K A N E C O U N T Y

Solid Waste Management Plan

Volume I

Adopted by the
Kane County Board

November 10, 1992

Printed on Recycled Paper

KANE COUNTY

SOLID WASTE MANAGEMENT PLAN

Volume 1

Prepared by the
Kane County Development Department
Geneva, Illinois

Adopted by the
Kane County Board
November 10, 1992

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EXECUTIVE SUMMARY

Kane County Solid Waste Management Plan

The Kane County Solid Waste Management Plan was developed in response to Public Act 85 - 1198, the Illinois Solid Waste Planning and Recycling Act. This statute requires all Illinois counties to plan for the management of all solid waste generated within the county for the next 20 years. Counties must update their plans every five years.

The Kane County plan was developed over a period of two years by the Kane County Development Department. A twenty member Solid Waste Plan Advisory Committee appointed by the County Board in June 1990, reviewed the plan during its development and made recommendations to the County. A statement of goals and objectives adopted by the Advisory Committee provided direction to the development of the plan. Each step of the planning process was also reviewed by the Development Committee of the County Board.

An assessment of solid waste needs found that in the base year of 1989, 490,820 tons of solid waste were generated, the equivalent of 8.4 pounds per person each day. A combination of population growth and a small increase in the per capita generation rate is expected to increase total generation to 690,668 tons in 2010. Of the total waste amounts, an estimated 37% originates from the residential sector, 28% from the commercial/institution sector, 22% from the industrial sector, and 13% from construction and demolition activity.

In 1989, approximately 9% of the waste stream was recycled. The recycling rate has increased to an estimated 20% by 1991. Over 90% of the non-recycled solid waste is disposed in two landfills: the county-owned Settler's Hill landfill in Geneva and the privately owned Woodland landfill near South Elgin. Both facilities also accept substantial amounts of waste from other counties. Woodland has an estimated 10 years of remaining capacity, while Settler's Hill has approximately 11 years of capacity remaining. The County recently purchased some 11 acres adjacent to Settler's Hill which may be available for expansion of the existing landfill.

During the planning process, numerous strategies and technologies for waste management were studied. Environmental and economic impacts of each potential approach were assessed. The plan recommends a comprehensive solid waste management system consisting of extensive waste reduction and recycling programs, further monitoring and evaluation of alternative technologies, and additional future landfill capacity.

Programs aimed at reducing the amount of solid waste produced in the County will be based on three strategies:

- Educational Efforts, targeted to consumers in all sectors.
- Economic Incentives, such as volume-based billing systems will be encouraged.
- Legislative Support, for appropriate state and federal proposals which encourage packaging reduction, product recyclability, and similar approaches.

The plan proposes a 47% recycling level, to be achieved by 1998. To reach this goal, the County intends to build on the many successful programs already in place. Existing residential curbside programs will be enhanced and new programs developed for multi-family residences. In addition, landscape waste composting facilities will be developed. The commercial and industrial sector will be addressed through waste audits, demonstration programs, and extensive educational efforts. The recycling of construction and demolition debris, such as wood, dry wall, concrete, and asphalt will also be expanded.

Other special materials are also targeted by the plan. Programs will be developed to divert both household hazardous wastes and contaminated soil from leaking underground storage tanks from landfills. In addition, materials such as automotive batteries, appliances, and used tires, as required by state law, will be managed separately.

Alternative technologies were extensively studied, with the assistance of technical consultants, during the planning process. Both incineration with energy recovery and solid waste composting were found to be promising non-landfill approaches. However, significant concerns related to economics, reliability, and environmental impacts were identified. Both alternatives must also be accompanied by new landfill capacity to handle non-processable waste and residues. In recognition of the rapid pace at which these and other technologies are being developed, the County will continue to monitor their development and re-evaluate the viability of alternative technologies during the first five year plan update period.

The plan recommends that the County immediately pursue siting and permitting approval for an expansion of Settler's Hills landfill, incorporating some 11 acres of adjacent property which already has been purchased. This expansion would add an estimated five years to the currently available 12 years of remaining capacity.

The plan further recommends that the County take all necessary steps to assure that future landfill capacity is available for all solid waste generated in the County which requires land disposal. The future facility should be controlled by the County, located within the County, and accept only solid waste generated within the County.

Based on information developed during the planning process some 885 tons per day of landfill capacity would be required if no alternative technologies are found to be acceptable. If alternatives are found to be viable during the on-going evaluation period, a waste-to-energy incinerator would still require an estimated 321 tons per day

of supporting landfill capacity and a solid waste composting facility would require some 544 tons per day of future landfill capacity. All estimates of future landfill capacity are significantly lower than the 2,262 tons per day currently accepted at the two existing landfills.

The County should initiate a site selection process for future facilities as soon as possible, following adoption of the plan, to protect the interests of all people who will be affected by the future site(s). As a first step, the County will appoint a public siting advisory committee which will develop appropriate site selection criteria and advise the County during all phases of the site selection process. In addition, an engineering consultant will provide assistance with criteria development, location screening, site analysis, and hydrogeological investigations.

To mitigate the impacts of a future landfill and other potential facilities on property values, water quality and other effects on adjacent property, a compensation plan for adjacent property owners will be instituted. In addition, host community benefits will be evaluated and offered to communities affected by the facility site. Concern for private property rights will be demonstrated at all times during the site selection and acquisition process and balanced with the public need. Furthermore, the County will create a system which allows affected property owners to monitor and make suggestions as to facility development and operations.

The plan recommends that the financing of any and all future facilities be based on user fees, revenue bonds, private financing and/or state and federal grants. Revenues from general taxes such as property, sales or other general taxes should not be used to construct, operate or otherwise support these facilities. The solid waste program should be operated as an enterprise fund. Any and all revenues generated by the program should be retained for solid waste or environmental programs within the County.

Several parties will be involved in the implementation of the solid waste management plan. They include the County and staff, public advisory committees for site selection and plan update processes, municipal and township governmental bodies, and private solid waste industry members. A County staffing level of three professional positions and one support position is recommended to implement the near-term recommendations.

The first five years of plan implementation will focus on developing aggressive waste reduction and recycling programs, expanding Settler's Hill landfill, and selecting a site for a future landfill. At the first five year plan update, progress in waste reduction and recycling will be reviewed, and a thorough evaluation of alternative technologies will be conducted. Decisions about alternative technologies at the five year update will allow sufficient time to site and develop a solid waste management facility and have it operational before existing landfills reach capacity.

CHAPTER 1 INTRODUCTION

1.1 OVERVIEW OF PLAN

The Kane County Solid Waste Management Plan provides a comprehensive, integrated solid waste management system designed to handle and dispose of solid wastes generated within the County for a 20 year planning period. The plan complies with the Solid Waste Planning and Recycling Act (Illinois Revised Statutes ch 85, ¶5951 et seq.) and conforms with the waste management hierarchy established as State policy in the Illinois Solid Waste Management Act (Illinois Revised Statutes ch 111½ ¶7051 et seq;):

(1) volume reduction at the source
(2) recycling and reuse
(3) combustion with energy recovery
(4) combustion for volume reduction
(5) disposal in landfill facilities

This plan contains all of the information which is required by the State of Illinois to be in an approved plan. There are thirteen associated reports (see Volume 2) which, with this volume, comprise the complete Kane County Solid Waste Management Plan:

- Assessment of Solid Waste Needs (October, 1990)
- Waste Reduction (October, 1990)
- Recycling Program Plan (November, 1990)
- Household Hazardous Waste (December, 1990)
- Special Wastes (September, 1991)
- Technology Assessment: Incineration (October, 1990)
- Technology Assessment: Landfills (October, 1990)
- Technology Assessment: Transfer Stations (October, 1990)
- Investigation of Emerging and Innovative Solid Waste Technologies (December, 1990)
- Feasibility Study for MSW (Municipal Solid Waste) Composting (February, 1992)
- Definition of Potential Integrated Solid Waste Management Systems (February,1992)
- Evaluation of Defined Solid Waste Management Systems (February, 1992)
- Implementation Issues and Strategies (February, 1992)

In compliance with the Illinois Planning and Recycling Act, the plan contains the following provisions:

1) A description of the origin, content, and weight or volume of municipal waste generated within the planning area and projections of waste that will be generated during the next 20 years (Chapter 2).

2) A description of facilities where municipal waste is currently processed or disposed of and the remaining available permitted capacity of those facilities (Chapter 2).

3) A description of the facilities and programs that are proposed for the management of municipal waste generated within the planning area during the next 20 years, including their size, expecte (Chapters 3,4,5,6,7, and 8).

4) Evaluation of the environmental, energy, life cycle cost, and economic advantages and disadvantages of the proposed waste management facilities and programs (Chapter 8).

5) A description of the time schedule for the development and operation of each proposed facility or program (Chapter 10).

6) Identity of potential sites for each proposed waste facility or an explanation

7) The identity of the governmental entity that will be responsible for implementing the plan on behalf of the county and an explanation of the legal basis for the entity's authority to do so (Chapter 10).

8) A recycling program to be implemented throughout the planning area, designed to recycle, by the end of the third and fifth years, respectively, a minimum of 15% and 25% of the municipal waste generated within the area. The plan recommends that these goals be exceeded (Chapter 4).

In October, 1990, the Kane County Solid Waste Plan Advisory Committee adopted a statement of goals and objectives which shaped the solid waste plan development. The objectives include encouraging waste reduction and recycling, reducing the importation of solid waste for disposal, providing a public educational system on integrated waste management and developing strategies which minimize environmental and economic impacts. The full statement of objectives appears in Table 1.1.

Table 1.1
STATEMENT OF GOALS AND OBJECTIVES

The goal of the Kane County Solid Waste Management Plan is to develop a comprehensive, integrated solid waste management system, designed to accommodate the needs of the County for at least the next 20 years. The primary objectives of this plan are:

1. To manage the solid waste produced within the County, primarily through the use of facilities located within the County.

2. To minimize to the extent legally feasible, the amount of solid waste imported into the County for disposal.

3. To maximize reduction of the amount of waste generated in the County and to minimize the generation of hazardous wastes, ensuring that they are not improperly disposed jointly with non-hazardous materials.

4. To recycle as much of the waste generated in the County as is practically and economically feasible.

5. To develop disposal strategies of non-recyclable waste which meet the following criteria:

   a. Minimize the environmental impact on air, water, and land resources.
   b. Minimize the economic impact on County citizens, businesses, and institutions.
   c. Provide a reliable and flexible system which maximizes compatibility with reduction and recycling efforts and is capable of incorporating future advances in disposal technologies.
   d. Provide for public control of major system elements.

6. To ensure that responsibility for achieving waste reduction and recycling goals is shared proportionately among residential, commercial, industrial, institutional and governmental sectors.

7. To provide an educational system which informs the public of the importance and complexity of solid waste issues, explains the need for an integrated waste management system, and promotes participation in implementation of the plan.

8. To comply with all relevant State and Federal requirements regarding solid waste planning, recycling, and facility design and operation.

1.2 DESCRIPTION OF PLANNING AREA

The Kane County planning area consists of 25 municipalities and 16 townships. The names of each are contained in Table 1.2. A map of the county appears in Figure 1.1.

The 1990 population of the County, as determined by census, was 317,471 and has been forecasted by the Northeastern Illinois Planning Commission (NIPC) to reach 434,000[1] in 2010, an annual growth of almost 2%. The number of households in 1990 was reported to be 111,496 total housing units. An estimated 74% of the total units are single family, with the remaining 26% being multiple family units. The average household size was 2.85 in 1990 and is expected to decrease to 2.66 by 2010.

The Kane County Board appointed a Solid Waste Plan Advisory Committee in June, 1990 comprised of government officials, businesses, disposal companies and community representatives. The Advisory Committee has met regularly throughout the planning period to review the plan during its preparation, make suggestions and propose any changes it believes are appropriate. The final plan recommendations were adopted at the Committee's last formal meeting on April 9, 1992.

The Solid Waste Plan reports were developed by County staff with the assistance of several consultants. All of the reports and Advisory Committee comments were reviewed by the County Development Committee of the Kane County Board. Comments and revisions of the Advisory Committee were incorporated as the drafts were finalized.

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[1] Since this plan was developed, NIPC has revised projections downward to 426,100 for 2010. Since this only represents a 2% decrease and since the earlier reports were prepared using that estimate, the original 434,000 projection will be used throughout the report.

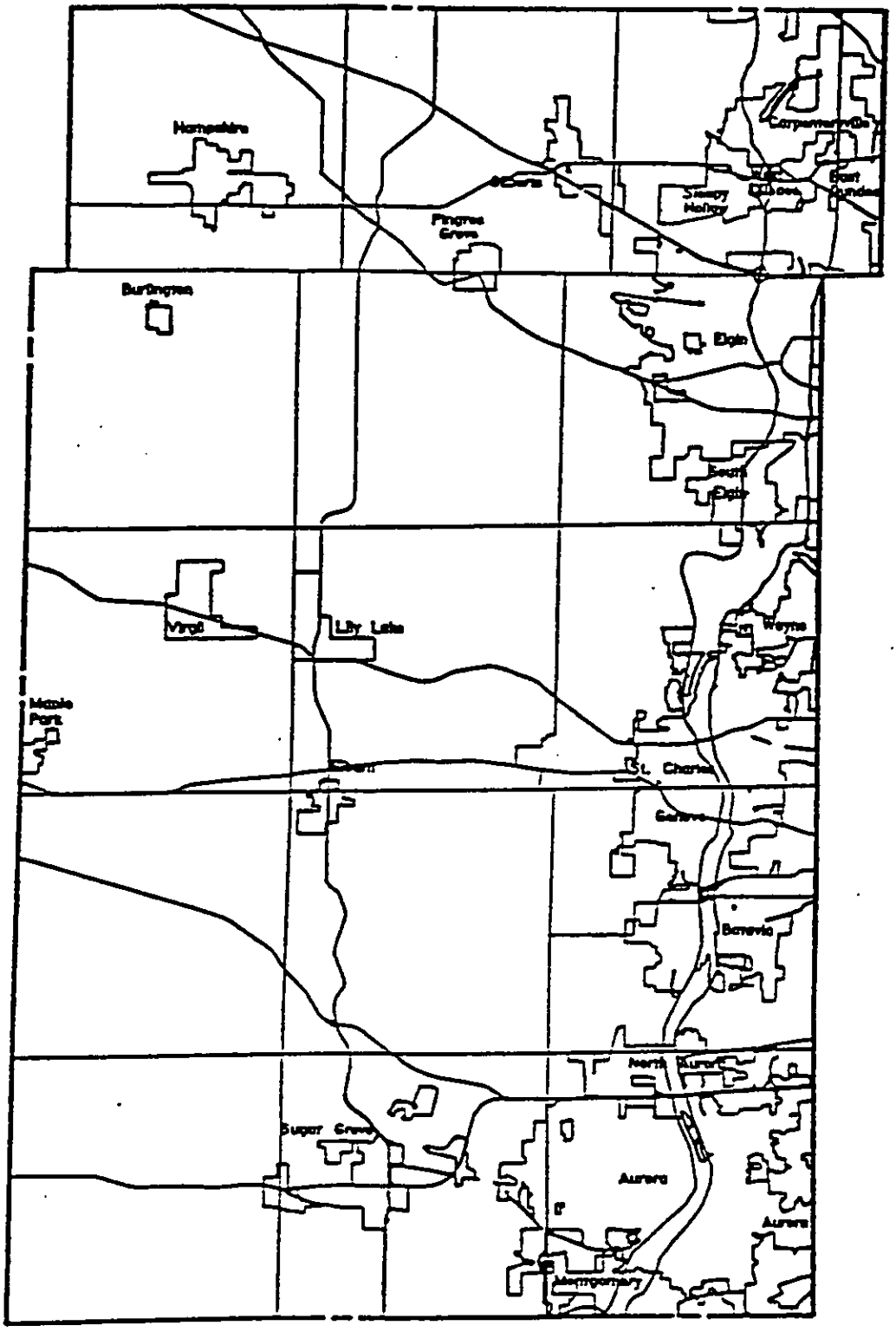
Table 1.2
KANE COUNTY MUNICIPALITIES AND TOWNSHIPS

Kane County Municipalities		
Algonquin*	Geneva	St. Charles**
Aurora**	Gilberts	Sleepy Hollow
Barrington Hills*	Hampshire	South Elgin
Batavia	Hoffman Estates*	Sugar Grove
Burlington	Lily Lake	Virgil
Carpentersville	Maple Park	Wayne*
East Dundee	Montgomery**	West Dundee
Elburn	North Aurora	
Elgin**	Pingree Grove	

Kane County Townships		
Aurora	Dundee	Plato
Batavia	Elgin	Rutland
Big Rock	Geneva	St. Charles
Blackberry	Hampshire	Sugar Grove
Burlington	Kaneville	Virgil
Campton		

** Primarily in Kane, extends into other counties
* Partially in Kane County

Figure 1.1
MAP OF KANE COUNTY, ILLINOIS



CHAPTER 2 SOLID WASTE NEEDS ASSESSMENT

2.1 WASTE GENERATION

Solid waste generation and waste projections were developed using information from the October 1990 Assessment of Solid Waste Needs for Kane County, Illinois. This plan addresses the total amount of solid waste generated in the County, including municipal waste and other waste types. Municipal waste is defined in the Illinois Environmental Protection Act as "garbage, general household, institutional and commercial waste, industrial lunchroom or office waste, landscape waste, and construction and demolition debris.

Other wastes which are generated in the County and covered in this plan include wastes from industrial operations (which includes significant amounts of corrugated paper and wood waste), and some types of special wastes including non-hazardous industrial process waste and pollution control waste. Other special wastes, as defined by the Environmental Protection Act, such as hazardous waste and potentially infectious medical wastes are not included in this plan.

The county generated an estimated 490,820 tons of solid waste in 1989 or 8.4 pounds per capita per day. Of this total, 82% is classified as municipal waste and 18% is classified as industrial manufacturing and processing waste. The sources of that waste are indicated in Table 2.1. The gross waste generation data includes waste amounts which are recycled.

Residential waste is collected by ten different hauling firms, generally through a contract between the municipality and a single hauler at an average cost of $8.39 per month. Residential wastes account for more than one-third of the waste generated in the county, an average of 3.09 pounds per capita per day, or 180,499 tons in 1989. Residential waste amounts were determined through a combination of municipal surveys, recycling surveys and landfill gate surveys.

Non-residential waste quantities could not be accurately determined from the results of the landfill gate survey. The information was therefore derived from hauler surveys and recycling surveys. Gate survey methodologies have since been revised to collect separate data on non-residential waste quantities including commercial, industrial, and construction wastes.

Commercial and institutional wastes are defined as part of municipal wastes and are collected by sixteen waste hauling companies in the county. Charges are based upon the size of the container and the frequency of service. Commercial wastes account

for more than one-fourth of the waste generated in the county, an average of 2.36 pounds per capita per day or 137,738 tons in 1989.

Industrial waste generation rates developed for the needs assessment apply to all industrial waste and were estimated from hauler surveys. Industrial wastes were estimated to comprise 22.5% of the waste stream. This equates to 1.89 pounds per capital per day or 110,563 tons in 1989.

The needs assessment report did not separately account for "industrial lunchroom and office waste" which is included in the definition of municipal waste. An estimated 20% of the industrial waste is assumed to be lunchroom and office waste. Thus 22,100 tons or 0.38 pounds per capita per day are municipal wastes from industrial

Table 2.1
SOLID WASTE GENERATION RATES BY SECTOR

	Tons per Year	Lbs/Capita/Day	Percentage of Solid Waste
Municipal Wastes			
Residential	180,499	3.09	36.8%
Commercial* Institutional	137,738	2.36	28.1%
Industrial Office/Lunch	22,100	.38	4.5%
Constr/Demo	62,020	1.06	12.6%
Subtotal	**402,357**	**6.89**	**82.0%**
Manufacturing & Process Wastes	**88,463**	**1.51**	**18.0%**
TOTALS	**490,820**	**8.40**	**100.0%**

Notes: * Includes 1500 dry tons of municipal sludge which is landfilled.

lunchrooms and offices[2]. Subtracting this from the industrial total leaves 88,463 tons or 1.51 pounds per capita per day of manufacturing and process waste. Manufacturing and process wastes thus account for 18% of the total waste generation.

Construction and demolition debris are also defined as part of municipal waste. The needs assessment estimated that 62,020 tons or 1.06 pounds per capita per day were generated in 1989.

Municipal sludge, although not defined as municipal waste by the State, is a significant portion of the total waste stream. In 1991, 10,180 tons of sludge were produced at one water and eight sewage treatment plants in Kane County. Most of the sludge is land applied, but 1498 tons were landfilled.

A total of 402,357 tons or an average of 6.89 pounds per capita per day of municipal wastes were generated in Kane County in 1989. This represents 82% of the county's total solid waste generation. Figure 2.1 shows the division of municipal waste generation among the different sectors.

2.2 WASTE PROJECTIONS

Waste generation is expected to increase over the 20 year planning period due to a combination of population growth and waste generation per capita growth as shown in Table 2.2. By the year 2010, population is projected to increase to 434,000. Using a Franklin Associates waste stream study for the U.S. EPA [3], the waste generation rate is projected to grow at a rate of 0.34% per year until the year 2000, when the rate will slow and remain constant. Thus in 2010, the per capita rate is projected to be 8.72 pounds per person per day yielding 690,668 tons of solid waste in 2010.

2.3 CURRENT FACILITIES AND PROGRAMS

Landfilling is the predominant form of disposal in Kane County. In 1989, 438,215 tons or 89.3% of the solid waste generated in Kane County was disposed of in landfills. 401,890 tons or 91.7% of that was disposed of at either Settler's Hill or

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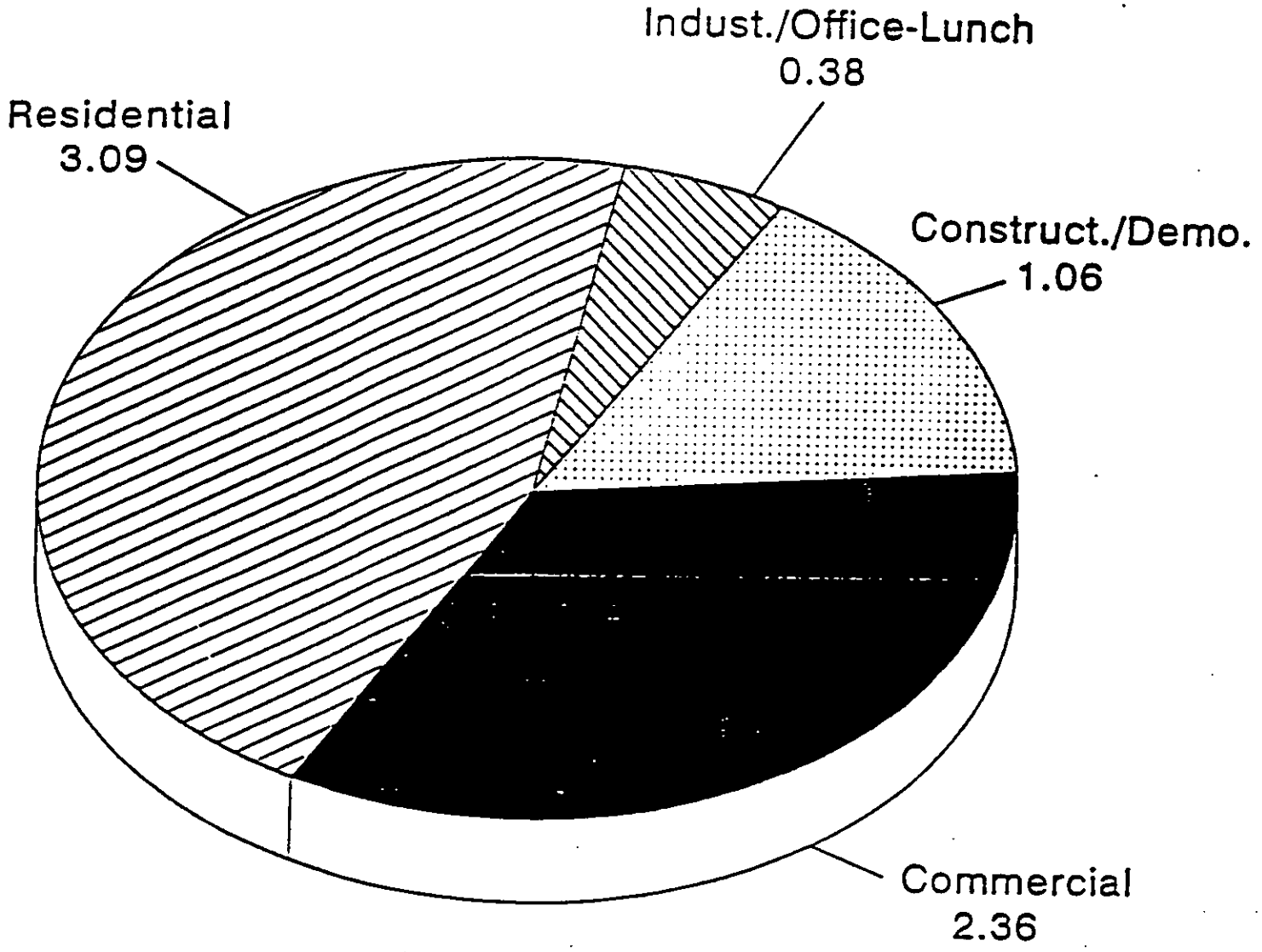
[2] Illinois law and regulations define the municipal portion of industrial wastes by their origin (e.g. office or lunchroom) rather than by the waste itself. For example, a cardboard box from an industry's office is municipal waste, whereas a cardboard box from the same industry's warehouse is industrial waste.

[3]Franklin Associates. Ltd., Characterization of Municipal Solid Waste in the United States 1960 to 2000. Prepared for the U.S. Environmental Protection Agency.

Figure 2.1

Municipal Solid Waste Generation
Kane County 1989



Average Pounds Per Capita Per Day

Note: Excludes Industrial & Process Waste

Table 2.2 PROJECTED SOLID WASTE GENERATION, 1989-2010			
Year	Population	Generation Rate*	Total Tons Per Year
1989	320,000	8.40	490,820
1990	325,429	8.43	500,664
1991	330,857	8.46	510,827
1992	336,286	8.49	521,050
1993	341,714	8.51	530,707
1994	347,143	8.54	541,040
1995	352,571	8.57	551,430
1996	358,000	8.60	561,881
1997	363,428	8.63	572,390
1998	368,857	8.66	582,960
1999	374,285	8.69	593,588
2000	379,714	8.72	604,277
2001	385,142	8.72	612,915
2002	390,571	8.72	621,555
2003	395,999	8.72	630,193
2004	401,428	8.72	638,832
2005	406,856	8.72	647,471
2006	412,285	8.72	656,110
2007	417,713	8.72	664,748
2008	423,142	8.72	673,388
2009	428,571	8.72	682,028
2010	434,000	8.72	690,668

Notes:

* Pounds per capita per day

** Since the plan was developed, the Northeast Illinois Planning Commission (NIPC) has revised the population projections somewhat downward for the year 2010 to 426,100, a projected decrease of 2%.

Woodland Landfills in Kane County. Settler's Hill is owned by the County and operated by Waste Management, Inc.. Woodland is owned and operated by Waste Management, Inc.. The balance of solid waste generated in Kane County was exported to Greene Valley and Mallard Lake Landfills in DuPage County (35,725 tons) and DeKalb County (600 tons).

Kane County's two landfills import wastes from Dupage, Cook, McHenry and other counties. Approximately half of the waste disposed of at these facilities in 1990 originates in Kane County (57.3% at Settler's Hill and 41.4% at Woodland). According to the IEPA 1991 report[4], the remaining capacities at the two landfills were 11 years for Settler's Hill and 10 years for Woodland. 1992 data submitted to the IEPA by the landfill operator indicates that, as of March 31, 1992, 12.5 years of capacity remain at Settler's Hill.

The year 1989 saw the introduction of curbside recycling in Kane County, with a total of fifteen programs in place by 1992. St. Charles has reported a consistently high 92% monthly participation rate due in large part to the financial incentive created by their innovative billing system. In addition, there are several commercially operated buy-back and drop-off facilities as well as municipally sponsored drop-off programs.

There is one permitted landscape waste composting facility. It was briefly operated by Waste Management, Inc., adjacent to the Settler's Hill Landfill and subsequently closed in January, 1991. Four other nearby compost sites may also accept some material from Kane County. These include a DuPage County facility near West Chicago and privately owned facilities in Kendall County (Browning-Ferris), DeKalb County (DeKalb County Disposal) and McHenry County (Marengo Disposal).

Quantities of materials recycled were estimated from hauler surveys and recycler surveys. In 1989, approximately 7% of the residential wastes (between 1/3 and 1/2 of that amount was landscape wastes), 6% of commercial wastes and 21% of manufacturing and process wastes were recycled. No construction/demolition wastes were known to have been recycled. However, since 1989, many new municipal programs have been started and major changes have occurred in yard waste management, increasing significantly the residential recycling rate.

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[4] Illinois Environmental Protection Agency, Available Disposal Capacity for Solid Waste in Illinois. Fifth Annual Report. October, 1991.

CHAPTER 3 WASTE REDUCTION

3.1 INTRODUCTION

Volume reduction at the source or waste reduction is the first level and highest goal of the waste management hierarchy (see Section 1.1). A reduction in the amount of waste generated would reduce the required capacity of disposal facilities and related capital investments. This would extend the lifetime of disposal facilities with a fixed total capacity. Waste reduction can also reduce the level of environmental impact regardless of the type of disposal facility.

Waste reduction can be achieved by altering the behaviors of product consumers and product manufacturers. Consumer activity affects waste generation through the purchase of products, the use of products and the disposal of products. Manufacturers affect waste generation through product design and packaging activities.

3.2 RECOMMENDED PROGRAMS

Three general categories of programs are recommended to achieve waste reduction in the plan:

- Educational Efforts
- Economic Incentives
- Regulatory Requirements

Since waste reduction efforts are difficult to measure, no numeric waste reduction goal was developed in the plan. Instead a commitment was made to include waste reduction efforts in the implementation plan. Each category is summarized below. A more complete description appears in Appendix B, "Waste Reduction".

3.2.1 Educational Efforts

An extensive educational campaign should by conducted by the County, targeted to consumers in all sectors. Residential waste generators can be targeted through direct mail literature, school programs, public presentations and the media. A similar campaign should be directed toward commercial and industrial generators.

Educational efforts should increase awareness of the impact of product design and packaging on the volume of solid waste. Consumers should be encouraged to purchase materials which are more durable, repairable, contain recycled materials, or

minimize the use of packaging.

Recommendation 3.1: Establish a waste reduction program which would compile educational materials, develop public presentations, and provide telephone assistance and information on request.

Recommendation 3.2: Fund local advertisement and publicity, including direct mailings to consumers.

Recommendation 3.3: Sponsor an annual "Waste Reduction Week".

Recommendation 3.4: Encourage a source-separation approach to recycling in the residential sector to require residents to pay attention to their waste, to ask "is this recyclable or isn't it?". This will also increase their awareness of products which generate inordinate amounts of waste.

Model waste reduction programs should be established by the County in representative businesses and institutions. By providing technical, and perhaps financial assistance, the County could develop pilot programs in a government building, school, hospital, several different types of retail establishments, private sector offices, etc. The results of these model programs would be used to encourage widespread implementation of waste reduction programs.

To further encourage widespread implementation of waste reduction programs in the commercial and industrial sectors, waste stream audits should be provided to county businesses either by county staff, subcontracted to a third party, or by the private sector. The issue of voluntary vs. mandatory audits should be considered.

Recommendation 3.5: Determine funding sources for waste stream audits in different sectors and determine how these audits should be conducted.

Recommendation 3.6: Conduct waste audits and set up model waste reduction programs in representative businesses and institutions. The information from the model programs should be made available to similar type institutions to assist them in establishing their own waste reduction programs.

Recommendation 3.7: Develop an honorary awards program for businesses and individuals who achieve significant waste reduction.

3.2.2 Economic Incentives

Both manufacturing and procurement practices should be evaluated and, where appropriate, modified to encourage the production and purchase of materials which are more durable, repairable, contain recycled materials or minimize the use of packaging.

> **Recommendation 3.8:** Evaluate and modify current County government procurement practices to encourage purchase of durable, reusable materials and/or those which contain recycled materials or minimize packaging. Encourage all of units of government within the County to similarly modify their procurement practices.
>
> **Recommendation 3.9:** Give full consideration to providing support, in terms of technical and financial assistance, to local businesses' efforts to modify their product design and packaging use so as to reduce their impact on solid waste management systems.

A volume based billing approach to solid waste services where consumers pay a fixed amount for each container set at the curb for collection and disposal should also be considered. This gives homeowners a direct financial incentive to reduce the amount of waste they place at the curb for disposal. It has been demonstrated that recycling participation rates are higher in communities with a volume-based refuse billing system. Actual waste reduction results from such programs have not yet been fully documented. Whether the effect is to increase recycling, waste reduction, or some combination of the two, volume-based billing approaches result in a considerable reduction in the amount of waste placed at the curb for disposal.

> **Recommendation 3.10:** Encourage a volume based billing approach to solid waste services in municipalities and unincorporated areas of the County.

3.2.3 Regulatory Requirements

Regulatory restrictions on the sale of products with an inordinate impact on the waste stream should be considered carefully by state and federal governments. Where appropriate, the County should actively support the introduction and approval of such legislative proposals.

> **Recommendation 3.11:** Support labelling requirements that inform consumers and consider supporting regulatory restrictions on the sale of products with an inordinate impact on the waste stream.
>
> **Recommendation 3.12:** Monitor product and packaging bans in Illinois

and other states and distribute information to the public and municipalities.

Recommendation 3.13: Develop model procurement guidelines and provide assistance to municipal governments in implementing them.

3.3 IMPLEMENTATION STRATEGY

3.3.1 Time Schedule for Implementation

All programs should begin immediately upon plan adoption and be fully implemented by 1995. After 1995, there should be continuing efforts to improve programs and increase waste reduction. The recommendations are summarized below. A more complete description appears in the text above.

1992-1995

- 3.1 Establish and staff a waste reduction office
- 3.2 Fund local advertisement & publicity on waste reduction
- 3.3 Sponsor an annual "Waste Reduction Week"
- 3.4 Encourage a source separation approach to recycling
- 3.5 Determine funding source & parties to conduct waste audits
- 3.6 Conduct waste audits & set up model waste reduction programs in representative businesses and institutions
- 3.7 Develop an honorary awards program for individuals & businesses that achieve significant waste reduction
- 3.8 Evaluate & modify County government procurement practices to achieve waste reduction
- 3.9 Consider providing technical & financial assistance to local businesses' efforts to reduce wastes by modifying products and packaging
- 3.10 Encourage a volume based billing approach to solid waste services
- 3.11 Support labelling requirements & consider supporting regulatory restrictions on products with an inordinate impact on the waste stream
- 3.12 Staff should monitor product and packaging bans
- 3.13 Develop model procurement guidelines which encourage waste reduction for municipal governments and assist in implementing them

A full review of the waste reduction efforts should be made during the 5 year plan update including measurements of program success. As a part of the plan update, the need for additional waste reduction initiatives should be assessed.

3.3.2 County Waste Reduction Office

Waste reduction is one of the primary strategies of the first five years of the plan. Waste reduction and recycling education efforts need to be coordinated. Waste reduction will be encouraged through source separation recycling programs. However, given the importance of waste reduction efforts as demonstrated by their placement

atop the state hierarchy, education programs for waste reduction should be considered separately from other related activities.

The extensive efforts detailed in the recommendations above will require additional staff in the Solid Waste Division of the Kane County Development Department devoted to providing information and advocating appropriate waste reduction practices. In addition to part-time involvement by the existing Solid Waste Director and Recycling Coordinator positions, a new position of Education Coordinator should be created to implement waste reduction and recycling initiatives.

First year expenses will include partial personnel costs for the three positions listed above. The program would incur expenses for the development, printing and distribution of materials; travel and supplies. Future year expenses may include start up expenses for pilot waste reduction programs in schools and institutions, a waste reduction audit program for county businesses, implementing a volume based billing approach for solid waste services, and providing technical and financial assistance to local businesses' efforts to modify their product design and packaging use so as to reduce their impact on solid waste management systems.

CHAPTER 4 RECYCLING

4.1 INTRODUCTION

Recycling, reclamation or reuse is defined by the Illinois Solid Waste Planning and Recycling Act as "a method, technique or process designed to remove any contaminant from waste so as to render the waste reusable, or any process by which materials that would otherwise be disposed of or discarded are collected, separated or processed and returned to the economic mainstream in the form of raw materials or products."

The solid waste plan sets a 47.3% overall material recycling goal for Kane County as presented in Table 4.1. This is comprised of a 33% material recycling goal for residential, commercial and industrial wastes, a 100% goal for landscape wastes and a 75% goal for construction/demolition wastes. Each program is phased in over several years. Table 4.2 presents each program's goals for percent of waste recycled over twelve years. Programs to achieve these goals by 1998 are summarized below. A more comprehensive description is presented in the "Recycling Program Plan" in Appendix C.

4.2 RECOMMENDED PROGRAMS

Four material recycling programs are recommended for achieving the county recycling goal. They address different sectors of the waste stream: residential, commercial and institutional, construction and demolition, and industrial. Landscape waste recycling is discussed in a later section of this chapter.

4.2.1 Material Recycling Programs

Residential Material Collection

In 1989, there were an estimated 87,526 single-family dwellings and 31,016 multiple-family housing units the County. By the fall of 1990, curbside recycling programs were provided to single family homes and 2-4 unit dwellings in 14 of the 22 municipalities in Kane County (see Table 1.2). These served 44,244 households and diverted an estimated 10,563 tons of waste per year or 6% of the residential waste. By mid-1992, curbside programs were being offered in all municipalities which contract for refuse service except for Sugar Grove. Local haulers provide voluntary curbside recycling programs to 24% of the 15,106 households in unincorporated areas. Unincorporated areas are also serviced by several drop-off facilities.

Table 4.1
SUMMARY OF DIVERSION POTENTIAL FOR RECOMMENDED RECYCLING PROGRAMS

Sector	1989 Generation (tons)	Recycling Goal (tons)	Recycling Goal (tons)
Residential:			
Existing Curbside Programs		10,563	
New Curbside Programs		13,763	
Enhanced Curbside Collec.		10,124	
Multi-Family Programs		4,483	
Recycling Centers		3,248	
Subtotal	127,983	42,181	33.0%
Commercial:	124,609	41,121	33.0%
Industrial:			
Office/Lunch		7293	
Manufacturing & Process		29193	
Subtotal	110,563	36,486	33.0%
Landscape Waste:			
Existing Programs		59,315	
"Exempt" Material:		6,330	
Subtotal	65,645	65,645	100.0%
Construction/Demolition:	62,020	46,515	75.0%
TOTAL	490,820	231,948	47.3%

Table 4.2
IMPLEMENTATION SCHEDULE FOR PROPOSED RECYCLING GOALS
(Percent Recycling in Each Sector)

Sector	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Residential	5.7	13.3	17.3	21.3	25.3	29.3	33.0	33.0	33.0	33.0	33.0	33.0
Commercial	6.9	6.9	8.0	13.0	18.0	23.0	28.0	33.0	33.0	33.0	33.0	33.0
Industrial	20.9	20.9	22.0	24.0	26.0	28.0	30.0	32.0	33.0	33.0	33.0	33.0
Landscape Waste	8.5	60.5	90.3	90.3	90.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C/D Debris	0	0	0	0	5.0	5.0	10.0	15.0	20.0	75.0	75.0	75.0
% of Total Waste Stream Recycled	9.1	18.0	23.6	26.4	29.7	33.7	37.2	39.5	40.3	47.3	47.3	47.3

To achieve the residential goal of 33% recycling by 1995, additional collection programs should be started and existing programs should be enhanced through the following recommendations.

> **Recommendation 4.1:** Provide technical assistance to the remaining communities without curbside programs to strongly encourage their implementation. Encourage a source separation approach to recycling in order to increase consumer understanding of waste reduction and product alternatives (See Chapter 3, Recommendation 3.4).

These new curbside programs could result in an additional 9,684 tons per year[5] or 5% of the residential waste being diverted.

> **Recommendation 4.2:** The County, Townships, or Township Solid Waste Disposal Districts should require all waste haulers serving unincorporated areas to provide curbside recycling service as an integral part of their refuse collection services.

If the current 24% participation rate in the unincorporated areas increased to 75% participation by 1995, an estimated 4,079 tons per year or 2% of the residential waste could be diverted.

> **Recommendation 4.3:** Support local pilot recycling programs at multifamily residences and collect data on the relative success of various approaches, potential diversion amounts, and program costs. Then disseminate information about the successful methods to municipal officials and building owners.

If collection programs are provided to 90% of the County's 27,675 multi-family dwelling units with a collection rate of 30 pounds per household per month, an estimated 4,483 tons per year or 2% of the residential waste could be diverted.

> **Recommendation 4.4:** Continue existing drop-off and buy back programs with the expectation that the amount of residential waste brought to these sites will decline about 50% due to the establishment of more convenient programs.

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[5] Projected tonnages diverted and corresponding percentages are based upon 1989 total waste generation tonnages (See Table 2.2).

An estimated 3248 tons per year or 2% of the residential waste would be diverted through drop-off and buy back programs.

Higher participation rates and per household volumes in existing programs should be encouraged. The goal is to increase the amount of material from single family curbside recycling programs from the existing 40 pounds to 60 pounds per household per month by 1995. Recommendations 4.5 through 4.7 would provide an estimated 10,124 tons per year or 5% additional residential waste diversion through recycling.

Recommendation 4.5: Increase educational efforts clarifying which materials can be recycled and encouraging participation.

Recommendation 4.6: Municipalities should implement volume-based billing systems for refuse collection. This provides a direct financial incentive to recycle and has been demonstrated to result in significantly higher recycling participation rates (see also Chapter 3, Recommendation 3.9).

Recommendation 4.7: Expand existing recycling programs by accepting additional materials such as plastics and other types of paper besides newspaper. In addition, the collection of used clothing and other household items by charitable organizations can be coordinated with curbside pick-ups to significantly increase the reuse of these materials.

Commercial and Institutional Material Collection

During 1989, scattered efforts to recycle old corrugated containers, several office paper recycling programs and a few other efforts diverted an estimated 8,612 tons or 5% of the commercial and institutional waste stream through recycling. The recycling goal for commercial and institutional wastes is 33% by 1996.

Recommendation 4.8: Support the establishment of pilot programs in a wide range of businesses and institutions. The results of these model programs could then serve as the basis of an extensive educational effort to encourage the establishment of more programs.

Recommendation 4.9: Investigate the feasibility of providing waste stream audits to commercial establishments and institutions to identify materials which could be recycled. These audits should be coordinated with the waste reduction audits (see Chapter 3, Recommendation 3.6).

Recommendation 4.10: If extensive educational efforts are not successful in spurring the establishment of commercial programs, work with municipalities to investigate making recycling efforts a condition for

receiving business, liquor or scavenger licenses. The County should also consider a licensing program for all haulers and make the provision of recycling services a license requirement.

Recommendation 4.11: Particular emphasis should be placed on establishing programs in public institutions such as schools, government offices, hospitals, and parks. The high level of public usage of these facilities provides an excellent opportunity to reinforce recycling behavior in residences and businesses and to demonstrate the level of government commitment to recycling efforts.

Construction and Demolition Debris Management

The needs assessment estimates that, in 1989, 62,020 tons of construction and demolition debris was disposed of in landfills. Recycling efforts are planned to gradually be phased in beginning in 1993 and reach 75% waste diversion by 1998.

Recommendation 4.12: Conduct a survey to more accurately estimate the amount of construction and demolition waste generated annually.

Recommendation 4.13: Closely monitor developments in the area of construction and demolition debris recycling. At least one pilot program should be established to gain direct experience in this area. The pilot studies should consider source separation vs. post collection separation options. Processing capability could be developed by private firms or provided at disposal facilities by the facility owner.

Recommendation 4.14: Disseminate information from the construction and demolition wastes pilot studies and proceed rapidly with full scale implementation in order to achieve the aggressive goal of 75% recycling by 1998.

Recommendation 4.15: Once separation and processing techniques and potential end-uses are better understood, consider a ban on the disposal of any construction/demolition debris that has not first been processed and any reusable material removed.

