N.E.S.T.

NorthEast-Southtowns
Solid Waste Management Board
c/o Erie County Department of
Environment and Planning

NorthEast Southtowns
Regional Solid Waste Management Plan

2000-2012

Submitted to:

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TABLE OF CONTENTS

Tables and Figures

1 INTRODUCTION

The purpose of this solid waste management plan (SWMP) is to document Northeast Southtowns' (NEST) achievements in integrated waste management and identify strategies for improvements that make the system more cost-effective and put it in compliance with State SWMP planning requirements.

This SWMP is being developed in conjunction with a baseline model of the regional solid waste management system, constructed using the WastePlan software developed by Tellus Institute. WastePlan is a modeling program municipalities can use to model their waste streams, facilities and equipment, recovery and disposal destinations, make future projections, and run various scenario analyses. The initial structure and data inputs for the NEST baseline model have been taken from this SWMP, including generation, composition and material-flow data on a municipality-by-municipality basis. It is anticipated that this WastePlan model will be of use to the region and to individual municipalities both in implementing the plan as presented here, and in other future planning and modeling efforts. A more extensive description of the WastePlan software and model as currently exists is included in Appendix K.

This chapter provides a general description of NEST and its solid waste management practices. It also discusses previous planning efforts, solid waste management challenges and needs, and the objectives of the SWMP. Chapter 2 identifies the sources and amounts of waste generated in the planning area, and includes generation projections over the planning period. Chapter 3 examines current recovery, including both recycling and composting, and discusses the status of recovery on a material-by-material basis. Chapter 4 provides details on the existing solid waste management arrangements for collecting, recovering, and disposing of waste in NEST. Chapter 5 describes specific integrated solid waste management alternatives and discusses their applicability to NEST. Finally, Chapter 6 presents NEST's proposed integrated solid waste management plan and the schedule for implementing the SWMP.

1.1 Planning Area Description

1.1.1 Geographic, Demographic, and Economic Data

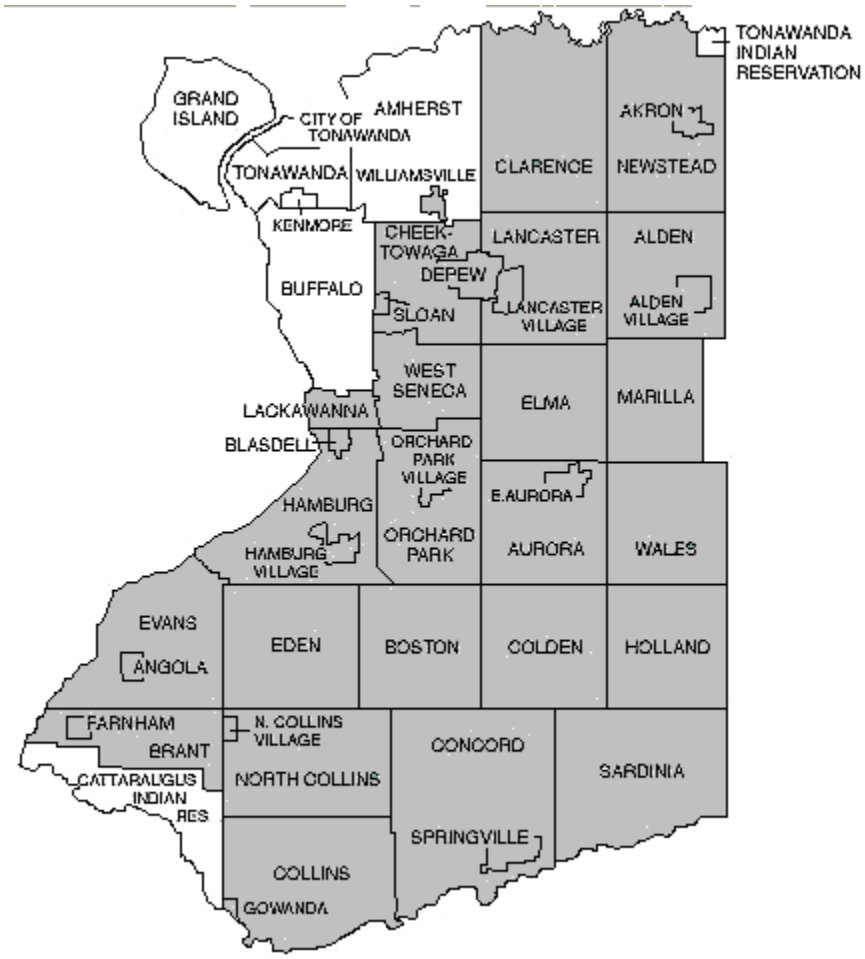
The NEST Solid Waste Management Board serves a region that includes 37 municipalities (22 towns, 14 villages, and one city) in Erie County, New York. The region is divided between suburban and rural areas. The densest and most populous portion of the region is part of the metropolitan Buffalo area. Approximately 60 percent of NEST's residents live within ten miles of downtown Buffalo City. The area located 15 miles or more from the center of Buffalo is predominantly agricultural. The county is divided into towns, which are typically rectangular quadrants roughly 38 square miles apiece, with incorporated villages within (and in the case of

Depew and Gowanda, straddling) town boundaries. The even geographic distribution of towns, combined with the uneven distribution of population, results in significant differences between the size and nature of municipal infrastructure. Four of the region's 37 municipalities contain 47 percent of its population.

These intermunicipal differences have several key implications for solid waste management: first, less populous municipalities often do not have substantial resources to devote to solid waste issues, and also individually lack leverage in contracting with disposal facilities and service providers, which operate on a regional scale. As discussed later, the 37 municipalities, particularly the rural units, have found advantages in collective contracting and regional action. At the same time, these differences in population density and economic activity should be considered in planning efforts.

The economy in the NEST region is closely tied to that of the City of Buffalo. Industry within the region is predominantly light manufacturing, with printing and retail sales also representing significant sectors of commercial activity. Large regional employers include Fisher Price (toy

Figure 1-1: The Municipalities of the NEST District
(as contained within Erie County)



manufacturing), and Moog (computerized aircraft, satellite & machinery control manufacturing) in East Aurora; Motorola Automotive (also computerized control manufacturing) in Elma; and the eastern U.S. headquarters for wholesale computer product distributor Ingram Micro in Williamsville. Industrial and commercial enterprises in the towns are on a smaller scale than in the villages. Retail sales are another large sector of the NEST economy.

With few exceptions, businesses contract privately with waste management companies for collection, hauling, and disposal. Few municipalities have statistical information about commercial, industrial or institutional (CII or non-residential) disposal or recycling levels or services. Although detailed knowledge is absent for this sector, non-residential wastes comprise a large fraction of municipal solid waste and must be considered and addressed in planning.

1.1.2 Major Transportation Routes

The largest traffic artery in the planning area is I-90, which extends northeast-southwest along the shore of Lake Erie to Buffalo and then generally east -west to the Rochester area and beyond, crossing the eastern and northern municipalities of NEST. Routes leading from the south and east toward Buffalo include US Highway 219 and NY 400, while US Route 20 and 20a run more directly east and west through the center of the planning area. Another significant route for purposes of waste disposal is NY Route 266, which leads from the Buffalo area to two disposal facilities north of Erie County.

1.1.3 Population Trends and Projection

Population is a primary factor when considering solid waste generation. The NEST region as a whole experienced a rapid population growth during the 1960s. Population leveled off during the 1970s and remaining relatively steady since then. The last decade has also seen a shift of population from the metropolitan region to the more rural areas.

No recent population projections were identified by the University of Buffalo's Institute for Local Government and Regional Growth, and so the most current data available was used to generate population projections for use in this SWMP. The 1990 and 2000 diennial census results for each municipality were used as a basis for projecting future population through the planning period.[1] Results vary among municipalities, from 2 percent annual growth to 2 percent annual decline; in total, the region is expected to grow slightly less than 1 percent annually.[2] For population comparisons, see Table A-1 in Appendix A.

[1] Simple linear extrapolation was used with 1990 and 2000 data points as inputs. See Appendix A for full municipal level projections and the 1990s census data on which the forecast is based.

[2] The 2000 results show slightly higher NEST population than expected from 1999 census estimates. See also Institute for Local Governance and Regional Growth, *State of the Region Report,* 1999, p6.

Table 1-1: NEST Population Data and Projections, 1990-2012[3]

Year	Population
1990	429,985
1995	433,950
2000	433,377
2006	435,412
2012	435,751

1.1.4 Other Significant Factors Affecting Waste Generation

Changes in CII sector activity can influence MSW generation. Growth in CII activity is expected to be moderate. All the large or significant industries and institutions are accounted for by the CII waste generation estimates presented below.

The effect of seasonal waste generation is a consideration in assessing the region's future waste generation rates. Typically, solid waste generation is highest between the months of April and August, due to the presence of grass clippings, leaves and other yard debris. Tonnages in April, May and June characteristically show a peak due to "spring cleaning" activities by area residents. However, the seasonal variation in NEST's solid waste generation does not appear to pose any problems for collection, disposal, or processing of the region's solid waste stream. NEST has not identified any other factors that are likely to significantly affect the solid waste generation over the planning period.

1.2 Waste Management Practices Within the Region

Within NEST most solid waste management decisions are made at the municipal level. Collection and hauling, for example, is arranged on the municipal basis. The majority of municipalities in the area contract with private hauling companies that operate regionally. Recycling is arranged on a municipal basis; however, many of the programs make use of the two large material recovery facilities within the area. Waste disposal also relies on the use of regional facilities. The NEST municipalities have addressed this aspect of waste management collectively. This plan and the intermunicipal district to which it applies are part of a trend toward regional planning and assistance to local municipalities. While the decision to be included in regional efforts rests with the municipalities, intermunicipal and regional initiatives offer options which local communities would be unable to develop alone. More detailed information on current practices, arrangements and facilities is provided in Chapter 4 below.

[3] Data in this document are presented for the period 2000 to 2012. 2000 is the last year for which reported historical data was generally available. The plan covers a full decade beginning with the current year 2002.

1.3 Historical Development of NEST

1.3.1 Formation and primary role of NEST

Before 1993, 14 of the NEST planning area municipalities were part of two solid waste management boards (the Northeast and the Southtowns boards). In 1993 they joined to form NEST. The primary function of NEST at that time was to negotiate standard facility contracts on behalf of the municipalities. Due to economies of scale and collective action, the board could secure more favorable and uniform tipping fees and rates than could the communities acting individually. The municipalities could then enter these standard contracts if they chose, by submitting a companion document.

1.4 Previous Planning Efforts

The NEST communities have established recycling systems, and have undertaken major planning efforts which predate this SWMP. The analysis of alternatives in Chapter 5 and recommendations in Chapter 6 of this SWMP have been developed and need to be evaluated in the context of NEST's prior plans and activities.

1.4.1 The Northern Recycling Council and the 1991 SWMP

The first comprehensive planning effort in and around the NEST area was made in connection with area recycling efforts. During the period 1990-91, recycling implementation began throughout Erie County. However, some municipalities felt the amounts charged by private business to process recovered materials was too high, and 15 joined together to form an intermunicipal recycling district, the Northern Recycling Council (NOREC). The purpose of NOREC was to establish and operate a material recovery facility (MRF). Development of a solid waste management plan was initiated, in part to facilitate and support state permitting and funding for this MRF.

The NOREC-sponsored MRF project was abandoned when private sector processing charges for recovered materials dropped. The municipalities opted to use private services rather than develop a MRF themselves. The task of completing a comprehensive plan was taken over by the NEST board and the County of Erie. The result was a Comprehensive Recycling Analysis (CRA), which was submitted to the state in 1995.

1.4.2 The 1995 CRA

The CRA provides a historical benchmark and analysis of the planning region's solid waste practices and recycling options. Although it did not address all aspects of a comprehensive Solid Waste Management Plan, the information and analyses developed in the CRA are integral to the

region's planning efforts, of which this SWMP is a continuation. Comparison with the historical data and projections of the CRA will be presented in Sections 2.5 and 3.4 of this document.[4]

1.5 NEST's Solid Waste Management Needs

As will be shown in the later chapters of this report, NEST does not expect substantial growth in waste generation. Existing regional disposal capacity, as well as capacity for processing recyclables, is satisfactory for the planning period. What NEST needs is to foster higher levels of waste reduction, recycling and composting within its existing infrastructure. This may need to be complemented by an expansion of regional composting capacity.

1.6 Objectives of the Plan

This plan documents existing integrated waste management operations in order to develop a plan for improving system cost-effectiveness and efficiency, and so bring NEST and its members into compliance with DEC SWMP requirements. It has been prepared in accordance with 6 NYCRR Part 360 which identifies the regulations and recommends an approach for developing solid waste management plans and comprehensive recycling analyses. The principles of the New York State Solid Waste Management Act and the New York State Solid Waste Management Plan are embodied in the management approaches discussed in this report. In particular, the plan emphasizes waste minimization through source reduction and composting, as well as environmentally sound disposal.

This plan diverges from published guidelines only to the extent to include previous integrated waste management planning in its analysis. This is required to appropriately build and improve upon the system already established.

[4] It should be noted that in making comparison with the CRA, there is some uncertainty because different methodologies and categorization have been used. These differences and the reasons for them will be noted. This will provide as much transparency as possible without undue repetition of the CRA's contents.

2 SOLID WASTE QUANTITIES AND CHARACTERISTICS

This chapter provides information on the waste generated in the NEST region. An analysis of the region's options to effectively manage its waste stream must be based on the clearest understanding of the quantity of waste currently generated, the composition of that waste, and projections of future generation and composition. Particular attention is paid to the development of a Baseline, showing MSW generation and composition in 2000.

2.1 Inventory of Waste Types

There are a variety of wastes that are generated or handled in such a way as to deserve separate analysis. Table 2-1 provides an inventory of the types of solid waste generated in the NEST region.

Table 2-1: Inventory of Waste Streams Generated in Northeast Southtowns

Municipal Solid Waste:
Residential (Household) Municipal Solid Waste
CII Municipal Solid Waste

Other Wastes:
Junk Automobiles; Automotive Oil & Batteries
Agricultural Wastes
Industrial, Non-Hazardous, Process Waste
Construction And Demolition Wastes
Sewage Sludge And Grit Screenings
Medical Wastes From region Doctor's Offices, Veterinarians, Clinics And Hospitals
Household Hazardous Waste
Industrial Hazardous Waste

Municipalities are primarily concerned with residential municipal solid waste, including yard waste and white goods; construction & demolition debris, and household hazardous waste. CII wastes in the region are, with few exceptions, handled privately. Waste types that do not enter the recovery and disposal activities of the region include agricultural waste, which is largely handled on-site, and junk automobiles, which are extensively reclaimed through a distinct salvage industry. Industrial hazardous wastes, medical waste, and sewage also are dealt with under separate regulations and through a separate set of arrangements.

2.2 Data Sources

As with any analysis, the quality and accuracy of the Baseline for this SWMP is determined by the information on which it is built. Data on public sector solid waste management are often incomplete. Where data exist, different methods have been used to collect and categorize it. Data on privately managed waste are generally unavailable.

The current analysis has been based wherever possible on locally reported, municipal-level information. Where data gaps exist methods have to be developed to combine extant data and to approximate missing information. To do this, regional aggregates and estimates were also relied upon. In the absence of either municipal or regional information, national data were used as default values. In all of these efforts the aim was transparency and replicability. Thus, only regional information that is reasonably transparent in its structure has been relied upon.

The information used to assess current generation, recycling, and disposal levels and characterization includes the following:

- **The Tellus 2000 Questionnaire.** Distributed to municipalities during the last quarter of 2000, this questionnaire requested basic information on municipal codes, service types, and levels. Of the 37 municipalities within NEST, 34 replied to the survey with varying levels of completeness.

- **The 1999 DEP Survey.** The Erie County Department of Environment and Planning (DEP) collected information on aggregate disposal and recycling, costs, and contract provisions, which were compiled in tabular form. Data are generally complete for 31 of the 37 NEST communities.

- **The 1995 Erie County (NEST) CRA.** This report was based primarily on 1991 data, complete or calculated for 35 municipalities. Gowanda, Lackawanna and Williamsville are not included, as this report predated their membership in NEST. The report includes waste generation and recovery data and statistics, projected through 2012. Also included is a complete local market analysis for recyclables, for which prices are updated in this SWMP. Other elements of the CRA are incorporated in this report for comparative purposes.

- **The US EPA/Franklin Associates "Characterization of Municipal Solid Waste in the United States: 1998 Update," (i.e., the Characterization Report).** This is the US EPA's most recent, complete assessment of municipal solid waste at the national level. National averages from this document were used as detailed in Table 2-2.

Table 2-2 below shows the basic source of data for each of the waste streams for which generation or composition is developed in this report. The Tellus Questionnaire indicates specific, municipal-level information, while the EPA/Franklin Associates *Characterization Report* indicates that municipal data was unavailable and so reasonable national averages have been applied to the NEST region for these data elements. Additional information on data sources and methods for their use is provided in the following sections.

Table 2-2: Primary Source of Data for Elements of the SWMP

	Total Amount	Composition
Residential MSW Generation	Tellus Questionnaire	EPA/Franklin
Residential MSW Recycling	Tellus Questionnaire	Tellus Questionnaire
Residential Composting	Tellus Questionnaire	Not Applicable
CII Generation	EPA/Franklin	EPA/Franklin
CII Recycling	EPA/Franklin	EPA/Franklin
Construction & Demolition Debris	Erie DEP 2001 Report	Erie DEP 2001 Report
Sewage Sludge	NYSDEC 1998 Report	Not Applicable

2.3 Estimates of Current Waste Generation

This section provides information on the total amount (i.e., tonnage) of MSW, Construction and Demolition (C&D) and Sewage Sludge which is generated in the NEST region. Table 2-3 presents these tonnages with MSW divided into the portions generated in the residential and CII sectors. The analysis of MSW is expanded in Table 2-5, to capture certain portions of MSW, such as deposit containers, that do not appear in the "NEST Collected" data used to develop Table 2-4. In this report, the focus is on the waste for which NEST has direct responsibility. Accordingly, the only other places the data refer to total rather than municipally collected MSW, besides Table 2-5, are Table 3-2, in which NEST-wide recovery rates are calculated, and Table 6-1, where NEST-wide waste management is summarized.

2.3.1 Residential MSW Generation

In general, generation is computed as the sum of all waste quantities, recovered and disposed. This SWMP statistic uses three sources to determine residential waste generation for the year 2000. The information on waste generation provided in the 2000 Tellus municipal survey was the starting point for the estimation of residential MSW generation. In cases where municipalities did not report generation, the values from the 1999 DEP survey (or in the case of composting, the 1995 CRA) were used in lieu of current data. Where data was missing or unreliable, a per-capita NEST average, developed using the data from reporting municipalities, was applied. The data sources for municipal-level data on disposal, recycling, and composting are summarized in Table 2-3. Twenty of the 37 municipalities reported disposal information using the 2000 questionnaire. Eighteen provided recycling and composting information. An additional four communities had submitted complete information in the 1999 DEP survey. Generation was estimated for the remaining thirteen municipalities; the regional per capita generation rate for reporting municipalities was 3.06 lbs/day. In total, the NEST municipalities generated 242,433 tons of residential MSW in 2000 (see Table 2-4).

Table 2-3: Sources for Residential MSW Statistics

2000 = Tellus Questionnaire; 1999 = Erie DEP Survey; 1995 = CRA E = Estimated from per capita average of reporting NEST municipalities				
	Disposal: D	**Recycling: R**	**Composting: C**	**Generation: G**
Alden (T)	2000	2000	2000	D + R +C
Alden (V)	2000	2000	2000	D + R +C
Williamsville (V)	2000	1999	2000	D + R +C
Aurora (T)	2000	2000	1995	D + R +C
East Aurora (V)	2000	2000	2000	D + R +C
Boston (T)	G - R - C	1999	E	E
Brant (T)	G - R - C	E	E	E
Farnham (V)	G - R - C	E	E	E*
Cheektowaga (T)	2000	2000	2000	D + R +C
Depew (V)	2000	2000	2000	D + R +C
Sloan (V)	2000	1999	1995	D + R +C
Clarence (T)	2000	2000	2000	D + R +C
Colden (T)	G - R - C	E	E	E*
Collins (T)	2000	2000	2000	D + R +C
Gowanda (V)	G - R - C	1999	E	E*
Concord (T)	2000	2000	2000	D + R +C
Springville (V)	2000	E	E	D + R +C
Eden (T)	2000	2000	2000	D + R +C
Elma (T)	2000	2000	2000	D + R +C
Evans (T)	G - R - C	1999	1995	E
Angola (V)	G - R - C	1999	E	E*
Hamburg (T)	G - R - C	1999	E	E
Blasdell (V)	G - R - C	E	E	E
Hamburg (V)	2000	2000	1995	D + R +C
Holland (T)	2000	2000	1995	D + R +C
Lackawanna	2000	2000	2000	D + R +C
Lancaster (T)	2000	2000	1995	D + R +C
Marilla (T)	1999	1999	2000	D + R +C
Newstead (T)	2000	2000	2000	D + R +C
Akron (V)	2000	2000	1995	D + R +C
North Collins (T)	G - R - C	1999	E	E*
North Collins (V)	G - R - C	1999	E	E
Orchard Park (T)	2000	2000	2000	D + R +C
Orchard Park (V)	G - R - C	E	2000	E
Sardinia (T)	G - R - C	E	E	E
Wales (T)	2000	2000	2000	D + R +C
West Seneca (T)	2000	2000	2000	D + R +C
# reporting current data	23	20	18	22
# reporting 1999 /1995 data	1	10	7	2
# with estimated data	13	7	12	13

* Indicates outlier values reported in the DEP survey. As assumptions behind 1999 responses may differ from the 2000 questionnaire, extreme values from the DEP survey (varying over 50% from national averages) were not included. These values and unreported values were replaced by estimates in the SWMP. Specific thresholds are noted in this SWMP along with the methodology for each category.

2.3.2 Commercial, Industrial, and Institutional (CII) MSW Generation

Few municipalities provided information on commercial-industrial-institutional generation. The municipalities that reported tonnages for CII include East Aurora, Clarence, Condord, Newstead, and the Town of Orchard Park. Williamsville, Gowanda, Marilla, and Akron reported combined

residential-and-CII tonnages. For the remaining 28 municipalities, this report uses the national per-capita CII generation rate of 1.91 lbs./day to develop a CII estimate.[5] The result is a NEST total of 139,218 tons (see table Table 2-4).

2.3.3 Construction & Demolition Debris Generation

Construction and Demolition Debris (C&D) is less easily estimated than MSW. Its generation and composition fluctuates considerably year to year based on local building and demolition activities.

Erie County DEP is currently involved in a study of building-related construction and demolition debris, and has created a report on the topic.[6] Estimates in the report apply national averages from the US EPA/Franklin Associates publication, "Characterization of Building-Related Construction and Demolition Debris in the United States, 1998." Using a per capita C&D generation rate of 2.8 lbs/day, NEST's current generation of building-related C&D is estimated at 208,891 tons (see Table 2-4). Appendix Table B-3 shows the estimated material and municipal breakdown of C&D waste generated within NEST.

2.3.4 Sewage Sludge

Data on sludge are presented in the 1998 NYSDEC study, "Biosolids Management in New York State." NEST is a subset of DEC region 9; facilities within NEST reported 4535 dry tons of sewage received annually (see Table 2-4). This disposal figure is taken here as an estimation of generation. Biosolids generation is not assumed to change significantly during the planning period.

2.3.5 Regulated Medical Waste Generation

Regulated medical wastes within NEST are generated primarily by three large medical facilities in the region. As regulated medical waste is not dealt with on a municipal basis and is not a significant waste flow to municipally-used facilities, it will not be integrated into the components of this report.

2.3.6 Household Hazardous Waste Generation

A program for collection and disposal of Household Hazardous Waste (HHW) has been established by Erie County. The program provides public education as well as four HHW drop-off days annually. The majority of municipalities rely on the county for this service rather than

[5] US EPA/Franklin , *Characterization of Municipal Solid Waste in the United States, 1998 Update* gives both US Population and CII generation, the ratio of which is the per capita CII generation rate.

