REGIONAL BRIEF No. 1

Money to Burn
New Hanover County's Waste Incinerator

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John Locke FOUNDATION

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Executive Summary

New Hanover County built its waste to energy incinerator WASTEC as a result of the difficulty the county had in the late 1970s with landfills. County officials wanted to make sure the new landfill built in 1981 would be able to last and saw incineration as a moneymaking way to do that.

WASTEC was expected to earn enough from energy sales for the county to elimi nate solid waste tipping fees. Energy prices began to plummet in 1983 and remained below historic averages for most of the next fifteen years. Tipping fees rose as high as 60 per ton and the waste management system has only been able to break even since fiscal year 2003 with a $46 per ton tipping fee.

It may have made sense at the time, but WASTEC has never lived up to its promise and it is time for the county to write off this failed experiment.

The New Hanover County Department of Environmental Management delayed numerous ways to improve efficiency at its landfill for fifteen years or more, perhaps unintentionally, while it focused efforts on managing WASTEC.

Some of these steps include:

- Adopt Posi Shell Cover System, which would have reduced the amount of daily cover needed from six inches to 1/4 inch
- Redirect construction and demoli tion materials from the landfill
- Introduce recycled leachate liquid to the landfill as a way to accelerate decompo sition and increase compaction methane gas produced can be collected and sold

Without WASTEC, New Hanover County could reduce tipping fees today or divert the extra revenue from its $46 tip ping fee to the General Fund. If a proposed private landfill opens in nearby Columbus County, New Hanover County would not need to impose flow control that keeps trash going to the incinerator. The com peting site could instead help to ease the burden and extend the life of New Hanover County's landfill.

Regardless what happens in Columbus County, New Hanover County's officials have nothing to lose from the closure of WASTEC. Whatever costs are involved in shutting down WASTEC can come from the same revenue stream that support its operation now.

Introduction

New Hanover County has operated a waste to energy incinerator WASTEC since 1984. By burning trash, the incinera tor conserves space at the landfill and earns money for the county through sales of steam and electricity. New Hanover Coun ty's Department of Environmental Manage ment operates the incinerator, a recycling program and its landfill as a comprehensive solid waste management system. Critics argue that the incinerator is simply a waste of money that provides little benefit to the county. A proposed landfill in Columbus County could drive tipping fees down and force New Hanover County to reconsider the value of its comprehensive system.

The first part of this report will exam ine the events that led to the building of the incinerator and its operation since. The second part will look more at the cost of in cineration and the impact of the proposed Columbus County landfill on solid waste flows in the region, particularly ending the ability to cross subsidize WASTEC with earnings from the landfill. The third part will compare the services approach taken by New Hanover County with the capacity approach taken by landfill operators. Here we find that few of the services offered by the county rely on WASTEC. The final part of the report offers some conclusions about the positive steps that the Department of Environmental Management has taken to make the landfill last longer and a recom mendation that builds on these steps to improve the waste management system.

History of Landfill and WASTEC

When New Hanover County tried in 1978 to expand its five-year-old Flemington landfill, county officials ran into a seem ingly insurmountable set of problems. First, a neighbor complained that the landfill contaminated groundwater. State officials issued a preliminary permit for expansion, but testing revealed that the groundwater source for 44 nearby wells was contami nated.[1] Years of further investigation even tually found that the landfill did not cause the contamination, but too late to have any effect on landfill decisions.