Industrial Material Management

Statutory definitions and Illinois EPA policy currently exclude manufacturing and process waste from their definition of "municipal waste" and therefore recycling of this material cannot be counted toward meeting state recycling goals. Since these wastes account for an estimated 18% of the waste generated in the County and 22.5% of the material delivered to landfills, the Kane County Solid Waste Plan states

that it should be addressed as a part of a comprehensive recycling program.

A goal to recycle 33% of the manufacturing and process waste by 1997 was selected to remain proportionate to the levels selected for the residential and commercial sectors. The overall recycling goal for Kane County is 47.3%. If the manufacturing and process waste is excluded both from the total tonnage and from the recycling tonnage, the overall recycling goal for "municipal wastes" rises to 50%.

An estimated 23,070 tons of material, primarily scrap metal, were recycled in the industrial sector in 1989. The waste stream is believed to contain significant quantities of at least two recyclable materials: old corrugated containers and wooden pallets and packing crates.

Recommendation 4.16: Survey a representative sample of County industries to more accurately determine waste stream composition and recycling potential.

Recommendation 4.17: Include in educational efforts making manufacturers aware of the availability of two existing services offered by state agencies:

1. The Industrial Materials Exchange Service (IMES), operated by the IEPA, which provides a monthly list of industrial process materials which are available from or wanted by companies throughout the midwest.
2. The Hazardous Waste Research and Information Center (HWRIC), a division of the Illinois Department of Energy and Natural Resources, which offers waste audits and grants for waste reduction efforts to state businesses.

Recommendation 4.18: Establish model recycling programs, sponsor waste audits and develop a recognition program with awards for successful industrial recycling programs.

4.2.2 Recommended Material Processing

The material recycling programs recommended in Section 4.2.1 would collect an estimated 119,788 tons per year or approximately 328 tons per calendar day of residential, commercial and industrial wastes. In addition, another 46,515 tons per year or approximately 127 tons per calendar day of construction and demolition debris would be collected for recycling. A further 65,645 tons per year or approximately 180 tons per day of landscape waste will be recycled through on-site management or composting.

In 1989, when the solid waste needs assessment was conducted, the County was

recycling an estimated 107 tons per calendar day of residential, commercial and industrial wastes. By 1990, the amount had increased to 133 tons per calendar day largely due to the introduction of more residential recycling programs.

In order to achieve the targeted 37% recycling rate by the year 1995, (which is the sum of 46,556 tons per year residential, 38,460 commercial, 36,563 industrial, 72,362 landscape wastes, and 6,837 construction and demolition in 1989 tonnages (see Tables 4.1 and 4.2), new processing capacity will be needed for an additional 200 tons per day of residential, commercial and industrial recyclables. Additional landscape waste processing and construction/demolition processing capacity will also be required.

Several local waste haulers, including Fox Valley and Elgin-Wayne Disposal, Speedway, and Monarch Disposal have already begun development of processing facilities to handle the materials they collect.

> **Recommendation 4.19:** Given the existing level of private sector involvement and the level of uncertainty of the economies of processing facilities, the County should not consider the development of centralized processing plants but should encourage private sector efforts in this area.

4.2.3 Landscape Waste Management Programs

During 1990, the first year that landscape wastes were banned from landfills, an estimated 1500 lbs per household per year were generated in Kane County. This totals 65,645 tons or about 13.4% of the overall County Waste Stream.

Of this total, 28% was collected in 1990-1991 by municipal landscape waste collection programs, 6% was collected by landscaping firms, 6% was exempt material[6] which was landfilled. The remaining 60% was managed on-site. Of the total 21,916 tons collected, about 16,800 tons were taken to several compost sites. Most of the 5,200 tons of leaves were applied to farmland within the County. The solid waste plan's goal is to divert 90% of the landscape wastes by 1991 and 100% by 1993.

Under the current IEPA interpretation of the Solid Waste Planning and Recycling Act, landscape waste which is managed on-site by mulching or other techniques, rather than collected for composting at a central site, is not considered to be recycling.

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[6] Exempted material includes any landscape wastes, which due to their size, hardness or configuration pose a processing hardship for all reasonably close composting facilities.

However, this waste reduction technique is an important approach to diverting this material from landfills. In this plan, for the purpose of simplicity, on-site management is included in the overall recycling goal. The County will resolve this inconsistency in accounting during the plan implementation period.

Recommendation 4.20: Continue public education efforts on the benefits of backyard composting, the non-collection of grass clippings and other mulching techniques.

Recommendation 4.21: Strongly encourage all municipalities to adopt volume-based billing systems, which provide generators with a direct financial incentive for on-site management of landscape wastes.

Recommendation 4.22: Pursue the development of landscape waste composting facilities with adequate capacity for Kane County's landscape wastes through the public ownership/private operation approach. Proposals for privately - owned facilities would require a special use zoning permit and will be governed through the County's zoning process. Facility development should be scheduled so that operation begins in the fall season, to insure proper mixing of materials and to maximize the efficiency of the composting process.

Recommendation 4.23: Include promotion of Christmas tree recycling and chipping in its overall educational efforts.

4.2.4 Market Development Strategies

The existence of end-use markets is essential to the success of any recycling program. Concern exists as to whether there is sufficient market demand for the increased supply of materials which is being collected across the country. Market capacity has generally been sufficient to meet the supply of material produced by recent recycling programs although prices have dropped. Most new recycling programs, such as curbside collection, have a net cost which is assessed to program users.

The existing markets are widely believed to be able to handle any future increases in aluminum, ferrous metal, glass, corrugated containers, high-density polyethylene (milk jugs and laundry detergent bottles) and polyethylene terephthalate (soda bottles). The market situation for old newspapers and high-grade office paper is improving with the construction of additional paper mills. Market capacity is just beginning to be developed for other types of plastics such as polystyrene, polypropylene and polyvinyl chloride.

The County's market development efforts should focus on encouraging increased

demand for recycled content products. Several specific recommendations follow:

Recommendation 4.24 Adopt procurement policies which require the purchase of recycled content products wherever practical, including preferential pricing strategies for recycled content goods.

Recommendation 4.25 Educational efforts directed toward both other government bodies and the private sector, including local manufacturers, should encourage recycled product procurement by making available source listings of available recycled products.

Recommendation 4.26 Develop a recognition program for organizations which demonstrate leadership in recycled product procurement.

Recommendation 4.27 Strongly support the enactment of appropriate recycled product procurement legislation on the state and federal levels.

4.2.5 Education and Information Programs Summary

Successful implementation of the programs proposed in this plan will depend upon a strong County commitment to support these proposals. The recommended educational programs are summarized below:

1. General Education Campaign. The County should develop and conduct a county-wide awareness campaign which focuses on solid waste problems and the benefits of recycling. This effort can take the form of a printed brochure, media coverage of the issue, and staff presentations to civic organizations and other groups. The County should also work to have solid waste and recycling concepts incorporated into the curriculum of every public and private school, using material available from the state and other sources.

2. Specific Educational Efforts. The County should provide specific information and encouragement to target groups such as municipalities, waste haulers, business and industrial groups, etc. Information ranging from how to establish a volume-based billing system or an office paper recycling program to how and where to purchase recycled products should be provided through fact sheets, specialized seminars and other activities.

3. Technical Assistance. County staff should provide technical assistance to selected waste generators to develop new and innovative recycling programs. This activity could include providing waste audits to

representative generators to encourage the establishment of recycling programs. The results of these programs could then be used to develop fact sheets and seminars. County staff will also have to work directly with industry to develop construction/demolition debris and large woody waste programs. Staff should also work with municipal recycling coordinators to provide educational assistance and to develop more sophisticated data collection and monitoring methods for curbside, multi-family, and other local programs.

4.3 COMPLIANCE STRATEGIES

This plan considers both voluntary inducements and mandatory requirements as means to achieve compliance with the established recycling goals. As an initial step, the plan relies strongly on voluntary inducements including aggressive educational programs and volume-based billing systems, which provide direct financial incentives for increased recycling.

One mandatory approach recommended earlier is requiring waste haulers in unincorporated areas to provide curbside recycling service to all residential customers. Other approaches may be applied if the level of recycling does not approach stated goals. In incorporated areas, the County should work with municipalities to make comprehensive recycling services a condition of receiving scavenger, business, or liquor licenses. The County will also consider licensing all waste haulers and making recycling a license requirement. In addition, the County will consider instituting a differential fee structure at the County-owned Settler's Hill landfill. In this case, loads which originate from areas without exhaustive recycling programs, or loads containing an excessive amount of recyclable material would be charged a significantly higher tipping fee.

4.4 IMPLEMENTATION STRATEGIES

4.4.1 Time Schedule for Implementation

Table 4.2 presented the recycling goals by waste sector from 1989 to the year 2000. In order to reach these goals, recycling efforts are divided into four phases. After the year 2000, there should be continuing efforts to improve programs and increase recycling. The recommendations are summarized below. A more complete description appears in the text above.

1990-1991

4.1 New Residential Curbside Recycling Programs, Municipalities
4.2 New or Expanded Curbside Recycling Programs, Unincorporated Areas
4.4 Continue existing drop-off and buy back recycling programs.
4.5 Increase educational efforts toward residences clarifying what can be recycled

and encouraging participation.

4.6 &
4.21 Assist municipalities in implementing volume based billing for refuse services.

4.20 Continue public education efforts on the benefits of backyard composting, the non-collection of grass clippings and other mulching techniques.

1992-1994

4.3 Support pilot recycling programs at multi-family residences, collect data and analyze.

4.7 Expand materials collected in residential recycling programs.

4.8 Support pilot recycling programs in a wide range of businesses and organizations. Evaluate and disseminate how-to information.

4.9 Investigate feasibility of providing waste audits to commercial establishments and institutions.

4.11 Establish model recycling programs in public institutions such as schools, government offices, hospitals, and parks.

4.12 Conduct a survey to more accurately estimate the amount of construction and demolition waste generated in Kane County.

4.13 Encourage private sector development of a pilot construction and demolition waste recycling effort.

4.16 Survey industry to determine waste generation rates and recycling potential.

4.17 Inform manufacturers about services offered by the two midwest waste exchanges.

4.18 Develop an industrial waste recognition program with awards for successful industrial recycling programs.

4.19 Encourage private sector development of centralized processing plants for recyclable materials.

4.22 Pursue the development of publicly-owned and privately-operated centralized composting facilities. Proposals for privately-owned facilities will be governed through the existing County zoning process.

4.23 Promote Christmas tree collection & chipping through educational efforts.

4.24 Evaluate and modify County government procurement practices to promote recycled product procurement.

4.25 Encourage recycled product procurement in other government organizations and the private sector.

4.26 Develop a recognition program for businesses and institutions which demonstrate leadership in recycled product procurement.

4.27 Strongly support the enactment of recycled product procurement legislation on the state and federal levels.

1995-1996

4.3 Disseminate information about successful multi-family recycling programs to municipalities and building owners. Encourage start-up of multi-family recycling programs.

4.14 Proceed rapidly with full-scale implementation of the construction and demolition recycling program.

1997-2000

4.10 If extensive educational efforts are not successful in spurring the establishment of commercial programs, the County should encourage municipalities to make recycling a condition of scavenger, liquor, and business licenses. The County should also consider licensing all haulers and making recycling a condition of the hauling license.

4.15 Consider a ban on the disposal of any construction/demolition debris that has not first been processed and any reusable material removed.

2001-2010

A full review of the recycling efforts should be made during the second 5 year plan update including measurements of program success. As a part of that plan update, the need for additional recycling initiative should be addressed.

4.4.2 County Recycling Program

Recycling is one of the primary strategies of the first five years of the plan. Recycling and waste reduction efforts need to be coordinated. The extensive efforts detailed in the recommendations above will require one additional staff in the Solid Waste Division of the Kane County Development Department devoted to implementing programs and public education.

First year expenses include two full-time professional staff and one half-time clerical staff. The Recycling Coordinator, who has already been appointed, will be responsible for data collection, technical assistance and overall implementation of the plan. The second professional would serve as an education coordinator. The clerical staff who is already appointed would work half-time on recycling and half-time on waste reduction.

CHAPTER 5 MATERIALS REQUIRING SPECIAL HANDLING

5.1 INTRODUCTION

As part of its expanded waste diversion effort, the County should implement programs that divert and reduce the use of hazardous household products, special wastes and difficult to handle materials such as tires, appliances, and automobile batteries. Programs that target these materials increase the recycling rate and help reduce negative environmental impacts associated with improper disposal. Recommended programs to achieve these goals are summarized below. A more comprehensive description is presented in "Household Hazardous Waste" in Appendix D and "Special Wastes" in Appendix E.

5.2 RECOMMENDED PROGRAMS

5.2.1 Household Hazardous Waste

An estimated 127-272 cubic yards of household hazardous wastes are generated in Kane County each year and an estimated 231-494 cubic yards are disposed of in Kane County landfills each year. Household hazardous wastes are waste products which exhibit hazardous characteristics, are disposed of by consumers and were originally intended for household use. Examples of household hazardous wastes include pesticides, drain cleaners, paint thinners, solvents, oil-based paints, aged or dirty fuels, used motor oils, battery acid, many aerosol products, and other materials which are flammable, reactive, corrosive, or toxic. The federal Resource Conservation and Recovery Act (RCRA) regulates hazardous waste, but specifically exempts household hazardous waste from regulation.

Recommendation 5.1: Pursue IEPA funding for local pilot collection programs for household hazardous wastes.

Recommendation 5.2: Develop County-funded permanent household hazardous waste collection centers in sufficient locations throughout the County to maximize convenience and participation by the public.

Recommendation 5.3: Monitor state and federal legislative initiatives to reduce the generation of household hazardous waste, and strongly support the adoption of appropriate measures.

Recommendation 5.4: Encourage local residents to reduce their usage of these materials and substitute non-hazardous products wherever

possible. Widespread educational efforts should be conducted in conjunction with recycling or other solid waste related education.

Recommendation 5.5: Include promotion of used oil collection in the overall educational efforts.

5.2.2 Special Wastes

Non-hazardous special waste includes industrial process waste and waste resulting from pollution control processes. Although the Environmental Protection Act definition of special waste includes hazardous waste, this plan addresses only non-hazardous special wastes. Examples of special wastes received at Kane County landfills include sewage treatment sludge, contaminated soil from leaking underground storage tanks, foundry casting sand, scrap soap, waste polymers and baghouse dust.

An estimated 18,340 tons of special wastes were generated in Kane County in 1991. This represents about 3.5% of the total waste stream. Approximately 70% of Kane County's special wastes are disposed of at Settler's Hill Landfill and the remaining 30% are disposed of at Woodland Landfill.

The transportation and disposal of special waste is regulated by the Illinois Pollution Control Board and the Illinois Environmental Protection Agency (IEPA). Generators of special waste must first have the material tested to insure that it is not a hazardous waste. Then they apply to the IEPA for a permit to dispose of the waste in a landfill which is permitted by the IEPA to accept such waste. Finally, a licensed special hauler is used to transport the waste. The entire handling process is tracked by a manifest system.

Both Settler's Hill and Woodland landfills in Kane County are permitted by the IEPA to accept special wastes. Kane County approved permit applications for special wastes for 102,704 cubic yards from Kane and surrounding counties in the first nine months of 1991. Extrapolated to a 12 month period, this represents about 6% of the total amount of waste received at the landfill. Approximately 80% of that special wastes received in 1991 was soil contaminated by leaking underground storage tanks (primarily gasoline, diesel fuel or heating oil).

Recommendation 5.6: Research alternative approaches to the landfilling of contaminated soil, select the most viable alternative and develop it to the extent allowed by contractual constraints with the landfills. The goals should be to maximize diversion from the landfills and to ensure it is handled in the most environmentally appropriate manner.

5.2.3 Tires

Used tires that are improperly stored in large piles provide breeding grounds for mosquitoes. In 1989, the Illinois Pollution Control Board adopted rules requiring all piles of 50 tires or more to be either kept dry, covered, shredded, or sprayed with approved pesticides.

Illinois P.A. 86-452 established a Used Tire Management Program. Responsibility for implementation is divided between the IEPA and the Illinois Department of Energy and Natural Resources (DENR). The IEPA is responsible for preventive, corrective and removal actions, inspection and enforcement activities, and administration of financial assistance to clean up accumulations of tires. The DENR provides grants and loans to local governments to encourage collection, recycling, and incineration of used tires.

Key provisions and deadlines of the Act are:

- 1/1/90 — persons with storage piles of 50 or more used or waste tires must notify IEPA;
- 7/1/91 — Illinois Pollution Control Board must adopt standards for storage, disposal, processing, and transportation of used and waste tires;
- 1/1/92 — owners of tire storage piles must register with IEPA and tire disposal sites must have tire removal agreement;
- 7/1/94 — no landfilling of whole tires; shredded or slit tires may be disposed if landfill meets certain conditions.

Recommendation 5.7: Continue to monitor developments in the disposal of tires within the County and respond if private sector efforts do not sufficiently manage this material.

Recommendation 5.8: The County should pursue State funding support for rubberized asphalt demonstration projects at County facilities and on County highways to stimulate the market for rubber-based products made from tires.

5.2.4 Appliances

Appliances, or white goods, are difficult to collect and dispose of due to their bulk and weight. In several communities, special fees are required for collection. Traditionally, appliances were sold to scrap dealers for salvage of metal. Used appliances can contains polychlorinated biphenyls (PCBs), mercury, and freon within the components of the appliances.

Recent revisions to Section 22.28 of the Environmental Protection Act requires

removal of toxic white good components before landfilling by 1994.

> **Recommendation 5.9:** Work with the private sector to develop markets for appliances once the landfill ban goes into effect in 1994.

5.2.5 Automobile Batteries

Automobile batteries contain lead which can escape from old battery casings and cause soil and water contamination. Illinois P.A. 86-2429 requires that retailers accept used batteries in exchange for new ones purchased. Used batteries are not accepted at the landfill in Kane County, but are accepted by retailers.

5.3 IMPLEMENTATION STRATEGIES

5.3.1 Time Schedule for Implementation

Recommended actions that target these materials are divided into two phases and are summarized below. A more complete description appears in the text above.

1990-1991

5.2 Actively monitor household hazardous waste collection efforts elsewhere for high participation rates and acceptable economics.

1992-1996

5.1 Pursue IEPA funding for household hazardous wastes pilot collection programs.
5.3 Monitor and support state and federal legislative initiatives to reduce the generation of household hazardous wastes.
5.4 Encourage residents to reduce usage of household hazardous materials and to use substitute products.
5.5 Promote used oil collection as part of educational efforts.
5.6 Research and implement alternative approaches to the landfilling of contaminated soils.
5.7 Monitor tire disposal practices in the County and respond if private sector efforts do not sufficiently manage this material.
5.8 Pursue State funding support for rubberized asphalt demonstration program.
5.9 Work with the private sector to develop markets for appliances once the landfill ban goes into effect.

As the federal and Illinois governments ban additional items, alternative waste reduction and waste handling methods will need to be developed and incorporated into the public education efforts.

5.3.2 Responsible Office

No additional staff are required to implement these programs. Efforts should be coordinated with the Waste Reduction and Recycling programs managed by the Solid Waste Division of the Development Department.

CHAPTER 6 ALTERNATIVE TECHNOLOGIES

6.1 INTRODUCTION

Several studies of non-landfill alternative technologies were performed as a part of the planning process. An assessment of incineration technologies, both for volume reduction and energy recovery purposes, was conducted (Volume 2, Appendix F). The "Investigation of Emerging and Innovative Solid Waste Technologies" (Volume 2, Appendix I) examined a number of technologies in various stages of development.[7] As a result of this investigation, further studies were conducted on municipal solid waste composting (Volume 2, Appendix J).

6.2 PLAN RECOMMENDATIONS

The plan recognizes that it may become feasible for the County to use alternative technologies such as municipal solid waste composting and waste-to-energy combustion. It recommends that the County closely monitor the development of these and other emerging technologies over the next five years.

> **Recommendation 6.1:** Continue monitoring technological developments in alternative technologies such as municipal solid waste composting and waste-to-energy combustion.
>
> **Recommendation 6.2:** Any future facility should be controlled by the County, located within the County and accept only that solid waste which is generated within the County, or from a jurisdiction which accepts an equal or greater quantity of Kane County waste for processing or disposal.

The studies performed on these two technologies and the resulting recommendations, should one of them be selected, are summarized below.

6.2.1 Municipal Solid Waste Composting

The "Feasibility Study for Municipal Solid Waste Composting" found in Appendix J

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[7] The technologies include municipal solid waste composting, fluidized bed combustion/refused derived fuel, mixed waste processing, anaerobic digestion, pyrolysis, ORFA technology, thermal oxidation, and other research and development technologies.

indicates that approximately 213,500 tons per year from the residential/commercial sector would be available for municipal solid waste composting processing. This amount represents 35% of the total solid waste stream.

The feasibility study found that a municipal solid waste composting program would be most effective if implemented in conjunction with an aggressive source separation program (curbside recycling) as well as home composting and waste reduction programs. It recommended that landscape wastes continue to be collected and processed separately to allow for the continued production of a high quality soil conditioner that meets the needs of the market.

With current technologies the study found that, of the total annual waste input to the facility of 213,500 tons, approximately 29,882 tons (14%) of materials could be recovered (recycled) and about 65,687 tons of compost could be produced each year. The total amount of non-compostable residue would be about 86,652 tons (41%) each year. Under a second alternative, if the residue is segregated and further processed to recover combustible materials, the residue requiring disposal could be reduced to approximately 52,605 tons (25%) per year.

From a total systems perspective, taking into account the proposed 47% recycling level, an MSW composting facility would divert 16% of the total waste stream from landfills.

The feasibility study also indicated that about 40,000 of the 65,700 tons of compost produced annually could be marketed initially. Suggested uses for the remaining compost are land reclamation and other low value uses. New unspecified markets would have to be developed to utilize the entire amount of compost produced by the facility.

The estimated costs for one facility on a 43 acre site to handle all of the wastes are about $63 million in capital costs, excluding site acquisition costs. Estimated operations and maintenance costs are almost $10 million per year plus annual capital costs of $6 million over 20 years for a total in 1991 dollars of approximately $16 million per year. Tipping fees for the facility were estimated at $82.82 per ton. Although this tipping fee would be 176% more than the current landfill tipping fee of $30.00 per ton, it should be noted that residential refuse bills would only increase an estimated 62%, since tipping fees account for only about 35% of total residential refuse collection and disposal costs.

The feasibility study indicates that the time required for implementing a mixed waste composting project in Kane County, from project development and site acquisition to commercial operation, would be 43 to 58 months.

6.2.2 Waste-to-energy/Incineration

The "Technology Assessment: Incineration" report found in Appendix F focused on the mass-burn method of incineration for volume reduction with and without energy recovery. The report stresses the importance of proper sizing of the facility, large enough to handle the waste but not so large as to discourage recycling or produce incomplete combustion.

The report examines siting and permitting requirements, potential environmental impacts and presents an economic analysis. Environmental issues addressed include air emissions, residue and ash disposal, wastewater discharge and odor and vectors.

Costs for a waste-to-energy facility are estimated to be $94.6 million for an 830 TPD facility. Annual operations and maintenance costs were estimated to be approximately $9 million per year. The tipping fee for an 830 TPD plant was estimated to be $90 per ton. Because the economic viability of these facilities is, in large part, dependent on revenue from the sale of energy, incineration without energy recovery was eliminated from further consideration. Although this tipping fee would be 200% more than the current landfill tipping fee of $30.00 per ton, residential refuse bills would only increase an estimated 70%, since tipping fees account for only about 35% of total residential refuse collection and disposal costs.

The time required for implementing a waste-to energy facility for Kane County, should this option be selected, from project development to commercial operation is estimated to be 60 to 73 months.

6.2.3 Other Alternatives

The "Investigation of Emerging and Innovative Solid Waste Technologies", found in Appendix I, addresses three types of solid waste technologies: emerging (with limited commercial application), innovative (tested on a pilot or small demonstration scale), and research and development. Emerging technologies considered include municipal solid waste composting, fluidized bed combustion/refused derived fuel and mixed waste processing. Innovative technologies described include anaerobic digestion, pyrolysis, and ORFA technology. Research and development technologies described include thermal oxidation, vermiculture, ethanol production and plasma technology.

Except for MSW composting and waste-to-energy incineration, the remaining technologies studied can be described as ranging from speculative to totally impractical. However, given the amount of research focused on this area, the County should continue to monitor the development of non-traditional technologies

6.3 ASSESSMENT PROCESS

6.3.1 Technology Assessment

Using the most current and factual information available, each alternative technology should be assessed using the checklist below. The current system should also be assessed by this checklist for comparison purposes.

1. Facility Requirements. Are facilities required as part of the technology? How many facilities are needed and of what size?

2. Siting. What are the facility siting requirements? Do sites exist within the area?

3. Economics. What are the capital, operating, and maintenance costs associated with the technology? What are the probable revenues and life cycle costs?

4. Technical Feasibility. Is the technology proven on the size proposed for Kane County and can it provide reliable long-term management of the targeted waste stream?

5. Application. Is the technology applicable for the type and quantity of waste generated in Kane County?

6. Implementation. Can the technology be implemented technically, and socially, and can it be implemented in time to serve the intended purpose?

7. Environmental Impacts. What are the environmental impacts on the air, water, and land of the technology?

8. Permitting. What is the relative ease or difficulty in obtaining permits for the technology in Illinois?

9. Safety Issues. What are the worker and general public safety concerns associated with the facility and can they be adequately addressed?

10. Health Risk Assessment. What are the health risks associated with the technology? Is a health risk assessment needed prior to making a feasibility determination?

11. Financing. How is the technology going to be paid for and can it obtain financing?

6.3.2 Evaluation

At the five year planning update, responses to the above questions for each technology should be evaluated by the County. The potential of alternative technologies, particularly MSW composting and waste-to-energy combustion, should be fully and carefully considered. Should waste-to-energy be selected, a feasibility study specific to Kane County, including market analysis for energy, should be performed.

> **Recommendation 6.3** Evaluate alternative technologies according to the checklist above as part of the first plan update process.

6.4 IMPLEMENTATION

6.4.1 Time Schedule for Implementation

Since the County's current contractual arrangement with the landfill operator includes a guarantee of waste clause, constructing an alternative waste technology in the near term would neither save landfill space nor save costs. Thus the decisions about alternative technologies are scheduled during the next plan update in order to allow time for siting and construction of a new facility after the current landfills have reached capacity, i.e., in approximately ten to fifteen years. Recommendations regarding alternative technologies should be further developed as part of the plan update process as indicated by the timetable below:

1992-1996

6.1 Continue monitoring the technological developments of alternative technologies such as municipal solid waste composting and waste-to-energy combustion.

6.2 Future facilities should accept only in-county waste or waste from a jurisdiction which accepts an equal or greater quantity of Kane County waste.

6.3 Assess and evaluate alternative technologies according to the checklist as part of the first plan update process.

CHAPTER 7 LANDFILLING

7.1 INTRODUCTION

Landfilling is currently the predominant form of waste disposal in Kane County. Appendix A "Solid Waste Needs Assessment" in Volume 2 describes in detail Kane County's two landfills, the amount and source of landfilled solid waste and the regional landfill situation. These findings are summarized in the current chapter.

A report on the technology and regulations governing the siting, design and operation of a sanitary landfill for municipal solid waste appears in Volume 2, Appendix G "Technology Assessment: Landfills". The report addresses permitting requirements, landfill design and operations, environmental considerations and economic impacts.

7.2 PLAN RECOMMENDATIONS

7.2.1 Current Capacity

About 89% (438,215 tons) of the solid waste generated in Kane County in 1989 was disposed of in landfills. Almost 92% of that was disposed of at either Settler's Hill Landfill near Geneva or Woodland Landfill near South Elgin. The balance was exported to Greene Valley and Mallard Lake Landfills in DuPage County and DeKalb County.

Settler's Hill Landfill is owned by the County and operated by Waste Management of Illinois, Inc. An estimated 12.5 years of capacity remains. However, the County has purchased approximately 11 acres adjacent to the landfill which would allow for a capacity expansion adding an estimated 5 years to the remaining life.

Woodland Landfill, owned and operated by Waste Management of Illinois, Inc., has an estimated 10 years of remaining capacity. Waste amounts received at both facilities over the past three years are shown in Table 7.1.

In addition to waste generated in Kane County, both landfills accept waste from at least five other counties. Gate surveys conducted during the summers of 1989 and 1990 determined that approximately half of the waste accepted at these two landfills (between 41% and 57%) was from Kane County as shown in Table 7.2.

Table 7.1 SOLID WASTE RECEIVED AT KANE COUNTY LANDFILLS 1989-1991[1] (cubic yards)			
Year	Settler's Hill	Woodland	Total
1989	2,357,721	823,555	3,181,276
1990	1,900,151	820,442	2,720,593
1991	1,773,996	1,115,841	2,889,837

[1] Illinois Environmental Protection Agency, Available Disposal Capacity for Solid Waste in Illinois. Fifth Annual Report. October, 1991.

Table 7.2 SOURCES OF WASTE ACCEPTED AT KANE COUNTY LANDFILLS 1989-1990				
	Settler's Hill		Woodland	
County	1989	1990	1989	1990
Kane	55.5%	57.3%	54.6%	41.4%
DuPage	37.4%	35.3%	11.6%	7.1%
Cook	4.1%	4.5%	25.3%	44.0%
McHenry	2.0%	0.9%	7.3%	4.2%
Other	1.0%	1.9%	1.2%	3.3%

Although some waste is exported out of county (36,325 tons or 8.3% of the waste generated), Kane County is a net importer of solid wastes.[8] Of the counties adjacent to Kane County, Cook and McHenry Counties export significant amounts of their waste to facilities outside of their boundaries. DuPage, Kane, and Will Counties import a substantial amount of waste from other counties. In 1989, the six county region had 5.9 years of remaining landfill capacity, assuming no changes in disposal practices.

[8] Illinois Environmental Protection Agency. Available Disposal Capacity for Solid Waste in Illinois, Fifth Annual Report. October, 1991, p. 32.

7.2.2 Need for Future Facilities

Analyses conducted as part of the planning process found that additional future landfill capacity will be required regardless of other approaches which may be utilized. With the proposed 47% recycling level and a waste-to-energy incinerator, approximately 321 TPD of landfill capacity would be required. With full recycling and an MSW compost facility, 544 TPD of landfill capacity would be needed. With full recycling only, an estimated 885 TPD of future landfill capacity would be required.

Land requirements for landfills are dependent on site-specific factors, such as hydrogeology and topography, the amount of buffer space required, and the design life of the facility. Available information varies on the amount of solid waste which can be accommodated by one acre of land, with values ranging from 24,333 - 45,169 tons per acre and an average amount of 33,387 tons per acre (see Appendix G). Using these figures, the land requirements for the three landfill sizes discussed above can be estimated as follows. All estimates assume the facility would begin receiving waste in 2005 and would have a 20 year lifetime, and do not include buffer spaces.

Daily Capacity	Range	Average
321 TPD	61-113 Acres	83 Acres
544 TPD	104-192 Acres	140 Acres
885 TPD	170-315 Acres	230 Acres

7.2.3 Facility Recommendations

The plan recommends that waste reduction programs, a 47% recycling rate and landfilling be the primary management techniques for municipal wastes in Kane County. Other wastes such as household hazardous wastes, contaminated soil and other special wastes should be diverted from the landfill and handled by either waste reduction or non-landfill management techniques.

Recently the County purchased 11 acres contiguous to Settler's Hills Landfill for expansion purposes for the near term. This expansion would increase the remaining capacity of the current facility by an estimated 5 years.

> **Recommendation 7.1:** Proceed immediately to obtain siting and permitting approval for the expansion of Settler's Hill Landfill into the contiguous 11 acres recently purchased by the County.

The plan further recommends planning for future landfill sites and defines a careful site selection process detailed in Chapter 9.

Recommendation 7.2: Take all necessary steps to assure that future landfill capacity is available for all solid waste generated in the County which requires land disposal. A public siting advisory committee should be appointed by July 1993 and a future landfill site should be selected and acquired as expeditiously as possible.

However, the future landfill should not continue to be a net importer of solid wastes.

Recommendation 7.3: The future facility should be controlled by the County, located within the County and accept only that solid waste which is generated within the County.

7.3 IMPLEMENTATION

7.3.1 Time Schedule for Implementation

Landfilling is a significant part of the solid waste management strategy, regardless of the alternative technologies which may be selected in the future. The time schedule includes expanding an existing landfill in the near term and assuring adequate landfill capacity in the long term. A time schedule for implementing landfill recommendations appears below.

1992-1996

7.1 Obtain siting and permitting capacity for the recently purchased 11 acres contiguous to Settler's Hill Landfill.

7.2 Appoint a public advisory siting committee by July 1993, select and acquire a future landfill site as expeditiously as possible.

7.3 Future landfill facilities should accept only in-county waste.

CHAPTER 8 SYSTEM DESCRIPTION, EVALUATION, AND FINANCING

8.1 INTRODUCTION

The Illinois Solid Waste Planning and Recycling Act requires that a solid waste plan include "an evaluation of the environmental, energy, life cycle cost, and economic advantages and disadvantages of the proposed waste management facilities and programs"[9]. This chapter complies with that requirement. In addition, this chapter provides general information concerning financing methods to pay for system development and operation.

More complete descriptions of the system selected are found in Volume 2, Appendix K "Definition of Potential Integrated Solid Waste Management Systems" and Appendix L "Evaluation of Defined Solid Waste Management Systems".

8.2 Integrated System Options

Four distinct comprehensive systems for solid waste management were evaluated during the planning process. Each alternative system included the waste reduction and recycling components described earlier in this plan. The systems varied significantly in components relied on to manage the non-recycled portion of the waste stream.

Alternative #1 included a waste-to-energy incinerator and landfill for non-combustible material and ash. Alternative #2 included only a landfill to manage non-recycled waste. Alternative #3 included a municipal solid waste composting facility and a landfill for non-compostible material. Alternative #4 included waste-to-energy incineration, solid waste composting, and a landfill. Mass balances and summaries of each alternative system are presented in Tables 8.1, 8.2, 8.3, and 8.4

8.3 COMPREHENSIVE WASTE SYSTEM DESCRIPTION

The selected solid waste management system for Kane County municipal solid waste management consists of waste reduction, recycling, further evaluation of alternative technologies, and landfilling. More specifically, the system includes the following four components:

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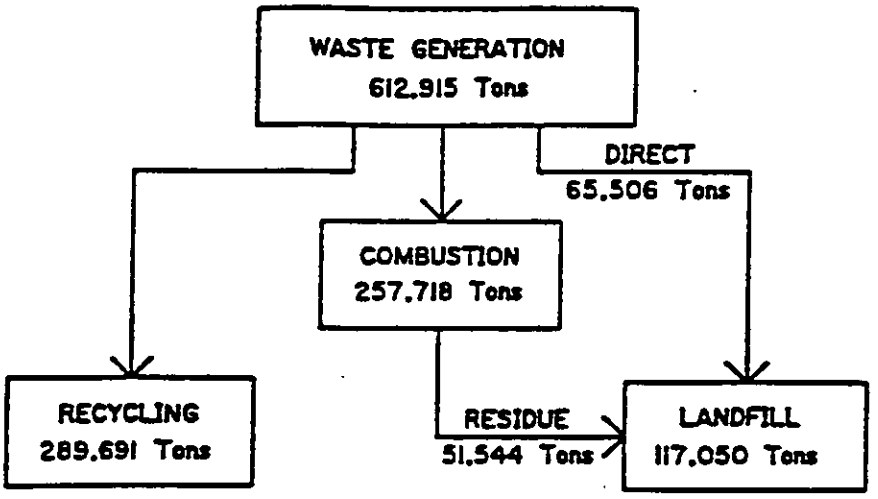
[9] Illinois Revised Statutes, ch. 85, ¶5954.

Table 8.1

ALTERNATIVE #1

WASTE DISTRIBUTION (2001)



ALTERNATIVE #1

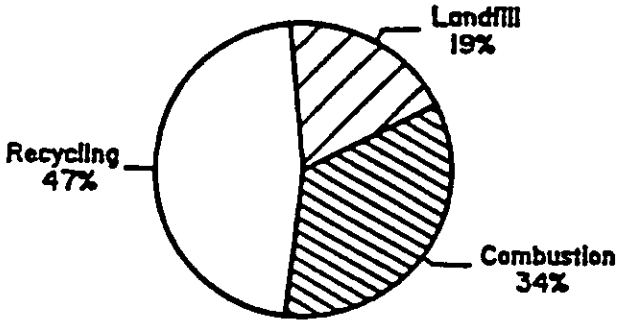
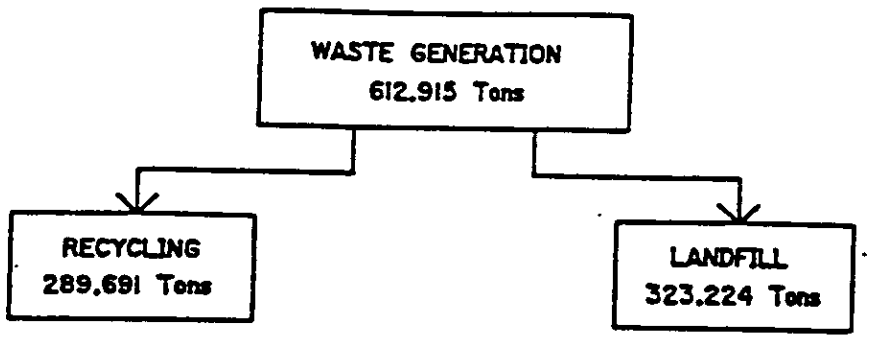


Table 8.2

ALTERNATIVE #2

WASTE DISTRIBUTION (2001)



ALTERNATIVE #2

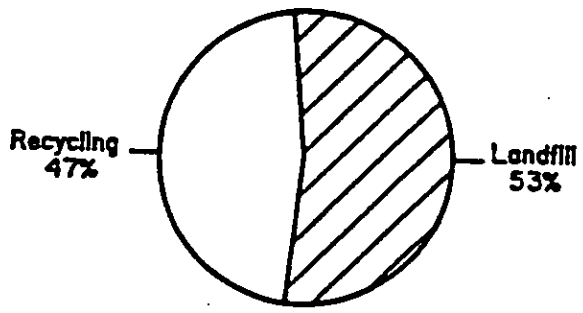
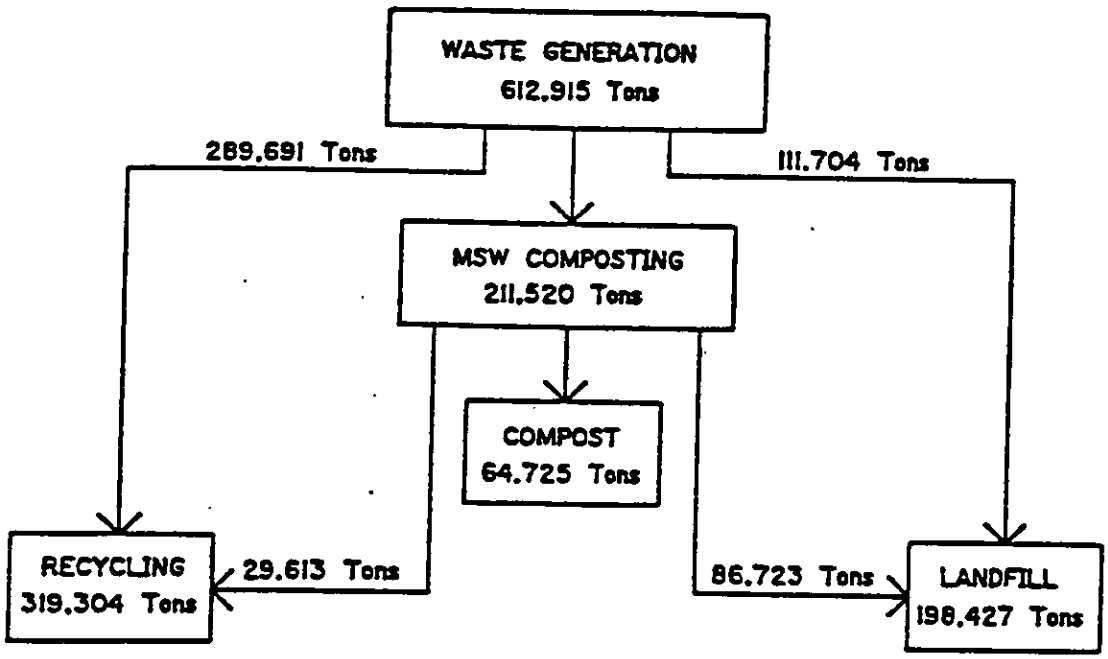


Table 8.3

ALTERNATIVE #3

WASTE DISTRIBUTION (2001)



ALTERNATIVE #3

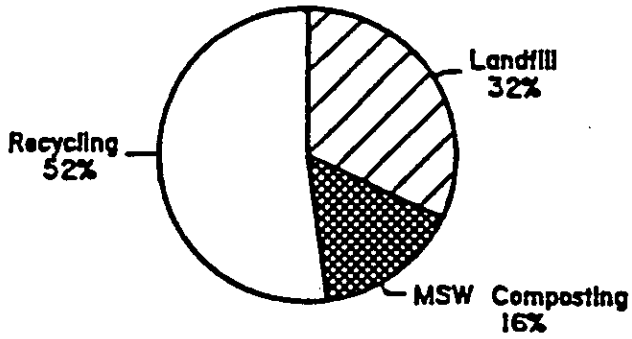
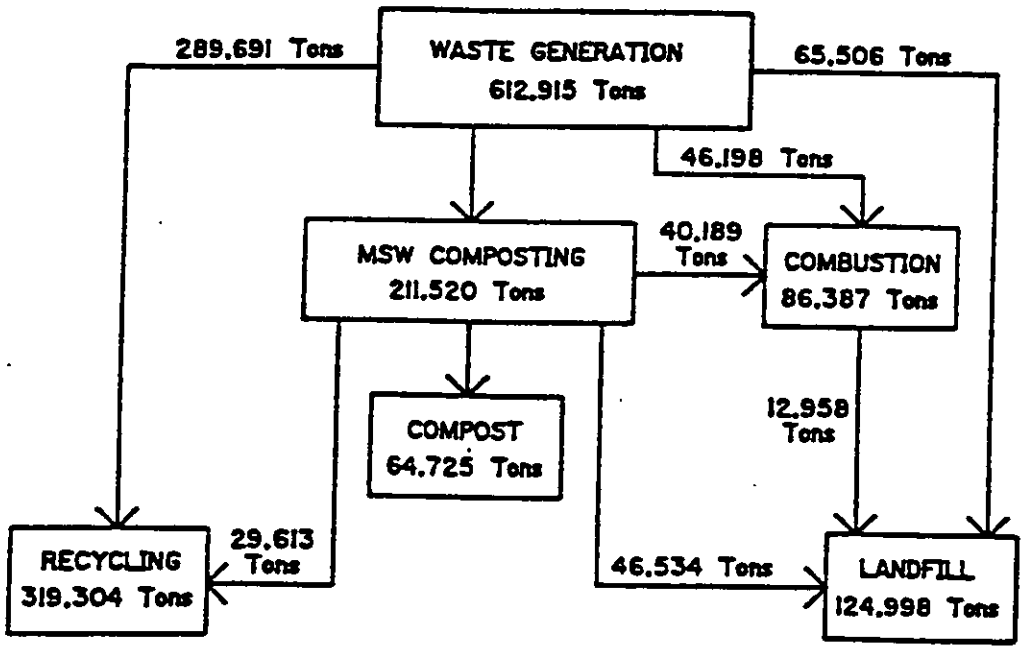


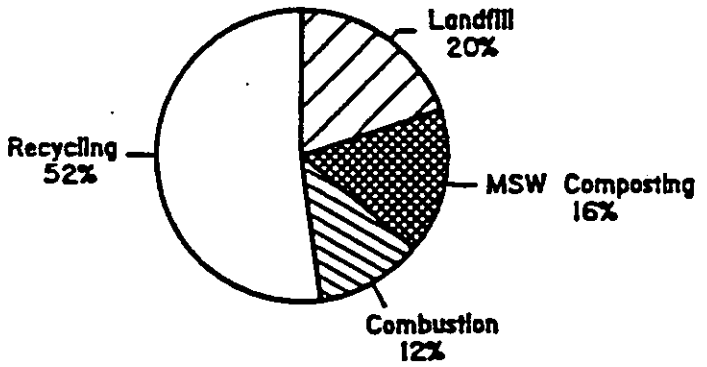
Table 8.4

ALTERNATIVE #4

WASTE DISTRIBUTION (2001)



ALTERNATIVE #4



- Immediately begin implementation of an aggressive waste reduction program.

