, compared with 2,222 tires in 2002-2003 and 1,666 in 2001-2002. While the volume increased over the past year, it was overshadowed by the tire collections sponsored by

the Midland Area Recycling Center and Mosquito Control. During collection events this year nearly 4,000 tires were collected to be shredded for use as fuel in Michigan industry.

The City of Midland Landfill again served as the site of the Midland County Household Hazardous Waste Materials Collections. This program allows Midland County and City residents to dispose of household hazardous materials, such as paint, pesticides, herbicides, and motor fueling and lubrication products. The collection of these hazardous materials is held in the landfill's maintenance building, whereby residents can conveniently drive in, unload into segregated bins, and drive out. During the five collections this year over 300 barrels of waste were collected and safely disposed.

CAPITAL IMPROVEMENTS

The largest of the capital projects undertaken this year at the landfill is the construction of a new landfill cell. The picture below shows Cell 15 last summer during placement of plastic

liner systems, which protect the environment from contamination. The cell is adjacent to active Cell 14 (visible on the right) and is approximately 11 acres in size. It was certified in November 2003 and began accepting limited waste in December that same year. This spring Cell 15 began accepting the full waste stream (with the exception of contaminated soil) and will accommodate nearly eight years' refuse from Midland County. The project cost just over $2.7 million dollars to complete.

With the opening of Cell 15 came the need to place an interim cap on Cell 14 until final closure. Landfill staff placed thousands of yards of sand and compacted clay over the slopes of waste to prevent storm water contamination and maintain compliance with regulations. Beginning in spring 2005 staff will work with contractors to install final cover soils and plastic liner over the side slopes of the cell.

Another site improvement was the construction of a three acre asphalt compost pad. The existing pad was crumbling, and was removed to allow installation of a heavier duty pad for compost operations. Future plans include expansion of the pad to accommodate increasing volumes of yard waste.

Staff researched and purchased an alternate daily cover (ADC) system this year. The ADC is an emulsion of asphalt and bentonite clay in water which is sprayed onto the daily refuse using a simple tank and spray pump on a trailer. The spray dries into a hardened film which complies with MDEQ regulations for daily cover. The largest benefit of the ADC system is the reduction in cover thickness. The ADC spray dries into a film less than a quarter inch thick, while six inches of sand are required to accomplish the same purpose and comply with regulations. Saving nearly six inches of landfill space each night extends the life of the landfill, easily offsetting the cost of the ADC system.

Part of the daily operation of the landfill is fueling of several large pieces of equipment. This year a new 4,000 gallon diesel fueling system was installed to replace a decades-old tank that was not compliant with new regulations. The system is an above ground, double walled tank which is protected by concrete barriers which surround the tank. The system is safer and more environmentally friendly than the previous tank.

Final capping and closure of Cells 1-13 neared completion in 2003-2004. Staff installed a leachate collection system onto Cells 1-6 which, having been built in the 1970s and 1980s, had no waste liquid removal system installed. The leachate is pumped to the waste water treatment plant from wells placed directly into the buried refuse. Removing leachate from these cells will aid in the decomposition of remaining waste and reduce the potential for leachate migration downward through clay to groundwater sources.

As blowing debris is a daily issue at the landfill, a new fence system was devised and installed by landfill staff to prevent debris from blowing onto neighboring properties. The height of existing fencing was increased, and a new fence was installed at the perimeter of landfill property where residents are most affected.

MAINTENANCE OF EXISTING FACILITIES

The landfill is visited each year by thousands of vehicles delivering refuse. Roadways must continually be maintained for a smooth transition from pavement to gravel and dirt roads. Landfill staff and temporary employees pick up blowing papers on a daily basis, repair landfill grounds areas and mend fences. Dust is kept to a minimum with the help of a water tanker truck, which during very dry seasons, is used to water landfill roads several times per day. Staff has also begun use of dust control mixtures with a chemical base called lignin. Lignin mixtures have a long lasting dust reduction effect, similar to brine on a gravel road. Mowing grass of the landfill grounds and trimming of trees helps to make the landfill as aesthetically pleasing as possible. Staff has also planted a flower bed at the entrance to the

site to improve the site's appearance. This flower bed earned the landfill a beautification award in 2003.

ENVIRONMENTAL MONITORING AND REGULATIONS COMPLIANCE

Engineering consulting services for groundwater monitoring and landfill gas monitoring is in the final year of a three-year contract extension. This quarterly testing has resulted in no exceedance in levels for 2003-2004.

Landfill staff continues to work with the MDEQ to insure compliance with personal and environmental health laws. MDEQ has certified that Cell 15 was constructed within regulatory compliance. The landfill also replaced its diesel fueling system to comply with updated regulations.

PUBLIC EDUCATION

One of the goals set for landfill staff this past year was to continue support in the area of public education. Through the efforts of staff the landfill has taken two steps forward in working with the public schools in our area. Educational brochures have been printed for adults as well as children. In coordination with their spring session about earth science school children toured the landfill and then received compost kits to take with them. Staff completed the recycling loop with a hands-on project of growing a flower in our recycled compost dirt, and created a teacher's packet with suggested projects. The landfill gave out approximately 500 compost kits, which included a ruler, a cup of compost dirt, a seed packet, a colorful brochure and activity pages.

GOALS SUMMARY FOR 2004-2005

- Achieve the City Manager's Award for Safety.
- Start final closure of Cell 14 slopes.
- Install new residential drop-off area to add convenience and reduce cell traffic.
- Complete closure of cells 1-13 and obtain certification.
- Install new gatehouse operating software to improve efficiency.
- Investigate scales to allow automation of a second traffic lane.
- Initiate implementation of a landfill gas-to-energy project.
- Investigate viability of bioreactor landfill system to increase site life.
- Continue public education efforts.