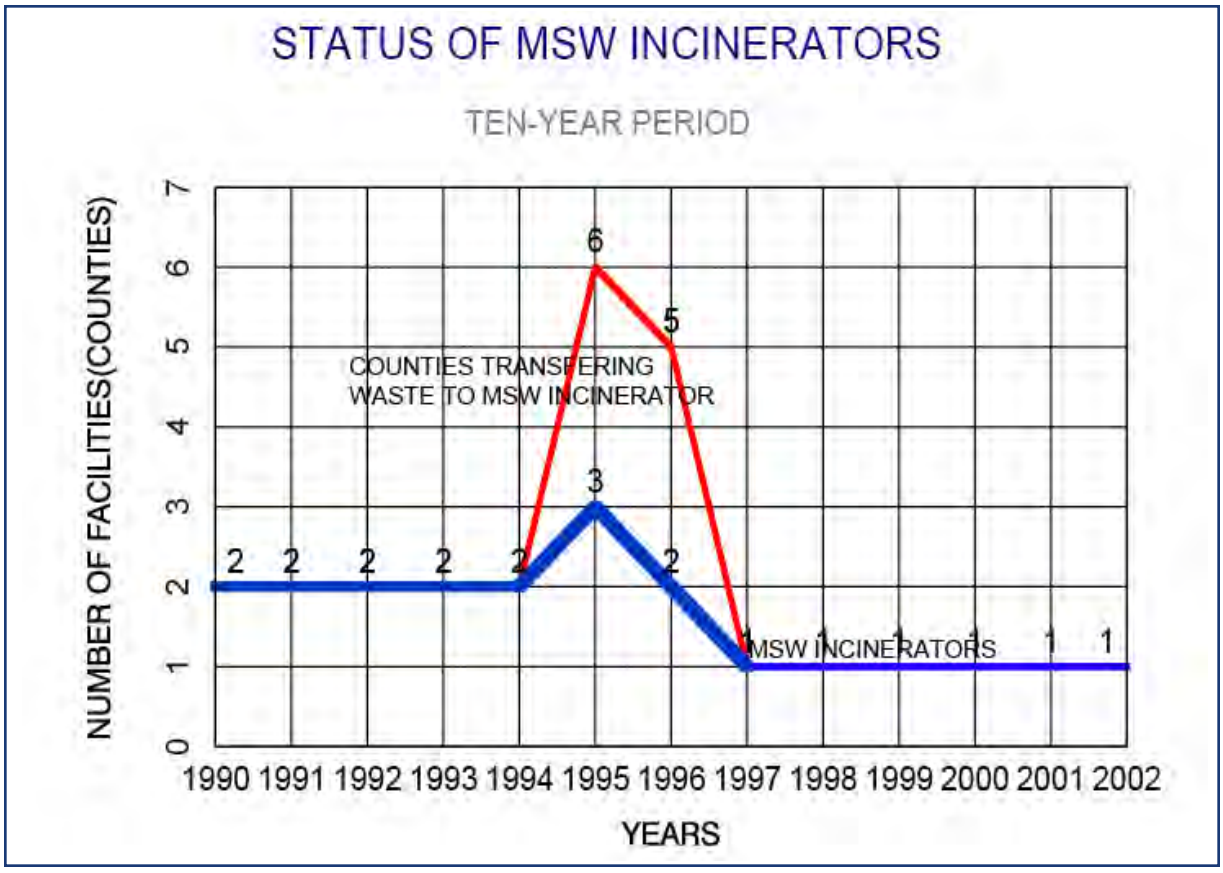
Unable to expand, New Hanover Coun ty had to close the Flemington landfill in 1979 when it reached capacity, leading to a two year search for a permanent replace ment. The first move was to an abandoned landfill near Carolina Beach, on land con trolled by the Army Corps of Engineers. County officials took out a one-year lease while it studied alternative sites for a new landfill within its borders. The search was fruitless, and the county could only get one 90 day extension before the Corps closed the gates.

In 1980, county officials opened another temporary facility on Blue Clay Road and obtained space at the Waste Industries landfill 68 miles away in Sampson County. The county still needed a permanent home for its trash and tried to find it in other counties. Uncooperative commissioners in 13 nearby counties responded by passing ordinances that barred New Hanover from condemning land for a landfill within their borders. The General Assembly later en dorsed these ordinances in state law.