- Immediately begin implementation of an aggressive recycling program to achieve a recycling goal of 47% of the total solid waste stream[10] by 1998.

- Fully and carefully consider the potential of alternative technologies such as MSW composting and waste-to-energy combustion, as well as any accompanying transfer stations, during the 1997 plan update process.

- Immediately obtain siting and permitting approval for the expansion of Settler's Hill Landfill into the approximately 11 acres contiguous to the existing facility. Take all necessary steps to assure that future landfill capacity is available for all solid waste generated in the County which requires land disposal. Any future facility should be controlled by the County, located within the County, and accept only that solid waste which is generated within the County.

Nevertheless, the County should continue to monitor regional developments in solid waste management practices and explore the possibility of regional approaches to what is clearly a regional problem.

8.4 SYSTEM EVALUATION

8.4.1 Contribution Toward Waste Reduction

The recommended system does not include a numeric waste reduction goal, but rather makes a commitment to aggressive waste reduction efforts during the first five years of plan implementation. Three categories of programs are recommended: educational efforts, economic incentives and regulatory requirements.

A waste reduction program will act as an information clearing house, sponsor educational programs, conduct waste audits and model programs in public and private sector institutions, sponsor awards programs and a "waste reduction week", and monitor legislation which promotes waste reduction. This effort is concentrated in the first five years of plan implementation with a full review of waste reduction efforts as part of the plan update. Chapter 3 provides a more complete description of the waste reduction program with 13 specific recommendations.

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[10] The total solid waste stream includes industrial waste. Without industrial waste, the municipal waste recycling goal is 50% by 1998.

8.4.2 Environmental and Energy Evaluation

Environmental impacts and energy considerations for the components of the recommended system are summarized below and addressed in greater detail in Volume 2, Appendix L, "Evaluation of Defined Solid Waste Management Systems". More detailed environmental impact discussions are also included in each technology assessment report (see Volume 2).

Factors to be considered in the environmental assessment include air, surface water and ground water, land, odor, noise, vectors, traffic impacts, energy, worker health and safety and public health and safety. The environmental impact of each component can be minimized through appropriate siting, design, operating and monitoring procedures. Federal and state requirements for siting and permitting also act to minimize any potential adverse impacts. Environmental evaluations of the recommended system are summarized in Table 8.5.

8.4.3 Economic Evaluation

This section summarizes cost information[11] for each component and the total system including capital costs, total annual cost and cost per ton (tipping fee). Total annual cost includes debt service, operating and maintenance costs, and government surcharges. The tipping fee is simply a statement of total annual costs divided by the total tons of waste handled each year.

The plan recommends that system components be phased in between 1992 and 1998. The recycling and waste reduction programs are scheduled to begin in 1992 and be fully implemented by 1998. The existing landfills have 10-15 years of capacity and thus will be used until 2002 or longer, depending upon the amount of waste diversion achieved and the proposed expansion of the Settler's Hill Landfill. In the 1997 plan update, a further evaluation of alternative technologies, including various combinations of MSW composting, incineration and landfilling, will be made. The following identifies the costs for the four components of the system.

- Waste Reduction: There will be near term expenses for hiring staff, funding public education and studies, and future expenses for incentive programs for public and private sector institutions.

- Recycling: The plan calls for curbside recycling collections to increase to 60 pounds per household per month through increased educational

[11] All costs are presented in current dollars. Total annual costs and tipping fees are presented only for the first year of operation. Increases in operational costs over facility life times are assumed to be identical for each system component.

Table 8.5
SUMMARY OF ENVIRONMENTAL AND ENERGY EVALUATION

Air Quality: Air emissions are associated with curbside vehicles collecting recyclables, and dust and gaseous emissions from landfill operation. Air emissions are reduced by manufacturing products from recycled feed-stock rather than virgin materials, however the County is home to only one recycled product manufacturer. Methane gas accumulations can be managed by flaring or a gas collection and use system.

Surface Water: Surface water run-off and erosion from recycling facilities, landscape waste compost sites and landfills can wash contaminants off the site. Such runoff is currently regulated through local and state requirements for the sites.

Ground Water: Accidental discharge of leachate from landfill sites can impact ground water quality. The 1990 state landfill regulations set groundwater protection standards. Liners and a leachate collection system allow operators to control runoff. Groundwater monitoring verifies the effectiveness of those controls.

Land: Relatively large tracts of land within the County are required for landfilling with limited use of land after the landfill is closed.

Odor: Odors can be generated through landfilling and landscape waste composting operations. They can be managed at outdoor compost facilities by proper turning of piles and at landfills by daily cover and gas collection systems.

Noise: Noise from operations at the landfill and landscape waste compost sites can be minimized by adequate buffer space and the use of earthen berms.

Vectors: The attraction of insects and rodents to waste facilities can be minimized through proper facility operations such as applying daily cover at the landfill.

Traffic: Traffic patterns at the current landfill site are not expected to change as a result of this plan; future landscape waste composting and landfill sites may create changes in traffic patterns.

Energy: Energy consumption is reduced when recovered rather than virgin materials are used in the manufacturing process but increases from collection and transport of recyclables. The Settler's Hill landfill gas collection system produced about 20 million kwh of electricity for sale in 1990; the future landfill would also include such a system.

Worker Health and Safety: Potential exposure to injuries from handling waste (e.g. dust, odors, machinery) or from the waste itself. Worker training, safety precautions and adequate supervision can protect workers.

Public Health and Safety: Public safety issues may be of concern from vehicular traffic along recycling and mixed waste transport routes and at the landfill sites, where emissions will be monitored and controlled.

efforts and the collection of additional materials. This is expected to increase the cost of recycling to about $2.50 per month or about $83 per ton. Sufficient information is not yet available to assess the costs of the proposed multi-family, commercial, office paper, and construction/demolition materials recycling programs. In addition there will be near term expenses for hiring recycling staff and funding educational and demonstration programs.

- Landfilling: All alternative technologies considered by the plan require landfilling of some portion of the waste. Depending upon the combination of alternative technologies selected (MSW composting, incineration, both, or neither), landfill sizing required could vary from 321 tons per day (TPD) to 885 TPD. Capital costs for the two sizes of landfills could vary from $4 million to $11 million; annual costs from $2 million to $9.7 million; and tipping fees will be approximately $30 per ton.

- Alternative Technologies: Cost estimates were also prepared for several combinations of alternative technologies. All options included identical waste reduction and recycling goals. Each required some landfilling of materials that could not be recycled, composted or incinerated for energy production. Capital costs for MSW composting were estimated at $62.7 million with operating costs of $17.5 million annually and tip fees at $83 per ton. Capital costs for a waste-to-energy incinerator were estimated at $94.6 million with operating costs of $8 million annually and tipping fees of $90 per ton.

  Tipping fees for alternative technologies are significantly higher than for landfilling. However, tipping fees represent only a portion of the total cost of waste collection and disposal services. For residential service, tipping fees make up approximately 35% of total residential bills, which currently average about $10.00 per household per month. Therefore, although the tipping fee for a composting facility is 176% higher than for a landfill, total residential bills would only be 70% higher, or about $16.20 per month. Likewise, although the estimated $90.00 tipping fee for an incinerator is 200% higher than a landfill, residential bills would only increase 70% to about $17.00 per month.

8.5 SYSTEM FINANCING

The plan recommends that the financing of any and all future facilities and programs should be based on user fees and should include the use of revenue bonds, state and federal grants, private revenue sources, and other non-tax revenue sources. Revenues from the property tax, sales tax or other general tax should not be used to construct, operate or otherwise support these facilities and programs.

Users of the solid waste system, such as households and businesses that generate waste, should pay for the collection, recycling, processing, and disposal of that waste. The plan recommends that fees be collected on a volume or tonnage basis rather than a flat monthly or quarterly fee. This provides the users with a financial incentive for waste reduction and recycling.

County surcharge funds and state grants could be used to finance overall planning activities, implement waste reduction and recycling activities, and pay for general administrative costs. Accrued solid waste enterprise funds could be used for land acquisition and pre-development engineering costs. County issued revenue bonds or private financing could be used for the construction of facilities, repaid by tipping fee receipts.

The solid waste program should be operated as an enterprise fund. Any and all revenues generated by the program should be retained for the purpose of operating the solid waste system, furthering the goals of the solid waste plan or supporting other solid waste or environmental programs within the County.

CHAPTER 9 SITING AND PERMITTING

9.1 INTRODUCTION

The Solid Waste Planning and Recycling Act requires that a solid waste plan identify potential sites within the County where each proposed waste processing, disposal and recycling program will be located or provide an explanation of how the sites will be chosen. Several studies prepared for Kane County discuss waste facility site requirements. General site requirements are described for municipal solid waste composting (Volume 2, Appendix J), waste-to-energy combustion/incineration (Volume 2, Appendix F), and landfills (Volume 2, Appendix G). Issues that relate to the site selection process are discussed in Appendix M "Implementation Issues and Strategies." In general, the text in Chapter 9 refers to a landfill siting process. However, the same process may be applied to any alternative facility which may be identified in future planning efforts.

9.2 PLAN RECOMMENDATIONS

9.2.1 Facility Site Requirements

Mixed waste sorting facilities, transfer stations, MSW compost facilities, incinerators, landfills and other regional pollution control facilities must all comply with the local siting law commonly known as SB 172[12]. The law identifies nine siting criteria that must be met in order for a facility to obtain local siting permission. Criteria include demonstration of need for the facility, protection of public health, safety, and welfare, compatibility with surrounding land uses, location outside of 100 year flood plain or demonstration of adequate flood-proofing, minimization of danger to the surrounding area from fire, spills, or other operational accidents, minimization of traffic impact, and demonstration of consistency with adopted solid waste plan.

Certain facility types have additional site requirements. MSW compost facilities must have a 200 foot setback between the boundaries of the site and any potable water supply well and they must be designed so that no compost is placed within five feet of the water table. Transfer stations must not be located less than 1000 feet from the nearest property zoned for primarily residential uses or within 1000 feet of any dwelling.

Landfills cannot be located within 1200 feet of a designated sole-source aquifer, within 500 feet of an occupied dwelling, school, or hospital, within 10,000 feet of turbojet runways, or within 5,000 feet of any runway used by piston type aircraft.

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[12] Ill. Rev. Stat. ch 111½, ¶1039.2.

Landfills must be located so as to protect historic/archaeological sites. They must not be located in areas where they may jeopardize designated endangered species or the critical habitats of endangered species. They must comply with Section 404 of the Clean Water Act and meet the requirements of the Wild and Scenic Rivers Act.

The plan recommends that any waste facility located within Kane County meet or exceed all applicable local, state, and federal regulations as they relate to location.

9.2.2 Site Selection Process

A successful waste facility site selection process includes substantive public participation in all phases of the process. The process usually consists of four major steps, with opportunity for public input during each step of the process.

Step 1: Initial Preparation

Identify facility needs and the proposed service area of each facility. At a minimum, the plan recommends that a new landfill be located in the County. Additional facility requirements may be identified as part of the alternative technology assessment described in Chapter 6. As part of Step 1, inform and educate the public and elected officials of the need for the waste facility and of the siting process.

Appoint a public siting advisory committee to advise the County during all phases of the site selection process. Committee membership should represent all geographic areas of the County and should include representation from governmental bodies, the business community, citizen's groups, and civic, environmental, and agricultural organizations.

> **Recommendation 9.1:** Initiate the landfill site selection process as soon as practical following County Board adoption and Illinois EPA review of the solid waste management plan. The County should expedite the siting process in order to protect the interests of all people who will be affected by the future site.
>
> **Recommendation 9.2:** Appoint the public siting advisory committee no later than July 1993 and charge that committee with completing its tasks as expeditiously as possible.

Step 2: Screening for Unsuitable Sites

Develop exclusive and inclusive regional site selection criteria and identify areas of the County which are unsuitable for waste facility development. At a minimum, use federal and state regulations. The adoption of siting restrictions which are more stringent than federal and state regulations should be considered. An engineering

consultant should be retained to map the siting criteria. During this step, the consultant should also determine size requirements and other design parameters relevant to site selection. The end result of Step 2 is a map of Kane County which identifies regions of the County which are unsuitable for landfill development.

> **Recommendation 9.3:** Retain an independent, qualified engineering consultant to assist the County and advisory committee in all necessary phases of the process, including development of criteria and initial screening of desirable and undesirable locations.

Step 3: Screening for Potential Sites

Involve the public siting advisory committee in the development of site-specific siting criteria, particularly those relating to land use, buffer requirements, and traffic impact. Weight the criteria and apply them to non-excluded areas of the County. Identify one or more candidate sites for detailed investigation.

> **Recommendation 9.4:** Work with the public siting advisory committee on the development of appropriate site-specific siting criteria and receive the committee's advise during all phases of the site selection process.

Step 4: Selection of Potential Site

Conduct an in-depth technical analysis of potential sites to select the site which best meets the siting criteria. The engineering consultant will analyze the potential disposal capacity of candidate sites and conduct all necessary hydrogeological investigations of candidate sites. Public involvement and sensitivity to the rights of private property owners is particularly important during this step in the process.

> **Recommendation 9.5:** Recognize the rights and concerns of private property owners at all times during the site selection and acquisition process.

> **Recommendation 9.6:** Once a site has been identified, and before any site work begins, create a system which allows affected property owners to monitor and make suggestions as to facility development and operation. Local citizens should be able to review operational reports, provide input on the type of development in buffer areas, and review environmental monitoring reports.

9.2.3 Mitigation and Host Community Benefits

As part of the site selection process, options should be provided to affected

communities for ways to mitigate a waste facility's real and perceived impacts to their residents. Mitigation measures include actions and changes beyond regulatory and technical measures that are used to insure the waste facility's safety, minimize nuisance impact, and alleviate other impacts to the community. Engineering, design, and operational changes reduce specific facility impacts. Additional visual screening and rerouting of truck traffic mitigate specific concerns and impacts associated with visual appearance and increased traffic. Limited hours of operation, particularly on weekends, address concerns about onsite equipment noise.

Two impacts commonly associated with solid waste facilities are impact on property values and impact on groundwater quality. A property value assurance program guarantees that a waste facility will not cause the decline of property values of homes within a defined area around the facility. A groundwater quality control program guarantees the provision of adequate water supplies to adjacent homeowners if contamination occurs.

Recommendation 9.7: Develop procedures to mitigate the impacts of the future landfill on property values, well water quality, and any other significant impacts on adjacent property and develop an appropriate plan to compensate adjacent property owners for any actual impact.

Recommendation 9.8: Determine what level of host community benefits would be appropriate for the eventual site and offer such benefits to communities affected by the facility site.

9.2.4 Permit Requirements

Each solid waste facility has unique State permit requirements. Under the State's coordinated permit review process, all permit applications should be submitted to the IEPA at the same time. The IEPA will not consider a regional pollution control facility application unless the applicant submits proof that the location of the proposed facility has been approved by the County board or governing body of the municipality, whichever is appropriate.

An MSW compost facility requires development and operating permits and submittal of closure and post-closure plans. Water pollution control and air emission permits may also be required, depending upon facility design and operation.

Landfill applicants must obtain a developmental permit prior to constructing a landfill. The applicant must demonstrate that the proposed facility will not cause pollution or violate any environmental laws or regulations. Subsequent to certification of compliance with IEPA approved design and construction plans, the landfill operator receives the operating permit which allows for landfilling in permitted and certified areas.

Waste-to-energy facility applicants must obtain permits from the IEPA's Division of Land Pollution Control, Division of Public Water Supplies, and Air Division. As with other solid waste facilities, both development and operating permits are required.

9.3 IMPLEMENTATION

1992-1996

9.1 Initiate the landfill site selection process as soon as practical. Expedite the siting process in order to protect the interests of people who will be affected by the future site.

9.2 Appoint the public siting advisory committee no later than July 1993.

9.3 Retain an independent, qualified engineering consultant to assist the County and advisory committee in all necessary phases of the siting process.

9.4 Work with the public siting advisory committee on the development of appropriate siting criteria and receive the committee's advise during all phases of the site selection process.

9.5 Recognize the rights and concerns of private property owners at all times during the site selection and acquisition process.

9.6 Create a system to allow oversight of facility development and operation by nearby property owners.

9.7 Develop procedures to mitigate and compensate adjacent property owners for significant impacts.

9.8 Determine what level of host community benefits would be appropriate for the eventual site and offer such benefits to communities affected by the facility site.

CHAPTER 10 PLAN IMPLEMENTATION

10.1 INTRODUCTION

The Solid Waste Planning and Recycling Act states that each County or municipal agency shall begin implementation of its waste management plan, including the recycling program, within one year of adoption of the plan. This chapter recommends activities that Kane County should take to ensure implementation begins within one year of plan adoption. The chapter identifies parties involved in implementation, summarizes major implementation tasks, provides an implementation schedule and a recommended funding approach. A more detailed discussion is presented in "Implementation Issues and Strategies" in Appendix M of Volume 2.

10.2 PARTIES INVOLVED IN IMPLEMENTATION

10.2.1 Kane County

Several organizational options exist for the implementation of solid waste plans. These include county responsibility, a Municipal Joint Action Agency, or a County-appointed Solid Waste Authority. Kane County is currently responsible for solid waste in the County. State law provides the County with the authority to issue bonds and enter into contracts for solid waste purposes, control the flow of waste within its jurisdiction, implement county-wide recycling programs, and conduct other necessary activities.

Primary responsibility for implementation of the adopted plan should be retained by the County. Potential avenues of intergovernmental cooperation with municipalities to effectively manage waste collection and disposal practices should be explored.

10.2.2 Staff Requirements

The Recycling Act requires that a Recycling Coordinator be appointed to administer the recycling program. The plan recommends that one additional full time staff position, for a total of four staff, be established in the Solid Waste Division of the Kane County Development Department. The four positions would be as follows:

- Solid Waste Director (existing)
- Recycling Coordinator(existing)
- Solid Waste Education Coordinator (new)
- Clerical (existing)

The Solid Waste Director would supervise the other staff and oversee all aspects of solid waste plan implementation. This would include working on landfill expansion and with the siting committee, evaluating alternative technologies, implementing special wastes recommendations, preparing plan updates and monitoring legislation. The Recycling Coordinator would assist municipalities with the implementation of recycling and waste reduction programs in Kane County, including developing model programs, market development and encouraging private sector programs. The Education Coordinator would be responsible for public education on waste reduction in public and private sector institutions, recycling education as each new program is developed and implemented, and technical assistance in response to public inquiries. The clerical staff would support all program areas.

It may be necessary to supplement staff support with outside consultant services in order to ensure timely implementation of the plan. In particular, the plan recommends that consultant services be considered for waste audits throughout the County.

10.2.3 Committee Organization

The plan recommends that two groups be involved in implementation of solid waste programs, the Siting Committee and the Plan Update Committee. Each would be appointed by and report to the Kane County Board.

Public Siting Advisory Committee

A public siting advisory committee should be formed to advise the County during all four phases of the site selection process (see Chapter 9). The Committee will be involved in siting a future landfill and may also be involved in siting alternative technology facilities should it be determined that a facility should be constructed within the County. Committee membership should represent all geographic areas of the County and should include representation from governmental bodies, the business community, citizen's groups, and civic, environmental and agricultural organizations. The committee's responsibilities would include participation in the development of site-specific siting criteria, assigning weights to the criteria, and selection of the preferred site.

Solid Waste Plan Update Committee

The Solid Waste Planning and Recycling Act requires that adopted solid waste management plans be revised every five years. A Plan Update Committee would be similar in size, function and responsibility to the Committee which assisted in the development of this Kane County Solid Waste Plan. Committee membership should represent all geographic areas of the County and should include representation from governmental bodies, the business community, citizen's groups, and civic, environmental and agricultural organizations. The committee would be responsible for providing advice and recommendations during the plan update process.

10.2.4 Local Governments

Municipalities and townships have an important role to play in the implementation of this solid waste management plan. Municipalities negotiate residential contracts with refuse, recycling and yard waste collectors and license commercial business haulers. Townships provide recycling service to residents in unincorporated areas. The Township Solid Waste Disposal Districts have an evolving role in solid waste management practices on the township level. Local governments will also disseminate waste reduction and recycling information to their residents and businesses and will participate in government waste reduction and recycling programs such as modifying procurement practices.

10.2.5 Other Interested Parties

Waste haulers, recyclers, and landfill operators are three groups currently managing waste in Kane County. These groups will be directly affected by recommendations of this plan. Each also has a role to play in the implementation of this plan. The Recycling Act affirms this by stating "in implementing the recycling program, consideration for the collection, marketing and disposition of recyclable materials shall be given to persons engaged in the business of recycling within the County on the effective date of this Act, whether or not the persons were operating for profit."

Waste Haulers

Waste haulers may be affected by the plan in three ways. When more municipalities adopt volume-based collection fee systems to encourage recycling and waste reduction, hauler's cash flow and method of collecting fees will be affected. Expansion of waste reduction and recycling programs into multi-family, commercial, and industrial sectors will reduce the volume of mixed waste collected by haulers while increasing the possibility of new collection contracts to service recycling routes. Finally, should an alternative technology be selected, municipalities participating in the plan may be required to direct their municipal waste to that facility.

Recyclers

The expansion of existing recycling programs and the development of new programs will expand the types of materials collected for recycling and increase the volume of materials currently recycled. The plan recommends private sector development of centralized processing plants for recyclable materials, centralized landscape waste composting facilities, and construction and demolition debris recycling. This emphasis will provide growth opportunities to the existing recycling industry in Kane County.

Landfill Operators

Implementation of the solid waste plan will have little impact on landfill operators in the first 10-15 years of implementation. After existing facilities close, however, the plan recommends that new landfills be limited to those needed to meet the County's disposal needs, discouraging significant importation of waste from outside Kane County.

10.2.6 Public Involvement

The County should provide clear and frequent communication with the public and maximize the opportunity for comment at key decision making stages during the implementation of this plan and during any subsequent revisions to the adopted plan.

10.3 IMPLEMENTATION TASKS, SCHEDULE AND FUNDING

10.3.1 Organization and Administration

- Create one additional position for a Solid Waste Education Coordinator in the Solid Waste Division of the Kane County Development Department and set up the source reduction and recycling program.
- Evaluate ongoing funding needs based upon current and projected funding sources and identify any shortfalls.
- Develop a detailed five year plan of work for implementation of the solid waste plan.

10.3.2 Major Implementation Tasks

Major implementation tasks emphasize developing the recycling and waste reduction programs along with landfill expansion in the near term and evaluating alternative technologies and facility siting in future years. Major implementation tasks are summarized below:

Major Implementation Tasks

Waste Reduction & Recycling: Establish a waste reduction and recycling education office responsible for educational efforts, waste reduction audits, model programs, economic incentives and regulatory requirements.

Material Recycling Programs:

Residential: Expand the types of materials collected by municipalities, service unincorporated areas and multi-family residences, increase volumes recycled through public education and volume based fee structures.

Commercial: Develop model programs leading to full scale collection and processing of commercial and institutional wastes.

Industrial: Develop model programs leading to full scale collection and processing of industrial wastes.

Landscape Wastes: Assist in programs to divert 100% of landscape wastes from landfills and pursue development of composting capacity located within the County.

Construction/Demolition: Encourage development of construction/demolition waste recycling programs.

Special Wastes: Monitor programs and encourage waste reduction and alternatives for disposal of household hazardous wastes, used oil, contaminated soils, tires and appliances.

Landfills: Immediately apply for siting and permitting approval for the expansion of Settler's Hill Landfill and ensure that future landfill capacity is available for Kane County wastes.

Alternative Technologies: Evaluate alternative technologies including municipal solid waste composting and waste-to-energy incineration for the first plan update in 1997.

10.3.3 Implementation Schedule

The first five years of the plan emphasize development of the waste reduction and recycling plans with continued use of the landfills. After the first five year plan update, decisions will be made regarding the development of alternative technologies and initial site selection studies for new facilities will be performed. Table 10.1 presents an implementation schedule for the major tasks described above.

10.3.4 Recommended Funding Approach

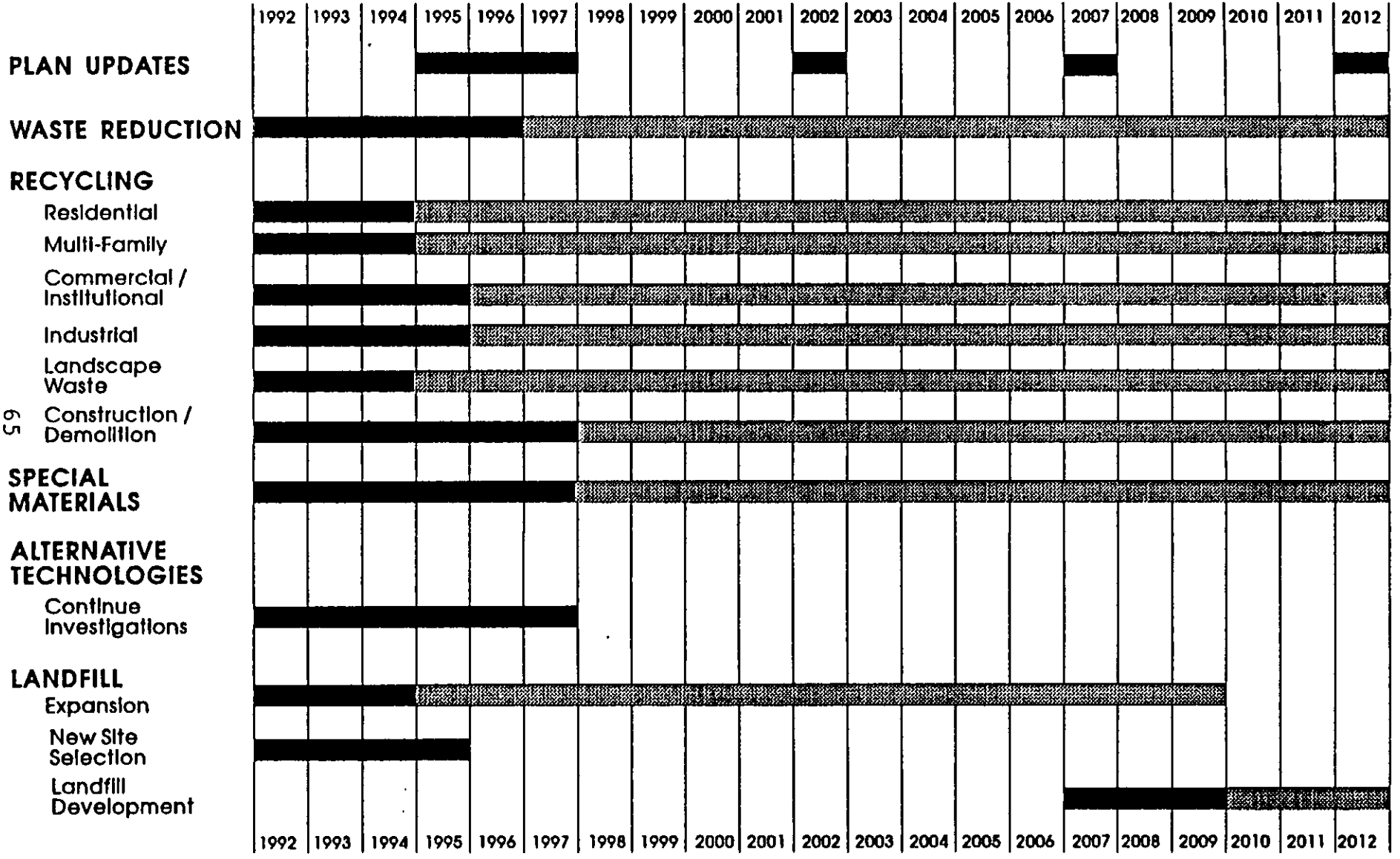
The plan recommends that the financing of any and all future facilities and programs should be based on user fees, revenue bonds, private funding sources, and state and federal grants. Revenues from general taxes such as property tax, sales tax or other general tax should not be used to construct, operate or otherwise support these facilities.

County surcharge funds and grants will be used to finance overall planning activities, implement waste reduction and recycling programs and pay for general administrative costs. Accrued solid waste enterprise funds may be used for land acquisition and predevelopment engineering costs. Revenue bonds or private financing will be utilized for facility construction.

The solid waste program should be operated as an enterprise fund. Any and all revenues generated by the program should be retained for the purpose of operating the solid waste system, furthering the goals of the solid waste plan or supporting other solid waste or environmental programs within the County.

Table 10.1

KANE COUNTY SOLID WASTE PLAN IMPLEMENTATION SCHEDULE



KEY

Full Program Development and Implementation

Ongoing Operation and Refinement

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K A N E C O U N T Y

Solid Waste Management Plan

Volume II
Appendices

Adopted by the
Kane County Board

November 10, 1992

Printed on Recycled Paper

KANE COUNTY SOLID WASTE PLAN

VOLUME II - APPENDICES

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APPENDIX A

ASSESSMENT OF SOLID WASTE NEEDS

Prepared by:

Kane County Development Department

October 1990

ASSESSMENT OF SOLID WASTE NEEDS

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A thorough understanding of the sources, amounts, and types of solid waste currently produced and of the current methods of disposal is necessary before an analysis of future recycling goals and disposal needs can be undertaken. This assessment will review the existing solid waste collection, recycling, and disposal system, present and analysis of the amount of solid waste currently generated in Kane County, and project the amount of waste generation which can be reasonably expected during the next 21 years.

The information presented in this section will serve as a basis for developing recycling goals and assessing the impact of recycling strategies on the overall waste stream. It will be further used to assess the need for future waste disposal facilities and to determine the appropriate size and capacity of such facilities. This assessment will serve as a base line for analyzing the impact of waste reduction and recycling programs, and population growth and economic change, and will provide a reference point for future analyses.

I. DEFINITION OF STUDY AREA

Kane County, located in Northeastern Illinois, is one of the six counties in the Chicago metropolitan area. It is surrounded by McHenry County to the North, Cook and DuPage Counties to the East, Kendall County to the South, and DeKalb County to the West. Geneva, the county seat, is located some 34 miles west of downtown Chicago.

Major political subdivisions include 19 municipalities located primarily in the County and 16 townships. Another three municipalities are partially in Kane County. Two-thirds of the county's 522 square miles is farm land. The majority of the population is found in 12 communities along the Fox River valley, in the eastern third of the County. Major transportation arteries include the northwest (I-90) and east-west (I-88) tollways, and eight state highways - Routes 25,31,47 in a north-south alignment and Routes 72,20,64,38, and 56 running generally east-west. Kane County is also served by eight major railroad lines and commuter rail stations in Elgin, Geneva, and Aurora.

Population in Kane County has grown from 278,405 in 1980 to an estimated 320,000 in 1989 and has been forecasted to reach 434,000 in 2010. This annual growth of almost two percent is attributable to relatively affordable land and housing costs, spill-over growth from Cook and DuPage Counties, and new economic opportunities. Approximately 72 percent of the population is found in communities along the Fox River, and nearly 20 percent lives in unincorporated areas.

In 1989 there were an estimated 87,526 single-family houses and 31,016 multiple-family housing units in the county. Seventeen percent of single family units are located in unincorporated areas while only 0.5 percent of multi-family units were outside municipal boundaries. The average household size declined from 2.85 in 1980 to 2.70 in 1989.

Total employment in 1986 was estimated at 121,380, with 38,512 (32%) in the industrial sector and 82,868 (68%) in the commercial and institutional sector. Employment forecasts for 2010 indicate an overall growth of 33,849 jobs, to a total of 155,229. Employment in the manufacturing and agricultural sectors are expected to decline, while employment levels in all other sectors will show healthy increases. Total retail sales in 1988 were $1,992,120,000.

Table 1

County Population, By Municipality

Municipality	1980	1988	2010
Algonquin*	258	1,710	5,417
Aurora*	79,610	83,550	104,742
Barrington Hills*	105	130	223
Batavia	12,574	15,590	23,581
Burlington	442	450	495
Carpentersville	23,272	25,870	33,790
East Dundee	2,618	3,010	7,410
Elburn	1,224	1,820	6,167
Elgin*	52,778	55,940	78,382
Geneva	9,881	11,010	20,985
Gilberts	405	900	3,069
Hampshire	1,735	1,830	4,226
Maple Park	637	1,300	823
Montgomery*	3,329	4,690	6,431
North Aurora	5,205	6,190	10,519
Pingree Grove	183	190	277
St. Charles*	17,471	20,740	33,147
Sleepy Hollow	2,000	2,940	3,631
South Elgin	6,218	8,140	10,479
Sugar Grove	1,366	1,790	7,214
Wayne*	480	710	1,841
West Dundee	3,551	4,630	8,733
Unincorporated	53,063	61,870	62,418
Total	**278,405**	**315,000**	**434,000**

***Includes only Kane County portion of municipal population.**

Sources: 1980: U.S. Census Bureau
1988: U.S. Census Bureau
2010: Northeastern Illinois Planning Commission

Table 2

County Employment, By Sector

Sector	SIC Code	1986	2010
Agricultural	07	562	500
Mining & Construction	14-17	5,272	6,221
Manufacturing	20-39	32,678	28,800
TCUW	40-51	9,555	14,400
Retail	52-59	23,752	39,100
FIRES	60-79	14,276	20,768
Health	80-89	18,361	26,432
Government	90-98	15,900	17,800
Other	99	1,024	1,208
		121,380	155,229

Notes:

1. TCUW = Transportation, Communication, Utilities, and Wholesale
   FIRES = Finance, Insurance, Real Estate, and Services
2. 1986 base data from U.S. Dept. of Commerce, County Business Patterns, except SIC codes 90-98 from NIPC Data Bulletin
   88-1.
3. 2010 forecast from NIPC Data Bulletin 88-1

II. EXISTING SOLID WASTE COLLECTION AND DISPOSAL SYSTEM

A. Residential Collection

According to surveys of both municipalities and waste haulers, 10 different hauling firms provide collection services for residential solid waste. A summary of the survey results are presented on the following page in Table 3. The predominant contractual arrangement in incorporated areas is a contract between the municipality and a single hauler, with costs paid either directly by the homeowner of through the municipal general fund. The typical duration of these contracts is three years. Homeowners in unincorporated areas individually contract for hauling service. Single-family residences and buildings with two to four or five residential units are typically included in the municipal waste contract. Multi-family buildings, with more than four or five units, contract individually for waste collection.

The average monthly cost for residential services in 1989 was $8.39, slightly lower than typical costs in more urbanized portions of the metropolitan area. Costs in Kane County tend to be higher in rural areas due to greater distances between stops and from existing landfills. During the past three years, residential collection costs have increased an average of 6.7 percent per year.

B. Commercial Collection

Collection practices in commercial, institutional and industrial sectors differ somewhat from the residential sector. These generators contract direct with one of 16 waste hauling companies in the County. Waste is stored in large metal containers (dumpsters or roll-offs) ranging in size from 2 to 40 cubic yards. The smaller containers are dumped into conventional packer trucks; the larger ones are usually hauled directly to the landfill. Businesses are charged according to the size of the container and frequency of service, essentially a volume-based system. Commercial haulers are regulated, i.e., required to obtain a license, by at least four municipalities. Local haulers reported, in their survey responses, that the average distance from their collection routes to the disposal site ranged from 4 to 20 miles. The average one-way hauling distance, weighted for population, is 11 miles.

TABLE 3

Summary of Municipal Solid Waste Collection

Municipality	Hauler	Type of Contract	Household Units Served	Mthly Cost
Aurora	Browning Ferris	MC	1-5	8.33
Batavia	Tri-County	MC	1-5	6
Burlington	Elgin-Wayne	FR	1-4	10.00
Carpentersville	Browning Ferris	MC	1	9
East Dundee	Browning Ferris	MC	1-2	5
Elburn	Fox Valley, Speedway	PC	N/A	N/A
Elgin	Elgin-Wayne	MC	1-5	8
Geneva	Speedway	MC	1-4	7.16
Gilberts	Monarch, Elgin-Wayne	PC	1	11
Hampshire	Elgin-Wayne	MC	1-5	10.67
Maple Park	DeKalb Co. Disp.	MC	1	8
North Aurora	Fox Valley	MC	1-2	6.40
Pingree Grove	N/A	N/A	N/A	N/A
St. Charles	Fox Valley	MC	1-4	9.30
Sleepy Hollow	Elgin-Wayne	N/A	1-2	11
South Elgin	Schrieber Valley	MC	1-5	8
Sugar Grove	Fox Valley	PC	1-5	8.50
West Dundee	Browning Ferris	MC	1-2	6

Notes: 1. MC = Municipal Contract
FR = Franchise
PC = Private Contract

2. St. Charles offers a volume-based, or "pay by the bag", billi system. $9.30 re presents the average Household cost, and includes the costs of curbside recycling.

C. Landfill Disposal

There are two permitted sanitary landfills operating In Kane County; Settler's Hill near Geneva and Woodland near South Elgin. The Settler's Hill landfill began operation on a 5 acre portion of the county farm in 1967. Originally known as the Midway landfill, it was first operated under contract with the County, by Al and Bill Stob and Fox Valley Disposal. In 1980, these operators were acquired by Waste Management of Illinois, Inc., who has continued to operate the facility under County contract. The contract is effective for the life of the landfill.

The current size of Settler's Hill is approximately 397 acres, of which 297 acres are landfillable. The remainder serves as buffer space and to support landfill operations. Fill heights average 30-40 feet. According to the Fourth Annual Report on Available Disposal Capacity for Solid Waste in Illinois, issued by the Illinois Environmental Protection Agency (IEPA), during the period of April 1, 1989 to March 31, 1990, Settler's Hill accepted 1,900,151 cubic yards of solid waste for disposal. The IEPA study also reports a remaining capacity of 21,338,258 cubic yards, or 11.2 years at current disposal rates.

Woodland landfill began operation in 1976. It has been owned and operated since its inception by Waste Management of Illinois, Inc. The site encompasses approximately 236 acres, of which 121 acres have been and are being used for waste disposal with the remainder used for buffer, roadways, buildings, etc.

1989-90 receipts at Woodland were 820,442 cubic yards. With 12,376,325 cubic yards of remaining capacity reported, Woodland has a remaining life of 15.1 years at current disposal rates. However, Waste Management officials have reported that over the next year, the volume of waste accepted will likely increase from 4,500 to 7,000 cubic yards per day.

The number of years of capacity remaining for each landfill in the state are reported to the IEPA each year, along with the number of gate yards received during the preceding 12 months and the operator's estimate of remaining capacity in gate yards. Since reporting first began in 1987, reported and calculated values for the remaining lifetime of landfills in Kane and other counties have been very inconsistent.

For example, the calculated lifetime of Settler's Hill has gone from 12 years in 1987 to 6 years in 1988 to 11 years in 1990. The variations at Woodland have been even more remarkable.

These discrepancies are apparently the result of the lack of a standardized methodology for predicting remaining capacity, as well as the lack of sufficient instructions on the IEPA reporting forms. The IEPA has begun to clarify their procedures and landfill operators are becoming more sophisticated at estimating remaining capacities. For example, Waste Management is now performing volumetrics analyses based on aerial photographs and topographical maps of Settler's Hill. However, it is apparent that additional efforts are necessary to accurately determine this important information.

D. Amount and Source of Landfilled Solid Waste

During 1989, according to reports made to the County by the landfill operators, Settler's Hill received 2,100,765 gate cubic yards of waste and Woodland received 759,333 gate cubic yards. Gate yards are a gross measure of the amount of material delivered to the facility's gate and include both loose and compacted waste.

To normalize this divergent information, loose cubic yards were converted to compacted yards by using a factor of 3.2 loose yards per compacted yard. This factor represents the relationship between loose and compacted yards as reported in solid waste management plans prepared for the Northwest Municipal Conference and West Central Municipal Conference. An Average density of 667 pounds per compacted cubic yard; as generally reported in the literature, was used to convert compacted cubic yards to tons. The calculations for both landfills are summarized on the following page in Table 4.

Table 4

1989 Solid Waste Amounts Received at Settler's Hill and Woodland Landfills

	Settler's Hill	Woodland	Total
Gate Yards	2,100,765	759,333	2,860,098
Compacted Yards	1,604,088	577,852	2,181,940
Tons	534,963	195,603	703,566

In addition to waste generated in Kane County, both landfills also received waste from at least five other counties in 1989. Gate surveys were conducted at both landfills during the summers of 1989 and 1990 to determine the source and type of waste entering each landfill. The gate surveys were conducted by teams from Aurora University for 20 days each summer at Settler's Hill and for 15 days in 1989 and 10 days in 1990 at Woodland. The counties of origin for waste accepted during these periods are shown in Table 5.

TABLE 5

Sources of Waste Accepted at Kane County Landfills

	Settler's Hill		Woodland	
County	1989	1990	1989	1990
Kane	55.5%	57.3%	54.6%	41.4%
DuPage	37.4%	35.3%	11.6%	7.1%
Cook	4.1%	4.5%	25.3%	44.0%
McHenry	2.0%	0.9%	7.3%	4.2%
Other	1.0%	1.9%	1.2%	3.3%

The amount of solid waste accepted at both facilities during the gate surveys was extrapolated to a 12 month period, seasonally corrected, and agreed with the operation's reports to the County within 3.8 percent, indicating a certain degree of accuracy of the gate survey results. However, the amounts imported from individual counties may vary from month to month, depending on such factors as comparative

prices and road conditions. Gate surveys conducted during other, non-summer, periods would be useful in quantifying these monthly variations in import amounts.

Kane County also exports solid waste to landfills in DuPage and DeKalb Counties. Exports to Green Valley and Mallard Lake landfills in DuPage County were estimated to be 35,725 tons during 1989, based on the results of gate surveys conducted by DuPage County and landfill operators' reports. The amount of waste exported to DeKalb County for landfilling was estimated to be 600 tons in 1989, based on waste hauler survey results.

As shown in Tables 6 and 7, Kane County is a net importer of solid waste. Of the estimated 438,215 tons sent to landfills in 1989, 401,890 tons, or 91.7 percent, remained in the County. However, of the estimated 730,566 tons received at the two landfills in 1989, those same 401,890 tons amount to only 55.0 percent of total receipts.

TABLE 6

Location of Landfills Receiving Kane County Waste, 1989

Location	Amount	Percent
Kane County	401,890 tons	91.7%
Other Counties	36,325 tons	8.3%
Total	438,215 tons	100.0%

TABLE 7

Source of Waste Received at Kane County Landfills, 1989

Source	Amount	Percent
Kane County	401,890	55.0%
Other Counties	328,676	45.0%
Total	730,566	100.0%

In addition to the total amount of solid waste disposed of in landfills by Kane County, the source of that waste (by sector) must be determined to gain a full understanding of waste generation patterns within the County. The waste stream is typically divided into four sectors: residential, commercial and institutional, industrial, and construction and demolition debris.

The gate surveys conducted during 1989 found that 37.9 percent of the waste accepted during the survey period was classified as residential. This percentage was corrected for seasonal variations in the amount of residential waste, as reported in the municipal surveys. The adjusted residential percentage, 40.5 percent, was multiplied by the total annual receipts from Kane County at both facilities, which resulted in a amount of 162,780 tons of Kane County residential waste disposed in Kane County landfills.

Non-residential amounts could not be accurately determined from the gate survey results, since the gate surveys did not include a category for construction and demolition debris. The surveys of waste haulers revealed that, for the non-residential solid waste amounts handled during 1989, 43.8 percent was from the commercial sector, 32.8 percent from the industrial sector, and 23.4 percent was construction and demolition debris. These percentages were multiplied by the amount of non-residential waste received at both landfills from Kane County.

This methodology resulted in estimated amounts of 117,387 tons from the commercial sector, 86,934 tons from industrial sources, and 34,789 tons of construction and demolition debris. Sector breakouts for Kane County waste sent to out-of-county landfills were estimated from DuPage County gate surveys and, for DeKalb County, the results of hauler surveys.

