

Report
of the
Mid-Connecticut Project Special Committee
To the
Connecticut Resources Recovery Authority
Board of Directors

Options for Disposing of Solid Waste
after the Expiration of
Mid-Connecticut Project
Municipal Service Agreements

October 27, 2010

Table of Contents

1. Introduction

2. Executive Summary

3. Future Disposal Options

A. Connecticut Resources Recovery Authority

i. Condition of Mid-Connecticut Project Trash Disposal System

ii. Expectations for post-2012 pricing

B. Out-of-State Options

3. New and Emerging Technologies

A. Technology Categories Evaluated

B. Technologies Considered to Be Commercially Viable

i. Estimated Disposal Fees for Commercially-Viable Technologies

C. Other Technologies that May Impact Trash Disposal Costs

4. Conclusion

Attachments: Mid-Connecticut Project map
PowerPoint from Special Committee meeting of January 27, 2010
Mid-Connecticut Project key date timeline
Legislative Program Review & Investigations Committee Report on Municipal
Solid Waste Management Services in Connecticut, January 12, 2010

1. Introduction

The Connecticut Resources Recovery Authority has Municipal Service Agreements (MSAs) with 70 cities and towns to use CRRA's Mid-Connecticut Project trash disposal system, which includes a trash-to-energy plant in Hartford permitted to process up to 3,700 tons of municipal solid waste (MSW) per day and burn up to 2,028 tons of refuse-derived fuel (RDF) per day to generate electricity. With the RDF technology used by the Mid-Connecticut plant, trash is processed into RDF, and then blown into furnaces. The combustion produces steam which spins turbines to generate power. The system also includes regional transfer stations in Torrington, Watertown, Essex and Ellington. (A map depicting Mid-Connecticut Project cities and towns and the locations of Project facilities is attached.) Some of these MSAs date back to the mid-1980s; all except for one, that of Waterbury, will expire by November 2012.

The Mid-Connecticut Project Special Committee was created by a resolution adopted by the CRRA Board of Directors on October 29, 2009. The Special Committee was created pursuant to Connecticut General Statutes Section 22a-268f, which reads:

***Special committees to study options for municipal solid waste disposal.** Not later than three years before the last maturity date of any outstanding bond issuance for a waste management project, as defined in section 22a-260, administered by the Connecticut Resources Recovery Authority, the board of directors of the authority shall establish a special committee for such project consisting of five representatives of the authority and not more than five representatives jointly designated by the municipalities having a contract with the authority for such project. At least two years before such last maturity date, such special committee shall study and present to said board of directors options for disposing of solid waste from such municipalities after the expiration of such contract. Such options shall include, but shall not be limited to, private sector management of such solid waste disposal.*

By ballot in October 2009, the 70 Mid-Connecticut Project cities and towns elected as their representatives on the Special Committee the following chief executive officers (or their designees): Barkhamsted First Selectman Donald S. Stein, Canton First Selectman Richard J. Barlow, East Hartford Mayor Melody A. Currey, Hartford Mayor Eddie A. Perez (who designated Chief of Staff Susan M. McMullen as his proxy) and Windsor Locks First Selectman Steven N. Wawruck Jr. Mr. Perez resigned as mayor in June and Ms. McMullen resigned from the City of Hartford shortly thereafter and, at this writing, new Mayor Pedro E. Segarra has not indicated who will fill Hartford's seat on the Special Committee.

CRRA Chairman Michael A. Pace appointed Director Alan J. Desmarais, Director David B. Damer, Director Timothy C. Griswold, President Thomas D. Kirk and Director of Environmental Affairs & Development Peter W. Egan to represent the Authority. When Mr. Desmarais resigned from the CRRA Board in May, Chairman Pace appointed himself to that seat.

The Special Committee held its first meeting on December 10, 2009. All records of the Special Committee are available on CRRA's website at http://www.crra.org/pages/mid-conn_special_committee.htm.

During the course of its work, the Special Committee examined

- the condition of the Mid-Connecticut Project facilities, specifically its trash-to-energy plant;
- new technologies for solid waste disposal that are being developed; and
- the broader solid waste disposal situation and its implications for Mid-Connecticut Project cities and towns.

The Mid-Connecticut system also includes a recycling processing center, located in Hartford, where recyclables from Project cities and towns are sorted and baled for shipping to manufacturers who turn these materials into new products. Because Sec. 22a-268f specifies "municipal solid waste" as the Special Committee's focus, this report does not discuss options for recycling.

The above-referenced statute requires the Special Committee to prepare a report discussing options that may be available to Mid-Connecticut Project cities and towns following the expiration of their municipal service agreements with CRRA in November 2012, and to submit said report to the CRRA Board of Directors two years before Mid-Connecticut Project bonds mature. Project bonds mature November 15, 2012; therefore this report must be presented to the CRRA Board of Directors by November 15, 2010.

The above-referenced statute is silent on the question of whether the Special Committee should recommend any particular option or options to the cities and towns. However, at its meeting of June 23, 2010, the Committee's consensus was that its report should only draw conclusions where the Committee had sufficient information to do so. It has long been the Authority's position that cities and towns should investigate their options themselves to determine which best suits their needs.

2. Executive Summary

The CRRA Mid-Connecticut Project's system of four regional transfer stations feeding its centrally-located trash-to-energy plant is geographically well suited to serve the 70 Mid-Connecticut Project cities and towns. Engineering studies have concluded that if CRRA continues to maintain the trash-to-energy plant to industry standards, the plant should operate at high efficiency into the 2020s. CRRA expects its post-2012 disposal fees to be lower than at present based on expected cost reductions and increased power prices.

Out-of-state options, including hauling by truck and rail to large regional landfills, are viable because Connecticut, due to political and regulatory obstacles, does not have enough in-state disposal capacity to manage its own waste. A study by the General Assembly's Legislative Program Review & Investigations Committee indicated that costs for exporting trash could be substantially higher than the current Mid-Connecticut Project disposal fee, but without the type of solid information that a specific Request for Proposals would produce the Special Committee was unable to draw any conclusions.

New technologies are being developed which could, someday, supplant the current trash-to-energy system as the most environmentally responsible and cost-effective disposal method. However, only a handful of those technologies will be commercially viable in the near future, and the Committee concluded that none of these technologies is ready to merit an investment at this time.

3. Future Disposal Options

A. Connecticut Resources Recovery Authority

The Mid-Connecticut Project cities and towns have been using the CRRA Mid-Connecticut Project system since the 1980s. Because its facilities were located to minimize transportation costs for these communities – with four regional transfer stations feeding the centrally-located trash-to-energy plant – this system, logically, is the first option this report will address. Therefore, the first question that must be addressed is the expected life span of this system.

When it began operating this system, CRRA maintained a regular capital expenditure program to keep these facilities operating at maximum efficiency. This program relied on annual contributions to a reserve account so that large repairs, refurbishments or improvements could be made without necessitating a spike in disposal fees.

However, when Enron went bankrupt and stopped making its payments for electricity generated by the trash-to-energy plant the Project suddenly lost about one-third of its annual revenue. Rather than closing that gap with massive disposal fee increases, CRRA's new board and management drained about \$36 million in reserves, including the capital-projects reserve, and deferred other major expenditures. Large maintenance projects, though necessary, were postponed.

i. Condition of Mid-Connecticut Project Trash Disposal System

The maintenance deferrals could only go on for a few years before the system suffered. Therefore, because of declining efficiency and safety concerns, along with inadequate maintenance by the contractor responsible for the WPF, resumption of these major projects was necessary.

Since resuming the capital expenditure program, CRRA has undertaken many such projects. In January 2010, CRRA Senior Engineer Rich Quelle outlined these projects to the Special Committee. Here is a summary of projects completed since 2006:

- Replacement of systems in the trash-to-energy plant control rooms – \$2.8 million

- Upgrading shredder motors and refurbishing shredder containment casings – \$1.8 million
- Replacement and upgrading of boiler tubes to increase availability – \$1.2 million
- Upgrades to fire-suppression system – \$500,000
- Expand ash load-out building and add a scale to accommodate long-haul trucks needed for ash disposal – \$1.9 million
- Add shredder to process bulky waste following closing of Hartford landfill – \$750,000
- Upgrades to belt conveyors and sealing systems to reduce housekeeping and maintenance – \$2 million
- Refurbishing steel pan conveyors – \$1.5 million
- Replacement of turbine rotor diaphragms – \$850,000
- Replacement of 20-year-old waste processing facility compressors – \$750,000
- Purchase spare shredder motors to speed maintenance and increase availability – \$600,000
- New heavy equipment – \$2 million
- WPF processing floor repairs and resurfacing – \$1.5 million

A copy of the PowerPoint presentation he delivered, which illustrates many of the projects completed, is attached to this report.

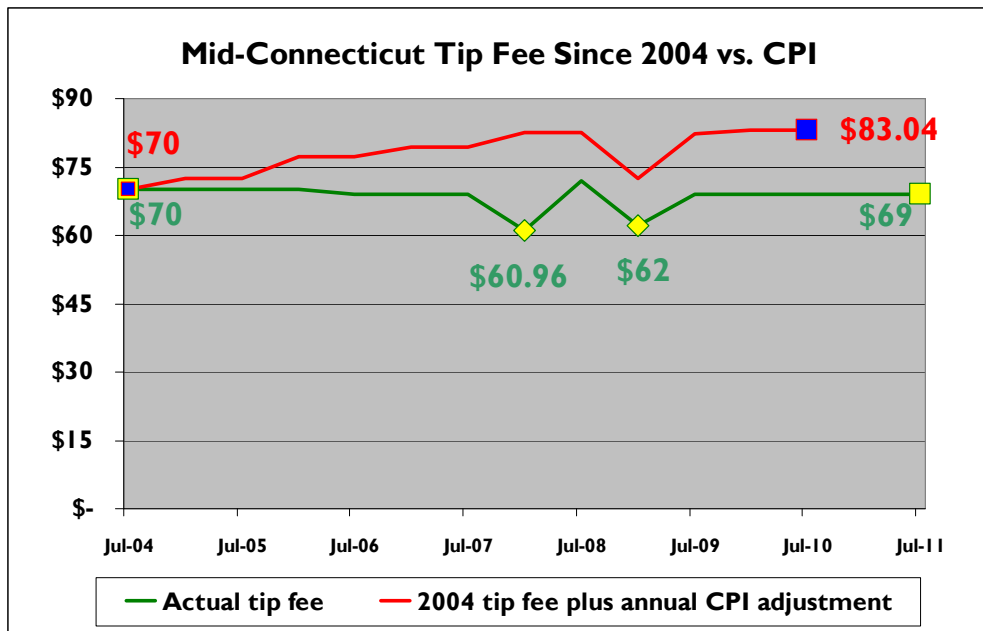
As a result of these and other, smaller projects, the plant's efficiency is returning to peak levels, and two engineering studies have concluded that by maintaining the plant according to industry standards, the Mid-Connecticut trash-to-energy facility should operate at high efficiency well into the 2020s.

CRRA is also spending to maintain the transfer stations. In fiscal year 2011, CRRA plans to spend more than \$150,000 on building, road, roof and floor repairs at the four stations.

ii. Expectations for Post-2012 Pricing

With this reasonable assurance of the long-term availability of the Mid-Connecticut Project system, it is important to discuss what it might charge for disposal beyond 2012 and how that would compare with other alternatives.

For the last several years, Mid-Connecticut Project disposal fees have remained stable, even with the dramatic increases in spending on maintenance and capital projects. The chart entitled “Mid-Connecticut Tip Fee Since 2004 vs. CPI” shows that had the \$70-per-ton disposal fee set in 2004 tracked growth in the U.S. Department of Labor consumer price index, the disposal fee would be more than \$83 per ton. In reality, the FY 2011 disposal fee is \$69 per ton.

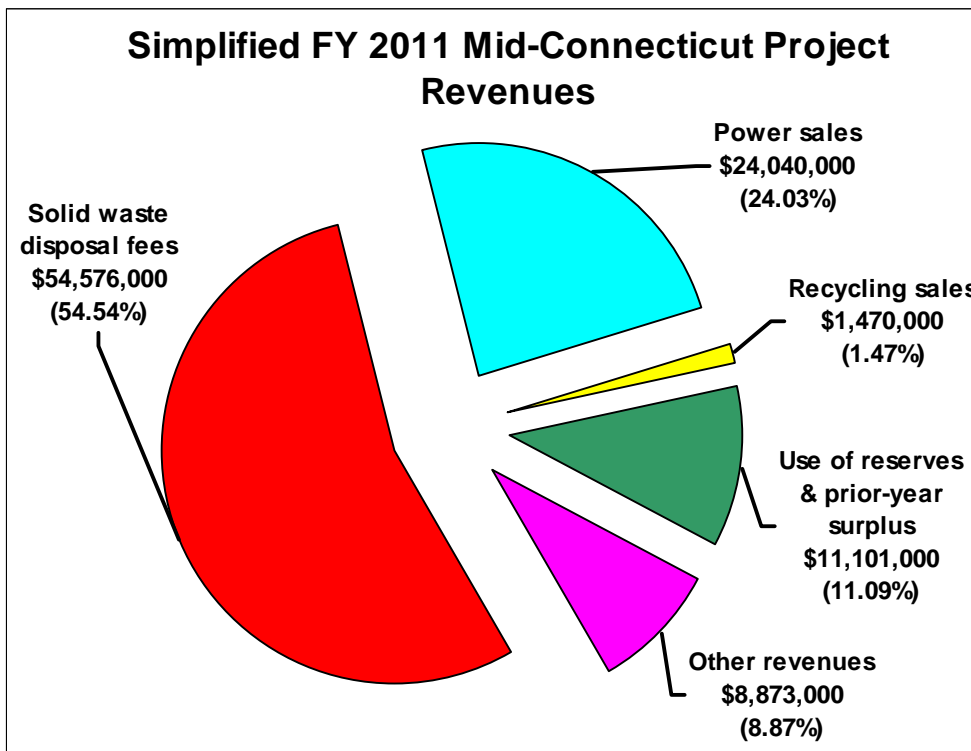


Barring any unforeseen circumstances, CRRA management expects the Mid-Connecticut Project disposal fee to be measurably less in FY 2013 for three reasons:

- Much of the Project’s power is still sold at prices set prior to electric utility

restructuring in the late 1990s. Those contracts expire in 2012 and market trends indicate that the Project’s electricity will generate much more revenue under new contracts, which will reduce the amount of disposal-fee revenue the Project will require. Management expects electric revenues to increase because power prices track fuel prices, and the consensus among forecasts CRRA has examined is that fuel prices will rise, especially in New England, which is heavily dependent on natural gas for generating power. (See chart entitled “Simplified FY 2011 Mid-Connecticut Project Revenues” for more detail.)

- Management has been working to reduce overhead, administrative costs and payroll and expects further savings will be realized in the next few years. CRRA FY 2011 general fund budget totals \$5.7 million, a 13-percent decrease from the FY 2010 budget of \$6.6 million and 28 percent below FY 2009’s actual expenditures of \$7.9 million.
- Management believes CRRA will realize significant savings through its competitive procurement for one or more contractors to operate the trash-to-energy plant. Two arbitration panels have confirmed that one of the current operators has overcharged CRRA for its services for years.



CRRA has crafted two types of draft renewal municipal service agreements – referred to as Tier 1 and Tier 2 MSAs. The first draft of the Tier 1 MSA was circulated to cities and towns for their feedback, and CRRA considered their comments in preparing a second draft of the Tier 1 MSA which, along with a first draft of the Tier 2 MSA, were

distributed in early July. At this writing, CRRA had completed a series of informational workshops to solicit additional feedback and answer questions about both MSAs.

CRRA requested comments on the latest drafts of the Tier 1 and Tier 2 MSAs by September 15, 2010. CRRA is considering all the input it has collected in preparing subsequent drafts or final versions of the renewal MSAs. At this writing, CRRA anticipates distributing a final version of the Tier 1 MSA in late 2010 and, pending the concurrence of the Mid-Connecticut Project Municipal Advisory Committee, will ask for towns wishing to do so to sign Tier 1 MSAs by July 1, 2011. Those dates, at this writing, are subject to change.

B. Discussion of Out-of-State Options

As cities and towns look at their options for disposal after their Mid-Connecticut Project contracts expire, many of them have already been contacted by private-sector operators. However, a report from the General Assembly’s Legislative Program Review & Investigations (PRI) Committee (a copy of the PRI report is attached) determined that cities and towns seeking alternatives to the Mid-Connecticut

Project will likely be forced to ship their trash out of state. Connecticut has six trash-to-energy plants and only one small municipal solid waste landfill, and combined they do not provide enough disposal capacity to meet the state's needs. In 2008, the latest year for which figures are available, the Connecticut Department of Environmental Protection reported (http://www.ct.gov/dep/lib/dep/reduce_reuse_recycle/data/average_state_msw_statistics_fy2008.pdf) that more than 260,000 tons of garbage – or almost 8 percent of all waste generated in the state – was disposed of outside Connecticut.

The authors of the PRI report, legislative analysts Scott Simoneau and Eric Gray, discussed their findings in a presentation to the Special Committee in May 2010. As their report (pages 33-34) noted, entities interested in building new disposal capacity in Connecticut face significant barriers to entry:

- **Government regulation.** *A number of federal, state and local, environmental, zoning, and permit laws and regulations dictate critical aspects of storage, handling, processing, and disposal of MSW at RRFs (resource recovery facilities, or trash-to-energy plants) and landfills. Obtaining a permit to construct a new disposal facility or expand an existing one is a costly and time-consuming process that typically takes many years to conclude. The Lisbon plant, for example, was the last RRF to be permitted in Connecticut and that took nearly a decade to permit and construct.*
- **Capital costs.** *The capital costs of building a large RRF plant have been estimated to be about \$500 million. Further, it is also difficult and costly to satisfy and overcome environmental concerns and other government requirements.*
- **Public opposition.** *Local public opposition often increases the time and uncertainty of successfully permitting a facility. CRRA's recent attempt to build an ash landfill in Franklin is a prime example of public and legislative opposition defeating a proposal to develop an ash residue disposal option.*

One government-imposed barrier particularly worth noting is the determination of need [DON] requirement in Connecticut that was established after five of the six RRF plants were in operation. Before a permit to build or expand an RRF, a mixed MSW landfill, or an ash landfill can be issued, DEP must find that a need exists for such a facility or expansion and such a facility or expansion will not result in "substantial" excess disposal capacity in Connecticut. This is contrary to the principles of supply and demand. Excess capacity tends to drive prices down.

Essentially, the DON requirements make it impossible for a competitor to enter the market unless there is substantial excess MSW to be disposed. However, it is likely that existing companies will try to expand before a new competitor enters.

Thus, in-state disposal services clearly appear to have high barriers to entry that could raise concerns regarding what impact they have on fair and reasonable pricing for services from existing providers.

CRRA management believes there may be additional capacity at Connecticut's other five trash-to-energy plants, since at one time or another all accept MSW at "fire-sale" prices when waste flows drop. Historically, there is less garbage in the winter, for example, so merchant-plant operators will cut their prices rather than allow capacity to go unused. This excess seasonal capacity is of limited value when considering long-term arrangements unless the facility operators are allowed to bale and store MSW for processing when deliveries drop off. Plant operators would obviously prefer to have longer-term contracts for MSW deliveries, which would fetch higher prices than the spot market or fire-sale prices, but it is impossible to obtain reliable data about how much spot-market MSW each of these plants accepts and thus management cannot definitively state how much capacity is in fact available.

In calendar year 2009 the 70 Mid-Connecticut Project cities and towns delivered almost 800,000 tons of garbage. It should be noted that

- 14 cities and towns' long-term contracts with the Bristol facility expire in 2014;
- A CRRA contract that enables 12 cities and towns to deliver trash to the Bridgeport facility expires in 2014; and
- 12 cities and towns' long-term contracts with the Preston facility expire in 2015.

Expiration of these contracts could free up capacity to serve Mid-Connecticut Project communities if the operators of those facilities and the towns they currently serve cannot agree to new contracts or extensions of existing contracts.

With the state's deficiency of capacity, and these barriers to entry, some Mid-Connecticut communities are considering out-of-state options. Following are some of the findings from the PRI report (pages 42 through 45) on out-of-state disposal.

Out-of-state market cost estimates. *Estimating the cost of out-of-state disposal of MSW involves three costs; the costs to construct and operate a truck-based or rail-based transfer station, the costs to transport the waste from the transfer station to the landfill, and the actual disposal or tip fee. There have been two fairly recent analyses performed on the cost to transport MSW from Connecticut to various landfills in the region. One was performed by a consultant for DEP and the other was performed by a different consultant on behalf of the South*

Central Regional Council of Governments (SCRCOG). These are not actual quotes from trucking or rail haul companies but estimates developed by experts.

Road haul. The table below shows the estimated costs found in the two reports to transfer and transport waste by truck to various out-of-state landfills from three different towns in Connecticut. The reports made a few different assumptions regarding transportation by truck that alter the outcomes. For example, DEP's estimated disposal tip fees tend to be higher; the SCRCOG report has assumed a better rate based on a longer-term contracts being signed by municipalities. Also, the assumed transportation cost per mile is different -- DEP's estimated about 14 cents per mile, while the SCRCOG report assumes 23 cents per mile. Finally, DEP's estimate assumes the hauler will find something to bring back ("backhaul") after the load is deposited at the landfill to subsidize the cost. For comparison purposes, the one-way costs for one town and the round-trip costs for the same town based on DEP's estimate are provided. The analysis suggests that for certain municipalities who are paying in the \$80 per ton or more range for disposal an out-of-state disposal option is viable under certain conditions.

Estimated Costs to Transfer MSW to Out-of-State Landfills

	<i>DEP estimate One way from Danbury</i>	<i>DEP estimate One way from Putnam</i>	<i>DEP estimate Round trip from Putnam</i>	<i>SCRCOG estimate Round trip from North Haven</i>
<i>Seneca Meadows (NY)</i>	\$80	\$82	\$125	\$180
<i>High Acres (NY)</i>	\$82	\$85	\$131	\$278
<i>American (OH)</i>	\$102	\$97	\$190	\$277
<i>Alliance (PA)</i>	\$63	\$80	\$118	\$117
<i>Conestoga (PA)</i>	\$77	\$85	\$128	\$136
<i>Middle Peninsula (VA)</i>	\$86	\$98	\$164	\$229

All estimates are price per ton including transfer, hauling and disposal costs.

Source: State of Connecticut DEP, State Solid Waste Management Plan, December 2006, and South Central Regional Council of Governments, Future of Regional Solid Waste Disposal, RS Lynch and Company, January 30, 2009. PRI calculation based on DEP data for the DEP round-trip estimate.

The competitiveness of out-of-state disposal options by long-haul trucking is not clear-cut based on the development and analysis of estimates by experts. Based on current in-state RRF disposal rates, both with and without estimated transfer station costs, running between \$60 to about \$85 per ton, the table shows that long-haul out-of-state disposal of waste could be competitive if municipalities only had to pay one-way costs. The most cost competitive disposal options are landfills in Pennsylvania with costs ranging from \$63 to \$80 depending on where the load originates. It should be noted that truck transportation is also very sensitive to volatility in fuel costs.

Rail haul. Another potential lower-cost option is to export MSW from Connecticut by rail to out-of-state landfills. Rail transport requires special loading and unloading facilities. Rail transport can be achieved through the use of intermodal containers, direct-loaded into bulk rail cars, or baled (i.e., MSW is wrapped into cubes). Rail car transport becomes more cost effective the greater the distance versus over-the-road trucking. There are several benefits cited in regard to rail transportation over trucking. These include:

- reduction of traffic congestion by keeping trucks off the highways;
- rail transportation produces almost five times less air pollution than transportation by trucking;
- rail hauling is also safer, from an accident point of view, than truck hauling; and
- a single rail car can carry up to 110-130 tons of waste while a single long-haul truck can only transport about 22 tons.

In the State Solid Waste Management Plan, DEP, with the help of a consultant, developed an estimated range of costs to ship waste by rail from Connecticut to landfills in New York, Virginia, South Carolina, Ohio, and Western Pennsylvania.

Estimated Cost Per Ton of Rail Haul to Out-Of-State Landfills from Connecticut, 2006.

<i>Landfill</i>	<i>Transfer</i>	<i>Rail Haul</i>	<i>Tip Fee</i>	<i>Total</i>
<i>Virginia</i>	\$7	\$48	\$25	\$80
<i>South Carolina</i>	\$7	\$57	\$25	\$89
<i>Ohio</i>	\$7	\$51	\$30	\$88
<i>Western Pennsylvania</i>	\$7	\$49	\$30	\$86
<i>Rochester, NY, area</i>	\$7	\$39	\$30	\$76

Higher end costs were used for DEP estimates if a range was presented.

Source: State of Connecticut DEP, State Solid Waste Management Plan, December 2006

Again, if the current in-state RRF disposal rates, both with and without estimated transfer station costs, are between \$60 to about \$85 per ton, rail haul could be a competitive option (especially to western New York and Virginia) for some municipalities paying tip fees on the higher end of the current range.

DEP notes that actual quotes from rail companies or shippers could be lower because of the large volumes of shipments that municipalities generate and therefore could be in a better bargaining position to negotiate better rates. They have estimated the rates could be 10 to 20 percent lower for large volumes of waste.

Recent actual experience. There have been a couple of examples of actual haul-by-rail quotes received by different municipalities in the state. In 2007, the city of Stamford issued a request for proposals for MSW management services. The city received proposals from five different vendors. The proposals included both in-state and out-of-state disposal options that ranged from \$69 per ton to \$96 per

ton. The city selected Transload America to handle its MSW disposal needs. Transload is shredding, baling, and loading solid waste on a flat-bed carrier, and rail-hauling it to a landfill in Ohio. The cost for the three-year rail haul and disposal contract is \$69.00 per ton in 2008, \$76.00 per ton in 2009 and \$79.80 in 2010. The contract has two one-year options to renew. These costs do not include complete transfer station expenditures. In addition, the city operates a transfer station operation and charges \$88.00 per ton for commercially generated municipal solid waste and bulky wastes.

The SCRCOG report mentioned earlier contains references to two quotes received from Transload America. Transload recently submitted a proposal to the New Haven [Solid Waste and Recycling Authority] to operate its transfer station, bale the MSW, and transfer and transport the baled MSW to an out-of-state facility for about \$82 per ton. In 2008, New Haven had been paying about \$91 per ton for hauling and disposal at the Lisbon RRF. Transload also estimated that it could provide another SCRCOG community with a transfer station with the same services as New Haven for about \$92 per ton.

It should be noted that services priced in the PRI report include nothing more than transportation from the locality to the final disposal site and disposal at that site. Other solid-waste services many towns use, including

- operation and maintenance of regional transfer stations,
- transportation from the regional transfer station to final disposal site,
- acceptance of mandated recyclables,
- bulky-waste disposal and
- electronics recycling,

could add considerable costs to those towns' solid-waste budgets.

And while the PRI report does include some data about possible pricing, the Committee believes that only a Request for Proposals will produce enough timely facts to enable it to make any recommendations in this report.

3. New and Emerging Technologies

The future of trash disposal may involve technologies other than the conventional waste-to-energy system in use in Connecticut. Many new technologies are under development or already in use in limited scale in foreign countries. CRRA commissioned an evaluation of these new processes and summarized its findings for the Special Committee in March 2010.

A. Technology Categories Evaluated

CRRA looked at several alternative technologies, which can be grouped into the following classifications:

- **Thermal (Gasification or Advanced Combustion)**
 - Use or produce heat to change the composition of MSW
 - Products include synthesis gas, vitrified ash or char
 - Includes Gasification, Pyrolysis, Plasma; Advanced Mass Burn
- **Digestion (Aerobic and Anaerobic)**
 - Decomposes organic fraction of MSW using microbes
 - Anaerobic digestion produces biogas and compost
 - Aerobic produces compost only
- **Hydrolysis**
 - Chemical reaction in which water (typically with an acid) reacts with another substance to form a new substance) (e.g.: extracts cellulose from MSW to form sugar; sugar in turn fermented to form ethanol)
- **Chemical Processing**
 - Depolymerization – converts organic fraction into energy, such as oil
- **Mechanical Processing for Gasification, Combustion or Fiber Recovery**
 - Recovers materials for gasification or combustion

The evaluation then focused on those technologies considered to be commercially viable. CRRA considered a technology to be commercially viable if it

- is currently or may be in commercial use so as to be able to replace the existing Mid-Connecticut Project Facility in Hartford (commercial use is defined as currently in regular use to process MSW on a contract basis);
- is capable, with no or reasonable scale-up, of processing 850,000 tons per year of mixed, unsorted MSW;
- requires either no or minimal change to MSW collection practices currently in use in Connecticut;
- provides for separation of materials for recycling and/or beneficial use of MSW; and
- has a potential disposal fee for receipt and processing of waste of \$80 per ton or less in 2012 dollars, considering all development, financing, design, construction and operating costs, less revenues from sale of energy and products.

B. Categories Considered to have Commercial Viability

Thermal Processing (gasification) is currently in commercial operation for MSW in countries such as Japan, Indonesia, Germany and Italy, but not in the United States. These technologies use or produce heat to change the composition of MSW, producing synthesis gas, vitrified ash or char. Several types of gasification technologies are in commercial operation, including fluid-bed gasification, high-temperature gasification, plasma gasification and pyrolysis. These gasification technologies have not been commercially applied within the United States. Technology transfer to the United States, and the Mid-Connecticut Project in particular, would need to be addressed in considering commercial application for this project.

Thermal Processing (advanced combustion) technologies are currently in commercial operation for mixed MSW in countries such as the Netherlands and Germany. These technologies have not been commercially applied in the United States, but technology transfer to the United States should not be a significant issue since the technology is an advanced form of traditional waste-to-energy presently in extensive use in the United States.

Advanced Mechanical Processing with Gasification or Combustion is in commercial operation in Germany, Italy and Belgium for MSW. This process has not yet been commercially applied in the United States. Accordingly, technology transfer is possible, but it would need to be examined in context

of commercial operation potential at the Mid-Connecticut Project (e.g., potential differences in MSW composition, waste management practices, end-product markets and regulatory requirements).

The Committee looked at one such process offered by a company called Summit BioFuels. While the technology is promising and could, at some point, offer cost savings over conventional trash-to-energy technology, CRRA management recommended and the Committee concurred that the potential savings are not enough to justify the risking of public funds on a process that, as yet, is unproven on the scale needed to be practical for Mid-Connecticut Project cities and towns. More information about this technology is available through a link on CRRA’s website at http://www.crra.org/pages/mid-conn_special_committee.htm.

i. Estimated Disposal Fees

The table below compares estimated disposal fees for several technology categories that have the potential of meeting commercial viability criteria (i.e., thermal processing, both gasification and advanced combustion, and mechanical processing with gasification or combustion).

Estimated Disposal Fees for Alternative Technology Categories Considered Commercially Viable

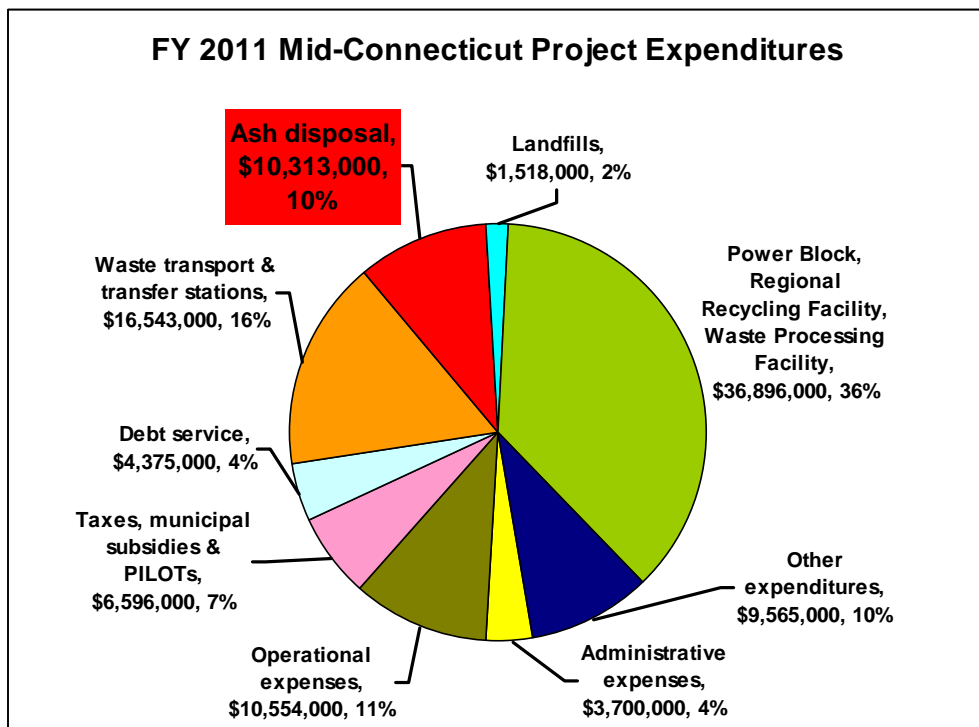
Estimated Disposal Fee	Thermal Processing Gasification	Thermal Processing Advanced Combustion	Mechanical Processing with Gasification or Combustion
Fee for 850,000 TPY facility in 2012 ⁽¹⁾⁽³⁾	\$82/ton	\$68-\$88/ton	\$114/ton
Fee for 850,000 TPY facility in 2012 ⁽²⁾⁽³⁾	\$70/ton	\$59-\$75/ton	\$101/ton
Notes: ⁽¹⁾ With 20-year amortization ⁽²⁾ With 30-year amortization ⁽³⁾ Possibility of fee reduction if renewable energy credits or sale of carbon credits is available.			

(Comparison of other technology categories – hydrolysis, chemical and mechanical processing with fiber recovery – was not made since these technologies have not been demonstrated to process mixed MSW at a commercial stage and the information necessary to make an informative, reliable comparison is not available. A comparison was not made for anaerobic digestion since the technology is not viable at the project size as required for the Mid-Connecticut Project).

After thoroughly considering the available information on these emerging technologies, it was apparent to the Committee that someday one or more of them might supplant the current trash-to-energy system as the most environmentally responsible and cost-effective disposal method. However, only a handful of those technologies will be commercially viable in the near future, and the Committee concluded that none of these technologies is ready to merit an investment at this time.

C. Other Technologies that May Impact Trash Disposal Costs

The by-product of the trash-to-energy process is ash residue. Since the Hartford landfill reached its permitted capacity in 2008, the Mid-Connecticut Project has had to truck its ash from Hartford to a privately-owned ash landfill in Putnam, which is now the only permitted ash landfill in the state. As shown on the chart entitled “FY 2011 Mid-Connecticut Project Expenditures,” ash disposal consumes



more than 10 percent of the Project’s annual budget. If less ash must go to a landfill, the cost of disposal would also go down. Therefore, beneficial re-use of combustor ash should be considered.