Forced to locate inside the county, New Hanover opened its new $3.2 million landfill on US Highway 421 in November 1981. County officials, who were frustrated by the difficult and lengthy process, also explored ways to make the landfill last longer. High energy prices at the time led them to think a waste to energy incinerator would "increase the design life of the New Hanover County Landfill by a factor of four ... to 150 years."[2] Energy sales would help keep tipping fees low and possibly allow the county to eliminate the fees.

The incinerator opened in September 1984 at a cost of $14 million, including $10

Figure 1: Municipal Waste Incinerators in North Carolina, 1990-2002



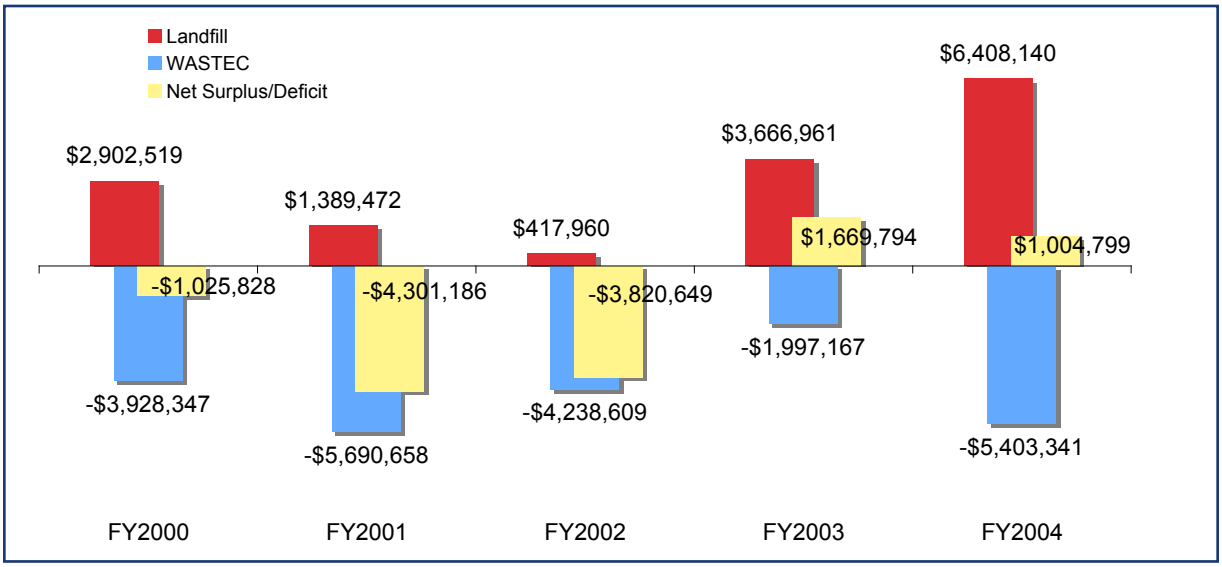
Source: N.C. Dept. of Environment and Natural Resources, Division of Waste Management

million in voter approved general obligation bonds. In 1990, the County issued another $29 million in bonds in 1990 to pay for an expansion of the plant. Debt service on the bonds was $7.9 million in fiscal year 2004-2005.[3]

Far from eliminating the tipping fee, however, WASTEC's costs have led the county to raise fees. The tipping fee reached $60 per ton in fiscal year (FY) 1992 before competition from a Waste Management transfer station outside the county forced a return to $25 per ton in FY 1994. It bounced up and down around $30 per ton over the next few years until, in FY 2003, the county raised the tipping fee from $32 per ton to $46 per ton. County officials also signed a seven year franchise agreement with private haulers to guarantee volume for the incinerator and the county landfill. These two steps made the entire solid waste management system self funding, eliminated the costly general fund subsidy to WASTEC, and improved the county's bond rating from Fitch to AA in 2005.[4]