As a further check, non-residential waste amounts were calculated using an average of per employee generation rates reported by neighboring counties. Per employee rates for each employment sector were multiplied by the number of employees in each sector (see Table 2). Construction and demolition debris generation was estimated by using an average of the per capita generation rate reported by other counties. This approach resulted in a total amount of non-residential

waste that was within 7 percent of the amounts determined by using gate and hauler survey results.

E. Regional Landfill Situation

In the six-county metropolitan area, solid waste is disposed of in 27 landfills and one incinerator, which is operated by the City of Chicago. Three counties, Cook, DuPage, and McHenry, export significant amounts of their waste to facilities outside of their boundaries. DuPage, Kane, and Will Counties import a substantial amount of waste from other counties.

According to IEPA figures, the region has 5.9 years of remaining landfill capacity, assuming disposal practices remain unchanged. Table 8 shows the number of landfills, and their remaining capacity, in each county.

TABLE 8

Number of Landfills and Remaining Capacity
In the Chicago Metropolitan Area

County	Number of Landfills	Remaining Capacity
Cook	11	3.6 years
DuPage	2	8.1 years
Kane	2	12.2 years
Lake	6	2.3 years
McHenry	1	1.3 years
Will	5	5.2 years

The average cost to dispose solid waste at landfills in the region has increased from $2.21 per compacted cubic yard in 1981 to $7.16 in 1989, an average annual increase of 16 percent.

F. On-Site Waste Disposal

Anyone who manages non-hazardous solid wastes on the same property where the wastes are generated must report such activity to the IEPA. Types of on-site waste management include landfills, waste piles, surface impoundments (lagoons),

and land treatment/spreading operations. This material must be considered here, since a change in the local operations could result in the material being landfilled.

The IEPA has received reports of such activity from three operations in Kane County. The City of Elgin operates both surface impoundment and landfill facilities to manage 10,500 cubic yards of water treatment sludge per year. The Meadowdale Shopping Center in Carpentersville reported handling 17,000 cubic yards of demolition material on-site. However, since this is not a recurring activity it is not included in waste amount totals. The third operation, concrete and other debris resulting from construction clearing work by Marc Realty in Silver Glen Estates, did not include a volume figure in their report. Therefore, the only accountable amount of on-site solid waste in Kane County is the 10,500 cubic yards, or 3,502 tons, of material handled by the City of Elgin.

G. On-Site Waste Incineration

A small amount of solid waste is currently incinerated at the same location as where the waste is generated. This practice occurs in two forms: residential burn barrels in rural areas and small incinerators at hospitals, schools, and other facilities. Although illegal, burning of residential waste occurs at an estimated five percent of households in unincorporated areas, according to survey responses from waste haulers. This level of activity translates into about 1,244 tons of solid waste per year handled in this manner.

IEPA records indicate the existence of 22 permitted incinerators in Kane County. Operators of these incinerators include 7 health care facilities, 4 schools, 4 animal hospitals, 3 industries, and 4 commercial establishments. All 22 incinerators are used for volume reduction reasons only; none involve energy recovery methods. The total amount of waste handled by these operations is 3,231 tons per year.

III. EXISTING RECYCLING PROGRAMS

Recycling programs were identified and quantified from the results of surveys sent to municipalities and townships, waste haulers, and independent recycling firms.

A. Residential Recycling

1989 saw the introduction of curbside recycling in Kane County, with programs initiated in East Dundee, Sleepy Hollow, and St. Charles. East Dundee and Sleepy Hollow began their programs in April, while St. Charles started recycling in October, in conjunction with a volume-based billing approach to refuse collection. A total of approximately 9,850 households are served by these three programs.

St. Charles has reported a 96 percent monthly participation rate due in large part to the financial incentive created by their innovative billing system, and volumes of 39 pounds per household per month. Survey results for the other two programs were incomplete, so average results of nearby communities, 40.7 pounds per household per month, were used to estimate their effectiveness. Accordingly, during 1989, it is estimated that a total of 845 tons of recyclable material were collected by the three existing curbside programs.

Kane County citizens recycled substantial amounts of solid waste at commercially-operated buy-back and drop-off facilities. Residential volumes were reported by three businesses: Eagle Recycling in Batavia, Elgin Salvage and Supply, and DeKalb Iron and metal. Eagle reported that 80 percent of their volumes were generated by the residential sector, while the two scrap dealers reported that only 10 percent of their amounts had a residential origin. Volumes for two scrap dealers that did not respond to the surveys were estimated from the reported amounts of respondents. The reported and estimated amounts of residential materials handled by these recycling centers total 6,497 tons for 1989.

The difficulty of quantifying recycling amounts from just these few programs illustrates a clear need for a better data collection and reporting system. With the rapid growth of recycling programs, and the importance of both state-mandated targets and recycling goals to be presented later in this plan, improved methodologies should be developed as soon as possible.

B. Landscape Waste

The most significant development in 1990, in terms of impact on the residential waste stream, was the statewide ban on landfilling of landscape waste which took

effect on July 1, 1990. Municipalities and waste haulers have implemented a variety of approaches for the separate collection of landscape waste in response to the landfill ban. Typically, homeowners can place their yard debris in 30 gallon kraft paper bags or in separate 33 gallon garbage cans for separate collection. Most municipalities require a sticker to be placed on the container. The sticker cost, ranging from $0.45 to $1.00, covers the additional costs for separate collection and handling.

The high cost of yard waste disposal has encouraged many homeowners to start backyard compost piles and discontinue the practice of bagging grass clippings. Hauling companies report that, in towns with stickers programs, 60-70 percent of homes do not set out grass clippings on a regular basis. A recent Chicago Tribune poll found that 69 percent of suburban homeowners say that are leaving more grass clippings on the lawn than a year ago, and 31 percent now have compost piles.

In addition to the bagged collection service, several municipalities (Elgin, St. Charles, Geneva and Batavia) use vacuum equipment operated by city crews to pick up leaves that have been raked to the curb. Leaf burning is still allowed in Carpentersville, East Dundee, and unincorporated areas. Bundled or bagged brush is accepted in the separate waste hauler pickups. Several municipalities offer "free" brush pickup service to their residents, financed by the town's general fund. This brush is chipped by city crews and used in public facilities and provided to local residents.

An estimated 20 percent of all landscape waste generated in the County is collected by private landscaping companies that service commercial properties, multi-family buildings not covered by municipal waste contracts, and homeowners who contract for landscape maintenance services.

The total amount of landscape waste collected during the first 12 months of the landfill ban is estimated to be 67,925 cubic yards, or 21,916 tons, based on information provided by Aurora, Batavia, Geneva, St. Charles, Elgin, and Carpentersville. In addition, 1990 landfill gate surveys found that an average of 59 cubic yards of exempt landscape waste were accepted from Kane County sources each day. Extrapolated to an eight month period, 3,800 tons of large woody material

and other exempt material is still being disposed.

The total amount of yard waste generated, not just collected, must be estimated to determine the amount of material that is not collected but managed on-site by homeowners. Generation rates have been estimated in the ENR report "Management Strategies for Landscape Waste". Although presented as rates per single-family household, the rates also include non-residential material. The rates were multiplied by the number of single-family households (87,256) in Kane County to determine total tons per year and are presented below.

ESTIMATED LANDSCAPE WASTE GENERATION

Material	Generation Rate (lbs/HH/year)	Tons per year
Leaves	160	7,002
Grass	1,040	45,514
Brush	300	13,129
Total	1,500	65,645

The total amount of 65,645 tons corresponds to about 13.4 percent of the overall County waste stream. Of this total, 28 percent was collected in 1990-91 by municipal programs, an estimated 6 percent was collected by landscaping firms, and exempt material which was landfilled represents another 6 percent. The remaining 60 percent of unaccounted for material coincides with estimates of the number of homeowners which manage their yard wastes on their own property. These amounts are summarized on the following page in table 9.

Table 9

Estimated Amounts of Landscape Waste
in Kane County, 1990-1991
(tons per year)

	Leaves	Grass/Brush	Total	Percent
Municipal/Hauler:	4,378	13,884	18,262	28%
Commercial:	876	2,778	3,654	6%
Total Collected	5,254	16,662	21,916	34%
Landfilled:	-0-	3,800	3,800	6%
Managed On-Site:	1,748	38,181	39,929	60%
Total Generation:	**7,002**	**58,643**	**65,645**	**100%**

1. Management of Collected Material

During the first year of the landfill ban, numerous methods have been used to manage the collected landscape waste. While the majority of material has been delivered to composting facilities, some has been directly land-applied and municipally collected brush has been chipped for use locally.

The majority of leaves collected by municipal programs in St. Charles, Geneva, and Batavia has been delivered to farmers for incorporation into the soil. Most leaves collected by the City of Elgin have been taken to a City-owned composting site.

However, most collected material has been delivered to compost facilities. The available data suggests that of the total 21,916 tons (67,925 cubic yards) collected by municipalities, haulers, and landscapers, 77 percent (16,772 tons or 48,451 cubic yards) was delivered to a compost facility during the 1990-91 season.

From July to November, 1990 almost all non-land applied yard waste collected in Kane County was taken to a Waste Management facility at Settler's Hill landfill. There, Waste Management attempted a modified land application operation, where incoming material was processed through a tub grinder and thickly spread on vacant land at the landfill. However, a combination of wet weather (which prevented access to the fields for spreading and incorporation) and lack of experience with this type of

operation resulted in significant odor problems. The operation was permanently closed in January, 1991.

In the spring of 1991, Kane County material was delivered to the DuPage County composting facility on Fabyan Parkway, 1.5 miles east of Settler's Hill. In early April, the DuPage facility experienced large increases in the amount of material delivered to the site - as much as 2,100 cubic yards per day, versus a peak of 800 cubic yards per day in 1990. Subsequently, DuPage County limited acceptance to 800-1,000 cu.yds. per day and restricted acceptance of non-DuPage County loads.

At this time, material from Aurora was still being accepted by DuPage County, since a portion of the City is in DuPage County. All other collected material from Kane County communities was than taken to two privately-owned facilities in DeKalb County. Higher costs were incurred by haulers and municipalities due to higher tipping fees at the DeKalb sites and increased transportation costs.

Yard waste generation dropped significantly during the 1991 summer due to climactic conditions, which allowed DuPage County to resume accepting out-of-county material. In late summer and early fall 1991, the majority of collected Kane County material was again being delivered to the DuPage County facility.

2. Regional Perspectives and Operational Review

The Illinois EPA has issued permits to 39 composting facilities in Northeastern Illinois, including 17 sites in Cook County, 2 in Kane (one never opened and Settler's Hill), 9 in Lake, 6 in Will, 2 in DuPage, 2 in DeKalb, and 1 in McHenry. Of these sites, 15 never opened or subsequently closed, 12 are small facilities accepting only local material, and 12 are larger regional facilities.

The initial composting efforts at most of the operating facilities resulted in significant odor problems. However, experience gained during the first year of operation has resulted in the odor problem being minimized at most facilities, through better mixing of incoming material, more stringent load acceptance policies, and better management of windrows.

Public concern about odors and other perceived problems (such as insects, groundwater contamination and mold) has made the siting of these facilities

increasingly difficult. Several bills were unsuccessfully introduced in the 1991 General Assembly to relax or repeal the ban on landfilling. It appears that facility operators and state officials generally feel that the experience gained during the first year is sufficient to operate these facilities in a satisfactory manner, that the early problems can and have been largely overcome, and that is likely that composting will become an established and acceptable method for managing landscape waste.

Another important issue is whether there is sufficient available capacity in the metropolitan area. There have been informal reports that large amounts of landscape waste that has been separately collected in the Chicago area is being taken to Wisconsin and Indiana landfills for disposal. Bans on the landfilling of landscape waste in those states are scheduled to take effect in 1993, which will result in a greater demand for composting capacity in the Chicago metropolitan area. In addition, it is likely that the DuPage County facility will cease operation after 1992 or 1993, in accordance with the terms of their lease with the property owner.

These capacity trends are expected to result in a number of proposals for new composting facilities in the outlying areas of the metropolitan areas. In fact, every major waste hauler serving Kane County and several independent companies have already expressed interest in establishing compost facilities in Kane County.

C. Curbside Programs

1990, while beyond the base year of this needs assessment, saw tremendous development in two recycling program areas. In the category of materials recycling, eight new curbside collection programs were begun in the municipalities of Carpentersville, Elgin, Burlington, Geneva, Gilberts, Maple Park, Hampshire, and South Elgin. Curbside programs were also initiated in the "border" communities at Algonquin, Barrington Hills, and Wayne. In addition, at least four waste haulers, Acorn Disposal, Marengo Disposal, Monarch Disposal, and Valley Sanitation, began offering curbside recycling service to their residential customers in unincorporated areas.

Several new drop-off programs were also initiated in 1990. These include municipally-sponsored programs in West Dundee and Aurora. In addition, Acorn

Disposal and Elgin-Wayne Disposal each has provided drop-off recycling bins in various locations around the County.

The first attempts in the County to provide recycling opportunities to residents of multi-family buildings were made by the City of St. Charles, which began pilot programs at two apartment complexes.

D. Commercial and Industrial Recycling

The level of recycling in businesses and industries can be estimated from the results of waste hauler and recycler surveys. A major area of recycling in the commercial sector is the collection and marketing of old corrugated containers. This material is collected separately by many waste haulers. In addition, some haulers sort through dry,commingled commercial loads to extract recyclable corrugated material. The amount of corrugated recycled by haulers in 1989 was 5,208 tons, as reported by 9 companies and conservatively estimated for two non-responding haulers.

Recycling of materials from this sector were also reported by four businesses, including two scrap dealers, and estimated for two non-responding scrap dealers. Eagle Recycling reported volumes of corrugated paper, high-grade office paper, and metals collected from the commercial sector. Euclid Beverage reported recycling some nine tons of aluminum cans from their commercial customers.

The two responding scrap dealers reported that 90 percent of their total volumes originated from businesses. The vast majority of this material is ferrous and non-ferrous metals. It is estimated that 90 percent of the scrap metal which is recycled is from large industrial generators. Therefore, recycling "centers" (businesses) collected and estimated 3,404 tons from the commercial sector and 23,070 tons from the industrial sector. Better survey techniques and response rates will be required in the future to more accurately measure recycling activity in these sectors.

The information presented in table 10 on the following page, results in total estimated recycling amounts of 8,612 tons in the commercial sector and 23,070 tons in the industrial sector.

Table 10
Summary of 1989 Recycling Amounts

Residential	
Curbside Collection:	845 tons
Recycling Centers:	6,497 tons
Landscape Waste:	5,604 tons
Subtotal:	12,946 tons
Commercial	
Waste Haulers:	5,208 tons
Recycling	3,404 tons
Subtotal:	8,612 tons
Industrial	
Recycling Centers	23,070 tons
TOTAL:	**44,628 tons**

IV. SOLID WASTE GENERATION RATES

The amount of solid waste generated in Kane County in 1989 is summarized, from information presented in preceding sections, on the following page in Table 11. The total amount of 490,820 tons is the equivalent of an 8.40 pounds per person per day generation rate. The generation rates for each sector are shown in Table 12.

TABLE 11

1989 Kane County Solid Waste Generation
(All Figures Are Tons)

A. Landfill Disposal

Sector	Kane	DuPage	DeKalb	Total
Residential	162,780	2,962	567	166,309
Commercial	117,387	5,532	33	122,952
Industrial	86,934	-	-	86,934
Construction/Demo.	62,020	34,789	27,231	-
Total:	401,890	35,725	600	438,215

B. On-Site Disposal

1. Landfilling
   Commercial: 3,502

2. Incineration
   Residential: 1,244
   Commercial: 2,672
   Industrial: 559 — 4,475

   Total: 7,977

C. Recycling

Residential:	12,946
Commercial:	8,612
Industrial:	23,070
Total:	44,628

D. Summary

Sector	Landfill	OnSite	Recycling	Total
Residential	166,309	1,244	12,946	180,499
Commercial	122,952	6,174	8,612	137,738
Industrial	86,934	559	23,070	110,563
Construction/ Demolition	62,020	-	-	62,020
Total:	438,215	7,977	44,628	490,820

Table 12

Per Capita Generation Rates, By Sector

(Pounds per Capita per Day)

Residential	3.09 pcd
Commercial	2.36 pcd
Industrial	1.89 pcd
Construction/Demolition	1.06 pcd
TOTAL	**8.40 pcd**

Figure 1, on the following page, presents the relative amounts contributed by each sector to the total county waste stream. The residential sector accounts for more than one-third (36.8%) of the total amount, while commercial generation is 28.1 percent, industrial generation is 22.5 percent, and construction and demolition debris accounts for 12.6 percent.

Figure 2 summarizes the management methods used for Kane County solid waste and shows that 89.3% of the total amount was landfill, 1.6% disposed on-site, and 9.1% was recycled.

A. Projected Waste Generation

The quantity of solid waste generated in future years can be projected from the 1989 data by considering both populating growth and growth in waste generation rates. Solid waste amounts will be projected to the year 2010, a period of 21 years.

According to forecasts by the Northeastern Illinois Planning Commission, the estimated 1989 Kane County population of 320,000 will increase to 434,000 by the year 2010. This growth represents an average annual population growth of 5,429 persons per year and a total growth rate of 35.6 percent during the next 21 years.

Franklin Associates, in their waste stream study for the U.S.E.P.A., estimate that waste generation will grow at the rate of 0.34% per year until the year 2000, when the rate will slow and remain constant. The percentage growth of population, per capita waste generation and total waste generation between 1989 and 2010 is illustrated in figure 3.

Figure 1

TOTAL SOLID WASTE GENERATED BY SECTOR

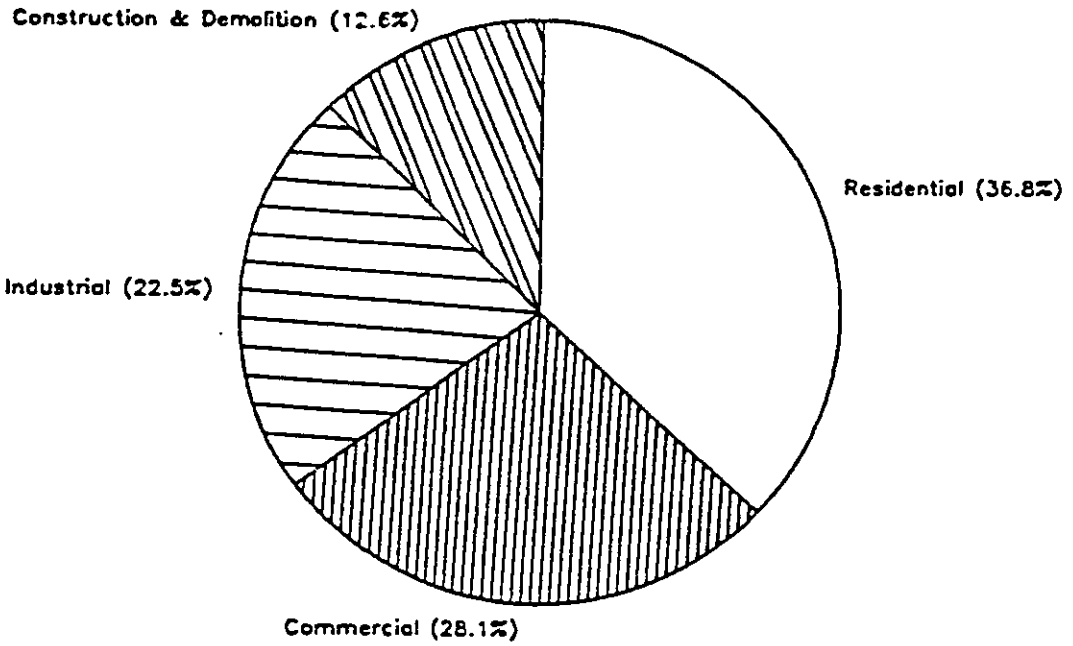

Figure 2

KANE COUNTY SOLID WASTE DISPOSITION

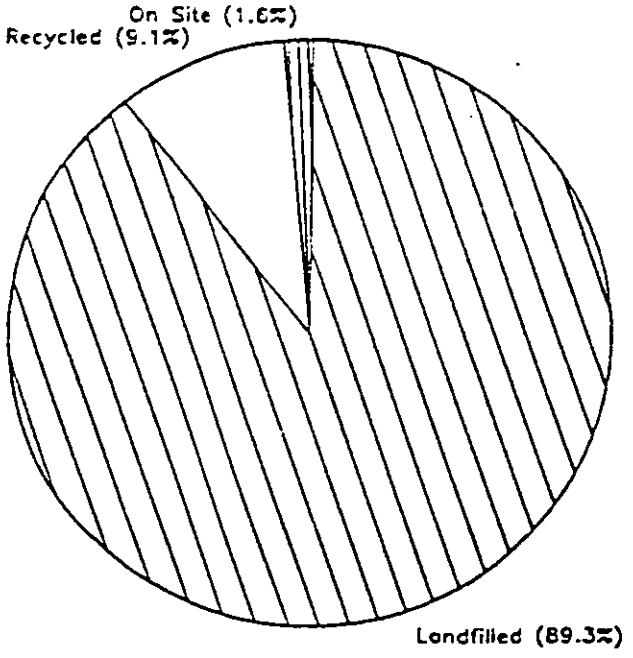

Figure 3

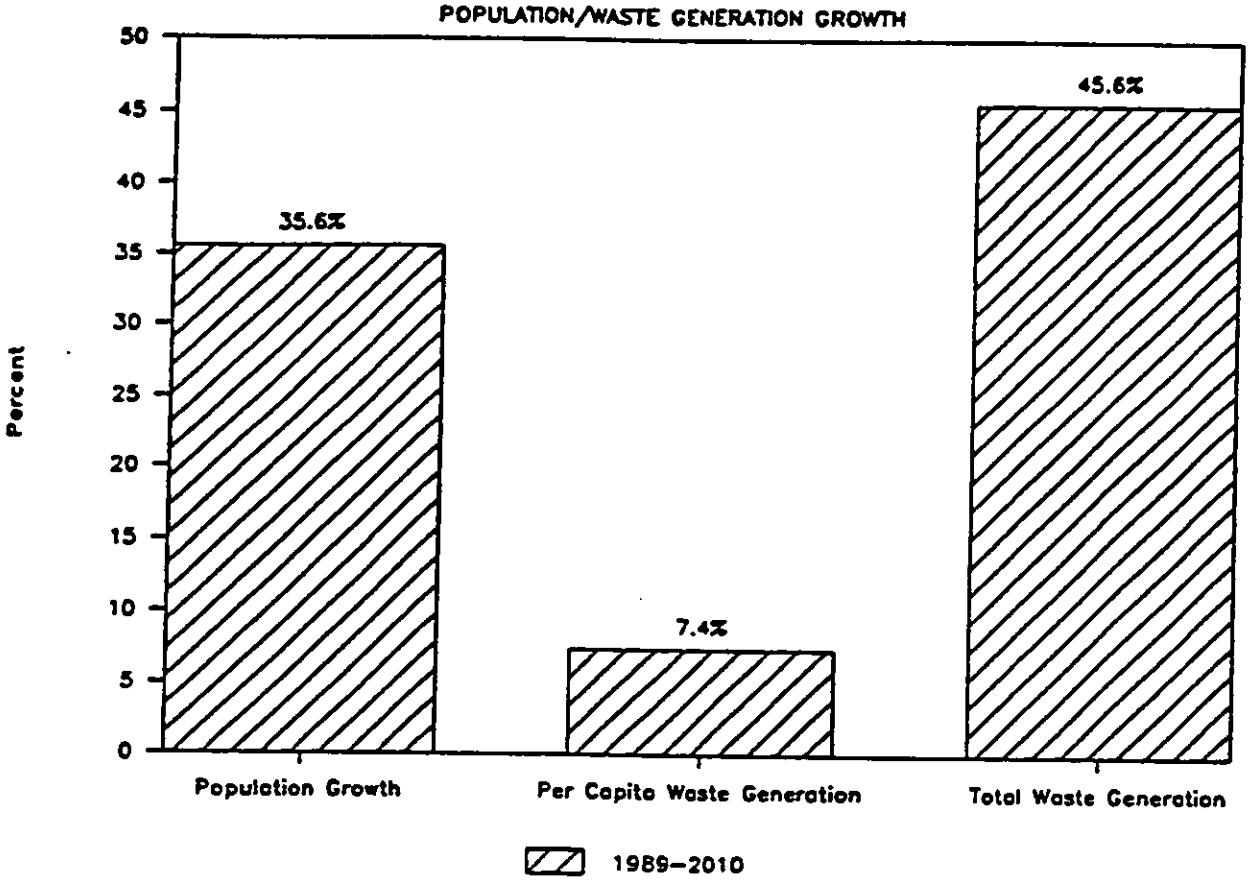
POPULATION/WASTE GENERATION GROWTH
Percent
50
45
40
35
30
25
20
15
10
5
0
35.6%
7.4%
45.6%
Population Growth
Per Capita Waste Generation
Total Waste Generation
1989–2010

Table 13

Projected Solid Waste Generation, 1989-2010

Year	Population	Generation Rate*	Total Tons Per Year
1989	320,000	8.40	490,820
1990	325,429	8.43	500,664
1991	330,857	8.46	510,827
1992	336,286	8.49	521,050
1993	341,714	8.51	530,707
1994	347,143	8.54	541,040
1995	352,571	8.57	551,430
1996	358,000	8.60	561,881
1997	363,428	8.63	572,390
1998	368,857	8.66	582,960
1999	374,285	8.69	593,588
2000	379,714	8.72	604,277
2001	385,142	8.72	612,555
2002	390,571	8.72	621,555
2003	395,999	8.72	630,193
2004	401,428	8.72	638,832
2005	406,856	8.72	647,471
2006	412,285	8.72	656,110
2007	417,713	8.72	664,748
2008	423,142	8.72	673,388
2009	428,571	8.72	682,028
2010	434,000	8.72	690,668

*Pounds per capita per day.

This growth projection, when applied to the 1989 Kane County rate of 8.40 pounds per capita per day (pcd), results in a projected year 2000 generation rate of 8.72 pcd.

As shown on the previous page, in Table 13, the effects of population and waste generation growth were combined to determine total waste amounts for future years. The total amount of solid waste is projected to increase by a total of 199,848 tons per year over the next 21 years, to a total of 690,668 tons of waste generated in the year 2010. These amounts represent a total growth rate of 40.7 percent over the next 21 years.

The amount of growth in each sector should be assumed to remain proportional. For example, in the year 2010, the residential sector should be assumed to account for the same 36.8% of the total waste stream as it does in 1989. The actual amount of growth in total solid waste amounts will be highly dependent upon actual population increases and, more importantly, general economic health.

V. WASTE STREAM COMPOSITION

An understanding of the type of materials (composition) found in the solid waste stream is important for several reasons. First, the type of materials dictates the type and extent of recycling programs which can be designed. Secondly, the type and amount of materials in a local waste stream must be considered in the design and sizing of waste-to energy incinerators, in order to determine the energy content of the solid waste fuel. Composition is also important in determining the design and viability of mixed-waste composting systems and other technologies where a portion of the waste stream may be processed and re-used in some form.

The ideal method for determining waste stream composition is to collect actual representative samples, being sure to include material from all sectors, for a twelve month period. However, an exhaustive year-long sampling program requires considerable time and financial resources. No Illinois counties are known to have undertaken such an effort. Further, the inclusive nature of results of partial sampling techniques leaves much to be desired.

The Kane County waste stream appears to be distributed among sectors in a

manner fairly consistent with other areas. There are no apparent special circumstances present, such as a disproportionate percentage of multi-family housing one or two dominating industries, or other significant specialized waste generators, which would limit the application of aggregate national data. Therefore, it appears appropriate to use existing studies of the composition of municipal waste streams.

Franklin Associates has developed well-known estimates of the type of materials which are discarded into the municipal waste stream. Studies were conducted analyzing the waste stream by weight for the U.S. Environmental Protection Agency and on a volume basis for the Council of Solid Waste Solutions. The findings of these studies are summarized in Tables 14 and 15.

TABLE 14

Estimated Volume of Materials in Municipal Solid Waste, 1986
(percent of total volume under landfill conditions)

Material	Percent
Paper	38%
Plastics	18%
Metal	14%
Glass	2%
Other	28%
Total	100%

Source: Franklin Associates, Ltd.

TABLE 14

Materials Discarded Into the Municipal Waste Stream, 1960 to 2000

(in percent of total discards, by weight)

Materials	1960	1980	1984	1990	2000
Paper and Paperboard	32.1	33.6	37.1	38.3	41.0
Glass	8.4	11.3	9.7	8.8	7.6
Metals:					
Ferrous	13.0	8.9	8.3	7.8	7.1
Aluminum	0.4	1.1	1.1	1.4	1.7
Other Non-Ferrous	0.3	0.3	0.2	0.2	0.2
Plastics	0.5	6.0	7.2	8.3	9.8
Rubber and Leather	2.2	3.3	2.5	2.5	2.4
Textiles	2.6	2.3	2.1	2.2	2.1
Wood	3.9	3.9	3.8	3.7	3.8
Food Wastes	14.6	9.2	8.1	7.7	6.8
Yard Wastes	20.3	18.2	17.9	17.0	15.3
Miscellaneous	1.7	1.9	1.9	2.0	2.1
Total:	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Franklin Associates, Ltd.

VI. RECOMMENDATIONS

Waste generation amounts, by sector and disposal method, should be thoroughly re-examined every five years in conjunction with the overall plan updates required by state law. However, additional consideration of certain portions of this needs assessment appear to be necessary prior to the five year update. These areas are described below.

A. Remaining Landfill Capacity

The erratic estimates for remaining capacities contained in the IEPA report indicate a need to more accurately determine this important information. Landfill operators should be interviewed and historical disposal data reviewed to determine both the reason for fluctuating annual estimates and reasonable and reliable estimates of actual remaining capacities at both existing landfills.

B. Modification of Gate survey Methodologies

The gate surveys conducted during 1989 and 1990 provided valuable information on the source and type of waste accepted at both facilities. Mid-summer surveys should be continued, to take advantage of the base-case information already developed. Additional gate surveys should be conducted during winter and either spring or fall seasons to gain a better understanding of seasonal variations. Also, construction and demolition debris should be added as a separate survey category, for consistency with categories presented in this needs assessment.

C. Recycling Amounts

A thorough understanding of recycling activity is obviously important, to measure progress toward both state targets and goals contained in this plan. Municipalities and waste haulers should be required to submit annual reports to the County, describing the amount of residential recycling occurring in their operations. The County should develop this methodology and, if necessary, provide training to the accuracy of this information.

The amount of non-residential recycling activity also appears to require additional attention. In addition to waste hauler reports, recycling companies, including scrap dealers, should be interviewed to determine annual recycling amounts.

Large waste generators in the commercial and industrial sectors should be surveyed directly, to better estimate the amount of materials which are recycled outside the identified network of waste haulers and county-based recycling businesses.

The County should develop an annual report on the amount of recycling activity to gauge the effectiveness of programs designed to achieve the recycling goals contained in this plan.

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APPENDIX B

WASTE REDUCTION

Prepared by:

Kane County Development Department

October 1990

WASTE REDUCTION

I. INTRODUCTION

The term "Waste Reduction" encompasses efforts to reduce the amount of solid waste that is generated and enters the waste management system. This concept is different from recycling, where waste is generated and then separated, processed and re-used. The Illinois Solid Waste Management Act refers to waste reduction as "volume reduction at the source" and assigns it the highest preference in the Act's waste management hierarchy.

A reduction in the amount of waste can have several positive effects on a waste management system. A smaller waste stream would reduce the required capacity of disposal facilities with a fixed daily capacity, thereby reducing necessary capital investments. A smaller amount of waste would also serve to extend the lifetime of disposal facilities, such as landfills, with a fixed total capacity. Waste reduction can also reduce the level of environmental impact, regardless of the type of disposal facility.

Waste reduction can be achieved by altering the behavior of both product consumers and product manufacturers. General areas in which consumer activity affects waste generation include the purchasing of products, the use of products, and the disposal of products. Manufacturers affect waste generation through decisions regarding product design and packaging.

Potential actions designed to affect the design, packaging, purchase, use, and disposal of products can be divided into three general categories:

1. Educational Efforts
2. Economic Incentives
3. Regulatory Requirements

II. CONSUMER-BASED ACTIVITIES

Product consumers in the residential, commercial, and industrial sectors can make direct contributions to waste reduction efforts through their activity regarding the purchase, use, and disposal of products.

A. Product Purchasing

Consumers can, and should be encouraged to consider the solid waste implications of their purchase decisions. Such consideration could include:

1. Can this product be re-used?

   Examples of commonly disposed items for which re-usable alternatives exist include furnace filters, writing pens, diapers, razors, rest room paper towels, coffee cups, and napkins.

2. Can this product be purchased with less packaging?

   Bulk purchases and refillable containers can reduce the amount of packaging.

3. How long will this product last?

   Are there re-usable, repairable, or more durable alternatives? If this is a one-time need, is there a rental opportunity?

4. Is this product necessary?

   Junk mail, although not "purchased", can be reduced by requesting removal from mailing lists.

Purchasing decisions also play an important role in recycling. (e.g. Is this product recyclable or does it contain recycled material.)

B. Product Use

Many products and materials can be used in a manner which results in less solid waste. Office paper provides a good example of this concept. Two-sided copying can reduce the amount of paper usage by up to 50 percent. The back of a piece of paper could be used for inter-office drafts or made into scratch pads. Computer printed draft documents can be single-spaced except, of course, for important items such as solid waste plans. Mailing lists can be carefully monitored to reduce duplicate mailings and out-dated addresses.

In some cases, products intended for one-time use may be re-used, including such items as plastic bags, wrap, and eating utensils. Manufacturing processes and shipping practices may be re-designed, in some instances, to reduce material usage.

C. Product Disposal

Decisions made at the time of disposal can also provide waste reduction opportunities: Used clothing and household goods may be donated to a charitable organizations or offered at a garage sale rather than disposed of. Excess business inventory or out-dated items can be donated to schools or other organizations.

Consumer-based waste reduction activities can have a considerable impact. A one-year pilot program conducted by Itasca County, Minnesota resulted in a 10 percent reduction in the amount of solid waste generated by the County's courthouse and Road and Bridge Department. These two departments represent 350 employees. Specific waste reduction programs included:

-Replacing rest room paper towels with cloth roll towels, waiving an estimated 1,134 pounds of waste;

-Using two-sided photocopying to save 1,060 pounds of waste;

-Replacing disposable furnace and air conditioner filters with reusable filters, saving 1,040 pounds of waste;

-Reducing duplicate mailings by sending out postcards requesting removal from mailing lists, saving 338 pounds of waste; and

-replacing disposable drinking cups with reusable ones, saving 210 pounds of waste.

The overall program reduced the annual amount of waste by some 3,782 pounds, or almost 11 pounds per employee. The actions also resulted in a $4,800 savings, primarily in the cost of air conditioner filters.

D. Recommendations

Consumer-based waste reduction efforts should be encouraged through the use of educational efforts and economic incentives. The first step in providing waste reduction is to increase consumer awareness of the need for such efforts and how it can be accomplished.

An extensive educational campaign should be conducted by the County, targeted to consumers in all sectors. Residential waste generators can be targeted through direct mail literature, school programs, public presentations, and the media.

A similar campaign should be directed toward commercial and industrial generators.

Model waste reduction programs should be established by the County in representative businesses and institutions. By providing technical, and perhaps financial assistance, the County could develop pilot programs in a government building, school, hospital, several different types of retail establishments, private sector offices, etc. The results of these model programs can then be used to encourage the widespread implementation of waste reduction programs.

As a further step in the commercial and industrial sector, waste stream audits should be provided to county businesses. The County should prepare an analysis of the costs of providing such audits, and determine whether they should be conducted by county staff, subcontracted to a third party, or provided by the private sector. The issue of voluntary versus mandatory audits should also be considered.

To further increase waste reduction awareness, a source-separation approach to recycling should be strongly encouraged. Source-separation requires waste generators to pay attention to their waste; to ask "is this recyclable or isn't it?" Recycling programs that separate materials from mixed waste at a remote facility do not allow generators to understand the waste stream for which they are responsible but rather, perpetuate the perception that once the material is "thrown away" it will be "taken care of" by someone else.

Economic incentives can have a considerable impact on consumer-based waste reduction efforts. In the residential sector, homeowners in most communities pay a flat fee for solid waste collection. This arrangement does not provide an incentive to reduce the amount of waste. It is also inequitable in that everyone pays the same price (except for senior discounts in some areas) regardless of the amount of waste they generate.

There is a trend toward viewing waste collection and disposal as a type of public utility. Waste services are provided by government either directly by municipal service or indirectly through contractual or franchise agreements. All other public utilities (gas, electric, water, telephone) charge for their services on a user-fee basis, i.e., consumers are charged for the amount of the service they use.

A volume-based billing approach to solid waste services has been successfully demonstrated in many Illinois communities, including St. Charles, Woodstock, Downers Grove, and Wheaton. In these programs, homeowners pay a set amount for each container set at the curb for collection and disposal. Curbside recycling is provided at no apparent charge to the homeowner, although the cost of recycling is built into the per-container fee. With this approach, homeowners have a direct financial incentive to reduce the amount of waste they place at the curb for disposal.

It has been demonstrated that recycling participation rates are higher in those communities with a volume-based refuse billing system. Actual waste reduction results from such programs have not yet been fully documented. A one week residential refuse weighing study conducted in March 1990 in McHenry County found a reduction in refuse disposal, although it is not clear if that reduction is due to increased recycling or waste reduction.

The McHenry study weighed refuse in six towns - two with volume-based billing and curbside recycling, two with flat-rate billing and curbside recycling, and two with flat-rate billing and no curbside program. The study results are summarized in Table 1.

Table 1

Analysis of McHenry County Refuse Weighing Study Results

Billing Method	Curbside	Pounds of Refuse per Household per Day
Volume-Based	Yes	4.96
Flat-Rate	Yes	6.08
Flat-Rate	No	7.30

Refuse amounts in flat-rate towns with curbside recycling were 16.4% less than in flat-rate towns without curbside recycling. Refuse amounts in towns with

volume-based billing and curbside were 18.4% less than in flat-rate towns with curbside. Whether the effect is do to increase recycling, waste reduction, or some combination of the two, it appears clear that volume-based billing approaches result in a considerable reduction in the amount of waste placed at the curb for disposal.

Waste generators in the commercial and industrial sectors are currently billed for waste disposal services based on the size of their disposal containers and frequency of collection. Therefore, less waste generation due to waste reduction and/or recycling would result in either the use of smaller containers or less-frequent collection. In either case, the establishment would benefit from lower refuse costs.

III. MANUFACTURER-BASED ACTIVITIES

Product manufactures can, to some extent, reduce the amount of solid waste produced by their products by addressing two general areas, the design of products and the packaging of products.

A. Product Design

Several design factors influence the eventual disposition of products. These factors include durability, repairability and recyclability. An additional design factor - recycled content - is an important component of providing markets for materials collected in recycling separation programs. Products which are more durable, repairable, or recyclable will result in lesser amounts of solid waste.

It is believed that manufacturers will modify the design of their product in order to minimize impact of the waste stream, in response to both market demand for such

products and government regulation. To encourage such a shift, consumers in all sectors should be educated about the benefits of improved product design.

B. Product Packaging

According to a recent study by Franklin Associates, packaging accounts for 34 percent of the municipal solid waste stream, on a volume basis. The growth in the amount of packaging has created concern about excessive packaging and its impact on waste quantities. Excessive packaging can be defined as any packaging not necessary to prevent tampering or spoilage, or to appropriately contain the product.

Bans on certain types of packaging have been imposed by various jurisdictions across the country. The most common material targeted is polystyrene, particularly in the form of foam cups and fast-food containers. The State of Maine recently banned the sale of aseptic packaging such as juice boxes.

Unfortunately, packaging bans can be counter-productive. Restrictions on a given material may result in the substitution of another material which requires greater disposal capacity than the original. Also, many observers believe that a patchwork of local, state, and federal restrictions will result in higher product costs as manufacturers struggle to satisfy different requirements in different areas.

C. Recommendations

Educational efforts should be targeted to consumers in all sectors, increasing their awareness of the impact of product design and packaging on the volume of solid waste. Procurement practices should be evaluated and, where appropriate, modified to encourage the purchase of materials which are more durable, repairable, contain

recycled materials, or minimize the use of packaging.

Regulatory restrictions on the sale of products with an inordinate impact on the waste stream should be considered carefully by state and federal governments. Where appropriate, the County should actively support the introduction and approval of such legislative proposals.

The County should give full consideration to providing support, in terms of technical and financial assistance, to local businesses' efforts to modify their product design and packaging use so as to reduce their impact on solid waste management systems.

IV. QUANTIFICATION OF WASTE-REDUCTION EFFORTS

The impact of programs designed to promote waste reduction can be estimated by monitoring trends in the combined amount of waste disposal and recycling volumes. If this combined amount, after adjustments are made for changes in population and employment, decreases, the decrease in waste volume may be attributable to reduction efforts. However, most estimates of the potential impact are in the range of one to five to ten percent.

With this level of uncertainty in the accuracy of calculations, it appears that existing methodologies may be unable to accurately assess the relatively small impact of waste reduction efforts. Therefore, there appears to be no basis for the selection of an arbitrary, and essentially unmeasurable numerical goal for waste reduction efforts.

V. PROGRAM COSTS

The extensive educational efforts recommended above will require the staffing of an office devoted to providing information and advocating appropriate waste reduction practices. Additional resources may be required at some future point, if and when the County proceeds with waste reduction audit programs and financial assistance programs for local businesses, as outlined above.

Staffing levels for initial educational efforts should consist of one full-time professional position and a half-time clerical position, with an estimated annual cost of $40,000. The development, printing, and distribution of materials is estimated at $60,00 for the first year. Other expenses, such as travel and supplies, are estimated at $15,000, resulting in a total program cost of $115,000 for the first year.

Educational campaigns targeted at waste reduction and recycling efforts will complement one another and should be coordinated. However, given the importance of waste reduction efforts as demonstrated by their placement atop the state hierarchy, education programs for waste reduction should be considered separately from other related activities.

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APPENDIX C

RECYCLING PROGRAM PLAN

Prepared by:

Kane County Development Department

October 1990

RECYCLING PROGRAM PLAN

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I. INTRODUCTION.

Recycling is defined in the Illinois solid Waste Planning and Recycling Act as "any process by which materials that would otherwise become municipal waste, including but not limited to metals, glass, paper, leaves and plastics, are collected, separated or processed and returned to he economic mainstream in the form of raw materials or products."

The Act requires that each county waste management plan adopted in accordance with the Act shall include a recycling program. Such recycling program:

(1) shall be implemented throughout the county and include a time schedule for implementation of the program.

(2) shall provide for the designation of a recycling coordinator to administer the program.

(3) shall be designed to recycle, by the end of the third and fifth years of the program respectively, 15% and 25% of the municipal waste generated in the county, subject to the existence of a viable market for the recycled material.

(4) may provide for the construction and operation of one or more recycling centers by a unit of local government, or for contracting with other public or private entities of the operation of recycling centers.

(5) may require residents of the county to separate recyclable materials at the time of disposal or trash pick-up.

(6) may make special provision for commercial and institutional establishments that implement their own specialized recycling programs, provided that such establishments annually provide written documentation to the county of the total number of tons of material recycled.

(7) shall provide for separate collection and composting of leaves.

(8) shall include public education and notification programs to foster understanding of and encourage compliance with the recycling program.

(9) shall include provisions for compliance, including incentives and penalties.

(10) shall include provisions for (i) recycling the collected materials, (ii) identifying potential markets for at least 3 recyclable materials, and (iii) promoting the

use of products made from recovered or recycled materials among businesses, newspapers and local governments in the county.

(11) may provide for the payment of recycling diversion credits to public and private parties engaged in recycling activities.

Although recycling has received much public attention during the last 2-3 years, this activity has occurred, in various forms, for hundreds if not thousands of years. During this century alone, recycling has gone through several phases, from the "ragman" who would collect used textiles in one of the earliest curbside programs to extensive multi-material efforts during World War II. After the war, newspaper drives began to collect material for various causes. The first "Earth Day" in 1970 led to the creation of numerous drop-off centers, which provided the basis for many of today's efforts in response to the perceived "garbage crises". Throughout all of these phases, scrap metal was steadily being "salvaged: and re-used as an industrial feedstock.