[6] *Erie County Construction and Demolition Debris Generation Report*, submitted in March 2001. Although permit information is also available for these facilities, it does not fully indicate the relative contribution of NEST areas alone.

providing it themselves. Since it too does not impact municipal collection or disposal facilities, it will not be included into the SWMP components.

2.3.7 Other Wastes

Several other wastes are generated in the region but are not part of the waste stream managed by the NEST members. This would include agricultural waste, which is handled primarily on site and therefore not a part of the municipal waste stream. Used automobiles are also handled on a private basis and largely recycled, with the exception of a small proportion of shredder fluff. Industrial process wastes are also handled privately.

Table 2-4: Size of Reported Waste Streams

Waste type	Amount	Units	Source
Residential MSW	242,433	Tons	2000 SWMP Analysis, local data
Commercial MSW	139,218	Tons	2000 SWMP Analysis, national average
C & D Debris	208,891	Tons	Erie DEP report, March 2001
Sewage Sludge	4,535	Dry tons	NYSDEC Biosolids Mgmt. Report, 1998

2.4 Current Municipal Solid Waste Characterization

In this report, "characterization" refers to material by material composition of a waste stream such as MSW. The term "composition" will be used interchangeably with characterization.

Section 360-1.9(f)(i) of 6 NYCRR Part 360 allows the analysis of waste stream characterization to be based on "applicable published information." Since the plan addresses MSW from residential and CII sources separately, it is necessary to separate characterizations for each of these sectors. Previous plans, specifically the 1995 CRA, do not differentiate between residential and CII sources. The US EPA/Franklin Associates *Characterization Report* does provide data for such a disaggregation. When residential and CII fractions in the *Characterization Report* are totaled, the composition fractions vary less than 3 percent from the aggregate MSW characterization published in the 1995 CRA in all but two material subcategories (newspaper and magazines, see Appendix Table B-2 for comparison). Also, like the *Characterization Report*, the CRA includes only MSW in its composition and projection tables. Thus, the data in the *Characterization Report* provide an appropriate basis for use here.

The composition data from the *Characterization Report* are applied to NEST generation amounts, in Table 2-5. This table includes a detailed categorization in order to be most useful in examining the MSW stream.[7] Figure 2-1 displays the same results using a more general categorization scheme.[8]

[7] Data sources for this report in several cases do not use similar categorization, and therefore require reconciliation in order to be applied. The *Characterization Report,* for example, uses both a material and a product classification. Municipalities often report

Table 2-5: NEST MSW Composition by Source, 2000

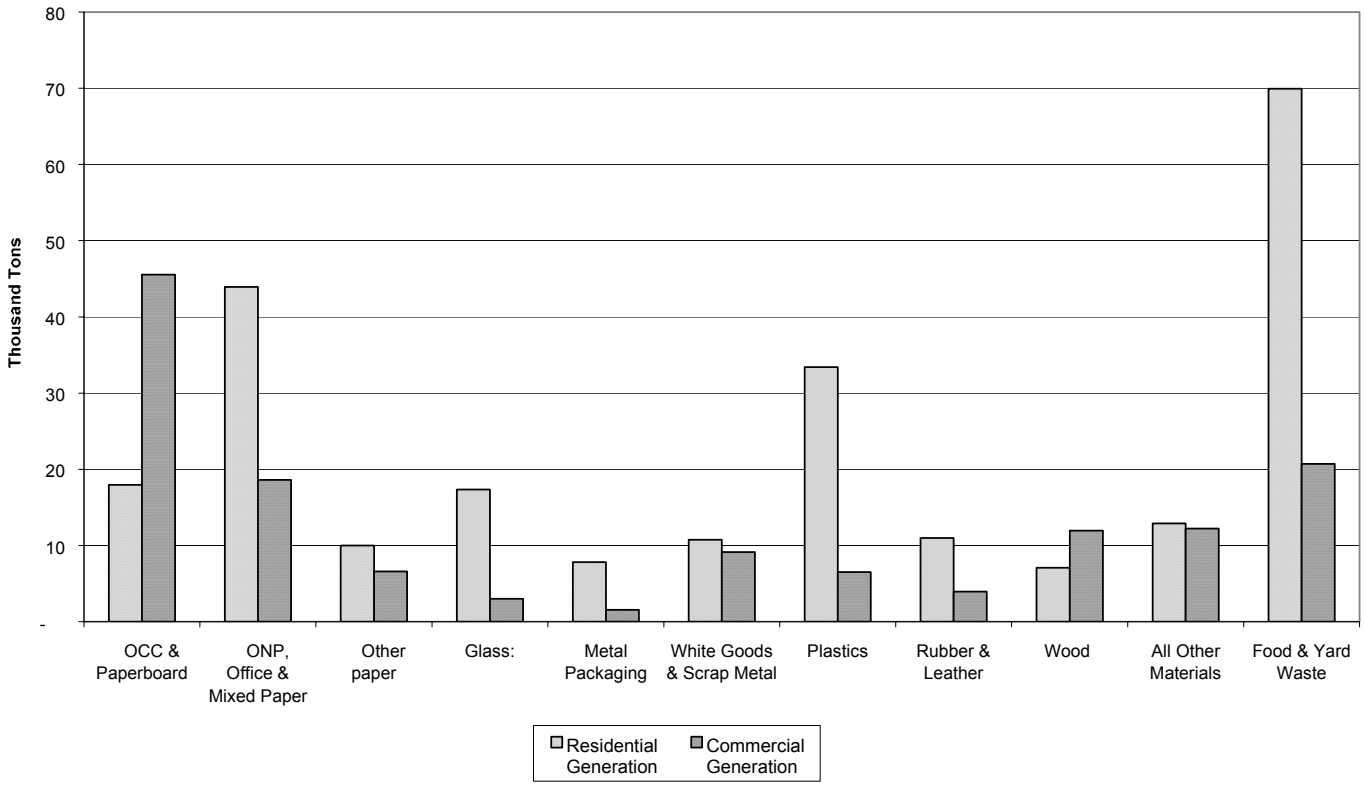
Materials:	RESIDENTIAL		CII		COMBINED	
	Tons	% of Res	Tons	% of CII	Tons	% of Total
Paper and Paperboard:						
Corrugated Boxes	5,883	2.4%	40,774	29.3%	46,657	12.2%
Paperboard	7,006	2.9%	3,767	2.7%	10,774	2.8%
Other Paper Packaging	5,105	2.1%	861	0.6%	5,965	1.6%
Newspaper	22,367	9.2%	3,040	2.2%	25,407	6.7%
Office Paper	3,413	1.4%	7,886	5.7%	11,300	3.0%
Other Letter & Printing	15,474	6.4%	11,916	8.6%	27,390	7.2%
Magazines	2,739	1.1%	1,136	0.8%	3,874	1.0%
Disposable Paper Goods	4,112	1.7%	3,037	2.2%	7,149	1.9%
Other Paper	5,893	2.4%	3,529	2.5%	9,421	2.5%
TOTAL PAPER	71,991	29.7%	70,501	50.6%	142,492	37.3%
Glass:						
Glass Containers	16,931	7.0%	2,901	2.1%	19,831	5.2%
Other Glass	437	0.2%	84	0.1%	521	0.1%
COLLECTED GLASS	17,368	7.2%	2,985	2.1%	20,352	5.3%
TOTAL GLASS*	19,364	7.9%	2,985	2.1%	22,348	5.8%
Metals:						
Ferrous Packaging	4,765	2.0%	987	0.7%	5,752	1.5%
Aluminum Packaging	3,068	1.3%	551	0.4%	3,619	0.9%
Other Ferrous	6,940	2.9%	5,846	4.2%	12,786	3.4%
Other Nonferrous	3,651	1.5%	703	0.5%	4,354	1.1%
Lead-acid Batteries	174	0.1%	2,540	1.8%	2,714	0.7%
COLLECTED METALS	18,598	7.7%	10,629	7.6%	29,228	7.7%
TOTAL METALS*	18,640	7.6%	10,629	7.6%	29,267	7.6%
Plastics:						
PET	3,048	1.3%	507	0.4%	3,555	0.9%
HDPE	7,480	3.1%	1,180	0.8%	8,660	2.3%
PVC	2,115	0.9%	354	0.3%	2,469	0.6%
LDPE/LLDPE	8,782	3.6%	1,320	0.9%	10,102	2.6%
PP	4,451	1.8%	763	0.5%	5,214	1.4%
PS	2,336	1.0%	1,355	1.0%	3,692	1.0%
Other Resins	5,237	2.2%	999	0.7%	6,236	1.6%
COLLECTED PLASTICS	33,450	13.8%	6,479	4.7%	39,929	10.5%
TOTAL PLASTICS*	33,531		6,479	4.7%	40,010	10.4%
Textiles	1,236	0.5%	6,327	4.5%	7,564	2.0%
Collected Rubber & Leather	10,991	4.5%	3,913	2.8%	14,904	3.9%
Total Rubber & Leather*	11,463	4.5%	3,913	2.8%	14,904	3.9%
Wood	7,084	2.9%	11,924	8.6%	19,008	5.0%
All Other Materials	11,667	4.8%	5,838	4.2%	17,505	4.6%
Food Wastes	21,368	8.8%	16,456	11.8%	37,824	9.9%
Yard Trimmings	48,680	20.1%	4,165	3.0%	52,845	13.8%
COLLECTED MSW	242,433	100.0%	139,218	100.0%	381,651	100.0%
TOTAL MSW	245,023	100.0%	139,218	100.0%	384,239	100.0%

* Collected Glass, Metals, Plastics, Rubber & Leather, and MSW is material managed within the municipal system and summarized from local data. Total Glass, Metals, Plastics, Rubber & Leather, and MSW also includes deposit containers (estimated at 1,996 tons glass, 41 tons metal packaging, and 82 tons plastic) and tires returned to dealers (estimated at 471 tons), which can be estimated for the NEST region as a whole.

materials and programs in different ways from one another. Appendix C includes a diagram to explain the way in which the primary material-specific categories in this SWMP relate to one another.

[8] Since municipal recycling reported more general categories, it is this broader scheme which is used for sections in the report that include recovery.

Figure 2-1: Summary of NEST MSW Generation by Source and Material, 2000



2.5 Baseline SWMP Generation Compared With 1995 CRA Projections for the Year 2000.

When projecting generation amounts, the 1995 CRA included a generation estimate, and then presented a smaller figure, adjusted to account for source reduction activities included as part of the regional plan. The estimated MSW generation in 2000 described in Section 2.3 is larger than both the pre- and post-reduction generation projections for the region as made in the 1995 CRA. The reasons for this include a higher population in 2000 than was predicted in 1995, as well as a higher per capita generation rate. The trend predicted in the 1995 CRA and the trend seen in the present SWMP can be seen in comparison in Table 2-6**.**. This indicates that regional source reduction activities in the last five years have not been able to lower total per capita generation rates. Continuing source reduction activities, and new opportunities to reduce waste generation, are discussed as elements of the current solid waste management plan in chapters 5 and 6.

The current SWMP also differs somewhat from the 1995 CRA in composition, reflecting updated national trends from the *Characterization Report*. It shows larger amounts of plastics, wood and food waste, and lower amounts of glass.

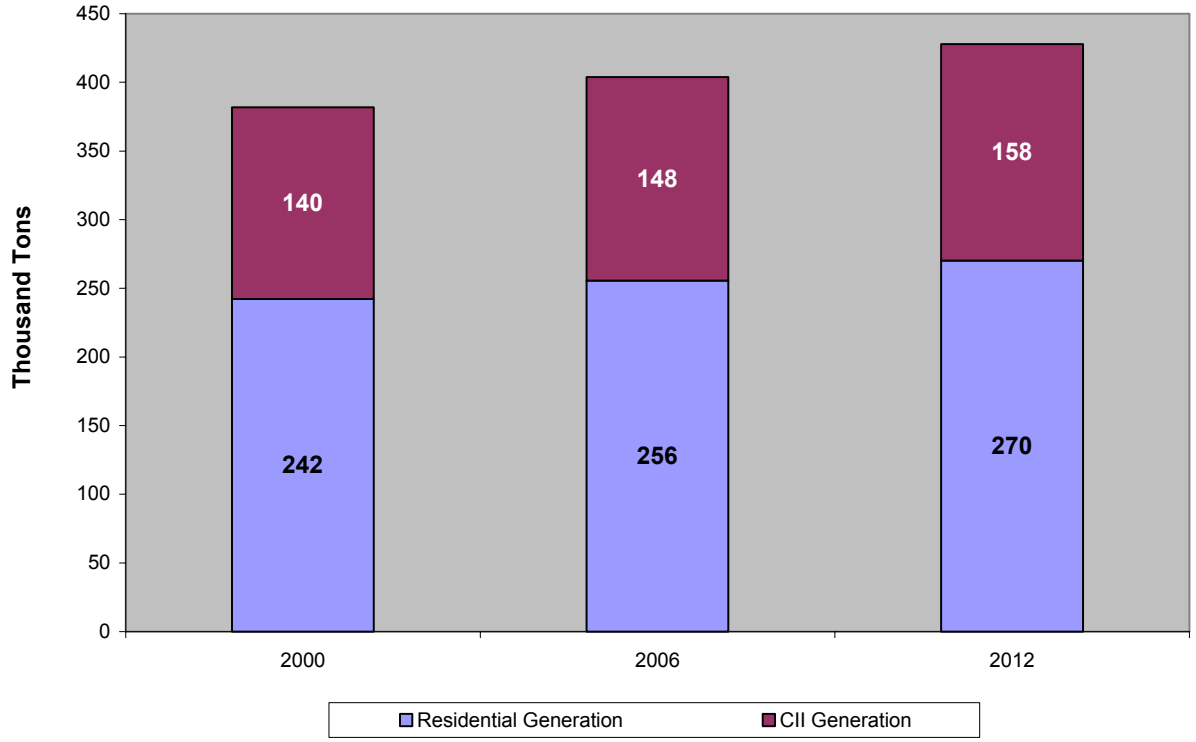
Table 2-6: Estimated MSW Generation in Northeast Southtowns, 1995-2000

	1991 [1995 CRA]	2000 Projection [1995 CRA]	2000 SWMP [Section 2.3]
NEST Population	409,856	419,885	433,377
Residential MSW Generated (tons)	*	*	242,433
Residential Gen Rate (lbs./capita/day)	3.31**	---	3.06
CII Gen Rate (lbs./capita/day)	---	---	1.76
Estimated CII MSW Generated (tons)	*	*	139,218
Total MSW Generated (tons)	330, 070	332,902	381,651
Total MSW Gen Rate (lbs/capita/day)	4.41	4.34	4.82

2.6 Future Municipal Solid Waste Quantification and Characterization

To predict future generation levels, increases in per-capita waste generation rates on a material-specific basis, taken from the 1998 Characterization Report, were combined with the population projections presented in Section 1.1.3. Using these data, generation projections were developed.[9] The aggregate results for the region are shown in below, with material streams given in Table 2-7. Detailed generation projections by municipality and material are found in Appendix C.

Figure 2-2: Northeast Southtowns MSW Generation 2000-2012



[9] The material-specific change in generation rate is given in US EPA/Franklin, *1998 update*, Table 31, for each of nine general material categories (paper and paperboard, glass, metals, plastics, textiles, rubber and leather, wood, food, and yard wastes). Included in Appendix B.

Table 2-7: NEST-wide Material Generation Projection Summary and Comparison with 2000 Baseline

Materials:	Generation								
	2000			2006			2012		
	Res.	CII	Total	Res.	CII	Total	Res.	CII	Total
	tons	tons	tons	tons	tons	tons	tons	tons	tons
Paper and Paperboard:									
OCC & Paperboard	17,994	45,402	63,396	19,553	48,471	68,025	20,666	50,631	71,297
ONP, Office & Mixed Paper	43,993	18,533	62,526	47,805	19,786	67,591	50,525	20,668	71,193
Other paper	10,004	6,566	16,570	10,871	7,010	17,881	11,490	7,322	18,812
TOTAL PAPER	71,991	70,501	142,492	78,230	75,267	153,497	82,680	78,621	161,301
Glass:	17,368	2,985	20,352	17,056	2,880	19,935	16,849	2,812	19,661
Metals:									
Packaging	7,833	1,538	9,372	8,215	1,585	9,800	8,479	1,617	10,096
White Goods & Scrap	10,765	9,089	19,854	11,290	9,365	20,655	11,652	9,553	21,206
TOTAL METALS	18,598	10,629	29,228	19,505	10,952	30,456	20,132	11,172	31,303
Plastics	33,450	6,479	39,929	36,349	6,917	43,265	38,417	7,225	45,641
Rubber & Leather	10,991	3,913	14,904	12,301	4,302	16,603	13,258	4,583	17,842
Wood	7,084	11,924	19,008	8,117	13,422	21,538	8,886	14,523	23,410
All Other Materials	12,903	12,166	25,069	14,515	13,753	28,268	15,701	14,929	30,631
Yard Waste	48,680	4,165	52,845	48,093	4,043	52,136	47,702	3,963	51,665
Food Waste	21,368	16,456	37,824	21,622	16,360	37,982	21,792	16,295	38,087
TOTAL MSW	**242,433**	**139,218**	**381,651**	**255,786**	**147,895**	**403,681**	**265,417**	**154,124**	**419,542**

3 MATERIAL RECOVERY ANALYSIS

This chapter describes the recovery of materials from the NEST waste stream. Current recovery estimates and factors that might influence future recovery levels are discussed. These issues are addressed in an effort to identify future recycling and diversion efforts consistent with New York State's solid waste management policy to maximize recovery of recyclable waste.

As was illustrated in Table 2-2, the residential recovery analysis for this SWMP is based completely on local data sources. Comparable data for the CII sector was not available, and so the CII analysis applies national recovery averages.

3.1 MSW Recovery

3.1.1 Residential MSW Recovery

Estimates of aggregate recycling levels use an identical methodology as that used to estimate generation levels. As noted in Table 2-3, there are reported values for residential recycling from 30 of the 37 municipalities. Twenty of these are from the 2000 questionnaire, and ten from the 1999 DEP survey. Recycling for the remaining seven municipalities was estimated based on the per-capita regional average of those reporting, which comes to 0.54 lbs/day. This closely matches the national average of 0.53 lbs./day given in the *Characterization Report*.

Residential recycling composition was based on local data as well. This data is fragmentary. In the absence of more complete information, residential recycling composition was constructed using recycling composition percentages from NEST municipalities where they were available. The majority came from documents submitted along with the 2000 questionnaire. However, composition data also came from other sources, including information on file at the Erie DEP

Table 3-1: Recycling Composition Sources

2000 = Tellus Questionnaire; 1999 = Erie DEP Recycling spreadsheet; 1996 = Erie DEP Recycling Survey; E = Estimated from composition average of reporting NEST municipalities. See Appendix B.

	Source
Alden (T)	2000
Alden (V)	2000
Williamsville (V)	2000
Aurora (T)	2000
East Aurora (V)	E
Boston (T)	2000
Brant (T)	1996
Farnham (V)	E*
Cheektowaga (T)	2000
Depew (V)	E*
Sloan (V)	E*
Clarence (T)	E*
Colden (T)	E*
Collins (T)	2000
Gowanda (V)	E
Concord (T)	1996
Springville (V)	1996
Eden (T)	2000
Elma (T)	1996
Evans (T)	1996
Angola (V)	1996
Hamburg (T)	E*
Blasdell (V)	E
Hamburg (V)	1996
Holland (T)	1997
Lackawanna	1996
Lancaster (T)	1996
Marilla (T)	1996
Newstead (T)	E*
Akron (V)	1996
North Collins (T)	E*
North Collins (V)	1996
Orchard Park (T)	2000
Orchard Park (V)	E*
Sardinia (T)	E*
Wales (T)	E*
West Seneca (T)	E*
# reporting current data	9
# reporting 1996/1997data	15
# with estimated data	13

* Indicates 1996/7 data totaling less than 30% of present total; see footnote 10.

from the second volume of the NEST CRA. Sources for recycling composition are listed in Table 3-1. These composition data in the form of percentages were applied to the current recycling tonnages derived from the 1999 and 2000 data discussed in the previous paragraph.[10]

An essential element of recovery is composting. As mentioned in Section 2.3.1, 18 participating municipalities have reported year 2000 composting totals. For another seven municipalities, composting values given in 1995 have been used as the current estimates. Finally, residential composting estimates were made for the 12 municipalities for which generation was estimated. (See Table 2-3). These are based on per-capita regional average from reporting communities, applied to municipal population. This regional average is 0.35 lbs./day (compared to 0.25 lbs./day nationally).

3.1.2 CII MSW Recovery

NEST-specific CII recycling information is scarce; only one municipality appeared to report reasonable and complete data for CII recovery. Therefore, as was the case with CII generation, recovery has been estimated from the national averages. Both the tonnage and composition of recovered CII MSW were calculated by applying national CII material recovery rates as taken from the *Characterization Report*. These fractions are included in Table 3-2.

3.1.3 Baseline Data on MSW Recovery

Baseline data on the tonnage and composition of MSW recycled and composted by the NEST municipalities is shown in Table 3-2. They are discussed in greater detail in Section 3.2. Data on tonnage and composition for specific municipalities are found in the tables in Appendix C.

[10]Percentages were only applied if the current recycling level was similar to the recycling level for which composition was given. If current recycling differed by 30 percent or more, the stream was considered either to have been lacking other recycled materials, or the level of recycling had changed significantly enough that the composition would likely have changed as well.

The Tellus Questionnaire did not require composition data, but where this was provided as ancillary material, it has been used. All white goods reported separately in the responses were assumed to have been recycled, and are included in the composition analysis, including for municipalities who did not otherwise report 2000 recycling composition data.

Table 3-2: Baseline NEST-wide MSW Disposal, Recovery and Recovery Rates[11]

Materials:	Disposal			Recovery			Recovery Rate		
	Res. tons	CII tons	Total tons	Res. tons	CII tons	Total tons	Res. %	CII %	Total %
Paper and Paperboard:									
OCC & Paperboard	15,944	17,578	33,522	2,049	27,824	29,873	11.4%	61.3%	47.1%
ONP, Office & Mixed Paper	22,697	11,455	34,153	21,295	7,078	28,373	48.4%	38.2%	45.4%
Other paper	10,004	6,509	16,513	0	57	57	0.0%	0.9%	0.3%
TOTAL PAPER	48,646	35,542	84,188	23,345	34,959	58,304	32.4%	49.6%	40.9%
Glass:	11,892	2,173	14,064	7,472	812	8,284	38.6%	27.2%	37.1%
Metals:									
Packaging	5,618	643	6,261	2,256	896	3,152	28.7%	58.2%	33.5%
White Goods & Scrap	4,697	3,692	8,389	6,068	5,397	11,465	56.4%	59.4%	57.7%
TOTAL METALS	10,315	4,334	14,650	8,324	6,293	14,617	44.7%	59.2%	49.9%
Plastics	31,190	6,192	37,382	2,341	287	2,628	7.0%	4.4%	6.6%
Rubber & Leather	10,789	2,576	13,365	673	1,337	2,010	5.9%	34.2%	13.1%
Wood	7,084	11,078	18,163	0	846	846	0.0%	7.1%	4.4%
All Other Materials	12,903	9,798	22,700	0	2,368	2,368	0.0%	19.5%	9.4%
Food Waste	21,368	16,020	37,388	0	436	436	0.0%	2.6%	1.2%
Yard Waste	20,993	2,439	23,433	27,686	1,726	29,412	56.9%	41.4%	55.7%
Collected MSW [12]	178,421	90,154	268,576	64,012	49,063	113,075	26.4%	35.2%	29.6%
TOTAL MSW [12]	175,181	90,154	265,334	69,842	49,063	118,905	28.5%	35.2%	30.9%

3.2 Material-Specific Recovery Rates, Markets, and Recovery Potential

The first step in developing waste diversion goals involves analyzing the waste stream to identify source reduction or recovery opportunities. This section provides an initial look at the materials identified in Table 3-2. It discusses each material and its general recyclability, identifies the current level of recovery in NEST, gives an overview of the market potential for these materials, and addresses the relative importance of the material to regional recovery. The above analysis shows room for additional diversion in all material categories, and anecdotal evidence also suggests that participation in existing recycling programs could increase recycling across categories. However, the most effective efforts to increase diversion will target specific materials. For example, NEST recovery of glass and plastic approaches the national average and is unlikely to significantly change in the near future. However, as shown in Table 3-2,

[11] Note there are fewer material categories given for recycling than for generation. This results from the smaller number of categories used by municipalities to report recyclables. The consolidated categories are noted by dashed lines in the category map included in Appendix B.