WASTEC has been the only municipal solid waste incinerator in the state for nearly a decade (see Figure 1). Others were opened, including one in Wrightsville Beach, but all of them eventually closed. At the same time, public and private landfills have become an important industry for a number of small, rural communities. All but six of North Carolina's 100 counties ship some or all of their municipal solid waste out of county or out of state.[5] Five large private landfills may open in North Carolina, including one in nearby Columbus County. When opened, this landfill could provide New Hanover County with landfill space at

Figure 2: Surplus or Deficit by Facility



Source: New Hanover County Comprehensive Annual Financial Reports FY2000–FY2004

competitive prices. This will make it dif ficult to continue using extra revenue from the landfill to cover costs at WASTEC.

Cost and Competition

Solid waste incineration makes sense in Europe and Japan where land is scarce. It makes less sense in a state such as North Carolina where land is relatively abundant. That WASTEC is the last municipal solid waste incinerator in North Carolina and that five large landfills are planned for the state reflect this economic fact.

When the landfill and WASTEC first opened in 1984, the tipping fee was $25 per ton. "In the 1980s, landfill fees were pro jected to reach 50 or higher by the year 2000—high enough to help solid waste incineration and aggressive recycling pro grams compete as serious management alternatives," according to a North Caro lina Division of Waste Management 2003 historical review.[6]

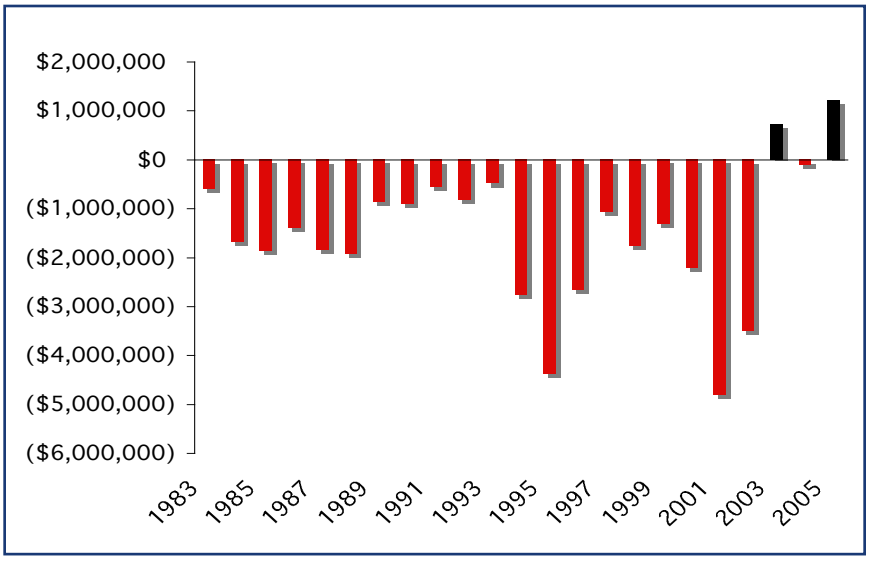
New Hanover County's Environmental Management officials also expected fuel prices to continue to rise enough that the incinerator would be profitable and the county would even be able to eliminate the tipping fee. Oil prices had already started to collapse by the time WASTEC opened in 2004 and rarely exceed $20 per barrel until 2000.[7] This left energy sales from the plant running below expectations and no chance to eliminate or even lower the tip ping fee.

Instead New Hanover County had to increase the tipping fee. The county tip ping fee reached 60 in the early 1990s, compared to a state average in the low $20 range.[8] The firm Waste Management, Inc., one of the haulers that serves New Hanover County, responded by building a transfer station outside the county and began to divert some solid waste it collected in New Hanover County through that transfer sta tion to other landfills. To keep waste from the county in the county, the Department of Environmental Management cut the tip ping fee back to $25 after two years. Lower tipping fees, however, left WASTEC's net costs as much as $4 million ahead of the net revenue from the landfill, so the entire solid waste management system was not self-sufficient and had to rely on subsidies from the General Fund (see Figure 2).