Each of these recycling phases were the result of distinct motivations. Rag collection, paper drives, and scrap metal salvage all resulted from direct or indirect economic motivation. War-time efforts were conducted in response to a national security threat. Current recycling efforts are clearly a response to heightened environmental concerns. Rather than producing financial gain or helping to win the war, the current phase exists to reduce the amount of waste, thereby lessening environmental impacts.

Current recycling programs are intended to divert as much material as possible from waste disposal facilities, in order to reduce the need for those facilities and reduce their impact on the environment. The amount of diversion attainable by recycling efforts is directly related to two key factors: the level of participation by waste generators and the availability of end-use markets for the separated material.

Participation levels are affected by four considerations: education, convenience, economics and mandatory participation requirements. Waste generators must first be made aware of why they should recycle and how to participate (what materials, where, when, etc.). To achieve maximum participation, programs must be convenient to the waste generator. Next, the cost of recycling programs must be

acceptable. For example, the current range of costs for curbside collection, $1.00 to $2.50 per household per month, has been accepted by residential waste generators. However, if these costs rose high enough , say to $20 per month, the public would likely demand that the program be reconsidered. Finally, participation can be mandated with approaches ranging from citations and fines for non-compliance to suspending garbage collection if recyclables are not separated.

The amount of waste diverted by recycling programs is also dependent on the type and number of materials collected. Residential curbside programs which collect only newspaper, glass, and aluminum will have a lower diversion rate than programs which, in addition to he three basic materials, also accept corrugated paper, high grade and mixed paper, and plastic containers. Regardless of which materials are targeted, end use markets must exist of those materials. If markets are not available, collected material will be sent to disposal facilities, thus undermining the entire program.

A successful recycling program, whether it serves the residential, commercial, or industrial sector, will address each of the following elements.

1. Separation. Recyclable materials must be separated from non-recyclable waste either at a point of generation (source separation) of after commingled collection has occurred (post-collection separation). Whenever possible, this plan will recommend programs which rely on source separation, for reasons discussed in the waste reduction report.
2. Collection. Recyclable materials must be collected, either separately or commingled with non-recyclable materials.
3. Primary Processing. Most recyclable materials, once separated from the waste stream, must undergo some type of processing, such as removing contaminants, separating glass by color or plastics by resin type, prior to shipment to end-users. In some cases, secondary processing is required. For example, once plastic containers are separated by resin type, they may be sent to an intermediate facility to be flaked, pelletized, or otherwise to readied for end-users.

4. Remanufacture and Re-Use. As stated earlier, markets must exist for the collected materials and in turn, these markets must have a sufficient demand for their final products (which contain recycled material for the recycling loop to be completed.

This report will identify recycling opportunities in each major sector of the waste stream, including the residential, commercial, institutional and industrial sectors, and for construction and demolition debris and other miscellaneous materials. The diversion potential and costs of each recommended program will be estimated and implementation strategies will be discussed. The report will conclude with a summary of the costs and benefits of all programs and an implementation schedule.

II. RESIDENTIAL SECTOR.

A. Single Family Residences.

Curbside recycling programs are currently provided to single family homes (and generally 2-4 unit dwellings) in 11 of the 19 municipalities located primarily in Kane County. (see Table 1). Curbside programs are also operating in three municipalities (Algonquin, Barrington Hills, and Wayne) which abut and extend into the County.

These existing programs serve an estimated 44,244 households. Except for the three programs which began in 1989 (East Dundee, Sleepy Hollow, and St. Charles), little data is available on the participation rates and the amount of material collected, because of their newness. Reported monthly participation rates range from about 75% in Elgin to 95% in St. Charles. A study of 18 Chicago-area curbside programs conducted by the Illinois Department of Energy and Natural Resources (ENR) found that participation ranged from 63 to 96 percent, with an average of 76 percent.

Table 1

Summary of Existing Curbside Programs

Municipality	Number of Households	Start Date	Materials Accepted
Algonquin	633	1990	N/A
Barrington Hills	48	1990	A, G, N
Burlington	140	1990	A, G, N, T
Carpentersville	5,784	1990	A, G, N, T
East Dundee	877	1989	A, G, N, T
Elgin	20,000	1990	A, G, N, T
Geneva	4,214	1990	A, G, N, T, MJ, PET
Gilberts	300	1990	A, G, N, T
Hampshire	523	1990	A, G, N, T
Maple Park	200	1990	A, G, N, T MJ, PET, MP
Sleepy Hollow	1,200	1989	A, G, N, T
South Elgin	2,042	1990	A, G, N, T
St. Charles	8,020	1989	A, G, N, T, MJ
Wayne	263	1990	N/A

Materials Accepted:

A - Aluminum cans
G - Glass
N - Newspaper
T - Tin/Steel Cans
MJ - Milk Jugs
PET - Plastic Soda Bottles
MP - Mixed Paper

St. Charles has reported that their program collects and average of 39 pounds per household per month. The ENR study found an average amount collected 50 pounds per household per month, with a range of 28 to 66 pounds. using a conservative figure of 40 pounds per household per month, the existing municipal curbside programs are diverting and estimated 10,563 tons of waste per year.

The County should provide technical assistance to the eight communities without curbside programs to strongly encourage their implementation. This level of

activity would result in an additional 9,684 tons of material recycled each year. Once basic curbside service is provided to all single-family households in incorporated areas, higher participation rates and per household volumes can be achieved in at least three ways.

First, increased educational efforts can encourage more homeowners to participate, and urge existing participants to be more thorough in their efforts. Random discussions indicate a substantial amount of confusion about which materials can be recycled. A common example is people not recycling glass because they believe, erroneously, that paper labels must be removed.

Second, municipalities should be strongly encouraged to implement volume-based billing systems for refuse collection. As discussed in the waste reduction report, this approach provides a direct financial incentive to recycle and has been demonstrated to result in significantly higher recycling participation rates.

Third, existing programs should be expanded by accepting additional materials such as plastics (starting with dairy and soda bottles and eventually including all plastic containers) and other types of paper besides newspaper (such as corrugated paper and mixed paper). In addition, the collection of used clothing and other household items by charitable organizations can be coordinated with curbside pick-ups to significantly increase the amount of these materials diverted. A reasonable goal for the impact of these curbside enhancements would be to increase the amount of material from the existing 40 pounds to 60 pounds per household per month. This level would increase the amount of material diverted by municipal curbside programs by and estimated 10,124 tons per year.

B. Unincorporated Areas

Practically all of the housing located in unincorporated areas consists of single-family residences. Several local haulers have already established voluntary curbside programs in these areas. These existing programs serve an estimated 3,600 households, or 24 percent, of the estimated 15,106 residences in unincorporated areas. Unincorporated areas are also served by several drop-off facilities. These facilities may be limiting participation in curbside programs since they provide a free

alternative to the typical $1.50 monthly charge for curbside service.

The County should encourage all haulers serving unincorporated areas to introduce or expand curbside collection. These areas may present some difficulties due to the lack of governmental regulation of waste haulers. If program results do not approach the results demonstrated in municipalities, the County should either work with Townships to provide regulation of these matters of investigate the legality of a direct County role. If one assumes that full-service curbside programs are provided to 75 percent of unincorporated households, the amount of material diverted would be an estimated 4,079 tons per year.

C. Multi-Family Residences.

Multi-family buildings with more than four units are typically not included in municipal refuse contracts, but contract individually with waste haulers for collection service. To date, the only recycling option for multi-family residents is to take their material to drop-off centers. The inherent inconvenience of this approach severely limits the amount of material diverted.

A better approach to multi-family recycling may be to provide either on-site compartmentalized recycling bins (essentially mini drop-off centers) or curbside service, depending on building size. Pilot programs testing such approaches have been conducted in several areas. Results of these programs are listed in Table 2.

Table 2

Results of Pilot Multi-Family Recycling Programs

Locations	No. of Buildings	No. of Units	Pounds Per Unit Per Month
Melbourne, FL	5	614	35.8
Prince George's Co.	15	N/A	17.2
Hyde Park, Chicago	N/A	N/A	27.6
Tukwila, WA	2	240	33.3
Average			**28.5**

If programs such as these were provided to 90 percent of the County's 27,675 multi-family dwelling units, with a collection rate of 230 pounds per household per month, the total amount diverted would be 4,483 tons per year.

Multi-family programs are not nearly as well understood as single-family programs. Accordingly, the County should first identify interested municipalities and haulers and support the initiation of local pilot programs to collect data on the relative success of various approaches, potential diversion amounts, and program costs. Once successful approaches have been identified, the County should disseminate that information to municipal officials and building owners.

If voluntary efforts do not become widespread, the County should assist municipalities in developing regulations mandating the establishment of these programs. Such requirements could be tied to existing regulatory mechanisms, such as non residential waste hauler licensing.

D. Drop-Off and Buy Back Programs.

In 1989, an estimated 6,497 tons of residential waste were recycled at drop-off and buy back facilities. Although drop-off centers are inherently inconvenient, many residents have patronized these facilities since they provide the only available recycling opportunity to many people. As curbside and multi-family programs become established, the need for drop-off facilities will lessen.

Even when widespread convenient programs are established, a small percentage of residents will continue to take certain recyclable items with value, such as aluminum cans, to commercial buy back facilities. The amount of material collected in this manner, and through a few remaining drop-offs, is estimated to be 3,248 tons per year, or about one-half of current levels.

III. COMMERCIAL AND INSTITUTIONAL SECTOR.

The Assessment of Solid Waste Needs estimates that a total of 8,612 tons were recycled in this sector during 1989. This existing activity includes the recycling of old corrugated containers (OCC) by waste haulers, some office paper recycling programs, and other scattered efforts.

It is generally recognized that there is considerable potential for increased recycling levels in this sector. For example, local haulers estimate that their existing OCC recycling efforts capture only 15 percent of the available material. Multi-material office recycling programs are just beginning to be established. The collection of glass from local bars and restaurants has not yet been attempted.

Much like multi-family programs, there is a general lack of data on the design and effectiveness of commercial recycling programs. As a first step, the County should support the establishment of pilot programs in a wide range of business and institutions. The results of these model programs could then serve as the basis of an extensive educational effort to encourage the establishment of more programs. It is not commonly recognized that commercial waste generators require the same type of education as homeowners-why recycling is important, what materials are recyclable, and who to contact to get started. Since they already pay for refuse collection based on the amount of waste generated, businesses and institutions should be made aware of avoided refuse costs that can be realized by recycling.

The County should also investigate the feasibility of providing waste stream audits to commercial establishments and institutions. Audit results serve as a method of education for waste generators. These audits should be coordinated with the audits recommended for waste reduction activities.

If extensive educational efforts are not successful in spurring the establishment of commercial programs, the County should work with municipalities to investigate making recycling efforts a condition for receiving business or liquor licenses.

Particular emphasis should placed on establishing programs in public institutions such as schools, government offices, hospitals, and parks. The high level of public usage of these facilities provides an excellent opportunity to reinforce recycling behavior in residences and businesses and to demonstrate the level of government commitment to recycling efforts.

Since the potential effectiveness of commercial recycling programs is not yet well understood, it is practically impossible to accurately assess the amount of this waste stream that can be recycled. Given the absence of detailed information, a

waste stream that can be recycled. Given the absence of detailed information, a reasonable approach may be to set a percentage recycling goal equal to the percent of the residential waste stream targeted for recycling, excluding landscape wastes. This goal should then be refined as more information becomes available, perhaps in conjunction with the solid waste plan updates required by law every five years.

VI. INDUSTRIAL SECTOR.

The industrial waste stream presents special challenges to the design of comprehensive recycling programs. Unlike the residential and commercial sectors, the type of waste generated depends on the manufacturing process at a particular facility.

Statutory definitions and IEPA policy currently exclude industrial process waste from consideration as "municipal waste." Recycling of this material, such as scrap metal from machining, lathe, and tool and die operations, cannot be counted toward meeting state recycling goals. However, industrial waste accounts for an estimated 22.5% of the material delivered to landfills in the County, and should be addressed as part of a comprehensive recycling program.

An estimated 23,070 tons of material, primarily scrap metal, were recycled in the industrial sector in 1989. As discussed in the Assessment of Solid Waste Needs, additional information is needed to more fully understand the current level of recycling activity in this sector. A representative sample of County industries should be surveyed at the earliest possible date to more accurately determine waste stream composition and recycling potential.

The industrial waste stream is believed to contain significant quantities of at least two recyclable materials: old corrugated containers and wood in the form of pallets and packing crates. Programs exist, or can be readily developed for each of these materials. Like the commercial sector, insufficient information is available to assess the recycling potential in this sector. A recycling goal proportionate to the relative recycling levels in the residential and commercial sectors should be established for the industrial sector.

Several types of educational efforts can be employed to encourage increased

recycling efforts by local industries. For example, County staff should make manufacturers aware of the availability of two existing services offered by state agencies:

1. The Industrial Materials Exchange Service (IMES), operated by the IEPA, provides a monthly listing of industrial process materials which are available from or wanted by companies throughout the midwest. Buying or selling material through this network can result in both disposal diversion and cost savings.
2. The Hazardous Waste Research and Information Center (HWRIC), a division of the Illinois Department of Energy and Natural Resources, offers waste audits and grants for waste reduction efforts to state businesses.

Other educational efforts should be developed after additional information is gathered on the industrial waste stream. The efforts could include the establishment of model recycling programs.

V. LANDSCAPE WASTE

Kane County faces two major issues related to management of landscape waste: (1) how to ensure adequate capacity for the management of material generated within the County, and (2) how to respond to anticipated proposals for the development of private composting facilities in the County which may accept potentially large amounts of out-of-county landscape waste.

Available data indicates that an estimated 60 percent of all landscape waste generated in the County does not enter the waste stream, but is handled on-site by property owners. The County should strongly encourage the continuation and expansion of these waste reduction efforts by continuing public education on the benefits of backyard composting, the non-collection of grass clippings, and other mulching techniques. The County should also strongly encourage all municipalities to adopt volume-based billing systems, which provide generators with a direct financial incentive for on-site management.

It is likely, however, that substantial amounts of landscape waste will continue to be collected and require centralized management. The two recognized approaches to handling this material are direct land application and aerobic composting, using windrow techniques.

Direct land application has been demonstrated as an effective technique for handling moderate quantities of leaves. However, several concerns about this strategy have not yet been resolved, including the effects of repeated applications of this material on soils, and whether large quantities of grass clippings can be successfully applied. Also, the logistics of coordinating a County-wide land application system, which would require centralized shredding of the collected material, followed by re-transportation to application sites would likely be extremely burdensome.

In accordance with development trends observed throughout Northeastern Illinois, it appears that centralized composting facilities are required to effectively manage the amount of landscape waste which is locally produced.

There are three approaches available to the County for the development and operation of composting facilities: (1) private ownership and operation. (2) public ownership and private operation; and (3) public ownership and operation. These three approaches can be evaluated by considering five different factors, as presented in table 3.

Table 3

OWNERSHIP AND OPERATION

	Private	Public/Private	Public
Facility Control	Med.	High	High
Flow Control	Low	Low-Med	Low-Med.
Cost to County	Low	Medium	High
Revenue	None	Low-Medium	Low
Risk	Low	Medium	High

1. Facility Control: The County would have some control over the operation of private facilities through the use of stipulations to the special use zoning permit. The County would have much greater control over a county owned and/or operated facility.
2. Flow Control: The County can limit the use of a County-owned facility to only in-County users. However, if that approach were taken, private facilities would likely be proposed to handle landscape waste from other counties. It does not appear that the County has the authority to prohibit private facilities from accepting material from other Counties.
3. Cost to the County: Capital and operating costs incurred by the County are directly-related to the level of involvement in the facility, ranging from no cost for a private facility to high costs for a publicly owned and operated facility.
4. County Revenue: Compost facilities do not generate large amounts of net revenue. However, the County could generate moderate revenues by levying a volume-based surcharge on incoming material at a County-owned facility.
5. Investment Risk: The level of risk is directly related to the amount of the investment made by the County, with the highest risk occurring in a county owned and operated facility. Potential difficulties include diversion of material to a lower-priced competitor; facility closure for environmental reasons; or unforeseen changes in state legislation.

It is recommended that the County pursue the public ownership/private operation approach for development of landscape waste composting facilities. This approach will provide a high level of certainty for municipalities and other landscape waste generators in the County that facilities will be available for the proper handling of this material.

The facilities should be located so that they are convenient to the sources of landscape waste. The number of facilities will be dependent on the availability of

centralized locations. Facility development should be scheduled so that operation begins in the fall season, to insure proper mixing of materials and to maximize the efficiency of the composting process.

VI. CONSTRUCTION AND DEMOLITION DEBRIS

Construction and demolition (C/D) debris consists primarily of wood, wall board, shingles, concrete, brick, and asphalt. The Needs Assessment estimates that in 1989, 62,020 tons of this material was disposed in landfills. This amount represents 12.6 percent of the total waste stream.

Most of this material can be reused or recycled. Old asphalt pavement can be ground or melted, mixed with new aggregate and binders and used as a road base or surface material. Mixtures of asphalt and glass or rubber are also being tested to determine their resilience and durability. Concrete can be crushed and substituted of aggregate. Old bricks are in many cases, already being reused for decorative and other purposes.

Wood waste processing facilities are beginning to be established across the country. Wood may comprise about 20 percent of C/D volumes. In addition, these facilities usually accept pallets, crates and other wood waste. The chipped wood can be uses as mulch, as a bulking agent for composting sewage sludge, as fuel, and for the manufacture of new wood products.

Wood waste can be either source-separated or hand-separated from other C/D debris at a processing facility. Lumber which has been creosoted, pressure-treated, or covered with lead paint is generally not processed because of environmental concerns. Nails and other ferrous metal can be removed with magnets during the processing.

The County should closely monitor developments in this area. The actual amount of C/D debris should be more accurately determined by improved survey techniques. At least one pilot program should be established to gain direct experience in this area. Once separation and processing techniques and potential end-uses are better understood, the County should consider a ban on the disposal of any C/D debris

addition, capital and operating costs would likely exceed any revenues produced through the sale of materials, requiring that the facility charge a tipping fee.

Several local waste haulers, including Fox Valley and Elgin-Wayne Disposal, Speedway, and Monarch Disposal have already begun development of processing facilities to handle materials which they collect. Given the existing level of private sector involvement and the level of uncertainty of the economies of processing facilities, the County should not consider the development of centralized processing plants but should encourage private sector efforts in this area.

IX. MATERIAL MARKETS.

The existence of end-use markets for any collected material is essential to the success of any recycling program. Considerable concern exists as to the availability of markets for materials being collected. Specifically, the issue is whether there is sufficient market demand for the increased supply of materials being collected across the country. This issue is best addressed on a material-by-material basis.

Sufficient market capacities appear to exist for aluminum, ferrous metal, and glass. Aluminum cans and glass containers are typically recycled back int their original form. Scrap ferrous metal is reused as a raw material in the steel industry. To date, end-users have been able to accept all the material that has been collected. This existing capacity is widely-believed to be able to handle any future increased in recyclable supply.

For paper, end-use markets vary with the grade of paper being recycled. Markets for old corrugated containers, while somewhat dependent on export markets, appear to be fairly stable and able to accept additional volumes. The market situation for old newspapers (ONP) appears to be improving. According to the American Newspaper Publishers Association (ANPA), only 9 of 65 existing newsprint mills in the U.S. and Canada currently produce recycled newsprint. However, 16 additional paper mills are being constructed, converted, or expanded to handle ONP. The ANPA estimates that recycled newsprint production will increase from 1.5 million tons in 1989 to more than five million tons in 1992. Market capacity for recycled high-grade

office paper has also been increasing in response to the increased supply of this material.

Plastics recycling is a relatively new concept and as such, markets for this material are not as established as those for other materials. Adequate market capacity appears to exist for high-density polyethylene (milk jugs and laundry detergent bottles) and polyethylene terephthalate (soda bottles). Market capacity is just beginning to be developed for other types of plastics such as polystyrene, polypropylene, and polyvinyl chloride.

A common misconception is that market demand does not exist or is weak because prices are low. This misconception is based on the outdated idea that revenue from the sale of recycled materials should equal or exceed the cost of operating a recycling program. In actuality, most new recycling programs, such as curbside collection, have a net cost which is assessed to program users.

Market capacity has generally been sufficient to meet the supply of material produced by recent recycling programs. Furthermore, industry is responding to the increased supply of their materials by creating additional capacity. To maintain this momentum, the demand for products made from recycled materials must continue to expand.

The County can and should encourage increased demand for recycled-content products in several ways. The County should adopt procurement policies which require the purchase of recycled-content products wherever practical. Bidding practices should be reviewed and reasonable preferential pricing strategies considered for recycled-content goods. Shared purchasing practices between the County and other units of government may result in lower unit costs by increasing the size of orders.

The County can also encourage recycled procurement in other governmental bodies and the private sector through educational efforts. These efforts should include an explanation of why recycled procurement is important and source listings of available recycled products. Recognition programs for organizations which demonstrate leadership in this area should also be considered. Recycled product

purchase should also be emphasized in any consumer-oriented educational programs.

The County should strongly support the enactment of appropriate market-related legislation on the state and federal levels. In addition, the County should work with local manufacturers to encourage their use of recycled materials in their operations. Local usage of these materials would help stabilize material markets and serve as a potential local economic development opportunity.

X. SUMMARY OF PROPOSED PROGRAMS

A. Diversion Impact

The diversion potential of the various programs outlined above are presented in Table 4. Residential programs can be expected to collect some 42,181 tons of recyclables per year. This amount equals 33.0 percent of the residential waste stream, excluding landscape waste. As discussed earlier, recycling goals for the commercial and industrial sectors should be proportionate to residential sector goals. Therefore, recycling targets of 33.0 percent have been set for these two sectors. The recommended programs in all sectors will recycle a total of 231,948 tons per year, or 47.3 percent of the amount of waste generated in 1989.

Although the estimated amount of material recycled in 1989 was only 9.1 percent of the total waste stream, estimated recycling levels for 1990 are 18.0 percent. This increase is due to the number of curbside programs started during 1990, and the effect of the July 1, ban on landfilling of landscape waste. If the total 12 month impact of the landscape waste ban is considered, existing programs are diverting 108,057 tons of material, or 22.0% of the total waste stream.

Table 5 shows existing recycling levels and goals for each sector. Existing recycling efforts have achieved almost half, 46.5 percent, of the recommended overall recycling goal of 47.3 percent of the total waste stream. Although existing programs make the overall goal seem within easy reach, the law of diminishing returns applies here. It is expected that the implementation of future programs will require significantly more effort than did already existing programs. An implementation schedule for the proposed programs is presented later.

Table 4
Summary of Diversion Potential For
Recommended Recycling Programs

Sector	1989 Generation (tons)	Recycling Goal (tons)	Recycling Goal (percent)
Residential:			
Existing Curbside Programs:		10,563	
New Curbside Programs:		13,763	
Enhanced Curbside Collection:		10,124	
Multi-Family Programs:		4,483	
Recycling Centers		3,248	
Subtotal:	127,983	42,181	33.0%
Commercial:	124,609	41,121	33.0%
Industrial:	110,563	36,486	33.0%
Landscape Waste:			
Existing Programs:		59,315	
"Exempt" Material:		6,330	
Subtotal:	65,645	65,645	100.0%
Construc./Demo.	62,020	46,515	75.0%
TOTAL:	**490,820**	**231,948**	**47.3%**

Table 5

Summary of Existing and Propose Recycling Activity
Recycling Activity

ector	1989 Waste Generation (tons)	1989 Tons	1989 %	1990 Tons	1990 %	Goal Tons	Goal %	Percent of Goal Achieved by 1990
esidential	127,983	7,342	5.7	17,060	13.3	42,818	33.0	40.3%
ommercial	124,609	8,612	6.9	8,612	6.9	41,121	33.0	20.9%
ndustrial	110,563	23,070	20.9	23,070	20.9	36,486	33.0	63.3%
andscape Waste	65,645	5,604	8.5	39,735	60.5	65,645	100.0	90.4%
/D Debris	62,020	--	--	--	--	46,515	75.0	0.0%
OTALS:	**490,820**	**44,628**	**9.1%**	**88,477**	**18.0%**	**231,948**	**47.3%**	**46.5%**

Includes 12 month contribution of landscape waste programs, not just the six months which actually occurred in 1990.

2. Economic Impact.

The variety of existing residential and commercial recycling programs makes generalizations of program costs extremely difficult. Residential curbside programs typically cost from $1.50-2.00 per household per month although in volume-based billing programs (such as St. Charles), the cost of recycling is hidden in the per-container charge. In the commercial sector, corrugated and office paper recycling has generally been conducted with a net return to the participant.

It is believed that most future programs in all sectors will require additional charges, beyond current collection charges. The collection of recyclables from multi-family housing and small commercial generators will involve equipment and operating costs that will undoubtedly exceed the market value of the collected material.

The current average residential refuse service cost of $8.34 per household per month equates to a cost of about $65.00 per ton of waste using estimated residential generation rates. Curbside recycling charges of $1.50 - $2.00 per month equates, assuming 40 pounds of material per household per month, to $75. - 100.00 per ton. Curbside recycling service, given these costs, results in an 18-24 percent increase in the total cost of residential refuse service. These higher costs have been accepted by residential generators. Apparently, the perceived environmental benefits justify the extra cost, although that cost is a relatively insignificant fraction of most household budgets.

Insufficient information exists to accurately predict the cost of the new recycling programs recommended earlier. It is believed that if the incremental costs of the new programs are reasonable, say no more than 10 - 20 percent, educational efforts which focus on the environmental benefits of such programs will be able to justify the costs. However, costs of any new programs must be carefully monitored, and programs designed to minimize extra costs, so that the costs do not exceed the actual or perceived benefits of the programs.

The recommended new programs will create new opportunities for both existing refuse-related companies and new ventures. Positive local economic impacts will result from new employment opportunities and purchases of equipment and other supplies.

C. Environment and Energy Impacts

Environmental benefits from recycling accrue in two ways. First, recycling reduces the amount of material handled by disposal facilities and therefore reduces the environmental impact of those facilities. Second, recycling reduces the amount of raw material required for product manufacture and also reduces the environmental impact of manufacturing processes. For example, producing recycled paper reduces water usage at the mill by 60% and cuts air and water emissions by 95 percent. Steel recycling, when compared with steel production from ore, reduces air and water pollution by 70 percent at the mill.

Recycling also significantly reduces the amount of energy used in product manufacturing. Energy savings range form 70 percent for making paper from recycled feedstock to 25 percent for glass containers to 95 percent of the re-smelting of aluminum. Energy savings for selected materials are shown in Table 6.

Table 6

Energy Savings From Recycling Selected Material

Material	Million BTU per Ton (average)	Barrels Crude Oil/Ton
Ferrous	16	2.8
Aluminum	220	38.0
Glass	2	0.3
Plastics	67	11.6
Newspaper	7	1.2
Mixed Paper	17	2.9
Corrugated	9	1.6
Office Paper	21	3.6

Source: Resource Conservation Consultants/Lake County Solid Waste Management Plan.

The collection, processing, and shipment to market of recyclable materials will,

obviously, result in some level of energy usage. However, it is believed that the scale of these processes (e.g., shipping truck loads of rail cars of material) results in energy usage which is significantly less than the energy savings realized in manufacturing processes.

XI. COMPLIANCE STRATEGIES

Several approaches are available to ensure a reasonable likelihood of achieving the recycling goals identified earlier. These approaches can be categorized as voluntary inducements and involuntary (mandatory) requirements.

Voluntary inducements include educational efforts and financial incentives. Waste generators must be made aware of the problems and concerns surrounding solid waste disposal, what specific alternatives (i.e., waste reduction and recycling) are available, and the benefits of alternative waste management practices. A strong educational campaign, addressing these issues and targeting waste generators in all sectors, will serve to reinforce the growing public concerns about environmental protection and encourage increased voluntary participation in recycling efforts.

Positive financial incentives, such as direct savings in waste disposal costs as a result of recycling, may have the greatest effect on increased participation levels. As discussed earlier, volume-based billing practices are already common in the commercial sector and have been successfully demonstrated in the residential sector. The County should make commercial generators aware of the savings potential already available to them, and work with municipalities and waste haulers to adopt residential volume-based billing systems throughout the County.

Any recycling programs developed or recommended by the County must be convenient to the targeted participant. Separation and collection programs which are perceived to be inconvenient will not be successful, regardless of the amount of education or availability of financial incentives.

As a last resort, the County should consider instituting a differential fee structure at future disposal facilities to encourage recycling. For example, higher tipping fees would be assessed for waste from communities without extensive

curbside programs. Commercial haulers could be assessed higher fees if they cannot document substantial recycling efforts by their customers. The actual price differential should be carefully established, so that the level of financial disincentive would be equal to, or greater than, the cost of establishing recycling programs.

XII. IMPLEMENTATION STRATEGY AND SCHEDULE

Successful implementation of the ambitious programs proposed in this plan will depend on a strong County commitment to support these proposals. Development of the recommended programs will be based on County-sponsored education and technical assistance programs. These programs can be summarized as follows.

1. General Educational Campaign. The County should develop and conduct a county-wide awareness campaign which focused on solid waste problems and the benefits of recycling. This effort can take the form of a printed brochure, media coverage of the issue, and staff presentations to civic organizations and other groups. The County should also work to have solid waste and recycling concepts incorporated into the curriculum of every public and private school, using material available from the state and other sources.
2. Specific Educational Efforts. The County should provide specific information and encouragement to target groups, such as municipalities, waste haulers, business and industrial groups, etc. Information ranging from how to establish a volume-based billing system or an office paper recycling program to how and where to purchase recycled products should be provided through fact sheets, specialized seminars, and other activities.
3. Technical Assistance. County staff should provide technical assistance to selected waste generators to develop new and innovative recycling programs. This activity could include providing waste audits to representative generators to encourage the establishment of recycling programs. The results of these programs could then be used to develop

fact sheets and seminars.

County staff will also have to work directly with industry to develop C/D debris and large woody waste programs. Staff should also work with municipal recycling coordinators to provide educational assistance and to develop more sophisticated data collection and monitoring methods for curbside, multi-family, and other local programs.

The County should also provide direct financial assistance to support pilot programs and other experimental efforts which will lead to the implementation of widespread programs in specific sectors. The existing Community Development Assistance Program provides grants to local governments for solid waste-related activities. Existing program guidelines should be re-evaluated to encourage the funding of innovative recycling programs.

The above activities, along with other tasks outlined elsewhere in this plan, will require two full-time professional staff and one full-time support staff. The Recycling Coordinator, who has already been appointed, will be responsible for data collection, technical assistance and overall implementation of the plan. The second professional staff would serve as an education coordinator.

Total annual staff costs are estimated at $100,000-$110,000, including benefits. Other direct costs such as travel, supplies, and professional development are estimated at $20,000 per year. Specific educational programs will require an estimated annual budget of $75,000, for the development, printing or purchase, and distribution of brochures and other items. Costs for financial assistance programs, such as grants, have not yet been determined.

Table 7

Implementation Schedule For Proposed Recycling Programs
(percent recycling in each sector)

ctor	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
sidential	5.7	13.3	17.3	21.3	25.3	29.3	33.0	33.0	33.0	33.0	33.0	33.0
mmercial	6.9	6.9	8.0	13.0	18.0	23.0	28.0	33.0	33.0	33.0	33.0	33.0
dustrial	20.9	20.9	22.0	24.0	26.0	28.0	30.0	32.0	33.0	33.0	33.0	33.0
ndscape Waste	8.5	60.5	90.3	90.3	90.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D Debris	0	0	0	0	5.0	5.0	10.0	15.0	20.0	75.0	75.0	75.0
rcent of Total tal Waste ream Recycled	**9.1**	**18.0**	**23.6**	**26.4**	**29.7**	**33.7**	**37.2**	**39.5**	**40.3**	**47.3**	**47.3**	**47.3**

An implementation schedule of efforts in each sector needed to achieve the proposed 47.3 percent recycling goals is presented in Table 7. Residential programs should be phased in over the next five years. The commercial and industrial sectors are scheduled to reach their assigned 33 percent recycling levels by 1996 and 1997 respectively. Diversion of all landscape waste should be accomplished by 1994. Programs addressing C/D debris will require the most development and are scheduled to gradually phase-in 1993, reaching their 75 percent diversion target by 1998.

This schedule calls for achieving the 47.3 percent goal in 1998, and easily exceeds the minimum state requirements of 15 percent by 1994 and 25 percent by 1996. The level of recycling outlined in this plan is unprecedented. Results of the County's on-going efforts may show that portions of the plan are not, in fact implementable, while other programs may have greater potential than outlined here. The required 5-year plan updates will provide a valuable opportunity to reassessing the goals proposed here. As further developments occur in the still-evolving recycling field, they should be incorporated wherever possible, to maximize the extent that recycling reduces the amount of county-generated waste requiring disposal.

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APPENDIX D

HOUSEHOLD HAZARDOUS WASTE

Prepared by:

Kane County Development Department

December 1990

HOUSEHOLD HAZARDOUS WASTE

Household hazardous waste refers to specific waste products which exhibit hazardous or toxic characteristics, are disposed by consumers, and were originally intended for household uses. The federal Resource Conservation and Recovery Act (RCRA) regulates hazardous waste, but specifically exempts household hazardous waste from regulation.

Examples of such wastes include pesticides, drain cleaners, paint thinners, solvents, oil-based paints, aged or dirty fuels, used motor oils, battery acid, many aerosol products, and other materials which are flammable, reactive, corrosive, or toxic.

A 1987 study by the Illinois Hazardous Waste Research and Information Center (HWRIC), based near Champaign, estimates that between 0.022 percent and 0.047 percent of total landfilled waste is unregulated household hazardous waste. When applied to solid waste amounts experienced in Kane County, these percentages correspond to 231-494 cubic yards per year disposed in Kane County, and 127-272 cubic yards generated in Kane County each year.

The HWRIC estimates correspond to concentrations of 220 to 470 parts per million of the total waste stream. These are relatively high levels; as much as 10,000 times higher than safe drinking water concentrations for some moderately toxic substances.

The cumulative impacts of hazardous or toxic household wastes have been alleged to have caused, or significantly contributed to, groundwater and surface water pollution at several sites in Illinois (Quincy Municipal Landfill #3, Danville H&L Landfill #1). However, the design (liner, leachate collection system) and site characteristics of these facilities must be considered before parallels can be drawn to other landfills.

Additionally, untraceable upsets have been experienced at sewage treatment plants where disposal of toxic household wastes were suspected as a cause. Potentially explosive vapors and instances of objectionable odors are an even more common problem which can be caused by inappropriate disposal of hazardous household wastes.

Separate Collection and Disposal

One alternative approach is to collect these wastes separately and dispose them in a regulated hazardous waste facility. The Illinois Environmental Protection Agency (IEPA) has conducted several pilot household hazardous waste collection programs in various communities since 1988. The results of these programs are summarized in the accompanying table.

In these one-day programs, local residents are asked to bring their hazardous waste to a central collection point, usually on a Saturday. The IEPA engages a licensed contractor to accept the material, separate it by type, and ship it to an authorized facility. The IEPA has provided funding to cover the costs of these events.

Participation rates in 10 programs ranged from 0.9 to 5.8 percent of local households, averaging 2.1 percent. These low rates are certainly a function of the inherent inconvenience of drop-off programs. Also, participation could be expected to increase if the service was repeated and provided on a regular basis in a particular locality.

To increase participation, some waste haulers are beginning to experiment with curbside or drop-off collection of selected materials, such as household batteries. However, results of these efforts are not yet available and the feasibility of collecting mixed materials including liquids has not yet been determined.

The pilot IEPA programs have been quite expensive, with costs ranging form $22,087 to $240,800 for each event. The average cost has been $273 per participant and $1.38 per pound ($2,760 per ton) of material collected. The high costs result from complex federal regulations for a cradle-to-grave tracking system, detailed recordkeeping, and restrictive specifications for the design and operations of disposal facilities. The relatively small volume of household hazardous waste, as compared to industrial volumes, contributes to a much higher unit cost for handling and disposal of household material.

Source Reduction

Another alternative approach is to minimize the generation of household hazardous waste. Educational programs can inform homeowners of the environmental

impact of this material and encourage the substitution of less hazardous products. Several publications which explain available alternative products are available from state agencies.

Legislative restrictions on the production,use, or disposal of these materials is another option. An example is the recent state ban on disposal of lead-acid automotive batteries, requiring that they instead be recycled. Unfortunately, many wastes, such as pesticides, cannot readily be recycled.

Recommendations

The high cost and questionable impact (with only 2.1 % participation) of the state pilot programs does not suggest that they are a satisfactory solution to this situation. However, these programs may be an appropriate first step in increasing public awareness of the issue. Accordingly, the County should pursue IEPA funding for a local pilot collection program. In addition, the County should actively monitor collection efforts in Illinois and other states with the intent of implementing centralized and/or curbside collection programs when high participation rates and acceptable economics can be demonstrated.

The County should also monitor state and federal legislative initiatives to reduce the generation of household hazardous waste, and strongly support the adoption of appropriate measures.

Finally, the County should encourage local residents to reduce their usage of these materials and substitute non-hazardous products wherever possible. Widespread educational efforts should be conducted in conjunction with recycling or other solid waste-related educational programs.

References

Illinois Environmental Protection Agency. "Household Hazardous Wastes: Feasibility of Operating a Collection and Disposal Assistance Program." IEPA/Env/89-066. April, 1990.

IEPA Household Hazardous Waste Collection Programs

	City	HH*	Partic.	PR	Pounds Total**	Pounds /Partic	Costs ($) Total	Costs ($) /Pound	Costs ($) /Partic
8	Quincy	16000	273	1.7%	34398	126	45259	1.34	168
	Mt. Carmel	4000	45	1.1%	10395	231	22087	1.97	455
	Homewood	20000	351	1.8%	41067	117	50403	1.27	150
9	Brookfield	7800	70	0.9%	26000	371	62759	2.41	897
0	Vienna	600	35	5.8%	16000	457	37872	2.37	1082
	Champaign	23300	564	2.4%	109600	194	156157	1.42	277
	Springfield	40000	643	1.6%	240800	374	248077	1.03	386
	Rockford	55900	771	1.3%	214800	279	208197	0.97	270
	Naperville	34000	1046	3.1%	113200	108	205009	1.81	196
	Rock Island	18700	729	3.9%	85200	117	200804	2.36	275
	total-	220300	4527		891460		1236624		
			average-	21.1%		197		1.38	273

* Eligble Households estimated from 1980 census data
** Assumes 400 lbs./barrel of waste collected

APPENDIX E

SPECIAL WASTE

Prepared by:

Kane County Development Department

September 1991

SPECIAL WASTE

Special waste can be generally defined as non-hazardous industrial process waste and waste resulting from pollution control processes. While special waste may contain certain constituents or exhibit certain characteristics which require special handling, it does not exhibit the characteristics of hazardous waste as defined by the Federal Resource Conservation and Recovery Act (RCRA). Examples of special wastes include sewage treatment sludge, contaminated soil from leaking underground storage tanks, foundry casting sand, scrap soap, waste polymers, and baghouse dust.

The transportation and disposal of special waste is regulated by the Illinois Pollution Control Board and Environmental Protection Agency. Generators of special waste must first have the material tested to insure that it is not a hazardous waste. They must then apply to the IEPA for a waste stream permit to dispose of the special waste at a landfill which is permitted by the IEPA to accept such waste. Finally, a licensed special waste hauler is used to transport the waste. The entire handling process is tracked by a manifest system.

Fourteen of the 21 landfills in the six-county Chicago area are permitted to accept special waste, including both Settler's Hill and Woodland landfills in Kane County. Some facilities which are permitted to accept special waste, such as the two DuPage County landfills, either do not accept special waste or restrict the type and amount accepted.

Tipping fees for special waste are significantly higher, sometimes double, the fees for municipal waste. The current fees for special waste at Settler's Hill range from $13.00 to $15.70 per cubic yard; the Woodland fees are $14.65 to $15.25 per cubic yard. Tipping fees for special waste at landfills in Cook and Lake Counties range form $18.00 to $20.00 per cubic yard.

As owner of Settler's Hill, Kane County must approve any application for a permit to accept specific special wastes at that facility. The number of permit

applications and the estimated volume of material for the first nine months of 1991 are shown below:

Summary of Special Waste Permit Applications
January - September, 1991
Settler's Hill Landfill

Source	Number	Cubic Yards	Percent
Kane	32	19,257	19%
DuPage	58	46,660	45%
Cook	61	31,109	30%
Other	23	5,678	6%
TOTAL	174	102,704	100%

The total amount of special waste received, extrapolated to a 12 month period, represents about six percent of the total amount of waste received annually at Settler's Hill.

The amount of special waste received from Kane County, extrapolated to a full year and converted to tons, is estimated at 12,838 tons per year. Since about 30% of the County's solid waste goes to Woodland, the total amount of special waste generated in Kane County in 1991 may approach 18,340 tons, or about 3.5 percent of the total waste stream.

It may be necessary to continue to accept special waste at Settler's Hill landfill in order to satisfy the minimum tonnage requirements of the agreement with the landfill operator. Tipping fees for special waste should be carefully reviewed to maximize revenue potential for this material.

Approximately 80 percent of the special waste at Settler's Hill landfill in the first nine months of 1991 was soil contaminated by leaking underground storage tanks. Almost all of this soil is contaminated by gasoline, diesel fuel, or heating oil.

Viable alternatives to the landfilling of contaminated soil should be fully considered. Two alternative approaches have been proposed. First, the contaminated soil could be spread out on a surface, allowing the volatile contaminants to dissipate into the atmosphere. The air pollution impact of this strategy would have to be fully considered. Second, bio-remediation techniques, such as using bacteria to convert the hydrocarbon contaminants to a benign form, could possibly be utilized.

The county should perform a literature search and other research to determine the viability of alternative approaches to the landfilling of contaminated soil. If viability is demonstrated, the County should, to the extent allowed by contractual constraints, proceed to develop alternative methods for the management of this material.

APPENDIX F

TECHNOLOGY ASSESSMENT: INCINERATION

Prepared by:

Patti S. Bex
Batavia, Il.

October 1990

TECHNOLOGY ASSESSMENT: INCINERATION

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I. Introduction

Incineration, or burning solid waste, is a method of reducing combustible garbage to carbon ashes before final disposal. By burning municipal solid waste, the original putrescible waste is reduced to typically inert ashes. Waste may be incinerated for volume reduction alone or for volume reduction along with energy recovery. Recovering energy from a waste incinerator in the form of hot water, steam or electricity is known as "resource recovery" or "waste-to-energy". Volume reduction without energy recovery is generally not economically viable. This report will focus on energy recovery.

Currently there are more than 160 operating municipal solid waste incinerators in the United States, with at least 150 more under construction.[1] There are two basic approaches to energy recovery systems; "mass-burn" systems and "refuse derived fuel" systems (described elsewhere). Mass-burn technology has been used since the 1970's and has experienced the greatest levels of technical and operating success of available technologies. The mass-burn method, related energy markets, environmental concerns, permitting requirements, and economic factors are detailed below.

II. Available Technologies

The mass-burn method of resource recovery is designed to incinerate solid waste in the condition in which it was received. The waste generally receives no processing prior to combustion except for the removal of bulky waste such as white goods, although mass-burn systems can be designed to include front-end processing for recovery of recyclable materials. The two main categories of mass-burn systems are field-erected systems and modular systems. The key components common to both systems are the receiving and storage area, the feed system, the grate system, the combustion area and boiler, and the ash handling system.

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[1] *Waste Age 1988 Refuse Incineration and Refuse-to-Energy Listings, Waste Age, November, 1988, p. 195.*

There are two types of field-erected systems: (1) "refractory systems", which have a refractory furnace chamber and a separate waterwall boiler, and (2) "waterwall systems", which have a refractory-lined waterwall furnace and boiler. Refractory systems are generally available in individual units with 25 tpd to 500 tpd capacities. Waterwall systems are generally used for large scale processing systems. Individual units for waterwall systems can exceed 1,000 tpd in size and have been used in facilities with total capacities as high as 3,000 tpd. The typical construction time for a field erected mass-burn facility is between 24 and 36 months.

Modular or "starved air" incinerators are generally shop fabricated in modules and assembled on-site. Individual units normally range in size from 25 to 100 tpd, but some new units are being built with 200 tpd capacities. Construction can be expected to take 15 to 20 months.