[12] Collected MSW is material collected, disposed or recovered within the municipal system, and summarized from local data. Material type subtotals and Total MSW include this material plus MSW generation and recovery streams that are not dealt with in municipal collection and recovery, but can be estimated for the NEST region as a whole. These include deposit containers (estimated at 1,996 tons glass, 41 tons metal packaging, and 82 tons plastic) and tires returned to dealers (estimated at 471 tons), which have here been added for generation/recovery. Also, scrap metal recovered after incineration is outside of the municipal system, and has been both subtracted from disposal and added to recovery (3,240 tons).

substantial amounts of CII wood and cardboard are being disposed rather than recycled; existing technologies or facilities might be used to substantially increase the diversion of these materials. Similarly, large potential exists for increased composting of yard waste in the residential stream. Both streams show recycling potential for office and mixed paper, and the more remote possibility of food waste recovery. As noted in the statement of solid waste management goals of the State of New York, recyclability is based on whether a material can be reused, recovered as a recyclable, or composted, even if such reuse, recovery, or composting is not occurring at this time. Specific options to begin or enhance recovery are covered in Chapter 5.

In order to provide an indication of the regional market for recyclables, Table 3-3 provides recent commodity price data for the Cleveland area. Cleveland is the closest major market for which prices are available in industry publications. These represent prices that the NEST municipalities may receive for recyclable material.

Table 3-3: Recycling Material Commodity Prices

Material	Price		
	National	Local (Cleveland)	Unit
Corrugated Boxes	44	40	$/ton
Newspaper	66	60	$/ton
Office Paper	118	90	$/ton
Computer Printout	167	180	$/ton
White Ledger	172	140	$/ton
Glass – Clear	39	45	$/ton
Steel Cans	60	60	$/ton
Aluminum Cans	48	47	¢/lb.
Plastic – PET	13	13	¢/lb.
Plastic – Natural HDPE	14	14	¢/lb.
Plastic – Colored HDPE	10	10	¢/lb.

Source: *Recycling Manager*, Aug 6, 2001

3.2.1 Corrugated Cardboard and Paperboard

Cardboard

Old corrugated cardboard (OCC), including uncoated boxboard, is discarded primarily by retail, wholesale, and industrial establishments. It is the largest component of waste generation and recovered materials in the CII sector, in the region and nationally. The recovery rate within NEST is estimated at 48 percent. The market for OCC is generally strong. Local firms and organizations could likely increase their OCC recovery.

Residential recovery of OCC is estimated at 11 percent. Residential corrugated programs often include paper bags and uncoated paperboard boxes within their OCC category. Since some

cardboard packaging of consumer goods is soiled by food (e.g., pizza boxes), somewhat lower recovery rates than in the CII sector are likely.

Paper Board

Polycoated paperboard, particularly food and drink cartons and cups, is often overlooked in recycling programs. However this category, which includes coated boxboard, has a high value potential as it can be substituted for virgin kraft pulp and in the future may be added to white paper grades. For example, a program in Erie County schools has collected coated-paper cartons, which are processed in Cincinnati and used as feedstock by Champion Paper.[13] The NEST municipalities did not report recovery of this specific category. However, as with other disposable paper products such as tissue and paper plates, cartons and paperboard packaging can be used for compost fiber where recycling options are not feasible.

3.2.2 Newspaper, Office Paper and Mixed Paper

Newspaper, office paper and mixed paper are each significant waste streams, and in the past have been separated at the source for recycling. However, current recycling technology and collection programs often do not require source separation. Within NEST, most paper recycling is reported under one category, although diversion programs may be tailored to encourage recycling of a specific paper type. For this reason these materials are discussed separately but their recovery within NEST is analyzed and presented in the aggregate. NEST currently recycles 49 percent of this residential stream.

Newspaper

Newspaper collection programs are well established within the NEST municipalities, and most reported paper recovery is likely composed of newspaper. Increased recovery would require increased public participation. The market for recycled newspaper, particularly when baled, is reasonably attractive. Prices have increased in the last decade but remain relatively low in comparison to collection costs.

During the late 1980s and early 1990s, a rapidly increasing supply of recovered newspaper from successful residential collection programs, coupled with low demand from paper manufacturers, resulted in very low prices. Many states, including New York, adopted requirements or voluntary programs under which newspaper publishers bought paper with increasing levels of recycled content. New York set a goal of 40 percent recycled content in newspapers by the year 2000. A ten-state Northeast Newspaper Recycling Taskforce, with representatives from recycling, publishing, and government, published a report in 1998 recommending initiatives to

[13] See 1995 Erie CRA, section 4.3.

set a minimum recycled content for large newsprint buyers at 27 percent, and otherwise act to increase recycled paper manufacturing capacity to match supply within the northeastern region. However, there is no record of success in increasing demand for recovered newsprint within the NEST region.

Office Paper

Office paper includes high-grade paper such as computer printout and white ledger paper; it has the highest value of all common post-consumer paper. Office paper is generated primarily by commercial establishments, such as banks, insurance companies, government offices, and other offices, although some office paper is present in the home. Recycled office paper is used primarily to manufacture tissue paper, although some is used to make writing and computer paper. In general, commercial establishments can recycle a much greater fraction than is presently the case. High-grade paper programs are well-established best practice. Collection service for recovered office paper can often be obtained easily.

Available data show that municipalities in the NEST region generally do not have residential programs dedicated to high-grade paper recycling. Because per-household generation levels tend to be low, recovery programs generally target mixed paper recycling rather than residential office paper alone.

Mixed Paper

Mixed paper includes many types of recyclable lower-grade paper, including catalogs, mail, colored paper, and paperback books. Markets for mixed paper recovery generally develop after those for higher-value, sorted papers, and due to their low value, depend upon local recycling facilities. However, as mixed-paper recycling can use higher paper grades as well, it can be established where paper is not generated or separated in sufficient volume to recycle otherwise.

Magazines are a mixed-paper component that has been collected separately by several municipalities in the past, and recycling is fairly well established within NEST. Due to the emergence of flotation de-inking technology, magazines can become more marketable than the general mixed paper stream. However, marketability depends on whether regional mills have this or an equivalent technology in place, and at present few if any do. The most likely scenario for increased magazine recovery would involve the establishment of the flotation technology in the newsprint mills of Eastern Canada.

3.2.3 Other Paper

Other paper includes tissue, paper plates, and some paper packaging, all of which are typically soiled in use and not suitable for use as paper-making feedstock. The most viable recovery

method for recovery of this type of paper is to use as fiber in composting. No current residential programs for recovering this type of paper were noted by NEST municipalities.

3.2.4 Glass

Glass in the municipal solid waste stream can be divided into two categories—glass bottles and jars, and other glass. The former includes beer, soda, and wine cooler bottles, which are subject to New York State's bottle bill, and other food containers such as jars and juice bottles. Curbside programs in NEST municipalities collect all of these containers. Other glass includes light bulbs, plate glass, decorative glass, and drinking glasses. These products are generally not recycled because they consist of lower value mixed-color glass and are more easily broken than are glass bottles and jars. As shown in Table 3-2, the current level of residential glass recovery is 39 percent. This includes an estimate of glass bottles recovered through the Returnable Container Act (RCA) in the NEST region. Given the low value and poor markets for recovered glass, this is not likely to be a good area in which to pursue enhanced recovery.

3.2.5 Metals

Here we will discuss two components of recycled metal: metal packaging (aluminum and steel cans), and other ferrous metal (white goods and scrap).

Both aluminum and steel cans are recovered through curbside programs within NEST. Aluminum cans are also recovered through New York State's container deposit program, so most metal recycled through residential collection programs is steel. NEST municipalities incorporate steel food container pickup into their curbside collection of commingled containers; magnetic separation of the steel makes it easy to process. An estimated 29 percent of both aluminum and steel containers is collected at the curb or through the state's RCA deposit program. This recovery rate includes an estimate of metal deposit cans collected through the RCA in the NEST region.

Remaining metals can be characterized as ferrous (including steel scrap and large appliances, referred to as white goods), or non-ferrous (including larger aluminum consumer products and lead-acid batteries). Many NEST municipalities run programs that collect white goods and ferrous scrap is magnetically separated from incinerator residue. There may also be additional, privately handled scrap recovery that is not reported by the municipalities. The largest source of recovered non-ferrous metal is lead from automobile batteries, which is dealt with outside of typical municipal waste collection. Residential recovery of white goods and scrap metal, aside from packaging, is therefore estimated to be 56 percent.

3.2.6 Plastics

The most common plastic resins in MSW are low-density polyethylene (LDPE), high-density polyethylene (HDPE), polyvinyl chloride (PVC), polypropylene (PP), polystyrene (PS), and polyethylene terephthalate (PET). To encourage recycling, the plastics industry has voluntarily introduced a coding system to identify the resins from which containers are made. The codes are: PET = 1, HDPE = 2, PVC = 3, LDPE = 4, PP = 5, and PS = 6. Products made from other resins or a combination of the six coded resins are coded "7" for "Other." PET and HDPE comprise the vast majority of recovered plastic.

Recovered PET comes primarily from bottles, and can be used to produce carpet, sleeping bag and jacket insulation, plastic lumber, car parts, and packaging sheet plastic. Methanolysis and glycolysis processes have proven capable of reducing PET to monomers, which can be made into new PET, completely closing the waste loop for this material. Therefore PET, which already could be recycled at much higher levels than is the case, promises to have even greater recyclability in the future.

HDPE, recovered largely from milk jugs and grocery bags, finds similar uses in containers, sheet film, and strapping. Markets are most favorable for natural (uncolored) HDPE, although uses for colored types exist and additional uses are continually being considered.

There are several roadblocks to plastics recycling. Because plastic is a lightweight, low-density material, recycled plastic generally must be baled or shredded before transportation for re-manufacture, which adds to handling costs. Separation by resin type is difficult and expensive. The plastic industry has responded actively to ease plastics recycling; industry groups such as the National Association for Plastic Container Recovery (NAPCOR) and the Council for Solid Waste Solutions have been formed to promote the recycling and reuse of post-consumer plastics. The capacity of plants capable of using recycled feedstock has increased significantly over the last few years. Although plastics recycling is still a young industry, the prognosis for continued expansion in the demand for post-consumer plastic appears favorable.

Plastics markets exist primarily for PET and uncolored HDPE resins. Northeast Southtowns currently collects HDPE and PET containers in its residential curbside recycling program, with recovery estimated at 7 percent, comparable with the national average. This includes the estimated recovery of deposit bottles in the NEST region.

3.2.7 Rubber & Leather

Although several NEST municipalities reported tire recycling within their communities, the amounts recovered were fairly small, representing 2 percent of the rubber stream. However, this

may not include recovery outside of municipal programs, such as at businesses that accept used tires when new tires are purchased.

3.2.8 Wood Waste

Wood waste indicates the waste from wood products, not that from landclearing or yard waste. Residential wood waste is primarily furniture. Commercial wood waste usually includes a high proportion of wood pallets, which can be readily reused with and without repairs. This presents a good opportunity for waste reduction and is discussed in chapter 5. While separated for the purposes of this report, a significant amount of Construction and Demolition debris is often wood, and can be recycled along with MSW wood waste.

Since wood products can be chipped along with logs and branches, some residential composting programs may in fact collect wood from this category; however, such inclusions are assumed to be modest. Wood recycling is primarily a commercial and C&D activity.

3.2.9 Other Material Wastes

Other material wastes include unspecified, generally inorganic miscellaneous wastes, as well as textiles. NEST currently does not recycle textiles. Some textiles are recovered through garage sales or secondhand clothing stores, or donated to groups such as the Salvation Army or international humanitarian organizations. However, it is likely that only a small percentage of region residents participate in such programs. NEST could foster such recovery activity through education and outreach.

3.2.10 Food & Yard Waste

This category includes food, yard, and miscellaneous organic wastes, which are recovered through composting programs rather than recycling service.

Food Wastes

Food waste represents a sizeable and currently unrecovered waste stream within the NEST region. In the past, byproducts of the food processing industry, restaurant waste, and residential food scraps were collected and used as animal feed. This practice has waned as small local farms—once the primary markets for the material—have vanished, and transportation and land use problems make it less desirable for larger, more technically sophisticated farms. However, in certain areas, the collection of food for donation to the needy or for conversion in animal feed is still in operation. Commercial food waste composting or co-composting is currently also important in some areas. NEST may be able to develop programs to collect and compost food

scraps collected from some local restaurants and supermarkets, although no plans have been developed to date.

The most likely form of diversion for residential food scraps is backyard composting. Backyard composters which permit composting of both food scraps and yard trimmings simultaneously are available, and they could be used to manage a large fraction of the residential food waste stream. Commercial composting facilities now also routinely accept moderate levels of food waste in their feedstock.

Yard Waste

Yard trimmings include leaves, grass, and brush. Commonly practiced yard trimmings recovery options include brush chipping to create mulch, and centralized composting. Yard trimmings can also be managed through source reduction programs such as backyard composting and grasscycling.

NEST currently collects for recovery approximately 57 percent of all residential yard trimmings generated. NEST intends to significantly decrease disposal of yard waste in the future through a combination of source reduction and increased composting as discussed in chapter 5. The potential market for compost within the area, either for landscaping or high-volume agricultural use, exceeds what could be produced if all residential yard trimmings were composted.

3.3 Other Wastes

3.3.1 Construction & Demolition (C&D) Debris

C&D material ranges from highly recyclable material such as plain concrete rubble and aluminum siding to materials that are difficult to recycle such as gypsum wall board and tree stumps. Separation of these materials is relatively simple, but because of the large size and weight of the pieces being sorted, heavy equipment is often needed.

Many components of C&D waste are easily and highly recoverable, particularly wood wastes, which are discussed in chapter 5. Several facilities presently exist within NEST to separate C&D material for disposal or recovery, and the Erie DEP has directed particular effort toward its C&D recovery program, which includes online information to connect local users and purchasers of recovered C&D material. At this point, data is not available on the tonnage of waste per the NEST communities that such facilities process or recover (see Section 2.3.3).[14] Recovery rates often vary from year to year, since the composition of C&D waste can differ significantly more than MSW composition. Despite fluctuations, it was estimated that approximately 45% of Erie

[14] Because C&D landfills within the region accept significant volumes of waste that are generated outside the NEST region, operating capacity or annual volume handled is not an accurate indicator of NEST disposal or recovery levels (origination data was not provided).

County's C&D debris was diverted from landfilling in 1998,[15] and it presents many opportunities for increased diversion.

Recently there have been a number of ideas for increasing the recovery of building-related C&D wastes. One option is to require a payment when a building permit is issued. This payment is refundable if all (or a specified part) of the waste from the project covered by the permit is recovered for reuse. Another complementary approach is to develop businesses such as used building materials stores, projects that make used materials available to the poor, or other businesses that recover all or part of the materials. NEST could take a leadership role in exploring local interest in such options, and then in developing programs around options that its members support.

3.3.2 Sewage Sludge and Residuals

At present, sewage sludge and residuals generated within the NEST area are managed through a combination of incineration and landfilling. On a state level, sludge is widely put to "beneficial use" as fertilizer or soil amendment in New York, with 51 percent so managed in 1998. However, NEST communities did not contribute to this figure at the time of the report. Erie County examined and promoted an alternative in the March 1993 "Final Report: Sludge Amended Yard Waste Co-Composting Study, Erie County, New York" which anticipated the recycling of all yard waste and sewage sludge produced within NEST. At present, however, the only such facility within NEST is that of the Village of Gowanda. The co-composting facility in Amherst, NY also serves the adjacent Town of Clarence, a NEST member. NEST may wish to re-examine recovery options for this material in the future.

3.4 Comparisons with Historical Data and Earlier Estimates of Recovery

A great deal of progress in waste recovery has been made in the NEST region since data was collected for the CRA in 1991. The implementation of recycling programs, as later required by the state, has resulted in significant amounts of paper, glass, and metal recycling where little or none existed in 1991. In 1991 the only material being recovered at a significant rate was yard waste (at 20 percent recovery). No other materials were recycled at rates greater than 2 percent. At present, curbside commingled recycling programs have been successful in diverting roughly a third of the waste in the region. In 1995, the region planned to divert significantly more waste by the year 2000 than appears to be the case. The largest discrepancies between projected 2000 recovery levels and currently estimated 2000 recovery levels are ONP, office and mixed paper (particularly its office paper component) and yard wastes, shown in Figure 3-2. In 1995, recycling rate forecasts were made for newspaper (98%), office and mixed paper (94%), and

[15] *Erie County Construction and Demolition Debris Generation Report*, 2001, p. 9.

yard waste (89%) which were not met. In the case of both yard waste and office paper, existing recovery programs are still small or significantly underutilized. Some municipalities still do not collect and process these materials. As mentioned in Section 3.2, there are still opportunities for enhanced recovery of these materials.

Figure 3-1: Progress in NEST MSW Recovery Since 1991

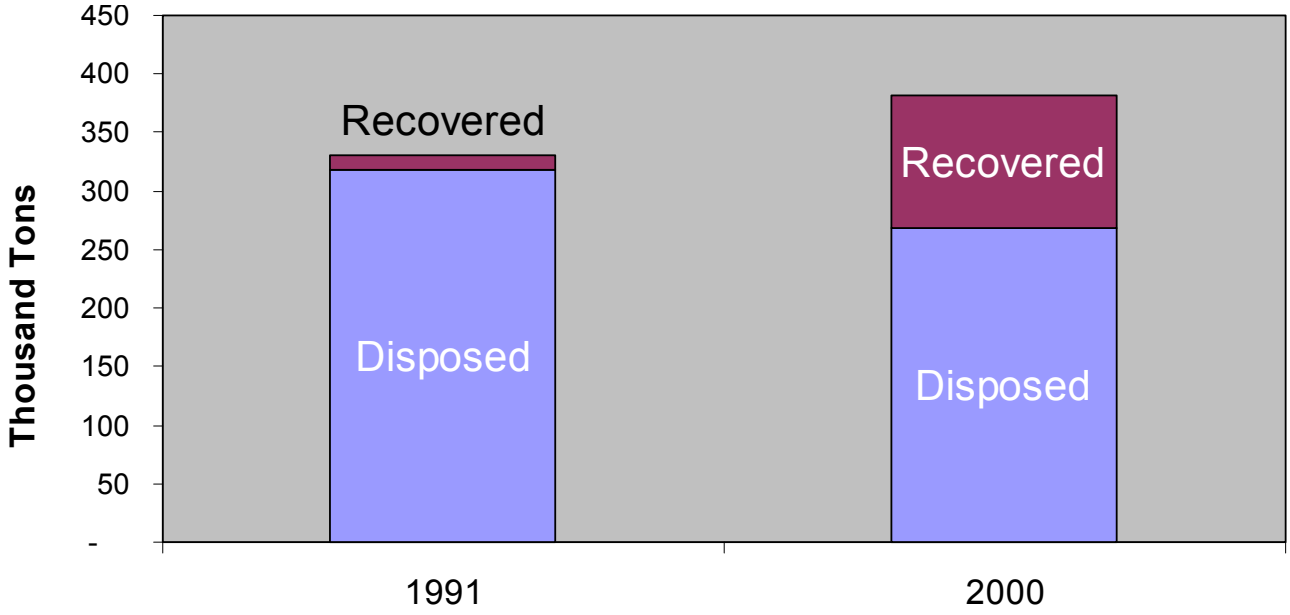
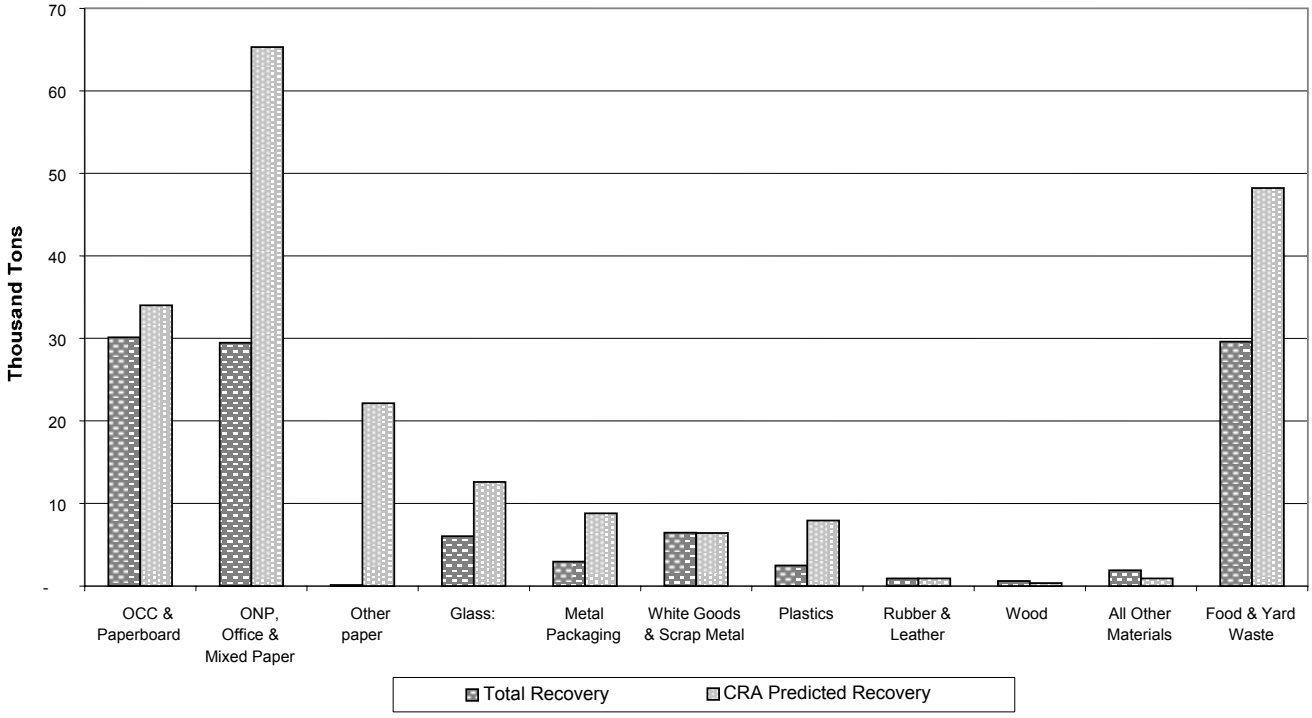


Figure 3-2: Material Recycling Discrepancies Between 1995 CRA Projections for 2000 and the 2000 SWMP Baseline Analysis



3.5 Current Recycling and Diversion Goals

In accordance with New York State solid waste management goals embodied in Section 27-0106 of the Environmental Conservation Law, a solid waste management program should maximize waste reduction and recovery/reuse for all components of the waste stream, to the extent economically and technically practical. The 1987 New York State Solid Waste Management Plan set a goal of 50 percent total waste reduction. Accordingly, the region has developed very aggressive goals for the planning period, 2000 to 2012. The region plans to achieve a 42 percent diversion rate by 2006 and a 50 percent diversion rate by 2012.[16]

These goals anticipate the continuation of the following trends:

- Identification of, and continued reliance on, secure and profitable markets for recovered recyclable materials;
- Progress in technology and research to expand recyclables recovery and reuse;
- Availability of adequate funding on the region and State level;
- More widespread participation in local recovery programs; and
- No sudden changes in the region's waste composition.

In order to achieve these goals, cardboard and yard waste diversion in particular must increase. Chapter 6 discusses how these goals could be attained. However, the region recognizes that actual recycling rates achieved in the target year may differ from the goal.

[16] "Diversion" refers to all waste materials that are prevented, recycled, or composted and thus "diverted" from the disposal stream.