This pattern continued until FY 2003

when county officials raised the tipping fee to $46 per ton. The new fee helped the solid waste management system break even for the first time since the new land fill opened (see Figure 3). High fuel costs now make shipping waste to the private landfill in Sampson County less attractive even though it has a significantly lower tipping fee.

Figure 3: New Hanover Co.'s Solid Waste Net Surplus (Deficit)



Source: New Hanover County Finance Office

Since the county introduced the $46 tip ping fee in FY2003, its waste management system has been able to break even, posting small returns as a whole. The $6.5 million net revenue it earns at the landfill now offsets the $5.5 million extra net of energy sales it spends to pro cess waste through the incinerator. Because of this balance, New Hanover County no longer has to divert millions of dollars from the general fund each year to cover WASTEC's losses

The $46 tipping fee is only sustainable as long as transportation costs remain high and until a proposed Waste Management, Inc., landfill opens in Columbus County. If approved and built, competition from this project will force tipping fees lower throughout the region.

A new landfill with lower prices will compel more efficient operations at all existing facilities or systems. This is a daunting challenge for others in the landfill business, such as the Waste Industries land fill in Sampson County. It becomes almost impossible for those who use net revenues from their landfill to subsidize more costly alternatives, such as recycling and incinera tion.

Even before that happens, however, the county is still burning money at WASTEC. Closing the incinerator will allow the coun ty either to reduce the tipping fee or to use the proceeds for other county services.

Given the paucity of energy sales from the incinerator and the apparent need for higher tipping fees, why did the county is sue new debt to expand WASTEC instead of shutting the plant down in FY 1993? Why does it continue to support WASTEC today? Because New Hanover County envi ronment officials do not think the incinera tor was distinct from the landfill. In their minds, the two are part of an integrated system with recycling that cannot be bro ken up, like Ike and Tina.

It Doesn't Take a System

"The private sector sells landfill space," said Ray Church, Director of the New Hanover County Department of Environmental Management. "The only concern is capac ity not environment, not systems, just capacity." Church argues that the county helps the environment and residents be cause it provides recycling, incineration and landfill services in an integrated solid waste system.

Most of the services the county provides, however, do not depend on it actually owning a recycling center or incinerator, and some would be easier to provide in a landfill-only environment. Hurricane clean up, an important service in New Hanover County, involves a great deal of energy to dry the saturated waste before it can burn. This process can consume more energy than it produces, which is not a good way for a power plant to operate. It is more economical for spoiled food and other waste from future hurricanes to go directly to the county landfill or another regional landfill.

Since the county began diverting construction and demolition materials in 2003, it has done this at the landfill. Glass and cardboard could also be separated there, instead of at WASTEC.

When New Hanover County began diverting construction and demolition waste from its landfill, it could increase compression rates, which extends the life of each cell and the entire landfill. Because the county has a contract with a private firm to purchase the construction and demolition materials, it also earns money from the diversion.

It also earns money by separating glass and cardboard for recycling. Plastic, however, costs more to recycle than the price paid by the market. Recycling as a whole is also more expensive than other forms of disposal for the county because the recycling program is responsible for its own collection a service that is not included in the costs of the landfill or WASTEC because it is contracted out to private companies, but which accounts for 75 percent of recycling cost.