This year, Governor Rell signed into law Public Act 10-87 which directs DEP and the Connecticut Academy of

Science and Engineering (CASE) to study beneficial re-use of ash and report its findings to the Legislature’s Committee on the Environment by January 1, 2011. CRRA has been calling for beneficial re-use of ash for years because

- It would avoid the cost of landfilling in a state where there is no competitive market;

- Ash can be used as an ingredient in asphalt or concrete, which can be made into shingles, paving blocks, or road sub-base;
- PRI's research indicated that several other states, including Florida, Massachusetts, Pennsylvania, Maryland, New Hampshire, New York, Hawaii, and Missouri, allow beneficial re-use, either in asphalt, road base or daily landfill cover.

The PRI report looked at beneficial re-use and its findings affirmed CRRA's position. It did point out that because coal ash, whose properties (including heavy-metal content) are similar to that of combustor ash, is so prevalent there may not be a market for products containing combustor ash.

The PRI report recommended specific points for the DEP/CASE study to address:

- Which states allow beneficial re-use of ash residue and for what purposes;
- The amount of ash actually re-used in those states and for what purposes;
- The potential for ash re-use in Connecticut;
- Barriers to re-use in Connecticut, including barriers to re-use of ash as a roadbed material or an ingredient in asphalt used in state construction projects; and
- Cost-effective solutions for the re-use or disposal of ash.

When considering this issue, DEP, CASE and the Legislature should recall that there was little market for recycled paper until Public Act 90-224 required publishers and printers to use newsprint containing a minimum amount of recycled fiber:

Sec. 22a-256n. Publishers: Use of newsprint with recycled content. Schedule. On a state-wide basis, the percentage of recycled fiber contained in newsprint used by all publishers shall be in accordance with the following schedule: For the year ending December 31, 1992, eleven per cent or more; for the year ending December 31, 1993, sixteen per cent or more; for the year ending December 31, 1994, twenty per cent or more; for the two years ending December 31, 1996, twenty-three per cent or more; for the year ending December 31, 1997, thirty-one per cent or more; for the year ending December 31, 1998, forty per cent or more; for the year ending December 31, 1999, forty-five per cent or more; and for the year ending December 31, 2000, and thereafter, fifty per cent or more.

Sec. 22a-256p. Printers: Use of newsprint with recycled content. Schedule. On a state-wide basis, the percentage of recycled fiber contained in newsprint used by all printers shall be in accordance with the following schedule: For the year ending December 31, 1992, eleven per cent or more; for the year ending December 31, 1993, sixteen per cent or more; for the year ending December 31, 1994, twenty per cent or

more; for the two years ending December 31, 1996, twenty-three per cent or more; for the year ending December 31, 1997, thirty-one per cent or more; for the year ending December 31, 1998, forty per cent or more; for the year ending December 31, 1999, forty-five per cent or more; and for the year ending December 31, 2000, and thereafter, fifty per cent or more.

Today, 10 years after the state required use of newsprint containing 50-percent recycled fiber, markets for recycled paper are robust. It is certainly conceivable that legislation could similarly create a market for combustor ash.

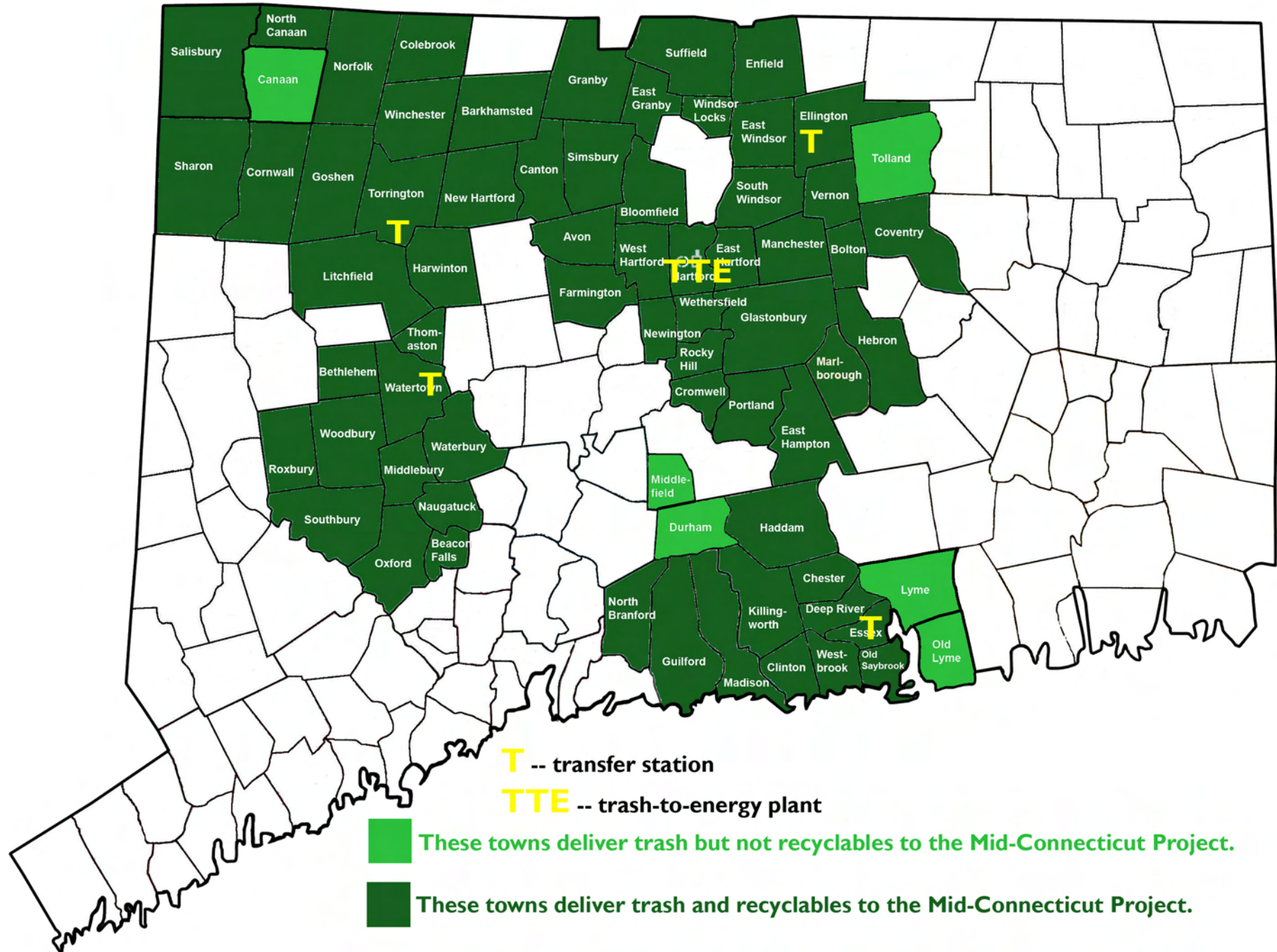
4. Conclusion

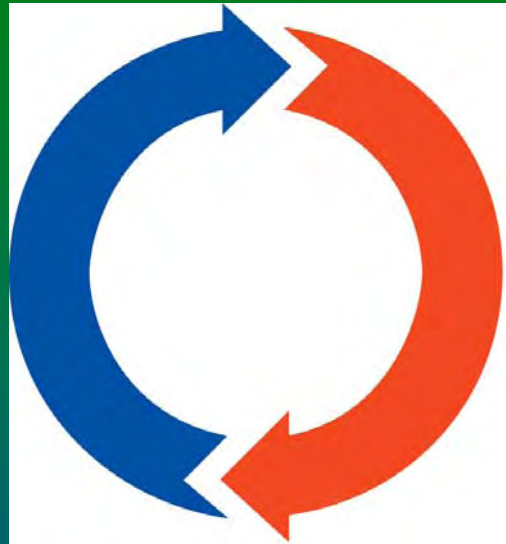
As stated earlier, the Special Committee would only draw conclusions where the Committee had sufficient information to do so. Because Sec. 22a-268f is silent on whether the Special Committee should recommend any particular option, this report makes no such recommendation.

However, it has long been the Authority's position that cities and towns should investigate their options themselves to determine which best suits their needs. This report provides details about what appears to be a limited number of options available today and a look at what may become technically or economically viable in the years to come.

The Committee gave much consideration to the information developed by the PRI staff, including information on private-sector management of waste disposal. The Committee agrees that relying completely on the private sector for the vital service of waste disposal would not necessarily be in the best interests of the state or its cities and towns.

The Mid-Connecticut Project Trash Disposal System





**CONNECTICUT
RESOURCES
RECOVERY
AUTHORITY**

CONNECTICUT'S RECYCLING LEADER

Mid-Connecticut Project Special Committee

Report on Trash-to-Energy Plant Condition

Rich Quelle, Senior Engineer

January 27, 2010

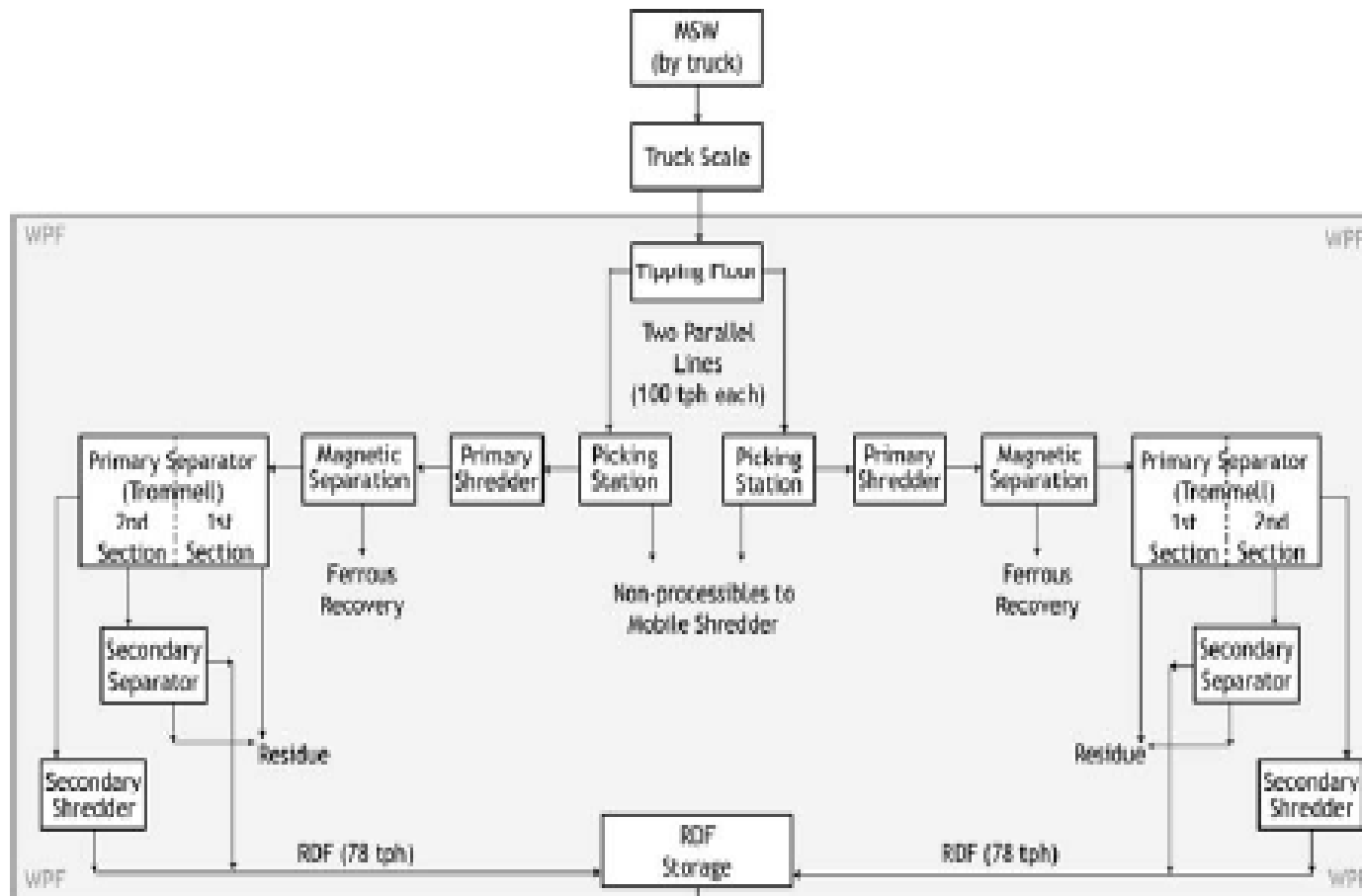
Mid-Connecticut Project Trash-to-Energy Facility



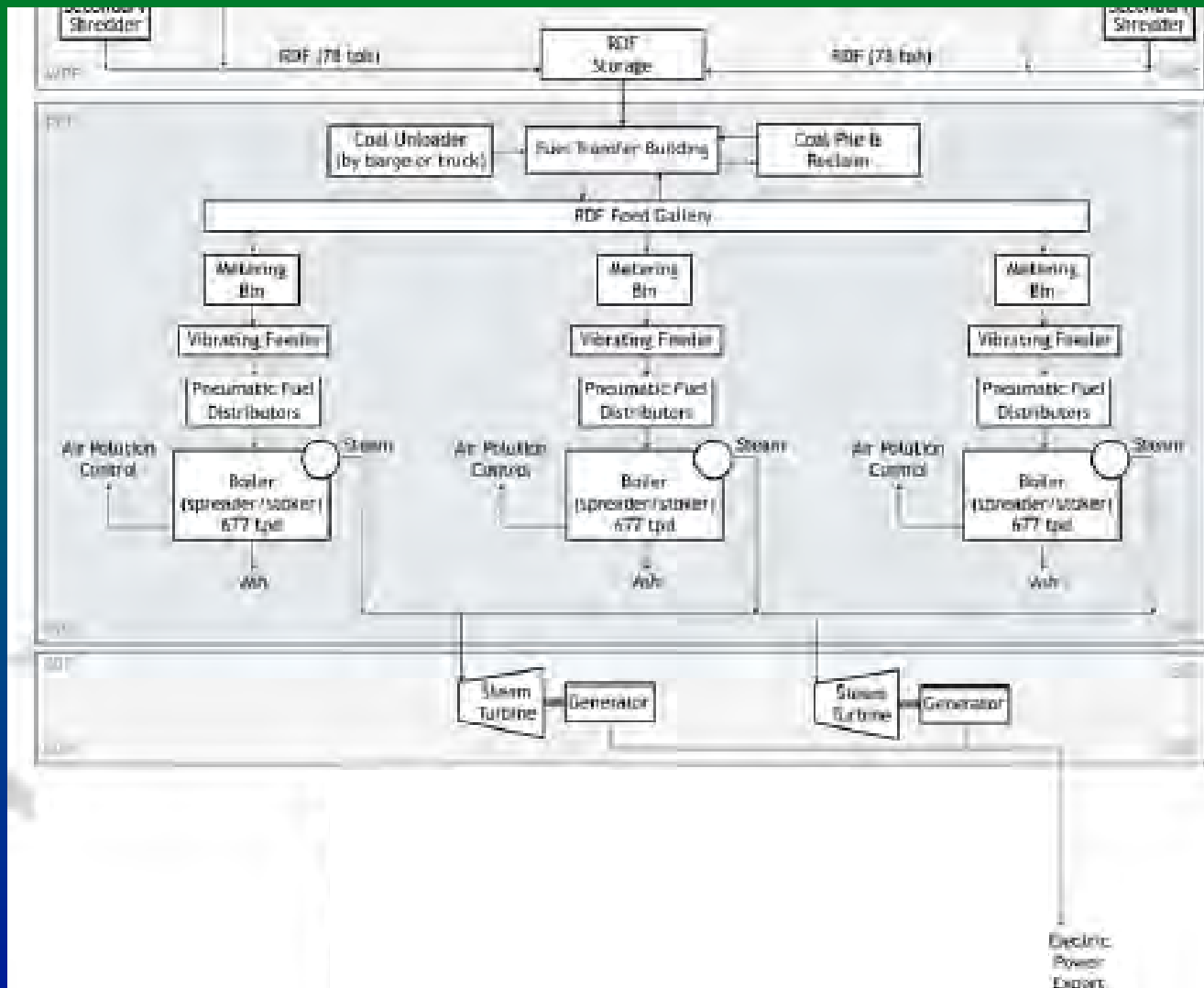
CRRRA Mid-Connecticut Project Special Committee
January 27, 2010



Trash-to-Energy Process



Trash-to-Energy Process



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January 27, 2010



PBF Control Room

- CRRA spent more than \$2 million replacing WPF controls with modern systems in 2009.



PBF Control Room



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January 27, 2010



PBF Control Room



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January 27, 2010



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Shredder Rotor Containment Casing

- In the last four years, CRRA has spent more than \$1.8 million upgrading shredder rotors and refurbishing shredder containment casings.



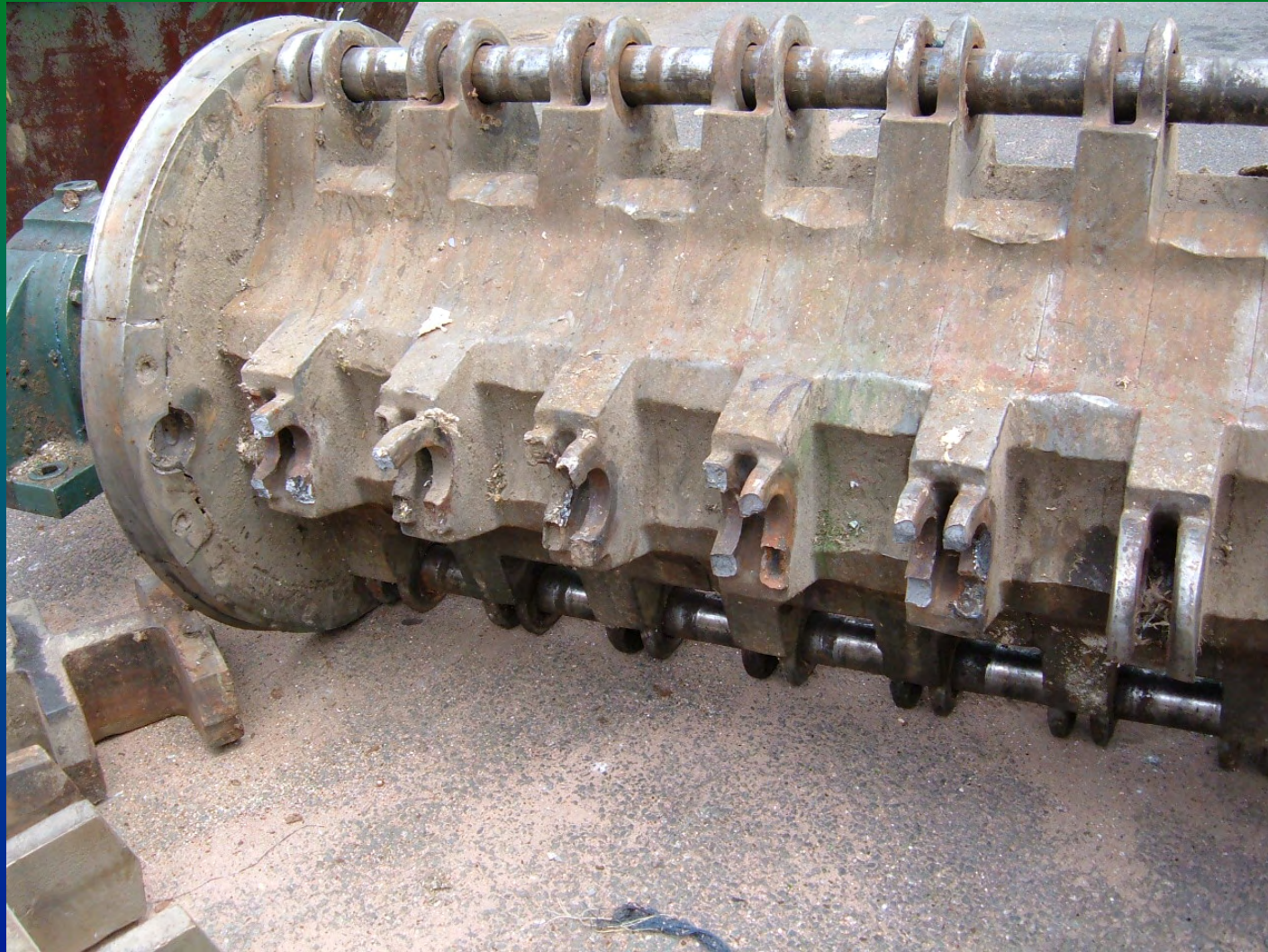
Shredder Rotor Containment Casing



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January 27, 2010



Shredder Rotor Containment Casing



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January 27, 2010



Shredder Rotor Containment Casing



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Shredder Rotor Containment Casing



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Shredder Rotor Containment Casing



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January 27, 2010



PBF Boiler Tubes

- CRRA is investing more than \$1.2 million in boiler tubes this year to increase boiler availability.



PBF Boiler Tubes



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PBF Boiler Tubes



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PBF Boiler Tubes



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PBF Boiler Tubes



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January 27, 2010



WPF Control Room

- Replacing WPF controls with modern systems in 2008 cost over \$800,000.



WPF Control Room



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WPF Control Room



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January 27, 2010



WPF Fire Suppression System

- In the last four years, CRRA has spent more than \$500,000 to upgrade the fire suppression system.



WPF Fire Suppression System



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PBF Ash Load-Out Building

- To accommodate larger truck trailers needed to transport ash long distances, in 2008 CRRA expanded the ash load-out building and added another scale at a cost of \$1.9 million.



PBF Ash Load-Out Building



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PBF Ash Load-Out Building



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MCAPS Free-Blow System

- The free-blow system was installed in 2005 at a cost of \$750,000. It has reduced CRRA's operating costs by as much as \$600,000 per year.



MCAPS Free-Blow System



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January 27, 2010



MCAPS Free-Blow System



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January 27, 2010



Mobile Bulky Waste Shredder

- CRRA purchased a \$750,000 shredder to accept the bulky waste that had been placed in the Hartford landfill prior to its closing on December 31, 2008.



Mobile Bulky Waste Shredder



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January 27, 2010



WPF Belt Conveyor

- In the last four years, CRRA has spent more than \$2 million upgrading belt conveyors and sealing systems to reduce spillage.



WPF Belt Conveyor



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January 27, 2010



WPF Belt Conveyor



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WPF Belt Conveyor



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WPF Belt Conveyor



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WPF Belt Conveyor



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January 27, 2010



WPF Belt Conveyor



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January 27, 2010



WPF Belt Conveyor



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January 27, 2010



WPF Belt Conveyor



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January 27, 2010



WPF Steel Pan Conveyor

- In the last four years, CRRA has spent more than \$1.5 million refurbishing steel pan conveyors.



WPF Steel Pan Conveyor



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January 27, 2010



WPF Steel Pan Conveyor



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January 27, 2010



WPF Steel Pan Conveyor



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January 27, 2010



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WPF Steel Pan Conveyor



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WPF Steel Pan Conveyor



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PBF Turbine Rotor

- Replacing turbine rotor diaphragms cost over \$850,000 in 2008.



PBF Turbine Rotor



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PBF Turbine Rotor



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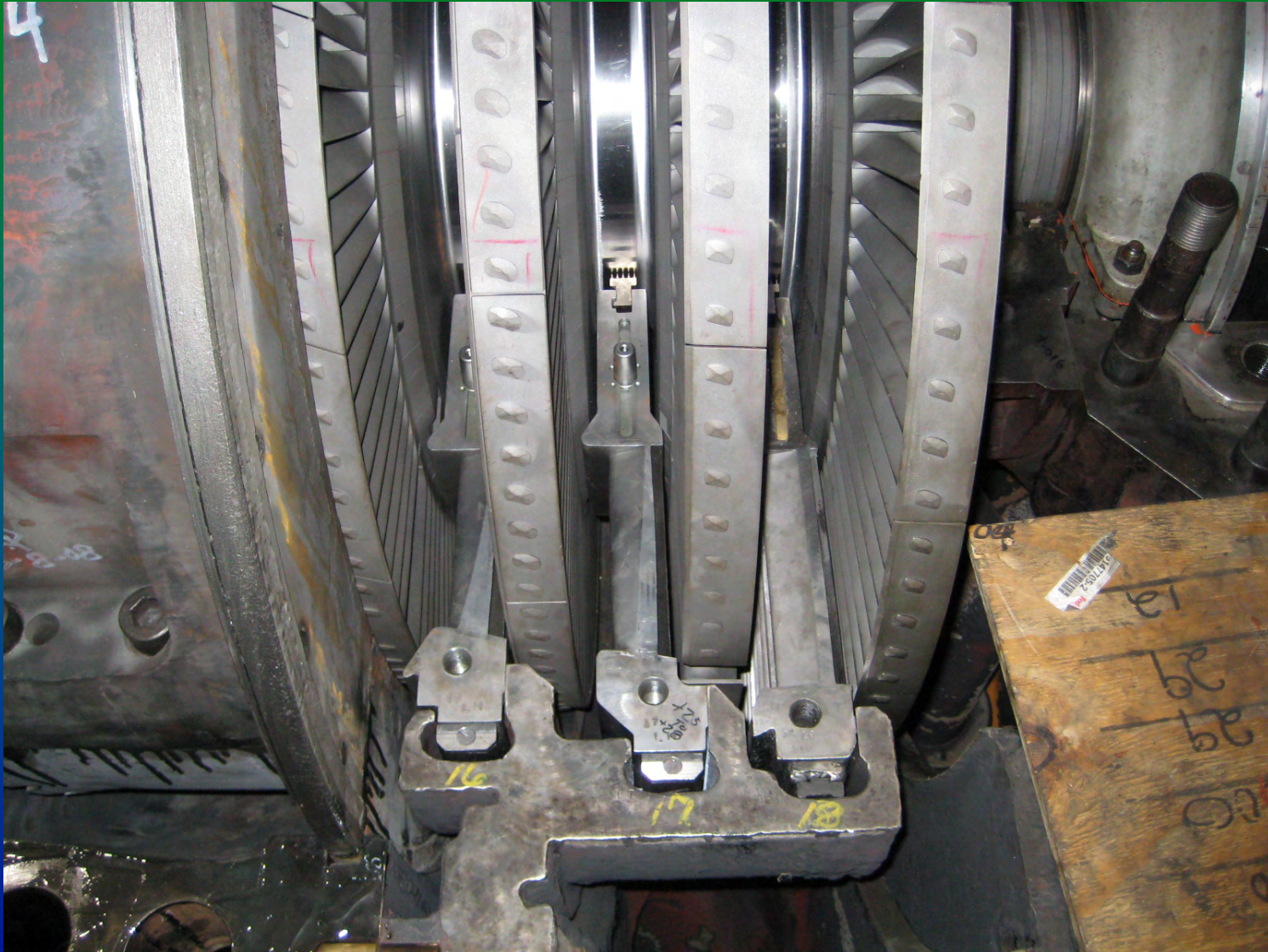
PBF Turbine Rotor



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January 27, 2010



PBF Turbine Rotor



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January 27, 2010



PBF Turbine Rotor



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January 27, 2010



WPF Compressors

- In 2009, CRRA spent over \$750,000 to replace 20-year-old compressors.



WPF Compressors



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January 27, 2010

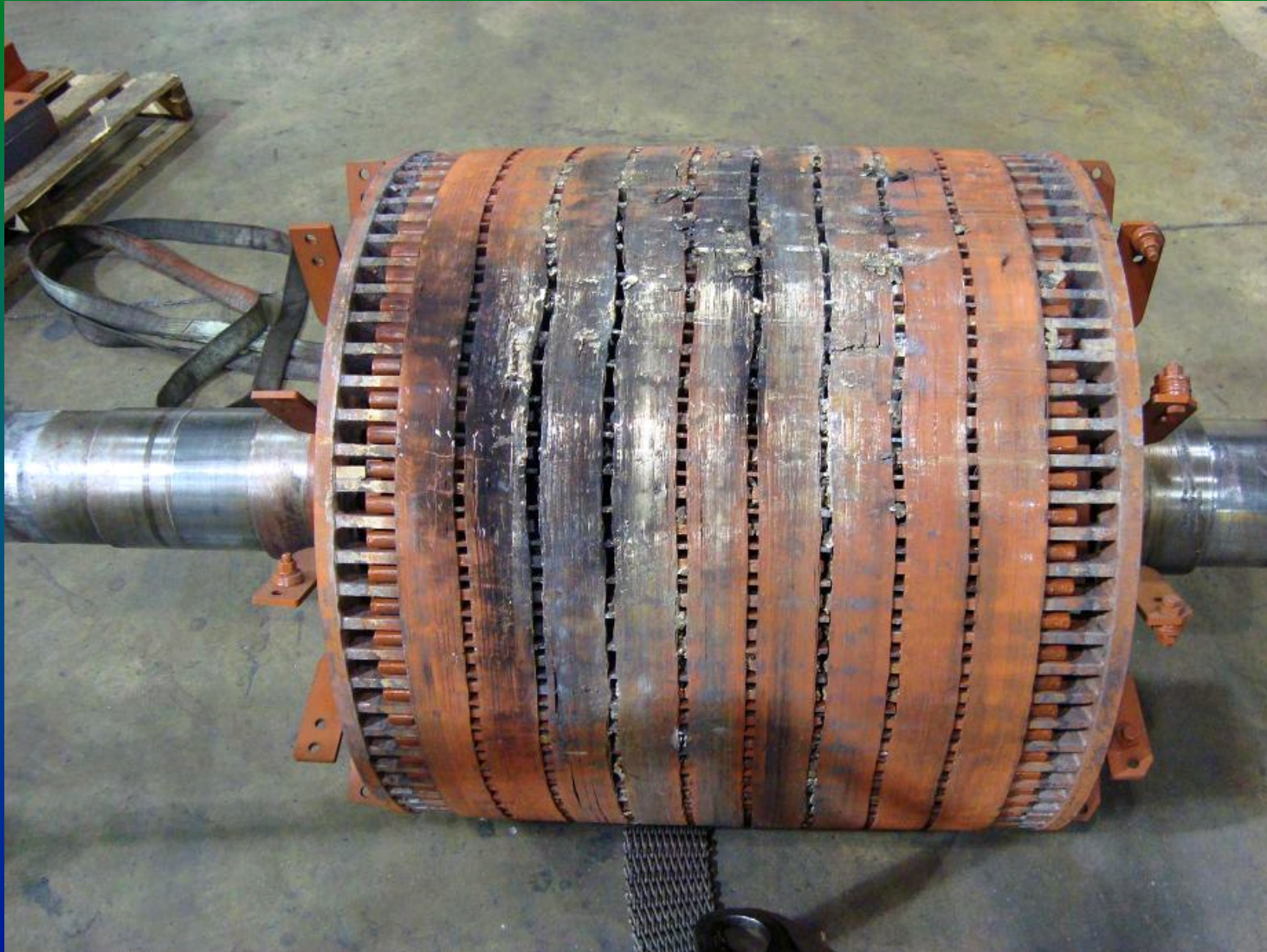


Spare WPF Shredder Motors

- In the last four years, CRRA has spent more than \$600,000 to purchase spare shredder motors, speeding maintenance and increasing WPF availability.



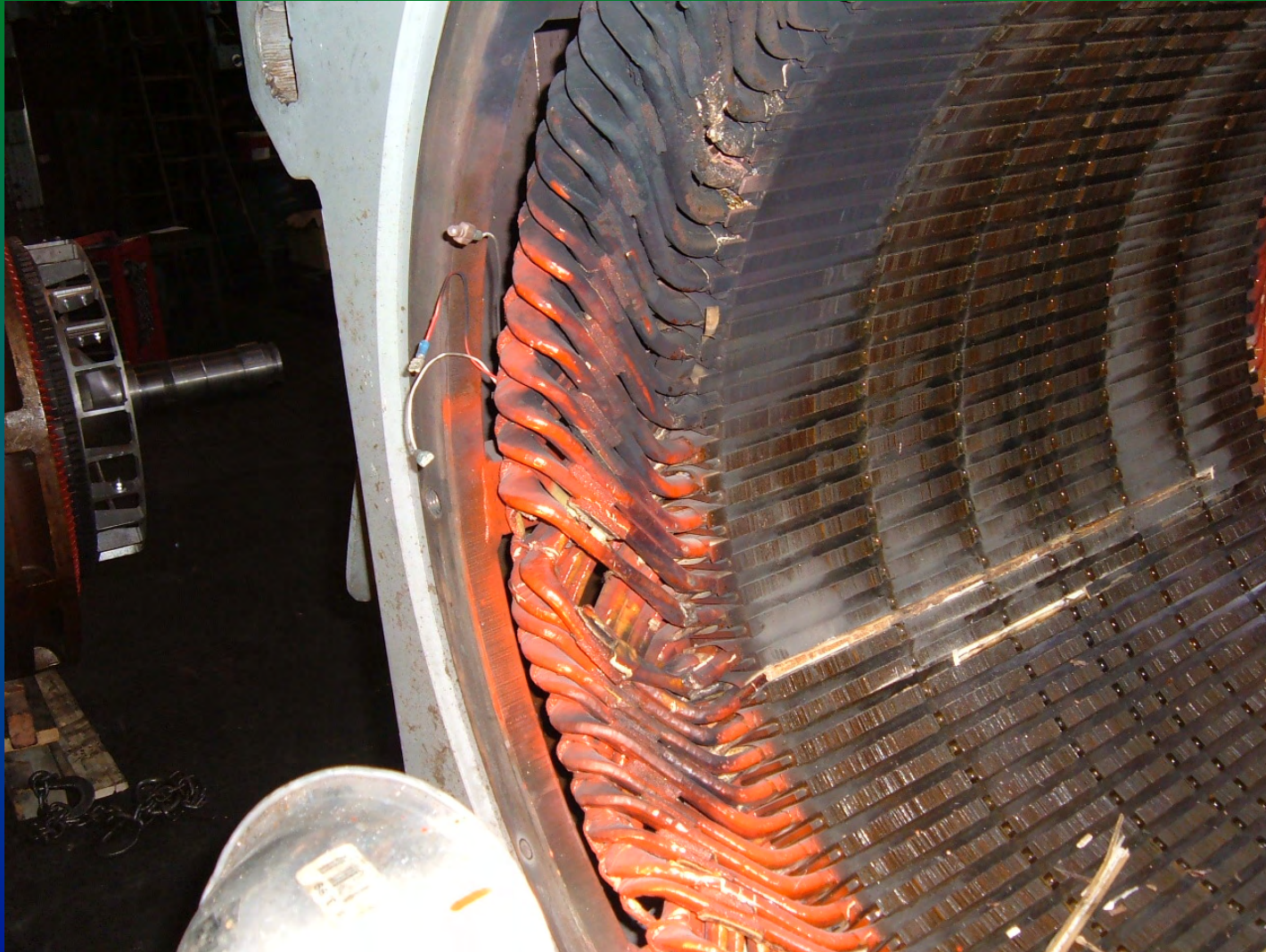
Spare WPF Shredder Motors



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January 27, 2010



Spare WPF Shredder Motors



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January 27, 2010



Spare WPF Shredder Motors



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January 27, 2010



Spare WPF Shredder Motors



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January 27, 2010



WPF Mobile Equipment

- CRRA has spent more than \$2 million on new heavy equipment in the last four years.