A. Storage System

Typical field-erected systems have a pit or tipping floor for waste storage and overhead bridge cranes for handling waste. Waste is discharged through tipping bays into a pit or onto the tipping floor. The pit is usually large enough to store three days waste, allowing continuous operation over long weekends and during downtime. The receiving and storage area is enclosed to control blowing dust and litter and to minimize noise and odor emissions. For further odor control, air is drawn from the receiving and storage area into the furnace where combustion destroys odor.

Waste storage pits typically have overhead cranes with grapples which are used to mix the waste to improve its combustion characteristics. Overhead cranes are also used to remove unprocessable waste from the storage pit and to lift the refuse into the furnace feed hopper. Unprocessable wastes are items such as appliances and large pieces of furniture, the processing of which is limited by the size of the feed chute. Processing such wastes can also have a negative impact on the grate system. Two cranes are generally used to avoid interruptions in system operations if one were to fail.

Most modular facilities have a tipping floor with a front-end loader for waste storage and feeding. Storage capacity is generally provided for two days of generation because modular facilities usually operate only 16 hours per day, five or six days per week.

B. Furnace Feed System

Once the loading system discharges waste to the feed hopper, it is automatically fed into the furnace either by gravity feeding screw augers or a hydraulic feeder. The ram feeder controls the amount of waste entering the furnace. Design features such as a cooling system surrounding the chute and adequate chute length for maintaining an air seal with waste should be used to prevent burnback.

C. Grate System

The feeder pushes the waste onto a grate system which moves the waste through the furnace for combustion and discharges the waste not combusted into the ash-handling system. Because of the heterogeneous nature of municipal solid waste, its incineration can result in uneven heat release. This can cause variations in steam quantity generation and steam conditions in energy recovery systems. To improve the efficiency of combustion, a number of grate systems have been designed to agitate the waste during combustion. The design of the grate system is the major component that distinguishes one mass-burn system from another.

Field erected systems are designed to tumble, turn and move the solid waste through the furnace chamber while allowing underfire air to pass through the grate. The reciprocating grate is the most frequently used design configuration, although one waterwall system uses a rotary combustion chamber instead of mechanical grates. The grate area typically has three zones of activity: the drying zone, combustion zone, and burn-out zone. The grates are usually inclined, sometimes stepped, to create the separate zones. The grates themselves are made from special alloy materials with heat-resistant properties. The air required for combustion is supplied by a forced-draft fan

below the grate system (underfire air) and by secondary air injectors above the grate system (overfire air). The underfire air also cools the grate reducing corrosion and wear. The overfire air jets provide oxygen to complete the combustion of the gases expelled from the primary combustion area. Potential problems with grates include blockage of air openings (resulting in heat damage), abrasion of moving parts, and wear of hydraulic mechanisms.

There is variety in the waste movement methods of modular systems. Some use a reciprocating grate system while others use recessed hydraulic rams, or transfer rams, to transport waste. The grate systems of modular facilities are designed to limit agitation of waste in an effort to reduce particulate emissions.

D. Combustion Area and Boiler

In both refractory and waterwall systems, the furnace has a thick lining of fire brick (refractory) to limit heat loss and protect the outer shell of the combustion chamber from corrosion and sudden temperature changes. The major difference between refractory and waterwall systems is the boiler location. Waterwall units have a furnace-boiler combination constructed with water tube membrane walls that extend from the furnace into the boiler, forming an integral furnace-boiler unit. This cools the wall surface and reduces slag accumulation (from ash melting, cooling and solidifying on furnace walls) while maximizing heat energy recovery. Refractory units have a boiler located downstream of the combustion chamber. They generally have air-cooled metallic blocks in the high-temperature zone of the furnace to prevent slag accumulation and to facilitate cleaning. Steam is superheated in hanging boiler tube bundles in the convective passes of the boiler.

Depending on the boiler design, an air-preheating section may be located near the boiler exit and a superheater section may be located at the boiler entrance. To ensure complete combustion and to keep metal surfaces in the combustion zone from overheating, the equipment is operated under excess air combustion conditions. The waterwall system uses less excess air for

combustion than the refractory system. The water tube membrane walls of the waterwall system absorb a significant amount of heat in the furnace, and the combustion chamber loses less heat than the refractory chamber. As a result, boiler thermalefficiency for a waterwall furnace is generally 65-70% and for a refractory furnace is 60-70%.[2]

Steam from the boiler is sent to a condensing turbine which produces electricity. Delivery of electricity to the utility grid is controlled by switchyard and interconnection equipment specified by the utility which will be using it. After going through the turbine, the exhaust steam is sent to a condenser then pumped back to the boiler as feedwater.

Most modular systems have refractory furnaces. Because modular units are smaller in size than field-erected units, the refractory used in the furnaces is more sensitive to temperature changes, abrasion, and chemical attack. Starved-air (or controlled-air) combustion is usually used in the primary chamber and is created by restricting the quantity of air fed into the chamber to less than the theoretical (i.e., stoichiometric) amount of air necessary for complete combustion. Combustible gases produced in the primary chamber are completely burned in the second chamber, where auxiliary fuel is often fired and excess air introduced. Heat recovery occurs after the primary and secondary chambers, making energy transfer by convection only. Two stage combustion limits air pollutant emissions because the low combustion temperature in the primary chamber minimizes the vaporization of the metallic components of the waste. Slagging of glass components is also minimized. The gases generated in the primary chamber also contain fewer entrained particulates due to the controlled combustion.

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[2]HDR Engineering, Inc., Lake County Solid Waste Management Plan, Final Report 5.0 Incineration Technology Assessment, March, 1988, p. 5-8.

E. Ash Handling System

Ash from mass-burn facilities is comprised of uncombusted ash remaining on the grate system (bottom ash), grate siftings, and fly ash from the air pollution control equipment. Ash can be handled through wet or dry systems.

In a wet ash handling system, bottom ash and grate siftings fall or are directed into a water-filled quench tank for cooling. The water in the tank acts as an air seal to prevent leakage of air into the furnace. The ash is removed by rams or drag chain conveyors which carry it to a hopper for loading into trucks. A dewatering incline is often incorporated to reduce moisture in the ash. The ash may be processed to remove metals.

In a dry ash system, bottom ash falls off the grates into a chute where the grate siftings are added. The chute is kept filled to provide an air seal for the boiler; the time spent in the chute allows the ash to cool. The ash is removed from the chute by conveyors along which water is sprayed to control dust.

Fly ash is collected from the air pollution control system by dust-tight conveyor systems. An ash conditioner mixes the ash with water mist to minimize dust. Flyash may be combined with bottom ash or handled separately.

Ash from field erected mass-burn plants typically is equal to 15-25% by dry weight and 5-10% by volume of as-received waste. Since approximately 25% of ash is moisture, the wet weight of ash is generally 20-35% of the weight of as-received waste.[3]

Most new modular systems have continuous ash removal systems similar to the submerged drag chain system used in field-erected facilities. Because

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[3] *HDR Engineering, Inc., Lake County Solid Waste Management Plan, Final Report 5.0 Incineration Technology Assessment, March, 1988, p. 5-68.*

modular mass burn facilities typically experience higher levels of unburned material in the ash, the dry weight of the total ash product will generally be in the range of 20-35% by weight of the as-received waste[4].

III. Facility Sizing and Compatibility With Recycling

Energy recovery facility sizing must take into account the heat value of the waste to be processed, availability, and low periods of waste generation. The inherent heat values of the individual components of municipal solid waste, and the overall composition of the wastestream to be processed have a direct effect on the proper design of energy recovery facilities. HHV is a measure of the energy content of waste in British thermal units per pound (Btu/lb). As the HHV of waste increases, more energy can be released during combustion from each ton of waste processed. Energy recovery facilities are designed to accomodate a specific rate of energy release during the combustion process; as the waste HHV increases, a facility is able to process fewer tons of waste. It is critical to the proper sizing of a facility that the design point (the maximum waste HHV value) be designated in the upper end of the expected range of annual average waste HHV. This requires a close examination of the HHV rates of individual components of municipal solid waste (shown in Table 1) and a thorough assessment of future waste stream composition given expected recycling program results.

Availability is a measure of the extent to which a facility is available to process waste at its full capacity over a given period of time (usually a year). Energy recovery facilities are typically designed to operate at a minimum of 85 percent availability on an annual basis.

Low periods of waste generation typically occur during the winter months when waste generation rates are below the annual average.

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[4]HDR Engineering, Inc., Lake County Solid Waste Management Plan, Final Report 5.0 Incineration Technology Assessment, March, 1988, p. 5-68.

TABLE 1

AVERAGE ULTIMATE AND SORTED ANALYSES OF U.S. MUNICIPAL SOLID WASTE

COMPONENT	MASS (%)	HEAT CONTENT (Btu/lb)
Sorted Analysis		
Paper	43.0	7,200
Plastics	3.0	9,500-16,000
Rubber, Leather	2.0	9,000
Wood	3.0	7,000
Textiles	3.0	8,000
Yard Waste	10.0	7,000
Food	10.0	7,800
Fines	10.0	0
Glass, Ceramics	9.0	0
Metals: Ferrous	6.0	0
Aluminum	0.7	0
Other nonferrous	0.3	0
Ultimate Analysis		
Moisture	25.2	
Carbon	25.6	
Hydrogen	3.4	
Oxygen	20.3	
Nitrogen	0.5	
Chlorine	0.5	
Sulfur	0.2	
Inorganics	24.4	

Source: UIC, Technological and Economic Evaluation of Municipal Solid Waste Incineration, September, 1988.

It is important that a facility be sized giving careful consideration to the above factors to avoid operating at below processing capacity, which could lead to disincentives for recycling and a greater need for landfilling peak volumes. The land requirement for an incinerator site is affected by the geometry of the facility, the location of access roads, surrounding land use, and consideration of local ordinances.

Field tests and quantitative derivations show that the incineration process can benefit from the removal of recyclables prior to incineration. Combustible and non-combustible materials can have a significant impact on incineration when recycled. Non-combustible materials include fines, glass, ceramics, and metals. Combustible materials include paper, plastics, rubber, leather, wood, textiles, yard waste, and food. The heat value of municipal solid waste can be increased through the removal of non-combustibles because the amount of slag formed is reduced, and the operational reliability of the combustor is increased. Heavy metal emissions through flue gas and bottom ash can also be reduced.[5] If 50% of the paper and all of the plastic, metal and glass were removed from the wastestream, the heat content of the municipal solid waste would increase 12%, from 5506 Btu/lb to 6148 Btu/lb.[6] Tests have shown that, in addition to increasing heat value, recycling increases boiler efficiency and reduces ash quantities.[7]

Recycling is an also important component of a solid waste management system using incineration because it has the potential to reduce heavy metals, acidic gases, nitrogen oxides, and, possibly, dibenzo-p-dioxins and chlorinated dibenzofurans in municipal solid waste. Recycling materials such as nickel-cadmium batteries can

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[5] *Rood., Technological and Economic Evaluation of Municipal Solid Waste Incineration, Office of Technology Transfer, University of Illinois Center for Solid Waste Management Research, p. 50.*

[6] *Mark J. Rood, Technological and Economic Evaluation of Municipal Solid Waste Incineration, Office of Technology Transfer, University of Illinois Center for Solid Waste Management Research, p. 51.*

[7] *Resource Recovery Focus, a publication of the Institute of Resource Recovery, Vol. 1, No. 1, Spring, 1989.*

reduce lead and cadmium mass emission rates by 41% and 71%, respectively (Sommer and Kenny, 1984).[8]

IV. Energy Markets

The economic viability of a resource recovery project hinges on the existence of a market for the energy or materials recovered from the municipal solid waste stream. Most modern waste incineration plants are designed to use combustion heat to produce thermal and/or electric energy. Each ton of municipal solid waste can produce approximately 4,000 to 6,000 pounds of exportable steam or 350 to 600 kwh of exportable electricity.[9] The product recovered, whether electricity or steam must meet the specifications of the potential buyer(s). Thermal energy can be used for in-plant processes, heating and cooling systems, or for mechanical drive power. Electrical energy can also be used in the plant itself, sold to local industry, sold to privately or publicly owned utilities, or "wheeled" to neighboring utilities.

A. Electricity Markets

The advantages to the generator of selling energy to an electric utility are the long-term financial stability of the utility and its ability to consume all of the electricity available for sale. The amount of electricity sold by a municipal incinerator is small relative to the power requirements of a large electric utility, therefore the only limitations are on availability. Unlike non-utility businesses, utilities are provided a measure of market and financial stability by the regulatory process.

Under the federal Public Utility Regulatory Policies Act (PURPA) of 1978, utilities are required to purchase electricity generated by independent producers. PURPA authorized the Federal Energy Regulatory Commission (FERC) to provide economic incentives and to remove institutional barriers to encourage the

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[8] *Mark J. Rood, Technological and Economic Evaluation of Municipal Solid Waste Incineration, Office of Technology Transfer, University of Illinois Center for Solid Waste Management Research, p. 51.*

[9] *Bruce Bawkon, P.E., Municipal Solid Waste Management Options: Landfills, Springfield, IL: Illinois Department of Energy and Natural Resources, 1989, p. 3-11.*

development of independent producers. PURPA requires utilities to purchase power generated by qualifying facilities at a price equal to their "avoided costs" (the costs the utility can avoid by not generating or purchasing the same power from other available sources).

In Illinois, utilities function with an excess generating capacity which lowers the "avoided cost" price. House Bill 942 (P.A. 85-882) enables waste-to-energy facilities to sell electricity at a price equal to that paid by local governments. Under this law, utilities would receive credits from the State of Illinois Department of Revenue in an amount equivalent to the utility's costs for purchase from the qualified facility. The qualified waste-to-energy facility is required to reimburse the State Revenue Department for credits received, but not until the capital costs for the waste-to-energy facility have been repaid. In this manner, the artificially high revenues the waste-to-energy facility receives initially are offset by repayment at a later time. PURPA also requires investor-owned electric utilities to purchase electricity from waste-to-energy facilities located within their service districts.

It is also possible for the waste-to-energy facility to sell electricity to a third party, making use of the transport facilities of another. This third-party "wheeling" involves a generator, a transmitter and a buyer. Two-party wheeling takes place when a utility transports power from a generator in its service area to a party outside its service area which either partly or wholly owns the generator. Wholesale wheeling occurs when the electricity purchaser sells the power to a retail customer. Retail wheeling occurs when the direct purchaser of the wheeled power is also the end user of the power. There are no existing state or federal laws that force an unwilling utility to wheel power, and some may be reluctant to do so because of the potential loss of a major customer in its service area.

B. Thermal Energy Markets

Thermal energy products can include steam, hot water, and chilled water. Unless thermal energy sales are made to an existing district heating

system, a distribution system must be constructed for energy transport. The relative proximity of individual customers must then be considered. The size and stability of a thermal energy market should also be evaluated to determine if the user can accept all of the thermal energy produced by the waste-to-energy plant 24 hours per day, 365 days per year. The best thermal markets are generally manufacturers who operate around the clock year-round and require large amounts of steam or hot water in their processes.

The purchaser will specify its requirements for the temperature and pressure of the steam; the recovery system will need to be designed to meet these requirements. Steam is usually produced in an incinerator at 600 psi or less, and temperatures can range from 250 to 1000° F.

V. Siting and Permitting

The objective of the site selection process is to identify areas which have the characteristics necessary for an environmentally sound incineration facility. This process is the same as that used in siting a sanitary landfill or any other regional pollution control facility, and is discussed in detail in a separate chapter.

Development and construction of an incineration facility cannot begin until a State Solid Waste Management Site Development Permit is issued by the Illinois Environmental Protection Agency (IEPA). The application requires SB172 Siting Approval (detailed elsewhere), which requires the municipality or county in which the facility is proposed to approve the location of the facility. Hydrologic and geologic analyses, a construction plan, an operating plan, and a monitoring program are also required. The application review period is 90 days. A finding must be made on the application completeness within 30 days. The remaining time is used for documentation.

The hydrologic and geologic analyses must contain a detailed evaluation of the hydrogeologic conditions beneath and adjacent to the proposed incinerator site. Hydrogeologic data are based on a systematic investigation using data from soil

borings, piezometers, water wells and other water sources, and the chemical characteristics of subsurface waters.

The site development plan must be prepared on a 1" = 200' topographic map to indicate buildings, traffic control installations, preprocessed refuse and processed residue storage facilities, combustion and air emission control equipment, water recirculation equipment, sewer connection points, fencing and all other items of the developed, operational facility. Cross sections of the final configuration of the physical plan are required.

The operating plan must describe procedures for unloading delivery vehicles, storing refuse, processing waste, controlling air emissions and ash residue, recirculating water for cooling, discharging wastewater, and any other information for clarification of the operation. All preliminary processing and other ancillary steps should be presented in detail. IEPA reviews the operating plan carefully to ensure the facility's operations maintain the level of environmental control afforded by the engineering design.

The monitoring program must be designed in accordance with IEPA and local environmental requirements to monitor pollutant emissions, wastewater discharge, ash residue management, and noise and odor control.

The following special permits may be required in addition to the above:

IEPA Division of Air Pollution Control - A permit is required from the IEPA for the construction of any new emission source. An application shall contain data regarding the nature of the emission source and air pollution control equipment; the specific sources and quantities of uncontrolled and controlled air contaminant emissions; the type, size, efficiency, and specifications of the proposed emission source or air pollution control equipment; and maps, statistics and other location data.

IEPA Division of Land Pollution Control - A special waste hauling permit to transport material collected by scrubbers, baghouses, or electrostatic precipitators may be required. Application for an Illinois special waste hauling permit requires owner and operator information and vehicle description be filed. An IEPA waste hauler ID number is issued and is to be displayed on vehicle while hauling material.

IEPA Division of Water Pollution Control - If cooling water is to be discharged from the facility, a permit is required for the construction of a new wastewater source and for wastewater discharge into an existing sewer system. The application requires characterization of the buildings and processes served by the sewer system and information regarding flow and engineering design. The quantity of discharge along with sewer layout drawings are specifically required.

Federal Aviation Administration Review - Any construction near an airport or construction of more than 200 feet in height above the ground requires review by the FAA to determine potential aviation hazards. Depending upon the proposed stack height of the facility, FAA review may be necessary. The FAA approval will normally require appropriate markings and warning lights. If the facility is located near an airport, additional height limitations may be imposed.

IEPA operating permits from each division are also required. Operating permits are issued if the facility has been constructed according to the specifications of the construction and development permits.

A local permit is required from the area sanitary district if connection is to be made for the discharge of wastewater. An application will include facility name, name of county contact person, SIC codes, detailed description of facility operations including raw materials and chemicals used and products, water usage and discharge information, pretreatment processes, and wastewater characteristics.

VI. Environmental Impact

A. Air Emissions

The combustion of municipal solid waste generates various emissions into the atmosphere. These pollutants are categorized by USEPA as criteria pollutants, acidic gases, heavy metals, and organic materials. They are summarized in Table 2.

1. Regulations

The National Environmental Policy Act (NEPA) was passed by the U. S. Congress in 1970, setting in the framework for environmental protection through this and future environmental laws. Also in 1970, the Illinois General Assembly passed Public Act 76-2429, known as the Environmental Protection

Act (The Act) which grants the IEPA full authority to administer environmental programs.

Federal regulations pertaining to the control of air pollutants are found in Title 40, Chapter I, Subchapter C - Air Programs, Parts 50-81 of the Code of Federal Regulations (CFR):

- 40 CFR 50 National Primary and Secondary Ambient Air Quality Standards (NAAQS).
- 40 CFR 52.21 Prevention of Significant Deterioration of Air Quality (PSD).
- 40 CFR 60 Standards of Performance for New Stationary Sources (NSPS).

National Ambient Air Quality Standards

The standards, established by the USEPA, establish the maximum ground level concentrations of designated pollutants in the ambient air determined to be adequate to protect the public health and welfare. There are both primary and secondary standards. Primary standards are designed to protect the public health; secondary standards, which are more restrictive, establish levels to protect the public welfare. Presently, National Ambient Air Quality Standards (NAAQS) have been adopted by the EPA for six pollutants (see Table 2). NAAQS standards are summarized in Table 2. Factors such as wind, stack height and surrounding topography are input to a dispersion mathematical model to assess compliance with both NAAQS and PSD standards.

TABLE 2

AIR POLLUTANTS GENERATED BY THE COMBUSTION OF MUNICIPAL SOLID WASTE

Criteria Pollutants

- Sulfur Dioxide (SO_2)
- Nitrogen Dioxide (NO_2)
- Carbon Monoxide (CO)
- Particulate Material
- Lead

Acidic Gases

- Hydrogen Chloride
- Hydrogen Fluoride
- Sulfur Dioxide
- Nitrogen Dioxide

Metals

- Arsenic
- Cadmium
- Mercury
- Chromium
- Nickel
- Lead
- Antimony
- Beryllium
- Copper
- Manganese
- Molybdenum
- Tin
- Selenium
- Vanadium
- Zinc

Organic Material

- Polychlorinated Dibenzo-p-Dioxins (PCCD)
- Polychlorinated Dibenzofurans (PCDF)
- Polynuclear Aromatic Hydrocarbons
- Benzo-a-anthracene
- Benzo-a-pyrene
- Benzo-e-pyrene
- Coronene
- Fluoranthene
- Non-Methane Hydrocarbons
- Polycyclic Aromatic Hydrocarbons

Source: IDENR, Municipal Solid Waste Management Options: Waste-to-Energy, June, 1989.

Based on NAAQS provisions of the Clean Air Act, an area is classified as either attainment or non-attainment; non-attainment meaning air quality in that area is poorer than NAAQS for the ozone pollutant. A resource recovery facility emitting more than 100 tons per year of volatile organic compounds (VOC) would be designated a "major stationary source", and its construction would be prohibited unless it complied with a strict set of rules regarding emission rates.

Prevention of Significant Deterioration (PSD) Review

PSD standards specify the maximum total contaminant increase for all new sources constructed in a region. In a PSD review, the impact of emissions must be analyzed for all regulated pollutants emitted in "significant amounts" and for which the project area is classified as attainment. The PSD significant emission thresholds as adopted by the State of Illinois are listed in Table 3.

Based on the preliminary calculations of emission rates for a 1000 tpd municipal waste incineration facility shown in Table 3, such a facility would be a siignificant source of all criteria pollutants. A PSD review also considers the need for additional air quality monitoring data in the project area. Monitoring data are required for up to one year for each pollutant whose impact exceeds a de minimis impact threshold (Table 3). If these thresholds are exceeded, up to one year of air monitoring data must be collected prior to facility construction.

The final element of a PSD review includes an evaluation of the Best Available Control Technology (BACT) which must be applied to each PSD pollutant emitted in greater than significant amounts. BACT guidelines are determined by the IEPA on a case-by-case basis and consider the following categories of pollutants:

1. particulate matter, sulfur dioxide, and nitrogen oxides;
2. acidic gases which must include hydrogen chloride;
3. heavy metals, which must include arsenic, cadmium, mercury, chromium, nickel and lead; and

TABLE 2

SUMMARY OF NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Primary $\mu g/m^3$	Secondary $\mu g/m^3$
Carbon Monoxide	8-hour 1-hour	10,000 40,000	10,000 40,000
Lead	Quarterly	1.5	1.5
Nitrogen Dioxide	Annual	100	100
Ozone	1-hour	235	235
Particulate Matter as PM_{10}	Annual 24-hour	50 150	50 150
Sulfur Dioxide	Annual 24-hour 3-hour 1-hour	80 365 none none	none none 1,300 none

Note:
(1) $\mu g/m^3$ means micrograms (or one millionth of a gram) per cubic meter
(2) PM_{10} means particulates which are less than 10 microns in diameter

TABLE 3

SIGNIFICANT EMISSION THRESHOLDS AND DE MINIMIS IMPACT THRESHOLDS OF PSD-REGULATED POLLUTANTS

Pollutants	Significant Emission Threshold (TPY)	De Minimis Impact Threshold (ug/m^3) [3]	Annual Emission Rate For 1000 tpd Facility (TPY)
Sulfur Dioxide (SO_2)	40	13 (24-hr avg.)	264.20
Particulates (TSP) [4] (PM_{10}) [5]	25 15	10 (24-hr avg.) 10 (24-hr avg.)	55.90 55.90
Carbon Monoxide (CO)	100	575 (8-hr avg.)	185.76
Nitrogen Oxides (NO_x)	40	14 (annaul avg.)	915.20
Ozone (O_3)	40[1]	----[2]	41.7
Lead (Pb)	0.6	0.1 (3 mo. avg.)	1.09

Notes:

(1) 40 TPY of VOC (hydrocarbons).

(2) No de minimis threshold has been established; if volatile organic compound emissions exceed 100 TPY, however, monitoring data would be required.

(3) Ground level concentrations.

(4) Total suspended particulates.

(5) Particulates less than 10 microns in diameter.

Source: 40 CFR 52.21, 1987, and 40 CFR 52.736, 1987.

4. organic materials, which must include polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, and polynuclear aromatic hydrocarbons.

If the facility is considered a stationary source, additional issues will need to be resolved in the permitting process. A facility is considered a stationary source if it is charging more than 250 tpd of refuse and has the potential to emit (as defined by 40 CFR 52.21(b)(4)) greater than 100 TPY of any one of the criteria pollutants.

USEPA has developed a set of combustion strategy elements termed "good combustion practices", which are designed to limit both carbon dioxide and organic emissions. The USEPA guidelines focus on minimizing organic emissions by proper incinerator design and operation and by continuous monitoring to control carbon monoxide (CO), an indicator of complete combustion and the potential for increasing levels of potentially toxic organic pollutants.

New Source Performance Standards (NSPS)

NSPS is a performance standard applicable to new resource recovery facilities. In 1974, a NSPS for particulate matter emissions from municipal incinerators was promulgated under Section 111(b) of the Clean Air Act (CAA). It required larger incinerators constructed or modified after the date of proposal of the NSPS to limit particulate emissions to 0.08 grains of particulate matter per dry standard cubic foot of exhaust gas (0.08 gr/dscf). In 1986, USEPA promulgated a particulate matter standard for new, large industrial boilers of 0.1 pounds of particulate per million Btu (approximately equivalent to 0.03 gr/dscf); this would apply to new resource recovery facilities processing over 200 tpd of municipal solid waste. EPA intends to revise the existing NSPS in the CAA to include further emission limits and quantitative requirements for monitoring.

2. Control Technologies

The control of air pollution from municipal solid waste incinerators can be accomplished through several approaches. One is to control the combustion process thereby minimizing the production of certain pollutants. Another is to use ancillary air pollution equipment to separate and remove pollutants from the flue gas.

Municipal solid waste combustion processes are designed to convert organic materials to carbon dioxide and water. Inefficiencies in the combustion process can result in the emission of substantial quantities of carbon monoxide (CO) and various organic compounds, including chlorinated dibenzodioxins (CDD) and chlorinated dibenzofurans (CDF).

Air pollution control technologies used to remove pollutants from flue gas include electrostatic precipitators, fabric collectors, wet scrubbers, dry injection and spray dryers. Because the application of one control technology for one pollutant may have a positive or negative effect on the control of several other pollutants, effective air pollution control requires a comprehensive assessment of available technologies.

Electrostatic Precipitators: An electric charge is applied to dust laden flue gas which is distributed between rows of discharge electrodes and grounded collecting plates. The particulates are pulled or attracted to collecting plates, where they are deposited. They are periodically removed from these plates by mechanical rapping and collected in hoppers beneath the precipitator.

Fabric Collectors (Baghouse): In this system woven or felted fabric is formed into bags. Numerous bags comprise a system. The dust laden flue gas is distributed among the bags, flows up the inside of the bags, through the fabric, and deposits particles on the filtering surface. Clean air exits the top of the collector.

Wet Scrubbers: Water soluble gaseous air pollutants can be separated by saturating the flue gas with water vapor. An alkaline scrubbing medium such as calcium hydroxide or calcium carbonate is introduced into the scrubber to

react with pollutants such as hydrogen chloride, hydrogen fluoride, and SO^2.

Dry Injection: Dry injection systems (dry scrubbers) can also be used to control pollutants. A dry alkaline material such as calcium hydroxide is injected into the flue gas. It reacts with the pollutants, then the particulate material is separated and removed from the gas stream with a fabric filter or electrostatic precipitator.

Spray Dryer: Contaminants may also be collected by atomizing an aqueous slurry (usually lime and water) that reacts with the pollutants in the flue gas. The dryer is operated to allow all the water in the slurry to evaporate; this eliminates the need to treat a secondary liquid waste stream.

Estimated collection efficiencies for the described systems are outlined in Table 4.

The USEPA has developed an analysis of total emissions from existing and projected municipal waste incinerators. The number and the total design capacity (tons of refuse per day) of existing municipal solid waste incinerators are summarized in Table 5. In view of the anticipated growth of the incinerator industry, EPA's analysis includes estimates of the number and capacity of new facilities expected in the near term. Capacity growth projections for incineration facilities through the year 2000 range from 120,000 tons per day (Franklin Associates) to 250,000 tons per day (Frost and Sullivan). The EPA's estimates of the number of projected facilities and the projected design capacity in tons per day are also summarized in Table 5. Included in the data presented are planned facilities which are not yet operating, but are either under construction, have contracts under negotiation, have contracts for construction or have been formally proposed.

The evaluation of stack emissions presented in Tables 6 and 7 is limited to those emission constituents for which emission test data and some indication of public health or welfare concern are available. The baseline emission estimates for existing facilities (Table 6) include consideration of air pollution control devices in place. The national estimates presented in Table 7

reflect extrapolation of existing test data for individual sources to the source categories by estimated annual waste throughput. The emission factors used to estimate both metal and organic emissions were developed from data presented in EPA's Municipal Waste Combustion Study, Emissions Data Volume, EPA (1987b).

TABLE 4

ESTIMATED COLLECTION EFFICIENCIES FOR SELECTED SYSTEMS

System	Particles	SO2	HCl	Hg	Other Metals	PCDD
ESP	98.5-	-0-	-0-	20-30	95-98	25-50
SD/ESP	99.9	60-75	95-98	50-80+	95-98	70-80
SD/FF	98.5-	65-80	95-98	80+	99+	90-99
DI/ESP	99.9	60-70	(70-80))	---	95-98	(60-70)
DI/FF	99.0-	70-80	80-90	---	99+	90-99+
SD/DI/FF	99.9	80-90	95-98	(80+)	99+	90-99+
ESP/WS(a)	98.5-	50-60	95+	(85+)	95-98	(80-90)
ESP/WS(2)	99.9	90-95	(95+)	(85+)	95-98	(90-99)
	99.0-					
	99.9					
	99.0-					
	99.9					
	98.5-					
	99.9					
	98.5-					
	99.9					

ESP = Electrostatic Precipitators
SD = Spray Dryers
FF = Fabric Filter
DI = Dry Injection
WS = Wet Scrubber

SO_2 = Sulfur dioxide
HCl = Hydrogen chloride
Hg = Mercury
PCDD = Polychlorinated dibenzo-p-dioxins

Uncertainties exist where parenthetical data are shown.

Uncertainties exist in all above values due to influence of many operational factors, such as temperature, flow rate, etc.

Source: IENR, Municipal Solid Waste Management Options, Waste-to-Energy, June, 1989.

TABLE 5
EXISTING AND PLANNED MSW INCINERATION FACILITIES BY DESIGN TYPE

Design type	Installed or projected design capacity[a] (tons per day)	Number of facilities
Existing Facilities:		
Mass burn		
With heat recovery	20,100	24
Without heat recovery	13,000	21
Subtotal	33,100	45
Modular		
With heat recovery	3,900	39
Without heat recovery	600	17
Subtotal	4,500	56
RDF		
With heat recovery	11,400	10
Without heat recovery	0	0
Subtotal	11,400	10
Total	49,000	111
Projected Facilities:		
Mass burn[b]	113,000	118
Modular[c]	5,000	24
RDF	39,000	31
Undetermined[d]	36,000	37
Total	193,000	210

[a] Installed design capacity applied to existing facilities; projected applied to planned facilities.
[b] Includes both overfeed stoker and rotary combustor designs.
[c] Includes both starved air and excess air designs.
[d] Design type has either not been specified or data on design type was not provided in the references. For the purposes of analysis, these facilities are subsequently allocated to the design categories based on the proportion of waste throughput for each category.

Source: USEPA: Assessment of Municipal Waste Combustor Emissions Under the Clean Air Act, 40 CFR Part 60.

TABLE 6
ESTIMATED ANNUAL STACK EMISSIONS FROM EXISTING MUNICIPAL SOLID WASTE INCINERATORS FOR SELECTED POLLUTANTS

	Current Emissions (kg/yr)			
	Massburn	RDF	Modular	Rounded total
Arsenic	2,300	120	240	2,700
Beryllium	20	80	<1	100
Cadmium	7,700	140	2,600	10,400
Carbon monoxide	13,300,000	6,370,000	404,000	20,000,000
Chlorobenzenes	3260	500	23	3780
Chlorophenols	4690	640	23	5350
Chromium [a]	450	140	6	600
Chlorinated dioxins [1] and dibenzofurans (CDD/CDF)	16.7	7.1	0.3	24
Formaldehyde	53,100	3,890	1,640	58,600
Hydrogen chloride	31,000,000	12,500,000	4,240,000	47,700,000
Lead	270,000	14,000	56,600	341,000
Mercury	65,500	1,100	1,800	68,000
Nitrogen oxides	22,400,000	7,800,000	280,000	30,500,000
Particulate matter	8,300,000	1,300,000	780,000	10,400,000
Polychlorinated biphenyls (PCB)	2	4,960	8	4,970
Polycyclic aromatic hydrocarbons (PAH)	490	460	5	955
Sulfur oxides	7,000,000	4,900,000	1,000,000	13,000,000

[1] The terms dioxins and dibenzofurans generally refer to a group of 75 chlorodibenzo-para-dioxin compounds and 135 chlorodibenzofuran compounds, each having similar chemical and physical properties.

TABLE 7
ESTIMATED ANNUAL STACK EMISSIONS FROM PROJECTED MSW INCINERATORS FOR SELECTED POLLUTANTS

	Current emissions (kg/yr)			
	Massburn	RDF	Modular	Rounded total
Arsenic	12,100	750	140	13,000
Beryllium	43	540	<1	580
Cadmium	16,200	850	2,740	19,900
Carbon monoxide	56,600,000	27,200,000	710,000	84,500,000
Chlorobenzenes	390	2,120	4	2,510
Chlorophenols	780	2,720	4	3,500
Chromium [a]	560	910	820	2,550
Chlorinated dioxins [1] and dibenzofurans	2.5	18.1	.2	21
Formaldehyde	109,000	8,500	2,900	119,000
Hydrogen chloride	139,000,000	48,400,000	7,100,000	194,500,000
Lead	572,000	87,600	600,200	1,260,000
Mercury	129,000	7,220	1,940	148,000
Nitrogen oxides	95,700,000	33,000,000	4,900,000	134,000,000
Particulate matter	17,600,000	8,000,000	830,000	26,700,000
Polychlorinated biphenyls (PCB)	9.1	21,200	1	21,200
Polycyclic aromatic hydrocarbons (PAH)	2,090	1,970	8.5	4,070
Sulfur oxides	34,500,000	25,500,000	1,400,000	53,100,000

[1] Emissions estimates based on facilities with good particulate matter control equipment.

Source: USEPA: Assessment of Municipal Waste Combustor Emissions Under the Clean Air Act, 40 CFR Part 60.

For the population of projected municipal solid waste incineration facilities, emissions were estimated using model plants and emission test data from the newer, well-operated existing facilities (Table 7). Design capacities selected for the model plants were 500, 1000, and 3000 tons per day for mass burn facilities, 1500 and 3000 tons per day for the RDF facilities, and 100, 250, and 400 tons per day for the modular facilities. The metal and organic emission factors varies by combustor technology. Baseline control efficiency assumed good particulate control equipment, with 99 percent control efficiency and good combustion to reduce organic emissions. All new facilities were assumed to include heat recovery equipment. No acid gas control equipment was assumed for the baseline analysis. The selection of emission baselines is described in detail in EPA's Municipal Waste Combustion Study, Assessment Of Health Risks (1987a).

B. Residue and Ash Disposal

The residue of ash and inert material that remains after combustion of municipal solid waste must be landfilled. Due to concerns about content and hazard potential, incinerator ash in Illinois is classified as "special waste" and cannot be co-disposed with municipal solid waste at a conventional landfill, except by special permit. Proposed state regulations will require disposal of ash residue in a lined monofill equipped with leachate collection and monitoring systems. Legislation recently introduced in Congress would provide options for co-disposal or monofilling of ash in landfill facilities that meet special design requirements such as single or multiple liners and leachate collection systems.

C. Wastewater Discharge

The principal sources of wastewater from mass-burn systems are stormwater runoff, sanitary wastes and process wastewater related to the production of steam and electricity. Stormwater runoff is a function of site and weather conditions and normally comes from roof drains and paved areas. It is routed to a retention basin or other outflow from the site.

Environmental concerns regarding stormwater relate primarily to contamination by solid wastes. Roofed waste storage and careful design of drainage patterns will ensure runoff does not come in contact with solid waste.

Sanitary wastes are a function of the number of workers at the facility. Total quantities generated are small.

Process wastewaters from the production of electricity include cooling water, boiler blowdown, and wastewater from boiler feedwater treatment systems. The amount produced is a function of the amount of electricity generated, the type of cooling system used, the portion of wastewater recycled in-plant, and the wastewater treatment selected. The greatest quantities of wastewater come from excess cooling tower blowdown and boiler blowdown not discharged to the ash residue quench tank. This excess is typically collected on site in a closed loop then discharged into the local sanitary sewer system.

Control of wastewater discharge is regulated by both the Federal and State Environmental Protection Agencies. A number of regulations have been formed as a result of the passage of the Federal Water Pollution Control Act (Clean Water Act) of 1972. Regulations and guidelines pertaining to wastewater discharges are contained in Title 40, Chapter I, Subchapter D - Water Programs, Parts 104-147 of the CFR.

State regulations regarding water pollution can be found in Title III, Sections 11-13 of the Act. Any facility capable of causing or contributing to water pollution is required to secure a permit from the IEPA; permit process guidelines are outlined in Title 35, Subtitle C - Water Pollution of the IAC.

Municipal solid waste combustion facility wastewater can be discharged to natural waterways and to municipal wastewater treatment plants. If discharged to natural waterways, the combustion facility must obtain a National Pollutant Discharge Elimination System (NPDES) permit from IEPA. Wastewater discharged to a municipal wastewater treatment plant must meet pretreatment

standards specified at 35 IAC 307. These standards are determined on a site specific basis and depend upon treatment plant control capabilities.

D. Odor and Vectors

Odors also have the potential to cause enough nuisance to require regulation (35 IAC 245). Complying with municipal solid waste storage time requirements and following good housekeeping practices will normally provide adequate control of odor emissions.

Vectors are generally not a concern in incineration facilities since all operations, including unloading and storage, take place indoors.

VII. Economic Analysis

The following is a comparison of costs for mass burn waterwall and mass burn modular facilities specifically pertaining to capital and operating expenses. Development costs are project specific and may include site acquisition, permitting, site approval, and contracts for waste flow commitment and energy sales. Individual project costs will vary significantly based on ownership and financing.

A. Capital Costs

The Illinois Department of Energy and Natural Resources conducted a study of capital costs for modular waste-to-energy facilities which range in design capacity from 100 to 360 TPD. The capital cost per ton of processing capacity ranges from $39,330 to $85,000 (Table 8). Waterwall waste-to-energy facilities with TPD processing capacities ranging from 200 to 3,00 TPD have costs per ton of processing capacity ranging from $51,500 to $150,000 (Table 9). Note the data presented in Tables 8 and 9 is somewhat dated.

Capital costs for a 250 TPD modular facility and a 1,000 TPD waterwall mass burn facility were based on facilities of similar size and technology, but not on a specific vendor's technology. The capital costs in Table 10 were based on the costs presented in Table 8 and 9. The costs presented in Table 10 are not specific for a particular site or technology. Each system is assumed to include gas scrubbing equipment and a baghouse system.

TABLE 8

MODULAR WASTE-TO-ENERGY FACILITIES
CAPITAL COSTS

Facility	Combustion Capacity (TPD)	Capital Cost ($1,000)	Year	Cost per ton Processing Capacity	Comments
Hartford, MD	300	20,448	1985	68,200	Steam
Oswego County, NY	200	16,000	1985	80,000	Cogeneration
Cleboine, TX	100	8,500	1985	85,000	Cogeneration
Poscagoula, MS	150	5900	1984	39,330	Steam Only
Shelton, Ct	360	28,400	1986	79,000	Cogeneration - Bid & Not Constructed
Average	222	15,850		70,306	

Source: IDENR, Municipal Solid Waste Management Options, Waste-to-Energy, June, 1989.

TABLE 9

WATERWALL WASTE-TO-ENERGY FACILITIES
CAPITAL COSTS

Facility	Combustion Capacity (TPD)	Year	Capital Cost ($1,000)	Cost per ton Processing Capacity
Essex County, NY	2,250	1988	243,000	108,000
Bergen County, NJ	3,000	1989	286,500	95,500
Boston, MA (1)	1,500	1988	160,000	106,700
Bethlehem, PA	1,000	1988	120,000	120,000
Town of Oyster Bay, NY	1,000	1988	120,000	120,000
Preston, CT	600	1988	90,000	150,000
Duchess County, NY	400	1987	30,500	76,250
Hempstead, NY	2,250	1986	252,553	112,250
North Andover	1,500	1985	123,000	82,000
Claremont, NH	200	1985	17,700	88,500
Bridgeport, CT	2,250	1985	211,180	93,900
Bristol, CT	650	1985	58,480	90,000
Marion, OR	550	1984	47,500	86,400
Alexandria, VA	975	1984	55,500	57,000
Westchester, FL	2,250	1984	178,900	79,500
Baltimore, MD	2,250	1984	185,000	82,200
Pinellas County, FL	2,000	1983	103,000	51,500
Average	1,449		134,283	92,673

Notes: (1) Project bid, vendor selected and not constructed.

Source: IDENR, Municipal Solid Waste Management Options, Waste-to-Energy, June, 1989.

TABLE 10

WASTE-TO-ENERGY FACILITY
CAPITAL COSTS (YEAR 1988)
COSTS IN 1,000 DOLLARS

Cost Component	250 TPD	1,000 TPD
Vendor Design Costs	3,000	5,000
Construction Phase	17,500	90,000
Community Development Fees and Contingencies	2,375	8,000
Total Capital Cost	22,875	103,000

Source: IDENR, Municipal Solid Waste Management Options: Waste-to-Energy, June, 1989.

The Vendor Costs presented include such things as:

Permits
Construction Management
Temporary Utilities

Construction Costs include such things as:

Site Work/Utilities
Building
Air Pollution Control
Mechanical Systems
Bonds/Insurance
Start-up/Testing

Costs incurred by the vendor may include the costs for permits, preliminary design for permitting purposes, air emission dispersion modeling, and construction permits. Permit costs are allocated to the vendor and the

engineering consulting firm assisting the communities. Construction management provides monitoring services during construction and start-up.

Fees and contingencies include costs for contract negotiations with energy markets and the vendor and the sale of bonds to finance the facility.

Capital costs are estimated in year 1988 dollars and are escalated to the year construction begins. An example would be to assume two years are required to permit and develop a facility. Given an acceptable site, the costs could then be escalated at 4 percent annually to reflect start of construction in the year 1992. These costs do not include property purchase, condemnation proceedings or legal fees which vary with different sites. The estimate for the 250 TPD facility assumes the distance to the steam market site from the facility will be less than one (1) mile with no major interference from existing streets and utilities. The estimate for the 1,000 TPD facility assumes only electricity will be sold and that steam will be used in internal processes.

B. Operations and Maintenance Costs

Annual operations and maintenance costs were estimated by ENR and are summarized in Table 11 (estimated in 1989 dollars). The assumption of the amount of solid waste processed per year is based on 85 percent plant capacity.

The cost of direct labor is based on an average salary of $25,000 per year, since many of the positions at a waste-to-energy facility are skilled or management. Labor benefits are based on 30% of the base salary.

Maintenance supply costs are estimated to be $4 per ton of waste processed. Contract maintenance refers to specialized labor and repair beyond that available from regular staff, estimated at 25% of direct labor costs.