4 EXISTING SOLID WASTE MANAGEMENT INFRASTRUCTURE

This chapter describes the collection, hauling, processing, and disposal services and facilities used by the municipalities of NEST. Discussion focuses on the residential sector because that is the sector for which these municipalities provide services. Collection and recycling service for the CII sector is discussed briefly. Privately-owned facilities for recycling, composting and disposal can service both the residential and CII sectors. Capacity considerations are discussed in light of the NEST residential tonnages and the total NEST waste tonnage.

4.1 MSW Collection

4.1.1 Residential Collection

Collection within NEST is arranged on a municipal or sub-municipal level. The predominant collection arrangement made by the NEST municipalities are contracts with private hauling firms. Twenty-four of the 37 municipalities, representing 37 percent of the population, address residential collection in this way. Ten municipalities (representing 47 percent of NEST population) manage collection themselves. The towns of Clarence, Concord, and Hamburg, which together contain 16 percent of NEST population, leave the responsibility of contracting for collection service to individual households, so multiple companies presently operate collection routes within each of these municipalities.

Collection within NEST is provided on a curbside basis, with the exception of the towns of Collins and Elma, which provide municipal drop-off service for both trash and recyclables. Special or bulky wastes, such as tires, waste oil, and white goods, are generally brought to a municipal drop-off point. Such services are often offered on a periodic rather than continual basis, depending on the municipality concerned.

Table 4-1 shows the collection and associated disposal arrangements for the individual NEST communities. The data in this exhibit is taken from the 2000 Tellus Questionnaire; the 1999 DEP survey was used for municipalities that did not submit the questionnaire. The DEP survey did not include collection method and therefore this element is left blank for municipalities not submitting a 2000 questionnaire response.

Table 4-1: NEST Residential Collection Service and Disposal Destinations

	Collection Provider Type			Collection Method		Destination Facility				
	Public	Contract	Private	Curbside	Dropoff	American Ref-Fuel	Chautauqua Cty DPF	CID	Modern	Hylands
Alden (T)		•		•		•				
Alden (V)	•			•		•				
Williamsville (V)		•		•					•	
Aurora (T)		•		•		•				
East Aurora (V)	•			•				•		
Boston (T)		•		•		•				
Brant (T)		•		---	---	•				
Farnham (V)		•		•		•				
Cheektowaga (T)	•			•		•				
Depew (V)		•		•		•				
Sloan (V)		•		•		•				
Clarence (T)			•	•		(private subscription)				
Colden (T)		•		•					•	
Collins (T)	•				•		•			
Gowanda (V)		•		•				•		
Concord (T)			•	•		(private subscription)				
Springville (V)	•			•				•		
Eden (T)		•		•		•				
Elma (T)	•				•	•				
Evans (T)		•		---	---	•				
Angola (V)		•		•		•				
Hamburg (T)			•	•		(private subscription)				
Blasdell (V)		•		•		•				
Hamburg (V)	•			•		•				
Holland (T)		•		•						•
Lackawanna	•			•						•
Lancaster (T)		•		•		•				
Marilla (T)	•			•		•				
Newstead (T)		•		•		•				
Akron (V)		•		•		•				
North Collins (T)		•		•						•
North Collins (V)		•		•						•
Orchard Park (T)		•		•					•	
Orchard Park (V)		•		•				•		
Sardinia (T)		•		---	---			•		
Wales (T)		•		•				•		
West Seneca (T)	•			•				•		
Pop. Served	193,751	153,169	68,169	378,545	16,800	216,684	6,207	68,820	29,446	25,763

4.1.2 CII Collection

With a few exceptions, CII collection is provided on the basis of an arrangement by the parties involved, and provided on a contractual basis. Data comparable to that in Table 4-1 are not available. Section 2 provides estimates of CII generation without reference to service providers.

4.1.3 Recycling Service

Provision of residential recycling service is required by legislation. It is provided in all NEST municipalities. The service varies in organization and extent within NEST. Table 4-2 shows the recycling services and Table 4-3 the composting services in NEST municipalities. These two tables also shows the materials included in municipal service, although each individual municipality may not collect all types of materials within categories such as plastics and glass.

It should be noted that several programs outside of municipal purview—such as car battery recycling and bottle bill deposits, are not included in the questionnaire responses and therefore are neither included in Table 4-2 nor section 3.1.1.

As was the case for disposal service, CII recycling is provided on an individual contractual basis. Data comparable to that provided in Table are not available for the CII sector. However, data on the amount and composition of CII recycling estimates were provided in Section 3.

4.2 MSW Disposal Facilities

Disposal facilities are one of the truly regional aspects of solid waste management within NEST. They are also the aspect on which regionalization efforts are most focused. At present there are five disposal facilities accepting solid waste from the NEST municipalities, and seven municipal solid waste transfer stations. A map showing these facilities and the regions they served is included in Appendix D.

4.2.1 Transfer stations

The five major transfer stations in the region are located along the Interstate-90 corridor. Four of these facilities are owned by or directly affiliated with a disposal facility. Browning Ferris Industries operates a transfer station in Cheektowaga that services the incinerator and material recovery facility in Niagara Falls, Waste Management operates a transfer station in nearby Depew, NEI has a regional transfer station in Blasdell from which waste is hauled to the Hylands Landfill in Allegany County, and NEST waste going to the Chautauqua County landfill is transferred via the Chautauqua DEP transfer station in Fredonia. The fifth facility is the East Side Transfer Station, which until recently was owned and operated by the City of Buffalo. Erie

Table 4-2: NEST Residential MSW Recycling Service

	Service Provider[17]/Destination					Materials Recycled									
Municipality	BFI	CID	Modern	NEI	Other	Corrugated	Newspaper	Office Paper	Mixed Paper	Magazines	Glass[18]	Metal Containers	Plastics[18]	White Goods	Tires
Alden (T)	●					●	●	●	●	●	●	●	●	●	
Alden (V)					●	●	●	●	●	●	●	●	●	●	
Williamsville (V)			●			●	●	●	●	●	●	●	●		●
Aurora (T)	●					●	●	●		●	●	●	●	●	
East Aurora (V)					●	●	●	●	●	●	●	●	●	●	
Boston (T)	●					●	●	●	●	●	●	●	●	●	
Brant (T)						●	●	●	●	●	●	●	●	●	●
Farnham (V)						●	●	●	●	●	●	●	●	●	●
Cheektowaga (T)	●					●	●	●	●	●	●	●	●	●	
Depew (V)	●					●	●	●	●	●	●	●	●	●	●
Sloan (V)	●					●	●	●	●	●	●	●	●	●	●
Clarence (T)	Private Subscription					●	●	●	●	●	●	●	●	●	
Colden (T)			●			●	●	●	●	●	●	●	●		
Collins (T)	●					●	●	●	●	●	●	●	●	●	●
Gowanda (V)		●				●	●	●	●	●	●	●	●	●	
Concord (T)	Private Subscription					●	●	●	●	●	●	●	●	●	
Springville (V)		●				●	●	●	●	●	●	●	●	●	
Eden (T)	●					●	●	●	●	●	●	●	●	●	
Elma (T)	●					●	●	●	●	●	●	●	●	●	●
Evans (T)						●	●		●	●	●	●	●	●	
Angola (V)	●					●	●		●	●	●	●	●	●	
Hamburg (T)	Private Subscription					●	●	●	●	●	●	●	●	●	●
Blasdell (V)					●	●	●	●	●	●	●	●	●	●	
Hamburg (V)	●					●	●	●	●	●	●	●	●	●	●
Holland (T)				●		●	●	●	●	●	●	●	●	●	●
Lackawanna					●	●	●		●	●	●	●	●	●	●
Lancaster (T)	●					●	●	●	●	●	●	●	●	●	●
Marilla (T)					●	●	●	●	●	●	●	●		●	●
Newstead (T)	●					●	●	●	●	●	●	●	●	●	●
Akron (V)			●			●	●	●	●	●	●	●	●	●	●
North Collins (T)				●		●	●	●	●	●	●	●	●	●	●
North Collins (V)				●		●	●	●	●	●	●	●	●	●	●
Orchard Park (T)			●			●	●	●	●	●	●	●	●	●	
Orchard Park (V)		●				●	●	●	●	●	●	●	●	●	
Sardinia (T)		●				●	●	●	●	●	●	●	●	●	●
Wales (T)		●				●	●	●	●	●	●	●	●	●	●
West Seneca (T)	●					●	●	●	●	●	●	●	●	●	●
Pop. Served	238,351	16,226	32,226	6,943	35,859	415,089	415,089	378,884	415,089	415,089	415,089	415,089	409,573	406,954	209,087

[17] All contractors include recycling in program.

[18] Individual municipalities may not collect all types of plastics and all types of glass.

Table 4-3: NEST Residential MSW Composting Service

	Facility Type				Materials Accepted[19]		
Municipality	Town Composting Facility	Limited Composting Through DPW	Limited Composting Through Local Business	Other Local Program Reported	Grass clippings	Branches & Twigs	Leaves
Alden (T)				●		●	●
Alden (V)				●	●	●	●
Williamsville (V)							
Aurora (T)				●			
East Aurora (V)		●	●		●	●	●
Boston (T)	●					●	
Brant (T)							
Farnham (V)							
Cheektowaga (T)					●	●	●
Depew (V)			●			●	●
Sloan (V)							
Clarence (T)				●		●	●
Colden (T)							
Collins (T)					●	●	●
Gowanda (V)	●						
Concord (T)							
Springville (V)	●				●		
Eden (T)							
Elma (T)					●		●
Evans (T)							
Angola (V)							
Hamburg (T)		●				●	●
Blasdell (V)				●		●	●
Hamburg (V)						●	●
Holland (T)					●	●	●
Lackawanna					●	●	●
Lancaster (T)		●					
Marilla (T)				●			
Newstead (T)				●			
Akron (V)	●				●	●	●
North Collins (T)	●						
North Collins (V)							
Orchard Park (T)	●					●	●
Orchard Park (V)		●					
Sardinia (T)							
Wales (T)				●			
West Seneca (T)	●				●	●	●
Population Served	90,799	104,770	22,804	61,407	183,491	343,048	311,051

[19] Materials information is taken from Tellus 2000 Questionnaire, and is not intended to be comprehensive. Some municipalities have composting programs but did not indicate which materials they handle.

County is working with the city to regionalize the East Side Transfer Station. By far the largest transfer station in the region, East Side is permitted to accept 625,000 tons annually, and could accommodate a large proportion of the Northeast Southtowns disposal stream. The options for NEST communities in hauling and disposal are clearly enhanced under the new arrangement. However, ESTS has not been operating due to snow damage but should be repaired by the City of Buffalo and Erie County in the near future.

In addition to the five major facilities, the towns of Elma and Collins also operate their own small drop-off/transfer stations.

4.2.2 Incinerators and Landfills

The incinerator located in Niagara Falls and operated by American Ref-Fuel provides the means of disposal for the majority of waste from NEST municipalities. Approximately 60 percent of the region's MSW disposal occurs there. The remainder of disposal facilities are landfills, including the CID landfill located in Sardinia and operated by Waste Management, Inc.; the Modern Disposal landfill north of Niagara Falls in Lewiston; and the Hylands Landfill (operated by NEI parent company Casella Waste Management) in Allegany County. The Town of Collins hauls its waste to the Chautauqua County DPF transfer station, from which it is taken to the Chautauqua DPF landfill, approximately 35 miles to the southwest. A map showing these facilities is included in Appendix D.

In addition to MSW facilities, there are a few landfills in the region that handle other waste streams. These include the Schultz landfill (Construction and Demolition waste) in Cheektowaga and the Niagara Recycling Landfill (Commercial and Industrial waste), which is operated by BFI (Allied Waste) and located in the City of Niagara Falls.

4.3 MSW Recycling Facilities

Information regarding the recycling destinations for recyclables is less complete than that for disposal. Only 20 of the 37 municipalities indicated the facilities to which they send their recyclables. Of the recyclables for which destinations were given, approximately 60 percent are handled by the MRF's own large waste management firms, primarily the BFI recycling facility located in Kenmore, Erie County, and the Waste Management recycling facility in Chaffee. The remaining 40 percent is handled by regional firms specializing in the recovery of that particular material. These include Phoenix Recycling for paper, Twin Village Salvage for ferrous metal, Huron Recovery and Flynn Enterprises for rubber tires.

4.4 Composting Facilities

At least 11 of the 37 municipalities have local municipal yard waste composting or mulching facilities, which provide material for local use and, in the case of the Town of Boston, for commercial landscaping.[20] The composting facility in Gowanda handles sewage sludge as well as yard waste. In addition to municipal facilities, two local nurseries and a poultry farm within the NEST area are also listed as recipients of residential yard waste. Nearly all of these composting facilities operate on a small enough scale not to require permitting by NYDEC, and they are unlikely to increase to "permit size." Expansion of these facilities would entail significant equipment and operating cost increases, and might perhaps require a shift in the technological method used. In addition to these small facilities, eight municipalities listed mulching programs operating without a town or village facility.

There is current interest with NEST in developing new composting facilities, whether on a municipal basis (as planned by the Town of Orchard Park), or on a regional basis. Opportunities also exist in the area for composting by private firms that produce a marketable product.

4.5 Permitted Facilities

Table 4-4 lists all solid waste facilities within the NEST region that currently hold permits. These facilities deal primarily with C&D and MSW waste streams. These permits are those on file at the NYSDEC Region 9 office for facilities within or pertaining to the NEST region.

4.5.1 Associated Capacity

The NEST region is not currently facing a shortfall of disposal capacity, nor is a shortfall likely during the planning period. The NEST municipalities, which include half of the population of Erie County, at present require only a small proportion of the permitted capacity of regional facilities—approximately 6 percent of disposal and 18 percent of recycling capacity, as shown in Table 4-5 below. This information is also shown graphically in appendix tables D-2 and D-3. The substantial capacity of these facilities promises continued competition throughout the planning period in the disposal market. The situation is similar for the regional recycling facilities; despite a strong upward trend in recycling since 1992, the capacity of existing facilities appears adequate for the planning period.

[20] West Seneca, Akron, North Collins, Gowanda, Cheektowaga, Springville and Boston reported having town-operated composting sites. Orchard Park (village), Lancaster, Hamburg (town), and East Aurora have limited composting (i.e., brush chipping) on-site at local departments of public works. In Depew and East Aurora, local businesses (Kreher's Farms, Masterson Nursery, and Lakefront Recycling) handle a portion of town yard waste. In addition, Wales, Blasdell, Hamburg (village), Clarence, Alden (town and village), Aurora, Marilla, and Newstead, reported local programs to mulch and use yard waste.

Table 4-4: Permit information for facilities near or related to the NEST region

Facility Name	Location	Permit Expiration	Capacity noted	Permit Description
Niagara Mohawk Huntley Fly Ash Landfill	Buffalo	1995	530 tons/day	Fly ash landfill only
Hyland Associates	Angelica	2005	2.5 million yd3 landfill; 232,440 tons/year	MSW & ash landfill
Schultz C&D Landfill	Cheektowaga	2005	600 tons/day	C&D landfill
Battaglia C&D Processing Facility	Buffalo	2006	3,000 tons/month	C&D processing & transfer
Republic (Clinton) C&D Processing Site	Buffalo	2003	200 tons/day	C&D processing & transfer
Tifft St. C&D Processing Facility	Buffalo	2004	800 tons/day -- 250,000 tons/yr	C&D processing & transfer
Casella	Buffalo	2006	200 tons/day	C&D processing & transfer
Syncor	Cheektowaga	2000	517 tons/mo.	Med waste
Amherst Yard Waste Composting Facility	Amherst	2009	85,000yd3/yr	Yard and food waste windrow composting
Kreher's Poultry Farms	Clarence	2003	171,000 yd3/year	Windrow composting: yard & food waste, poultry manure
American Ref-Fuel	Niagara Falls	2005	Design capacity- 801,600 tons/year Max throughput-- 821,250 tons/year	Incineration and transport of ash.
Chautauqua County Landfill	Ellery	2009	87,750/quarter	Transfer station and landfill
CID Landfill	Chaffee	2009	150,000 tons/quarter	Landfill permit renewal
Modern Disposal	Model City	2005	landfill -- 2383 tons/day C&D processing -- 224 tons/day	MSW & C&D approved landfill
Casella Transfer Station	Blasdell	2001	1,000 tons/day	MSW and C&D transfer station
BFI Material Recovery Facility	Kenmore	2002	360 tons/day	Material recovery facility
Huron Recovery	Buffalo	1996	Storage capacity--7000 car tires & 750 truck tires	Tire processing and storage
Integrated Tire	Buffalo	2003	134 tons/day	Tire recovery, shredding.
Waste Mgmt.Recycling/Transfer facility	Depew	2006	599 tons/day	MSW, industrial, C&D, recyclables
Modern Recycling	Buffalo	2006	500 tons/day	C&D recycling facility (temporary MSW permit)
American Recyclers Transfer Station	Tonawanda	2006	12 tons/day	Non-hazardous industrial processing & transfer
BFI South Side Transfer station	Cheektowaga	2006	800 tons/day -- 62,400 tons/qtr	MSW transfer station
Clinton Disposal Transfer Station	Buffalo	2004	200 tons/day	C&D processing station
East Side Transfer Station	Buffalo	2006	2000 tons/day	Transfer station (currently inoperable)
North Chautauqua County Transfer Station	Fredonia	2008	162,500 yd3/yr	Recyclables, C&D, pre-approved industrial
Noco Energy	Tonawanda	2005	1,100,000 gallons/mo handled	Non-hazardous oil & antifreeze processing
Amherst Wastewater Treatment Plant	Amherst	2006	9 tons/day	Sludge treatment to produce fertilizer
Gowanda Wastewater Treatment Plant	Gowanda	2002	1,000 yd3/yr	Biosolids composting
Town of Orchard Park Composting facility	Orchard Park			Yard waste composting (recently permitted, not yet operational)

Capacity is more constrained in the case of transfer stations and composting facilities. The latter is particularly important in light of current opportunities to increase yard and food waste composting. Since significant expansion of existing facilities does not appear either feasible or desirable, additional facilities will need to be found or constructed to handle the increased diversion rates for compostable materials as presented in this plan. This may involve either hauling to existing facilities in the vicinity of the NEST region, or establishing new local and regional facilities.

Table 4-5: Permitted Regional Destination Capacity Compared to Tonnages Generated

Facility Name	Outcome	Date Permit Expires	Approx. Permitted Annual capacity (tons)	Approx. Annual NEST Residential Tonnage	Approx. Annual NEST CII Tonnage*	Approx. Total Annual NEST Tonnage*	% permitted capacity currently filled by NEST
American Ref-Fuel	Disposal	2005	821,250	146786	?	?	18%
Chautauqua County Landfill	Disposal	2009	351,000	2288	?	?	1%
CID Landfill	Disposal	2009	600,000	55037	?	?	9%
Modern Disposal	Disposal	2005	744700	35413	?	?	5%
NEI Transfer Station**	Disposal/Recycling transfer	2001	310500	31046	?	?	10%
BFI Material Recovery Facility	Recycling	2002	112500	15586	?	?	14%
Waste Mgmt. Recycling/ Transfer facility	Recycling	2006	187500	4236	?	?	2%
Modern Recycling	Recycling	2006	156000	6824	?	?	4%
Recycling Total‡			**456,000**	**36,326**	**47,166**	**83,492**	**18%**
Disposal Total			**2,827,450**	**178,421**	**90,334**	**268,755**	**6%**

* Data is unavailable for private contracts with haulers and facilities, so no facility-specific information can be estimated for CII or the sum of residential and CII waste. Total NEST capacity and tonnage use is estimated in the two bottom rows of the table.

** For the purposes of this SWMP, the capacity of the NEI transfer station was used (for both recycling and disposal) rather than final destination capacity. Since hauling directly to the Hylands Landfill would be impractical without consolidation at the transfer station, the transfer station capacity was considered the limiting factor to use here.

‡ Recycling only; does not include composting.

5 ALTERNATIVES ANALYSIS

This chapter addresses the options that NEST and its member municipalities might consider in their efforts to divert materials from the disposal stream. The alternatives included in this chapter are not exhaustive in scope. Rather, they are the best alternatives identified among the policy or technology alternatives which potentially:

- Deal with materials that constitute a significant proportion of the NEST regional disposal stream.
- Significantly increase diversion rates for these materials.
- Can be guided or promoted regionally by NEST.
- Are proven to be economically viable in situations similar to that of NEST.

Based on consideration of the above criteria, the following alternatives were selected for discussion.

1. A broad, NEST-wide effort to foster source reduction.
2. Promotion of Pay-As-You-Throw as a basis for provision of municipally provided solid waste management service.
3. Promotion of Resource Management Contracting as a basis for the provision of solid waste management services in the CII sector, and as a basis for municipal contracting to provide residential service.
4. Expansion of opportunities to compost or otherwise divert organic wastes, particularly food waste.
5. Promotion of end-of-life recovery of pallets for chipping to use in mulch or for composting.

The chapter also includes a discussion of single-stream recycling (also known as commingled collection), which may be of interest to NEST although it has not yet been proven feasible in similar circumstances.

Consideration of such a limited set of alternatives reflects the fact that this SWMP is a "second generation effort" on the part of NEST and its members. As discussed in Section 1.4 above, the NEST municipalities have established recycling programs. An earlier regional body, NOREC, developed a SWMP for at least part of the region in 1991. The alternatives analysis conducted as part of that process is on file with Erie County. In 1995, a Comprehensive Recycling Assessment was undertaken by NEST. In these two efforts a wide range of options were

considered. Here the goal is to go beyond the wide-ranging consideration that is appropriate in first generation regional planning efforts, and to consider a well-chosen set of alternatives that could make a significant difference in the NEST region.

5.1 Source Reduction

Source reduction is any change in the design, manufacturing, purchase, or use of materials or products to reduce their amount or toxicity before they become waste. Here the focus is on reductions in the amount (i.e., tonnage) of material entering the MSW stream.

A variety of strategies exist to promote source reduction in local communities. The US EPA's *Source Reduction Program Potential Manual*[21] identifies six source reduction programs that have been implemented in communities across the country. Tellus has identified five more programs that could also be easily implemented. These programs are identified and described in Table 5-1.

Table 5-1: Source Reduction Programs

Program	Description
Grasscycling	Grass clippings are left on the lawn instead being bagged and discarded.
Home Composting of Yard Waste	Residents compost yard trimmings instead of discarding them.
Home Composting of Food Scraps	Residents compost food scraps instead of discarding them.
Food for the Hungry	Unsalable, but edible food is given to food banks/soup kitchens.
Food for Hogs	Food scraps are fed to hogs.
Office Paper Reduction	Increased computer networking and copier duplexing reduces the amount of office paper used.
Paper Towel Reduction	Roll paper towels replace tri-fold paper towels.
Reusable Corrugated Cardboard	Reusable corrugated boxes replace single-use boxes.
Corrugated Cardboard Trays	Full corrugated boxes are replaced by corrugated trays that are shrink-wrapped.
Multi-Use Pallets	Single use pallets are replaced by multiple use pallets.
Pallets to Slipsheets	Pallets are replaced by large plastic sheets, which are placed under the load and then dragged instead of lifted by the forklift.

The EPA has developed program potential factors that can be used to quantify the percentage of waste that could be addressed by the source reduction programs listed in Table 5-1. Each program potential factor reflects the applicability, feasibility and technology used in that specific

[21] US Environmental Protection Agency, *Source Reduction Program Potential Manual*. September 1997.

program. Additional details on development of the program potential factors are provided in the EPA manual.

EPA's Source Reduction Program Potential approach provides Program Potential Factors. These are percentages that can be applied to material-specific data on local solid waste generation to produce estimates of the amount by which the source reduction programs listed in Table 5-1 might reduce MSW generation in the NEST region.