WPF Mobile Equipment



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January 27, 2010



WPF Mobile Equipment



CRRA Mid-Connecticut Project Special Committee
January 27, 2010



WPF Processing Floor

- In the last four years, CRRA has spent more than \$1.5 million on WPF processing floor repairs and resurfacing.



WPF Processing Floor



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WPF Processing Floor



CRRA Mid-Connecticut Project Special Committee
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WPF Processing Floor



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January 27, 2010

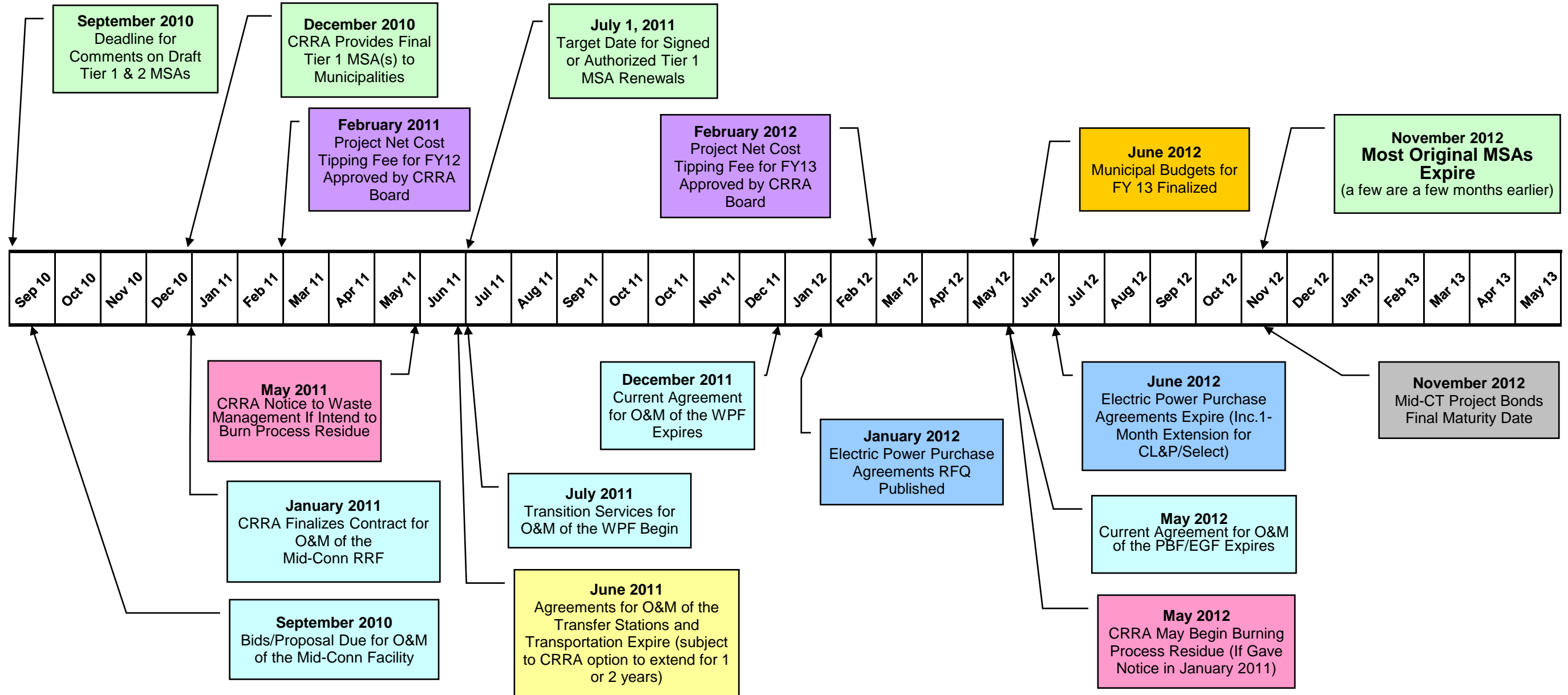


Your Questions

CRRRA Mid-Connecticut Project Special Committee
January 27, 2010



SELECT MILESTONES ON THE PROJECTED MID-CONNECTICUT PROJECT TIMELINE



Staff Findings
and Recommendations

Municipal Solid Waste
Management Services in
Connecticut

January 12, 2010

Legislative Program Review
& Investigations Committee

Committee Staff on Project
Scott M. Simoneau, Principal Analyst
Eric Michael Gray, Legislative Analyst

Legislative Program Review and Investigations Committee
Connecticut General Assembly
State Capitol Room 506
Hartford, CT 06106

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Web: www.cga.ct.gov/pri/index.htm

Municipal Solid Waste Services in Connecticut

What were nascent efforts by the state two to three decades ago to create and nurture an alternative and more environmentally sound waste management infrastructure have fully matured. Connecticut has a waste management system that has been and largely remains self-sufficient and environmentally sensitive. New challenges, however, face Connecticut as the in-state disposal capacity for municipal solid waste is now constrained, and the Department of Environmental Protection (DEP) has created an ambitious vision and proposal to significantly increase diversion efforts and alter the state's disposal habits by 2024.

At the same time, the fulfillment of a number of contractual obligations and the release from particular methods of handling waste in the state are underway. Transitions in ownership of key disposal facilities from the public sector to the private sector have occurred and will continue to occur over the next several years. Long-term contracts that bound municipalities to these disposal facilities are also expiring. Concerns about the impact of these changes on the state's solid waste management system have been raised by the legislature and were expressed in two scopes developed by the Legislative Program Review and Investigations Committee.

In May 2008, the committee initially approved a study focused on the ownership options and implications of the four resources recovery facilities (RRF) operating at the time in connection with the Connecticut Resources Recovery Authority (CRRA).

Subsequently, at its December 9, 2008, meeting, the Legislative Program Review and Investigations Committee approved an expanded scope of study to review the full range of municipal solid waste management services from trash haulers and transfer stations, through recycling facilities, trash-to-energy facilities, MSW landfills, and ash landfills in order to assess whether the services are: 1) adequate; 2) available at a reasonable cost; 3) sustainable; and 4) compatible with state policies and goals. The study is to also explore alternatives to the state's current disposal technologies and the potential uses of ash residue.

A briefing report issued on October 8, 2009, covers a significant portion of that new scope of study. It describes the characteristics of key elements of the municipal solid waste (MSW) system including collection, recycling, transfer stations, resources recovery facilities, landfills, and out-of-state disposal. A discussion of how municipalities operate with respect to each element was provided along with the identification of significant laws and regulations pertinent to each element. In addition, trends in solid waste management, the planning process, and the roles of various participants in the system were explained, while potential uses of ash residue were described.

Main findings. The information contained in this report specifically examined the following questions, through the described methods, and makes certain key findings and recommendations to address those findings as discussed below.

Is the overall municipal solid waste system adequate? This question is addressed by exploring how well the system meets state goals and the larger purpose of solid waste management – that is, to provide a clean and wholesome environment by ensuring safe and sanitary disposal options.

Program review staff find that significant progress has been made in achieving certain aspects of the state's waste management goals, especially in reducing the state's reliance on landfills, and in creating and promoting a viable network of resources recovery and recycling facilities. On the other hand, efforts aimed at reducing the amount of solid waste generated within the state (source reduction) as well as those efforts intended to increase recycling are not sufficient. In addition, increasing amounts of waste have been exported to out-of-state landfills, which conflicts with state policies.

Are the solid waste management services provided in Connecticut sustainable as currently structured? Answers to this question involve an examination of how the municipal solid waste system may continue as currently structured over the next 20 years given the projections of increasing waste generation levels of solid waste.

Program review staff find that while in-state disposal capacity is likely to continue (through the use of resources recovery facilities), without the use of out-of-state disposal facilities, Connecticut's disposal system would not be sufficient to process the waste generated in the state. In-state ash disposal capacity is also insufficient to handle the ash produced in state for the next 20 years, while out-of-state landfill capacity for MSW and ash is abundantly available. However, the sorting facilities for the most commonly accepted recyclable materials are currently operating far below capacity and infrastructure for other diversion methods is undeveloped.

Are municipal solid waste collection and disposal services available at a reasonable cost? For this question, reasonable cost is analyzed in terms of the existence of a competitive market for solid waste collection and disposal services.

Program review staff find that with regard to collection services the potential exists for improper pricing of collection services due to a lack of competition but there is also an absence of comprehensive data to properly analyze the MSW collection market.

Competition for in-state disposal services is limited, but the RRFs that have recently changed ownership have offered contract terms to municipalities that are comparable to, if not less than, out-of-state disposal options and regional tip fees. The long-term trend in market competitiveness is unclear because the disposal market in Connecticut appears to rely on the nearest out-of-state disposal sites and the short-term spot market to provide competition to the only two operators of RRF disposal services in Connecticut. Both of those disposal alternatives, though, carry risks.

Recommendations. Program review staff have provided recommendations intended to address deficiencies in the areas cited above. Staff have also developed descriptions of various options that the state may want to pursue that are much larger in scope and are intended to have a broader impact.

To address the findings regarding the adequacy and sustainability of the solid waste management system, program review staff offer recommendations to improve waste diversion that include: the creation of a mechanism to periodically review and refresh the mandated recyclables list; the development of diversion incentive programs with dedicated funding; and a study of Connecticut's composting infrastructure to explore and expand the potential of this waste diversion opportunity.

A number of options are also discussed that would allow the state to pursue increased self-sufficiency including the construction of new publicly-owned RRF capacity, either through a new plant or by providing encouragement/incentives to expand existing plants, and the development of additional publicly-owned landfill capacity.

In order to respond to potential long-term risks to the state that tend to inhibit competition, staff have presented an array of options for the committee's consideration that are intended to influence the long-term cost competitiveness of disposal services (both RRFs and landfills), improve disposal capacity, and provide more information about the cost of those disposal services.

Program review staff recommend, at a minimum, revising state policies to encourage competition and to position the state to act should the need arise to become self-sufficient in the future. This includes the elimination of the determination of need (DON) process for RRFs and ash landfills; research on the beneficial reuse of ash; and consideration of a state purchase of land for future use as a landfill.

Several other recommendations are offered to improve the functioning of the overall solid waste management system. This includes modifications to the way solid waste system data is collected and disseminated, a mandated timeframe for revisions to the State Solid Waste Management Plan (SWMP), a re-examination of CRRA's role and purpose, and a review of landfill monitoring practices by DEP.

Report Contents

This report is organized into five sections. The first section provides an analysis of the adequacy of the state's solid waste management system, while Section II examines the sustainability of the system. The third section examines costs and competition within the collection and disposal markets. Sections IV and V provide recommendations and policy options for the committee's consideration.

Adequacy of the Solid Waste Management System

This section examines the adequacy of the solid waste management system as a whole. This is accomplished by examining system-wide activities and broad measures of outcomes compared to state policies and goals.

Any discussion of outcomes must begin with the state's articulated goal for the solid waste management system. One of the key legislative findings about solid waste management embedded in the Solid Waste Management Services Act (SWMSA) enacted in 1973 is that "...the people of the state of Connecticut have a right to a clean and wholesome environment."¹

There are many factors that contribute to a clean and wholesome environment. This section focuses on how well the solid waste management system provides safe and sanitary disposal options that contribute to a clean environment, and determining if those practices are consistent with state policies and goals. Specifically, below is a discussion of changes that have occurred over time in the number of active landfills, water quality, and how well the system is managed compared to the solid waste hierarchy. Recommendations based on findings discussed below can be found in Section IV and V.

It can be concluded from the discussion below that:

- significant progress has been made by the state of Connecticut in reducing its dependence on permitted in-state landfills; the picture is less clear on the trend in the number of unpermitted landfills;
- the environmental impacts of reducing reliance on landfills as a disposal option have not been systematically measured;
- efforts aimed at reducing the amount of solid waste generated within the state (source reduction) are not sufficient, according to the waste hierarchy established in statute;
- although the initial legislatively mandated recycling rate goal appears to have been met in the 1990s, the recycling rate goal established by the legislature for the year 2000, a decade ago, has never been met;
- waste stream analysis shows much of the MSW that is being disposed of at resources recovery facilities contains materials that are already required to be recycled or are a type of plastic that generally has a readily available market;
- most of Connecticut's solid waste is disposed of at in-state resources recovery facilities and those facilities are at their maximum useable capacity;
- while MSW landfill capacity in Connecticut has purposely declined, the amount of waste being exported, mostly to out-of-state landfills, has increased, which conflicts with state policy; and

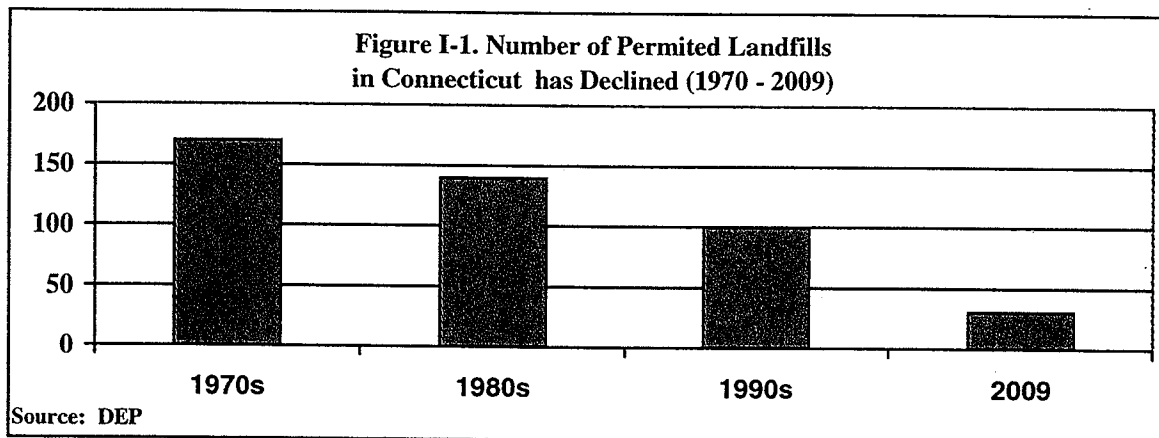
¹ C.G.S. Section 22a-258

- without the use of out-of-state disposal facilities, Connecticut’s disposal system would not be sufficient to process the waste generated in the state.

Number of Landfills

One of the principal reasons for developing a network of resources recovery facilities and mandating the recycling of certain items was to reduce Connecticut’s dependence on landfills for the disposal of waste. The SWMSA declared that “the prevailing solid waste disposal practices generally, [i.e., landfills] throughout the state, result in unnecessary environmental damage, waste valuable land and other resources, and constitute a continuing hazard to the health and welfare of the people of the state.”

Number of permitted landfills in Connecticut. Figure I-1 shows the approximate number of permitted landfill in Connecticut for each decade from the 1970s through the 1990s, as well as the actual number in 2009. This includes MSW, ash residue, bulky waste, and other special waste disposal areas. The number of permitted landfills has steadily declined from about 170 in the 1970s to 31 in 2009. Clearly, significant progress has been made by the state of Connecticut in reducing its dependence on in-state landfills.



Rate of illegal dumping and unpermitted landfills. The trend in the rate of illegal dumping and the number of unpermitted landfills is not readily tracked by DEP. In fact there is not a comprehensive list of unpermitted landfills in the state maintained by DEP. Department staff have made a conservative estimate of over 300 unpermitted waste disposal areas, many of which were established and used before permitting was mandatory, in the state that the department has had some involvement in through solid waste closure or remediation activities. Each year additional unpermitted sites are discovered while developing property, remediating brownfields, investigating complaints, and similar activities.

Environmental Impacts

Any disposal option has environmental impacts on air, land, and water quality. One goal of Connecticut’s shift to the use of RRFs was to protect the state’s water quality by nearly

eliminating the use of in-state MSW landfills. Thus, part of the success of the state's strategy could be broadly measured in terms of the solid waste management system's impact the environment. Two key questions would be how has water quality changed and how has air quality been impacted since the introduction of RRFs.

Landfills. According to the federal Environmental Protection Agency, about 15 percent of Connecticut's population relies on ground water, while 85 percent is dependent on surface water as a source of drinking water.² Either type of source is vulnerable to potential contamination from a variety of sources.

Neither DEP nor the Department of Public Health (DPH) have any readily available trend data on the quality of Connecticut's surface or ground water. For example, DPH, which oversees drinking water quality, does collect data on water quality for specific water systems but it does not generally trend data because their focus is mainly on compliance within a specific monitoring period. What is known is that old landfills have and continue, from time to time, to contaminate wells in Connecticut.

There are a number of potential impacts that landfills could impose on the environment. Landfills, though, have been strictly regulated under federal and state statutes since the implementation of RCRA regulations in 1976. Landfills since that point have specific construction and operation standards that must be followed that limit the impact of contamination of surrounding land and waterways. Landfills can generate large amounts of methane and carbon dioxide. DEP could not provide estimates what the effect on air quality would have been of having landfills instead of RRFs.

Resources recovery facilities. Resources recovery facilities are regulated under state and federal law, including, RCRA, the Clean Air Act, and the Clean Water Act. An RRF is required to obtain air emission and waste water discharge permits the terms of which specify that the permittee must monitor and report various air emissions and any discharges that could cause adverse impacts to human health and the environment. The facilities are inspected once every two years by DEP. This comprehensive on-site evaluation of compliance status includes a review of required reports and records, and an assessment of control device and process operating conditions for all emission units located at the facility. Partial compliance evaluations may be conducted within the two year timeframe if follow-up inspections are deemed necessary and/ or a complaint is received regarding the facility.

The primary pollutants of concern for these facilities, on an ongoing basis, are sulfur dioxide, nitrogen oxides, carbon monoxide, particulate matter, cadmium, lead, mercury, dioxin/furan, hydrogen chloride, opacity (visual and fugitive ash emissions) and ammonia (as applicable, dependent on whether ammonia is used for nitrogen oxide control). Emissions of other pollutants may be evaluated if deemed necessary. Both federal and state statutes strictly regulate these emissions.

² *Drinking Water in New England*, US Environmental Protection Agency, October 6, 2008 (http://www.epa.gov/region01/eco/drinkwater/ne_drinkwater.html)

There are basically two forms of emissions testing. The first, continuous emissions monitoring (CEM) is performed for sulfur dioxide, nitrogen oxides, carbon monoxide and opacity emissions. In addition, air pollution control device and process operations are continually evaluated through measurements of various operating parameters such as combustion temperature, particulate matter, and other process measures. Both quarterly reports and reports of any deviations from certain parameters are required under law. The second type of emissions testing requires the facilities to perform annual testing for particulate matter, cadmium, lead, mercury, dioxin/furan, hydrogen chloride, ammonia, and fugitive emissions. It should be noted that DEP no longer conducts its own testing at RRFs. RRFs are reimbursed through the Solid Waste Fund account for the emission testing costs. Since the RRFs hire the test contractors and DEP no longer conducts its own testing, there is no opportunity for any “surprise” testing.

The Bureau of Air Managements’ point source inventory tracks emissions of the following pollutants: Volatile Organic Compounds (VOC), Nitrogen Oxides (NOx), Carbon Monoxide (CO), Particulate Matter less than 10 microns in diameter (PM10), Sulfur Oxides (SOx), and Lead (PB). According to that database, the total amount of pollutants (i.e. only those listed above) emitted to the ambient air in 2008 from all RRFs in Connecticut is 4,272 tons per year. Note that this does not include pollutants such as Carbon Dioxide (CO2). Program review staff obtained enforcement data from DEP regarding air violations for the RRFs in Connecticut since 1990. The information is summarized in Table I-1.

	Informal Actions	Formal Actions	Total
Mid Connecticut (Hartford)	10	7	17
Bristol	4	3	7
Bridgeport	7	2	9
Wallingford	10	5	15
Lisbon	0	0	0
Preston	0	0	0
Total	31	17	48

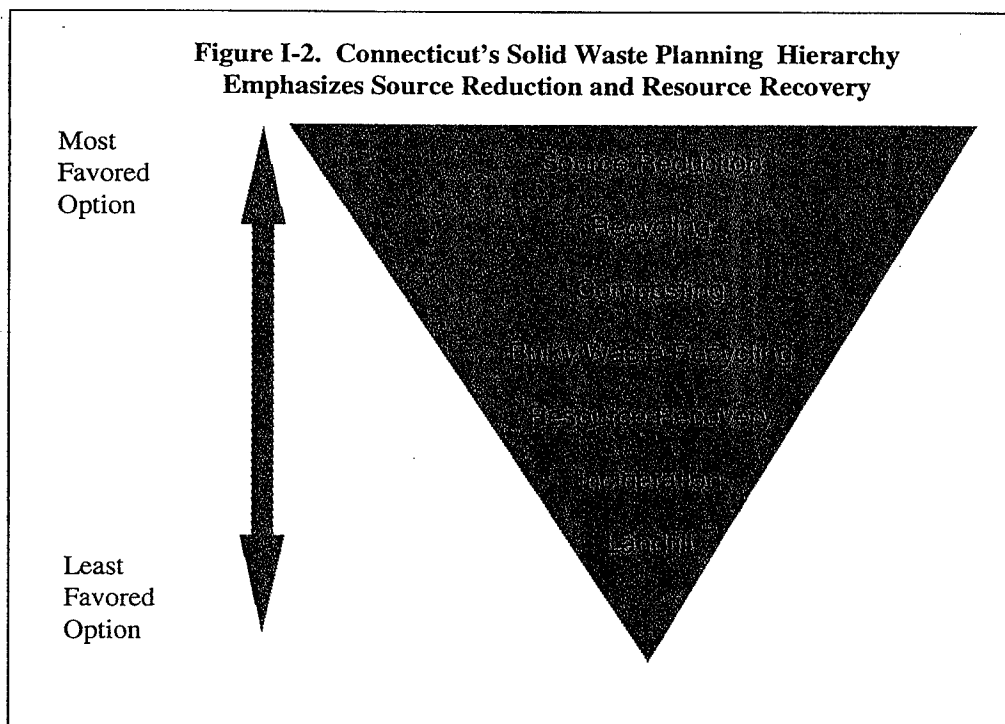
Source: DEP and PRI calculations

RRFs also have a land-related impact because the six plants operating in Connecticut produce about 550,000 tons per year of ash residue. Connecticut regulations require specific management and disposal requirements.

Waste Hierarchy

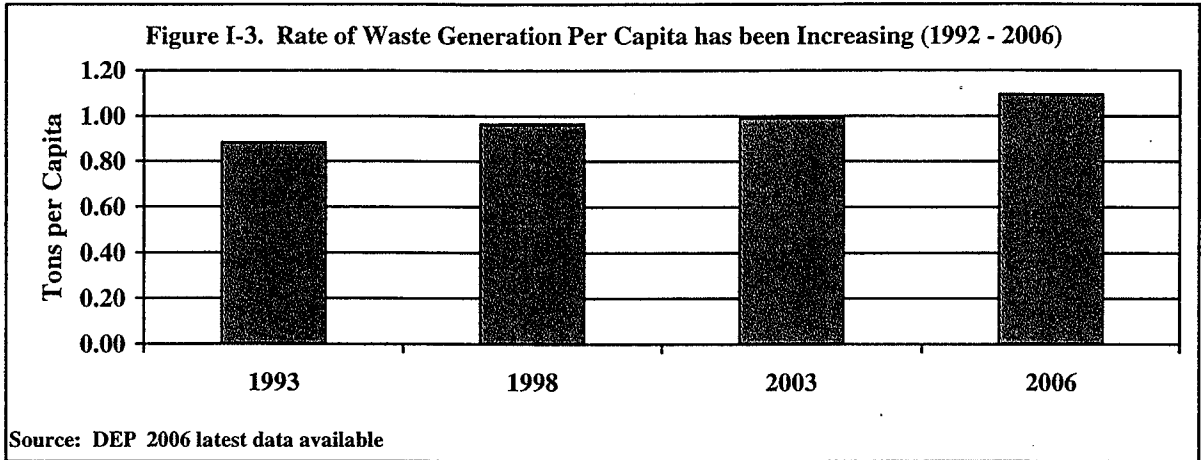
State statutes require that DEP’s State Solid Waste Management Plan, which is the core solid waste planning document, establish goals to manage waste according to a preferred hierarchy. The various approaches to solid waste management are listed in statute in a priority order as depicted in Figure I-2. The first four activities, considered solid waste diversion strategies, are intended to avoid the problem of disposal altogether. Resources recovery facilities

and landfill disposal are the last two options. (Incineration without energy recovery is no longer permitted in Connecticut). The area of analysis below examines how well the state has followed these waste management methods.

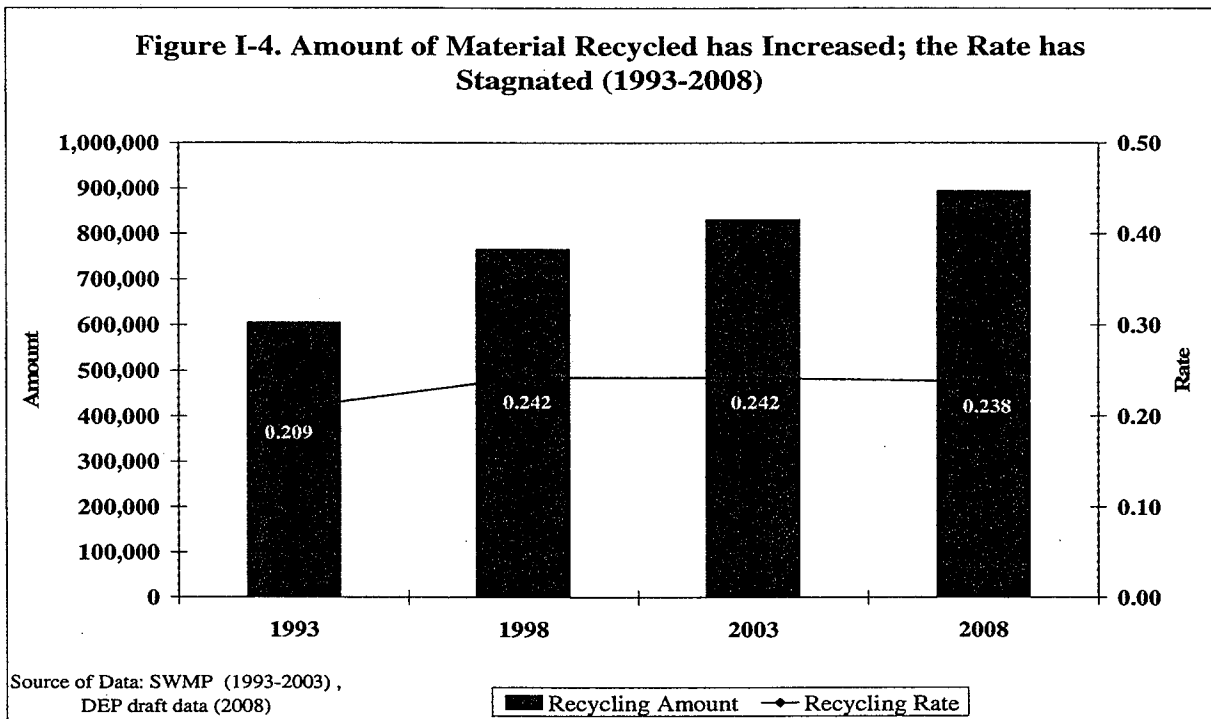


Source reduction. Source reduction refers to those activities that reduce both the *toxicity* and the *amount* of solid waste generated in Connecticut. It is the highest priority in managing solid waste and one of the more difficult waste management practices to implement because it requires both consumers and product manufacturers to change routine behaviors and procedures. Overall measures of the change in waste toxicity are difficult to find. However, there have been a number of voluntary and legislatively mandated actions to reduce the amount of toxicity of certain products, including Public Act 02-90 that created a comprehensive program to nearly eliminate the amount of mercury in consumer and commercial products and the recently passed (July 2007) electronics recycling law which requires manufacturers to finance the transportation and recycling of computers, monitors, and televisions.

A number of actions have been taken by individuals, businesses, and government that have contributed to the reduction in the amount of MSW generated, including various industrial efforts to reduce the weight of products and packaging; pay-as-you-throw programs that require generators to pay more if they dispose more waste; and the operation of “swaps” at transfer stations to encourage the reuse of products. One way to measure how well source reduction efforts are impacting solid waste generation is to look at the amount of MSW generated per person in Connecticut. Figure I-3 shows that the amount of MSW generated has been steadily rising since 1992. This indicates that source reduction efforts in Connecticut are not sufficient.



Rate of recycling. Recycled material in Connecticut includes items mandated through regulation (i.e., corrugated cardboard, glass and metal food containers, leaves, newspaper, office paper, scrap metal, batteries, and waste oil) and non-mandated items (e.g., plastics, magazines, mail, coated paper beverage cartons, telephone directories, and boxboard). Composted material, which at the present time in Connecticut means chiefly leaves, is a form of recycling and included in the recycling rate.



Since the early 1990s the amount of MSW generated in total and per capita has climbed steadily upward. The amount of waste that is recycled and marketed has also consistently grown, but the ratio of recycled to disposed waste has not changed much after an initial surge in

the early 1990s, as can be seen in Figure I-4. The result is that, while the recycling rate remains steady, the total amount of MSW that must be disposed continues to increase.

In 1990, the legislature established a statewide recycling rate goal of 25 percent. In 1991, mandatory recycling, both residential and non-residential, was enacted. It appears the state had met the initial recycling goal of 25 percent by the early-1990s, and in 1993 the legislature established a new recycling and source reduction goal of 40 percent by 2000. As the figure shows, this goal has not been met. The current rate remains at about 25 percent (not including bottle bill deposit returns, auto scrap, home composting, and certain commercial recyclables).

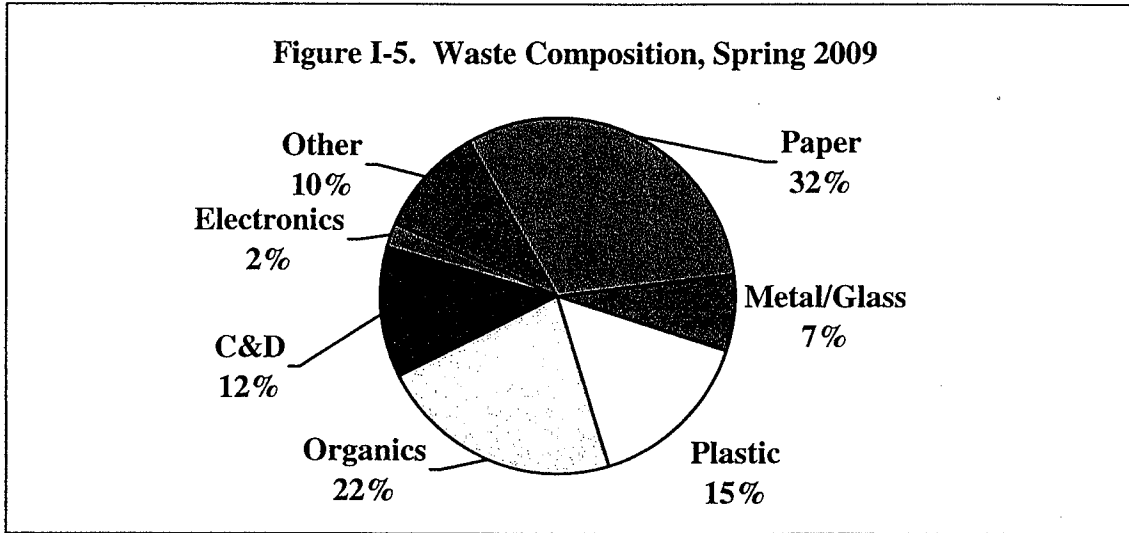
According to estimates in the 2006 SWMP, the recycling rate in 2005 with the deposits based recyclables included was about 30 percent. It is arguable that the state has been meeting the original recycling rate goal of 25 percent, but even the estimate of 30 percent falls short of the revised statutory goal of 40 percent. Further, the SWMP predicts that, in order to be able to continue to meet statewide disposal demand without exporting to other states, the statewide recycling rate would have to increase to 58 percent by 2024.

It appears that the current recycling system was adequate to meet the original diversion goal of 25 percent, but it is possible that the system that is currently in place is not capable of meeting higher recycling goals. It remains to be seen how several recent developments, such as adjustments to the deposit laws and capital upgrades at recycling processing centers that allow for a simpler recycling process (i.e., single stream), will impact the statewide recycling rate.

Waste characterization. One strategy in the SWMP requires that DEP conduct a solid waste characterization study for the purpose of better targeting waste disposal diversion efforts and estimating associated costs for managing the waste stream. The State-wide Solid Waste Composition and Characterization Study estimates the actual composition of disposed municipal solid waste. The study will give DEP a snapshot of what is currently in the Connecticut MSW waste stream and will provide information to guide DEP on what material to select to enhance the recycling system and to consider for other disposal diversion activities.

The study is being carried out over the course of two seasons, with waste sampling activities occurring at five permitted solid waste facilities throughout the State. An interim report has been completed and represents the results of the first round of sampling and analysis. Figure I-5 shows the results of this first analysis.