Sidebar: Flow Control

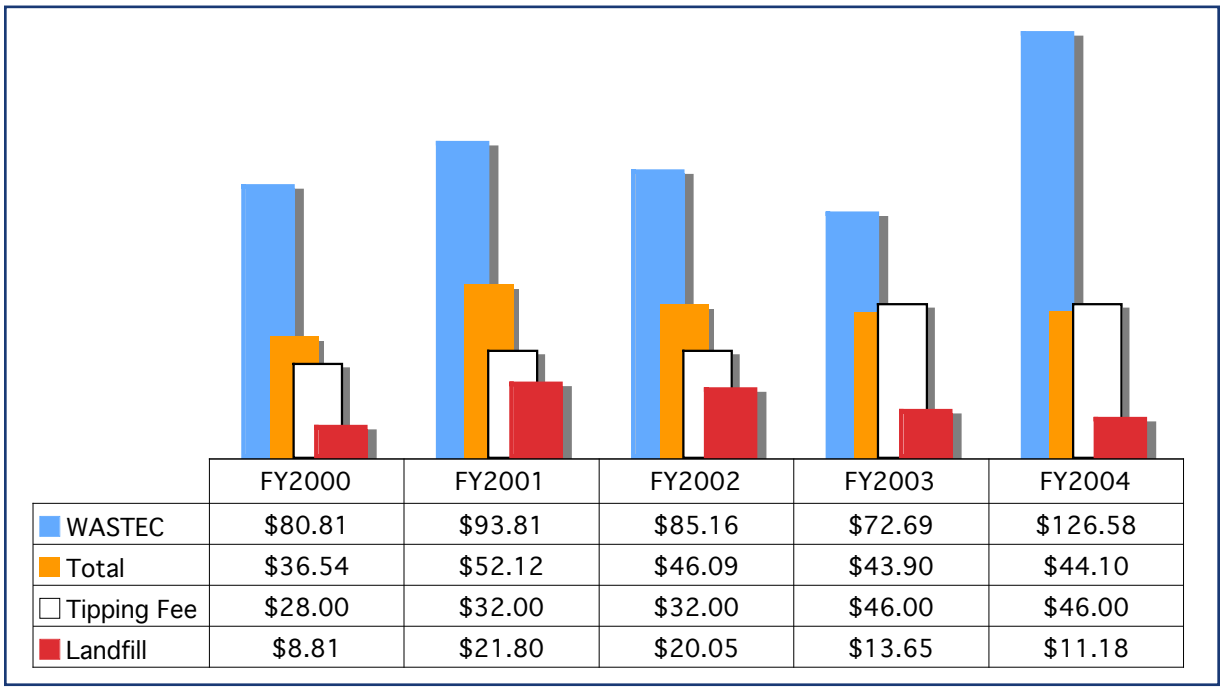
Flow control is a way to force municipal solid waste to certain facilities, which makes higher tipping fees possible. Governments have had the option to impose flow control on municipal solid waste, but New Hanover County's ability to use this tool may be limited due to a series of court rulings. First was a 1994 Supreme Court decision that broadly declared such controls unconstitutional *C & A Carbone, Inc. v. Clarkstown*[9]). A 2001 Second Circuit court of appeals decision *United Haulers Association, Inc. v. Oneida-Herkimer Solid Waste Mgmt. Authority* made some allowance for flow controls as applied to publicly owned disposal facilities.[10] But a Sixth Circuit court decision in January 2006 (*NSWMA v. Daviess County*) specifically rejected "the Second Circuit on the proposition that Carbone lends support for the public private distinction drawn by that court."[11]

These activities do not rely on WASTEC or its 60-person workforce. While the landfill operates with a handful of full time employees plus a score of part time and temporary workers, WASTEC has 60 technical jobs to run the heavy machinery and complex systems of the power plant.

WASTEC is always open, in part because it costs more to shut down and restart the facility than to keep it running. The New Hanover County landfill, like most landfills, is open five or six days a week. The continuous operation of the incinerator is convenient to haulers who can dump waste at any time of day or night, but the tipping fee for the landfill is the same $46 as the fee for WASTEC. Apparently the convenience of midnight tipping is not worth a premium.