Calculations were made to determine the program potential for each source reduction program listed in Table 5-1. Program potential factors were taken from the US EPA's *Source Reduction Program Potential Manual*, or from data developed by Tellus (see Appendix E). Table 5-2 below shows the resulting source reduction potential.[22]

Table 5-2: Estimates of NEST Source Reduction Potential

Waste Category	Program	Annual Tons Generated[1]	Program Potential (%)	Program Potential (tons)
Yard Trimmings	Grasscycling	52,845	29.7[2]	15,695
	Home Composting	52,845	59.9[2]	31,654
Food Scraps	Home Composting	37,824	26.6[2]	10,061
	Food for the Hungry	37,824	2.0[3]	756
	Food for Hogs	37,824	21.6[3]	8,170
Paper and Paperboard	Office Paper	142,492	1.6[2]	2,280
	Paper Towel	142,492	0.3[2]	427
	Reusable Corrugated	142,492	9.3[3]	13,252
	Corrugated Trays	142,492	6.6[3]	9,404
Wood	Multi-Use Pallets	19,008	5.5[3]	1,045
	Slipsheets Replace Pallets	19,008	29.5[3]	5,607

Notes to Table:

1. Program potential factors were calculated to apply to general waste categories, such as "all paper," and reflect the fact that only a subset of that stream may be effected by teach particular reduction strategy. These general MSW categories correspond with those used in this SWMP, including Table 2-5, Table 2-7, and Table 3-2; and in the Franklin *Characterization Report*.
2. Program Potential Factor comes from the US EPA's *Source Reduction Program Potential Manual.*
3. Program Potential Factor was calculated by Tellus.

The results in Table 5-2 show the largest potential reduction—over 41,000 tons—comes through home composting of yard and food waste. Other significant reductions in waste result from grasscycling and corrugated cardboard reuse. Together with its potential impact, the planning area should consider which options are most easily influenced on a local or regional basis. For example, it may be difficult to alter the type of corrugated packaging used for products coming into the region, but much easier to influence pallet use. Options such as office paper reduction

[22] Program potential factors have been developed on a "stand alone" basis. When programs are combined, the sum of the individual program potentials could be an over-estimate of the aggregate program potential.

do not require the cooperation of external suppliers to achieve results, and might therefore become a higher priority than their tonnage reduction potential might suggest.

5.2 Pay-as-you-Throw (Unit Based Pricing)

Pay-As-You-Throw (PAYT) is a MSW financing policy that connects waste generation with its consequent costs. The result is a strong and intrinsic economic incentive to reduce waste. PAYT is most useful for communities that provide public waste collection, although it can also be made part of public-private contracts.

Traditionally, communities have financed waste service through a flat fee or tax. Although citizens know that waste collection and disposal incur costs, they generally treat waste disposal as a free service, because they are not penalized for disposing of more rather than less. The situation has been likened to other utilities that were, early in their development, without unit fees—such as unmetered electricity. Just as with other utility billing, PAYT charges residents according to the amount of service they use. By reducing the level of freeriding, the system is both more efficient and more equitable.

There are three common pricing systems for PAYT. Each has advantages and disadvantages that the community should consider in deciding which alternative to implement.

- In Proportional PAYT systems, there is a single standard charge for each bag or container of trash. This system is easy for residents to understand and gives municipalities very simple and inexpensive options in implementation. For example, rather than household billing, the community might make specially marked garbage bags, tags or stickers available for purchase, including the per-unit disposal cost in the sale. The community could arrange with retail stores to sell the bags, and thus reduce program overhead to a small staff commitment.

  The disadvantage of the proportional approach is that waste collection has both fixed costs (administration, equipment) and variable costs (tip fees, labor, etc.), so a fully variable system does not reflect the actual cost structure of the program. Fluctuations in residential use may stretch the operating margins of the collection infrastructure.

- With Variable-Rate PAYT, a somewhat more complex pricing system applies one price to a baseline service level, and another for additional trash. The unit price for additional waste may be either higher or lower than regular service, depending on the goals and situation of the community. The different charges can either be assessed through different

stickers and tags, or through a household billing system in which collection personnel record household set outs.

- Variable-rate programs give communities additional options, either enhancing or reducing the incentive to reduce waste, adapting to the policy which residents find more palatable. However, the added complexity can result in higher administration costs.

- Two-tiered or Multi-tiered PAYT follows the same pattern as used by most telephone, gas, and water utilities. A flat fee is charged for baseline service—covering what are basically fixed costs for the provider—and additional unit-based pricing is used to cover variable costs. This system better reflects the cost structure of the provider and can therefore result in revenue stability. However, as only the second portion of the price is unit-based, the incentive for residents to reduce waste may be less than under the other options.

There are several useful guides available to communities wishing to set PAYT rates and implement this system. The WastePlan software provided to the NEST communities provides an option for creating PAYT rates. A list of useful published references on PAYT, and excerpts from these publications, are included in Appendix F.

PAYT has been shown to reduce disposal and additional 27 percent even in areas where curbside recycling was already in place. The additional 27 percent reduction is due to two factors: people throw away less and they recycle more. Of this figure, 14 percent is estimated to result from source reduction, and 13 percent from enhanced recovery of recyclables.[23]

Since PAYT is both equitable and generally leads to lower service costs, the primary obstacle to its implementation is gaining public support for the financing change. NEST can serve as a significant resource to municipalities that plan to implement PAYT, as discussed in chapter 6.

5.3 Resource Management Contracting

Contracts are pervasive in the solid waste field. They directly influence the way in which virtually all CII waste is managed. In addition nearly three-quarters of residential waste generated within Northeast Southtowns is managed under contractual arrangements. In typical "disposal contract" arrangements, disposal volume drives compensation for hauling and disposal service. Thus, contractors receive a financial incentive to handle ever-increasing quantities of waste.

[23] Tellus Institute, *Massachusetts Source Reduction Report,* November 4, 1999, p. 13. This is a national average and not specific to Massachusetts alone. See also Skumatz, Lisa A., *Nationwide Diversion Rate Study: Quantitative Effects of Program Choices on Recycling and Green Waste Diversion,* 1996.

Resource Management (RM) is a strategic alternative to disposal contracting that emphasizes resource efficiency through prevention, recycling, and recovery. It uses contractual relationships to reduce, not simply dispose, of waste. RM is premised on the idea that contractors will pursue resource efficiency if they are provided with financial incentives to do so. RM contracts align customer and contractor incentives by constraining disposal compensation and providing opportunities for the contractor to profit from resource efficiency innovations. RM contracts can be designed in numerous ways to explicitly create incentives for haulers to improve diversion. With RM, if a contractor identifies cost-effective recycling markets for disposed materials, or techniques for preventing waste altogether, he receives a portion of the savings resulting from the innovation. This arrangement enhances recovery of readily recyclable materials such as corrugated cardboard and wood pallets, while also producing tangible source reduction and market development for difficult-to recover materials such as paint sludge and solvents.

The RM approach was conceived in work with the General Motors Corporation (GM). Building on GM's success with RM, several projects have been launched recently in the Midwest to evaluate RM's potential in a number of diverse institutional, commercial, municipal, and industrial settings. The U.S. EPA Nebraska Environmental Trust, the Iowa Waste Management Assistance Division, and the Missouri Department of Natural Resources are sponsoring ongoing projects. Demonstration sites include: Clark County (Nevada), Leon County (Florida), Palm Beach County (Florida), St. Charles County (Missouri), Jackson County Government (Missouri), Metro Community College, Nebraska State Recycling Association, Omaha Public Power District, West Des Moines Public School District, and Harvard University. A potentially key use of RM is to manage MSW and particularly residential waste. See the example of RM use by the Omaha Public Works Department, detailed in Appendix G.

In the communities and institutions where it has been implemented, Resource Management has led to 20 percent source reduction in comparison to levels before implementation, and also to a 65 percent increase in recycling rates.[24]

RM will develop to some extent without regional policies or programs to foster it because it is profitable. However, the form in which it develops and the speed in which it spreads are likely to depend heavily on promotional efforts both from customers and developing RM service providers.

[24] Paul Ligon, et al., *Advancing Resource Management in Nebraska,*Tellus Institute, June 2001, ES-3. Included in Appendix G.

5.3.1 CII Resource Management

Since commercial, industrial and institutional waste is handled almost exclusively through contracting, RM is particularly applicable in the private sector, where the service model of business embodied by RM is becoming increasingly understood. The NEST municipalities can support the adoption of RM by local businesses through distributing case study literature, providing additional information or references to contact on the subject, and related steps to foster local services of this type. However, the influence of the municipalities on private waste contracts will depend on the responsiveness of private firms and haulers, which is difficult to predict. RM has been shown to result in as much as a two-thirds decrease in CII waste and a doubling of recycling. In the specific circumstances of Northeast Southtowns, RM would at its least provide a means to lower CII generation rates and enhance cardboard and wood pallet recovery. In addition, the firms providing such RM service would be very likely to support or perhaps establish regional composting facilities and other options in which the NEST municipalities are interested.

NEST's own role in furthering CII Resource Management would lie primarily by serving as a facilitator and information clearinghouse for publications or guidance documents on Resource Management.

5.3.2 Residential Resource Management

Most significantly, the Northeast Southtowns municipalities which currently contract for solid waste service, or which plan to do so in the future, can themselves implement this type of contracting with their own MSW service providers. This would most likely take place with substantial regional support both in drafting a standard RM contract, and coordinated efforts between NEST municipalities to convince potential RM contractors that a sizeable market exists in the region to undertake this type of service. To date, coordinated contracting through NEST has been limited to disposal service. Since RM reaches beyond mere disposal to influence sorting, collection, and even generation, this would require a higher level of involvement among NEST municipalities.

5.4 Organic Waste Diversion

Many of the materials most readily diverted from the NEST disposal stream are organics. This includes yard waste which is already widely composted in the region, as well as food waste, wood, sewage sludge, and paper fiber. Many composting and other diverse options exist for these materials. This section will first address material types and technologies, and then discuss options for the region.

5.4.1 Yard Waste

A significant amount of yard waste is already being composted by NEST municipalities, demonstrating that it can be successful in the region. . This indicates the potential for additional composting of the significant volumes of yard waste that are also being disposed through combustion or landfilling. According to the baseline analysis, yard waste comprises 20 percent of the residential disposal stream, and of all materials offers the largest diversion potential.

5.4.2 Sewage Co-Composting

In 1993 the NEST municipalities commissioned a report investigating co-composting feasibility for the region. This type of composting combines yard waste and biosolids from sewage sludge, producing a combination of soil amendments. The report found that, with few exceptions, the sludge from the NEST area conformed to NYSDEC part 360 requirements for composting, (i.e., absence of toxics). The village of Gowanda operates a co-composting facility of this nature; however, the remainder of the NEST community has not currently decided to implement the recommendations of the co-composting plan.

5.4.3 Food Waste Recovery

There is growing interest in food waste recovery programs. Food represents one of the largest components of national and the NEST waste streams. Although composting technologies for materials such as yard trimmings and bio-solids have been in place for many years, Commercial Food Recovery and Composting is still in its early stages of development. There are currently 138 composting facilities nationally that accept food residuals from institutional, commercial, and industrial generators. These facilities also target "carbon rich" material streams such as wood, pallets, leaves, and mixed paper, which are used in a 2:1 ratio to incoming food residuals as a bulking agent in the composting process.

5.4.4 Land Options for Increasing Organic Waste Diversion

There are a variety of ways in which NEST could help its member municipalities increase the diversion of organic waste. NEST could organize and lead a regional effort to increase the availability of facilities that provide composting service.

One alternative, assumed in the previous discussion, is that the municipalities (working through NEST) establish and operate (a) composting operation(s) themselves. Several NEST municipalities operate limited compost facilities. One community, the Village of Orchard Park, is pursuing a more extensive municipal compost operation.

A second option is to look for composting facilities operating within the region that would accept compostables from the NEST communities, at rates competitive with those for disposal. This might involve standard contracting facilitated by NEST, and perhaps the use of transfer stations to consolidate loads and reduce transportation expenses for hauling to facilities outside of NEST's boundaries. One such possibility involves the Compost Management facility located in Port Colborne, Ontario. Recently licensed to accept New York wastes, this facility's operation creates and markets a potting-quality mulch from wastes including corn fiber, diatomaceous earth, zebra mussels, wax corrugated cardboard, chicken and pig sludges, leaf and yard waste, paper mill waste, gypsum board, whole body fish, restaurant and grocery store waste, flour and related off-spec grain waste, and large scale food processing waste.

The third option would be a combination of the previous two—merging public ownership (either on the part of the municipalities or, perhaps more logically, on a county level) with private operating contracts. This public-private contracting would operate much as is the case with collection arrangements in most NEST municipalities. Here again, the Compost Management facility serves as a business model that might be successfully replicated at a location within the NEST region. In this model, the county leases land to the composting operation, which operates on a for-profit basis and manages all aspects of composting, product marketing, and distribution themselves.

Going beyond composting facilities, NEST could develop and implement a plan for providing food recovery information and/or developing additional recovery capacity. Some actions that NEST could take to foster enhanced food residual recovery include:

- Target "organics rich" generators such as retail grocery stores, large restaurants, hotels, institutional cafeterias, and produce wholesale warehouses, and interesting them in exploring organic waste diversion options;
- Identify the number and location of targeted businesses within the region and assess/baseline waste management and/or organics recovery practices;
- Working with food residual recovery organizations, animal feed processors, and composting facilities in the region to refine estimates of regional food recovery capacity, costs, and options for expansion;
- Working with local hauler(s) and targeted industries to pilot test commercial food diversion feasibility and cost;
- Involving interested municipalities in these activities and discussing the result with all NEST members.

These actions would provide a basis for the consideration of food waste diversion options in the NEST region.

5.5 Wood Recovery Programs

A significant component of NEST solid waste is wood, particularly from the CII sector (wood pallets) and the C&D sector (building materials, landclearing). In addition to source reduction efforts, wood can be recovered for a number of uses: compost bulking agent, chipped-wood landcover, fuel, animal bedding, or feedstock for the manufacture of particleboard. A prime example of the latter involves the recent CanFibre fiberboard plant in Lackawanna. Another such plant was planned to be built by Ligna Technologies in the same town; however, construction on that plant has been halted. The proximity of such a large market for recovered wood should spur regional efforts to eliminate wood from its disposal stream.

5.6 Single-Stream Recycling

A recent development with the possibility for a large impact on waste recovery is Single-Stream, Commingled Collection and Processing of recyclable materials. Single-stream recycling is usually implemented using automated and/or semi-automated collection systems vehicles. In some cases commingled recyclables are co-collected with mixed refuse, dramatically reducing collection costs which are typically the most expensive element of recycling programs. Single-stream processing strategies are typically associated with residential recycling programs, but may also be relevant for certain businesses as well. Some regions are actively considering promoting commingled recycling as a best management practice for reducing commercial waste, as it reduces the amount of space necessary and simplifies the recycling program.

The potential for substantial increases in recycling and the apparent cost-effectiveness of single-stream hauling technologies warrants consideration of the technical and economic feasibility of this approach for the region. However, given the fact that the region's existing processing capacity for recyclables is substantial, single-stream recycling may not be a good option for NEST. Single-stream recycling requires specialized local sorting and processing capacity, which is typically more capital intensive, and in some cases more expensive than dual-stream (i.e., fiber and container) sorting and processing systems. Given the region's capacity situation, it is unclear whether the private sector would supply the required additional capacity, or whether it should be a high priority for NEST itself to develop it. Despite this, NEST could take the following actions, just to "test the water" for single-stream recycling:

- Contact local recyclers, particularly those owned or operated by national public firms such as Waste Management, to determine the extent to which single-stream commingled recycling

collection and processing is occurring within the region. Public companies may also be willing to share limited information on relevant hauling and processing technologies employed outside of the region.

- Obtain a copy of the Government Advisory Associates' *2001 Material Recovery and Recycling Yearbook*, which contains detailed information on capital and operating costs, contacts, and other relevant technical information related to operating and planned single-stream recycling facilities throughout the country. This information could be used as a basis for conducting an initial feasibility study and economic analysis of single-stream technologies.

6 SOLID WASTE MANAGEMENT PLAN

Drawing from the analysis and program alternatives presented in the preceding chapters, this chapter describes the Plan for NEST, including the steps NEST must take to implement this plan. The elements included in the plan have been chosen as the most cost-effective means to achieve the regional waste diversion goals; namely, 42 percent or more diversion by 2006 and 50 percent or more diversion by 2012 through waste reduction, composting, and recycling. Implementation of this plan is projected to produce 45 percent diversion by 2006 and 58 percent by 2012.

6.1 Findings Relevant to Construction of the Plan

This section identifies and summarizes findings from Chapters 1 through 4 that are particularly relevant to the strategy and components of the Plan presented in this Chapter.

Currently the NEST region collects about 382 thousand tons of MSW. Population growth during the planning period is expected to be modest, combining with anticipated growth in per-capita waste generation to result in net growth in MSW generation of 10 percent by 2012, or 1 percent per year. Thus, the Plan to be developed for NEST does not have to address substantial change in either the population or the waste stream. What the Plan does have to address is increasing diversion. In 2000 only 29 percent of NEST's MSW was diverted from disposal. For 2012 the goal is 50 percent. Examination of NEST's current disposal stream and infrastructure shows many opportunities for source reduction, recycling and composting. For example, as shown in Table 3-2, the stream includes substantial amounts of residential yard waste and non-residential corrugated cardboard that could be source reduced or, alternatively, composted or recycled.

Review of NEST's current collection system shows that the infrastructure required to accommodate substantially increased recycling is in place. Residential recycling service is widespread and, in many cases, covers a wide range of materials. There is substantial capacity for processing recyclables in or near the NEST region. Only 18 percent of this capacity is required to provide the current residential and non-residential tonnage recycled by NEST. The prospects for additional composting are also quite promising. In principle much of the residential yard and food waste currently going to disposal could be managed on site, through grasscycling and home composting, or it could be collected and composted off site. For the latter to occur, additional composting capacity might be required. NEST members could develop this, individually or as a group, perhaps in cooperation with Erie County. Or, following the pattern for recycling, composting could be contracted out, to Compost Management, for example.

Disposal capacity reasonably accessible to NEST greatly exceeds the tonnage of MSW produced by NEST. Disposal of MSW from NEST is currently provided by privately owned facilities,

principally the American Ref-Fuel incinerator in Niagara. Over the period through 2012 current disposal contracts will end, allowing NEST and its members to make new arrangements which could assure that, if diversion occurs, there will be corresponding reductions in disposal costs.

Given the modest anticipated changes in population and waste generation, as well as the extensive, well-established waste management system in the region, it is reasonable to take the current NEST waste management system as the basic framework within which the Plan for NEST for the period through 2012 will be developed. Using this framework, the Plan needs to identify actions that NEST could and should take to modify the current waste management system so that waste is managed in a safe, reliable, cost-effective fashion, with diversion reaching at least 50 percent by 2012.

6.2 Options Selected

The Plan proposed by NEST is based on five specific options identified in Chapter 5. Each will play a role in increasing waste diversion for the residential and/or non-residential sectors. Additional goals and milestones will support these options, and outreach to three broad audiences – municipalities, non-residential generators, and haulers – will encourage source reduction, recycling, and composting. Implementation will be gradual but cumulative in it impact. Figure 6-2 presents a timetable for plan implementation.

1. Source Reduction for Organic Wastes

The Planning Unit will achieve source reduction by promoting grasscycling and backyard composting. Source reduction of residential organic wastes through grasscycling and on-site composting eliminates the need for, and cost of, collection and processing or disposal. Success in source reduction of residential organic waste is well documented across the nation.[25] Outreach conducted by NEST in cooperation with Erie County to non-residential generators and municipalities, as well as assistance with municipal outreach to citizens, will emphasize source reduction. Source reduction is also addressed in Section 5.1 and in Appendix E.

2. Residential Resource Management (RM) Contracting

The information contained in the Table 4-1 shows that 37 percent of residential collection is provided through public-private contracting. Contract service provides an opportunity to implement RM contracting. RM contracting is described in Chapter 5 and, at greater length, in Appendix G. Through RM contracts, financial incentives are created for the waste service

[25] See *Cutting the Waste Stream in Half: Community Record-Setters Show How*, (Washington, D.C.: EPA, June 1999) EPA-530-R-99-013.

provider to reduce the tonnage of waste disposed. Such contracts motivate the service provider to find cost-effective source reduction and diversion opportunities, without the need to specify particular programs or technologies. RM contracting has been demonstrated to result in 20 percent source reduction, and to increase recovery rates by 65 percent where it has been implemented.[26] NEST outreach to its members and haulers will increase awareness of this profitable contracting mechanism and thereby accelerate its adoption. RM is described further in Section 5.3 and in Appendix G.

3. Non-Residential RM Contracting

For the non-residential sector, the Plan focuses on the promotion of RM contracting. RM contracting is an appropriate basis for dealing with NEST's non-residential waste for the following reasons:

- In the non-residential sector the provision of waste management service is a private, rather than a public matter. The best point of entry and leverage for a public agency such as NEST is through the contracts governing these services.

- Use of RM contracting in the residential sector provides an opportunity to bring waste service providers "up to speed" on the RM approach. This will make the introduction of RM in the non-residential sector easier and more likely to be successful.

In the non-residential sector RM can target items such as corrugated and wooden pallets for which source reduction or recycling is possible. In addition, it can foster the composting of organic wastes where that is technically feasible and cost-effective. NEST and County outreach to the municipalities, commercial generators, and haulers will highlight potential costs savings and increased diversion. As with residential RM contracting, this will hasten its incorporation into CII waste management contracts.

[26] Paul Ligon, et al., *Advancing Resource Management in Nebraska*, Tellus Institute, June 2001, ES-3 (included in SWMP Appendix G).

4. Pay-As-You-Throw (PAYT) Pricing

PAYT is a key option for the 10 municipalities that use public collection service. It could also be useful in the other municipalities in coordination with RM contracting. In communities with curbside recycling, PAYT has been shown to result in 14 percent source reduction as well as a 13 percent increase in recycling.[27] NEST and Erie County will conduct outreach and provide technical assistance to the municipalities to assist them in their consideration of PAYT. NEST will also conduct outreach designed to educate citizens about the potential benefits of PAYT. PAYT is described further in Section 5.2 and in Appendix F.

5. Off-Site Composting

For the residential sector, source reduction and off-site composting are interrelated; the more successful source reduction efforts are, the less organic waste will need to be composted off-site. The Plan includes increased composting of yard wastes, either on site or through municipal composting programs. A portion of residential food waste is composted. In addition, the NEST Planning Unit will work with Erie County to provide education, outreach, and technical assistance, and will explore development of an off-site composting facility in the future. Composting is also addressed in Section 5.4 and Appendix H.

6.3 Requirements for Implementation

Successful implementation of the Plan will require a strong, carefully organized effort to change the outlook and financial incentives of both waste generators and waste management service providers. Making this effort is the basic requirement for the implementation of the Plan. Specific requirements for implementation are as follows:

- Targeting of specific materials for residential and non-residential source reduction needs to be addressed in conjunction with the promotion of RM contracting and, in the residential sector, adoption of PAYT. In the residential sector additional efforts may be appropriate, including education, demonstrations of backyard composting techniques, arrangements with local merchants to promote the sale and use of mulching mowers for grasscycling, and compost bin distribution. Individual municipalities will be encouraged to ban yard trimmings from disposal as a key component in a strategy to avoid disposal of this easily diverted material, and to design their PAYT systems so that on-site organic waste management is the preferable alternative.

[27] Tellus Institute, *Massachusetts Source Reduction Report,* Nov. 4, 1999, p13. This is a national average and not specific to Massachusetts alone.

- RM contracting relies on a business model and contract provisions that are not currently familiar to local waste service providers. Service providers will need assistance in understanding the requirements of the RM business model and conforming to it. In addition, initial work with local businesses, particularly large businesses, chain stores with multiple locations, and business associations will be encouraged to establish RM contracting as the "regional norm" for providing waste management services in the non-residential sector. Further, residential RM contracts are likely to be more sophisticated than those currently in place. Effort will be necessary to develop RM contracts that fit the needs of the individual NEST municipalities.