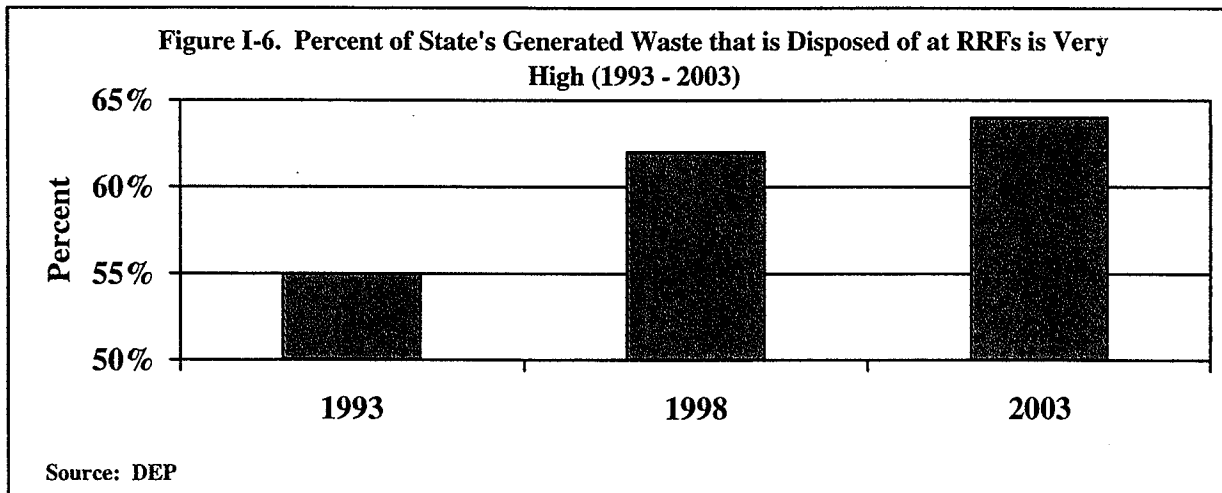
Figure I-5. Waste Composition, Spring 2009



It can be noted that about 22 percent of the MSW waste stream is composed of organics, which could be a prime new target for additional diversion efforts. However, it should also be pointed out that the majority of the waste stream (54 percent) is composed of paper, metal, glass and plastics. Most of the paper, metal and glass components are already required to be recycled, and most towns offer plastics recycling, though not necessarily all types of plastics. Thus, the study not only shows where there are new opportunity areas but also where current efforts may need to be redoubled.

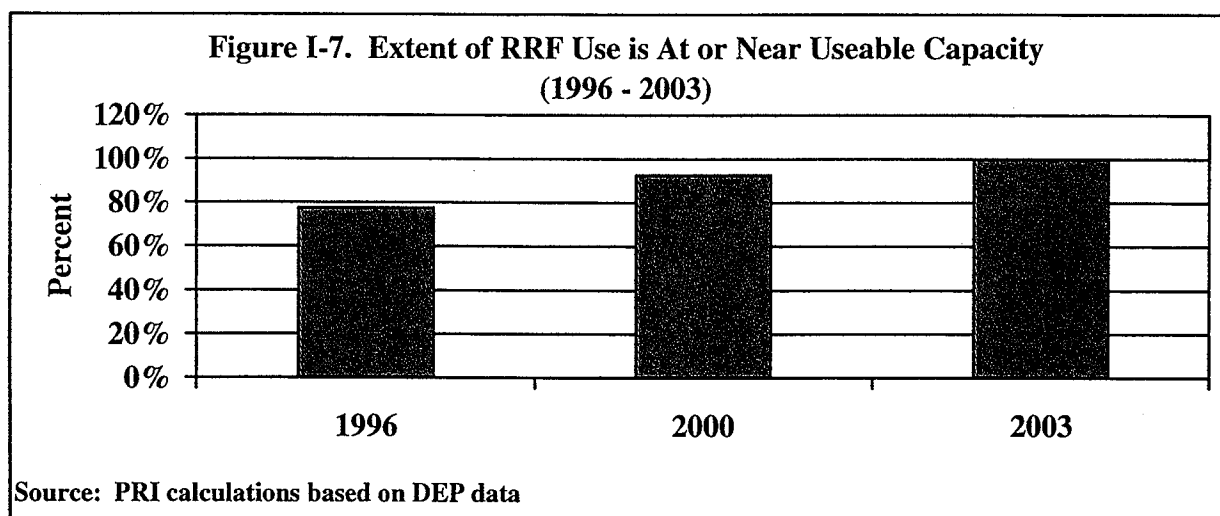
Resources recovery facilities. Resources recovery through waste-to-energy plants is the second to last waste management strategy in statute. Among the various “declared policies of the state of Connecticut” articulated in the Solid Waste Management Services Act is “that maximum resources recovery from solid waste” shall be considered an environmental goal of the state. Figure I-6 shows that the percentage of MSW disposed of at the six RRFs has been increasing since 1993. About 64 percent of generated MSW is disposed of at an RRF in Connecticut.

Figure I-6. Percent of State's Generated Waste that is Disposed of at RRFs is Very High (1993 - 2003)



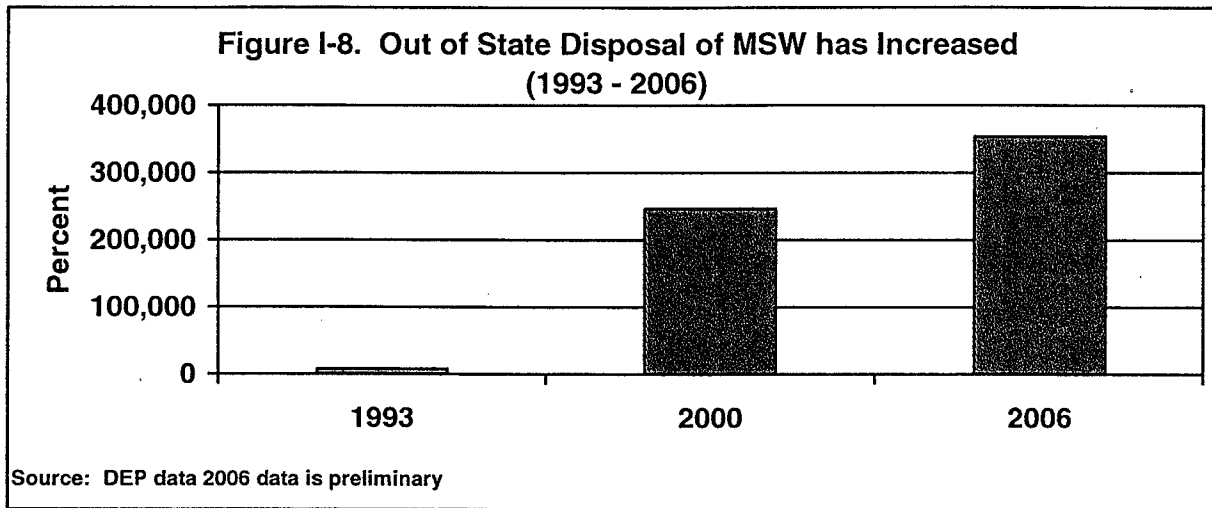
Currently, the six RRFs in Connecticut have a permitted capacity of approximately 2.6 million tons of MSW per year, the smallest of which, Wallingford, has a permitted capacity of 420 tons/day and the largest of which, Mid-Connecticut (Hartford), has a permitted capacity of 2,850 tons/day.

Permitted capacity is a maximum amount not assumed to be actually useable due to maintenance and other operational aspects, so assumptions about how much capacity is actually useable are important. A standard estimate of useable capacity is 85 percent of permitted capacity. Figure I-7 shows the extent of RRF use compared to the useable capacity of RRFs. Connecticut's resources recovery facilities are at about their maximum useable capacity. Long-term reliance on disposal at RRFs, as well as the capacity of RRFs, will be discussed in Section II.



Landfill use. According to DEP, in FY 2008 4.8 percent of MSW was landfilled in Connecticut, while 7.7 percent is disposed of outside of Connecticut (mostly in landfills). Landfill capacity for MSW in Connecticut is now virtually nonexistent, as most of the MSW landfilled in the state in FY 2008 was sent to the now-closed Hartford landfill. As reported to DEP, by 2015 the one remaining Connecticut MSW landfill (Windsor/Bloomfield) will be at capacity and/or closed, at which point all MSW must go to either Connecticut RRFs or be shipped out of state. As seen in Figure I-8, the amount transported out of state though has been increasing from about 27,000 tons in FY 1994 to about 354,000 tons in FY 2006. (This does not include the landfill capacity that is needed for some of the non-processible residue produced at the RRF in Hartford). This trend of increasing use of landfills, regardless of their location, conflicts with the waste management hierarchy.

As noted above, RRFs also require the use of landfills to dispose of the ash residue that is generated as a byproduct of the plant's operation. The plants in Connecticut generate about 550,000 tons of ash per year. So the amount of material generated by Connecticut citizens that is disposed at a landfill that is either MSW or the result of burning MSW totaled about one million tons in FY 2008 and is expected to grow.



Self Sufficiency as a Public Policy Goal

In-state disposal facilities can not process all the MSW that is produced in Connecticut – the shortfall for MSW in FY 2008 was about 260,000 tons³. The DEP projects that by 2024 the MSW disposal shortfall will grow to about 1.5 million tons, assuming that the current diversion rate remains constant. The SWMP sets as a primary state goal that the state will increase diversion rates from roughly 30 percent steadily up to 58 percent by 2024 to meet the projected growth in MSW with the current level of RRF capacity.

A key premise underlying the SWMP is the idea that the state should be self-sufficient for waste disposal. This means that Connecticut should have adequate disposal capacity for the waste generated in the state that needs disposal. The department has stated that it will use its authority as much as possible to follow this approach.⁴ Acceptance of this premise has important implications for the policy choices that lawmakers would have to consider to ensure self-sufficiency. These implications involve the possible imposition of additional system costs; new mandates on municipalities, businesses and individuals; and increased regulation. Aside from the barriers discussed further below, these implications will be explored further in the policy options presented in Section IV.

Risks of not being self-sufficient. Every state imports and/ or exports waste. In fact, nine states export more than one million tons of MSW per year to other states, including New York, New Jersey, and Massachusetts.⁵ Moreover, many specialty wastes, such as medical waste, are handled on a regional basis due to cost efficiencies. However, there are a number of reasons cited by stakeholders to demonstrate why self sufficiency is a good public policy goal. They cite a number of potential risks that the state would be exposed to without the ability to manage almost all of its own solid waste. These risks relate to not having reliable, readily

³ Shortfall would be larger today, by at least 135,000 tons, because of the closure of the Hartford landfill.

⁴ Connecticut Department of Environmental Protection, *State Solid Waste Management Plan*, Amended December 2006. p. I-4

⁵ Congressional Research Service, *Interstate Shipment of Municipal Solid Waste: 2007 Update*, James E. McCarthy, Updated June 13, 2007 Report RL34043

available, and economical disposal options that are also compatible with Connecticut's environmental policies. Some of these risks are described below.

- *Loss of control.* By relying on out-of-state disposal facilities, Connecticut could be subject to another state's (changeable) policies and regulations that could serve to limit access to disposal facilities in other states without much notice or subject Connecticut municipalities to a price shock. Although solid waste is considered a commodity and enjoys certain protections from undue state regulation as interstate commerce, individual states do not always look with favor on being an importer of solid waste. One method used to reduce imports is for the state to impose a uniform fee or tax on top of tip fees. For example, Pennsylvania has been a leading importer of solid waste in the nation but the waste imports have been declining since 2003. A principal factor has been the imposition of an additional \$4.00 per ton state fee on waste disposal, which was levied on top of the per ton disposal charge.⁶
- *Transportation costs.* Typically, solid waste that is exported from Connecticut is transported in large, long-haul trucks. Price fluctuations in the cost of fuel and other expenses can lead to volatility in the cost of disposal. The development of long-haul rail options can mitigate some of the price impact but requires the development of such capacity in Connecticut. Rail can also limit where the waste can be sent because the receiving disposal area has to be served by rail or be a short distance from a rail transfer station.
- *Liability.* Although landfills are supposed to be permitted and properly monitored by government agencies, there is some risk that the facilities may not be properly operated. In addition, enforcement and permitting of facilities in other states may not be as stringent as Connecticut. Among other problems, this may leave Connecticut municipalities open to liability concerns under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).⁷ Connecticut municipalities and resources recovery authorities have been subject to CERCLA liability in the past. For example, during the construction of the Bridgeport RRF, CRRA had arranged for solid waste to be shipped to various landfills. One of those landfills in the state of New Jersey, which received less than 100 tons of waste from Connecticut, was later determined to be a hazardous waste site. Allocation of financial responsibility is still being worked out.
- *Environmental impacts.* Transporting waste out of state has environmental impacts. Both truck and rail haul options produce air emissions from diesel

⁶ Ibid

⁷ CERCLA is intended to reduce and eliminate threats to human health and the environment posed by uncontrolled hazardous waste sites. To meet this objective, CERCLA created a hazardous waste site response program and a comprehensive liability scheme that authorizes the government to hold persons who caused or contributed to the release of hazardous substances liable for the cost or performance of cleanups.

fuel that are a public health concern. For example, DEP has estimated that if 400,000 tons of MSW are transported to landfills in Eastern Pennsylvania with an average round trip distance of about 400 miles from central Connecticut, this will result in about 200 tons of diesel engine pollutants added to the air per year. Rail does have fewer emissions per mile traveled. Emission from truck transportation is about 2.8 to 5.0 times greater than rail transportation over the same distances. By contrast, studies have shown that diesel trucks transporting MSW from New York City to Pennsylvania and Virginia emit five times more particulate matter per ton than if combusted in more local RRFs.⁸ Aside from emission concerns, both rail and truck transport have other potential health and safety impacts, such as increases to traffic congestion (for trucks), litter and leakage of waste not properly contained, and leakage of hydraulic oil and fuel spills.

- *Consistency with Connecticut's own policies.* Due in large part to concerns about environmental impacts, the state of Connecticut has purposely reduced its dependence on landfills in policy pronouncements, regulation, and in actual practice. Some argue that to proceed in a manner that allows Connecticut's MSW to end up in landfills in other states raises concerns about the appearance of a double standard.

Barriers to self sufficiency. In addition to considering the various risks associated with not achieving a degree of self-sufficiency, consideration must be given to barriers to achieving self sufficiency. These barriers include:

- *Siting considerations.* It is difficult to site any type of solid waste facility in Connecticut. These facilities take a long time to develop, are usually costly to permit, and have a limited number of areas that would meet Connecticut's siting requirements.
- *Public opposition.* There is often significant local opposition to any type of proposed solid waste facility in Connecticut. One example of this opposition was the 2009 Senate Bill 3, which would explicitly ban the construction of either an ash landfill in Franklin or an organic digester in Waterbury. There are real and perceived negative impacts associated with construction and operation of solid waste facilities, from traffic concerns to runoff. There is also a public perception that combustion in RRFs and landfill operations are hazardous to public health.
- *Desire for economical solutions.* As will be discussed later, out-of-state facilities have the potential to be competitive compared to in-state options. RRFs are costly to construct and an uncertain electric market makes this type of disposal a more speculative venture.

⁸ Connecticut State Solid Waste Management Plan, DEP, 2006 p. I-18

- *Social costs.* Social concerns are important considerations in siting any kind of disposal facility, but it is a concern that comes with costs. Both Public Act No. 08-94 and DEP's Environmental Justice Policy require that "Environmental Justice Communities" are provided enhanced notice leading to "meaningful public participation" in the siting and permitting processes for solid waste facilities. Any changes to or expansions of Connecticut's waste management system must ensure that no segment of the population bear a disproportionate share of the risks or consequences of environmental pollution.

Further discussion on self-sufficiency can be found in Section II, which examines the sustainability of MSW disposal in Connecticut.

Section II

Sustainability

In this section, the sustainability of the MSW services industry is examined, in whole and by component. For the purposes of this document, sustainability will be judged on whether the system is capable of disposing of its waste while maintaining the status quo for 20 years in regard to infrastructure, waste generation growth, and diversion rates.

A key issue regarding sustainability is the concept of self-sufficiency. Where applicable, this section will discuss whether the current system is sustainable with and without the premise of self-sufficiency.

There are several key findings in the discussion of sustainability, including that:

- existing RRF capacity is likely to continue to be available for at least the next 20 years;
- in-state RRFs do not now have the processing capability to handle the entire state's disposed MSW;
- the determination of need process for siting additional disposal capacity prevents the development of excess disposal capacity, which is at odds with the creation of a self-sufficient system;
- in-state ash disposal capacity is insufficient to handle the ash produced in-state in the next 20 years;
- out-of-state landfill capacity for MSW and ash is abundantly available and will likely continue to be for at least the 20 years contemplated in this section;
- the waste services system is incapable of self-sufficiency as currently constructed;
- a primary barrier to self-sufficiency is lack of in-state landfill capacity for MSW or ash; and
- the sorting facilities for the most commonly accepted recyclable materials (e.g., bottles, cans, paper) are currently operating far below capacity.

In-State Sustainability for Disposal

In-state sustainability for the disposal of MSW relies on two primary methods: resources recovery facilities and MSW landfills. Resources recovery facilities are the primary disposal facility for non-recycled MSW and as such are an important part of the long-term sustainability of the state's MSW services. Landfills are no longer relied on in Connecticut as a primary means of disposal. The specific issues that surround the sustainability of MSW disposal are: RRF longevity, RRF capacity, and sufficient RRF ash residue and MSW landfill capacity.

RRF longevity. The six in-state RRFs provide approximately 2.2 million tons of disposal capacity per year. Five of the six facility owners/operators indicated that their facilities are projected to have a useful life well over the 20 year time-frame used in this sustainability discussion. The only facility that did not project over 20 years was the Mid-Connecticut plant in Hartford, which was projected in 2008 to continue operation until at least 2028. There is little reason to believe that with proper maintenance and current operating procedures that any of the RRFs will cease operations within the next twenty years, thus reliance on the facilities as a significant source of disposal seems reasonable as part of a sustainable policy going forward.

RRF capacity. Reliance on current in-state RRFs for the disposal of all MSW generated in Connecticut is not a sustainable practice. In order to achieve self-sufficiency for disposal services, the amount of waste generated in-state, minus the amount diverted through recycling, must be equal to or less than the available disposal capacity in the state.

The combined capacity of the in-state RRFs is approximately 2.2 million tons per year, significantly less than both the 3.4 million tons generated and the 2.5 million tons disposed in FY 2008. Because of the capacity shortfall, the system is not currently capable of self-sufficiency.

RRFs as volume reduction facilities. RRFs do not eliminate the need for landfill based disposal, as landfills are needed to dispose of the ash residue by-product of the waste-to-energy process. For the purposes of sustainability, RRFs should be viewed as volume reduction facilities, not as final disposal facilities. It is important to note that even with sufficient RRF capacity to process all MSW needing disposal in the state, the remaining ash landfill capacity within the state is insufficient for the 20 year timeframe, which will be discussed at greater length below.

Landfills. Landfills are sparsely used in Connecticut as a means of disposal, but both one MSW landfill and one ash landfill have remaining capacity available. The remaining capacity in either landfill is insufficient to meet state-wide need for the next 20 years.

MSW landfill. The lone remaining landfill permitted to accept MSW has approximately 126,000 tons of remaining capacity, which is estimated to be filled by 2015. The total remaining capacity of the Windsor landfill represents less than the annual average tonnage accepted by the Hartford landfill prior to closure after FY 2008. If the waste tonnage from FY 2008 that was in excess of RRF capacity was sent to the Windsor landfill in an effort to achieve self-sufficiency, the landfill would be completely full within four months.

Ash landfill. The remaining ash landfill in Putnam processes approximately 450,000 tons of ash per year and had an estimated 7.6 million tons of remaining capacity at the close of FY 09. The state has relatively little control over the operation of the plant beyond environmental concerns. The privately owned and operated landfill is able to accept ash from out of state, and in fact occasionally accepts coal ash. The ability to process ash from out of state makes predictions of the lifetime of the remaining lifetime somewhat tenuous.

The latest estimate shows that there is approximately 17 years of remaining capacity. As some ash residue is disposed of out of state, the Putnam facility does not currently dispose of all of the ash created in state. Processing all of the ash in the state, the sum of which is

approximately 550,000 tons per year, would bring the useful remaining lifetime of the landfill from 17 years to 14 years.

If RRF capacity was expanded to meet the 2008 capacity shortfall, the additional ash created at those facilities would also need to be disposed. The additional ash would amount to 106,000 tons, or roughly 25 percent by weight of the processed MSW. This additional tonnage would bring the Connecticut generated ash up to 656,000 per year and would decrease the lifetime of the ash landfill to between 11 and 12 years.

Non-mono-fill. In an extreme scenario, both the MSW and ash landfills could be re-permitted to accept both materials instead of the current mono-fill requirements of the ash landfill. In this case, there would be approximately 7.7 million tons capacity remaining for the combined disposal of ash and MSW. In this scenario, the combined tonnage of ash and MSW that would need landfilled would be approximately 975,000 tons per year (550,000 tons of ash, 425,000 tons of MSW), meaning that repurposing the existing landfills would allow the state to achieve self-sufficiency for just under eight years. While this situation is highly unlikely, it suggests that the state would have some time to react should all currently feasible out-of-state options for disposal suddenly become unavailable.

Ash Reuse. As stated in the October briefing, eight states currently allow some form of beneficial reuse of ash. Connecticut currently does not allow for the re-use of ash residue. The low number of states with ash reuse policies is partially due to the low levels of reliance on waste-to-energy facilities in the nation. Regardless, beneficial use of ash is largely limited to alternate uses in building, operating, and closing MSW landfills. As the most common beneficial use of RRF ash is in MSW landfills, it seems unlikely that most of the Connecticut generated ash will be reused in-state.

Some non-landfill uses of ash are permitted elsewhere. Pennsylvania allows RRF ash to be used in the manufacture of asphalt and as road sub-base. Florida and Massachusetts allow ash in the manufacture of asphalt. New York allows RRF ash to be used as road sub-base. New Hampshire currently allows RRF as sub-base in asphalt paving, but in a research and development stage.

It is recognized that even in a best case scenario, beneficial use of ash will not replace the need for disposal at ash landfill. However, reuse of ash may lower the rate at which current ash landfill capacity is used. It is also recognized that reviewing ash reuse policy and creating a commercially viable reuse of ash are two distinct processes. However, having a formal ash reuse policy will remove some of the uncertainty and therefore some of the risk to entities that may consider pursuing ash reuse.

Options to Achieve Self-sufficiency

The primary means to achieve self-sufficiency in MSW disposal are to reduce the amount of waste needing disposal through diversion, which will be discussed later, and to increase the usable disposal capacity.

Disposal Capacity Expansion. There are three specific types of disposal capacity expansion possible in the state. These are: expansion of an existing RRF; creation of a new RRF; and creation of a new landfill. There are specific issues that reduce the feasibility of each type, which will be explored below. First the general obstacles to increasing in-state capacity are discussed.

Barriers to expansion. While expansion of disposal capacity would certainly impact current and future in-state disposal shortfalls, there are several notable barriers to expansion. Most of the key issues surrounding capacity expansion involve balancing the economic and operational issues of a facility with the environmental and residential issues of the surrounding community and the state. These issues include, but are not limited to, the siting/permitting process, funding, and residential and political opposition.

Siting. Siting a waste facility is a long, expensive task. Depending on the type of facility and the classification of the material to be processed, siting is limited to parcels of land that meet certain environmental benchmarks. Prospective locations must also make provisions with the host community. Special consideration must also be afforded for projects that would be located in impoverished areas because of recent environmental justice legislation. In addition to the environmental benchmarks required by DEP for siting and permitting, proposed waste facilities must also pass through the determination of need process.

Determination of need. Additional RRF capacity and landfill capacity are subject to DEP's "determination of need" process to obtain the proper permit. The "determination of need" process states that additional disposal capacity can only be permitted if the additional capacity does not leave the state with "substantial" excess capacity¹. The baseline measurement of how much capacity is necessary is the amount of waste in need of disposal annually and does not consider the seasonal swings in generation.

Ideally, waste would be available at steady rates year round, but in reality waste generation has seasonal ebbs and flows. Additionally, waste cannot be stored for a long enough time to counteract the seasonal highs and lows. In the winter months, excluding late December, the amount of waste generated in Connecticut on a daily basis is lower than during the spring and summer months, when daily waste generation peaks.

By the determination of need provision, a new facility would have to have capacity equal to or less than the average yearly excess need. Should a proposed facility have the exact capacity needed to negate the annual in-state capacity shortfall, the overall system would still be over-capacity in low months and under-capacity in peak months, though it is possible that the magnitude of the seasonal changes is inconsequential.

The determination of need process also does not include clear guidelines as to the time-frame of when the need will become apparent. With stagnant diversion rates and increasing generation rates, it is expected that the capacity shortfall will continue to grow. It is unclear whether the expanded capacity of a new facility, which would likely take over five years to

¹ The definition or amount that "substantial" refers to is unclear in this context.

become operational, would be judged under the determination of need process using the capacity shortfall at the time the application was submitted or the projected shortfall from some time in the future, either when the additional disposal capacity is first available or at some other point in the proposed facilities useful life.

Feasibility of capacity expansion types. Of the three ways to expand in-state disposal capacity, expansion of existing facilities appears to be the most feasible option. New facilities, whether landfills or RRFs, must undergo extensive land exploration and testing processes. New facilities must also secure both funding and tonnage, likely by entering in to long-term contracts with municipalities that, at this time, appear reluctant to enter in to contracts of 20 years or longer. Existing facilities will likely face the same hurdles to expansion, but the risk and objections seem to be lessened. This is also true for overcoming local opposition. Existing facilities may face opposition to expansion because of increased waste traffic, but new facilities will face the same concerns as well as greater questions about the particular site and how it may affect the municipality, region, and its residents.

Existing facility capacity expansion. The owners/operators of the in-state RRFs indicated that each facility has the potential to expand their existing capacity, however the amount and type of expansion varied by the project. Estimates for statewide capacity expansion ran from adding the capacity for an additional 1,000 to over 2,000 tons per day, or a 14 to 28 percent expansion to the roughly 7,400 tons per day currently available at RRFs.

Expansion could be achieved through some combination of incorporating additional processing lines, replacing existing processing lines with higher capacity lines, or building a standalone facility in the proximity of the existing facility. The expansion could be greater depending on the particular technology and expansion type enacted.

The capacity gained through these expansions would be approximately enough to balance the disposal shortfall in FY 2008. However, even the expanded capacity would not be adequate if the amount of waste generated and not diverted continues to grow as projected.

Out-of-State Disposal Sustainability

The current RRFs are unable to process all of the waste needing disposal in the state, but processed 83 percent of disposed waste in 2008. The SWMP projects that at current diversion rates, there will be a capacity shortfall of approximately 1.5 million tons by 2024. If the capacity at the plants remains unchanged, 2.2 million tons will be processed at RRFs in 2024. This means that roughly 59 percent of Connecticut's non-recycled MSW will be disposed of at an RRF. Though the percentage of disposal at RRFs would be significantly less than today's figure, 59 percent is still well above the national average, the regional average, and even the second most RRF reliant state's use.

Import and export of MSW. In order to determine the long-term feasibility of relying on out-of-state disposal options, it is important to examine the import and export trends around the nation. According to a study by the Congressional Research Service, approximately 42.2 million tons, 17 percent, of the 245.7 million tons of MSW generated was moved between states

in 2005². Of the 11 states that imported more than 1 million tons of MSW³, all but one, Oregon, are located in the mid-west or on the east coast.

Fifteen states each exported at least 500,000 tons of waste⁴. Four of the top exporters, Illinois, Indiana, Ohio, and New Jersey, are also in the top ten for MSW imports. At first glance this appears odd, but nearly every state had some combination of both MSW import and export. One reason for states being both importers and exporters of waste is that the generators of waste can be located as close to out-of-state disposal facilities as they are to in-state waste disposal facilities.

Connecticut ranked as the 14th highest exporter of waste, well behind three other states in the Northeast, New York (1st), New Jersey (2nd) and Massachusetts (6th), in both ranking and amount exported. The remaining Northeastern states were all well below the median tonnage of MSW exported. According to the study, 24 states, including Connecticut, are net exporters of waste.

The sustainability of continued, and likely increased, reliance on out-of-state landfills is based on the availability of disposal capacity. Virginia and Ohio are two of the states with relatively high levels of MSW importation and, according to the SWMP, had at least 14 and 22 years of remaining useful disposal life, respectively, without further expansion. The SWMP also indicates that there are many landfills with available capacity in nearby states New York⁵ and Pennsylvania⁶. While it is possible that a few of the 26 states with a net import of MSW in 2005 would fill their existing capacity without establishing additional capacity, it seems unlikely that out-of-state landfill capacity would completely dry-up.

The continued existence of landfill capacity appears likely considering that every state except Connecticut and Massachusetts relies on landfills for disposal more than on waste-to-energy. Based on estimates published by Biocycle magazine in the 2006 State of Garbage survey, only 12 states use waste-to-energy to dispose of more than 10 percent of generated MSW. Reliance on landfills is dramatically higher than on waste-to-energy facilities, as every state except Connecticut and Massachusetts uses landfills to dispose of more than 35 percent of generated MSW. Based on these figures, it seems safe to assume that out-of-state landfill capacity will continue to be available for at least the next 20 years.

What is far less known is the cost of out-of-state landfill usage. Out-of-state disposal costs are primarily driven by the two factors: the actual "at-the-gate" fee for disposal, and the

² Congressional Research Services, *Interstate Shipment of Municipal Solid Waste: 2007 Update*

³ In descending order of total MSW tonnage imported: Pennsylvania, Virginia, Michigan, Indiana, Wisconsin, Illinois, Oregon, Georgia, New Jersey, Ohio, South Carolina.

⁴ Washington D.C. and Ontario, Canada exported more than 500,000 tons of MSW each to U.S. states, but are left out of the state comparisons that follow.

⁵ The New York Department of Environmental Conservation's website indicates that there are 27 active MSW landfills with approximately 226 million tons of permitted capacity remaining, enough for over 28 more years at current rates, which include import from CT.

⁶ In a 2002 draft Solid Waste Management Plan, the Pennsylvania DEP indicated that there were at least 10-15 years of landfill disposal capacity remaining at the 49 permitted landfills. Since that time, there has been landfill expansion including at least 1 additional landfill being permitted.

cost to transport the material to the facility. The cost of landfilling will increase as the value of land increases. Relatively low land prices in the Mid-West and West are partially responsible for the creation of several very large landfills. If the relatively close landfills in Pennsylvania, Virginia, and Ohio either close or raise their tip fees, then MSW may be transported further West or South, raising the cost of transportation. A further examination of costs will be provided in Section III.

For the purposes of examining long-term sustainability, it is important to note that transportation may be the most volatile component in assessing all long-term projections. Regardless of the method of disposal, all major waste services are dependent on waste transportation systems. The major point to be aware of is that a self-sufficient system would be less dependent on transportation primarily because the distances traveled are expected to be smaller in a closed in-state system than in a system that transports waste out-of-state.

Recycling

The sustainability of recycling is much harder to define than for disposal options. Under the criteria set for disposal sources, the current recycling system appears sustainable. That is, the recycling system is capable of handling the recycled material generated at current recycling rates while accounting for growth. Another way to look at recycling is disposal mitigation. For its role in the overall waste stream (i.e., diversion from disposal), the sustainability of the recycling system is far less certain.

The following discussion will look at the recycling system as an independent component and then as a piece of the larger MSW services system. In both cases, sustainability of the recycling system will be examined only on an in-state basis. As nearly all major recycling is done using in-state infrastructure, there does not seem to be a need to examine the availability of recycling capacity elsewhere.

Recycling component taken by itself is sustainable. The majority of recyclable material is a combination of paper and containers (i.e., bottles and cans), and the processing facilities for these materials (IPCs) currently operate far below capacity.

As seen in Table II-1, in FY 08, approximately 516,000 tons of paper and containers were processed at IPCs, or about 1,400 tons per day. The six currently operating IPCs⁷ have a combined permitted daily capacity of 4,000 tons per day, meaning that current usage is around 35 percent of permitted capacity. Using the 1.6 percent inflation suggested in the SWMP and the FY 08 numbers, we estimate that there will be approximately 732,000 tons of paper and containers to be sorted in FY 30. These predictions estimate that if recycling rates remain stagnant, the IPC capacity will continue to be underused.

⁷ The IPC in Groton has ceased operation since the briefing in October 2009.

	Total Permitted Capacity	FY 2008 Use	FY 2030 Projection
Per Day	4,000	1,400	2,000
Per Year	1,460,000	516,000	732,000
Percentage of Capacity	-	35.0%	50.0%

According to the interim results of the waste characterization study performed by DEP, 52.6 percent of disposed waste is paper, plastic, metal, or glass. Between 15 and 20 percent of disposed waste is paper, plastic, metal, or glass that is not currently able to be or required to be recycled. Assuming that recyclable paper and containers constitute approximately 30 percent of the current 2.86 million tons of disposed waste, nearly 860,000 tons of recyclable material are currently being burned or landfilled, an amount equal to what was actually diverted in FY 2008.

If nearly all of these recyclable materials were pulled out of the waste stream and sent to IPCs along with the material already processed there, the total tonnage of recycling would be 1.38 million tons, still under the permitted capacity of existing facilities. Additionally, removing all the currently recyclable materials would temporarily eliminate the disposal capacity shortfall that the state experienced in FY 2008; however the state would experience additional capacity shortfalls if overall waste generation increased annually as expected.

Current recycling practices are not sustainable in the overall MSW system. Viewing recycling as a separate component may over-simplify the situation. While recycling for its own sake has some merit, most recycling requirements were put in place in order to divert MSW from disposal. In Connecticut, mandatory recycling was intended to decrease the amount of waste being disposed and to date the results have been somewhat successful. The adopted waste management hierarchy puts both recycling and its subcategory composting ahead of disposal methods. The implications of the hierarchy is that more should be recycled or composted than disposed, but, as seen in Table II-2, this is not the case.

	Hierarchy Rank	Actual Usage Rank*	2008 Tonnage
Recycling	2	2	562,504
Composting	3	4	343,698
Resources Recovery	5	1	2,110,855
Landfill	6	3	424,798

*Actual Usage Rank does not include the other items listed in hierarchy (i.e., source reduction, bulky waste recycling, or incineration).
Source: DEP

Currently, significantly less MSW is recycled or composted than is disposed. From this basic measure, it appears that the current use of recycling systems is not in line with state policies and goals. The picture of recycling may not be complete as the recycling and

composting amounts are likely understated because it does not capture reuse or home composting. Even if the unaccounted tonnage of recycling were enough to make recycling the predominant waste stream, landfill usage will likely increase in parallel to the in-state capacity shortfall.

The state and most municipalities have arguably achieved the original recycling goal of 25 percent, but have failed to approach the revised goal of 40 percent that took effect in 2000. Besides the mandate to recycle, there is also an economic incentive to recycle. In Connecticut, a ton of material that is recycled instead of disposed of can save a municipality, hauler, or resident from \$40 to \$93. That material goes unrecycled in a waste system where there is economic incentive and statutory requirement to recycle suggests that the current system is neither efficient or sustainable.