The problem with a single tipping fee, which we assume is what the market will bear, is that costs are not the same. Even with the incinerator available 24 hours a day, every day, it cost the county $72.69

Figure 4: Cost Per Ton vs. Tipping Fee (CAFR)



	FY2000	FY2001	FY2002	FY2003	FY2004
WASTEC	$80.81	$93.81	$85.16	$72.69	$126.58
Total	$36.54	$52.12	$46.09	$43.90	$44.10
Tipping Fee	$28.00	$32.00	$32.00	$46.00	$46.00
Landfill	$8.81	$21.80	$20.05	$13.65	$11.18

Source: New Hanover County Finance Office

per ton or more because of its high staffing needs and other expenses. The highest cost per ton at the landfill was $21.80 in fiscal year 2000-2001 (Figure 4). The tipping fee was always somewhere between these two extremes. In other words, the county earned money with each ton disposed at the landfill but lost money with each ton disposed at the incinerator. Higher volumes at the incinerator spread the capital cost and lowered the cost per ton, but lower volumes due to maintenance meant higher cost per ton.

More Efficient Use of Landfill Space

One benefit of using landfill space is the ability to focus on one set of costs. It encourages stewardship of the precious re source called airspace. Closing a section of a landfill, called a cell, costs money. Open ing a cell costs money. The longer a land fill operator can go between closing and opening cells, the longer it can avoid those capital costs.

Incineration can reduce the volume of waste in the landfill by up to 85 percent, but it does not eliminate the need for a landfill. The ash must still be deposited somewhere. For this reason, critics of the incinerator say the ash should be subtracted from the tonnage calculations at the incinerator, which would increase the incinerator's cost per ton. New Hanover County claims that this ash should not count as taking landfill volume because it replaces soil as ground cover.

An alternative to ash or soil is the Posi Shell Cover System, a spray on slurry that dries to a quarter inch hard cover instead of six inches of ash or soil.[12] Orange County has used Posi-Shell since fiscal year 1994-95. In December 2000, the county reported saving about $2,000 of space each day with Posi-Shell. New Hanover County did not start using Posi-Shell until 2002[13] and the Department of Environmental Manage ment still hopes to mix incinerator ash into the Posi-Shell slurry.

Another way to extend the life of a landfill is to recycle the liquid "leachate" back into the fill. This method speeds the degradation of trash and also helps remove the volatile organic compounds from both the trash and the liquid. As this happens, the landfill produces more methane. This gas can be captured and piped to power industries around the landfill as well, pro viding another source of revenue for the landfill. In addition, the more rapid degra dation helps compact the trash further.

Despite these advances in prolong ing the useful life of the landfill, and the county's claim that its system is not just about space, one of the most persistent and prominent arguments for the WASTEC waste to energy incinerator is that it re duces the volume used at the New Hanover County municipal landfill, and so extends the landfill's life.

In the last five years, the City of Wilm ington and private citizens commissioned studies of the landfill's remaining life. Each study extended the life of the current landfill further into the future, even with out consideration of the adjacent parcel which is of equal land area but has not been surveyed to determine how much volume it can hold. The Department of Environ mental Management has started taking active steps to extend the landfill's life and now estimates the surveyed section will last another 20 years.

In June 2002, William Dreitzler, an engineer with the Raleigh firm Marlowe, Dreitzler & Associates, at the request of a New Hanover citizen, David Carnell, used available data to calculate a conservative estimate of nine years (through 2011) of life for the surveyed section of the land fill.[14] Hazen and Sawyer, an environmental engineering firm specializing in solid waste management, then produced an evaluation of the landfill and incinerator for the City of Wilmington in February 2003. Under the estimates in this report the landfill, includ ing additional height, would be full between 2009 and 2014.[15]

In a memo to Hazen and Sawyer's John Bove dated April 14, 2003, New Hanover County Director of Environmental Man agement Ray Church complained that the Hazen and Sawyer report did not consider a number of improvements in space man agement and use at the landfill that had either been recently introduced or were under consideration at the time, including using the Posi-Shell cover system.[16] Bove responded that the firm's estimate was also conservative and that the county's actions were congruent with Hazen and Sawyer's recommendations.[17]