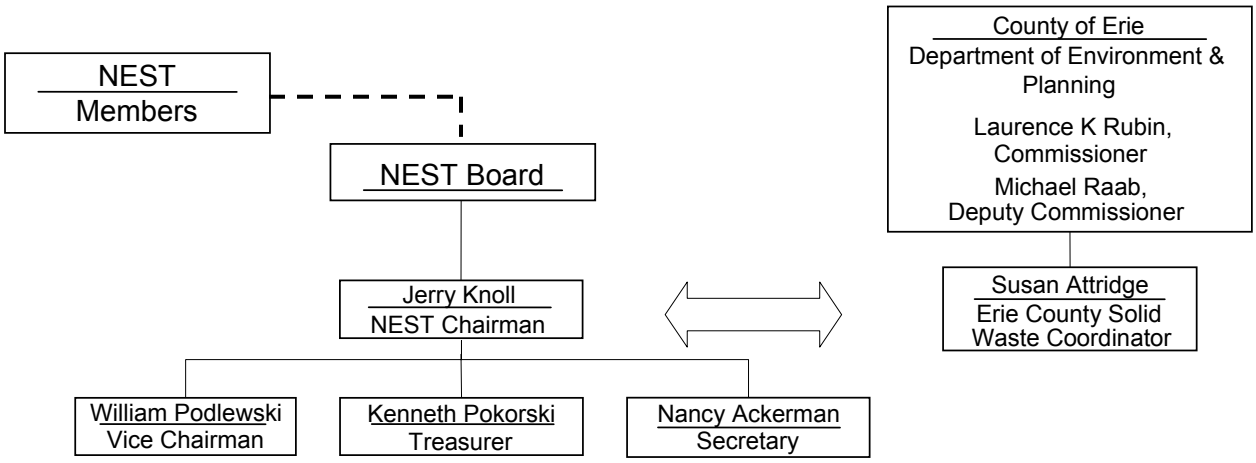
- Experience shows that fostering the adoption of PAYT pricing can involve a significant amount of time and effort. Municipalities need to decide on the type of PAYT system (can, special bag, sticker, etc.) to be adopted. Fees need to be set and various practical concerns, such as the sale of bags or stickers if these are used, need to be arranged. Municipalities often need assistance as they work through the consideration and adoption of the rule changes or legislation required to implement PAYT. Finally, for those municipalities who contract for waste services, the operation of PAYT needs to be integrated with their contracts so that service providers' efforts to foster source reduction and increase diversion fit well with PAYT.

- The NEST Planning Unit will work with Erie County to assess regional needs for additional off-site composting capacity or contract services. This assessment will begin as soon as the SWMP is adopted and NEST will not hesitate to act in regard to yard wastes that are unlikely to be affected by backyard composting (e.g., branches and some fallen leaves). However, further action will await evaluation of the contribution on-site management can make, after approximately a year to 18 months of source reduction strategy implementation.

6.4 Arrangements for Implementation

NEST will assume primary responsibility for directing the implementation of the solid waste management plan contained in this chapter. The actions and activities required for successful implementation of the plan match the capabilities of NEST. NEST will work closely with individual municipalities and with the Erie County Department of Environment and Planning, to accomplish the objectives established in this SWMP. The organizational structure supporting this approach is shown in the organization chart, provided in Figure 6-1.

Figure 6-1: NorthEast Southtowns Organizational Structure



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The plan addresses both the residential and non-residential sectors. In the course of implementing the plan, NEST, with the assistance of Erie County, will:

- Foster the adoption of RM contracting by NEST member communities and by businesses in the NEST region;
- Promote the adoption of PAYT pricing for residential waste disposal;
- Work with the NEST members to develop and implement programs that identify and address materials for which source reduction is particularly promising;
- Help NEST members make any changes needed to fully utilize composting as a diversion option;
- Submit compliance reports as needed, with monitoring and preparation conducted on an ongoing basis;
- Survey white goods recovery programs;
- Send out source separation and recycling education material for commercial recycling, including schools;

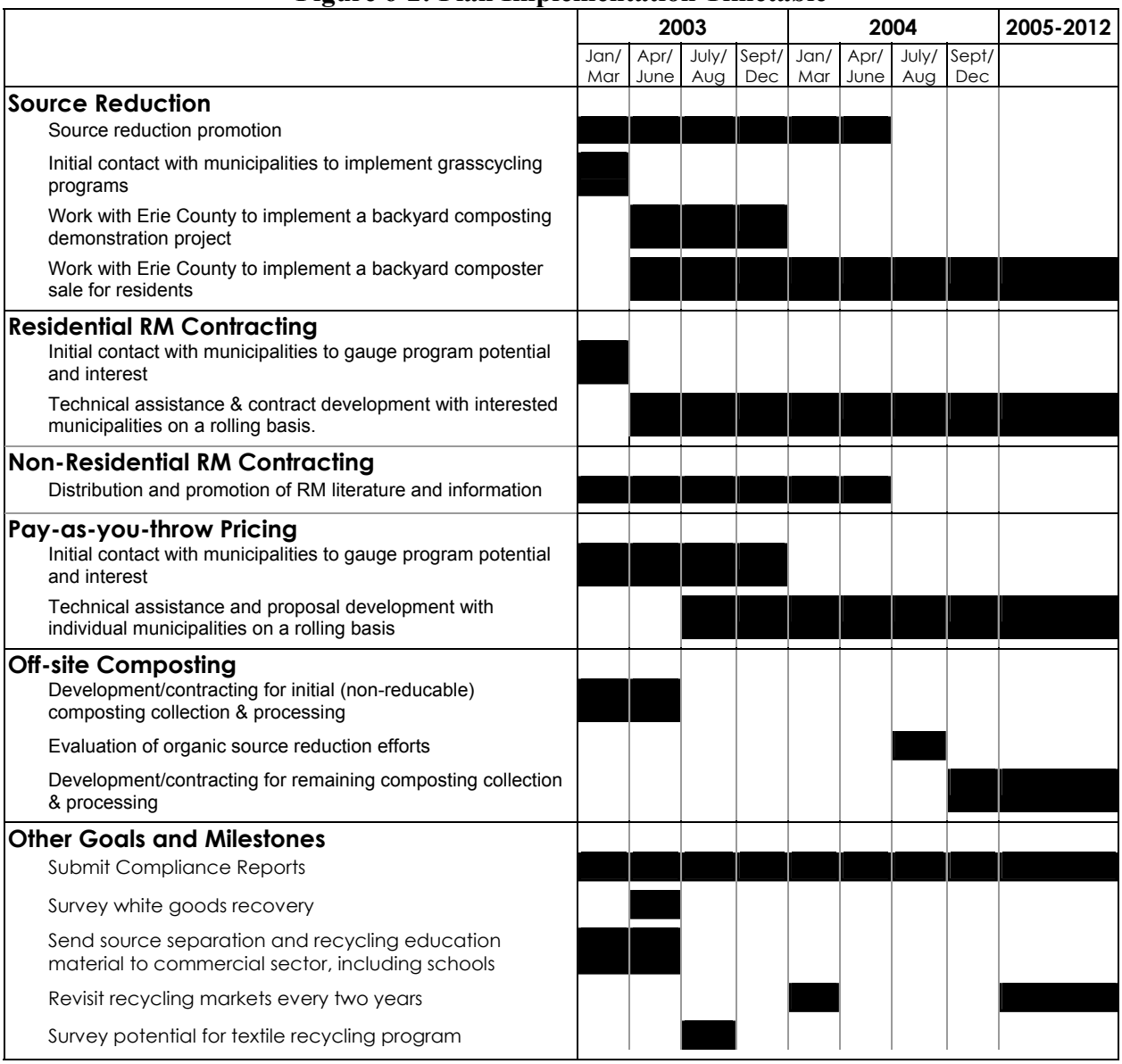
- Revisit recycling markets every two years to ensure all material for which an economic market exists are included in the recycling program; and
- Examine textile recycling.

In addition to work by the NEST board and its chairperson and by the staff of the individual NEST member communities, it is anticipated that the PAYT and RM contracting will together require the equivalent of one dedicated full-time staff person. This required staff resource would be provided by the Erie County DEP.

Implementation of the Plan will proceed in three stages: (1) start-up, (2) initial implementation of RM, PAYT and source reduction and assessment of additional needs related to off-site composting, and (3) continuing work on RM, PAYT and source reduction efforts as well as development of additional composting programs and capacity. During the start-up period, staff will work with the NEST member communities, to help them assess their individual roles in plan implementation. Start-up will require approximately 2-3 months. After start-up is complete, the focus will shift to PAYT pricing and RM contracting. Once support is built for these programs, technical assistance with their implementation will begin. Regional source reduction promotional efforts will begin at the same time. After 18 months progress with PAYT, RM contracting and source reduction will be evaluated, and the need for additional regional composting facilities will be considered by NEST. However, within the first 18 months, some individual communities may continue or initiate efforts to develop such facilities.

After 18 months, the level of work related to RM contracting or PAYT should have lessened, allowing the staff in those areas to address composting. Work related to the plan will continue after the initial 18 months, focusing on PAYT program development and adoption by individual NEST members, foster increasing use of RM contracting and source reduction in the residential and non-residential sectors and development of composting facilities as required. For RM contracting, the pace of implementation will be constrained by the length of current disposal contracts. Figure 6-2 below shows the timetable for these three stages of effort. Figure 6-2 also shows the timetable for a number of specific activities that do not fit simply into the three stages.

Figure 6-2: Plan Implementation Timetable



6.5 Impact of the Plan

Table 6-1 summarizes the anticipated impacts of the Plan. It shows the tonnage of MSW managed throughout source reduction, recycling, composting and disposal for the NEST region in 2012. To provide a basis for comparison, the table provides similar data for 2000. The starting point for the development of Table 6-1 is the detailed information on current waste management, and the estimates of waste generation for 2012 given in Appendix C (i.e. generation projections before incremental source reduction is applied). The notes accompanying Table 6-1 explain how the estimates in the table were developed. The calculations reflected in the table assume that the effects of the plan phase in linearly. While there will be a start-up, delay the impacts, there is also a tendency to capture "low hanging fruit," i.e., easy waste reduction and recovery early in the implementation period. On balance, it is reasonable to assume that impacts occur uniformly over time as shown.

Table 6-1: Current and Planned Waste Management in the NEST Region (Tons)[28]

	Residential			Non-residential			Total		
	2000	2006	2012	2000	2006	2012	2000	2006	2012
Source Reduction	**-**	**18,579**	**37,158[29]**	**-**	**9,247**	**18,495[30]**	**-**	**27,827**	**55,653**
Recycling	**42,156**	**59,563**	**76,971[31]**	**46,901**	**60,132**	**73,363[32]**	**89,057**	**119,696**	**150,334**
Paper & Paperboard	23,345	32,985	42,624	34,959	44,821	54,683	58,304	78,362	98,420
Glass	7,472	10,558	13,643	812	1,041	1,270	8,284	11,134	13,984
Metals	8,324	11,762	15,199	6,293	8,068	9,844	14,617	19,646	24,675
Plastics	2,341	3,308	4,275	287	368	449	2,628	3,532	4,437
Rubber & Leather	673	951	1,229	1,337	1,714	2,091	2,010	2,702	3,393
Wood	-	-	-	846	1,084	1,323	846	1,136	1,427
All Other Materials	-	-	-	2,368	3,036	3,704	2,368	3,183	3,998
Composting	**27,686**	**30,011**	**32,335[33]**	**2,162**	**2,375**	**2,589[34]**	**29,848**	**32,386**	**34,925**
Food Waste	-	-	-	436	479	522	436	473	510
Yard Waste	27,686	30,011	32,335	1,726	1,897	2,067	29,412	31,914	34,415
Disposal[35]	**175,181**	**147,633**	**118,953**	**90,154**	**76,140**	**59,677**	**265,336**	**223,773**	**178,630**
Total	**245,023**	**255,786**	**265,417**	**139,218**	**147,895**	**154,124**	**384,239**	**403,681**	**419,542**

As indicated in Table 6-1, the Plan includes substantial source reduction. Due to this source reduction, there are approximately 364,000 tons of waste to be managed by recycling, composting, or disposal in 2012. This is approximately 20,000 tons less than the amount managed by these means in 2000. The Plan relies on adoption of PAYT and the use of RM contracting for the provision of waste management services. These foster source reduction and improve the efficiency of waste management programs and infrastructure. This, in turn, will lower the cost per ton of waste managed. Development of a regional composting program may involve investments or additional service from composting service providers. However, the basic cost of this service is likely to be $22 per ton, not the $45 per ton NEST has paid for disposal.[36] Thus, this service is also expected to be cost reducing.

[28] Projections are based on experience with recycling and source reduction, including the effects of RM and PAYT.

[29] See Section 5.2; results include 14 percent source reduction (taken here as percentage of projected total).

[30] See Section 5.3; twenty percent source reduction has been demonstrated where RM was put in place. Here a more conservative figure of 12 percent of the projected total is used, as it may be unreasonable to project 100 percent participation of non-residential sources in RM by 2012. The level of participation used here (60 percent) is the approximate level necessary to reach regional diversion goals.

[31] See Section 5.3., footnote 23. Fourteen percent increase over 2000 recycling rate of 15 percent yields 29 percent recycling.

[32] See Section 5.3; a 65 percent increase over previous recycling has been demonstrated where RM was put in place. Here a more conservative increase of 40 percent is used for the reasons stated in note 30. 40 percent increase in recycling over 34 percent (the current recycling rate as noted in the *Characterization Report*) yields 48 percent recycling.

[33] See composting and yard waste restriction sections above, and yard and food waste generation projections in Appendix Table C-2. This figure represents the remainder of residential organics after source reduction.

[34] See note 32 above. Here a more conservative increase of 40 percent is used for the reasons stated in note 30. 40 percent increase in composting over 1.2 percent (see characterization report) yields 1.7 percent composting.

[35] Given for 2012 as the remainder of waste after reduction and diversion.

[36] The $45 average tip fee is taken from the 1999 DEP municipal survey; current fees may be lower. The $22 compost tip fee is taken from personal communication with a regional compost service provider.

6.6 Policy Compliance

Local ordinances pertaining to waste management in NEST are presented in Appendix J. The Solid Waste Management Act of 1988 established a statewide goal to maximize solid waste reduction and recovery to the extent economically and technically feasible. Consistent with this goal, as detailed in Chapter 3, NEST's goals are to achieve a 42 percent or more diversion rate by 2006 and 50 percent or more by the end of the ten-year planning period in 2012. Implementation of this plan is projected to produce 45 percent diversion by 2006 and 58 percent by 2012.

Tellus and Erie County, acting on behalf of NEST, have sought guidance from NYDEC in the development of this SWMP. DEC staff provided comments on the content and organization of the SWMP. DEC's comments are included in Appendix I.

6.7 Participation in the Plan's Preparation

The NEST representatives for each municipality included in the SWMP have supported development and implementation of this SWMP. Additionally, representatives of Erie County Department of Environment and Planning have contributed towards the design and content of this plan. The plan will be submitted to a public review process as well as by the New York State Department of Environment and Conservation. All NYSDEC comments have been addressed and, as required, incorporated into the final report.

6.8 Neighboring Jurisdictions

NEST is submitting this SWMP as an independent planning unit as provided for in Section 27-0107 of the Environmental Conservation Law (Chapter 88, Laws of New York 1996). Each of the components described is not considered to have a detrimental effect on neighboring jurisdictions. Composting within NEST boundaries would not affect other locales, and transportation of collected compost to facilities such as that in Ontario would generally not significantly increase the amount of waste traffic through the Northwest Communities, as these roads are currently being used for disposal transport.

The Plan is designed to be implemented solely within the NEST region. However, based on the structure of the Plan and the requirements for its implementation, adoption in a wider region such as Erie County as a whole may be appropriate.

- Promotion of RM contracting involves waste service providers, many of whom may have clients outside the NEST region. There is no reason to limit adoption of the RM business model by these service providers to the NEST region. Indeed, such a limitation may make work with the service providers more difficult and less productive.
- There would be benefits to fostering the adoption of PAYT pricing on a county-wide basis. At a minimum, this would avoid any claim that PAYT is a "unique burden" being placed on NEST communities.

- There are economies of scale associated with the promotion of source reduction. For example, once educational materials are selected or developed, it is often most cost-effective to distribute them widely.
- The cost of developing new composting facilities or contracting for composting services have economies of scale. It is unlikely to be significantly more costly to contract for all of Erie County than for the NEST region alone.

In light of these considerations, there will be consideration of the integration of the implementation of the Plan for NEST with broader, Erie County-wide solid waste management efforts. If such an integrated approach is taken, the staff required to work on the NEST plan should be part of a larger team working on the county-wide effort. Responsibilities, such as promotion of RM and PAYT within NEST, could be shared among staff working on these issues at the county level.

Appendix A

POPULATION DATA AND PROJECTIONS

CONTENTS:

Table A-1: Population Data and Projections, 1990-2012

	Data		Projection		Percent Change		
	1990	2000	2006	2012	00-'06	'06-'12	00-'12
Alden (T)	7,915	7,804	7,737	7,671	-0.9%	-0.9%	-1.7%
Alden (V)	2,457	2,666	2,791	2,917	4.7%	4.5%	9.4%
Williamsville	5,583	5,573	5,567	5,561	-0.1%	-0.1%	-0.2%
Aurora	6,786	7,323	7,645	7,967	4.4%	4.2%	8.8%
East Aurora	6,647	6,673	6,689	6,704	0.2%	0.2%	0.5%
Boston	7,445	7,897	8,168	8,439	3.4%	3.3%	6.9%
Brant	1,692	1,584	1,519	1,454	-4.1%	-4.3%	-8.2%
Farnham	427	322	259	196	-19.6%	-24.3%	-39.1%
Cheektowaga	84,387	79,988	77,349	74,709	-3.3%	-3.4%	-6.6%
Depew	17,673	16,269	15,427	14,584	-5.2%	-5.5%	-10.4%
Sloan	3,830	3,775	3,742	3,709	-0.9%	-0.9%	-1.7%
Clarence	20,041	26,123	29,772	33,421	14.0%	12.3%	27.9%
Colden	2,899	3,323	3,577	3,832	7.7%	7.1%	15.3%
Collins	6,020	7,451	8,310	9,168	11.5%	10.3%	23.0%
Gowanda	2,901	2,842	2,807	2,771	-1.2%	-1.3%	-2.5%
Concord	4,077	4,274	4,392	4,510	2.8%	2.7%	5.5%
Springville	4,310	4,252	4,217	4,182	-0.8%	-0.8%	-1.6%
Eden	7,416	8,076	8,472	8,868	4.9%	4.7%	9.8%
Elma	10,355	11,304	11,873	12,443	5.0%	4.8%	10.1%
Evans	15,247	15,328	15,377	15,425	0.3%	0.3%	0.6%
Angola	2,231	2,266	2,287	2,308	0.9%	0.9%	1.9%
Hamburg (T)	40,393	43,425	45,244	47,063	4.2%	4.0%	8.4%
Blasdell	2,900	2,718	2,609	2,500	-4.0%	-4.2%	-8.0%
Hamburg (V)	10,442	10,116	9,920	9,725	-1.9%	-2.0%	-3.9%
Holland	3,572	3,603	3,622	3,640	0.5%	0.5%	1.0%
Lackawanna	20,585	19,064	18,151	17,239	-4.8%	-5.0%	-9.6%
Lancaster (T)	37,516	32,646	29,724	26,802	-9.0%	-9.8%	-17.9%
Marilla	5,250	5,703	5,975	6,247	4.8%	4.5%	9.5%
Newstead	4,442	5,319	5,845	6,371	9.9%	9.0%	19.8%
Akron	2,998	3,085	3,137	3,189	1.7%	1.7%	3.4%
North Collins (T)	2,167	2,297	2,375	2,453	3.4%	3.3%	6.8%
North Collins (V)	1,335	1,079	925	772	-14.2%	-16.6%	-28.5%
Orchard Park (T)	21,352	24,343	26,138	27,932	7.4%	6.9%	14.7%
Orchard Park (V)	3,280	3,294	3,302	3,311	0.3%	0.3%	0.5%
Sardinia	2,667	2,692	2,707	2,722	0.6%	0.6%	1.1%
Wales	2,917	2,960	2,986	3,012	0.9%	0.9%	1.7%
West Seneca	47,830	45,920	44,774	43,628	-2.5%	-2.6%	-5.0%
NEST TOTAL:	429,985	433,377	435,412	437,447	0.5%	0.5%	0.9%

Appendix B

DATA SOURCES AND INPUTS

CONTENTS:

DATA COLLECTION FORMS FOR MUNCIPALITIES TO BE INCLUDED IN THE NORTHEAST SOUTH TOWN'S (NEST) SOLID WASTE MANAGEMENT PLAN (SWMP)

1. Background Information

Municipality: _____

Contact Name: _____
Address: _____

Phone/Fax/Email: _____

Date: _____

1. Please attach a brief summary of historic and current solid waste management practices, problems experienced, and involvement in previous planning efforts (CRAs and SWMPs).

2. Please attach information relating to unique local features that may impact solid waste management within the municipality, such as major population centers, transportation routes, State or Federal parks, seasonal area usage, large or significant industries and institutions, and private solid waste facilities operating or seeking to operate within the municipality. If available, attach historical waste generation and/or projections of future waste generation growth.

3. Please attach copies of local laws, ordinances, regulations, or amendments to existing local laws, ordinances, or regulations that have been passed in accordance with General Municipal Law §120-aa in regards to the requirement for all municipalities to pass a mandatory source separation ordinance by September 1, 1992. If no such laws have been passed, please discuss your municipality's plans to comply with General Municipal Law §120-aa.

4. If applicable, please identify or attach municipal laws, rules, regulations, or ordinances that could cause potential constraints to recyclables recovery.

2. Residential and Municipal Collection Services Information

Please indicate which of the following residential solid waste services are provided in your municipality by filling out the following table to the greatest extent possible. Please attach any readily information such as contracts, budgets, invoices, brochures, etc.

Municipality:_____

Check all that Apply	**Type of Service**	**Number of Units Receiving Service** *Please specify units (e.g., "100 single family houses")*	**Type of Service Provider** *Circle best answer*	**Materials targeted**	**Annual tons**	**Annual costs** *Attach budget, contracts, if available*	**Facility destination** *See Form 4*	**Other notes** *e.g., please provide year to which information applies, contractor information, etc.*
☐	Source reduction/ public education		Municipal/ Private					
☐	Curbside recycling		Municipal/ Private					
☐	Drop-off recycling		Municipal/ Private					
☐	Curbside yard trimming		Municipal/ Private					
☐	Drop-off yard trimming		Municipal/ Private					
☐	Bulky waste or white goods		Municipal/ Private					
☐	Household hazardous waste		Municipal/ Private					
☐	Curbside garbage		Municipal/ Private					
☐	Drop-off garbage		Municipal/ Private					
☐	Other: _____		Municipal/ Private					
☐	Other: _____		Municipal/ Private					

3. Non-Residential and Special Waste Service Information

Please indicate which of the following services are provided in your municipality by filling out the following table to the greatest extent possible with the most current information. Please attach any readily information such as contracts, budgets, invoices, brochures, etc.

Municipality:_____

Check all that Apply	**Type of Service**	**Number of Units Receiving Service** *Please specify units if possible (e.g., "100 commercial establishments")*	**Service Provider** *Circle best answer*	**Annual Tonnage**	**Annual costs** *Attach budget, contracts, if available*	**Facility destination** *See Form 4*	**Other notes and clarifications** *e.g., please provide year to which information applies, contractor information, etc.*
☐	Commercial garbage		Municipal/ Private				
☐	Commercial recycling		Municipal/ Private				
☐	Hazardous industrial		Municipal/ Private				
☐	Non-hazardous industrial		Municipal/ Private				
☐	Construction and demolition		Municipal/ Private				
☐	Agricultural wastes		Municipal/ Private				
☐	Wastewater treatment residuals		Municipal/ Private				
☐	Incinerator residue		Municipal/ Private				
☐	Asbestos waste		Municipal/ Private				
☐	Other: _____		Municipal/ Private				
☐	Other: _____		Municipal/ Private				
☐	Other: _____		Municipal/ Private				
☐	Other:		Municipal/ Private				

4. Solid Waste and Recycling Facility Destinations

Based on services identified in sheets 2 and 3, please use the following sheet to identify facility destinations to the extent possible. Please attach readily information on facilities such as service agreements, invoices, brochures, etc.