A sustainable recycling system should limit the effects of waste generation growth. There are two main approaches to absorb the additional waste in the recycling system instead of the disposal stream. One is to remove currently recyclable materials that are not separated from the disposal stream and the other is to find ways to recycle additional types of materials. These two methods and their occurrence in Connecticut are discussed below.

Removing designated recyclable items from the waste stream. Under state law, the items that are required to be recycled are: corrugated cardboard, glass food containers, metal food containers, leaves, newspaper, office paper (non-residential), scrap metal, batteries (lead acid and nickel cadmium), and waste oil. Some of these items, such as paper and containers, are commonly collected at the curb for residents. Others, such as batteries and waste oil, have special programs for their collection. Some of each type of recyclable material still make it into the disposal stream. Given that increasing diversion can help reduce the statewide disposal capacity shortfall while saving money on disposal, efforts to further eliminate items that are required to be recycled from disposal should be integral part of a sustainable recycling system.

Finding uses and markets for new wastes. What makes a material “recyclable” is largely defined on whether there is a market for the discarded item. The markets for various waste items, along with the composition of MSW, have changed significantly since mandatory recycling was instituted. Since 1991, the state has added one item to its recycling list, nickel cadmium batteries in 1996⁸. However, in that same time frame, both use and voluntary recycling of several materials has occurred, most notably plastic bottles and various types of paper.

Plastics. Recently additional plastics, those labeled three through seven using the voluntary resin identification system, have been added as acceptable recyclable material at a number of IPCs. Industry personnel that encouraged the acceptance of these additional plastics indicated that not only did they expect additional recycling tonnage from the new materials, but that by allowing a larger range of recyclables, waste generators may have less confusion about what can be recycled, leading to further tonnage gains.

Paper and containers. As noted above, there appears to be approximately 860,000 tons of paper and containers that are disposed of instead of being recycled. This figure includes both

⁸ Though not designated as recyclable, grass clippings were banned from incineration or landfill in 1998.

items that are currently required to be recycled as well as many materials that are acceptable as recyclable. Removing just those items which are already able to be recycled would virtually eliminate the in-state disposal capacity shortfall experienced in FY 2008.

Composting. Composting has two main areas, yard waste (i.e., leaves, grass clippings) and food waste (i.e., plant matter, fats and greases). Both yard waste and vegetable matter are specifically mentioned in the solid waste hierarchy, however yard waste is the better developed composting area. Leaves are part of the mandatory recycling list, and grass clippings are specifically excluded from disposal at solid waste facilities other than a composting facility⁹. Indeed, many towns provide yard waste collection services, and some have a compost site for residential drop-off of yard wastes.

The mandatory recycling statutes make mention of food containers, but there is no such mention of the food itself. There are currently no requirements that food be composted, either at home or at a designated facility. In fact, there is only one large-scale food waste composting site in the state.

Faced with a relatively well-established infrastructure including specific mention in law for yard waste composting and a negligible infrastructure for food waste composting with no legal requirement, it is expected that food waste has a greater presence in the disposal stream than yard waste. Indeed, the interim results of the DEP's waste characterization study indicate that 14.5 percent of the waste stream by weight is food waste, while leaves and grass amount to only 1.4 percent.

It is difficult to measure how much home composting is happening for either yard waste or food waste, but the relative ease of yard waste composting techniques such as "grasscycling" seems to help keep grass clippings out of the disposal system.¹⁰ DEP estimates that over 40,000 tons of waste was home-composted or grasscycled in FY 2008.

⁹ C.G.S. Sec. 22a-208v.

¹⁰ "Grasscycling" is the reduction of waste by leaving grass clippings on the lawn after mowing.

Section III

Reasonable Cost

One aspect of the scope of this study calls for a review of whether municipal solid waste management services are available at a reasonable cost in Connecticut. Basic economic theory states that reasonable costs are obtained in a competitive market environment.¹ The market economy is based on the belief that through competition a consumer's wants will be satisfied at the lowest price while using the fewest resources.

The focus here is on understanding more about the market for municipal solid waste collection and disposal at RRFs in Connecticut. Findings about costs in collection and disposal services are offered, while the next section of this report presents options on how the state can influence the market and ultimately costs. This section provides an overview of the basic economics of the collection and disposal markets, an analysis of the collection services market in Connecticut (to the extent information is available), a summary of nationwide tip fees for disposal, estimates of the costs of out-of-state disposal, and cost comparison of disposal services obtained by municipalities that were members of the two RRFs that have or are in the process of reverting to private ownership.

Overall, based on the analysis provided below, it can be concluded that both collection and disposal service pricing will be affected by supply and demand for those services and both sets of markets exhibit certain barriers to market entry for new vendors. The barriers in the disposal market, though, are significant and can raise concerns about impacts on reasonable costs. In addition, with regard to *collection services* program review staff have found:

- though there is an absence of comprehensive data to analyze the MSW collection market in Connecticut, the potential exists for improper pricing of collection services due to a lack of competition; and
- illegal anti-competitive practices by haulers have been uncovered recently in Connecticut and various legislative proposals to address this issue have failed.

Further, based on the discussion and analysis provided below regarding *disposal services*, program review staff have found:

- landfills are a less expensive MSW disposal option than RRFs, but Connecticut has no appreciable MSW in-state landfill space to compete with RRF disposal;

¹ The description of economic theory in the overview is largely derived from Paul A. Samuelson and William D. Nordhaus, *Economics*, (Boston: McGraw-Hill/Irwin, 2005) and *Some Basic Concepts of Market Power for State Public Utility Commissions to Consider*, Kenneth Costello, National Regulatory Research Institute, July 2009.

- competition for in-state disposal services is limited. Competition for disposal services may be found in exploring out-of-state landfill options for certain municipalities or through the use of short-term, in-state spot market contracts, but both options carry risks;
- most of the towns that were part of the Bridgeport and Wallingford projects preferred reentering into contracts with the previous disposal facility over requesting competitive bids;
- comparing average tip fees paid by municipalities before and after CRRA affiliation with the Bridgeport and Wallingford RRFs is complex. Generally speaking, new tip fees charged by privately-owned RRFs are not significantly different from the prices charged under CRRA agreements for comparable disposal services to municipalities;
- privately owned and operated in-state RRFs have offered contract terms that are comparable to, if not less than, those offered by out-of-state disposal options and regional RRF tip fees;
- without access to the private vendors' costs of services it is unclear if the fees paid for disposal by CRRA to these same operators, while the plants were affiliated with CRRA, represented reasonable and competitive costs; and
- it is unknown what the longer-term trend in market competitiveness will be like because the Connecticut disposal market appears to rely on the nearest out-of-state disposal sites to provide competition to the only two operators of RRF disposal services in Connecticut.

Economics Overview

It is important to understand why competition in the waste management market or any market is important in assuring reasonable cost for consumers. The discussion below highlights how prices are influenced through supply and demand and how competition is supposed to operate. If the market is not competitive, questions can be raised about whether government action is needed.

Supply and demand. In perfectly competitive markets prices are set according the principle of supply and demand. Generally, an increase in demand for a service will raise the price of the service and a decrease in demand will have the opposite effect. On the other hand, an increase in the supply of a service will lower the price but a decrease in supply will raise it.

What are some of the factors that influence the price of MSW services in terms of supply and demand? The overall market for disposal services in Connecticut can be used as an example to illuminate the theory. Certainly a business such as an RRF needs to cover its fixed costs. Because the private marketplace demands a return on its investment, the concern from a public policy standpoint is that facilities, delivering a critical and necessary public service, will charge whatever the market will bear rather than just what they must charge to cover costs and a reasonable return on investment. Generally speaking, the market for solid waste disposal can be influenced by the following:

- **The amount and availability of municipal solid waste generated (demand for disposal services).** Municipalities are responsible for finding someplace to dispose the MSW generated within their boundaries and need to buy disposal services (or have a hauler buy it for them). As noted in Section I, the amount of waste being generated in Connecticut has been increasing, so demand for disposal capacity/services has been increasing.
- **The number and type of disposal options available (supply of disposal services).** Connecticut has effectively only one type of in-state disposal option – resources recovery facilities. There are currently six RRF plants in Connecticut with four owners (two public, two private) but only two operators of the six plants (all private). Landfills as a disposal option are cheaper but are difficult if not impossible to build in Connecticut. A key problem is that this scarcity of disposal options within the state puts municipalities at a disadvantage because MSW is being generated at a rate over the capacity of the RRFs. For the most part, they are purchasing disposal services in a limited capacity in-state disposal market. The exception to this is that during the price dip that is often experienced in the spot market typically during the low volume winter months, disposal fees at RRFs can be lowered significantly. However, most municipalities sign up for long-term contracts and are not able to take advantage of this seasonal dip in price. RRF ownership and barriers to market entry are described in more detail below.
- **The distance to each disposal option (transportation costs).** An element in defining the availability of viable disposal options is the distance to those alternative disposal providers. A major consideration in the overall cost of disposal is the price to get MSW to the disposal site. Generally, the closer the disposal options the less costly and more competitive it can be, depending on how close the nearest competitor is. Disposal alternatives at a further distance are subject to higher transportation costs and the volatility of fuel costs. The feasibility of out-of-state options will be discussed later in this section.

The principle of supply and demand also applies to collection services. The more

suppliers there are the more competitive prices will be. An analysis of collection services is provided further below.

Barriers to competition. Economists define markets along a continuum from perfect competition to imperfect or monopolistic. A perfectly competitive market is one where, among other factors², no firm is large enough to affect the market price; that is, prices are set by aggregate supply and demand and there are low profit margins. An imperfect market is where the sellers have some degree of influence over the price of their product; the extreme form is a monopoly where the seller has complete control over the price. Thus, in an imperfect market, a firm is said to have market power when it can set a price above competitive levels for a sustained period of time without a substantial loss of sales. Vigorous disagreements exist in the legal and economic arenas over the prevalence of market power, how to measure and detect it, and how to mitigate it.

Few, if any, markets are perfectly competitive. Concerns, though, are raised by the degree of imperfection and whether market power is being used to cause substantial harm to consumers. Historically, governments have implemented measures that have curbed the most extreme forms of imperfect competition. Governments have regulated the price and profits of certain monopolies, such as utilities, and have enacted antitrust laws to prohibit various forms of price fixing.³

Ideally, a competitive price should match a company's fixed costs and a "normal" profit (i.e., marginal cost). In a perfectly competitive world, companies could only set prices above their marginal cost for a short period of time before they lose customers to lower priced competitors or until new firms enter the market. Therefore, a major source of market imperfection is a high barrier to entry. These barriers include but are not limited to large capital requirements, sunk costs, excess capacity, strategic pricing, product differentiation, government regulation, and economies of scale.⁴ When there are a number of restrictions to entry, the number of competitors will be limited and they will have a tremendous amount of influence over pricing.⁵ A natural monopoly, such as a utility distribution system (e.g., water, gas, and electric lines), is an example that is often used to illustrate this, where one company can serve the market a lower cost than is achievable with two or more companies.

Barriers to entry for waste collection. To a certain extent, the barriers to entry for the waste collection business are relatively low, compared to other elements in the solid waste

² Equal access to accurate information about the market is another key element of a perfect market. Lack of accessible information is discussed further in the data management recommendations.

³ Also, government has a recognized role in regulating spillover effects (when economic activity imposes costs not paid for in the marketplace, such as pollution) and in the provision of public goods (commodities which can be enjoyed by everyone and from which no one can be excluded, such as public health). These roles, though present, are not explicitly covered here.

⁴ Economies of scale refer to the increase in efficiency of production as the number of goods being produced increases. Typically, a company that achieves economies of scale lowers the average cost per unit through increased production since fixed costs are shared over an increased number of goods.

⁵ A situation where an industry is dominated by a few number of suppliers is called an oligarchy

system. However, as collectors seek to expand their business more barriers present themselves. There are generally no proprietary techniques involved in waste collection, financing is not that difficult, and government regulation is limited. Of course, costs will vary with the type of service, type of collection vehicle, labor rate, and the characteristics of the collection area.

Certainly starting out with a one-truck collection operation may not be that difficult. However, in order for a small operation to grow and be competitive additional significant barriers can be present. For example, ramping up of production usually has additional costs and risks especially when moving to servicing a municipality with a fleet of trucks and personnel. For a new hauler looking to build commercial accounts, there are often additional barriers to entry, such as a need for route density, the practice of incumbent haulers using long-term contracts sometimes with restrictive terms (e.g., automatic renewal), and the ability of existing firms to lower prices temporarily to discourage new entrants.

Barriers to entry for disposal services. Nationally, the market for disposal has been described as the least competitive part of the solid waste industry.⁶ Promulgation of new federal requirements regarding landfills in the late 1980s and early 1990s led to changes in environmental practices and business models for solid waste disposal. One result was that the number of landfills nationwide have been reduced significantly, though the capacity increased as the industry shifted toward more large scale operations. The changes have led to more concentration of landfill ownership in the overall MSW disposal market. Landfills are the predominate form of disposal in the nation, but play very little role in Connecticut.

Vertical integration of waste management services (collection, hauling and disposal) has been used as a means to ensure that large volumes of waste could be collected to supply large-scale disposal facilities.⁷ The result of these trends over the last two decades is that the solid waste industry has become increasingly concentrated and dominated by a few large companies.

The two companies providing RRF disposal services in Connecticut are Covanta Holding Corporation and Wheelabrator Inc. Wheelabrator Inc. is a wholly-owned subsidiary of Waste Management Inc., which is the largest waste management company in the country. Waste Management, through its subsidiaries, provides the full range of integrated services including collection, transfer, recycling, disposal, and waste-to-energy services. Covanta operates 40 waste-to-energy plants throughout the country, including four of the six RRFs in Connecticut.

Aside from the trend in the increasing concentration of ownership, both landfills and resources recovery facilities have high barriers to entry. Some barriers to consider:

- *Government regulation.* As noted in the briefing, a number of federal, state, and local, environmental, zoning, and permit laws and regulations dictate

⁶ *Meeting the Challenge – ensuring Capacity for Connecticut’s Municipal Solid Waste And Recyclables in Changing Market Conditions*, Gershman, Brickner & Bratton, Inc. February 27, 2007

⁷ Molly Macauley, *Waste Not, Want Not, Economic and Legal Challenges of Regulation-induced Changes in Waste Technology and Management, Resources for the Future*, Discussion Paper, June 2009

critical aspects of storage, handling, processing, and disposal of MSW at RRFs and landfills. Obtaining a permit to construct a new disposal facility or expand an existing one is a costly and time-consuming process that typically takes many years to conclude. The Lisbon plant, for example, was the last RRF to be permitted in Connecticut and that took nearly a decade to permit and construct.

- *Capital costs.* The capital costs of building a large RRF plants have been estimated to be about \$500 million. Further, it is also difficult and costly to satisfy and overcome environmental concerns and other government requirements.
- *Public opposition.* Local public opposition often increases the time and uncertainty of successfully permitting a facility. CRRA's recent attempt to build an ash landfill in Franklin is a prime example of public and legislative opposition defeating a proposal to develop an ash residue disposal option.

One government-imposed barrier particularly worth noting is the determination of need requirement in Connecticut that was established after five of the six RRF plants were in operation. Before a permit to build or expand an RRF, a mixed MSW landfill, or an ash landfill can be issued, DEP must find that a need exists for such a facility or expansion and such a facility or expansion will not result in "substantial" excess disposal capacity in Connecticut. This is contrary to the principals of supply and demand. Excess capacity tends to drive prices down.

Essentially, the DON requirements make it impossible for a competitor to enter the market unless there is substantial excess MSW to be disposed. However, it is likely that existing companies will try to expand before a new competitor enters.

Thus, in-state disposal services clearly appear to have high barriers to entry that could raise concerns regarding what impact they have on fair and reasonable pricing for services from existing providers.

Collection Services

Under state statute, each Connecticut municipality must "make provisions for the safe and sanitary disposal of all solid wastes generated within its boundaries." It is not entirely clear what "make provisions for" means because, similar to other locally provided services, MSW collection practices can vary tremendously among municipalities. Solid waste collection involves the provision of a service that can be provided through the use of various systems. The most common approaches include the following:

- *Municipal collection* - a municipal department uses its own employees, fleet

of vehicles, and other equipment to collect solid waste and determines its level of service;

- *Municipality contracts with private collector* - a municipality contracts for a specific level of service with a private provider to collect waste. A variation of this can be through the use of franchise agreements, where a municipality awards contracts for the right to collect solid waste within specific geographical boundaries;
- *Municipal drop off*- a municipality provides a drop off station to which residents bring their trash. The aggregated waste is then transported for disposal en masse;
- *Resident contracts with private collector (also called private subscription)* – residents directly pay and contract with private trash collectors. Some communities using this approach give residents the complete freedom to choose haulers and the level of service provided; and
- *Combination* – some municipalities may use a combination of public and private options for collection services.

As mentioned earlier, market power signifies the degree of control a single firm or a small group of firms have over the price and production decisions in an industry. One approach to understanding any market and the potential of any firm to exercise market power is to examine market concentration. This type of analysis is performed in anti-trust enforcement. However, there is not enough readily available information about the number of collection companies operating in Connecticut or about their corporate relationships to perform a formal market concentration analysis. As noted in the briefing, the level of competitiveness in the solid waste collection industry in Connecticut is difficult to readily ascertain because the state does not separately license or require registration of municipal solid waste collectors with one agency. This fact makes developing any information about collectors in Connecticut difficult, including the basic information as to how many there are.

In this study, program review staff used a simple, though not comprehensive or definitive, approach to try to obtain an indication of potential competitive issues that could lead to improper pricing of curbside collection services. Using DEP survey data, staff categorized Connecticut municipalities by different collection types. The different collection types are noted above. Two collection types that are of interest here are the ones that would be subject to the open competitive market- they are: 1) municipalities that only provide for private subscription for collection services (i.e., resident is responsible); and 2) municipalities that have a contract with a private company for collection services. *As discussed below, in both cases program review staff find the potential for noncompetitive pricing for curbside collection due to a lack of*

bids or actual collectors in 15 towns.

Municipalities with private subscription. To understand the amount of competition within municipalities that only provide for private subscription services, program review staff used two approaches. One approach was to compare existing town-provided DEP survey data on the number of collectors per town within those municipalities. The other approach was to survey a small sample of these towns to confirm the data and determine how many collectors the towns had. Based on those two approaches, it was determined that:

- According to DEP data, there are at least eight towns that rely on private subscription services that have only one hauler identified within their town. The number could be larger because the question in the DEP survey did not ask towns to identify what type of collector was on the list, nor did all towns respond to the question or the survey. Specifically, 27 towns who had private collection did not respond and 14 towns did not identify the type of collection service they had.
- Based on the small sample survey of private subscription towns (11),⁸ PRI staff found:
 - two towns identified only one hauler each for residential curbside service;
 - five towns identified two haulers each for residential service;
 - the remaining five towns each identified 3 to 31 haulers. Some of these haulers also service commercial customers, but in most of the towns surveyed, there are haulers who only provide commercial hauling;
 - in all of these towns, residents have the option of bringing their MSW directly to a transfer station;
 - most towns noted they had a list of haulers, while two towns did not know, and two said they did not. It is unclear how the statutory hauler registration requirement is being implemented.

Municipalities that contract with a private collector. Program review staff sent a survey to 47 municipalities that were each identified as having a contract with a private vendor to collect MSW to determine how competitive the bidding was for those services.⁹ Twenty-two towns responded to the survey. Among other things, the survey asked the towns to identify the name of all the companies that submitted bids during the last bid process. In addition, the survey asked the respondents if they felt the bids for residential collection were competitive. The survey results indicated that:

⁸ Brooklyn, Essex, Greenwich, North Stonington, Plymouth, Prospect, Simsbury, Somers, Wallingford, Watertown, Weston, and Woodbridge

⁹ The DEP survey identified 50 municipalities that contract with private collection services; however three municipalities were later identified as either having municipal collection or private subscription services only.

- of the 20 municipalities who answered a question regarding the number of bids submitted for collection services, seven towns received only one bid. Again, this could be underestimating the prevalence of one-bid towns because 25 towns did not respond to the survey; and
- eight of 18 respondents felt that the bids received were not competitive; most cited the receipt of a single bid as the primary reason.

As noted in the briefing, Connecticut has had problems with collectors trying to monopolize the MSW collection business. A recent criminal investigation and prosecution between 2003 and 2008 by the federal government revealed an extensive price fixing scheme or “property rights system” in the collection business in western Connecticut as well as Westchester and Putnam Counties in New York resulting in the arrest and conviction of 33 individuals. The investigation centered on James Galante, who controlled 25 trash hauling and related companies, including a transfer station in Danbury. It is important to note that Galante did not act alone, as several other companies in Connecticut and in eastern New York also participated in the system to eliminate competition.

In the wake of these revelations, Governor Rell requested that the commissioners of the Departments of Public Health, Consumer Protection, Environmental Protection, and Public Safety and the Office of the Chief State’s Attorney form an advisory group regarding solid waste hauling. A bill to create a solid waste commission based on the advisory group’s recommendations (HB 7092) and a similar bill to license solid waste haulers (SB 1288) in 2007 did not pass. At least four bills have been introduced in the last two years that would require the licensing of haulers either by DEP or the Department of Consumer Protection as well as imposing other regulatory requirements, but none have passed.¹⁰

As noted in the briefing, since the arrest of Galante, the competitive situation for collection services in the Housatonic region has changed. The Galante-owned hauling businesses controlled at least 57 percent of the market share of MSW in the Housatonic region in 2006, according to the Housatonic Resources Recovery Authority.¹¹ This understates his influence because it does not include the other solid waste collection companies who participated in the property rights scheme but were not owned by Galante. Since 2006, the control exercised by the Galante businesses, which are now run by the federal government, has declined to about 47 percent of the market share. These businesses, though, still control over 50 percent of the hauling in four of the 11 towns in the region.

Disposal Services

The expiration of municipal contracts that have tied most of Connecticut’s municipalities

¹⁰ In 2008 -- SB 522, SB 137; In 2009 -- SB 918, SB 324

¹¹ HRRRA is an eleven-town regional authority responsible for MSW disposal and recyclables.

to a particular RRF for disposal for 20 or more years presents opportunities and risks. It is an opportunity for municipalities to change the way they have been approaching MSW disposal, to try to lower costs, and improve or change their level of services. The risks involve the unknowns for municipalities, haulers, and RRFs in changing that approach by selecting a different disposal option. A primary question, though, is whether the market for disposal in Connecticut is competitive.

To try to answer that competitiveness question, program review staff analyzed information from three different sources to put municipal costs and choices in context. First, there is an overall examination of tip fees for RRF and landfill disposal nationwide to see how the Northeast compares. Secondly, a review of the potential out-of-state market options is presented. Finally, two case studies are used to illustrate what has actually happened in towns that have or are going through a transition in ownership (as well as contractual relationships) for two RRF projects in Bridgeport and Wallingford.

There are three caveats to keep in mind regarding cost comparisons. The first has to do with what costs tip fees contain. The basis of most cost comparisons for disposal is usually expressed as a tip fee on a per ton basis. Tipping fees are typically a charge on waste handling or disposal. They are based primarily on the operating and administrative expenses of waste disposal. But they can include a range of costs and services that make comparisons difficult. For example, as will be noted in the CRRA pricing, some tip fees also include subsidy for recycling and other waste management activities. PRI staff have tried to adjust costs as much as possible to make accurate comparisons.

Second, PRI staff do not have access to actual costs of service or the true fixed costs of disposal, or necessarily all the revenues generated by RRF plants, making a true assessment difficult. For example, CRRA receives bills for disposal services from private providers but not an indication of what the actual cost of those services are.

Finally, it should be noted that some fixed costs, such as operating a transfer station, could be included in the tip fee and affect viable cost comparisons. When costs are broken down to a per ton basis, the cost for a transfer station can vary based on the number of tons processed versus its capacity, which could tend to skew results. For example, the city of Norwalk, as discussed further below, has a transfer station that is capable of processing nearly 100,000 tons of MSW per year. The cost to run the transfer station is \$700,000. If they were processing the full amount of MSW, the cost would be about \$7.00 per ton. The city is currently processing 30,000 tons per year at a cost of about \$23.00, significantly changing the overall cost per ton.

Nationwide Tip Fees Comparisons

The comparisons provided below examine the various tip fees charged for both landfills and RRFs in different parts of the country. *In general, landfills are cheaper than RRFs as a disposal option and the Northeast region tends to be more expensive for disposal than the rest of the country, in part because of the regional scarcity of landfill capacity.*

Landfills: As shown in Table III-1, the Northeast Region (CT, ME, MA, NH, NY, RI, VT) saw average 2004 tipping fees of \$70.53 per ton for landfills in comparison to the 2004 national average of \$34.29. The Northeast was by far the highest region, as the remaining six regions ranged from \$24.06 to \$46.29.¹² Reasons for the higher costs in the Northeast may have to do with the high cost of land, relatively high population density, and a more restrictive regulatory environment. In states where there are large amounts of level land, the price of land is low and it is relatively easier to construct landfills.

Table III-1. Landfill Tip Fees (\$/ton)				
Region	2004	2002	2000	1998
Northeast	70.53	69.07	69.84	66.68
Mid-Atlantic	46.29	45.26	45.84	44.11
South	30.97	30.43	30.53	30.89
Midwest	34.69	34.14	32.85	30.64
South Central	24.06	23.28	21.90	21.02
West Central	24.13	23.40	22.29	22.51
West	37.74	38.90	34.54	36.08
National	34.29	33.70	32.19	31.81
Regions: Northeast: CT, ME, MA, NH, NY, RI, VT Midwest: IL, IN, IA, MI, MN, MO, OH, WI Mid-Atlantic: DE, MD, NJ, PA, VA, WV South Central: AZ, AR, LA, NM, OK, TX South: AL, FL, GA, KY, MS, NC, SC, TN West Central: CO, KS, MT, NE, ND, SD, UT, WY West: AK, CA, HI, ID, NV, OR, WA				
Source: Edward W. Repa, <i>National Solid Wastes Management Association's 2005 Tip Fee Survey</i> , NSWMA Research Bulletin 05-3, March 2005.				

Comparatively speaking, RRFs are generally more expensive for disposal than landfills. According to the National Solid Waste Management Association's latest tip fee survey, in 2004 the average RRF tip fee nationwide was about 80 percent higher than the average landfill tip fee (\$61.64 per ton versus \$34.29). Table III-2 shows the range for 2006 RRF tip fees among nine states from a survey conducted by BioCycle magazine. The range is from \$36 per ton (Minnesota) to \$98 per ton (Washington). Connecticut's tip fees for RRFs ranged from \$57 to \$74 per ton in 2006.

¹² The latest landfill tip fee survey found in the publication *State of Garbage in America*, Biocycle, December 2008, was for 2006 and the average tip fee per ton for the nation was calculated to be \$42.08, with a reported range of \$25 (Montana) to \$96 (Vermont). The survey is not comprehensive because not all states reported tip fee information.

Table III-2. Resources Recovery Facilities Tip Fees 2006 (\$/ton)		
State	# RRF Plants	Average Tip Fee
Florida	11	\$53
Iowa	1	64
Massachusetts	7	71
Minnesota	9	36
New Jersey	5	80
New York	10	71
North Carolina	1	52
Washington	3	98
Wisconsin	2	59

Source: *State of Garbage in America*, BioCycle, December 2008.
Note: Eighteen states that collectively have 54 RRF plants did not report any information on tip fees

Other information, found in Appendix A, compiled for Covanta and provided to the committee shows the range of RRF tip fees by region. In general, the data show the tip fees for RRFs can go as low as \$12 to \$28 per ton in the South and Midwest areas of the nation and as high as \$98.00 in the West. Covanta notes that the \$12 tip fee is an unusual situation and is offset by the incineration of higher cost special wastes, like medical waste. Similarly, Wheelabrator Inc. has provided selected RRF tip fees for their Massachusetts and New York RRFs. The tip fees range from \$64.00 to \$71.50 per ton.

Out-of-State Market

A key question in any competitiveness analysis is how large is the relevant market for MSW disposal generated in Connecticut. As noted earlier, because the current amount of waste generated in Connecticut exceeds the current disposal capacity of the state's RRFs, out-of-state disposal may represent the only real competition.

Summary of current in-state disposal via RRFs. All six operating resources recovery facilities in Connecticut started commercial operation within a seven-year period from 1988 through 1995. Table III-3 shows the order in which they began commercial operation along with the years their bonds have been or will be paid.

Facility	Commercial Operation Date	Year Bonds Fully Paid	Current Operator
Bristol Resource Recovery Facility	May 1988	2014	Covanta
Bridgeport Resources Recovery Project	July 1988	2008	Wheelabrator
Mid-Connecticut Project (Hartford)	October 1988	2012	Covanta/MDC
Wallingford Project	May 1989	2009 (FY)	Covanta
Southeast Project (Preston)	February 1992	2015	Covanta
Wheelabrator Lisbon Waste-to-Energy Facility	1995	2020	Wheelabrator

Source: PRI

The Bridgeport, Mid-Connecticut (Hartford), Wallingford, and Southeast (Preston) projects were financed with CRRA revenue bonds. The Bristol and Lisbon facilities were financed with municipal-connected bonds.

Each facility's ownership is determined by complicated agreements entered into many years ago, both financial and otherwise. As described further below, two facilities have changed or are in the process of changing ownership. One facility's ownership (Southeast Project) could transfer to private ownership in either 2015, or 2018 if certain options to extend are exercised. One other facility agreement (Bristol) allows the authority to purchase the facility for fair market value when the bonds are repaid in 2014 or to extend the agreement. The current status of each facility is summarized below:

- three facilities will be or are privately owned (Bridgeport, Southeast, and Wallingford, representing 48 percent of overall RRF capacity);
- one facility will continue to be privately owned unless the authority involved exercises its option to purchase at fair market value (Bristol, representing 9 percent of overall RRF capacity); and
- two will be owned publicly by authorities (Mid-Connecticut and Lisbon, representing 43 percent of overall RRF capacity).

Concerns have been raised about the amount of Connecticut's RRF capacity (48 percent to potentially 57 percent) in the hands of the private sector, including the specter of private operators raising prices with little consequence and of not serving Connecticut communities. This is especially of concern since there are not any other viable in-state disposal options other than RRFs.

Outlined below is a discussion of the potential out-of-state regional disposal market,

identification of actual bid quotes for municipalities looking for out-of-state options, and descriptions of how municipalities in two original CRRRA resources recovery projects (Bridgeport and Wallingford) have to date handled the transition to private ownership and what that reveals about competition for disposal services.

Out-of-state market cost estimates. Estimating the cost of out-of-state disposal of MSW involves three costs; the costs to construct and operate a truck-based or rail-based transfer station, the costs to transport the waste from the transfer station to the landfill, and the actual disposal or tip fee. There have been two fairly recent analyses performed on the cost to transport MSW from Connecticut to various landfills in the region. One was performed by a consultant for DEP and the other was performed by a different consultant on behalf of the South Central Regional Council of Governments (SCRCOG). These are not actual quotes from trucking or rail haul companies but estimates developed by experts.

Road haul. Table III-4 shows the estimated costs found in the two reports to transfer and transport waste by truck to various out-of-state landfills from three different towns in Connecticut. The reports made a few different assumptions regarding transportation by truck that alter the outcomes. For example, DEP's estimated disposal tip fees tend to be higher; the SCRCOG report has assumed a better rate based on a longer-term contracts being signed by municipalities. Also, the assumed transportation cost per mile is different -- DEP's estimated about .14 cents per mile, while the SCRCOG report assumes .23 cents per mile. Finally, DEP's estimate assumes the hauler will find something to bring back ("backhaul") after the load is deposited at the landfill to subsidize the cost. For comparison purposes, the one way costs for one town and the round-trip costs for the same town based on DEP's estimate are provided. *The analysis suggests that for certain municipalities who are paying in the \$80 per ton or more range for disposal an out-of-state disposal option is viable under certain conditions.*

Table III-4. Estimated Costs to Transfer MSW to Out-of-State Landfills				
	DEP's Estimate/Ton One Way (Danbury)	DEP's Estimate/Ton One Way (Putnam)	DEP's Estimate/Ton Round Trip (Putnam)	SCROG's Estimate /Ton Round Trip (North Haven)
Seneca Meadows (NY)	\$80	\$82	\$125	\$180
High Acres (NY)	\$82	\$85	\$131	\$278
American (OH)	\$102	\$97	\$190	\$277
Alliance (PA)	\$63	\$80	\$118	\$117
Conestoga (PA)	\$77	\$85	\$128	\$136
Middle Peninsula (VA)	\$86	\$98	\$164	\$229
All estimates include transfer, hauling and disposal costs Higher end costs were used for DEP estimates if a range was presented. Source: State of Connecticut DEP, <i>State Solid Waste Management Plan</i> , December 2006 and South Central Regional Council of Governments, <i>Future of Regional Solid Waste Disposal...</i> , RS Lynch and Company, January 30, 2009. PRI calculation based on DEP data for the DEP round-trip estimate				

The competitiveness of out-of-state disposal options by long-haul trucking is not clear cut based on the development and analysis of estimates by experts. Based on current in-state RRF disposal rates, both with and without estimated transfer station costs, running between \$60 to about \$85 per ton, the table shows that long-haul out-of-state disposal of waste could be competitive if municipalities only had to pay one-way costs. The most cost competitive disposal options are landfills in Pennsylvania with costs ranging from \$63 to \$80 depending on where the load originates. It should be noted that truck transportation is also very sensitive to volatility in fuel costs.¹³

Rail haul. Another potential lower cost option is to export MSW from Connecticut by rail to out-of-state landfills. Rail transport requires special loading and unloading facilities. Rail transport can be achieved through the use of intermodal containers, direct-loaded into bulk rail cars, or baled (i.e., MSW is wrapped into cubes). Rail car transport becomes more cost effective the greater the distance versus over the road trucking.

There are several benefits cited in regard to rail transportation over trucking.¹⁴ These include:

¹³ Of course, not included in the cost estimates are the additional environmental impacts of truck transportation. As noted earlier, diesel trucks transporting MSW emit five times more particulate matter per ton than if disposed of in local RRFs.

¹⁴ *City of New Haven Solid Waste System*, Malcolm Pirnie, Inc. January 2008

- reduction of traffic congestion by keeping trucks off the highways;
- rail transportation produces almost five times less air pollution than transportation by trucking;
- rail hauling is also safer, from an accident point of view, than truck hauling; and
- a single railcar can carry up to 110-130 tons of waste while a single long-haul truck can only transport about 22 tons.

In the State Solid Waste Management Plan, DEP, with the help of a consultant, developed an estimated range of costs to ship waste by rail from Connecticut to landfills in New York, Virginia, South Carolina, Ohio, and Western Pennsylvania. These estimates are presented in Table III-5.