Equipment replacement was calculated at $2.50 per ton of waste processed. This annual budgetary allotment will accrue in a fund that will ensure funds are available to repair and replace equipment and be fully operable over the debt-service period.

TABLE 11

WASTE-TO-ENERGY FACILITY
OPERATIONS AND MAINTENANCE COSTS (YEAR 1989)
COSTS IN 1,000 DOLLARS

COST COMPONENT	250 TPD	1,000 TPD
Assumptions		
Solid Waste (tons) processed per year	77,563	310,250
Number of Staff	23	44
Operations Costs		
Direct Labor and Benefits	697	1,430
Maintenance Supplies	450	1,520
Equipment Replacement	310	1,240
Utilities	87	349
Host Community Fee	80	310
Operating Fee	170	480
Plant Insurance	364	480
Direct Cost Subtotal	2,210	5,850
Landfill Hauling and Disposal - Residue	860	3430
Indirect Cost Subtotal	860	3,430
TOTAL	3,070	9,280

Source: IDENR, Municipal Solid Waste Management Options: Waste-to-Energy, June, 1989

Electric costs are based on a plant demand of 80 kwh per ton of waste processed and also factors electrical consumption during the time when the turbine generator is not generating power during maintenance (assumed to be 10% of the time).

Host community fee (payment in lieu of tax) provides the host community a revenue source since the property occupied by the facility will not generate property tax and will generate additional traffic.

Residue hauling costs are estimated at $2.13/ton assuming a 20 mile round trip distance. Landfill disposal fees for residue and bypass waste are estimated at $20.00 per ton in year 1989 dollars.

The operating fee assumes a private company specializing in waste-to-energy facility operations will be contracted to manage the facility. The facility management fee is assumed to be 10 percent of the total operations and maintenance budget.

C. Tipping Fees

Analyzing tipping fees is another way of comparing costs for solid waste processing and disposal. Data from Will, Lake and DuPage County Solid Waste Management Reports indicates that tipping fees for mass-burn facilities ranging in design capacity from 550 to 1200 TPD range from $40.38/ton to $43.75/ton (in 1990 dollars).

D. NSWMA Survey Results

The National Solid Waste Management Association, (NSWMA), conducted a fall 1990 survey of all operating and planned incinerators in the United States and Canada. The survey included cost information which is significantly greater than estimates from sources cited on the previous pages.

The NSWA survey of 83 facilities scheduled for start-up between 1983 and 1994 found an average capital cost of $114.00 per daily design ton, significantly higher than the $92,673,000 to $103,000,000 reported in the IDENR study. The timeliness of the NSWMA data suggests it is the more accurate source of information. In addition, new provisions of the Clean Air

Act and other Federal regulations will likely result in the capital costs of WTE combustion plants being significantly higher than what is currently reported.

The NSWMA survey concludes that "facilities built today can be expected to have tipping fees in the $40 to $100/ton range." The tipping fees cited in the draft Incineration Report, $40.38 to $43.75 per ton, are at the extreme low end of the NSWMA - reported range.

The capital and O&M costs cited in the draft report for a 1,000 TPD plant correspond to total costs of 63.72 per ton, assuming 8% interest over a 20 year period. Total costs of a 1500 TPD unit, as analyzed in a plan for Madison, Monroe, and St. Clair Counties, equate to $81.20 per ton. Total costs for separate 1,000 TPD and 500 TPD units would equate to $104.40 per ton.

The major variable in determining tipping fees is the rate received for electricity sales. The current avoided cost rate for Commonwealth Edison is approximately 2.2¢ per kilowatt-hour. This rate would translate into tipping fees of $50 - $56 for the 1,000 TPD plant and $68 - $73 for the 1,500 TPD facility.

Higher electricity rates are provided for in House Bill 942 (P.A. 85-882), which enables waste-to-energy facilities to sell electricity at a price equal to that paid by local governments. However, this provision has not yet been tested by an actual facility, and the actual price which could be expected is difficult to determine.

In conclusion, there appears to be a high level of uncertainty as to the actual tipping fees that can be expected at a WTE facility. Given the increasing capital costs likely to result from increased regulatory efforts, the middle of the range reported by the NSWMA , i.e. $60 - $80 per ton, may be a reasonable estimate of tipping fees for facilities constructed during the next 5-10 years.

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APPENDIX G

TECHNOLOGY ASSESSMENT: LANDFILLS

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Batavia, Il.

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TECHNOLOGY ASSESSMENT: LANDFILLS

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I. Introduction

The purpose of this report is to provide a basic understanding of the technology and regulations governing the siting, design and operation of a sanitary landfill for municipal solid waste. Federal and State permitting criteria, landfill design and operations, environmental considerations, and economic impact will be reviewed.

Landfilling has been considered the most convenient and economical method of refuse disposal for thousands of years. The oldest known centrally located landfill was in Athens in around 500 B.C. Since that time landfilling has remained the most common refuse disposal method. According to the Illinois Environmental Protection Agency, (IEPA), 95% of the state of Illinois' solid waste was disposed of in landfills in 1988. The USEPA reports that nationally about 87% of the nation's solid waste is disposed in landfills. Today's landfills, however, are a far cry from the open dumps used in Athens almost 2500 years ago or even those located in the United States 20 years ago. Modern landfill technology has evolved from an unregulated, environmentally unsound disposal method to a highly regulated, advanced technology utilizing state-of-the-art environmental controls.

Sanitary landfills are developed and operated according to the wastes contained in the fill. Solid waste has been classified relating to the waste type in an effort to aid landfill operators and regulators in determining the level of environmental safety and monitoring necessary to ensure toxic contaminants present within the fill do not migrate and contaminate adjacent areas. Class III sanitary landfills accept construction and demolition waste. Because these wastes are considered inert, fewer regulatory requirements are placed on these disposal sites. Class II sanitary landfills are the disposal class for non-hazardous and municipal solid waste. Class I requirements are the most stringent because hazardous wastes are disposed in Class I sanitary landfills.

II. Permitting Requirements

Solid waste management activities, including storage, treatment and disposal are regulated by the IEPA Division of Land Pollution. Sanitary landfilling in the state

is regulated under Title 35 of the Illinois Administrative Code. The construction and operation of a facility designed for waste disposal such as a sanitary landfill would require a development permit and an operating permit, issued by the IEPA. Federal guidelines have also been established for solid waste activities under the Resource Conservation and Recovery Act (RCRA) of 1976. Both state and federal regulations are under revision to further control potential releases of contaminants from sanitary landfills. The USEPA is currently developing revisions to Subtitle D of RCRA. These proposed regulations are expected to become effective after June of 1991. (Note: The new Subtitle D regulations were adopted in October 1991.) The new federal regulations will likely increase costs, promote uniformity among states, and result in more widespread use of state-of-the-art technologies. The proposed revisions to existing Illinois solid waste rules are contained in Docket R88-7, and are summarized in Chapter III of this report. (Note: The new Illinois regulations became effective in August 1990).

A. <u>Development Permit</u>

A development permit is necessary for construction of access roads, waste processing facilities, and environmental controls. To obtain a development permit, a general non-hazardous municipal landfill development proposal and application must include a legal document stating local approval, site selection criteria, and a management plan.

Local approval and site selection criteria are detailed in the accompanying report entitled "Regional Pollution Control Facility Siting".

A management plan would include:

- Soil and hydrology testing and analysis;
- Liners and berms;
- Daily cover material evaluation;
- Surface water, erosion, and landscape management plan;
- Groundwater monitoring plan;

- Gas management plan;

- Closure and post-closure care plan; and

- Operating plan which includes personnel, delivery procedure, landfill cell parameters, screening procedure, pest control, dust control, odor control, run-on/run-off diversion, erosion control, final reclamation, monitoring/management of gas and leachate, and resource recovery operations.

B. Operating Permit

An operating permit certifies the developer has adhered to the provisions of the development permit plan. This permit is issued after the initial facility development takes place but before the facility accepts waste. It does not require planning information beyond that specified in the development permit application operating plan.

Under IPCB's proposed regulations (R88-7), separate development and operating permits will not exist. All owners/operaters would submit an application to the IEPA to receive a single permit when either developing or operating a landfill.

III. Landfill Design and Operations

Landfill design is influenced by the geographic area served, the type of waste accepted, and the quantity of waste received. A principal consideration is the desired landfill site operating life. A determination of operating life is needed to make sound financial decisions and is helpful in explanations to potential neighbors. The final use of the site after landfill operations have ceased is another consideration which should be included in the preliminary design. The preliminary design should also identify the density of uncompacted waste when it arrives at the landfill, the expected volume reduction from compaction at the site, the volume of cover compared to the volume of solid waste and the expected design depth.

A. Landfilling Technologies

There are a number of design technologies for sanitary landfill operations. They include the Trench Method, Area Method, and Progressive Slope Method.

1. **Trench Method**

In the Trench Method, solid waste is spread and compacted in an excavated trench. The material removed as the trench is formed is used as daily cover. It is spread and compacted over the waste to form the basic cell. Excess excavation soil is stockpiled for future covering uses. Solid waste trenches are spaced together closely and placed perpendicular to the prevailing wind. This alignment provides maximum soil stability and decreases the amount of blowing litter. The Trench Method is suited for areas with low ground tables and high clay soil formations more than six feet deep.

Equipment

The principal equipment used in the Trench Method is machinery for spreading and compacting the waste as it arrives. Compactors smooth the surface area, break up the waste, and compact it. At large landfills, earth movers spread the waste prior to compaction by other machines. Landfills also require service equipment to maintain haul roads, control dust (sprinkling), pump water, build drainage ways, install leachate collection pipes and so on. Examples are: road graders, sweepers, water trucks and backhoes.

Advantages/Disadvantages

The advantages of the Trench Method are the ability to use on-site borrow material, and its adaptability to large variations in terrain and operation sizes. Another advantage is that the small size of the face minimizes blowing and littering. Wet weather operations are more efficient because of the optimal design for drainage.

Groundwater close to the land surface is a disadvantage for the trench method for obvious reasons. Bottom liners are difficult and expensive to install using the trench method because the narrow bands are excavated immediately before being filled.

2. **Area Method.**

In the Area Method, a large area of land is excavated, and layers of cells are constructed until the permitted height is reached. Each cell contains the

waste received and compacted in one day. This method is most often used to dispose of large quantities of solid waste.

Equipment

The equipment used to operate the Area Method, as for the Trench Method, includes spreaders, compactors, and site maintenance equipment. Because of the large open face of the site, a movable fence is required to contain blowing litter. Additional equipment to aid in receiving, weighing-in and/or sorting may also be necessary.

Advantages/Disadvantages

The Area Method of landfilling is most frequently used where excavation below grade is impossible. It is able to accommodate large volume operations because of the large working face. Because a large area is excavated before operations begin, liners and leachate collection systems are relatively easy to install.

One disadvantage of this method is that adequate on-site material will be available for daily, intermediate and final cover only if extensive excavation is done. The costs to import and store cover material are significant. The increase in traffic such importing necessitates is another disadvantage.

3. Progressive Slope Method

In this method, solid waste is spread and compacted on a slope. The area directly in front of the working face is excavated for cover material. This excavation provides a depression into which the next days waste is compacted, then covered.

Equipment

Progressive Slope landfilling requires spreading, compacting and ancillary equipment as do the Trench and Area Methods. However, tank trucks and portable pumps may be necessary to remove rainwater and condensation from the excavated depressions.

Advantages/Disadvantages

This method is suited to a single layer disposal site because cover material is available on-site and a portion of the waste is deposited below the original surface.

The disadvantages to this method are limited disposal capacity and the difficulty of installing environmental quality controls such as liners and leachate collection systems due to the progressive nature of site excavation.

B. Area and Volume Requirements

A landfill site's capacity to receive solid waste is influenced by many factors, including:

- Solid waste density following placement
- Refuse moisture content
- Types of waste received
- Waste to soil cover ratio
- Settlement

Capacity is also dependent upon several design parameters, including fill height and sidewall slope. Also, area and volume requirements are obviously dependent upon the amount of solid waste accepted, and the design life of the facility.

Area requirements for landfills, expressed in total tons of capacity per acre, have been reported in (or can be calculated from) several recent studies, listed on the following page.

SOURCE	CAPACITY
Illinois Dept. of Energy and Natural Resources[1]	18,667 tons/acre
Mass. Dept. of Environmental Quality Engineering[2]	32,175 tons/acre
Minnesota Waste Management Board[3]	21,933 tons/acre
Will County[4]	36,500 tons/acre
AVERAGE	**27,319 tons/acre**

The land area requirement for a landfill disposal facility should take into account not only the area necessary for waste disposal, but also a "waste land factor" which considers the amount of site space necessary for access roads and other working areas. This factor ranges between 1.25 for the area method to 2.0 for the trench method.[5] Baling, recycling and other on-site processing systems would increase the land requirement.

Shredding

Processing solid waste by shredding prior to landfilling increases the compaction rate of the waste, thereby increasing the capacity of the landfill. This method is most often used to prolong the life of a landfill with limited remaining operating capacity.

Equipment

Typically, a rasp mill is used to shred solid waste. Mill feeding equipment such as conveyors and transport equipment are also necessary.

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[1] *Bruce Bawkon, P.E., Municipal Solid Waste Management Options: Landfills, Springfield, IL: Illinois Department of Energy and Natural Resources, 1989.*

[2] *WastePlan: Default Data Report, Version 90-6, Boston, MA, Tellus Institute.*

[3] *WastePlan: Default Data Report, Version 90-6, Boston, MA, Tellus Institute.*

[4] *Will County Solid Waste Management Plan, Landfill/Ashfill Component.*

[5] *Bruce Bawkon, P.E., Municipal Solid Waste Management Options: Landfills, Springfield, IL: Illinois Department of Energy and Natural Resources, 1989, p. 4-3.*

Advantages/Disadvantages

The advantage to shredding solid waste before landfilling is that shredded wastes can be compacted to a density approximately 27% greater than unshredded wastes. The Shredding Method decreases the amount of time necessary to spread and compact waste and minimizes blowing and littering problems. Site maintenance is reduced because settling gas production occurs over a shorter period of time.

The disadvantages of the Shredding Method include the potential for explosion during the shredding process and the cost of constructing buildings to house the equipment which will limit the trajectory of exploding machinery. Repair and replacement costs are also factors.

The costs of a shredding operation are site specific, but will generally be higher on a per ton basis than at a landfill with no processing. These additional costs may be justified by the increase in life expectancy of an existing landfill (vs. siting a new landfill).

Balefilling

The Balefill Method compresses solid waste into bales which may weigh more than one ton. Bales are stacked on the working face of a landfill using a forklift and covered with soil at the end of each working day, forming a cell. Baling can take place on-site or at an off-site transfer station.

Equipment

Baling facilities are usually enclosed structures with a receiving area (tipping floor), conveyors to feed the balers, and a loading dock to transport the bales to the landfill site. Bales are often transported by forklift at the disposal site and stacked (usually three tiers high) on the working face. A standard earth mover or loader can cover the stacked bales with the required (additional compaction is unnecessary).

Advantages/Disadvantages

A notable advantage of baling solid waste is that a balefill can hold a larger amount of waste than a regular landfill of the same size. An efficiently

operated landfill can attain in-place compaction of 1000 to 1200 lbs. per yd^3. Baled municipal solid waste can be densified to 1000 to 2500 lbs. per yd^3, depending on the type of bales and characteristics of the waste.[6] The impact of this expansion will be determined by the initial compaction rate, waste characterization, and the method and materials used to bind the bales.

The costs associated with baling municipal solid waste, while site specific, are significantly greater than those with unprocessed landfill disposal. This method is generally used to conserve the capacity of an existing landfill.

C. Geotechnical and Hydrogeologic Data Requirements

After the preliminary design of a sanitary landfill has been prepared, a thorough assessment of specific site characteristics must be made. These characteristics determine the necessary control accessories regulatory agencies will require. To explore the potential for migration of leachate to present or potentially usable groundwater table, geotechnical information and evaluation of hydrogeologic conditions are required. These evaluations must be based on an investigation using data from soil borings, piezometers, waterwells and surface impoundments. Soil samples are tested on factors such as:

- Particle size distribution
- Atterberg limits
- Moisture contents
- Hydraulic conductivity
- Cation exchange capacity
- Shear strength
- Compaction
- Consolidation

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[6] *Bruce Bawkon, P. E., Municipal Solid Waste Management Options: Landfills, Springifliefd, IL: Illinois Department of Energy and Natural Resources, 1989, pp. 2-10.*

D. Design Requirements

Site characteristics will affect the design requirements for a given site, as will the requirements specified under Subtitle D and the proposed revisions to the Illinois solid waste regulations. The following design systems must be addressed.

1. Liners

The proposed Illinois solid waste regulations require a liner system to collect and contain leachate at the site. The intent is to capture and remove the leachate as quickly as possible to avoid leakage into groundwater. Liners must be able to endure chemical and physical attack mechanisms and must not fail structurally during or after installation. Liners may be composed of soil or synthetics.

Soil liners are the most chosen in Illinois because of the state's abundant supply of clay - the most appropriate type of soil for liner construction due to its low permeability. The proposed state regulations specify that the liner must be at least five (5) feet thick and should be compacted to achieve a maximum hydraulic conductivity of 1×10^{-7} cm/sec. The liner should be compacted to minimize void spaces and support the loadings imposed by the waste disposal operation without settling so as to cause or contribute to the failure of the leachate collection system. The liner should be constructed from materials compatible with the constituents of the leachate expected to be produced. Alternative specifications, using standard construction techniques for hydraulic conductivity and liner thickness may be utilized, provided the liner thickness is not less than five feet, and the modified liner operates in conjunction with a leachate drainage and collection system to achieve equal or superior performance to the requirements above.

Synthetic (geomembrane) liners may be used only in conjunction with a compacted earth liner system meeting the above requirements and a leachate drainage and collection system meeting the requirements later specified. the geomembrane should be supported by a compacted base, free from sharp objects, and must be compatible with the supporting soil materials and expected leachate. The liner should have sufficient strength and durability to function at the site for the design period under maximum expected loadings imposed by the waste and equipment and stresses

imposed by settlement, temperature, construction and operation. Seams should be made in the field according to the manufacturer's specifications. Their use is to be minimized and seams are to be laid in the direction subject to the least amount of stress. The leachate collection system should be designed to avoid openings through the geomembrane.

2. Leachate Collection System

Leachate collection and removal systems are provided to remove fluids from above the landfill liner. Leachate is fluid in the landfill contaminated by contact with waste materials; it includes any fluids that were in the waste as it was deposited. and any rainfall that percolates through the cap or cover. Collection of leachate from above the liner removes the pressure (head) that would drive the fluid through the liner. The collection system is typically composed of a drainage system overlying the liner and a perimeter collection pipe network within a granular envelope. The proposed state regulations for leachate collection drainage systems specify that the system be designed so that a maximum head of one foot above the liner is maintained, and be designed to operate during the month having the highest average monthly precipitation. If the liner bottom is located in the saturated zone, the system should be designed to operate under the seasonal high groundwater table level. The system should be designed and constructed to function for the entire design period. A drainage layer should overlay the entire liner system, be no less than one foot thick, and have a hydraulic conductivity equal to or greater than 1×10^{-3} cm/sec. The drainage layer should be designed to maintain laminar flow throughout the drainage layer under the conditions described above.

Materials used in the leachate collection system should be chemically resistant to the wastes and the leachate expected to be produced. Collection pipes should be designed for open channel flow to convey leachate under the conditions established in Section 811.307(b). Collection pipes should be of a cross sectional area that allows cleaning. The collection pipe material and bedding materials as placed should possess structural strength to support the maximum loads imposed by the overlying materials and equipment used at the facility. Collection pipes should be constructed

within a coarse gravel envelope using a graded filter or geotextile as necessary to minimize clogging. The system should be equipped with a sufficient number of manholes and clean out risers to allow cleaning and maintenance of all pipes throughout the design period. Leachate should be able to drain freely from the collection pipes. If sumps are used then pumps should remove the collected leachate before the level of leachate in the sumps rises above the invert of the collection pipes.

3. Leachate Monitoring

Representative samples of leachate should be collected from each unit at a frequency of once per quarter while the leachate management system is in operation. Discharges of leachate from units that dispose of putrescible wastes should be tested for the following constituents prior to treatment or pretreatment:

- Five day biochemical oxygen demand (BOD_6);
- Chemical oxygen demand;
- Total Suspended Solids;
- Total Iron;
- pH;
- Any other constituents listed in the operator's NPDES discharge permit, pursuant to 35 Ill. Admin. Code 304, or required by a publicly owned treatment works, pursuant to 35 Ill. Adm. Code 310; and
- All of the indicator constituents used by the operator for groundwater monitoring.

The operator should collect and dispose of leachate for a minimum of five years after closure and thereafter until treatment is no longer necessary. Treatment is no longer necessary if the leachate constituents do not exceed the wastewater effluent standards in 35 Ill. Adm. Code 304.124, 304.125, 304.126 and do not contain a BOD_5 concentration greater than 30 mg/L for six consecutive months.

The landfill must either provide facilities for the leachate to be treated on-site or must haul or pump the leachate to off-site facilities for treatment. If the leachate

is to be hauled to a municipal wastewater treatment facility, pretreatment may be necessary due to the normally high organic concentration (and the possible presence of heavy metals which will concentrate in wastewater sludges) found in leachate.

The proposed Illinois solid waste regulations allow the recirculation of leachate through the landfill. Studies have indicated recirculation allows a landfill to stabilize more quickly. Ultimately, some of the leachate will still need to be removed and treated off-site.

4. Gas Collection System

Landfill gas control systems are a fundamental element of the design process. Landfill gas is a byproduct of the natural decomposition of organic material in the waste deposits by the action of microbes. Landfill gas consists of about 50% methane and 50% carbon dioxide, with trace concentrations of other constituents. While the site is operating and open to the atmosphere, landfill gases dissipate naturally. When the site closes, the final cover system traps the gases in the landfill. As pressure from the gases increases, the gases begin to migrate from the site. Cracks in the final cover may allow gases to vent upwards. The gases may also migrate laterally from the site possibly endangering neighboring development.

There are four areas of concern associated with the uncontrolled migration of landfill gas:

- Landfill gas, when mixed with air, is explosive at concentrations between 5% and 15%.

- Though methane and carbon dioxide are odorless, some of the trace constituents (e.g. hydrogen sulfide) can cause offensive odors.

- There is growing concern regarding emission of some of the trace organic constituents due to their potential toxicity.

- The emission of landfill gas (specifically hydrocarbons) may contribute to the greenhouse effect.

Landfill gas control systems are classified as active or passive. Passive control generally involves non-mechanical elements such as vents or flares drilled through the landfill cap to control the gas at the point of emission or barrier walls or gravel

trenches around the site perimeter to preclude subsurface migration. These systems rely on the pressure of the gas in the landfill to direct the gas to the vents or collection system. Since it is difficult to know in advance which path the gas will take, passive vents may not be placed to effectively capture the gas.

Active systems generally use blowers. Individual vents can be connected with pipes, and a vacuum placed on the entire gas collection system to draw the landfill gas to a central point. The gas can then be processed through a central flaring system, but the opportunity for energy recovery is ideal. During initial landfill development, the low rate and poor quality of gas generated will necessitate the burning of gas without energy recovery. This will require an IEPA permit. As the quality and quantity of gas increases, alternative uses are available. The carbon dioxide fraction of the gas is non-combustible, but the methane component possesses a heating value similar to natural gas. Unprocessed landfill gas has a heating value of about 500 BTU/cubic ft., compared to 1,000 BTU/cubic ft. for natural gas. There are three main energy recovery technologies for landfill gas recovery.

> Medium BTU/Direct Gas Sales - Provision of landfill gas, with minimal processing, directly to a nearby industrial user.
>
> High BTU/Pipeline Quality Gas - Sophisticated treatment of landfill gas to achieve 1,000 BTU/cubic ft., with sale to local utility to supplement natural gas supplies.
>
> Electrical Generation - Use of landfill gas as fuel in internal combustion engine/generator(s), with electricity used on-site or supplies to utility grid.[7]

The method chosen for long term disposal of the gas will be based on field testing of gas quality and quantity and the economic forecast for gas and electric power. The minimum proposed IPCB requirements for the gas management system are listed on the following page.

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[7] *Municipal Solid Waste Management Options: Landfills, Vol 1, Eldredge Engineering Associates, pp. 17-18.*

Gas Collection System:

- Gas collection systems may be installed either within the perimeter of the unit or outside the unit.

- The gas collection system should transport gas to a central point or points for processing for beneficial uses or disposal in accordance with the "Landfill Gas Processing and Disposal Systems" requirements (as presented later in this text).

- The gas collection system should be designed to function for the entire design period. The design may include changes in the system to accommodate changing gas flow rates or compositions.

- All materials and equipment used in construction of the system should be rated by the manufacturer as safe for use in hazardous or explosive environments and shall be resistant to corrosion by constituents of the landfill gas.

- The gas collection system should be designed and constructed to withstand all landfill operating conditions, including settlement.

- Under no circumstances should the gas collection system compromise the integrity of the liner, leachate collection or cover systems.

- The gas collection system should be tested to be airtight to prevent the leaking of gas from the collection system or air into the system.

- The gas collection system should be operated until the waste has stabilized enough to no longer produce methane in quantities that exceed the "specified" allowable concentrations. Excedance of the specified allowable concentrations are determined by the following:

    - A methane concentration greater than 50 percent of the lower explosive limit in air, attributable to the unit that is detected below the ground surface by an ambient air monitor or a monitoring device which is located at or beyond outside the property boundary or 30.5 meters (100 feet) from the edge of the unit, whichever is less;

    - Methane attributable to the unit that is detected at a concentration greater than 25 percent of the lower explosive limit in air in any building on or near the facility.

- Malodors caused by the unit which are detected beyond the property boundary.

- The gas collection system should be equipped with a mechanical device, such as a compressor, capable of withdrawing gas, or be designed so that a mechanical device can be easily installed at a later time, if necessary, to
meet the "specified" allowable concentration requirement as described above.

Landfill Gas Processing and Disposal System:

- The processing of landfill gas for use is strongly encouraged but is not required.

- No gas may be discharged directly to the atmosphere. Gas should be treated or burned on-site prior to discharge in accordance with a permit issued by the Agency pursuant to the Illinois Environmental Protection Act, Subtitle B (Air Pollution Regulations).

- Representative flow rate measurements should be made of gas flow into treatment or combustion devices.

- Landfill gas may be transported off-site to a gas processing facility in accordance with the following requirements:

  - The solid waste disposal facility contributes less than 50 percent of the total volume of gas accepted by the gas processing facility. Otherwise, the processing facility must be considered a part of the solid waste management facility.

  - The landfill gas should be monitored for methane, pressure, nitrogen, oxygen, carbon dioxide, any compound on the list of air toxics, adopted by the IPCB pursuant to Section 9.5 of the Illinois Environmental Protection Act. Other constituents such as ammonia (NH_3), hydrogen sulfide (H_2S) and hydrogen (H_2) should also be monitored.

  - The gas processing facility is to be sized to handle the expected volume of gas.

5. Cover

Landfill cover is the soil spread over the solid waste. Daily cover is applied at the end of each working day to shed rain, minimize odors, reduce litter and control vectors. In a balefill facility, soil cover may not be the most appropriate form of daily cover. Alternatives are heavy duty tarps or foam.

The State of Illinois proposed solid waste regulations specify the following requirements for daily cover:

- A uniform layer of at least 0.15 meter (six inches) of clean soil material should be placed on all exposed waste by the end of each day of operation.

- Alternative materials or procedures, including the removal of daily cover prior to additional waste placement, may be used, providing that the alternative materials or procedures achieve equivalent or superior performance to the requirements above, in the following areas:

    - Prevention of blowing debris;

    - Minimization of access to the waste by vectors;

    - Minimization of the threat of fires at the open face; and

    - Minimization of odors.

Final cover of the landfill cap usually includes a hydraulic barrier layer intended to prevent precipitation from centering the landfill. The principle purpose of the cap is to shed stormwater thereby reducing the production of leachate. The cap is composed of several layers of material applied across the entire finished landfill surface. The first layer is called the grading layer and is used to create a smooth, compacted surface on which to build the cap system. The next layer is the capping layer, usually composed of clay or an artificial liner. It is used to shed stormwater. The third layer, or hydraulic barrier layer, protects the cap from root and frost penetration which could damage the seal on the landfill. The final layer is topsoil, used to support vegetation.

The proposed revisions to the Illinois solid waste regulations require a minimum of two material layers, one a low permeability (claylike) layer, the other a protective layer capable of growing vegetation. The minimal proposed regulations are as follows:

Standards for the Low Permeability Layer:

- Not later than 60 days after placement of the final lift of solid waste, a low permeability layer should be constructed.
- The low permeability layer should cover the entire unit and connect with the liner system.
- The low permeability layer should consist of either a compacted earth layer, a geomembrane layer or any other low permeability type layer that provides equivalent or superior performance to the requirements listed below.
- A compacted earth layer should be constructed in accordance with the following standards:
  - The minimum allowable thickness shall be 0.91 meter (3 feet);
  - The layer should be compacted to achieve a permeability of 1×10^{-7} cm/sec and minimize void spaces.
  - Alternative specifications may be utilized provided that the performance of the low permeability layer is equal to or superior to the performance of a layer meeting the requirements above.
- A geomembrane should be constructed in accordance with the following standards:
  - The geomembrane should provide performance equal or superior to the compacted earth layer described above.
  - The geomembrane should have strength to withstand the normal stresses imposed by the waste stabilization process.
  - The geomembrane should be placed over a prepared base free from sharp objects and other materials which may cause damage.

Standards For The Final Protective Layer:

- The final protective layer shall cover the entire low permeability layer.

- The thickness of the final protective layer shall be sufficient to protect the low permeability layer from freezing and minimize root penetration of the low permeability layer, but shall not be less than 0.91 meter (3 feet).

- The final protective layer shall consist of soil material capable of supporting vegetation.

- The final protective layer shall be placed as soon as possible after placement of the low permeability layer to prevent desiccation, cracking, freezing or other damage to the low permeability layer.

E. Environmental Monitoring System

To monitor the effectiveness of a state of the art landfill, a number of monitoring systems should be included in the design plan. These systems include ground and surface water monitoring, monitoring gas emissions, and monitoring air quality at the site.

Leachate that is allowed to escape from the base of a landfill may migrate down to the water table and enter the groundwater flow system. The installation of wells or other monitoring devices provides a way to detect contaminants escaping and acts as an early warning signal before those contaminants are allowed to reach nearby water supplies. The minimum proposed IPCB regulations for groundwater monitoring all the following:

Standards for the Location of Groundwater Monitoring Points:

- A network of monitoring points should be established at sufficient locations downgradient with respect to groundwater flow and not excluding the downward direction, to detect any discharge of contaminants from any part of a potential source of discharge.

- Monitoring wells should be located in stratigraphic horizons that could serve as contaminant migration pathways.

- Monitoring wells should be established as close to the potential source of discharge as possible without interfering with the waste disposal operations, and within half the distance from the edge of the potential source of discharge to the edge of the zone of attenuation downgradient, with respect to groundwater flow, from the source.

- The network of monitoring points of several potential sources of discharge within a single facility may be combined into a single monitoring network, provided that discharges from any part of all potential sources can be detected.

- A minimum of at least one monitoring well should be established at the edge of the zone of attenuation and should be located downgradient with respect to groundwater flow and not excluding the downward direction, from the unit.

Groundwater Monitoring Schedule and Frequency:

- The monitoring period should begin as soon as waste is placed into the unit of a new landfill. Monitoring shall continue for a minimum period of fifteen years after closure. The operator should sample all monitoring points for all potential sources of contamination on a quarterly basis, throughout the time the source constitutes a threat of groundwater contamination.

- Monitoring should be continued for a minimum period of fifteen years after closure. Monitoring, beyond the minimum period, may be discontinued under the following conditions:

    - No statistically significant increase in the concentration of any constituent greater than the previous sample is detected for three consecutive years, after changing to an annual monitoring frequency; or

    - Immediately after contaminated leachate is no longer generated by the unit.

Gas Monitoring:

The gas monitoring regulations currently proposed in the State of Illinois are summarized below:

- Gas monitoring devices should be placed at intervals and elevations within the waste to provide a representative sampling of the composition and buildup of gases within the unit.

- Gas monitoring devices should be placed around the unit at locations and elevations capable of detecting migrating gas from the ground surface to the lowest elevation of the liner system or the top elevation of the groundwater, whichever is higher.

- A predictive gas flow model may be utilized to determine the optimum placement of monitoring points required for making observations and tracing the movement of gas.

- Gas monitoring devices should be constructed from materials that will not react with or be corroded by the landfill gas.

- Gas monitoring devices should be designed and constructed to measure pressure and allow collection of a representative sample of gas.

- Gas monitoring devices should be constructed and maintained to minimize gas leakage.

- The gas monitoring system should not interfere with the operation of the liner, leachate collection system or delay the construction of the final cover system.

- At least three ambient air monitors should be located no higher than 0.025 meter (1 inch) above the ground and 30.49m (100 feet) downwind from the edge of the unit or at the property boundary, whichever is closer to the unit.

Gas Monitoring Frequency:

- All gas monitoring devices, including the ambient air monitors shall be operated to obtain samples on a monthly basis for the entire operating period and for a minimum of five years after closure.

- The sampling frequency may be reduced to yearly sampling intervals upon the installation and operation of a gas collection system equipped with a mechanical device such as a compressor to withdraw gas.

- After a minimum of five years after closure, monitoring frequency may be reduced to quarterly sampling intervals.

- A minimum of fifteen years after closure, monitoring should be discontinued if the following conditions have been met for at least one year:

    - The concentration of methane is less than five percent of the lower explosive limit in air for four consecutive quarters at all monitoring points outside the unit; and

- Monitoring points within the unit indicate that methane is no longer being produced in quantities that would result in migration from the unit and exceed the "specified" allowable concentrations as were previously described.

- All below ground monitoring devices shall be monitored for the following parameters at each sampling interval:

  - Methane;

  - Pressure;

  - Nitrogen;

  - Oxygen;

  - Carbon dioxide; and

  - Any compound on the list of air toxics, adopted by the Board pursuant to Section 9.5 of the Illinois Environmental Protection Act, which is expected to be produced in the landfill unit.

- Ambient air monitors should be sampled for methane only when the average wind velocity is less than 8 kilometers (five miles) per hour at a minimum of three downwind locations 30.49 meters (100 feet) from the edge of the unit or the property boundary, whichever is closer to the unit.

- All buildings within a facility should be monitored for methane by utilizing continuous detection devices located at the most likely points for methane to enter.

F. Operations

The landfill operations phase is critical because it requires the consistent implementation of the engineering design. The design will only be effective if the primary goal of operations is to conform with it. An efficient operation minimizes environmental problems and reduces delays in delivery of waste to the site. A well-run site can be an asset to the community and can be operated in a manner compatible with other land uses. The initial planning process generally produces a written site operating plan (SOP). This plan should be read, understood and signed by all landfill personnel. Items generally included are listed on the following page.

- List of equipment, by type, number and function.
- List of personnel specific to the planned daily waste volume.
- Methods for identifying and excluding hazardous or incompatible wastes.
- List of site rules.
- Health and safety plan, with emergency contact numbers.
- Measures for fire prevention and control.
- Hours of operation.
- Site inspection and maintenance provisions.
- Fill face procedures.
- Control measures for litter, dust, mud and vectors.
- Site development sequence.
- Waste compaction and covering requirements.
- Personnel training.

Landfill personnel selection must be carefully and in-depth training provided. Health records for operators should be maintained and safety training records established. A long-term safety program is critical.

Dust, fire and litter controls must be undertaken. Dust may be managed by paving roads receiving frequent use and spraying water or spreading calcium chloride on dirt roads. A water truck must be available in the event of fire. Operating personnel must be trained in fire management procedures. Litter control should be practiced by installing wind barriers or portable screens near the working face and by unloading trucks at locations that minimize blowing. The smaller the working face area, the less potential for blowing litter.

Erosion must be controlled to prevent site damage and water pollution problems. Landfills which have reached final grade should be seeded as soon as possible, and areas at intermediate grades that will not be worked for a long time

should be seeded or mulched. Erosion problems can be limited by maintaining proper drainage, storm water diversion, and storm water detention structures.

G. Closure and Post-Closure

Proper closure and maintenance of landfills can minimize their potential threat to human health and the environment. Closure/Post-Closure Plans (CPC) detail the necessary owner/operator requirements and responsibilities for proper closure. Long-term environmental planning and management is necessary for appropriate site closure in order to meet the facility permit and regulatory requirements.

Closure and End Use

At the completion of site operations, final closure of the site is necessary to bring the facility into compliance with the proposed end use of the facility. Closure operations include final grading capping and final cover. The proposed IPCB regulations specify that the final slopes and contours should be designed to complement and blend with the surrounding topography. All drainage ways and swales should be designed to safely pass the runoff from the 100-year, 24-hour precipitation event without scouring or erosion. The final configuration of the facility should minimize the need for further maintenance.

Completed sanitary landfills have been successfully used for parks and recreation, botanical gardens, and greenbelts. However, maintenance such as regrading and reseeding is required to prevent wind and water erosion. The most common vegetation used is grass; shrubs and small trees may be added where funding allows. Landfills are often used as ski slopes, toboggan runs, ball fields, golf courses and playgrounds. Small buildings such as concession stands, sanitary facilities and equipment sheds are often required at recreational areas. Settlement and gas migration should be considered in construction of these buildings. Roads, parking lots and sidewalks should be constructed of flexible and easily repaired materials.

Post-Closure Care

Long-term post-closure care is necessary to maintain and operate landfill site environmental systems such as gas control and leachate collection and treatment. The revised Illinois solid waste rules will require maintenance of the site for 30 years

beyond the end of the design life in contrast to the 15 years currently required. Leachate collected after closure will need to be treated at the facility or hauled off-site for treatment. Gas control systems need to be maintained and operated to prevent migration and possible explosions.

Environmental monitoring systems will also need long-term care to assess the facility's impact on ground water, surface water, etc., and to detect any leakage. The site itself will need to be regraded periodically to avoid pooling of water in areas which have settled, increasing the generation of leachate. Ground cover maintenance will also be necessary to encourage runoff and promote water transpiration in the soil.

The proposed State of Illinois regulations require that the operator treat, remove from the site, or dispose of all wastes and waste residues within 30 days after receipt of the final volume of waste. The operator must remove all equipment or structures not necessary for post-closure land use, unless otherwise authorized by permit. The operator must also conduct a quarterly inspection of all vegetated surfaces for at least five years after closure. After five years, the frequency of inspections may be reduced to an annual basis until erosion has stopped and there are no eroded or scoured areas. For landfills other than those used exclusively for disposing waste generated on-site, final cover and vegetation inspections must be continued for 15 years after closure. All rills, gullies and crevices identified in the inspection should be filled. Areas susceptible to erosion should be contoured. All eroded and scoured drainage channels should be repaired and lining material replaced if necessary. All holes and depressions caused by settling should be filled and recontoured to prevent standing water. All reworked surfaces and areas with failed or eroded vegetation should be revegetated.

H. Municipal Incinerator Ash Disposal

The residue remaining after municipal solid waste is incinerated is often called "ash". The characteristics of this ash vary with the wastestream, the type of incineration process ,and the air emissions control system used. It is generally comprised of the material remaining after waste volume reduction by burning and the residue of additives used in the burning or gas scrubbing process. Municipal solid

waste ash is considered a solid waste by the USEPA and is regulated under RCRA. Both federal and state regulations contain a "household exclusion clause" excluding municipal incinerator ash from RCRA's hazardous waste regulations. Municipal incinerator ash is defined as a "special waste" in Illinois (IEPA). Current and proposed Illinois regulations restrict the disposal of "special wastes" in municipal landfills unless specifically permitted by the IEPA under the Part 809 (Special Waste Hauling). The IEPA grants special waste permits on a case-by-case basis after consideration of the characteristics of the waste.

The USEPA has released draft regulations for incinerator residue disposal. Ash is to be managed separately and disposed in monofill cells designed to standards comparable to hazardous waste disposal units. These design standards include full containment concepts such as double liners, natural features capable of containing waste and leachate away from groundwater and site locations in areas away from geologic or other environmental hazards.

I. Financial Responsibility

Section 21.1 of the Illinois Environmental Act mandates that no person other than the State of Illinois shall conduct any waste disposal operations on or after March 1, 1985, which require a permit, unless he has posted a performance bond or other security with the IEPA for the purpose of insuring closure of the site and post-closure care in accordance with that Act. Bonds may be forfeited and rolled into a fund called the Landfill Closure and Post-Closure Fund and can be used for any purposes for which the bond or other security was issued. The proposed Subtitle D revisions will require owners to prove financial responsibility based on current estimates to close the site, provide for post-closure care, and potential corrective action. These estimates will be adjusted annually for inflation.

IV. Environmental Protection Considerations

Sanitary landfills have evolved from unregulated open dumps into highly organized, aggressively regulated facilities. Past concerns over environmental hazards have been all but eliminated because state-of-the-art landfills are now equipped with sophisticated leachate collection systems, cell liners, extensive final cover systems

and gas/groundwater monitoring. Most of the following potential environmental impacts are considered by the IEPA in the landfill permit application review process.

Air Quality

Common air quality concerns regard re-entrained road dust from vehicular traffic, entrained particulate from dusts received as wastes, gaseous emissions from the products of decomposition and wind erosion of final cover. All of these concerns can be relieved through measures either regulated or considered standard practice. Re-entrained road dust should be managed by site road cleaning after wet weather and by minimizing the travel distance of collection vehicles on the site itself through construction of major finished site roads. Entrained particulates can be minimized by rejection of dusts or powders unless wetted and by keeping a water truck and power hose on standby. Gaseous emissions can be controlled with the use of daily cover and by minimizing the width of the working face. Gas collection and flaring or reuse will minimize the impact of decomposition gases. Gas monitoring equipment is very important at a landfill to properly manage the release of gas and reduce the potential for subsoil buildup or migration to areas outside the landfill. The biological processes which govern waste decomposition in a landfill occur in stages and are dependent upon the availability of moisture and the pH of the leachate (acidic). Current landfill design concepts which eliminate the introduction of additional water to the waste slow down the decomposition process. The dryer the landfill, the less gas likely to be produced. The landfill site itself should be at least 500 feet from existing and planned development. Wind erosion can be controlled by constructing visual berms with final cover and by seeding.

Surface Water Quality:

Surface water quality concerns generally relate to the discharge of runoff containing putrescible material and/or suspended solids and airborne dust settling in water. All contaminated runoff is transferred to treatment facilities. Surface water runoff should be settled to remove suspended solids. The site

itself should be at least 600 feet from a lake or pond, and the cover pile should be seeded to prevent airborne dust settlement.

Geology Impacts:

Concerns over land pollution due to leachate migration can be controlled through leachate removal and treatment, composition liner and final capping (seeded), and groundwater monitoring. Land pollution concerns related to runoff should be addressed by collection and treatment of all contaminated runoff and by proper drainage to prevent contact between runoff and landfill waste.

Groundwater Impacts:

Groundwater impacts generally relate to leachate migration concerns. Liners, leachate collection systems and daily and final cover soils are recognized as effective in controlling leachate. Leachate monitoring and collection requirements are specified in detail in Chapter II, Section D of this report. Leachate is the fluid including metals and compounds in solution which results from the biological breakdown of organic waste. Leachate composition will vary not only with the composition of the waste, but with the stages of the decomposition process. There is little data available on the chemical characteristics of leachate from landfills which accepted only municipal solid waste and no special or hazardous waste. Much of the existing data on leachate is from old non-representative landfills and dumps. These characteristics appear in Table 4.1. It is anticipated leachate from a new landfill, utilizing state-of-the-art technology, will be lower in dissolved chemicals than the leachates in Table 4.1.