Municipality:_____

Name and owner	**Type of Facility** ***i.e., transfer station, recycling facility, composting facility, incinerator, landfill***	**Facility contact information** ***Location, telephone, fax, email***	**Applicable collection services** ***From forms 2 and 3***	**Tip Fee and/or annual costs** ***Attach budget, contracts, service agreements, etc. as appropriate***	**Other notes**

THANK YOU FOR YOUR TIME AND ASSISTANCE!

We look forward to assisting NEST communities in creating a successful and useful solid waste management plan (SWMP). The approved plan will maximize NEST communities' ability to manage waste in a cost-effective, environmentally sound, and flexible manner. Representatives from Tellus Institute and ILGRG will be on hand at the January 11 NEST meeting to address any questions or concerns you may have and present the schedule and plan for completing the SWMP.

Please send, fax, or email completed forms and attachments to:

John Sheffer or Karen DePalma
Institute for Local Governance and Regional Growth
University at Buffalo, Beck Hall
3435 Main Street, Building 9
Buffalo, NY 14214-3004
Tel: 716-829-3777 Fax: 716-829-3776
Email: regional-institute@acsu.buffalo.edu

by December 22, 2000

Best wishes for a happy and safe holiday season.

Table B-1: 1999 DEP Survey Results

MUNICIPALITY	Ind. household	Public via private contract	Public	TPY Disposed*	TPY Recycled*	Disposal	Tip Fee	Annual Disposal Cost	Annual Transportation Cost	Total Annual Cost	SOLID WASTE BUDGET			CONTRACTUAL INFORMATION						
											Tax Base	Monthly Bill	Other	Yes	No	w/PU	Comp.	Total years	Years left	Satisfied
Alden (T)			X	1,027.08	167	Amref	$56.12	$57,639.73				X	Annual fee		X					
Alden (V)		X		3,496.43	809.2	Amref	$47.91	$167,493.00	$112,037.00	$279,530.00	X		$126.37/unit	X		No	Amref	5	3	YES
Williamsville (V)		X		2324.26	625.93	Amref	$44.00	$102,267.44	$189,000.00	$291,267.44	X			X		No	Amref	12	11	Yes
Aurora (T)		X		3,119.54	900.65	BFI		$0.00	$0.00	$331,808.00	X		$123.12/unit	X		Yes	BFI	3	2	YES
East Aurora (V)			X	4474.8	1927.4	CID	$45	$201,366.00			X			X		No	CID	5	4	Yes
Boston (T)		X		4767.61	782.22	Amref		$0.00	$0.00	$379,875.00	X		$125/unit	X		No	BFI	6	3	Yes
Brant (T)																				
Famham (V)		X		1481	186	Amref					X		w/Brant	X		No	BFI	1	0.5	Yes
Cheektowaga			X	34824.84	6303.13	Amref	44				X			X						
Depew (V)		X		7,543.84	1173.12	Amref	$41	$309,297.44	$530,959.00	$840,256.44	X		$79/unit	X		Yes	BFI	5	3	Yes
Sloan (V)		X		2000	341.03	Amref	$57.93	$115,860.00	$105,713.00	$221,573.00		X		X		No	Amref	2	2	No
Clarence (T)	X			*8368.5*	*3505.5*	CID						X								
Colden (T)		X		4062.66	3082.61	Modern				$157,451.00	X		$125.76/unit	X		No	Modern			Yes
Collins (T)			X	77.88	184.69	Modern	$45	$3,504.60			X			X		No	Modern			
Gowanda (V)		X		*2500*	*250*	CID				$160,000.00			sticker	X		No	CID	3	1	Yes
Concord (T)	X			1935.81	359.89	CID						X			X					
Springville (V)																				
Eden (T)				*2174*	*733*															No $
Elma (T)			X	3570	912	Amref	$56.12	$200,348.00	$287,840.00	$488,188.00	X		$70/unit	X		Yes	Amref	14	2.5	No $
Evans (T)		X		5,714	945	BFI	$49.25	$281,414.50	$72,796.36	$354,210.86				X		No	BFI	5	1	?
Angola (V)		X		2249.19	165.7	Amref								X		No	BFI	4	2	Yes
Hamburg (T)	X			*22041*	*5213*	CID				*$2,449,980.00*		X	$180/unit		X	No				Yes
Blasdell (V)		X		1,097.96		Amref	$59	$64,779.64	$69,885.25	$134,664.89	X			X		No	Modern	1	1	Yes
Hamburg (V)			X	3000	1500	Amref	$49.37	$148,110.00	$323,340.00	$471,450.00	X		$72.67/unit	X		Yes	Amref	5	2	No $
Holland (T)		X		*1388*	*313*	NEI				$192,060.00	X		$132/unit	X		No	NEI	5	3	No
Lackawanna		X		9,142.56	921.42	NEI	$37.50	$342,846.00	$530,035.00	$872,881.00	X			X		No	NEI	5	3	Yes
Lancaster (T)		X		14,306.46	2,748.26	Amref	$44.00	$629,484.24	$69,154.73	$698,639.00	X		$128.45/unit	X		No	Amref	10	10	Yes
Marilla (T)			X	1800	289	Amref	$46.91	$84,528.00	$146,622.00	$231,150.00	X		$115/unit	X		No	Amref	20	15	No $
Newstead (T)		X		1629.66	266.21	Amref	$57.93	$94,406.20	$143,979.00	$238,385.20	X			X		Yes	BFI	7	2.8	No $
Akron (V)				*1826*	*506*															
North Collins		X		*673*	*108*								unit	X		No	NEI	2	1	
Orchard Park		X		*10368*	*4354.2*	Modern				$1,039,523.00	X		$127.05/unit	X		No	Modern	5	0.9	Yes
Orchard Park		X		*1125*	*755*	CID				$219,424.20			$150/unit	X		No	CID	3	2	Yes
Sardinia (T)																				
Wales (T)			X	15875.84	4459.38	CID	$29.20	$463,541.52	$236,458.48	$700,000.00	X			X			CID			Yes
West Seneca		X		1064.78	155	CID				$163,130.00	X		$135/unit	X		No	CID	5	2	No report

ERIE COUNTY COMPREHENSIVE RECYCLING ANALYSIS

VOLUME I

TABLE OF CONTENTS

ERIE COUNTY COMPREHENSIVE RECYCLING ANALYSIS

VOLUME I

TABLE OF CONTENTS (Continued)

ERIE COUNTY COMPREHENSIVE RECYCLING ANALYSIS

VOLUME I

TABLE OF CONTENTS (Continued)

Appendices

ERIE COUNTY COMPREHENSIVE RECYCLING ANALYSIS
VOLUME I

LIST OF TABLES AND FIGURES

Table B-2: Comparison of SWMP MSW Generation Composition (derived from EPA/Franklin 1998 Characterization Report) with those of the 1995 Erie CRA

	Derived from EPA/Franklin			1995 CRA	Difference
Materials:	**RES**	**CII**	**Total**	Total	
Paper and Paperboard:					
Corrugated Boxes	2.4%	29.3%	12.3%	12.0%	0.3%
Paperboard	2.9%	2.7%	2.8%		
Other Paper Packaging	2.1%	0.6%	1.6%		
Newspaper	9.2%	2.2%	6.6%	11.5%	4.9%
Office Paper	1.4%	5.7%	3.0%	6.5%	2.2%
Other Letter & Printing	6.4%	4.6%	5.7%		
Magazines	1.1%	0.8%	1.0%	4.0%	3.0%
Disposable Paper Goods	1.7%	2.2%	1.9%		
Other Paper	2.4%	2.5%	2.5%	8.0%	0.7%
TOTAL PAPER	29.7%	50.6%	37.4%	42.0%	4.6%
Glass:	0.0%	0.0%	0.0%		
Glass Containers	7.0%	2.1%	5.2%	6.6%	1.4%
Other Glass	0.2%	0.1%	0.1%	0.6%	0.5%
TOTAL GLASS	7.2%	2.1%	5.3%	8.0%	2.7%
Metals:	0.0%	0.0%	0.0%		
Ferrous Packaging	2.0%	0.7%	1.5%	3.0%	1.5%
Aluminum Packaging	1.3%	0.4%	0.9%	0.5%	0.4%
Other Ferrous	2.9%	4.2%	3.4%	4.5%	1.1%
Other Nonferrous	1.5%	0.5%	1.1%	0.5%	0.6%
Lead-acid Batteries	0.1%	1.8%	0.7%		
TOTAL METALS	7.7%	7.6%	7.7%	8.5%	0.8%
Plastics:	0.0%	0.0%	0.0%		
PET	1.3%	0.4%	0.9%		
HDPE	3.1%	0.8%	2.3%		
PVC	0.9%	0.3%	0.6%		
LDPE/LLDPE	3.6%	0.9%	2.6%		
PP	1.8%	0.5%	1.4%		
PS	1.0%	1.0%	1.0%		
Other Resins	2.2%	0.7%	1.6%		
TOTAL PLASTICS	13.8%	4.7%	10.5%	8.0%	2.5%
Textiles	0.5%	4.5%	2.0%	2.0%	0.0%
Rubber & Leather	4.5%	2.8%	3.9%	2.0%	1.9%
Wood	2.9%	8.6%	5.0%	3.0%	2.0%
All Other Materials	4.8%	4.2%	4.6%	3.5%	1.1%
Food Wastes	8.8%	11.8%	9.9%	8.0%	1.9%
Yard Trimmings	20.1%	3.0%	13.8%	15.0%	1.2%
TOTAL MSW GENERATED	100.0%	100.0%	100.0%	100.0%	0%

[see also category-mapping table, Appendix B-5]

Table B-5: Reconciliation of reported categories used in the 2000 SWMP

SWMP -- NEST Generation	US EPA/Franklin --Product	US EPA/Franklin -- Material	1995 CRA
Corrugated Boxes	Corrugated Boxes	Paper & Paperboard	Corrugated
Paperboard	Milk Cartons Folding Cartons Other Paperboard Packaging		[Other Paper]
Other Paper Packaging	Bags and Sacks Wrapping Papers Other Paper Packaging		
Newspaper	Newspaper		ONP
Office Paper	Office Paper		Fine Paper
Other Letter & Printing	Directories Standard (A) Mail Other Commercial Printing		Other Paper
Magazines	Magazines		Magazines
Disposable Paper Goods	Tissue Paper & Towels Paper Plates and Cups Disposable Diapers (2%)		[Other Paper]
Other Paper	Books Misc. Paper		
Glass Containers	All Glass Packaging	Glass	Glass
Other Glass	Miscellaneous Durables (11%)		
Ferrous Packaging	All Steel Packaging	Ferrous	Ferrous Cans
Aluminum Packaging	All Aluminum Packaging	Aluminum	Aluminum Cans
Other Ferrous	Major Appliances Small Appliances Misc. Durables (18%) Furniture & Furnishings (15%)	Ferrous	Other Ferrous
Other Non-ferrous	Furniture & Furnishings (25%)	Aluminum Other Non-ferrous	Other Non-ferrous
Lead-acid Batteries	Lead-acid Batteries	Ferrous	Other Ferrous
Total Plastics	Disposable Diapers (98%) Misc. Durables (52%) Misc. Non-durables (18%)	Plastics	Other Plastic Plastic Film
	All Plastic Packaging		Plastic Containers
Textiles	Carpet & Rug Sheets & Pillowcases Clothing & Footwear (90%)	Textiles	Textiles
Rubber & Leather	Rubber Tires Clothing & Footwear (10%)	Rubber & Leather	Rubber & Leather
Wood	Wood Packaging Furniture & Furnishings (60%)	Wood	Wood
All Other Materials	Other Product and Non-Product Wastes	All Other Materials	All Other Materials
Food Wastes	Food Wastes	Food Wastes	Food Waste
Yard Trimmings	Yard Trimmings	Yard Trimmings	Leaves Grass Brush

Table B-3: NEST Construction and Demolition Debris by Material and Community

Taken from Erie County Construction and Demolition Debris Generation Report, March 2001.

Municipality		US EPA/Franklin National Average Composition														
		Brick & Rubble	Cardboard & Paper	Wood	Concrete	Plastic	Ceramic	Land-clearing Debris	Drywall	Metals	Textiles	Glass	Roofing Materials	Misc.	**Total Generated**	**Estim. Diversion (45%)[1]**
		13.7%	0.8%	21.7%	14.1%	0.6%	0.9%	1.3%	4.6%	4.0%	1.0%	0.1%	7.4%	29.9%		
Alden (T)	3%	842	49	1,333	866	37	55	80	283	246	61	6	455	1,837	6,144	2,765
Aurora (T)	3%	842	49	1,333	866	37	55	80	283	246	61	6	455	1,837	6,144	2,765
Boston (T)	2%	561	33	889	578	25	37	53	188	164	41	4	303	1,225	4,096	1,843
Brant (T)	1%	281	16	444	289	12	18	27	94	82	20	2	152	612	2,048	922
Cheektowaga (T)	24%	6,734	393	10,666	6,930	295	442	639	2,261	1,966	492	49	3,637	14,696	49,151	22,118
Clarence (T)	5%	1,403	82	2,222	1,444	61	92	133	471	410	102	10	758	3,062	10,240	4,608
Colden (T)	1%	281	16	444	289	12	18	27	94	82	20	2	152	612	2,048	922
Collins (T)	1%	281	16	444	289	12	18	27	94	82	20	2	152	612	2,048	922
Concord (T)	2%	561	33	889	578	25	37	53	188	164	41	4	303	1,225	4,096	1,843
Eden (T)	2%	561	33	889	578	25	37	53	188	164	41	4	303	1,225	4,096	1,843
Elma (T)	3%	842	49	1,333	866	37	55	80	283	246	61	6	455	1,837	6,144	2,765
Evans (T)	4%	1,122	66	1,778	1,155	49	74	106	377	328	82	8	606	2,449	8,192	3,686
Hamburg (T)	13%	3,647	213	5,777	3,754	160	240	346	1,225	1,065	266	27	1,970	7,960	26,623	11,981
Holland (T)	1%	281	16	444	289	12	18	27	94	82	20	2	152	612	2,048	922
Lackawanna	5%	1,403	82	2,222	1,444	61	92	133	471	410	102	10	758	3,062	10,240	4,608
Lancaster (T)	8%	2,245	131	3,555	2,310	98	147	213	754	655	164	16	1,212	4,899	16,384	7,373
Marilla (T)	1%	281	16	444	289	12	18	27	94	82	20	2	152	612	2,048	922
Newstead (T)	2%	561	33	889	578	25	37	53	188	164	41	4	303	1,225	4,096	1,843
North Collins (T)	1%	281	16	444	289	12	18	27	94	82	20	2	152	612	2,048	922
Orchard Park (T)	6%	1,683	98	2,666	1,733	74	111	160	565	492	123	12	909	3,674	12,288	5,529
Sardinia (T)	1%	281	16	444	289	12	18	27	94	82	20	2	152	612	2,048	922
Wales (T)	1%	281	16	444	289	12	18	27	94	82	20	2	152	612	2,048	922
West Seneca (T)	12%	3,367	197	5,333	3,465	147	221	319	1,130	983	246	25	1,819	7,348	24,575	11,059
NEST totals	100%	28,618	1,671	45,329	29,454	1,253	1,880	2,716	9,609	8,356	2,089	209	15,458	62,458	208,891	

[1] Estimated diversion for all of Erie County, from *Erie County Construction and Demolition Debris Generation Report*, 2001, p. 9. Comparable with other state rates, which range from 37 percent to 77 percent (see 1998 EPA/Franklin "Characterization of Building-Related Construction and Demolition Debris in the United States", p. 3-9)

Table B-4: Sewage Sludge Data for Northeast Southtowns

Facility Name	SPDES Number	Sludge Treatment	Dewatering Method	Biosolids Quantity	Biosolids Management Method	Ultimate Use/Disposal Location
				Dry Ton/Year		
*ALDEN VILLAGE	20541	Anaerobic Digestion	Belt Filter Press	70	Landfilling	CID Landfill
BLASDELL	20681	Anaerobic Digestion	Drying Beds	100	Landfilling	CID LF
CLARENCE RESEARCH	167169	Aerobic Digestion	None	1	Incineration	Thru Southtowns
EAST AURORA	28436	Aerobic Digestion	Centrifuge/D. Beds	180	Landfilling	Lakeview LF in PA
ELMA (T) JERGE SUBDIVISION	23019	Septic Tank	None	2	Incineration	Thru Buffalo Sewer A
ELMA SD# 4 (BRIGGSWOOD)	32051	Aerobic Digestion	None	2	Incineration	Thru N. Tonawanda
ELMA SD# 5 (MEADOWS)	33995	Aerobic Digestion	None	3	Incineration	Thru N. Tonawanda
ELMA SD# 7 (PONDBROOK)	203360	Aerobic Digestion	None	1	Incineration	Thru N. Tonawanda
ERIE COUNTY SD# 2	22543	Aerobic Digestion	D. Beds/Centrifuge	512	Landfilling	Niagara Recycling In
GOWANDA	32093	Anaerobic Digestion	Belt Filter Press	280	Composting	On-site
HOLLAND	108103	Aerobic Digestion	Drying Beds (Covered	25	Landfilling	Niagara Recycling LF
LACKAWANNA	22136	Aer/Anaer Digestion	Centrifuge	364	Landfilling	Niagara Recycling LF
SISTERS OF ST JOSEPH	90077	Aerobic Digestion	None	1	Incineration	Thru Southtowns
SOUTHTOWNS	95401	Lime Stabilization	Plate & Frame Press	2914	Incinerate/Landfill	On-site/Niagara Recy
SPRINGVILLE	21474	Anaerobic Digestion	None	80	Incineration	Thru Buffalo Sewer A
					Landfilling	28%
					Incinerate/Landfill	66%
					Compost	6%
					TOTAL	**100%**

Source: pages B16-B17, "Biosolids Management in New York State," October 1998
New York State Department of Environmental Conservation, Division of Solid & Hazardous Materials

Appendix C

BASELINE ANALYSIS RESULTS:

GENERATION & RECOVERY STATISTICS AND GENERATION PROJECTIONS

CONTENTS:

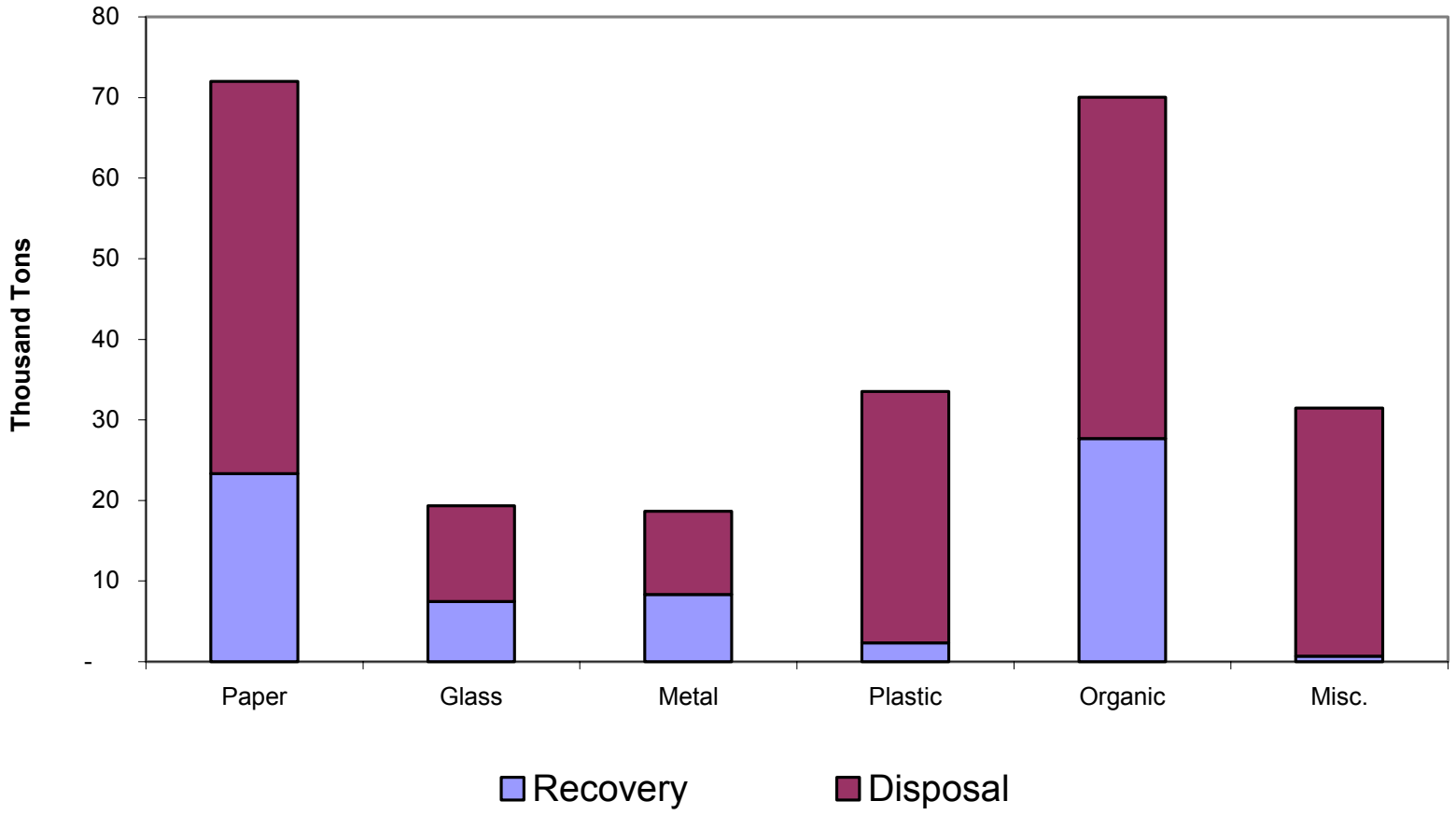


Figure C-1: Residential MSW Recovery and Disposal, 2000

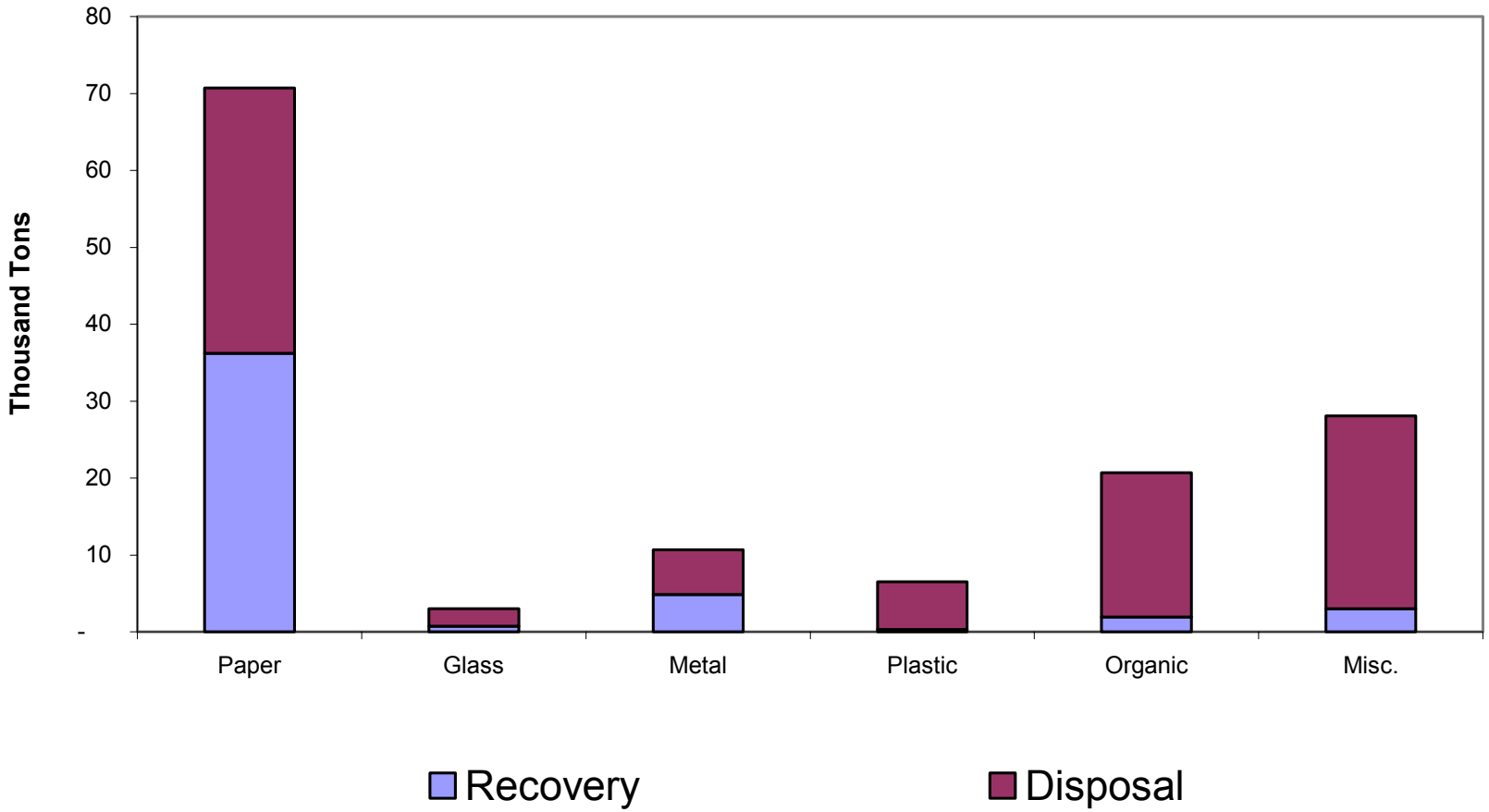


Figure C-2: CII MSW Recovery and Disposal, 2000

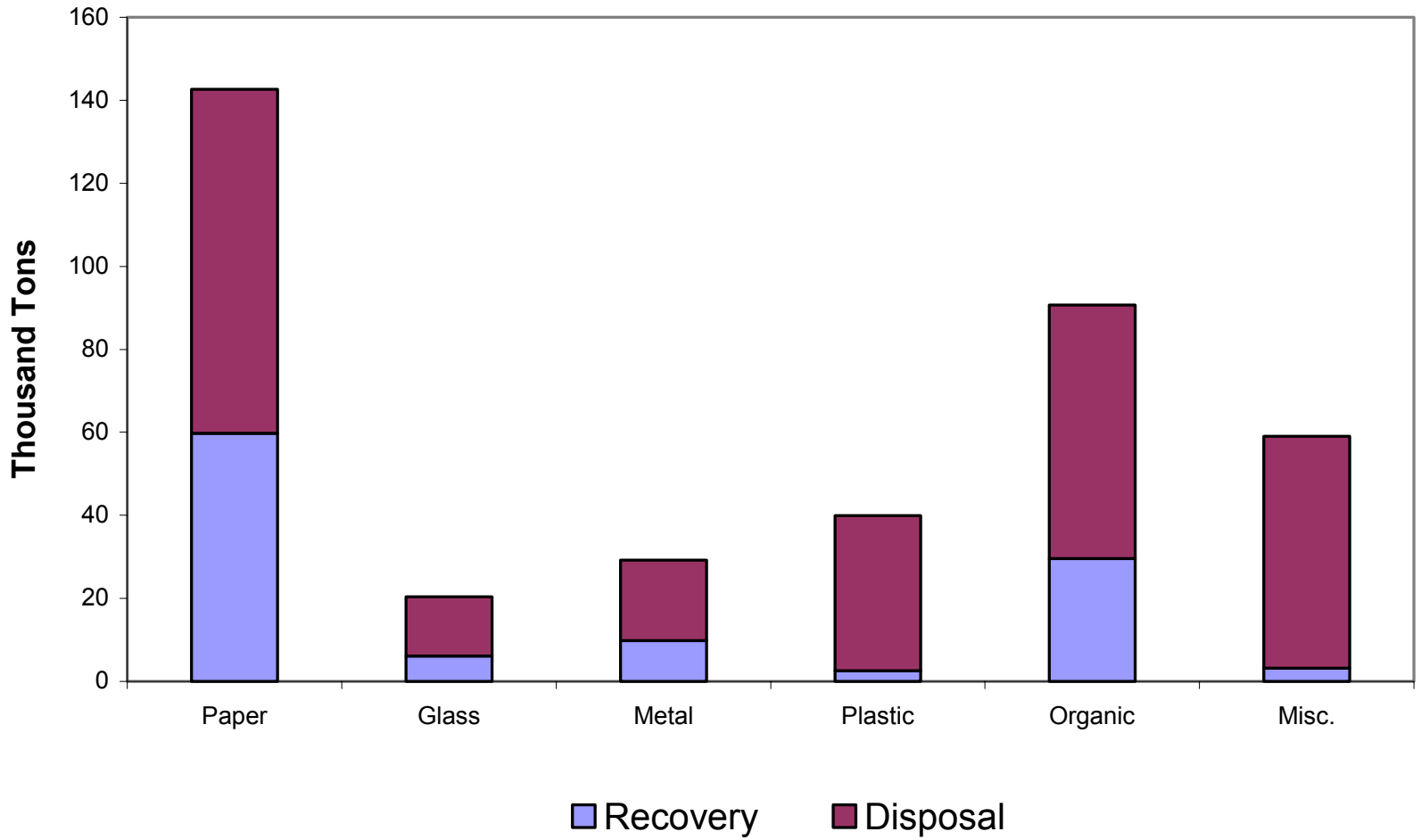


Figure C-3: Combined MSW Recovery and Disposal, 2000

Table C-1: 2000 Baseline Analysis Summary by Municipality*

	Residential					CII					Combined		
	Generated	Recycled	Composted	Recovered	Recovery	Generated	Recycled	Composted	Recovered	Recovery	Generated	Recovered	Recovery
Municipality	tons	tons	tons	tons	%	tons	tons	tons	tons	%	tons	tons	%
Alden (T)	3,805	693	250	943	24.8%	2,716	924	34	957	35.2%	6,521	1,900	29.1%
Alden (V)	1,747	190	498	688	39.4%	937	318	12	330	35.2%	2,684	1,018	37.9%
Williamsville (V)	3,115	626	860	1,485	47.7%	799	272	10	282	35.2%	3,914	1,589	40.6%
Aurora (T)	4,089	629	130	759	18.6%	2,571	874	32	906	35.2%	6,660	1,665	25.0%
East Aurora (V)	4,474	636	1,290	1,926	43.1%	5,896	2,005	73	2,078	35.2%	10,370	4,004	38.6%
Boston (T)	4,439	782	507	1,289	29.0%	2,768	941	34	976	35.2%	7,208	2,265	31.4%
Brant (T)	879	155	100	256	29.1%	548	186	7	193	35.2%	1,428	449	31.4%
Farnham (V)	174	31	20	51	29.1%	109	37	1	38	35.2%	283	89	31.4%
Cheektowaga (T)	39,056	2,072	5,911	7,983	20.4%	27,728	9,428	344	9,772	35.2%	66,785	17,755	26.6%
Depew (V)	9,578	1,202	833	2,034	21.2%	5,622	1,911	70	1,981	35.2%	15,200	4,016	26.4%
Sloan (V)	2,341	341	241	582	24.8%	1,314	447	16	463	35.2%	3,655	1,045	28.6%
Clarence (T)	23,800	2,600	2,200	4,800	20.2%	1,567	533	19	552	35.2%	25,367	5,352	21.1%
Colden (T)	1,881	332	215	547	29.1%	1,173	399	15	413	35.2%	3,054	960	31.4%
Collins (T)	780	204	2	206	26.4%	2,647	900	33	933	35.2%	3,427	1,139	33.2%
Gowanda (V)	1,585	250	181	431	27.2%	1,165	396	14	410	35.2%	2,750	842	30.6%
Concord (T)	3,542	415	0	415	11.7%	2,957	1,005	37	1,042	35.2%	6,499	1,457	22.4%
Springville (V)	2,373	419	271	690	29.1%	1,480	503	18	522	35.2%	3,854	1,212	31.4%
Eden (T)	3,305	664	0	664	20.1%	2,838	965	35	1,000	35.2%	6,143	1,664	27.1%
Elma (T)	3,591	833	20	853	23.8%	3,973	1,351	49	1,400	35.2%	7,564	2,254	29.8%
Evans (T)	6,659	945	979	1,924	28.9%	5,346	1,818	66	1,884	35.2%	12,005	3,808	31.7%
Angola (V)	1,269	166	145	311	24.5%	1,146	390	14	404	35.2%	2,415	715	29.6%
Hamburg (T)	24,443	5,213	2,791	8,004	32.7%	15,243	5,182	189	5,372	35.2%	39,685	13,376	33.7%
Blasdell (V)	1,509	266	172	439	29.1%	941	320	12	332	35.2%	2,450	770	31.4%
Hamburg (V)	4,622	1,570	296	1,866	40.4%	3,515	1,195	44	1,239	35.2%	8,137	3,105	38.2%
Holland (T)	1,321	157	20	177	13.4%	1,257	427	16	443	35.2%	2,578	620	24.1%
Lackawanna	10,100	1,100	1,000	2,100	20.8%	6,592	2,241	82	2,323	35.2%	16,692	4,423	26.5%
Lancaster (T)	18,440	3,194	832	4,026	21.8%	11,210	3,811	139	3,951	35.2%	29,650	7,977	26.9%
Marilla (T)	2,159	289	70	359	16.6%	111	38	1	39	35.2%	2,270	397	17.5%
Newstead (T)	1,994	399	0	399	20.0%	759	258	9	268	35.2%	2,754	666	24.2%
Akron (V)	1,401	250	175	425	30.3%	1,107	376	14	390	35.2%	2,507	815	32.5%
North Collins (T)	1,291	42	147	189	14.7%	805	274	10	284	35.2%	2,096	473	22.6%
North Collins (V)	589	108	67	175	29.8%	192	65	2	68	35.2%	781	243	31.1%
Orchard Park (T)	25,460	4,435	4,894	9,329	36.6%	3,123	1,062	39	1,101	35.2%	28,583	10,429	36.5%
Orchard Park (V)	1,842	325	355	681	37.0%	1,149	391	14	405	35.2%	2,991	1,086	36.3%
Sardinia (T)	1,506	266	172	438	29.1%	939	319	12	331	35.2%	2,445	769	31.4%
Wales (T)	1,073	37	204	242	22.5%	1,033	351	13	364	35.2%	2,106	606	28.8%
West Seneca (T)	22,200	4,487	1,838	6,325	28.5%	15,940	5,420	198	5,618	35.2%	38,140	11,942	31.3%
NEST totals	**242,433**	**36,326**	**27,686**	**64,012**	**26.4%**	**139,218**	**47,334**	**1,729**	**49,063**	**35.2%**	**381,651**	**112,896**	**29.6%**

* Municipal totals do not include estimates of NEST-wide RCA deposit bottles recovery.

Table C-2: NEST-wide Material Generation Projection Summary and Comparison with 2000 Baseline*

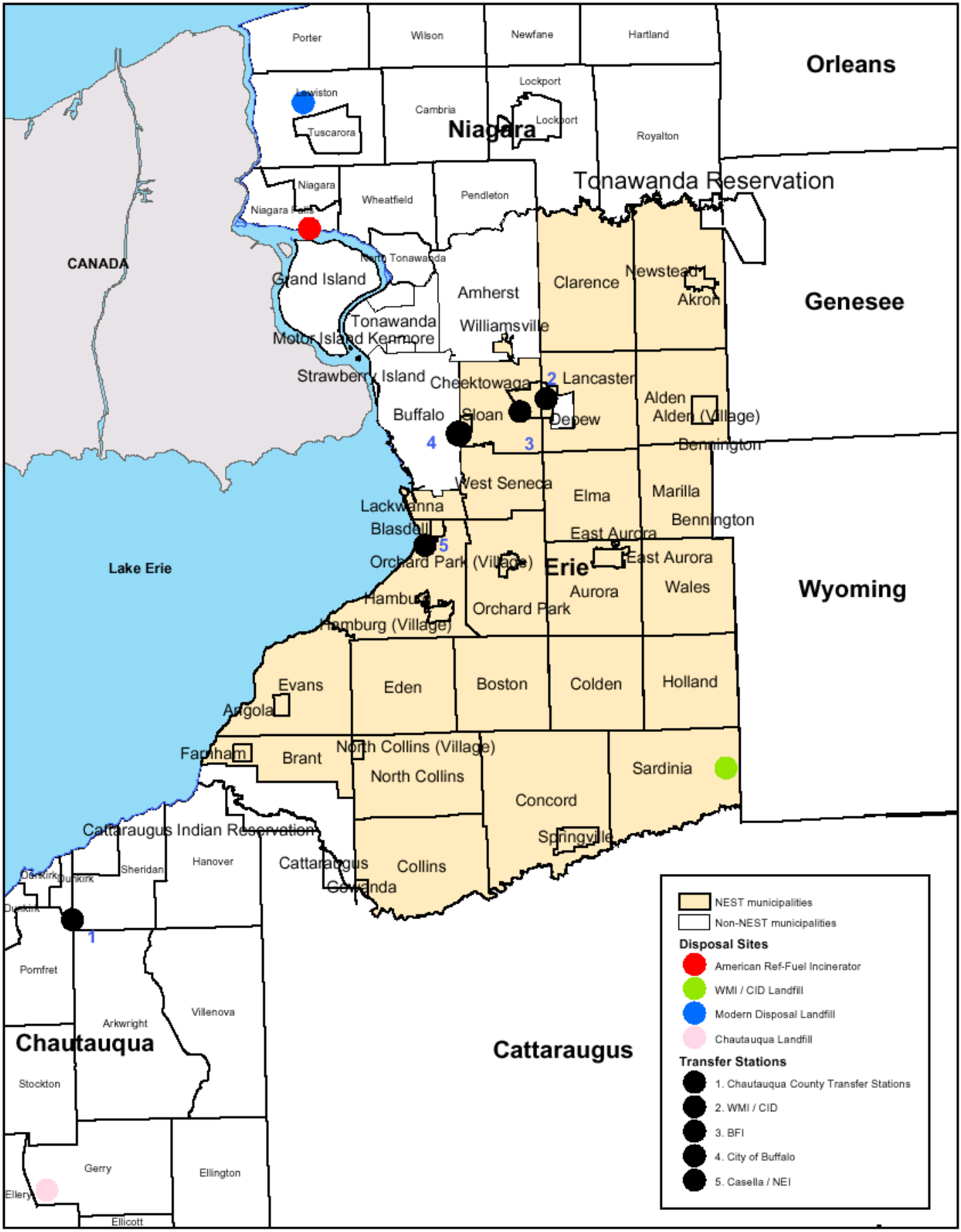
Materials:	Generation								
	2000			2006			2012		
	Res.	CII	Total	Res.	CII	Total	Res.	CII	Total
	tons	tons	tons	tons	tons	tons	tons	tons	tons
Paper and Paperboard:									
OCC & Paperboard	17,994	45,402	63,396	19,553	48,471	68,025	20,666	50,631	71,297
ONP, Office & Mixed Paper	43,993	18,533	62,526	47,805	19,786	67,591	50,525	20,668	71,193
Other paper	10,004	6,566	16,570	10,871	7,010	17,881	11,490	7,322	18,812
TOTAL PAPER	71,991	70,501	142,492	78,230	75,267	153,497	82,680	78,621	161,301
Glass:	17,368	2,985	20,352	17,056	2,880	19,935	16,849	2,812	19,661
Metals:									
Packaging	7,833	1,538	9,372	8,215	1,585	9,800	8,479	1,617	10,096
White Goods & Scrap	10,765	9,089	19,854	11,290	9,365	20,655	11,652	9,553	21,206
TOTAL METALS	18,598	10,629	29,228	19,505	10,952	30,456	20,132	11,172	31,303
Plastics	33,450	6,479	39,929	36,349	6,917	43,265	38,417	7,225	45,641
Rubber & Leather	10,991	3,913	14,904	12,301	4,302	16,603	13,258	4,583	17,842
Wood	7,084	11,924	19,008	8,117	13,422	21,538	8,886	14,523	23,410
All Other Materials	12,903	12,166	25,069	14,515	13,753	28,268	15,701	14,929	30,631
Yard Waste	48,680	4,165	52,845	48,093	4,043	52,136	47,702	3,963	51,665
Food Waste	21,368	16,456	37,824	21,622	16,360	37,982	21,792	16,295	38,087
TOTAL MSW	**242,433**	**139,218**	**381,651**	**255,786**	**147,895**	**403,681**	**265,417**	**154,124**	**419,542**

* Projections developed from municipal totals that do not include estimates of NEST-wide RCA deposit bottles recovery.

Appendix D

FACILITIES MAPS & FIGURES

CONTENTS: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Hartland
Orleans
Lewiston
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Lockport
Lockport
Royalton
Tonawanda Reservation
Niagara
Niagara Falls
Wheatfield
Pendleton
CANADA
North Tonawanda
Grand Island
Amherst
Clarence
Newstead
Akron
Genesee
Tonawanda
Motor Island Kenmore
Williamsville
Strawberry Island
Cheektowaga
2
Lancaster
Alden
Buffalo
Sloan
Depew
Alden (Village)
4
3
Bennington
West Seneca
Elma
Marilla
Lackawanna
Blasdell
Bennington
East Aurora
5
Lake Erie
Orchard Park (Village)
Erie
East Aurora
Aurora
Wales
Wyoming
Hamburg
Orchard Park
Hamburg (Village)
Evans
Eden
Boston
Colden
Holland
Angola
Farnham
Brant
North Collins (Village)
North Collins
Sardinia
Concord
Springville
Cattaraugus Indian Reservation
Sheridan
Hanover
Cattaraugus
Collins
Dunkirk
Dunkirk
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Pomfret
Villenova
Arkwright
Chautauqua
Stockton
Cattaraugus
Gerry
Ellington
Ellery
Ellicott
NEST municipalities
Non-NEST municipalities
Disposal Sites
American Ref-Fuel Incinerator
WMI / CID Landfill
Modern Disposal Landfill
Chautauqua Landfill
Transfer Stations
1. Chautauqua County Transfer Stations
2. WMI / CID
3. BFI
4. City of Buffalo
5. Casella / NEI
N
Miles
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Solid Waste Disposal & Transfer Sites
Serving NEST Municipalities
March, 2002

Figure D-2: Permitted Regional Disposal Capacity Compared to NEST Tonnage

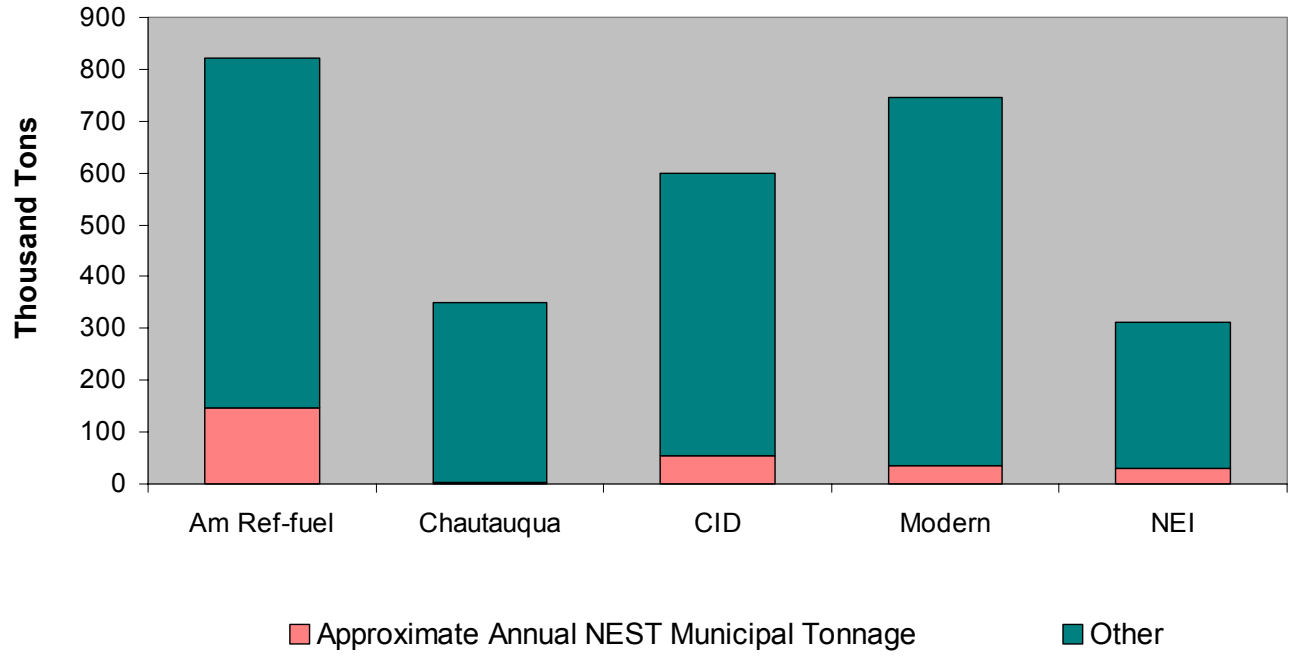
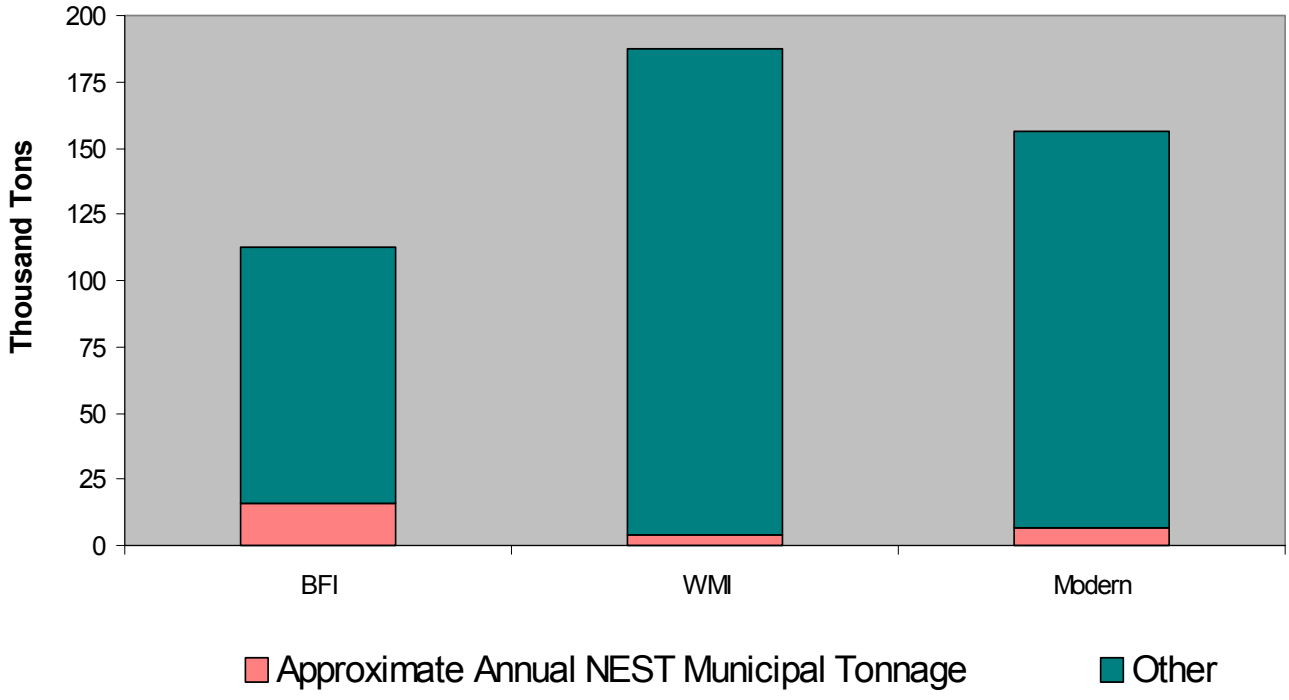


Figure D-3: Permitted Regional Recycling Capacity Compared to NEST Tonnage



Appendix E

SOURCE REDUCTION MATERIALS AND REFERENCE LIST

Applied Compost Consulting. National Backyard Composting Program: Cost-benefit analysis of Home Composting Programs in the United States. Report for the Composting Council, Alexandria, VA and U.S. EPA. May 1996.

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