Table III-5. Estimated Cost Per Ton of Rail Haul to Out-Of-State Landfills from Connecticut, 2006

Landfill	Transfer	Rail Haul	Tip Fee	Total
Virginia	\$7.00	\$48.00	\$25.00	\$80.00
South Carolina	7.00	57.00	25.00	89.00
Ohio	7.00	51.00	30.00	88.00
Western Pennsylvania	7.00	49.00	30.00	86.00
New York, Rochester Area	7.00	39.00	30.00	76.00

Higher end costs were used for DEP estimates if a range was presented.
 Source: State of Connecticut DEP, *State Solid Waste Management Plan*, December 2006

Again, if the current in-state RRF disposal rates, both with and without estimated transfer station costs, are between \$60 to about \$85 per ton, rail haul could be a competitive option (especially to western New York and Virginia) for some municipalities paying tip fees on the higher end of the current range. DEP notes that actual quotes from rail companies or shippers could be lower because of the large volumes of shipments that municipalities generate and therefore could be in a better bargaining position to negotiate better rates. They have estimated the rates could be 10 to 20 percent lower for large volumes of waste.

Recent actual experience. There have been a couple of examples of actual haul-by-rail quotes received by different municipalities in the state. In 2007, the city of Stamford issued a request for proposals for MSW management services. The city received proposals from five

different vendors. The proposals included both in-state and out-of-state disposal options that ranged from \$69 per ton to \$96 per ton. The city selected Transload America to handle its MSW disposal needs. Transload is shredding, baling, and loading solid waste on a flat-bed carrier, and rail-hauling it to a landfill in Ohio. The cost for the three-year rail haul and disposal contract is \$69.00 per ton in 2008, \$76.00 per ton in 2009 and \$79.80 in 2010. The contract has two one-year options to renew. These costs do not include complete transfer station expenditures. In addition, the city operates a transfer station operation and charges \$88.00 per ton for commercially generated municipal solid waste and bulky wastes.

The SCRCOG report mentioned earlier contains references to two quotes received from Transload America. Transload recently submitted a proposal to the New Haven to operate its transfer station, bale the MSW, and transfer and transport the baled MSW to an out-of-state facility for about \$82 per ton. In 2008, New Haven had been paying about \$91 per ton for hauling and disposal at the Lisbon RRF.¹⁵ Transload also estimated that it could provide another SCRCOG community with a transfer station with the same services as New Haven for about \$92 per ton.

Two Case Studies: Municipal Disposal Options Post-RRF 20-Year Contracts

Case Study #1 Bridgeport Project

The Bridgeport RRF project was the first to experience a change in ownership and the end of the original long-term municipal contracts. After a previous unsuccessful attempt to establish a waste-to-energy plant in Bridgeport in the early -1980s, the current plant went into commercial operation in July 1988. By the end of the project, it served 18 towns through long-term disposal contracts. The project consists of two now closed landfills, eight transfer stations, and a 2,250-ton per day mass burn incinerator that converts solid waste into electricity, which is capable of producing 67 megawatts of power.

Wheelabrator Technologies, Inc., the facility operator, took ownership of the plant as of January 1, 2009. The facility was in part financed through CRRA bonds. CRRA held the title to the facility and leased it to a vendor under a long-term, sales-type arrangement until Wheelabrator exercised its contractual right to purchase the plant for one dollar. The transfer stations were originally owned by CRRA, though the land under the transfer stations was owned by the towns and leased to CRRA for one dollar per year. The ownership of the transfer stations reverted back to the towns in which they are located on January 1, 2009. The closed landfills remain the responsibility of CRRA.

Of the 18 towns that formerly had long-term disposal contracts, 12 again signed long-term contracts (although only five years, plus options to renew, compared to the original 20-year contracts) with CRRA to dispose of their MSW at the Bridgeport facility.¹⁶ One town has signed

¹⁵ Ibid

¹⁶ Bethany, Bridgeport, Easton, Fairfield, Milford, Monroe, Orange, Shelton, Stratford, Trumbull, Westport, and

a long-term contract directly with Wheelabrator for disposal at the facility.¹⁷ The remaining five towns issued a request for proposals to find another vendor and no longer have a contractual obligation to dispose of their MSW at the Bridgeport facility, though much of their waste is still disposed there.¹⁸

Below is a description of the previous pricing structure and the different arrangements that occurred after Wheelabrator took ownership of the Bridgeport plant. Complicating the description and comparison are at least two factors 1) the 18 member towns split into different groups; and 2) certain services that were provided under the CRRA contract tip fee were not continued in the new contracts.

Previous tip fees. The basic tip fee is the price paid for MSW disposal. As noted earlier the fee can include a range of expenses and other services that can make comparisons difficult. Bridgeport project towns had a complicated tip fee pricing structure. For at least the last decade, the Bridgeport project towns were charged the highest or close to the highest tip fees in the state. Table III-6 contains the tip fees charged to the Bridgeport project towns from 2005 through the first 6 months of 2009. (The project changed ownership mid-fiscal year in 2009.)

	2005	2006	2007	2008	2009 (first 6 mos)
Tip Fees per Ton	\$64.50/ \$8.00	\$66.00/ \$8.00	\$70.00/ \$8.00	\$76.00/ \$5.00	\$80.00/ \$18.50
Source: CRRA					

The total tip fee for those years had been composed of two elements: a “market component” and a “minimum commitment component.” Using 2009 as an example, each town was assessed a fixed charged by CRRA of \$18.50 per ton for its minimum tonnage commitment (regardless of the number of tons actually delivered), and \$80.00 per ton of MSW actually delivered to the Bridgeport RRF. So, each town would pay \$98.50 up to its minimum commitment, and \$80.00 per ton for each ton in excess of its minimum.

If a town disposed less than its minimum commitment, it would pay \$98.50 per ton for the amount of tons it disposed and would still have to pay \$18.50 per ton for any tonnage not delivered up to the minimum required. As will be shown below, the average actual amount

Woodbridge

¹⁷ East Haven

¹⁸ Darien, Greenwich, Norwalk, Weston, Wilton, and New Canaan, New Canaan was not part of the CRRA Bridgeport project but its disposal contract ended at about the same time as did Norwalk’s.

collected from a town could be higher than the tip fee charged if a town is disposing less than its minimum commitment, as it is still being charged the minimum commitment component. Thus, the actual amount charged per ton would rise.

“The Bridgeport 12.” In mid-2007, the majority of the original Bridgeport project towns asked CRRA to negotiate on their behalf a new agreement with Wheelabrator. Ultimately, the participating towns agreed to pay \$63.00 per ton for disposal at the Bridgeport RRF. This tip fee is paid to CRRA and is composed of \$61.00 per ton disposal fee plus a \$2.00 per ton administrative fee. The new contracts, however, do not include the cost of transporting trash from the town or regional transfer stations to the Bridgeport plant or the costs for operating the transfer stations, which were either subsidized or covered completely in the previous CRRA tip fee. The agreement also calls for a minimum amount of trash from all 12 communities of 265,000 tons. East Haven negotiated directly with Wheelabrator and entered into a five-year agreement at \$62.50 per ton, with an annual adjustment based on the consumer price index.

“The Norwalk six.” In anticipation of the expiration of its long-term contract with CRRA for waste disposal at the Bridgeport RRF project, the City of Norwalk issued a request for proposals (RFP) in September 2007 for the operation of its transfer station and disposal services in an attempt to acquire these services at a lower cost and improve the level of service.

Other towns eventually joined in Norwalk’s effort in return for covering a portion of the procurement costs. Six towns joined in (the original five plus New Canaan).¹⁹ Each town only needed a commitment from the town’s mayor or town selectmen as required by local ordinance. According to Norwalk, the towns were guided by the belief that they could create competition where it had not existed.

The RFP asked the bidders to respond to three discrete scenarios that involved different levels of responsibility for the transfer station operations. The city received three bids from City Carting, IESI NY Corporation, and Enviro Express/Wheelabrator Bridgeport, L.P. CRRA did not participate in the bidding. Only one vendor was determined to be responsive and City Carting was selected.

After the selection of the vendor, each town was responsible for contracting separately with the winning bidder. For calendar year 2009, the municipalities are being charged \$74.88 per ton for the transport and disposal of MSW. Under the contract, the tipping fee increases by four percent each year. Ultimately, the six towns entered into separate 5-year agreements with City Carting and there is a provision for three 5-year renewals. City Carting offered the same flat rate for disposal to all the towns involved, regardless of each town’s relative distance to possible disposal locations. It is likely that due to the shared bidding process the six municipalities share what is in essence a blended rate because the tipping fee is the same for Greenwich as it is for Norwalk and Weston, though costs incurred by City Carting likely vary between towns. There is

¹⁹ East Haven and Stamford initially participated in the Norwalk effort. East Haven decided to negotiate directly with Wheelabrator and Stamford developed its own RFP and selected a different vendor than did the Norwalk six.

no minimum tonnage commitment.

Originally, the proposal was for City Carting to install a MSW baler at the Norwalk transfer station and MSW from the area would be transported by truck to a landfill in Pennsylvania. Since the inception of the contract, however, City Carting has been delivering the MSW from all the towns to the Bridgeport RRF on a spot market basis. Therefore, a baler has not been installed and the waste has stayed in state.

Tip fee comparison. How do the tip fees compare before and after CRRA ownership of the Bridgeport facility? The answer is not straightforward due to differences in the services towns received while being a part of CRRA and after Wheelabrator took ownership of the Bridgeport RRF.

Provided in Table III-7 is a description of the basic expenditure categories that are part of the operation of an RRF based on CRRA's budget reports and statements. The various descriptions are intended to aid in any cost comparison discussions below.

Table III-7. Description of RRF Expenditure Categories	
Item	Description
General Administration	Includes costs related to various administrative charges including legal, auditing, consulting, office supplies, and the allocation of CRRA salaries and overhead
Debt Service/ Administration	Cost for the repayment of principal and interest on CRRA's portion of the bonds to finance the project and other financial and bank fees related to borrowing
Resource Recovery Facility	Various costs related to the operation of the RRF plant including the solid waste assessment tax ("Dioxin Tax"), payment in lieu of taxes, insurance premiums, and certain maintenance costs
Disposal	Also called the Contract Operating Charges – this is a fee charged by the operator for disposal of MSW in the RRF facility
Ash disposal	Cost for the hauling and disposal of ash, the byproduct of RRFs
Waste Transport	Costs for the export or diversion of waste brought to or intended to be delivered to the RRF plant but processed elsewhere because the intended facility could not process due to capacity or other processing issues. Subsidies for certain towns who transport waste for a long distance (in Bridgeport project).
Recycling	Costs related to the support of various recycling activities in the area, including advertising, education, and electronics recycling
Landfills	Costs related to the maintenance of closed landfills
Transfer Station Operations and Maintenance	Costs related to the operation and maintenance of transfer stations

Transportation from Transfer Station to RRF	Transportation costs for hauling MSW from transfer stations to the RRF
Transfer Station	Capital construction costs related to the improvement of transfer stations
Source: PRI descriptions based on CRRA budget documents	

Final years with CRRA. Table III-8 shows how the expenses compared to the tip fees for the Bridgeport project towns before ownership was transferred to Wheelabrator. The table shows two ways of calculating the tip fees over two time periods.

Table III-8. Bridgeport Project Expenditures and Tip Fees, FY 2007 and FY 2009				
Expenditure	Actual Total Cost per Ton FY 2007	Average Cost Member Town per Ton FY 2007	Adopted* Total Cost per Ton FY 2009 (6 mos.)	Adopted Average Cost Member Town per Ton FY 2009 (6 mos.)
CRRA General Administration	\$ 4.48	\$ 4.13	\$ 9.61	\$ 9.54
Debt Service/ Administration	3.35	3.09	2.92	2.90
Resource Recovery Facility	5.82	5.37	6.11	6.06
Disposal (Wheelabrator)	58.38	53.84	59.04	58.58
Transfer Station Operations	Included in Disposal	Included in Disposal	Included in Disposal	Included in Disposal
Transport from Transfer Station to RRF	Included in Disposal	Included in Disposal	Included in Disposal	Included in Disposal
Ash Disposal	6.38	5.89	14.23	14.12
Recycling	0.94	0.88	0	0
Landfills	4.56	4.20	7.23	7.17
Other (Transfer Station Capital, Waste Transport Subsidy)	1.97	1.81	2.72	2.70
Total	\$ 85.89	\$ 79.21	\$ 101.86	\$ 101.08
* Budgeted amounts Source: CRRA, Fiscal Year 2009 Operating and Capital Budget and PRI calculations				

Both fiscal years 2007 and the first six months of 2009 are shown because of concerns

about which time period can be considered the fairest comparison. CRRA maintains that due to the project closing in the middle of FY 2009 additional expenses were incurred in the final year and one-half (FY 08 and 6 months of FY 09) such as legal and administrative costs, which are not representative of the project's true operation costs over time. CRRA believes FY 2007 to be more appropriate and represents a "normal" year²⁰. Not all member towns, though, were convinced costs would have gone down if CRRA maintained ownership and insist that FY 09 costs are representative. Fiscal year 2007 also represents actual costs, while FY 2009 figures are based on adopted budgeted amounts. Program review staff chose to show both time periods.

Also both *total cost* per ton and the *average member town cost* per ton for fiscal year are presented in the table. The total cost tip fee represents what the fee would have been if all of CRRA's costs of the project were borne by the tip fee only and did not include other types of revenue.²¹ The difference between the total cost and per member town costs shows the impact (or total subsidy) of other revenue sources. The Bridgeport project, though, did have other income including interest income, and fee and permit revenue, among others. So, the member town tip fee shows how much, on average, the member towns actually paid per ton after adjusting for other revenues. (Appendix B shows the detailed revenues and expenses for the Bridgeport project and how PRI applied various costs to develop the tip fee estimate.) Some general observations about the tip fees are made below.

- The total tip fee for FY 2007 would have been \$85.89, but due to other revenues the average member town cost was actually \$79.21 per ton. This is more than the \$70.00 plus \$8.00 pricing structure noted earlier. This indicates that the member towns on average did not meet their minimum commitments and effectively paid a penalty. It should also be noted that the Bridgeport project ran a nearly \$3 million deficit in FY 2007, which was financed in the subsequent year. If that deficit were included in FY 2007 and funded entirely by the member town tip fee, the effective additional cost would have been \$7.29 per ton.
- The adopted total cost tip fee for FY 09 is not notably different than the adopted member cost tip fee (\$101.86 versus \$101.08). Again, both tip fees are higher than what the tip fee pricing structure for FY 09 (\$80.00 plus \$18.50) calls for, indicating member towns on average were not expected to meet their minimum tonnages.
- The costs for administration, ash disposal, and reserves for landfill expenses

²⁰ As noted later the Bridgeport Project ran a \$3 million deficit for FY 2007.

²¹ The Bridgeport Project had both costs and revenues beyond CRRA's direct control. The facility operator, Wheelabrator, maintained separate costs and revenues. It should be noted that what is described in Table III-8 as "total costs" do not include costs born by the facility operator, nor do the subsidized costs reflect the effect of electricity sale revenue on the disposal costs charged by the operator.

in FY 09 do increase significantly compared to FY 07. As Appendix B shows a number of limited use revenues (i.e., use of unrestricted reserves, use of bond proceeds, and, use of board designated reserves) were also used to stabilize the tip fee in the last several years.

- Unlike the other projects, all the revenues from the generation of electricity in Bridgeport completely accrued to the operator - Wheelabrator. In exchange, Wheelabrator assumed a significant portion of the debt for the project. Presumably, all of Wheelabrator's debt costs, operation and maintenance costs (i.e., RRF and project related transfer stations) and electric generation revenues were considered in determining the disposal fee of about \$58.00 – \$59.00 per ton.
- Those expecting a large reduction in the tip fee due to the retiring of project debt paid by CRRA would be disappointed. CRRA's portion of debt service from FYs 2007 through 2009 is relatively low –only amounting to about \$3.00 per ton of the tip fee. Wheelabrator reports that it will be paying its share of the debt service until 2014. PRI staff have estimated that Wheelabrator's current debt costs about \$21.00 per ton.²²

New contracts. Table III-9 compares tip fee pricing and costs under the new CRRA disposal contracts for the Bridgeport RRF and for the city of Norwalk for the final six months of FY 2009. Separate pricing is shown for towns with transfer stations.

²² Estimated debt payment provided by Wheelabrator of about \$16,000,000 annually. Per ton amount is based on 2007 tonnage of 758,000. This per ton fee would be much higher if the fee was based on only the 265,000 tons of waste secured through CRRA.

Table III-9 . Bridgeport Project, New FY 2009 CRRA Contracts and Norwalk			
Expenditure	New CRRA Contract w/out Transfer Station, FY 2009	New CRRA Contract w/ Transfer Station, FY 2009	Norwalk, FY 2009
CRRA General Administration	\$ 2.00	\$ 2.00	n/a
Debt Service/ Administration	n/a	n/a	n/a
Resource Recovery Facility	Included in Disposal	Included in Disposal	n/a
Disposal	61.00	61.00	74.88
Transfer Station Operations	n/a	7.00**	23.33
Transport from Transfer Station to RRF	n/a	14.00**	Included in Disposal
Ash Disposal	Included in Disposal	Included in Disposal	n/a
Regional Recycling	Municipal Expense	Municipal Expense	Municipal Expense*
Landfills	n/a	n/a	n/a
Other (Transfer Station Capital, Waste Transport Subsidy)	n/a	Municipal Expense	Municipal Expense
Total	\$ 63.00	\$ 84.00	\$ 98.21
<p>* Norwalk's new recycling contract with a different vendor contains a provision for rebate of \$17.50 per ton for recycled material</p> <p>** New Contract estimate based on current and previous contracts, CRRA estimates the weighted average cost of transportation to be \$14.00/ton and estimates the cost of transfer station O&M to be \$7.00/ton.</p> <p>Norwalk transfer station operations portion of tip fee based on \$700,000 costs and 30,000 tons MSW</p> <p>Source: CRRA, City of Norwalk, and PRI calculations</p>			

Under the old contracts with CRRA, the Bridgeport project towns' tip fee included a recycling subsidy and the costs for landfill closure. These costs were spread among all members of the project. The costs of transfer station operation, transfer of waste from transfer stations to the RRF, and the operation and maintenance of the RRF itself were included in the disposal fee charged by Wheelabrator. The make-up of the disposal fee was determined in the original operating/ownership agreement and it is likely that both ownership options and electricity revenue for the operator resulted in significantly lower disposal charges than would have occurred in their absence.

Under the new contracts, each town is responsible for their own transfer station costs and landfill closure costs are no longer collected. The recycling subsidy was included in CRRA's FY

07 costs but was not in FY 09. The prices under the new contract with a transfer station column include estimates for the average costs of transfer station operation and transportation. Each individual town's situation will be different. It can be noted that:

- The average cost for *those towns without a transfer station* dropped from FYs 2007 (\$79.21) and 2009 (\$101.08) to \$63.00 under the new CRRA contract with Wheelabrator. This is true even when subtracting out the landfill, recycling, and other costs from the old CRRA contract amounts for FY 2007 (\$72.32) and in FY 09 (\$91.21). This assumes that the municipal expense of replacing whatever services CRRA was providing through the recycling subsidy did not exceed the difference between the prices.
- The average cost for towns *with transfer stations* under the new CRRA contract with Wheelabrator includes an estimate for transfer station operations and transportation to the RRF and totals \$84.00 per ton.²³ The new contract costs for these towns appears higher than the FY 2007 costs (\$79.21) but lower than the FY 2009 costs (101.08), even when adjusting for the landfill and other costs in FY 09 (\$91.21).
- The city of Norwalk's new contract cost (\$98.21) appears to be higher than the average CRRA FY 2007 cost (\$73.32) and FY 2009 cost (\$91.21) after adjusting for the recycling subsidy, landfill, and other costs. Norwalk reports its actual tip fee costs charged by CRRA in 2009 were \$116.00 per ton. If that fee were adjusted by the landfill and other costs, the comparable CRRA tip fee would be about \$106.00 per ton and higher than the new contract. To be truly comparable, other unknown costs would have to be included to Norwalk's new contract costs over the life of the contract including the cost to develop the RFP and any additional administrative costs involved in administering the contract with City Carting that would be different than contracting with CRRA.
- The city of Norwalk has pointed out that the level and types of service offered by the new contractor is qualitatively different than what CRRA was providing, reducing the comparability of the figures. For example, differences include improved cleanliness, the addition of electronics recycling, expansion of plastics recycling, and the addition of managed disposal of oil and batteries. The town also changed recycling contracts from CRRA to City Carting.

²³ These estimates by CRRA appear reasonable. The town of Milford is reported to be paying \$23 per ton for transfer station operations and transportation, while the town of Westport is reported to be paying about \$22 per ton for those services.

Under CRRA, the town was not charged for recycling. Under the town's new vendor the range of recyclable material has been expanded and the town is now paid \$17.50 per ton of recyclables.

Wheelabrator cost comparison. Staff also tried to compare Wheelabrator charges after the change of ownership in January 2009 to CRRA costs in FY 2007 and FY 2009. The goal was to provide a comparison between like services to the extent possible. Because the electricity revenues accrue to Wheelabrator and are unknown to PRI staff, and staff does not have access to Wheelabrator's actual cost of services, a valid comparison could not be completed.

Case Study #2 Wallingford Project

The Wallingford RRF project will be the second plant to experience a change in ownership. As discussed in more detail below, the towns involved in the project have signed agreements with Covanta, the current operator and soon-to-be owner of the plant, for the disposal of their MSW when the current agreements expire in June 2010. What follows below is a brief description of the negotiations, key aspects of the proposals, elements in the process that made it difficult for CRRA to compete, and the outcome of the negotiations.

Contract. The Wallingford RRF facility began operation in May 1989 to serve Cheshire, Hamden, Meriden, North Haven, and Wallingford. The facility consists of a now closed landfill and a 420-ton per day mass burn incinerator that converts solid waste into electricity, which is capable of producing 11 megawatts of power. There are no transfer stations. Covanta Projects L.P. of Wallingford operates the facility.

The towns entered into a disposal contract with CRRA, which provided the financing for the project and oversees the facility until June 2010. Covanta has a service agreement with CRRA that is set to expire on June 30, 2010. Unlike the Bridgeport project, CRRA under this agreement had the right to purchase the plant at fair market value, though CRRA had to declare its intent to purchase the facility (by December 31, 2008) before the actual value of the plant was established. If the parties could not agree on a purchase price, it would go through an arbitration process. If CRRA decided not to purchase the plant, Covanta could purchase the plant for one dollar. This process, established 20 years ago, was problematic for CRRA because committing to purchasing the plant without knowing the price introduced a level of risk that was unacceptable to the potential long-term disposal customers.

Negotiations. The towns began negotiations with both Covanta and CRRA in the late summer and through the fall of 2008. Various proposals were floated at different times, even purchase of the plant by CRRA without the member towns' support. This eventually prompted Wallingford Mayor William Dickinson Jr. to go before the CRRA board to urge the authority to abandon its efforts to buy the plant. Table III-10 highlights a few of the key differences between the disposal services proposals offered by CRRA and Covanta based on an analysis developed by

municipal officials in the Town of Wallingford.²⁴

CRRA's proposal was hampered by three shifting variables: the cost of ash disposal; the uncertain cost of energy; and the purchase price of the facility. CRRA's only ash landfill was in the closure process and the siting of a new CRRA landfill was not assured (and later dropped by CRRA). The Wallingford plant enjoyed the highest purchase price for energy contracts in Connecticut, but expired in FY 2009. By FY 2010, market pricing for the facility's electricity was in effect and electric revenues declined 71 percent from FY 2008.

Table III-10. Wallingford Project Towns Proposals: Key Provisions		
	CRRA	Covanta
Tip fee for disposal	Yearly tip fee based on net costs of operation. Reportedly, the tip fee was estimated to be between \$63.98-\$110.77 for the first year. Any natural and unavoidable catastrophes (force majeure) or changes in law would add to the disposal fee	\$65.00 first year Increases based on CPI with a minimum of 1.75% and a maximum of 3.5% with a reset provision every 5 years based on the local market Any natural and unavoidable catastrophes (force majeure) or changes in law would add to the disposal fee
Contract duration	20-year term	10-year term with an option for two 5-year contract renewals at same terms as initial term
Purchase option	None. CRRA to own.	Option for municipal purchase in year 20
Minimum commitment	Towns must pay their share of any shortfall between revenues and expenses of the facility based on average annual tonnage.	Less than current commitment of 125,000 tons
Electric rate revenue sharing	Applied to project expenses	If electric market rate exceeds benchmark rate, towns receive pro rata share of 20% of difference between market and benchmark rate. If electricity revenues fall below benchmark, Covanta bears full loss.
Source: Town of Wallingford. See footnote 24 in this section regarding CRRA's objections to this summary.		

²⁴ PRI staff obtained information about these final offers from interviews and documents from municipal officials. This information is based on written comparisons used by town officials to explain the proposals before a vote on them by the Wallingford Town Council. CRRA disputes that the proposal attributed to it in the table was its final proposal, and offered to let PRI staff review what it said was its last proposal. However, CRRA considered the information proprietary, meaning PRI staff would not be able to publicly discuss the proposal in this report. PRI staff determined instead to rely on the statements and documents provided by the Town of Wallingford that municipal officials stated were the last proposals from each proposer.

The biggest uncertainty behind the proposals was the purchase price of the plant. The reported appraisals of the plant's market value ranged from \$23 million to \$100 million. (Other reports have stated that CRRA put the price at \$10 million to \$14 million.)²⁵ Consequently, CRRA was unable to commit to a firm tip fee. Reported estimates for CRRA's proposed tip fees were in the range of about \$64.00 to \$111.00 per ton in the first year, though the real number would be determined by the net cost of operations.²⁶

The five towns in choosing the Covanta proposal clearly favored certainty and a stable tip fee over the possibility of CRRA ownership and an open-ended price structure. In contrast to CRRA's proposal, Covanta offered a first year (July 1, 2010) tip fee of \$65.00 per ton (the tip fee in 2008 was \$60.00 per ton). Increases to the fee would be based on the Consumer Price Index and no lower than 1.75 percent a year and no higher than 3.5 percent a year. Covanta's proposal did not require a 20-year commitment, contained a revenue sharing component, had a lower minimum tonnage requirement than CRRA, and an option to buy the plant at the end of 20 years. In addition, the town of Wallingford would receive \$11.00 per ton as a host benefit fee, which was higher than the proposal offered by CRRA. Table III-11 shows the trend in the tip fees for the Wallingford project towns, including Covanta's charge for 2011.

	2007	2008	2009	2010	2011
Tip Fees per Ton	58.00	\$59.00	\$60.00	\$60.00	\$65.00
Source: CRRA and Town of Wallingford					

Aside from the purchase option in the Wallingford project contract, there are other significant differences from the Bridgeport situation that underscores the various arrangements that exist that make comparisons among RRFs difficult. Unlike the Bridgeport project, as noted above, the revenue for electricity at the Wallingford RFF was collected by CRRA and it made a big difference in pricing. Electricity sold by the RRF projects was generally not at market rates. Electricity providers purchased RRF-generated energy under contracts entered into at a time when the providers were compelled, by statute, to purchase all available RRF-generated electricity at the same rate that the energy was sold to municipalities. The Wallingford project's electric revenues amounted to nearly 50 percent of total project revenues. But the electric rate "subsidy" ended in FY 2009 for the Wallingford project and the revenue declined by 71 percent. Appendix C shows the detail on both the revenues and expenditures for the Wallingford project.

²⁵ Minutes, Cheshire Town Council Solid Waste Committee Joint Town Council Meeting, November 24, 2008

²⁶ A pro forma base case was developed by CRRA in August 2008 and was provided to the Wallingford project towns that assumed a purchase price for the plant of \$23.5 million and indicated a tip fee of \$67.45 per ton in Year 1 to \$77.97 in Year 5. Other scenarios were developed based on various assumptions including changes in electric revenue, recycling rates, operator of the facility, and the cap on CRRA personnel, that resulted in the \$64.00 to \$111.00 range.

In addition, debt service for the Wallingford project was a large portion of total expenditures in the final years, though not the last one, while under CRRA affiliation. In FY 2008, it amounted to about 20 percent of expenses.

There were a couple of other interesting aspects of the transition process that are worth mentioning. For one, the Wallingford project towns had built up a reserve account over time that grew to about \$52 million by June 2008 and was held by CRRA.²⁷ One purpose of this reserve was to use it for possible purchase of the plant. The reserve fund no doubt provided some leverage in negotiations because it demonstrated some financial ability to actually make the purchase. It also represented an opportunity for the towns to assert some control over their own disposal needs. On the other hand, it also involves more risk in having a greater role in being responsible for determining how to manage a waste-to-energy plant. Ultimately, the towns decided not to pursue ownership and to have CRRA distribute the money to them on a pro rata basis.

Also, the Wallingford project towns throughout the negotiations remained united. These five towns represent the overwhelming majority of the tonnage already being delivered to the plant. By working and staying together, the towns had some negotiating advantage because of the sizable amount of MSW they generate compared to the amount the plant needed. Waste-to-energy plants need fuel seven days a week, 24 hours per day to be cost-efficient.

Finally, in exchange for not pursuing the purchase of the plant, CRRA entered into a spot market agreement with Covanta.²⁸ The agreement is for one year with seven one year renewal options and permits CRRA to use up to 25,000 tons of capacity at the Wallingford plant for \$55.00 per ton with price escalators in subsequent years. CRRA has, in effect, become a broker of capacity at the Wallingford plant. The Wallingford towns also have a right to the capacity of the plant to process their MSW. On the one hand, it appears that CRRA negotiated a better deal than the towns as the member communities are paying \$65 per ton to CRRA's \$55 per ton. On the other hand, under the old agreement, CRRA paid \$51.00 per ton for disposal of the minimum commitment of 125,000 tons to Covanta and \$11 per ton for any tonnage delivered in excess of the minimum.²⁹ The towns have not had any recent problems in meeting their minimum commitment. Assuming the towns will probably use at least up to their previous minimum disposal amount, Covanta has realized a net gain for the tonnage above the minimum compared to what CRRA was paying.

Covanta cost comparison. Program review staff attempted to perform a check on the reasonability of the bid the Wallingford towns received from Covanta at \$65 per ton. Without

²⁷ Minutes, Cheshire Town Council Meeting, November 24, 2008

²⁸ Covanta had also initiated a civil action against CRRA seeking a restraining order and other injunctive relief for various CRRA actions, as well as an arbitration proceeding. Both actions were dropped as a result of this agreement.

²⁹ Also worth noting is that the CRRA capacity is a spot market contract, not a long-term minimum tonnage commitment. It is likely that CRRA's contractual ability to purchase the plant impacted the price offered in the spot market agreement.

access to Covanta's actual costs of doing business, staff made a broad brush estimate based on previous revenue and costs established by CRRA for the project.

Staff examined the revenues and expenses for the Wallingford project in FY 2010 (as shown in Appendix C) and selected a few major expenses and the major revenue source (electricity) to compare as shown in Table III-12.³⁰ (Appendix C also shows FY 2008 actual revenues and expenses and FY 2009 estimated amounts as points of comparison.) The expense side incorporated those activities that have to be performed or paid. This includes operations and maintenance the facility, ash disposal, taxes (or host community fees) and some other miscellaneous fees like the dioxin tax, transportation for diverted material, and insurance.

The point was to examine just the basic costs without getting into other soft cost areas such as legal and administrative salaries or overhead. Those expenses were not included below but as a point of reference those expenses for CRRA in FY 2010 amounted to over \$7.00 per ton. Other revenues such as permit and fine revenue were not included, but they tend to be relatively small amounts. It should also be noted that the FY 2008 through 2010 CRRA budgets had a number of short-term revenue sources such as the use of various reserve funds and bond proceeds. The tip fee was based on these budgeted amounts but the numbers were not audited and could change as the fiscal year draws to a close.

As the table shows, the total costs were about \$63 per ton after subtracting out revenues derived from the sale of electricity. If it can be accepted that the cost CRRA was paying for those selected services was not excessive, then the bid of \$65 per ton by Covanta does not appear excessive.

	FY 10 Estimate	Per Ton Cost
Disposal	\$7,623,000	\$48.87
Ash Disposal	\$2,772,000	\$17.77
Payment in Lieu of Taxes	\$1,489,000	\$9.54
Other Miscellaneous*	\$1,286,000	\$8.24
<i>Total Estimated Expenditure</i>	<i>\$13,170,000.00</i>	<i>\$84.42</i>
Electric Revenue	(\$3,336,000)	(\$21.38)
<i>Net Total</i>	<i>\$9,834,000</i>	<i>\$63.04</i>
* Waste transport and balance of Resource Recovery Facility (Building Operation, Dioxin Tax, Insurance)		
Source: PRI calculations based on CRRA data		

RRF disposal competitiveness. There are a number of factors that influence disposal contract decisions, of which reasonable cost is only one. Accounting for differences in preferences other than cost is beyond the limited scope of this study. Based on the case studies

³⁰ Fiscal Year 2010 is a fair comparison year because the expenditure categories used for comparison do not include extra collections for reserves.

of the Bridgeport and Wallingford RRF contract expiration and negotiations, a few key points were found:

- new tip fees charged by privately-owned RRFs are not significantly different from the prices charged under CRRA agreements for comparable disposal services to municipalities;
- many towns preferred reentering into contracts with the previously utilized disposal facilities over requesting competitive bids;
- privately owned and operated in-state RRFs have offered contract terms that are comparable to those offered for out-of-state disposal options and to regional RRF tip fees;
- without access to the private vendor's costs of services, it is unclear if the fees paid for disposal by CRRA to these same operators, while the plants were affiliated with CRRA, represented reasonable and competitive costs; and
- it is unknown what the longer-term trend in market competitiveness will be like because the Connecticut disposal market appears to rely on the nearest out-of-state disposal sites to provide competition to the only two providers of RRF disposal services in Connecticut.

Policy Options and Recommendations

This section contains policy options and recommendations to address the findings in the previous three sections. The findings and recommendations regarding system adequacy and sustainability are discussed first followed by those related to reasonable cost. Staff have also provided a number of policy options to address the findings that generally require significant additional resources or changes to state policy and practices for the committee's consideration.