Church now (February 3, 2006) says the landfill can last "somewhere in the neighborhood of 20 years," but refuses to be more specific than that because "some things are better left vague or someone hangs there sic hat on it like the 150 year estimate from 1984]."[18]

In short, the landfill is not in danger of running out of space in the next decade. When it had to, New Hanover County's Department of Environmental Manage ment found ways to improve space utiliza tion at the landfill. A new landfill in Co lumbus County would remove the ability to cross subsidize incineration and recycling in New Hanover County, but could help extend the landfill's life without WASTEC or the recycling facility. Tipping fees of $46 could not be offset by transportation costs as they are now with the Sampson County landfill. Flow control laws to create a monopoly seem unlikely to survive many more court challenges. However New Ha nover County officials look at the future of solid waste management, there can be little room in that vision for WASTEC.

Conclusion

In its 2003 report, Hazen and Sawyer offered recommendations for more efficient use of the landfill space in New Hanover County and for ways to increase the avail able space. The county's Department of Environmental Management had already proposed increasing the top of the landfill from 100 feet to 170 feet. Soon after the report, New Hanover began diverting con struction and demolition debris from the landfill for processing at other sites. This helped improve compaction at the landfill from 1200 pounds per cubic yard to 1600 pounds per cubic yard, about the industry average. The Department of Environmen tal Management is still seeking approval for the ability to recycle the liquid from trash (leachate) back into the landfill as a way to speed decomposition and remove volatile chemicals from the trash. The increased volume of methane produced in this pro cess could be captured for use in nearby industrial facilities, turning the landfill into a "bioreactor" that naturally converts waste to energy. None of these alternatives is nearly as expensive as running WASTEC.

It also seems likely that using ash from WASTEC as an alternative cover slowed New Hanover County's adoption of Posi Shell for cover. As mentioned earlier, this could cut the need for ground cover from six inches per day to just a quarter inch per day. New Hanover began using Posi-Shell in 2001, by which time other counties had been using the system for more than five years.

The Department of Environmental Management considers solid waste man agement for New Hanover County as an indivisible system, rather than as a business with different operations, each of which can be evaluated as a distinct unit. There is no reason for the county not to profit from its current $46 tipping fee. Without WASTEC, the county could keep the fee for now and set aside the surplus earned from operating the landfill for future needs or current needs, such as schools and roads, or it could lower the tipping fee and save money for residents and businesses. With WASTEC, the county can make unsubstan tiated claims about helping the environ ment and eventually face a crisis when the Columbus County landfill opens.

New Hanover County has 20 years left in the current landfill and a large tract of adjacent land that can house a number of additional cells. There is little reason to expect the adjacent site to reach capacity in less than 20 years after it opens. WASTEC has already been in operation for 22 years. It is time to acknowledge the nobility of the experiment, but also to acknowledge that the plant was built for a different fu ture and that the county now has a number of more cost-effective ways to extend the life of the landfill.

Finally, there is no sense waiting until the bonds for WASTEC are paid off. The sooner WASTEC closes, the sooner county officials and the Department of Environ mental Management can begin to redirect their energies to more productive pursuits.

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Notes

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14. William Dreitzler, report to David Carnell, June 7, 2002.

15. John Bove, report to Steven Bridges for City of Wilmington, Feb. 25, 2003.

16. Ray Church, memo to John Bove, April 14, 2003.

17. John Bove, e-mail to Ray Church, March 17, 2003.

18. Ray Church, e-mail to author, Feb. 3, 2006.

"To prejudge other men's notions before we have looked into them is not to show their darkness but to put out our own eyes."

JOHN LOCKE (1632–1704)

Author, *Two Treatises of Government* and *Fundamental Constitutions of Carolina*

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