Adequacy and Sustainability

Through the examination of whether the state's waste system was adequate and sustainable, there were several important findings including that:

- efforts aimed at reducing the amount of solid waste generated within the state (source reduction) are not sufficient, as the amount of waste generated and disposed per capita has continued to steadily increase;
- although the initial legislatively mandated recycling rate goal appears to have been met in the 1990s, the recycling rate goal established by the legislature for the year 2000, a decade ago, has never been met;
- Connecticut's recycling rate is below the national average and is the second lowest rate in the Northeast region;
- waste stream analysis shows much of the MSW that is being disposed of at resources recovery facilities contain materials that are already required to be recycled or are a type of plastic, that largely has a readily available market;
- diverting waste from disposal includes economic incentives, partially due to revenue received from most diverted materials;
- the sorting facilities for the most commonly accepted recyclable materials (e.g., bottles, cans, paper) are currently operating far below capacity; and
- infrastructure for additional diversion methods (i.e., composting) remains mostly undeveloped.

To address staff findings regarding system adequacy and sustainability, the state should focus significant efforts on diverting waste from disposal. Program review staff offer recommendations to improve waste diversion that include: the creation of a mechanism to periodically review the mandated recyclables list; the development of incentive programs with dedicated funding; and a study of Connecticut's composting infrastructure.

Periodically update which materials are mandated recyclables. As noted in the briefing, the list of materials that must be recycled has only been adjusted once since mandatory recycling

began in 1991. Since then, many elements of the waste stream have changed, most notably the increased presence and use of plastic beverage containers. Each municipality has decided which, if any, additional items must be recycled in the absence of statewide additions to the mandatory recycling list. Variations in what items can be or must be recycled between towns have led to general confusion for residents, which may negatively impact the diversion of materials.

In order to be responsive to advances in the recycling market, program review staff recommend C.G.S. Sec. 22a-241b be amended to include provisions for the commissioner of DEP to review the regulations designating items that are required to be recycled at least every ten years beginning January 1, 2011. Should it be determined there is a demonstrated market for the reuse of additional material(s), the commissioner shall adopt by regulation the material to be added to the designated recyclable list¹.

Adjusting the list of mandatory recyclables will help reduce, though not eliminate, confusion over variation in material classification between municipalities. It is possible that adjusting the mandatory recycling list will increase statewide diversion by increasing recycling in towns that have not adjusted their recycling lists independent of the state list. As part of the process of adding additional materials, it is expected that education and advertising will help increase recycling beyond just removing the additional materials.

Review municipal recycling incentive and enforcement programs. DEP has the authority to enforce recycling at the municipal level if it is determined that “a municipality is making insufficient progress in implementing a recycling program”². Further, waste generators, collectors, and facility operators all have some amount of responsibility to ensure that recyclable materials are separated from disposed materials. Enforcement of recycling mandates at either the municipal or generator level have been lax or non-existent due partially to an apparent general aversion to enforcement activities by state agencies towards municipalities or residents.

Nevertheless, municipalities and waste generators are the key to reducing waste disposal. The authority to help achieve state goals for diversion through enforcement already exists, but the state and many municipalities fail to meet the statewide recycling goals.

There are a number of ways to enhance recycling compliance and achieve recycling goals that include:

- further enforcement of existing recycling statutes;
- creating incentive programs for municipal recycling leaders; and
- creating a cap and trade program for per capita waste disposal between municipalities.

All strategies have a mix of advantages and disadvantages, the most prominent of which involve either increased costs to municipalities or funding problems at the state level. The

¹ In this context, a “demonstrated market” for a recyclable material means that one or more sorting facilities have the capability and capacity to accept the material or that several municipalities have ordinances or programs that successfully require or promote the separation of the material in question.

² C.G.S. Sec. 22a-220

strategies listed above are discussed further in Appendix D. Regardless of the specific strategy or combination of, DEP should work with other states and high-performing municipalities to develop a series of best practices for minimizing disposal and maximizing diversion of waste.

Because increased diversion can positively impact most aspects of the waste disposal system, **program review staff recommend that DEP: 1) review the state's diversion and recycling policies and strategies and 2) develop specific flexible incentive programs after consultation with various stakeholders to assist the state and its municipalities in achieving the state solid waste management plan's recycling and diversion goals. These incentive programs can include incentives for implementation of pay as you throw programs, development of single stream recycling, and development of incentives for improved commercial recycling.**

The programs shall be developed by January 1, 2011, and submitted for review to the committee having cognizance over environmental matters. The incentive programs shall begin on December 31, 2011, and end on December 31, 2016, and contain specific program goals and measures. The department shall provide updates to the committee having cognizance over environmental matters on the impact of the incentive programs and recommend any other strategies to improve recycling and diversion on an annual basis beginning on December 1, 2012 until the programs are terminated.

Funding for incentive or other recycling programs is likely to be at a premium. Program review staff have identified a few potential revenue sources that could be used for waste diversion programs. These sources, along with their potential pros and cons, are listed in Table IV-1. **Program review staff recommend that C.G.S. Sec. 22a-232 be amended to increase the solid waste assessment fee by 50 cents (\$0.50) per ton to two dollars (\$2.00) beginning June 1, 2011, and be reduced by 50 cents (\$0.50) to one dollar and fifty cents (\$1.50) on June 1, 2016. The additional revenue shall be deposited in the Environmental Quality Fund and used to fund the recycling and diversion incentive programs.**

The recommended increase in the fee would raise approximately \$1.1 million per year and a total of \$5.5 million for the five-year period to be dedicated to the incentive programs³. The incentive programs are intended to provide a short-term boost to assist municipalities in transforming their current disposal practices to focus more on diversion and recycling.

It is expected that the temporary increase of diversion funding will result in long-term cost savings. Assuming a cost avoidance of \$40 for each ton of waste that is recycled instead of disposed, only 27,500 additional tons of disposed waste, less than one percent, would have to be diverted from RRFs to recycling facilities to realize a net savings in any one year of the program. If the diversion programs are successful and diversion continues at or above the increased levels, municipalities will be able to realize long-term cost avoidance.

³ \$1.1 million yearly estimate based on 2.2 million tons of waste processed at in-state RRFs being charged an additional \$.50 per ton.

Table IV-1 Revenue Options	
<i>Revenue Option</i>	<i>Description</i>
Increase solid waste assessment fee	<ul style="list-style-type: none"> The solid waste assessment fee ("dioxin tax"), which is charged for every ton of waste received at RRFs, would be temporarily increased
<i>Pro</i>	<i>Con</i>
<ul style="list-style-type: none"> Would work as an excise tax, would not be charged on diverted waste Increase of currently assessed fee is relatively easy to implement May stimulate cost savings through increased diversion 	<ul style="list-style-type: none"> Tax would be passed through to generators (i.e., residents, businesses) Increases incentive to escape fee by disposing out of state, as it is not charged on waste that is not sent to RRFs (i.e., landfill or sent out of state)
<i>Revenue Option</i>	<i>Description</i>
Institute a statewide disposal fee and eliminate dioxin tax	<ul style="list-style-type: none"> All solid waste would be charged a per ton fee for disposal, regardless of disposal facility (transfer station, RRF, landfill)
<i>Pro</i>	<i>Con</i>
<ul style="list-style-type: none"> Expand the fee base to include waste that is disposed out of state Would decrease incentive to dispose of waste out of state 	<ul style="list-style-type: none"> Tax would be passed through to generators (i.e., residents, businesses) Administrative burden due to inclusion of additional facilities May create incentive to under-report waste taken directly out of state Removes funding from environmental testing of RRFs
<i>Revenue Option</i>	<i>Description</i>
Recapture bottle deposit money	<ul style="list-style-type: none"> Unclaimed deposit money would be put in a dedicated fund for waste diversion programs
<i>Pro</i>	<i>Con</i>
<ul style="list-style-type: none"> Money from recyclables would be used most directly for additional recycling programs Funding source would allow further development of diversion incentive programs 	<ul style="list-style-type: none"> Would remove money recently claimed into the general fund Can expect opposition from recyclers, bottlers, and grocers/retailers Sale would be one time revenue gain
<i>Revenue Option</i>	<i>Description</i>
Sell Mid-Conn Plant	<ul style="list-style-type: none"> CRRA would sell its RRF asset
<i>Pro</i>	<i>Con</i>
<ul style="list-style-type: none"> CRRA could use the money from sale of the plant to provide other statewide services, such as diversion and recycling 	<ul style="list-style-type: none"> Lose public control of large state asset (unless alternative public buyer was found and preferred)

Table IV-1 Revenue Options	
<ul style="list-style-type: none"> • Statewide agency would not be dependent on opt-in membership to fund state-wide programs • Allows CRRA to focus on other responsibilities such as developing new technologies/best practices in disposal and diversion instead of being another service provider 	<ul style="list-style-type: none"> • Base funds were ultimately provided by Mid-CT members • One time revenue gain • Expect CRRA opposition to forced sale of largest agency asset

Study the viability of food waste composting systems. The interim results of the DEP waste characterization study as well as other research on food waste generators in the state indicate that food waste is a large portion of the disposed waste within the state. There are several ways to help reduce the amount of food waste that is disposed, ranging from home composting to large-scale composting facilities for institutional food waste generators.

Connecticut currently has very little infrastructure or formal programs to promote food waste composting of any type. **To help determine the viability and feasibility of food waste composting in Connecticut, program review staff recommend that DEP examine the potential costs and benefits to the state, municipalities, and waste generators of the various methods of removing food waste from the waste stream, identify any incentives or guidance the state could provide to develop the necessary composting infrastructure, and report the results to the committee having cognizance over environmental matters by June 1, 2011.**

The study should examine the infrastructure changes needed to create a statewide or regional food composting system for institutional sources (i.e., schools, correctional facilities, groceries) and/or residential generators. A secondary goal of the study would be to determine what impact increased focus on home composting may have on waste disposal rates.

Reasonable Cost

Collection services. Based on the analysis in the previous section, the findings regarding the cost of collection services in Connecticut include the following:

- there is a lack of comprehensive data to analyze and fully understand how competitive the MSW collection market is in Connecticut;
- illegal, anti-competitive practices by haulers have been uncovered by law enforcement recently in Connecticut; and
- the potential exists for improper pricing of collection services due to a lack of competition. Based on surveys of municipalities, it was found that in at least 15 municipalities there was either a single bidder for collection services or there only one collector operating in an open market.

Highlighted in Table IV-2 are various alternatives to address these findings along with a description of some of the advantages and disadvantages of each approach. These options run the gamut from enhancing existing reporting requirements to the regulation of collector rates.

Table IV-2. Collection Services Recommendation Options		
Option	Pros	Cons
Enhance Municipal Registration Requirements; Report Results to DEP	<ul style="list-style-type: none"> • Further define what registration means in statute by specifying reporting requirements that would include identification of: principal partners and any related hauling enterprises; type of collection (residential, commercial, construction and demolition, other) • Provide tool to understand: the overall collection market; interrelationships between collection companies; extent of competition and market concentration • Greater consistency in reporting requirements • Not as burdensome as full licensing 	<ul style="list-style-type: none"> • Some increase in time and cost to haulers to provide information • Mandate on local governments; significant opposition from some municipalities could be expected • Additional reporting requirements from haulers could cause significant opposition from industry • Possible additional costs for DEP to administer and report
Licensing of Haulers by State Agency	<ul style="list-style-type: none"> • Provides tool to understand: the overall collection market; interrelationships between collection companies; extent of competition and market concentration • Could explicitly outlaw operators or employees with criminal backgrounds; could require background checks to be performed • Intended to reduce reliance on sporadic and cumbersome law enforcement efforts to assure no anti-competitive practices • Statewide reporting requirement would ensure greater consistency • Could improve tracking of MSW disposal and recycling • Provides state additional authority to leverage environmental compliance • Eliminates municipal registration requirements; reduces costs 	<ul style="list-style-type: none"> • Increase cost to haulers • Increase in state regulatory personnel to oversee system • Haulers object to revealing collection information • Break with a traditionally local function • Major change in state function; significant opposition from industry • Similar proposals have been defeated several times in the legislature • Loss of revenue to some towns
Mandate Franchising of Collection for Municipalities that Rely on Private Subscription Services	<ul style="list-style-type: none"> • This option would require each municipality that currently relies on private subscription to designate services area(s) and assign a collector to those areas through a 	<ul style="list-style-type: none"> • Would require municipality to develop actual structure of the franchise districts in their area • Would require some municipalities to develop a

Table IV-2. Collection Services Recommendation Options

Option	Pros	Cons
	<p>competitive bid process.</p> <ul style="list-style-type: none"> • Allows each resident to take advantage of volume contracting resulting in the lowering of everyone's price for collection • Franchising allows for uniform and efficient waste collection • Reduces the number and frequency of collection vehicles traveling on town roads • Reduces diesel fuel and greenhouse gas emissions • Could include commercial collection and possibly increase recycling and improve reporting amount of MSW disposed • Could improve residential recycling collection and improve the accuracy of the amount of MSW disposed • Provides a consistent revenue stream for haulers • Eliminates need for hauler sales force to acquire or maintain a customer base • Services could be offered on a Pay-As-You-Throw system; increasing economic efficiency 	<p>contracting procedure but could still require hauler to collect from customer</p> <ul style="list-style-type: none"> • Could put some haulers out of business if municipal bids are not carefully constructed; may require special set-aside districts for small haulers • Limits residents to use of designated hauler; no ability to choose • Significant opposition from industry
Regulate Rates of Collectors	<ul style="list-style-type: none"> • Control rates using cost-based pricing and provide an allowance for profits similar to utility rate regulation • Stabilize pricing for municipalities • Provide state with knowledge of the overall collection market; interrelationships between collection companies; extent of competition and market concentration • Department of Public Utility Control has experience in setting utility rates 	<ul style="list-style-type: none"> • Few places do this, though New York City reports success through regulation of commercial collectors, while the State of New Jersey has de-regulated this area. • Major change in state function; significant opposition from industry
Regulate Rates if Municipalities that Rely on Private Subscription Have Not Franchised	<ul style="list-style-type: none"> • Option would require only municipalities that rely on private subscription services for collection • Would encourage but not requires these municipalities to franchise • Similar pros as regulation of rates and franchising noted above 	<ul style="list-style-type: none"> • Additional cost to customers in towns that did not franchise to pay for rate regulation • Similar cons as regulation of rates and franchising noted above • This model is used in the state of Washington

MSW Collection Services Information Should be Enhanced. The first key issue is to gather information to know more about the MSW collection market for the purposes of determining if there are any competitive deficiencies and for deterring certain anti-competitive practices. Connecticut statutes currently only require that any collector of solid waste generated within a municipality shall register with that municipality and identify any other municipality in which that collector hauls solid waste. As noted earlier and in the briefing document, municipal registration practices vary widely among towns. Several data elements are missing that would assist in indentifying anti-competitive practices, such as the identification of principal partners and managers who have financial decision making authority, identification of subsidiaries, the type of collection and waste collected, and any criminal convictions of applicants and principals.

Requiring a single, centralized point of licensing by a state agency, such as DEP, would be perhaps the most efficient method of obtaining this information. In addition, by requiring a license, the department would also have another tool to ensure compliance with environmental laws by collectors. A central licensing agency is also similar the recommendations of a governor's task force on solid waste hauling in 2006 that called for state-level solid waste hauling authority. Given that this type of proposal, though, has not passed the legislature, it is doubtful the legislature would want to pursue this type of elaborate approach. **Program review staff, therefore, recommend that the current municipal registration requirements for collectors be enhanced to include, but not be limited to, the following:**

- **name and address of applicant/owner, principal partners, and of any manager or other person who has policy or financial decision-making authority in the business;**
- **identification of any and all subsidiaries;**
- **names of other towns and states in which collector is doing business;**
- **type of collection performed (residential, commercial, other);**
- **type of waste collected (solid waste, recyclables, construction and demolition, yard waste, other);**
- **location of current and expected disposal areas of all solid waste; and**
- **any other information required by municipalities to ensure the health and safety of its citizens.**

Each municipality shall provide an updated list of registered collectors and the required information to DEP on at least an annual basis in a format and timeframe prescribed by the commissioner of the Department of Environmental Protection. DEP shall collate the data and provide on-line public access to the information collected. Municipalities not providing the data in a timely manner shall not be eligible for any recycling incentive grants from DEP.

Other MSW collection services policy options. The second key issue has to do with the potential of noncompetitive pricing of collection services due to a lack of competition. Program review staff have provided a range of options in Table IV-1, along with the pros and cons of each, that can assist in promoting competition or regulating the actual price of collection

services. Staff offer these options for the committee's consideration for possible adoption. These options include:

- rate regulation of collectors;
- mandate franchising of collection services for towns with private subscription services; and
- provide rate regulation of collection services to those towns with private subscription services that do not franchise.

The franchising of collection services could also be accomplished on a regional basis. Contiguous municipalities could realize significant savings by banding together to franchise collection services and achieve greater efficiencies. Municipalities that have difficulty in attracting multiple bidders especially may experience a new level of market power through this mechanism. Care needs to be exercised to ensure that there are a mix of districts within the franchise area to allow smaller haulers the ability to compete.

Disposal Services. Staff have made a number of findings regarding the disposal market in Connecticut in the previous section. Generally speaking, competition in the disposal market currently relies either on out-of-state disposal options for certain municipalities or the in-state spot market -- both of which carry risks as discussed below.

What this may mean for the long-term trend in pricing is unclear. There are some characteristics in the structure of the disposal market that may raise some concerns. These include:

- four of the six RRF plants are or will be privately owned, but there remains only two private operators of all six plants (Wheelabrator and Covanta);
- private-sector facility owners can choose to contract for and process out-of-state solid waste, further diminishing capacity dedicated to Connecticut municipalities -- though very little of this appears to be happening now;
- CRRA may be providing some in-state cost competition, but it relies on contractors to perform all of its operations. Some of those contractors are providing competing services;
- landfills generally provide lower cost disposal options; however there is only one ash landfill in Connecticut and virtually no MSW landfill capacity;
- there are tremendous barriers to entry to the disposal market, even more so in Connecticut compared to other states;
- increasing market concentration of disposal services both within and outside the state could further reduce the state's municipalities' bargaining position; and
- depending how wide geographically the market for disposal is defined, the Connecticut disposal market arguably has elements of a natural monopoly or a duopoly.

Based on these structural factors, many have noted that there are long-term risks to the state in transferring significant control of waste management to the private sector, including noncompetitive pricing and a reduced amount of MSW disposal capacity available to Connecticut municipalities. Table IV-3 presents an array of options that are intended to influence the long-term cost competitiveness of MSW disposal services (both RRF and ash), improve disposal capacity, and provide more information about the cost of those disposal services.

Table IV-3 State Policy Options to Influence Disposal Costs			
Option	Description	Pros	Cons
RRF Disposal			
Regulate Disposal Rates at RRFs	<ul style="list-style-type: none"> Per ton disposal rates at in-state RRFs would be set by regulator Control rates using cost-based pricing and provide an allowance for profits similar to utility rate regulation 	<ul style="list-style-type: none"> Less expensive than outright purchase of facilities Stabilize pricing for municipalities Provide state with knowledge of financial viability of plants Department of Public Utility Control has experience in setting utility rates 	<ul style="list-style-type: none"> Additional regulatory responsibility of the state Added expense for plant owners and ultimately rate payers Added expense for municipalities to intervene in rate cases Few states regulate; unclear how rates would be impacted Major change in state policy; significant opposition from industry Unclear whether all facilities provide same rate, or variable between facilities If regulated rate is higher, municipalities may choose to go out-of-state (may need to mandate municipal use)
Require Financial Reporting to DPUC	<ul style="list-style-type: none"> RRFs would be required to submit financial documents to DPUC as proof of future solvency Similar to insurance and banking requirements 	<ul style="list-style-type: none"> Provides cost information to determine competitiveness of pricing Less expensive than full regulation Provide state with knowledge of financial viability of plants 	<ul style="list-style-type: none"> Cost to industry to provide information and state to develop and oversee; ultimately paid by customers Significant industry opposition would be expected
Build More In-State RRF Capacity by Public Entity by Expansion	<ul style="list-style-type: none"> A public entity (state, regional, or local) would fund capacity expansion, 	<ul style="list-style-type: none"> Encourage the development of additional in-state RRF capacity; ideally at cost-based pricing 	<ul style="list-style-type: none"> Significant costs to the state or regional authority to develop and build or expand facility – estimates at \$500 million for new plant

Table IV-3 State Policy Options to Influence Disposal Costs

Option	Description	Pros	Cons
or New Facility	either at an existing facility or by building a new facility	<ul style="list-style-type: none"> • Additional renewable energy supply would be created • May give additional choices and leverage to municipalities in negotiation with any disposal vendor • All the benefits and avoidance of issues previously described regarding in-state capacity in Section I 	<ul style="list-style-type: none"> • May be incurring cost that private marketplace may decide to do on its own • Public opposition to either expansion or new facility can be expected • Additional environmental impacts, especially air impacts, would be incurred, though its unclear whether the avoided transportation emissions and MSW landfill emissions would balance the increased burn emissions • Likely to need long-term contracts to secure funding
Disallow Favored Nation Status in Contracts	<ul style="list-style-type: none"> • Most Favored Nation clauses would be disallowed in future contracts. • Most Favored Nation clauses in RRF contracts require that the RRF owner (the seller) give a purchaser of disposal services as favorable a price as any other subsequent purchasers of disposal services. 	<ul style="list-style-type: none"> • Eliminate the current floor pricing incentives by private companies; now the first one to contract sets price for everyone else • Allow contractees more leverage in contract negotiations • Increase flexibility in market pricing for disposal services 	<ul style="list-style-type: none"> • Unclear legal status • Without MFN status, there may be a greater discrepancy in costs of disposal for same service among towns • May only apply to public entities entering into contracts
Expand MSW Landfill Capacity	<ul style="list-style-type: none"> • Public entity would build a new MSW landfill within the state 	<ul style="list-style-type: none"> • New landfills for MSW would be sited in the state using the technical specifications outlined in RCRA subtitle D 	<ul style="list-style-type: none"> • Capacity/land use would have to be very large to realize significant statewide effects • Once acceptable sites are used, landfilling will no longer be an option in the state • Significant pressure from

Table IV-3 State Policy Options to Influence Disposal Costs

Option	Description	Pros	Cons
		<ul style="list-style-type: none"> • Optionally, landfill could be for mixed use, allowing for both MSW disposal and beneficial use of ash • Landfill space is necessary step if seeking self-sufficiency • Landfill operations are relatively inexpensive and cost of disposal should reflect this • Possible that disposal capacity provided at lower disposal rates will help lower RRF disposal rate 	<ul style="list-style-type: none"> • residents and environmental groups • High development costs (i.e., permit and land acquisition) may largely negate decreased operational costs • Contrary to state waste management hierarchy
Public Purchase of RRF Plants	<ul style="list-style-type: none"> • Public entities (i.e., CRRA, regional authority, municipalities) would purchase the privately owned facilities using public financing mechanisms 	<ul style="list-style-type: none"> • Public control over pricing and operation • Operations would be cost based • Limit issues from lack of competitive market • Little need for economic regulation 	<ul style="list-style-type: none"> • Significant costs to state and ultimately customers from “repurchase” of the plant • Unless publicly operated, operations costs (and operators) may be similar to private ownership • Assumes public employees can provide service at less cost than private sector • Greater risks associated with ownership than use, possible there’s less stability • Purchase of plants that are aging
State Finance of Large Scale Rail Transfer Station	<ul style="list-style-type: none"> • State would finance public entities to develop a centralized rail based transfer station to ship waste out of state • Could also develop a series of smaller 	<ul style="list-style-type: none"> • Rail-based transportation would increase the market for out-of-state disposal options • Increase competition within the state • Potentially easier to site than RRF or landfill • May be able to use some federal funds to 	<ul style="list-style-type: none"> • Must have rail-based landfill disposal options to be worthwhile • Initial development may be costly • Could undermine the economic feasibility of in-state RRFs • Promotion of landfill use goes against disposal hierarchy

Table IV-3 State Policy Options to Influence Disposal Costs

Option	Description	Pros	Cons
	regionalized transfer stations	further develop railways	
Purchase Out-of-State Disposal Capacity or Landfill by Regional Resource Recovery Authority	<ul style="list-style-type: none"> • Purchase of landfill capacity to a greater extent than 5-10 year deals that are already in place • Secure long-term usable disposal capacity for municipal use 	<ul style="list-style-type: none"> • Assures disposal capacity at lower cost • Likely to be less costly than siting in Connecticut • Minimal environmental impacts to Connecticut 	<ul style="list-style-type: none"> • Intricate undertaking that could take years and outcome not certain to try to pursue a landfill purchase • Requires upfront costs with an outcome that is uncertain • Long-term liability of owning a landfill • Transport costs would still be incurred • Would probably require legislative authorization • Conflicts with Connecticut's hierarchy of waste disposal
Ash Landfill			
Development Of Site By the State/CRRA	<ul style="list-style-type: none"> • State or CRRA would develop an ash landfill in the state for the disposal of state generated ash 	<ul style="list-style-type: none"> • Increased in-state capacity would help put state on path towards self-sufficiency • Costs to dispose ash would be passed through to generators without profit markup • More options for ash disposal may help drive down the market price 	<ul style="list-style-type: none"> • Significant siting opposition • Cost savings may accrue to the plant owners instead of waste generators • Would require a long-term commitment • Unclear how project development would be funded and who would reap the benefits
Purchase Only of Property by the State	<ul style="list-style-type: none"> • Purchasing of potential landfill sites • Sites would be held until certain trigger conditions are met and landfill space becomes necessary 	<ul style="list-style-type: none"> • Number of suitable sites in state is limited, purchasing one or more would protect those areas from alternative uses • Sites can be part of a long-term plan to minimize risk of being locked out of out-of-state disposal • Property can be used as public green space until needed 	<ul style="list-style-type: none"> • Purchase would require immediate funding without immediate benefit • Prevents development of sites which may otherwise have economic benefit • Significant siting opposition
Purchase of Out-of-State	<ul style="list-style-type: none"> • State or CRRA would purchase 	<ul style="list-style-type: none"> • Avoids in-state siting issues 	<ul style="list-style-type: none"> • Agreements with entities in other states may not be as safe

Table IV-3 State Policy Options to Influence Disposal Costs

Option	Description	Pros	Cons
Capacity	sufficient capacity at out-of-state sites for long-term use for ash disposal	<ul style="list-style-type: none"> • Large enough purchase is likely to lower price from market value • Minimal environmental impact to Connecticut 	as in-state guarantees <ul style="list-style-type: none"> • Ignores concept of in-state self-sufficiency • Purchasing capacity may be more expensive than owning site • Transportations costs may make use of the capacity a burden

Concerns have also been raised about self-sufficiency or the need to develop reliable and dependable in-state disposal capacity. The major premise of the 2006 SWMP was that the state should be self-sufficient in waste disposal services. The risks associated with a reliance out-of-state disposal have been described in Section I and include a loss of control over disposal, volatile transportation costs, potential liability issues, and increased negative environmental impacts. While there are significant risks in depending on out-of-state options, becoming self-sufficient also has significant barriers, including:

- a considerable investment in disposal capacity expansion unless recycling goals are met. A self-sufficient system would most likely have to include use of existing RRFs and expanded capacity at RRFs through existing facility expansion or development of new expensive facilities;
- at a minimum, development of landfills are necessary to become completely self-sufficient, which are difficult to site in Connecticut;
- the additional capacity required to become self-sufficient may ultimately be as or more costly than capacity than is available out of state; and
- due to limited land availability, a self-sufficient system will eventually cease to be unless there is a technological breakthrough that does not require the use of an ash landfill or landfills for other noncombustible material.

In-state disposal options would not necessarily create a competitive market for waste in the absence of out-of-state alternatives, so it is possible that a self-sufficient system would have to be regulated, unless actions are taken to secure additional publicly-owned capacity. Some options provided in Table IV-3 could allow the state to pursue increased self-sufficiency as well as possibly increasing competition. These options include building of new publicly-owned RRF capacity, either through a new plant or the encouragement/incentive of expansion of existing plants, and the development of additional publicly-owned landfill capacity.

The options also have an impact on other state goals such as consistency with state policies as expressed in the waste hierarchy. The Table E-1 in Appendix E shows the impact on various state goals as well as competition and gives a general indication of the cost of those options.

The options are offered for the committee's consideration with no specific staff recommendation. Because of the scale of these recommendations, more direction from the legislature and study of the proposals would be warranted before the recommendations could be made and implemented. Program review staff recommend, at a minimum, revising state policies to encourage competition and to position the state to act should the need arise to become self-sufficient in the future. This includes:

- the elimination of the determination of need process for RRFs and ash landfills;
- research on the beneficial reuse of ash; and
- consideration of a state purchase of land for future use as a landfill.

Determination of need process should be eliminated. The determination of need process acts as a barrier to competition, virtually insulates the current RRF operators from local competitors, and without price regulation may be inadvertently driving up disposal prices. As noted earlier, before a permit to build or expand an RRF, a mixed MSW landfill, or an ash landfill can be issued, DEP must find that a need exists for such a facility or expansion and such a facility or expansion will not result in substantial excess disposal capacity in Connecticut. This is contrary to the principals of supply and demand. Excess capacity tends to drive prices down. In addition, DON by inhibiting new entrants into the marketplace may also be hindering the adoption of new disposal technologies.

Essentially, the DON requirements make it impossible for a competitor to enter the market unless there is substantial excess MSW to be disposed. However, it is likely that existing companies will try to expand before a new competitor enters. **Therefore, program review staff recommend that the determination of need process outlined in C.G.S. Sec. 22a-208d for resources recovery facilities, ash landfills, and MSW landfills be eliminated.**⁴

Even with the elimination of DON, significant barriers still exist for the expansion or siting of new facilities. Other environmental and siting protections would still remain. New facilities would still have to meet all current environmental, health, and siting requirements. In addition, new facilities would still have to find financing to ensure financial viability; effectively the financial marketplace would act similar to DON. The downside is that with the introduction or expansion of new plants, a current plant may not be financially viable and it could increase the amount of out-of-state waste processed in Connecticut.

Potential beneficial use of ash residue should be researched. There has been much controversy lately regarding the need for an ash landfill in Connecticut. CRRA recently investigated the possibility of siting an additional ash landfill in Franklin, Connecticut. CRRA pursued the landfill while stating that a publicly owned ash landfill could save municipalities money in the long-term while providing additional in-state infrastructure to support the RRFs. CRRA's geological testing showed that the Franklin site would meet the criteria set forth by DEP. However, CRRA's board of directors decided in August of 2009 to suspend their pursuit

⁴ Mixed municipal solid waste composting facilities also mentioned in this statute are not regarded as an acceptable method for handling MSW by DEP and have been removed from the solid waste management hierarchy by the general assembly.

indefinitely “based on its understanding of the directives received from State leaders”⁵. At that time, CRRA also made known its intention to pursue other low-costs options for ash disposal.

Ash residue is a byproduct of the resources recovery process. The residue ash has about 10 percent of the volume and 20 to 30 percent of the weight of the original MSW. The ash itself is a combination of fly-ash, which is known to contain potentially dangerous amounts of heavy metals, and bottom ash, which is typically considered to be non-hazardous. The combination of bottom ash and fly ash is the material referred to as ash residue. The ash residue must be disposed of, and in Connecticut the only legal disposal method for ash is landfilling.

From 1999 through 2008, there were two ash landfills within the state. The closure of the Hartford landfill at the end of 2008, which had been accepting both MSW and ash in separate sections, leaves the Putnam ash landfill, owned by Wheelabrator Technologies Inc., as the only remaining in-state ash disposal facility for 2009 and beyond.

Ash residue is a substance that hardens over time and sets up with a consistency close to that of concrete. Ash residue has several potential methods of reuse, including as an ingredient for asphalt or concrete, and their many derivatives such as shingles, paver blocks, or road sub-base. According to a recent survey⁶, Florida, Massachusetts, Pennsylvania, Maryland, New Hampshire, New York, Hawaii, and Missouri allow at least one type of beneficial use of ash residue. In most cases, the eight states allow ash residue to be used as a component of asphalt, as road base, or as supplemental material for landfills (i.e., daily cover or under liner base).

Since there are no ash reuse methods in place within the state, it is unclear whether methods used in other states would meet the environmental standards of DEP. Connecticut law requires a permit in order to reuse MSW ash residue, but to date, no formal application has been submitted.

Legal and permitting issues aside, unless a reuse method develops that proves to be more cost effective than using an ash-only landfill, it is unclear whether there would be a market for items that contain reused ash. It should be noted, however, that there are reuse programs in place for coal ash, which has similar characteristics to MSW ash residue. DEP has indicated that the reused coal ash has effectively flooded any market there may be for MSW ash residue. **Because the question of beneficial reuse of ash residue has not been fully explored, program review staff recommends that the PRI co-chairs request that legislative leadership consider requesting the Connecticut Academy of Science and Engineering (CASE) to evaluate the potential beneficial use of ash residue. Specifically, a CASE evaluation should:**

- 1. Determine how many states allow the beneficial reuse of ash residue and for what purposes;**

⁵ “CRRA Resolution Regarding Ash Landfill Initiative”. CRRA. August 27, 2009.

<http://crra.org/documents/press/2009/CRRA_board_resolution_regarding_ash_landfill_8-27-2009.pdf>

⁶ “2006 Beneficial Use Survey Report” November, 2007. Association of State and Territorial Solid Waste Management Officials.

2. Compare how much residue is actually reused in those states that permit ash residue reuse and for what purposes;
3. Evaluate the potential for the beneficial reuse of ash residue in Connecticut;
4. Examine barriers to the beneficial reuse of ash residue in Connecticut, including barriers to possible adoption by Connecticut state agencies of ash residue as a roadbed material or component in asphalt used in various state-funded infrastructure projects; and
5. Propose cost-effective solutions for the reuse or disposal of ash residue.

The state should consider the purchase of parcels of land to ensure the future availability of landfill space. The most prominent risks caused by the lack of in-state landfill capacity to both cost and sustainability are the possibility of significant and sudden changes beyond the state's control. Based on state policies and practices, it appears that waste stakeholders are currently comfortable with the risks associated with the lack of in-state landfill capacity. In addition, it is unlikely that out-of-state disposal capacity will cease to be available in the near future

However, there are many variables involved in the current situation that may change the waste disposal landscape sometime in the future. Most notably, program review staff finds that:

- it is possible that out-of-state disposal costs will increase, due partially to changes in other states' policy, though the increase could be mitigated by cost and availability of disposal in other states or regions;
- transportation costs may be the most volatile and unpredictable component of waste disposal;
- out-of-state disposal is more heavily dependent on transportation than in-state disposal;
- Connecticut has limited potential land available for waste disposal;
- additional landfill capacity for ash residue or MSW may reduce the cost of disposal; and
- land that is suitable for disposal in Connecticut may become more scarce if the land is used for disposal or the land is otherwise developed.

While the lack of landfill capacity is currently something of a liability, having the potential for developing landfill capacity is a potential asset. The landfill capacity capability of the state is fixed at a relatively small amount due to the size of the state and the environmental restrictions. Developing some of the potential landfill capability would likely lead to a decrease in disposal costs, both directly for those using the disposal facility and indirectly as the prices of the disposal market are likely to be driven lower. The cost savings will happen whenever the landfill's disposal capacity is available for use.

If the potential landfill disposal sites in Connecticut are few and fixed, as stated above, the state runs the risk of running out of potential in-state landfill disposal sites. If the landfill disposal sites are used to mitigate costs and move the state toward self-sufficiency now, they

would not be available to protect the state from future risks. Given that the current levels of risks and costs for out-of-state disposal appear to acceptable to some municipalities, it may be worth protecting the potential disposal sites so that they may be developed at some point in the future when the combination of transportation costs, other states' waste disposal policies, and lack of in-state disposal capacity have made out-of-state disposal options unpalatable.

One way to mitigate such risk would be to acquire potential disposal sites now but prevent development of the site as a disposal area unless certain criteria are met. As part of the purchase and hold strategy, the potential sites should be properly permitted using current environmental regulations to help prevent the site from being unusable due to changes in regulations when the site may be needed. An acquired and held site would serve several key functions that include:

- mitigating some of the risks of continued reliance on out-of-state disposal options;
- potentially creating a ceiling for disposal prices (if alternative disposal price is included as a condition to build);
- giving the state an emergency disposal option in the case of a major state-wide disaster; and
- preventing the loss of potential disposal capacity due to non-waste related development of the site.

The acquire and hold scenario is not without potential problems. Among other considerations, a potential site may prove costly to acquire, maintain, or permit. Additionally, the held site cannot be used for other purposes that may serve as economic drivers for the municipality or region in the area. Also, if the use criteria create a cost ceiling, it may reassure other disposal facilities that competition will not increase except under the specified criteria. As with all potential disposal facilities, even a site that is not to be used except under certain conditions is still likely to face local opposition.

As the mitigation of risks and costs that occur because of the acquisition of land may or may not outweigh the risks associated with the acquire and hold scenario, **program review staff recommend that DEP study the economic feasibility of a state purchase and hold of potential disposal sites.**

The study itself should include a discussion and recommendations regarding:

- **the entities that are most appropriate to acquire and maintain the sites;**
- **the costs of acquiring, maintaining, and permitting the sites without use; and**
- **the conditions necessary that would call for the development and use of the disposal site, including;**
 - **the presence of uncompetitive disposal practices or other unreasonably high disposal costs; and**

- **the minimum and maximum time frame the land should be held before either use or sale.**

The study shall be completed by July 1, 2011, and the results shall be reported to the committees of cognizance over environmental matters.

Other Recommendations

During the course of this review, program review staff noted a number of areas where some system improvements could be made that were not encompassed in the adequacy, sustainability, and reasonable cost framework. This includes improvements to the collection and dissemination of solid waste system data, a mandated timeframe for revisions to the State Solid Waste Management Plan, a re-examination of CRRA's role and purpose, and a review of landfill monitoring practices by DEP.

MSW Services Data Management Practices Need Improvement

One role of DEP in the solid waste management system is to administer and enforce those policies instituted by the state to ensure that waste disposal practices contribute to a clean and wholesome environment. Adequate data collection and analysis are crucial components of both planning and enforcement strategies. Information systems should be designed such that the minimum amount of time is spent capturing the data so that the maximum amount of time can be spent analyzing and reacting to the data. Program review committee staff find that:

- DEP collects the statutorily specified information from solid waste disposal facilities (i.e., RRFs, transfer stations) regarding the delivered tonnage of MSW and town of origin, but does not regularly collect additional information as allowed by statute;
- information submitted from disposal sites to DEP about MSW tonnage is done so via hard-copy, despite the fact that solid waste facilities generally aggregate data electronically;
- DEP personnel eventually enter the submitted information into an electronic database;
- the current reporting requirements include a number of redundancies. For example, municipalities and solid waste disposal facilities are both required to report tonnages to DEP, but municipalities typically have no way to independently assess the amount and destination of their MSW. DEP has recently instituted changes to help eliminate the redundancies;
- the accuracy of the data provided to DEP is largely dependent on collectors, though DEP has little formal recourse to ensure that data provided by haulers is accurate;
- the usefulness of current data is limited in several ways, including lack of accessibility, timeliness of publishing, and accuracy of reporting; and
- due partially to the limitations of the data and the data reporting system, few enforcement actions have been taken toward entities that fail to report or provide inaccurate data.

The inadequacies of the current data management system likely mask several underlying problems in the waste management system itself. Access to a clear, timely description of the current system can help inform interested parties (e.g., public officials, industry personnel) to make comparisons of their own performance to others. Information about current system performance can also assist DEP in fulfilling its environmental planning and enforcement role, and support decision-makers at all levels.

Electronic data submission. The RRFs and many transfer stations already aggregate waste tonnage data electronically. Submitting the data to DEP using paper creates unnecessary waste and introduces greater potential for error as DEP staff must recreate the data electronically.

For this reason, **program review staff recommend that DEP allow and encourage electronic submission of waste tonnage data by solid waste facilities, with a goal of eliminating paper-based submission by FY 2012.**

DEP should take the following steps to allow electronic submission of data:

- **notify solid waste facilities of the option to submit data electronically for the remainder of FY 2010 and of the goal to switch by FY 2012;**
- **notify solid waste facilities of the range of electronic formats that are acceptable;**
- **require that electronically submitted data be organized using basic labels for the information to be submitted;**
- **develop an electronic verification system to replace the current need for signed hard copies; and**
- **reassign staff responsibilities from manual entry of paper-based data to temporarily assisting solid waste facility operators in complying with electronic data submission.**

Waste tonnage data detail level. DEP receives statutorily required waste data that includes the amount of MSW tonnage, municipality (or facility) of origin, and identification of the solid waste facility reporting the tonnage. Current statute allows DEP to require that solid waste facilities include “such information the commissioner deems necessary.”¹ There are often inconsistencies within the data submitted to DEP, such as a spike in the waste delivered from one municipality or a sharp decline in the waste delivered from another municipality to a certain facility. At current levels of detail, it is somewhat difficult to make accurate claims about the validity of the data. **Program review staff recommend that C.G.S. Sec. 22a-208e be amended to include a requirement that solid waste facilities shall report to DEP the collector or transporter of all loads of waste received, except those loads weighing less than one ton.**

While most solid waste planning can be achieved using more aggregated levels of data, reporting the hauler along with the tonnage will, among other things, allow the state to direct

¹ C.G.S. Sec. 22a-208e

further questions about discrepancies to the collector who provided the information. Including the hauler of origin can also help verify municipal registration lists. Additionally, program review staff have contacted every in-state RRF and each indicated that hauler information is already collected and would not be difficult to include in data reports. Staff recognizes that exemptions from this requirement may need to be made for direct residential use of transfer stations or municipal convenience centers.

Data publishing schedule. Due partially to the time constraints associated with non-electronic submission of data, solid waste tonnage data is neither timely nor easily accessible by stakeholders (i.e., solid waste facility personnel, haulers, or municipal personnel). Increased access to waste tonnage data may help solid waste facilities and municipal officials better track the flow of waste within the state, including allowing analysis that may reduce the instances of improper attribution of waste to municipalities.

Program review staff recommend DEP adopt the following data publishing policy:

- **Submitted waste tonnage data should be aggregated and made publicly available online in its unaudited form within one month of the deadline for data submission.**
- **Verified data should be made publicly available online on an annual basis.**

State Solid Waste Management Plan Needs Revision Schedule

The State Solid Waste Management Plan is a statutorily required document for outlining the state's environmental goals with regards to handling of solid waste². Municipalities are required to make provisions for solid waste disposal with regards to the solid waste management plan and one of the primary charges for CRRA is enacting the plan. Waste management systems change as new problems emerge and trends change, so planning for waste services should be similarly responsive. The current plan was updated in 2006, 15 years after the previous plan. The current statute does not specify a timeframe for revising the SWMP and program review staff find that too much time has elapsed between plan revisions.

Therefore, program review staff recommend that C.G.S. Sec. 22a-228 be amended to require the commissioner of DEP to prepare a solid waste management plan revision at least once every 10 years with the next revision to be adopted on or before July 1, 2016. Additionally, the statute should be amended to require that by July 1, 2011 and within five years of submission of a plan, DEP prepare and publish an adjustment to the most recently published plan that includes a comparison of the state's performance to the projections in the plan, revised projections for the remaining duration of the plan, and the status of accomplishment of goals outlined in the plan.

² C.G.S. Sec. 22a-228

The Role and Purpose of CRRA Should be Evaluated

A review of the legislative history shows that one of the main reasons CRRA was created was to provide a vehicle to encourage a regional approach to transform the way in which solid waste was managed in Connecticut, through voluntary decisions on the part of towns to utilize the services of CRRA, among their other options.

The creation of CRRA was based on the belief that resources recovery projects and related services could be developed more quickly and with greater flexibility by an independent, quasi-public organization authorized to issue special revenue bonds, than through a state agency structure. The authority developed and at one time oversaw an integrated system that included four of the six resources recovery facilities in Connecticut, two regional recycling centers, five landfills (all of which are in post-closure), and several transfer stations. The four original CRRA-connected RRFs handled more than 80 percent of the municipal solid waste disposed of in Connecticut. Comparing CRRA's purposes, accomplishment, and the current state solid waste management plan it can be noted that:

- **Some of the major CRRA purposes have been accomplished.** Some of the major goals of CRRA, such as the creation of a network of resources recovery facilities and development of recycling facilities in Connecticut to transform the way in which solid waste is handled, have largely been accomplished. Connecticut used to rely primarily on landfills as a means of waste disposal. As documented in the briefing report, the state now disposes of nearly 64 percent of its solid waste in RRFs and about 25 to 30 percent of its waste is recycled.
- **Significant changes in ownership of and affiliation with RRFs have occurred.** CRRA will only own or be affiliated with one RRF by 2015, when the Preston RRF bonds will be paid, though it maintained a role with the Bridgeport project by negotiating capacity at the RRF for 12 municipalities and has purchased some disposal capacity at the Wallingford plant. In some sense, CRRA is a competitor with municipalities in securing disposal services, which may not have been envisioned in the original purposes of CRRA. In addition, the long-term municipal contracts that bind 70 communities to CRRA-owned Mid-Connecticut plant will expire in 2012, and some of the 70 municipalities may choose to dispose of their waste elsewhere.
- **the State Solid Waste Management Plan has a new vision and aggressive goals.** DEP issued an amended State Solid Waste Management Plan in 2006 with a new vision and goals. The previous plan was issued 15 years before. CRRA has a key statutory responsibility in implementing major portions of the SWMP, whose primary goal is to increase the diversion rate to 58 percent (from 25-30 percent) by 2024. CRRA has increased its recycling efforts over the years. But in order to meet the new goal, CRRA's role may need to be

changed or expanded, if appropriate, to further develop the waste diversion infrastructure.

- **There is a tension between municipal control and state goals.** While CRRA is intended to play a major role in implementing the solid waste management plan, state statutes give each municipality maximum flexibility in determining how it wants to manage its own solid waste. Because joining CRRA is voluntary, a fundamental question arises as to whether CRRA is really equipped to act broadly on a statewide basis to achieve state goals. While the responsibility to act on a statewide basis is envisioned in statute, the necessary authority to do so is not. The remaining member towns of CRRA's Mid-Conn facility may also question the fairness of having to fund and have liability for solid waste initiatives with potential statewide benefits and use. If CRRA is not properly equipped to achieve state goals, a question remains as to how those goals should be accomplished.
- **CRRA impact on disposal price is worth a closer examination.** It is unclear what impact CRRA is having on disposal prices and if the organizational model under which the authority operates truly reduces costs. CRRA does perform an oversight and contracting function, which should be acting as a check on costs, but the authority does not actually operate any RRF, transfer station, or recycling facility. By statute it is limited in the number of employees it can hire and it must use private industry or contractors to implement nearly all of its activities. Each of those industries presumably has a profit component, which is added to CRRA administrative costs.

Given the changes in ownership of Connecticut's resources recovery facilities and the aggressive waste diversion goals adopted by DEP, program review staff recommend that a task force be created to examine if any changes or refinements need to be made to the statutory role and purpose of CRRA. The task force shall examine: 1) how changes in RFF ownership and affiliation have affected CRRA operations and its influence over waste management compared to its statutory responsibilities; 2) if CRRA is the best mechanism to be the primary contributor to the accomplishment of the goals of SWMP; 3) if so, what type of changes, if any, should be made to CRRA's structure and funding to better address the goals of SWMP; 4) how other waste management authorities contribute to state waste management goals and if any statutory changes are necessary to ensure greater support and promotion of state goals by these entities; and 5) the impact of CRRA's structure and ownership of key solid waste facilities on disposal prices.

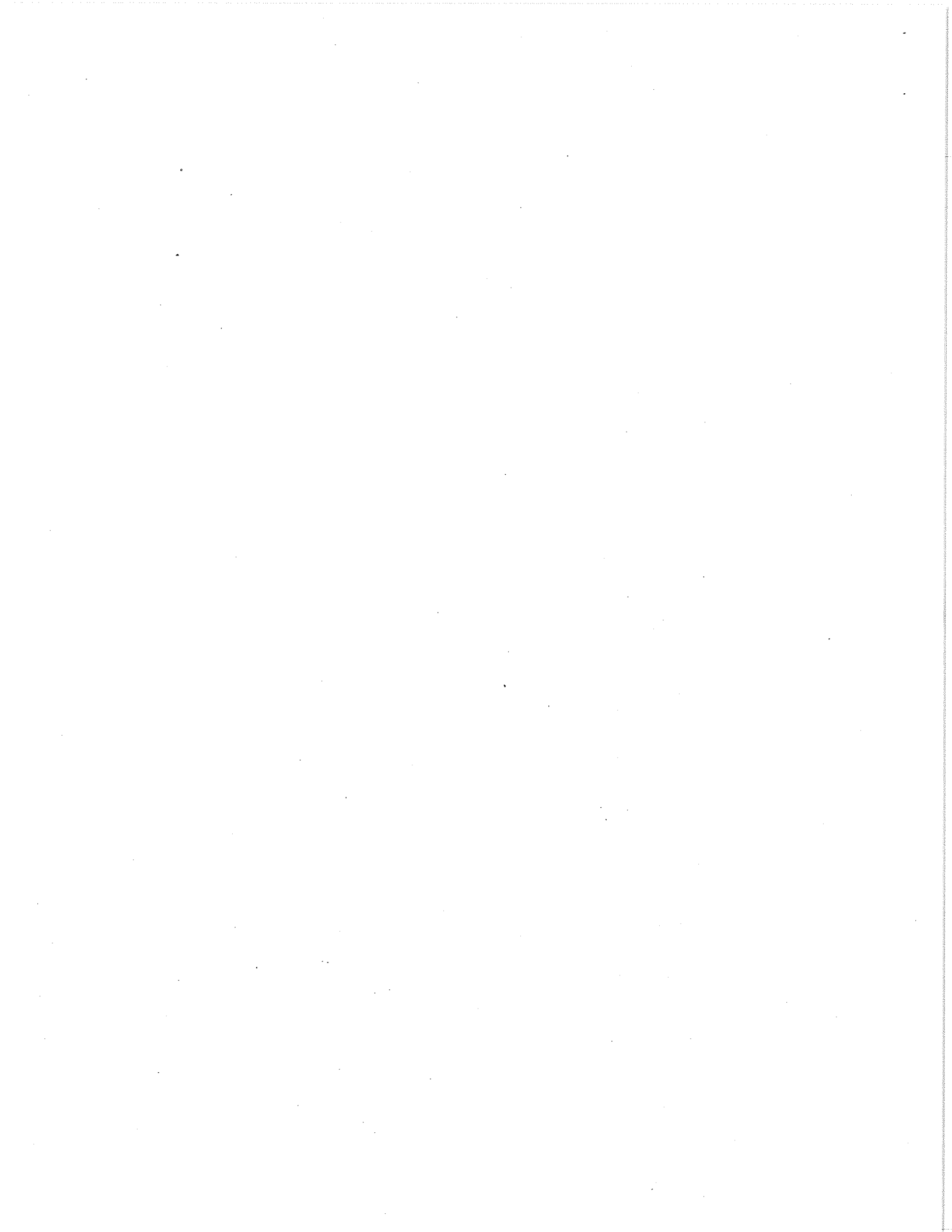
The task force shall consist of 14 members and be appointed by the governor (1 appointee) and the six legislative leaders (2 appointees each) from among various stakeholders from local, regional, and state government entities, industry experts, and environmental organizations. The DEP commissioner or designee shall be an ex officio,

non-voting member. The task force shall report its results to the committee of cognizance over environmental matters by June 1, 2011.

Department of Environmental Protection Landfill Monitoring

DEP is required to collect data from many closed landfills but reports that it lacks the staffing to thoroughly address the large amount of monitoring data that comes to the agency. DEP staff resources for landfill monitoring are prioritized to track landfills with previously established violations rather than combing through looking for issues on facilities that have not been previously flagged. While a thorough review of DEP landfill monitoring policy was not within the scope of this study, it is recognized that this is a critical component of ensuring appropriate protection of the environment. **Therefore, program review staff recommend that DEP review its current landfill monitoring practices. DEP should evaluate if the monitoring is performed adequately to protect the public health and environment, and if the monitoring requirements should be reduced, performed in a different manner by the department, or performed by an independent third party that provides results to DEP. The department should estimate any costs of any changes and report its results to the committee of cognizance over environmental matters by January 1, 2011.**

Appendices



Appendix A

Sample Resources Recovery Facility Tip Fees

Regions	Tip Fee Ranges
Mid Atlantic	\$65.25-\$72.22
Mid West	\$28.00-\$88.80
New England	\$56.00-\$76.05
South	\$12.00-\$85.00
West	\$51.91-\$98.00
Source: Covanta Holding Corp. 2009	

Municipality/WTE facility	Tip Fee
<i>Massachusetts:</i>	
Millbury	\$70.00
North Andover	\$64.00
Saugus	\$71.00
<i>New York:</i>	
Westchester County	\$71.50
Source: Wheelabrator Inc. 2009	



APPENDIX B

Bridgeport Project Expenses and Revenues

<i>CRRA Project Amount</i>	FY 2007 Actual		FY 2008 Estimated		FY 2009 Estimated	
	Amount (Tons)	%	Amount (Tons)	%	Amount (Tons)	%
Member Towns	407,331	64%	414,000	64%	211,100	65%
Contracted Amount	231,988	36%	233,000	36%	112,000	35%
Diversions	416	0%	-	0%	-	0%
Total CRRA Project MSW	639,735		647,000		323,100	

Contracted amount identifies the amount of tonnage processed through contracts arranged by CRRA
Diversions are the amount of tonnage sent to another disposal site due to capacity or operational concerns
Source: CRRA, Fiscal Year 2009 Operating and Capital Budget

Revenue Source	Actual FY 07	Adjusted (Net Ash Disposal and Recycling Revenues and Expenses)*	%	Actual Rate per Ton (Revenue/Tonnage)
Service Charge Solid Waste – Member Towns	\$32,266,714	\$32,266,714	62%	\$79.21
Service Charge Solid Waste – Contracts	15,171,622	15,171,622	29%	\$65.40
Ash Disposal Reimbursement Fees	4,485,119		0%	
Recycling Sales	2,442,295		0%	
Recycling Sales - settlement	23,097		0%	
Rental Income	1,184,709	1,184,709	2%	
Permit Fees	21,750	21,750	0%	
Miscellaneous Income	5,389	5,389	0%	
Interest Income	321,200	321,200	1%	
Use of Undesignated/Unrestricted Reserves	2,998,000	2,998,000	6%	
Use of Bond Proceeds (DSRF)	-	-	0%	
Use of Board Designated Reserves	11,645	11,645	0%	
Total Revenues	\$58,931,540	\$51,981,029	100%	

* See explanation in note in next table.

Source: CRRA, Fiscal Year 2009 Operating and Capital Budget and PRI calculations

Table B-3. Bridgeport Project Actual Expenses and Tip Fee for Member Towns, FY 2007

Expenditure	Actual FY 07	Adjusted (Net of Ash and Recycling)*	Total Member Share (62% of Total Expenses)	% of Total	Member Town Tip Fee Per Ton**
General Administration	\$ 2,865,279	\$ 2,865,279	\$ 1,778,594	5.2%	\$ 4.13
Debt Service/ Administration	2,142,569	2,142,569	1,329,979	3.9%	3.09
Resource Recovery Facility (w/o COC)	3,721,693	3,721,693	2,310,204	6.8%	5.37
Contract Operating Charges (Disposal)	37,349,628	37,349,628	23,184,415	68.0%	53.84
Ash Disposal	8,568,960	4,083,841	2,535,004	7.4%	5.89
Waste Transport	563,368	563,368	349,705	1.0%	0.81
Regional Recycling	2,858,625	393,233	244,096	0.7%	0.57
Recycling Education	215,000	215,000	133,459	0.4%	0.31
Landfill Shelton	2,838,043	2,838,043	1,761,687	5.2%	4.09
Landfill Waterbury	79,479	79,479	49,336	0.1%	0.11
Transfer Stations	696,701	696,701	432,470	1.3%	1.00
Total	\$ 61,899,345	\$ 54,948,834	\$ 34,108,950	100.0%	\$ 79.21
Balance	-2,967,805	-2,967,805	-1,834,249		

Wheelabrator invoice (7/1/07) shows amount paid for disposal \$38,231,883 or \$59.76 per ton – if refinance savings are included cost declines to \$58.62 per ton.

* Both Ash Disposal and Recycling functions have a revenue and expenditure component. The result shown here is the net expense.

** Total does not include financing of deficit as noted in Balance. Deficit is financed in succeeding year. If deficit was paid in current year entirely by member town tip fee, the cost would be \$7.29 per ton.

Source: CRRRA, Fiscal Year 2009 Operating and Capital Budget and PRI calculations

Table B-4. Bridgeport Project Actual Cost Per Ton, FY 2007*			
Expenditure	Actual FY 07	Adjusted for Ash and Recycling	Actual Cost Per Ton based on Project Total Tons (639,735)
General Administration	\$ 2,865,279	\$ 2,865,279	\$4.48
Debt Service/ Administration	2,142,569	2,142,569	3.35
Resource Recovery Facility (w/o COC)	3,721,693	3,721,693	5.82
Contract Operating Charges (Disposal)	37,349,628	37,349,628	58.38
Ash disposal	8,568,960	4,083,841	6.38
Waste Transport	563,368	563,368	0.88
Regional Recycling	2,858,625	393,233	0.61
Recycling Education	215,000	215,000	0.34
Landfill Shelton	2,838,043	2,838,043	4.44
Landfill Waterbury	79,479	79,479	0.12
Transfer Stations	696,701	696,701	1.09
	\$61,899,345	\$ 54,948,834	\$ 85.89
* See notes in above table regarding adjustments and balance			
Source: CRRRA, Fiscal Year 2009 Operating and Capital Budget and PRI calculations			



APPENDIX C

Wallingford Project Expenses and Revenues

Table C-1. Wallingford Project Revenues and Tip Fees, FY 08 and FY 10				
Revenues	FY 08 ACTUAL	Actual Rate per ton	FY 10 ADOPTED	Adopted Rate per ton
Service Charge Solid Waste – Members	\$ 8,648,771	\$ 58.98	\$ 9,180,000	\$ 60.00
Service Charge Solid Waste – Spot	177,155	\$ 56.11	180,000	\$ 60.00
Electricity	11,189,152		3,336,000	
Permit Fees	18,550		20,000	
Fines/Penalties	20,800		-	
Interest Income	1,169,395		300,000	
Use of Tip Fee Stabilization Fund	-		1,747,000	
Use of Future Use Reserve	-		820,000	
Use of Bond Proceeds (DSRF)	2,015,000		-	
Total Revenues	\$ 23,238,823		\$ 15,583,000	
Source: CRRRA, Fiscal Year 2010 Operating and Capital Budget and PRI calculations				

Table C-2. Wallingford Project Expenditures FY 08 and FY 10		
Expenditure	FY 08 ACTUAL	FY 10 ADOPTED
General Administration	\$ 939,612	\$ 1,109,000
Local Administration-Project	51,048	54,000
Project Closure Reserve	-	820,000
Debt Service / Administration	4,532,795	-
Resource Recovery Facility	1,839,487	1,936,000
Disposal	7,605,833	7,623,000
Future Planning Reserve Contribution	3,543,996	-
Ash Disposal	3,140,132	2,772,000
Waste Transport-Diversion & Exports	751,336	839,000
Regional Recycling	120,906	139,000
Landfill - Wallingford	136,346	291,000
Total Expenditures	\$ 22,661,491	\$ 15,583,000
Source: CRRRA, Fiscal Year 2010 Operating and Capital Budget		

**Table C-3. Wallingford Project Expenditures as Portion of
Actual and Member Tip Fees,
FY 2008 and FY 2010**

Expenditure	Actual Total Cost per Ton FY 2008	Average Cost Member Town per Ton FY 2008	Adopted Total Cost per Ton FY 2010	Adopted Average Cost Member Town per Ton FY 2010
General Administration	\$ 6.27	\$ 2.31	\$ 7.11	\$ 4.27
Local Administration- Project	0.34	0.13	0.35	0.21
Project Closure Reserve	-	-	5.26	3.16
Debt Service / Administration	30.26	11.13	-	-
Resource Recovery Facility	12.28	7.85	12.41	7.45
Disposal	50.77	18.67	48.87	29.35
Future Planning Reserve Contribution	23.66	8.70	-	-
Ash Disposal	20.96	7.71	17.77	10.67
Waste Transport- Diversion & Exports	5.02	1.84	5.38	3.23
Regional Recycling	0.81	0.30	0.89	0.54
Landfill - Wallingford	0.91	0.33	1.87	1.12
Total	\$ 151.27	\$ 59	\$ 99.89	\$ 60

Source: CRRA, Fiscal Year 2010 Operating and Capital Budget and PRI calculations

APPENDIX D

General State Strategies to Increase Diversion

Table D-1. Strategies to Increase Diversion	
<i>Strategy</i>	<i>Description</i>
Further enforcement of existing recycling statutes	<ul style="list-style-type: none"> • DEP would inspect various aspects of the solid waste disposal system to determine whether the requirements of mandatory recycling were being fulfilled • DEP would require that individual towns meet the 40 percent recycling goal
<i>Pros</i>	<i>Cons</i>
<ul style="list-style-type: none"> • Further reduce the presence of recyclable items in the waste stream • Create a revenue source through fines • Increase economic incentive to recycle • Target underperforming municipalities or regions 	<ul style="list-style-type: none"> • Unpopular process for both the fines and the inspection of trash • Not clear what entity would be responsible for payment of fines • Greater enforcement requires higher level of staffing • Current data reporting is inadequate to ensure accurate list of underperforming towns • Recycling rate goal may reward towns with high generation rates and punish towns with low generation rates • Increase incentive to misreport waste and recycling figures

<i>Strategy</i>	<i>Description</i>
<p>Develop incentive program with a dedicated source of funding for recycling and source reduction</p>	<ul style="list-style-type: none"> • Create system that focuses on providing greater economic incentives for municipalities with high diversion or low disposal rates • DEP should reward municipalities with high recycling rates or low disposal per capita rates in order to give further economic incentive to under performing municipalities
<i>Pros</i>	<i>Cons</i>
<ul style="list-style-type: none"> • Economic incentives could be used to offset costs of recycling and/or capital investment in diversion system • Level for incentive based on median rates for Connecticut municipalities • Outcome based incentive gives towns flexibility to achieve goals • DEP already has enforcement authority 	<ul style="list-style-type: none"> • Needs a funding source • Levels may be unrealistic goals without population density adjustment, which would make the system more complicated • Top performers may use incentive for non-recycling purposes • System depends on accurate, timely reporting system which may be manipulated with self reporting

<i>Strategy</i>	<i>Description</i>
<p>Develop a cap and trade system for disposal</p>	<ul style="list-style-type: none"> • DEP first sets a cap for MSW disposal per capita • Municipalities issued credits based on current per capita rates • If a municipality comes in below its cap or above its floor, it has extra credits which it may trade with other municipalities • Municipalities which come in below caps can sell their extra credits, while reducing their MSW disposal • Municipalities which cannot get their disposal rate low enough are given the opportunity to purchase excess credits from other towns or be penalized
<i>Pros</i>	<i>Cons</i>
<ul style="list-style-type: none"> • By creating a cap, it makes it clear the state wants to reduce its overall MSW disposal rate rather than just fining municipalities for not meeting goals • Avoids moral hazard of rewarding municipalities who have done less than other municipalities to increase recycling or reduce generation • Municipalities that need to buy additional credits can assign the costs to residents/businesses as they see fit 	<ul style="list-style-type: none"> • Setting initial rate is potentially difficult • Setting at current rates may punish those that already excel and reward those that have not yet reduced • Adjustment necessary for residential and commercial density • May encourage non-reporting of direct haul out of state • relies on accurate hauler reporting, like the current data system



Policy Options Relationship to State Goals, Competition, and Costs

Table E-1. Policy Options					
Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
<p>Adequacy and Sustainable</p> <p><i>Diversion</i></p> <ul style="list-style-type: none"> • Inadequate source reduction and recycling efforts • The sorting facilities for the most commonly accepted recyclable materials (e.g., bottles, cans, paper) are currently operating far below capacity 	<ul style="list-style-type: none"> • Increase diversion <ul style="list-style-type: none"> ◦ DEP incentive program with dedicated funding ◦ Composting study ◦ Cap and trade ◦ Allow commissioner to mandate more items ◦ Enforce current regulations 	Yes	Yes	Yes	Low-Med
<p><i>MSW Disposal</i></p> <ul style="list-style-type: none"> • Connecticut's disposal system is not sufficient to process all the waste generated within the state • Existing RRF capacity is likely to continue but in-state RRFs do not have the processing capability to handle the entire 	<ul style="list-style-type: none"> • Increase diversion <ul style="list-style-type: none"> ◦ See above • Increase in-state publicly-owned RRF disposal capability to prevent out-of-state landfill use 	Yes	Yes	Yes	Med

Table E-1. Policy Options

Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
<p>state's disposed MSW</p> <ul style="list-style-type: none"> • Resource recovery is at maximum capacity • Waste being exported has increased • The determination of need process for siting additional disposal capacity prevents the development of excess in-state disposal capacity. • Out-of-state landfill capacity for MSW and ash is abundantly available and will likely continue to be for the foreseeable future 	<p>Policy Options</p> <ul style="list-style-type: none"> • Eliminate DON to increase in-state disposal options • Develop in-state landfill capacity • Develop connection to out-of-state landfill to improve sustainability 	<p>Yes</p> <p>Yes</p> <p>No</p>	<p>Yes/No</p> <p>No</p> <p>No</p>	<p>Yes</p> <p>Yes</p> <p>Yes</p>	<p>Low/Savings</p> <p>Med</p> <p>Med</p>

Table E-1. Policy Options

Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
<p><u>Ash Disposal</u></p> <ul style="list-style-type: none"> In-state ash disposal capacity is insufficient to handle the ash produced in-state for 20 years Out-of-state landfill capacity for MSW and ash is abundantly available and will likely continue to be for the foreseeable future 	<p>in-state ash landfill</p> <ul style="list-style-type: none"> Develop in-state ash landfill Develop better connection to out-of-state ash landfill to improve sustainability Purchase by public entity and preserve property for possible future use as ash landfill Research possible permitting, beneficial use of, and market for ash residue 	<p>Yes</p> <p>No</p> <p>Yes</p> <p>Yes</p>	<p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p> <p>Yes</p>	<p>Yes</p> <p>Yes</p> <p>Possible</p> <p>Possible</p>	<p>Med</p> <p>Med</p> <p>Med</p> <p>Low</p>
<p>Reasonable Cost</p>					
<p><u>MSW Landfill Disposal</u></p>	<ul style="list-style-type: none"> Build in-state MSW 	<p>Yes</p>	<p>No</p>	<p>Yes</p>	<p>Med</p>

Table E-1. Policy Options

Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
<p>MSW disposal option than RRFs, but Connecticut has no appreciable in-state landfill space to compete with RRF disposal.</p> <ul style="list-style-type: none"> Certain municipalities have found and other municipalities with high-end tip fees may find that disposal in out-of-state landfills is a less expensive alternative to in-state RRFs. Competition for disposal services, may be found in exploiting out-of-state landfill options for certain municipalities or through the use of short-term, in-state spot market contracts. 	<p>landfill capacity</p> <ul style="list-style-type: none"> Develop better connection to out-of-state landfill through public entity Purchase of out-of-state landfill capacity by public entity 	<p>No</p> <p>No</p>	<p>No</p> <p>No</p>	<p>Yes</p> <p>Yes</p>	<p>Med</p> <p>Med</p>
<p><u>RRF disposal</u></p> <ul style="list-style-type: none"> Limited in-state competition for RRF services. Competition for disposal services may be found in 	<ul style="list-style-type: none"> Eliminate DON 	<p>Possible</p>	<p>Yes</p>	<p>Yes</p>	<p>Low/Savings</p>

Table E-1. Policy Options

Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
<ul style="list-style-type: none"> exploiting out-of-state landfill options for certain municipalities or through the use of short-term, in-state spot market contracts but both options carry risks 	<ul style="list-style-type: none"> Regulate Rates Require Financial Reporting to DPUC but No Rate Setting 	No	-	Yes	Hi
<ul style="list-style-type: none"> Unknown long-term trend in market competitiveness because market appears to rely on nearest out-of-state competitor and only two providers of disposal services - no true public option. 	<ul style="list-style-type: none"> Build more in-state RRF capacity by expansion or new facility by public entity 	Yes	Yes	Yes	Hi
<ul style="list-style-type: none"> Without access to the private vendor's costs of services, it is unclear if the fees paid for disposal by CRRRA to these same operators, while the plants were affiliated with CRRRA, represented reasonable and competitive costs. 	<ul style="list-style-type: none"> Disallow Favored Nation Status in Contracts 	No	-	Yes	Low
<ul style="list-style-type: none"> It is unknown what the longer-term trend in market competitiveness will be like 	<ul style="list-style-type: none"> Public Purchase of RRF Plants 	Possible	Yes	Possible	Hi

Table E-1. Policy Options

Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
<p>because the Connecticut disposal market appears to rely on the nearest out-of-state disposal sites to provide competition to the only two providers of RRF disposal services in Connecticut.</p>					

*Note: Estimated implementation cost ranges: Low = Less than \$10 million; Medium = Between \$10 million to \$100 million; High = Over \$100 million