The concentrations of chemicals and characteristics of the leachate are determined by dilution factors. When placed in a modern landfill or balefill, one cubic yard of baled refuse is capable of absorbing approximately 30 gallons of water. When the addition of more water would result in excess fluid (which would flow downward by gravity to the leachate collection system), "field capacity" is said to be reached. A properly designed, constructed, and

CHARACTERISTICS OF MUNICIPAL SOLID WASTE LEACHATES[a]

TABLE 4.1

Constituents	Reference[b] (mg/L)	Reference[c] (mg/L)	Reference[d] (mg/L)	Reference[e] (mg/L)	Reference[f] Fresh	Reference[f] Old
BOD_5	9-54,610	...	7,500-10,000	...	14,950	...
COD	0-89,520	100-51,000	16,000-22,000	500-1,000	22,650	81
Total Dissolved Solids	0-42,276	...	10,000-14,000	...	12,620	1,144
Total Suspended Solids	6-2,685	...	100-700	...	327	266
Total Nitrogen	0-1,416	20-500	...	...	989	7.51
pH	3.7-8.5	4.0-8.5	5.2-6.4	6.3-7.0	5.2	7.3
Electrical Conductivity (μmho/cm)	...	...	6,000-9,000	1,200-3,700	9,200	1,400
Total Alkalinity as $CaCO_3$	0-20,850	...	800-4,000	630-1,730	...	...
Total Hardness as $CaCO_3$	0-20,800	200-5,250	3,500-5,000	390-800	...	...
Chemicals and Metals:						
Cadmium (Cd)	...	...	0.4	...	...	...
Calcium (Ca)	5-4,080	...	900-1,700	111-245	2,136	254
Chloride (Cl)	34-2,800	100-2,400	600-800	100-400	742	197
Copper (Cu)	0-9.9	...	0.5	<0.04-0.11	0.5	0.1
Iron (Fe)	0.2-5,500	200-1,700	210-325	20-60	500	1.5
Lead (Pb)	0-5.0	...	1.6	...	...	...
Magnesium (Mg)	16.5-15,600	...	160-250	72-82	277	81
Manganese (Mn)	0.6-1,400	...	75-125	1.02-1.25	49	...
Phosphate (P)	0-154	5-130	...	21-46	7.35	4.96
Potassium (K)	2.8-3,770	...	295-310	107-242	...	...
Sodium (Na)	0-7,700	100-3,800	450-500	106-357	...	...
Sulfate (SO_4)	1-1,826	25-500	400-650	13-84	...	...
Zinc (Zn)	0-1,000	1-135	10-30	<0.04-0.47	45	0.16

[a]EPA, 1975a. [b]EPA, 1973. [c]Steiner et al, 1971. [d]Genetelli and Cirello, 1976. [e]Ham, 1975. [f]Brunner and Garnes, 1974.

SOURCE: Ham, Robert K., University of Wisconsin-Madison, "The Generation and Characteristics of Leachate and Gas from Sanitary [redacted]" Presented to the [redacted] rd, [redacted], 1

operated modern sanitary landfill will produce very little leachate. Compaction, daily cover, and final capping are used to prevent moisture from reaching the refuse during the operating life of the landfill. After landfill closure, final cover, grading, seeding, and site maintenance to prevent erosion and puddling will control leachate generation.

Leachate was a concern at old landfills and dumps without thick soil covers because rainfall was allowed to seep into refuse, bringing it to field capacity which allowed the uncontrolled release of excess leachate. With no liners or collection systems rpovided leachate often flowed out the bottom and sides of the dumps into surrounding groundwater causing contamination. The uncontrolled release of nutrients such as phosphorus and nitrogen or organic material could have a negative impact on the aquatic ecosystems of surface waters such as lakes. The presence of VOC's in surface waters is less of a concern as these compounds are released to the atmosphere in the presence of oxygen in the surface water. Heavy metals in the leachate will generally settle into bottom deposits in lakes and slow moving streams.[8] Siltation from run-off is of primary concern to surface water supplies in the vicinity of landfills. Sedimentation basins can be used to control the deposition of silts in surface waters.

Modern landfills are designed and operated to prevent the generation of leachate, to collect and contain that which is generated and to provide for its on or off-site treatment. Landfill environmental monitoring systems are required to detect possible leaks, and, to avoid contamination, groundwater can be pumped out and treated, or barrier walls and/or pumpout systems can be constructed to stop the migration of any contamination.

Fire Protection

Fire protection fears can be alleviated by taking special precautions to control hot loads and by training employees in site fire fighting. Incoming loads

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[8] *Bruce Bawkon, P.E., Municipal Solid Waste Management Options: Landfills, Springfield, IL: Illinois Department of Energy and Natural Resources, 1989, pp.4-17.*

showing evidence of smoke or char may be denied entry to the site or immediately segregated and placed in a designated "hot load" area with an earth liner, located well away from fill face activity, traffic, vegatation and structures. On-site water supply and portable water trucks should also be provided for firefighting.

Vector Control:

The application of daily cover, proper compaction of wastes, and general "good housekeeping" will make the landfill less attractive to disease carrying insects (flies and encephalitis-carrying mosquitos) and to animals like rats, skunks and racoons.

Noise Control:

Mufflers and other noise control devices should be used on all on-site equipment and maintained as necessary. Poorly maintained delivery vehicles which may create noise problems may be denied site access. The use of berms and fences should be considered to further reduce noise.

Dust and Mud Control:

Paving all major roadways will reduce the creation of dust and tracking of mud. Rigorous cleaning and maintenance of paved surfaces are essential to dust and mud control. The stretch of paved roadway departing vehicles travel before entering public roadways should be long enough for mud accumulated on their tires to be dislodged.

Flood Protection:

Flood protection measures include severe restrictions on siting a landfill within the flood plain. If a landfill were to be sited within the flood plain, specific flood proofing measures must be taken.

Socio-Economic:

Landfills generally hire 10-15 employees. Heavy equipment and building supplies are generally contracted on a bid basis.

V. Economic Impact

The capital and operating costs for a sanitary landfill are dependent upon a number of variables. The two most critical cost factors are regulatory requirements for siting, design and operation, and site-specific considerations such as soil conditions and groundwater levels.

This section will present cost information in two forms. The first is a detailed analysis of estimated costs for a hypothetical facility, as presented in the Illinois Department of Energy and Natural Resources report, "Municipal Solid Waste Management Options: Landfills, Volume II". This analysis demonstrates the variety of considerations and assumptions involved in determining costs. The second set of cost information consists of a summary of costs from five different sources. This section focuses not on the cost of each individual component, but, rather, on the range of total costs reported in various areas.

A. Detailed Cost Analysis

This section is intended to provide an estimated cost for the development, construction, operation and maintenance, final closure, and long-term care costs of a sanitary landfill designed for the disposal of municipal solid waste. These estimated costs do not take inflation into account and are not site-specific. The costs presented in Table 5.1, reflect the potential changes in landfill siting and design requirements due to the proposed changes in RCRA Subtitle D and Illinois solid waste regulations and are based on the following assumptions.

Assumptions for Predevelopment Costs

- 300 and 1,000-ton-per-day municipal solid waste facility
- 10-year site life
- 2,800,000 ton total capacity
- 5.5-day work week
- 60-foot average depth of fill
- 4:1 fill to cover ratio

- Buffer area provided for screening and for on-site borrow
- Phased development in four equal-sized phases
- Landfill is closed in phases as new phases are developed
- Estimated site selection and initial feasibility report costs included
- Estimated licensing and regulatory review fees included
- Administration, contingency, and miscellaneous cost factors included as noted
- Rolling stock (compaction; trucks)

Assumptions for Site Preparation

- 3-foot clay liner using on-site materials
- 1-foot sand blanket using off-site materials
- 6-inch PVC collection pipe in the leachate collection system
- Collection pipe placed at 200 feet on center
- 10-foot excavation assumed
- Active gas collection and flaring system included
- Bituminous entrance road and gravel on-site roads included
- Estimated surface drainage system included

Assumptions for Site Operating Costs

- Adequate material is available on-site for daily cover
- Off-site treatment of leachate
- Operating costs are based on available information for other sites and may vary significantly from those estimated based on local conditions.

Assumptions for Site Closure Costs

- 3-foot clay cap
- 3-foot protective cover and topsoil layer
- Adequate on-site material is available for the cap and protective cover layer

Assumptions for Post-Closure Care Costs

- 30-year post-closure care period
- Maintenance of environmental monitoring systems and leachate collection system.

The costs presented in these tables will be significantly impacted by the proposed regulations concerning liners and closure and by specific site characteristics.

- The above analysis assumes relatively low costs for land, $1,500/acre, and assumes that near square site boundaries are possible. Additional unit costs for land and an irregular site boundary will increase the costs or land requirements for site development.
- The permitting and siting costs estimated for legal and engineering fees assumes that the siting and permitting process, including local site review, will not be contested.
- A single clay liner with leachate collection system is assumed, however synthetic or double liner/leachate collection systems will significantly increase the above costs.
- The cell cap is assumed to be a simple clay and sand cap, however additional measures to minimize infiltration and plan root penetration, such as geomembrane capping, will significantly add to capping costs.
- Closure costs assume that an active gas recovery system, (blowers, and well system connected by header pipe, venting to a flare, with condensate tanks and appropriate utilities), is not required by state regulations. Locating a landfill near residential or commercial buildings requires an active gas collection and flaring system to ensure that gas migration into occupied buildings does not occur.

- A financial assurance fund to provide engineering and site remediation for ground water contamination and gas migration is not included in the above cost estimate. If the proposed state regulations do not require a specific amount, it is recommended that local siting criteria or zoning require this security bond.

- Financing is assumed to be General Obligation, (G.O.), with 12% interest rate. Changes in the interest rate and financing method, or use of cash payment for predevelopment will significantly decrease these costs.

TABLE 5.1
GENERIC LANDFILL DEVELOPMENT COST ESTIMATE
(1,000 DOLLARS)

	Cost	
Predevelopment		
Land Acquisition: 150 acres @ $1,500/acre	$230	
Mobilization estimated	80	
Clear and grub 15 acres @ $3,000/acre	50	
Subsurface Investigation 20 borings	60	
Access Road 1/4 mile	110	
Highway modifications estimate	250	
Fencing: 5,000 ft	60	
Building 14,000 ft^2 @ $40/$ft^2$	580	
Scale	50	
Utilities estimate	40	
Leachate Storage: tank and pumps	30	
Groundwater monitoring wells 16	40	
Permitting; legal	250	
Permitting: engineering	200	
Engineering design, construction monitoring	400	
Contingency @ 20%	310	
Subtotal Predevelopment		$ 2,740
Cell Development Costs (assuming 4 cells)		
Clear and grub: 20 acres @ $3,000/acre	60	
Excavation: $3/yd minimal 3 ft. depth	300	
Drainage ditching and subgrade prep.	150	
Clay liner 3 ft depth 6" PVC on 100 ft. grid and Leachate collection system $70,000/acre	1,400	
Lysimeter 4/cell	40	
Contingency 20%	400	
Subtotal Cell development Cost per Each Cell		2,350
Cell Closure per Each Cell		
Clay cap 3 ft depth $6/$yd^3$	580	
Sand/topsoil 3 ft depth $4/$yd^3$	390	
Compaction/Earthwork	480	
Hydroseed surface prep. $2,000/acre	40	
Methane gas venting (passive system/22 vents)	20	
Methane monitoring equipment	50	
Contingency 15%	100	
Methane Collection System (not required site dependent est. $150.00/cell		
Subtotal Cell Closure per Each Cell		$1,660

TABLE 5.1 CON'T
1,000 TPD Landfill

Equipment		
Steel wheel compactor (2)	400	
Earth mover, track drive (2)	400	
Dump truck (2)	120	
Water truck (1)	20	
Earth Scraper	130	
Spare parts (10%)	100	
Subtotal Equipment		$1,170
Annual Operating Costs		
Labor including benefits at 30%		
Heavy Equipment Operators (4)	170	
Laborers (2)	50	
Mechanic (1)	50	
Site Supervisor	50	
Clerk	30	
Subtotal Annual Labor		$ 350
Daily cover (Availability Site Dependent) $4/yd^3 300 yd/day 20% of waste	350	
Intermediate cover 1 ft. depth; 3 lift; $6/yd^3	580	
Groundwater/gas monitoring laboratory and engineering	50	
Fuel/oil Building maintenance	210	
Leachate disposal 5,000 gallon/cell/day $0.06/gal transportation & treatment	110	
Utilities	20	
Environmental Monitoring		
Water 4/year 16 wells $700/sample	50	
Gas 4/year 4 man-days $500/day	10	
Subtotal Annual Operating Costs		$1,380
Post Closure - 5 year period		
Groundwater Monitoring	100	
Gas Monitoring	50	
Re-Grading 80 acres total	50	
Leachate Treatment and maintenance	440	
Engineering inspection/reports	110	
Subtotal Annual Post Closure		$ 750

TABLE 5.2
ANNUAL LANDFILL COST AND TIP FEE SUMMARY

Costs	$/year	$/ton
Predevelopment and first cell development 10 years; 12%; G.O. Bond	1,015	3.55
Cell development New cell every 2.5 years; amortized @ 12%	1,093	3.82
Cell closure Closure every 2.5 years; amortized @ 12%	772	2.70
Equipment 5 year operating life; amortized @ 12%; 5 yrs	544	1.90
Annual Labor Costs	350	1.22
Annual Operating Costs	1,380	4.83
Post Closure Monitoring - 5 years Collected over 10 year operating life	375	1.31
Total Annual Costs	5,529	
Total Annual Tons Disposed	286,000	
Tip Fee		$19.33

B. Summary of Reported Landfill Costs

For planning purposes, three types of cost information are necessary to estimate the fiscal impact on the operating agency and to compare the costs of landfilling with other waste disposal technologies:

1. Total Capital Costs are necessary to estimate budgetary impact and, if appropriate, the amount of bond sales required;

2. Capital Cost per Daily Design Ton ($/TPD) is useful for comparative purposes; and

3. Total Cost per Ton represents total capital and operating costs divided by the total number of tons accepted during the facility's lifetime. This value can be considered as the present tipping fee, although inflation and regulatory-driven cost increases are not included.

Table 5.3 presents a summary of landfill size, capacity, and cost, as reported in five different studies. The underlying assumptions from the cost estimates of each study may not be consistent. However, both the average value and overall range of values shown in Table 5.3 will be useful in developing preliminary cost estimates for other facilities.

TABLE 5.3
SUMMARY OF REPORTED LANDFILL COSTS

SOURCE	FACILITY CHARACTERISTICS			CAPITAL COSTS			TOTAL COST PER TON
	Acres	Tons Per Life	Day (TDP)	Total	$/TPD	$/Acre	
Illinois[9]	150	10 yrs.	1,000	5,090,000	$5,090	$33,933	$19.33
Lake County[10]	-	20 yrs.	1,000	9,484,000	9,484	-	18.77
	-	20 yrs.	1,000	12,429,000	8,286	-	15.89
Massachusetts[11]	88	33 yrs.	330	9,532,000	28,885	108,318	18.91
Minnesota[12]	45	42 yrs.	90	6,840,000	(76,000)	(152,999)	29.98
Will County[13]		20 yrs.	1,300	10,358,000-19,895,000	7,968-15,304	51,790-99,475	17.10-24.53
Average	-	-	-	-	**$12,500**	**$73,379**	**$20.64**

Notes:
1. Lake County developed cost estimates for several different capacities, two of which are shown here. Facility size was not reported.
2. Will County reported low and high estimates for capital costs.
3. Capital cost factors from Minnesota bracketed by ( ) were not used to calculate averages, due to inconsistency with other reports.

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[9] *Bruce Bawkon, P.E., Municipal Solid Waste Management Options: Landfills, Springfield, IL: Illinois Department of Energy and Natural Resources, 1989.*

[10] *HDR Engineering, Inc., Lake County Solid Waste Management Plan, Final Report 5.0 Incineration Technology Assessment, March, 1988.*

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6. Lake County Solid Waste Management Plan, Landfill Report, May, 1988.

APPENDIX H

TECHNOLOGY ASSESSMENT: TRANSFER STATIONS

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October 1990

TECHNOLOGY ASSESSMENT: TRANSFER STATIONS

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I. Introduction

Transfer stations are facilities where solid waste is transferred from collection trucks to larger vehicles for transport to disposal sites. They can act as an effective means of lowering costs and improving the efficiency of waste hauling and disposal systems in areas where disposal sites are distant from collection areas. Transfer station systems, where appropriate, allow more efficient use of waste collection vehicles and crews, simplified route organization, minimized traffic congestion and impact on roads and improved landfill operations. Transfer station facilities can also provide a logical base for waste volume reduction processes such as baling, compacting, sorting and recycling through which revenues can be generated. Transfer stations, however, are not a feasible or necessary component of all solid waste management systems. Socioeconomic and demographic characteristics of an area must be evaluated to determine such feasibility.

II. Operational Systems

Transfer stations may be designed to receive and process waste from a variety of generators including municipal collection systems, private hauling companies, and self-hauling citizens. The station's site plan and equipment must be capable of handling a wide range of collection vehicles including compactor vehicles, open-top trucks, vans and cars. The type of vehicle delivering waste to the transfer station affects the site's total capacity (measured in tons per day) because vehicles with longer unloading times occupy space at the station longer and thereby reduce the amount of waste received during a given time period.

A. Direct Dump System

The basic transfer system involves direct dump of waste from collection vehicles into a larger transfer container or trailer. In this system, a combination of ramps and/or pits is used to elevate the collection vehicle allowing a direct dump into an open-top container below. Hoppers or conveyors are sometimes used to direct the dumped waste. This system is often used in rural areas where waste quantities are small. Since direct dump

systems are usually not enclosed, they are often secluded from view. While capital and operating costs are relatively low, stations may face difficulties at peak times when waste quantities are too large for direct disposal and require temporary on-site storage. This system is less efficient than others in that waste transferred from the station remains loose and low in density, limiting the capacity of trailer loads.

B. Tipping Floor System

In this system, collection vehicles dump waste either into a pit or onto a tipping floor. End loaders then transfer the waste to transfer trailers or onto a conveyor which loads the trailers. Because this type of facility is usually fully enclosed, it is able to store waste in an enclosed area during peak periods and is suited to higher volume and/or urban conditions. Because it is a more sophisticated contained facility, capital and operating costs are higher than with the direct dump system. Yet, like the direct dump method, lack of waste compaction and resultant light transfer loads are a disadvantage.

C. Compaction System

In this system waste is unloaded from collection vehicles as in the tipping floor system, but from there waste is loaded into a compactor by a variety of methods: tractors feeding a hopper, conveyors feeding the compactor from a storage area or hydraulic rams feeding storage area waste into compactors. Once loaded into a compactor, the waste is forced into a transfer trailer with reinforced sides by a hydraulically powered compacting ram. The density of compacted waste is in the range of 600-800 lbs./yd^3 as compared with 200-400 lbs./yd^3 for loose waste. Because compaction systems are enclosed, use heavy-duty equipment, and are of a more sophisticated design (often with a receiving area, storage area and compaction area), they require higher capital and operating costs than those systems previously mentioned. However, compaction provides for much more efficient transportation of wastes to final disposal sites.

D. Baling

Baling is a compaction method in which waste is hydraulically compacted into dense bales then bound with wire. The operation is similar to the compaction system detailed above with the added step of tying the bales. The advantages of this system lie in equipment and transportation savings. The use of bales eliminates the need for heavy transfer trailers with reinforced sides. Bales can be loaded onto trailers, barges or railcars for transport to final disposal sites. When flatbed trailers are used the trailer weighs less than compaction trailers and therefore allows for greater legal payloads. Unlike trailer-compacted waste which increases in volume when dumped in a landfill, baled waste retains its compaction consuming less landfill space.

E. Shredding

Shredding is a method which can be employed in conjunction with a compacting or baling system. Shredding wastes before compacting or baling makes wastes homogenous in size and more compactable. A rasp mill is generally used in this process; waste is fed into the mill by conveyor or hopper and is then moved to the compactor or baler. Some large items may need to be manually removed prior to milling to receive special processing, but shredding allows greater densities for transport and improved landfill operations.

F. Recycling

Because many materials received at transfer stations are reusable, transfer stations are an ideal location for recycling efforts. Waste received commingled in refuse collection vehicles can be processed manually and/or mechanically to separate recyclables before they are shredded, baled or compacted. Mechanical processes include magnetic separation of ferrous metals, eddy current separation of non-ferrous metals, and mechanical screening of the waste. Manual sorting will provide increased resource recovery and may be necessary to prepare waste for mechanical processing. Recovering recyclables from the waste stream may provide a source of revenue

for the transfer station (sale to end-markets) and reduce the amount of waste transported to and disposed of at landfills.

G. Refuse Derived Fuel

Transfer stations are also practical locations for the production of refuse derived fuel (RDF). This approach may also generate revenue and reduce waste disposal costs.

III. Evaluation of Options

The siting, design, size and layout of a transfer station is dependent on numerous considerations such as environmental impact, siting and permitting considerations, technical feasibility, and economic impact.

A. Environmental Impact

A properly designed, sited and managed transfer station will have little or no negative environmental impact on the surrounding area. The loss of flora and fauna would be limited to the land occupied by a building and parking facility. Depending on the building design and the opinion of the viewer, the aesthetic value of the structure may vary considerably. Health and safety concerns can be minimized through a design which limits human contact with waste and provides adequate ventilation for vehicles operating inside the building. Public concerns will include increased truck traffic, decreased property values and operational problems such as odors, noise and dust. Proper site selection, design and operation are essential to alleviating these concerns.

B. Siting and Permitting

The objective of the site selection process is to search for and locate areas which have the characteristics necessary for a safe, environmentally sound transfer station. This process is the same as that used in siting a sanitary landfill or any other regional pollution control facility, and is discussed in detail in a separate chapter. Permit applications will be reviewed by the IEPA only if the developer of the proposed facility first obtains local governmental

acceptance of the facility.

Special site and building features which require attention during the site selection and building design process are internal traffic circulation, proper drainage, perimeter treatment (fencing), fuel storage facilities, utilities, scales, office and employee space, tipping floors, push walls, and receiving and handling areas.

C. Technical Feasibility/Economic Impact

To estimate the economic and technical feasibility of a transfer station, both capital and operating costs need to be considered.

Capital costs include land, site construction, stationary equipment, and vehicular equipment. Most facilities require two to three acres of land.

Operating costs include labor, stationary and vehicular equipment maintenance, utilities, and administrative expense and office supplies. See Table 1 for standard capital and operating costs associated with a 200 ton per day transfer station with a drive through design.

The costs of constructing and operating a transfer station should be weighed with the savings such a facility offers the solid waste management system and possible revenue sources (recycling and RDF). Savings may be seen in lower transportation costs because the transport of waste from transfer station to disposal site is performed by larger trucks, allowing the use of fewer vehicles. Additional savings are realized from reduced maintenance and operating costs resulting from the use of fewer trucks. Collection also becomes more efficient because trucks are able to return to their routes sooner, spending less time travelling to disposal sites.

TABLE 1

TRANSFER STATION BUILDING SITE AND EQUIPMENT COSTS
DRIVE THROUGH ARRANGEMMENT
200 TONS PER DAY

Category		Item Cost
Pavement and Retaining Walls		$219,080
Excavation and Landscaping		148,680
Building		285,890
Utilities		84,680
	TOTAL	$738,410
Engineering - 10%		$ 74,000
Contingency - 10%		$ 74,000
		$886,410
	Total Building Estimate	$890,000
Equipment Costs		$230,000
TOTAL CAPITAL COSTS		**$1,120,000**
Labor		$ 98,000
Utilities, Supplies and Maintenance		10,750
Fuel		18,000
Insurance (Property)		4,000
	Total	$130,750
TOTAL ANNUAL OPERATING COST - ESTIMATE		**$131,000**

Source: IDENR: Municipal Solid Waste Management Options: Transfer Stations, Vol. III, June, 1989.

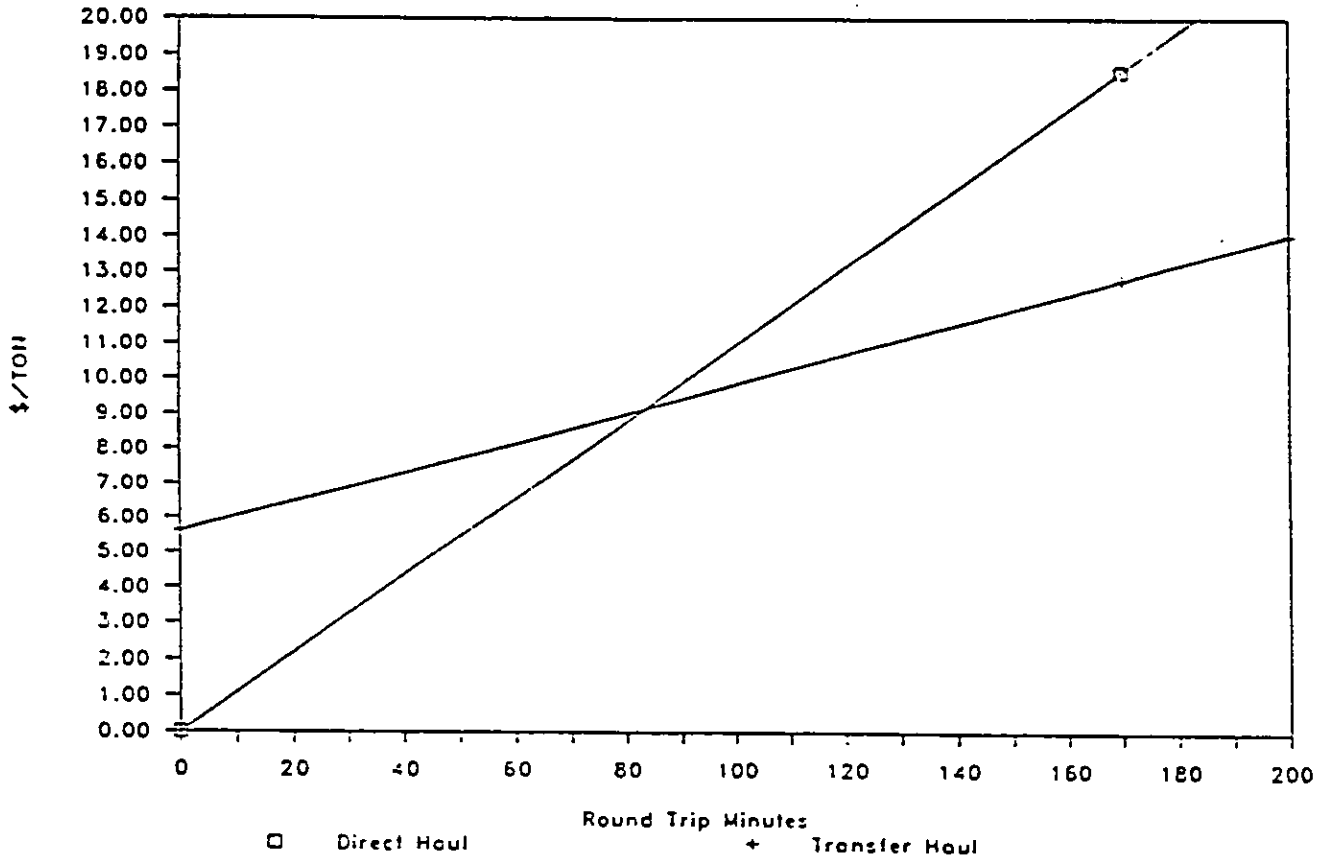
Qualifiers: Prices are installed costs, including all hardware and related items.
Prices include 5% surcharge to account for a distance of transfer station location from city or suburb.
Contingencies and land costs are not included.
Prices are rounded up to facilitate quick calculations.
Assumes facility operates eight hours per day; five days per week.

The feasibility of a transfer station versus a direct-haul system can be evaluated by using a break even analysis based on system costs. By comparing the hauling costs in dollars per ton and the round trip time in minutes of both the direct haul and transfer haul methods, the sample analysis illustrated in Figure 2 arrives at a break even point, about 85 minutes round trip in this example, found where the two lines intersect. If the round trip distance is greater than that at the point of intersection, a transfer station becomes an economically viable alternative in the solid waste management system.

FIGURE 2

EXAMPLE BREAK EVEN ANALYSIS

TRANSFER AND DIRECT HAUL 200 TPD



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INVESTIGATION OF EMERGING AND INNOVATIVE SOLID WASTE TECHNOLOGIES

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APPENDIX I

INVESTIGATION OF EMERGING AND INNOVATIVE SOLID WASTE TECHNOLOGIES

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KANE COUNTY, ILLINOIS

INVESTIGATION OF EMERGING AND INNOVATIVE SOLID WASTE TECHNOLOGIES

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PART 1

EMERGING TECHNOLOGIES

This report subsection will detail emerging solid waste technologies of municipal solid waste composting, mixed waste processing and fluidized bed/RDF systems. The emerging technologies, for the purpose of this investigation, are those technologies that are just beginning to be implemented at the commercial level. There is limited large-scale application of these technologies.

SECTION 1

INTRODUCTION AND SUMMARY

1.1 Introduction

The field of solid waste management is continuously evolving. Technologies thought to be on the "cutting edge" at one time may have virtually disappeared. Other technologies have had a cyclic development or evolution depending on economic, environmental or socio-political issues. Still others, which only a few years ago were considered undemonstrated, have continued to evolve and are starting to be implemented on a large scale in commercial facilities.

Keeping abreast of this rapidly changing and still evolving solid waste management field is a tremendous job. To accomplish this, it is critical to have a working understanding of the processes which commercial availability, technical reliability, products and product markets, and developmental stage technology must go through. Failure to understand the status, benefits, and limitations of a technology has, in too many cases, resulted in financial and operational problems.

In mid-1990, Kane County, Illinois contracted with Roy F. Weston, Inc. (WESTON) to review and assess innovative and emerging technologies for solid waste management. The primary purpose of the study was to evaluate the viability of innovative and emerging technologies. Kane County's desire to develop this review resulted from diminishing and increasingly expensive landfill capacity, changing attitudes regarding solid waste management around the country, and an interest in building a foundation of understanding of the emerging and evolving options and alternatives available for solid waste management.

The first task that WESTON and the County undertook in this review was defining the following terms:

Emerging Technologies - Those technologies that are starting to be implemented at the commercial level; there is limited large-scale application of the technology for management of municipal solid waste.

Innovative Technologies - Those technologies that have been tested on a pilot scale or small demonstration scale only; there is little or no commercial experience with municipal solid waste.

Research and Development Technologies - Those technologies that have been tested in the laboratory or small pilot scale only; there is limited experience with homogeneous feedstock and little or no experience with municipal solid waste.

Emerging technologies reviewed for this report are MSW composting, fluidized bed combustion/refuse-derived fuel, and mixed waste processing. Innovative technologies reviewed are anaerobic digestion or composting, pyrolysis, and ORFA technology. Research and development technologies reviewed consist of thermal oxidation, vermiculture, ethanol and methanol production from MSW, and plasma technology.

1.2 Summary of Evaluation Criteria

To assess the viability of technologies within the three overall categories, several evaluation criteria were used consistently. These criteria are described below:

Commercial Availability

The most reliable basis for judging commercial availability is previous experience. This criterion distinguishes those technologies and practices which are at the conceptual or testing stage from those that are generally available and readily able to be implemented. For emerging technologies, operating facilities using each technology have been researched with special attention given to design features, construction techniques, operating costs, equipment availability, available facility capacity, the conditions surrounding and enhancing application, and other relevant aspects. Technologies which have not been demonstrated to be available and reliable at an appropriate scale are considered to be innovative. For these technologies, the trial and errors of pilot or demonstration scale facilities has been examined.

Technical Reliability and Availability

The ability of a solid waste management process to be technically reliable and available is critical. Municipal solid waste disposal is a daily responsibility. The technology to be employed must be able to operate on a regular schedule over a long period. Technical reliability is a function of the physical durability of the technology and the expected service life. Availability, or the fractional time that a facility can be effectively operated in a given period of time, is a function of reliability, operating procedures, and maintenance requirements. It is also the ability of the process to meet all environmental criteria.

The most reliable means of determining technical reliability and availability is past experience. For emerging technologies, the experience at commercially operating facilities has been used to determine the likely reliability and availability of a project. For innovative technologies, the experience gained from limited pilot-scale testing has been used to determine the potential for scaling the facility up to larger commercial operations.

Environmental Impacts

Alternatives in the three categories were evaluated to determine their environmental impacts, including the disposal of residue, effect of air emissions, and waste water disposal. In some cases, the use of products from the processes was examined for additional environmental impacts.

Economics

To understand the economics of a technology, it is important that a facility using a particular technology be operating for a long enough period of time to evaluate the normal costs associated with the technology. Since most of the facilities using either the emerging or innovative technologies have short operating histories, determination of the true economics has been difficult. Where possible and determined not to be misleading, based on limited operating experience, capital and operating cost ranges were estimated for emerging and innovative technologies.

Markets for Products

Markets for the end products of a technologic process are critical to the successful application and economics of the technology. Each technology reviewed includes an analysis of the products produced from the process and the success or failure of marketing efforts. The discussion of markets for end products includes regulatory, as well as perceived, limitations on the markets. Where possible, ranges of potential product revenue were provided. Economic and socio-political issues that affect the future of end product markets were also discussed.

Non-Processibles and Residues

For each technology, the quantity of non-processibles and residues was examined. If the non-processibles and residues of a process are unable to be reused or further processed, it is assumed they will require final disposal. For each of the emerging and innovative technologies, an estimation of the potential amount of non-processibles and residue has been made. The net percent reduction in the waste requiring disposal has been estimated where historic data allow.

1.3 Summary of Technologies

From the review and analyses that were completed, the following is provided as a summary of each technology.

1.3.1 Emerging Technologies

MSW Composting

Composting is the process of biologic decomposition of solid organic materials by micro-organisms, such as bacteria and fungi. Composting as a solid waste management option means using this natural process to treat and reduce in volume all or a part of the solid waste stream, either with or without the addition of sludge. The process involves controlling the moisture, temperature and availability of oxygen so that this natural process decomposes the solid organic material in the MSW and destroys harmful organisms, thus producing a stable usable end product.

Since composting only works on the organics in the waste stream, it is most effective when as many of the inorganics (usually recyclable glass, metal and plastic) as possible are removed before the composting process. This also improves the quality of the end product. These inorganic materials can be removed either through source separation recycling programs or through mechanical separation at the composting facility.

Advantages of MSW composting include:

- MSW composting processes are commercially available. The technical availability and reliability associated with both the preprocessing of waste and the biological compost process itself is growing.
- Since MSW composting is a non-burn disposal alternative, public acceptance may be greater than thermal treatments.
- Potential environmental impacts can be minimal if the composting process is operated properly.
- A usable, potentially marketable product results.
- There will be a net landfill reduction from composting some or all of the MSW generated. The level of landfill reduction will depend on the size of the MSW composting facility.

Disadvantages of MSW composting include:

- Although there are commercially operating MSW composting facilities, there is still limited commercial availability of complete MSW composting systems.
- Research of the impact of uptake in food crops resulting from using MSW compost is still ongoing and currently non-conclusive.

- Potential environmental impacts due to compounds leaching out of compost produced from MSW are not fully understood. This may result in limited use or markets for the compost.

- MSW composting operations could cause odor problems unless proper ventilation and air filtering are employed.

- The capital and operating costs associated with MSW composting operations are still difficult to predict with any degree of accuracy. Capital and operating costs vary widely for those facilities currently operating.

- Many vendors currently marketing MSW composting systems have experience only in Europe. This experience may not be directly applicable to the U.S. since the waste stream in the U.S. may differ significantly from that in Europe.

Fluidized Bed Combustion/Refuse-Derived Fuel

RDF processing is the conversion of municipal solid waste (MSW) to a fuel, through the removal of non-combustible items. Typically, RDF facilities include shredding, screening, magnetic separation, and, in some cases, fuel densification processes.

Fluidized bed combustion is the combustion of products on a suspended bed of material within a combustion chamber. Energy can be recovered in this process. The suspended bed has the properties of a fluid and may either remain near the bottom of the chamber or be circulated through the entire chamber. These technologies are discussed together because to burn MSW in a fluidized bed furnace, the MSW must first be converted to RDF.

Converting waste to RDF and subsequently burning it in a fluidized bed combustor has the following advantages:

- Combustion efficiency is improved by merely converting MSW into RDF, because RDF burns more uniformly and has a higher heat content than raw garbage. The fluidized bed method further enhances combustion because of the more turbulent conditions present in the boiler. Quantitatively, RDF combustion alone increases boiler efficiency from 70 percent (mass-burning) to 75 percent. Burning RDF in a fluidized bed boiler may further boost efficiency to over 80 percent.

- NO_x emissions are reduced because fluidized combustion is efficient using less complete combustion (anywhere between 30 and 90 percent less). Excess air contributes to emissions of NO_x, so less excess air results in a lower level of this pollutant. Also, fluidized bed boilers operate at lower temperatures than

conventional boilers, and this further reduces NO_x produced during the combustion process.

- Fluidized bed combustion experiences fewer operational and maintenance problems in the boiler. Slagging, or the depositing of molten ash on boiler walls and tubes, hampers boiler operation. Use of RDF and fluid bed combustors that operate at lower temperatures reduces the content and ability of material that can slag.

- Fluidized bed combustors have the ability to remove sulfur through in situ scrubbing, thus curbing sulfur dioxide emissions.

- Heat transfer from the burning RDF to the water tubes is efficient from turbulent conditions in the chamber.

- If necessary, a fluidized bed unit can operate at substantially less throughput than it is designed to handle.

The major disadvantages to the RDF/fluidized bed combustion technology are found in the RDF processing area:

- RDF processing lines have not been perfected or optimized, despite their being in existence almost 20 years.

- Explosions in the shredders have the potential to shut down the entire processing line,

- Facilities have also experienced shutdowns elsewhere in the line as a result of "mechanical jams or bridging of RDF at transfer points."

However, fluidized bed combustors do exhibit some problems, namely:

- Although RDF processing systems remove most of the glass and metal in the MSW stream, any remaining may slag within the bed and then solidify upon cooling. This "freezing up" of the bed adversely affects performance in two ways: the particles cannot move and cannot transfer their heat to the boiler walls, and the combustion gases cannot push the resulting "lumps" around as easily as tiny particles, causing the furnace conditions to become less turbulent.

- Erosion of furnace and tubes can result from the sandblasting effect of bed particles impacting on the boiler tubes and walls. This can lead to frequent tube replacement or a shortened life for the whole unit.

Mixed Waste Processing

Mixed waste processing is defined as any process that accepts mixed solid waste and, as its main objective, converts the waste to at least two or more products including recyclables, compost, or fuel. Most mixed waste processing systems recover recyclables, manually, mechanically, or using a combination of the two approaches. The recovered recyclables are then prepared for market. After recyclables are removed, the remainder of the waste is shredded and then further processed, perhaps pulverized or pelletized, to be used as compost feedstock or fuel. The resulting fuel product can be burned for energy production.

Advantages of mixed waste processing include:

- Mixed waste processing has the potential to significantly reduce the waste stream destined for disposal, although projected reduction rates of 90 percent or more have yet to be achieved.

- Combining the processes for extracting recyclables, compostables, and combustibles from the waste stream in a single system can reduce total solid waste management costs because fewer facilities are needed, and a single delivery point for waste can be used.

Disadvantages of mixed waste processing include:

- A tried and true mixed waste processing system "package" is not commercially available. Most of the existing technology evolved as a result of an entrepreneur recovering more and more components of the waste stream.

- Although individually each piece of equipment in these systems is usually simple, an entire system that produces a number of end products usually leads to a system with a complexity greater than the sum of its parts. Thus, the long term availability and reliability of these systems must be monitored.

- The greatest stumbling block to implementing mixed waste processing is the uncertainty of markets for the products, especially compost and fuel. If no markets exist for the end products, the processing system accomplishes nothing more than slightly reducing the volume of the waste destined for disposal. One of the stumbling blocks to development of markets for compost and fuel from a mixed waste processing system is that no market will accept an untested product, but the processing system must be in place. Thus an investment must be made to produce the product to be tested. Pilot-scale tests, or processing of waste from the area in a similar facility can be used to at least partially overcome this obstacle.

The success of mixed waste processing systems should be monitored, paying particular attention to the reliability of the system and the marketability of end products. Since several mixed waste processing systems are in the development stages, there potentially are several examples to watch.

1.3.2 Innovative Technologies

Anaerobic Digestion

Anaerobic digestion is the controlled decomposition of waste in an oxygen-free environment. Waste is first preprocessed to remove recyclable and/or inorganic materials from the waste stream. Then a wet slurry is produced from shredded waste mixed with water and is introduced into a closed digestion vessel. A resulting fuel gas can be used in energy production.

Advantages of anaerobic digestion include:

- The fuel gas produced has the potential to be a source of revenue or energy for the facility. However, optimizing fuel quantities produced will increase capital costs, because of the greater retention time and corresponding need for more reactor volume.

- The system is highly compatible with existing curbside recycling programs. These programs tend to divert inorganics from the waste stream, which reduces the amount of preprocessing before waste enters the digesters. Leaving yard waste in the waste stream saves collection and composting costs and raises the organic material content in the digesters.

- The degradation process is completely enclosed, and potentially odorous gases can be collected and treated. A well-managed facility should gain public acceptance more easily than an aerobic composting facility, with open-air or semi-enclosed piles or windrows.

Disadvantages associated with anaerobic digestion include:

- There are currently no commercially operating facilities in the U.S.; the process essentially remains in the research stage.

- The marketability of the residue solid fraction is certainly unproven. If this material cannot be sold, more than 50 percent of the input waste will still wind up being landfilled. On-site disposal would create additional costs and additional difficulties, as it would likely require incineration or composting. Implementing either of these techniques on-site can hinder public acceptance of the project.

- From RefCom's experience, it appears that substantial design work must be done on digesters. At the least, appropriate materials of construction must be selected.

Pilot anaerobic digestion systems have not yet proved that large quantities of waste can be processed with this technique. Future interest in the system will likely be related primarily to technical reliability and availability. The state of the energy market may also affect future interest. Rising energy prices could help a facility more easily justify the cost of additional digester volume and biogas cleaning equipment. In summary, the following elements would really be required for emergence of this technology: additional pilot testing of anaerobic digestion technology for processing MSW, a financially capable developer, political and community support, and the ability to keep costs at levels competitive with other solid waste management options.

Pyrolysis

Pyrolysis is the thermal decomposition of materials in the absence of oxygen. Unlike complete combustion, or incineration, material in the pyrolysis process does not burn in flames. Rather, after the waste is preprocessed to remove recyclables and non-combustibles, heat is applied either directly or indirectly, transforming the materials in a reactor to yield solid, liquid, and gas products. Some of the liquid and gas products can be used to produce energy. The yield of various products can be controlled by manipulating the complex chemistry within the reactor.

Advantages associated with pyrolysis include:

- Low temperature, low velocity pyrolysis systems would require less extensive air pollution control equipment than conventional combustion.
- Environmental impacts from landfilling inert residue may be less than landfilling the waste directly.
- If pyrolysis could be maximized to produce a high-quality and consistent product, markets would be promising as a fossil fuel substitute.

Disadvantages associated with pyrolysis include:

- Although pyrolysis is a promising process, pilot and demonstration scale projects in the U.S. have been plagued with technical and economic difficulties.
- The pyrolysis processes are varied and complex. More research is needed for almost every aspect of the process, product refinement and product marketing.

- Although there are U.S. vendors of pyrolysis and gasification processes, none have had demonstrated success with their systems.

- Very little reliable economic information is available to compare with other options.

ORFA Technology

The ORFA system is a materials processing system, originating in Switzerland, that accepts mixed solid waste as input. The process, in theory, generates three useful products, the most abundant of which is an inert fluff, called ORFA fiber. In addition to this fiber, the system recovers ferrous metal and an inert granulated material.

ORFA has built and operated one facility in the U.S., located in Philadelphia. The facility has operated commercially for short periods of time and in 1989 was shut down completely and remains idle. Technical difficulties and lack of demand for the end product have plagued the ORFA technology development.

Advantages of the ORFA technology include:

- The system requires no source separation of refuse. While not a materials recovery process, it is designed to incorporate nearly all components of the municipal waste stream into the end products. Source separation, particularly of ferrous and non-ferrous metals, would probably improve system performance and increase system availability.

- The system has a high degree of redundancy in individual stages of the process. While two completely identical processing lines do not exist, most of the major pieces of equipment exist in duplicate.

- When functioning properly, the system should be able to process the entire municipal (residential and commercial) waste stream. However, the process may be more efficient when loaded with purely commercial waste or waste with a higher-than-average paper content.

Disadvantages of the ORFA technology include:

- The process line is technically very complex, which has, in the past, contributed to lengthy shutdowns and below-normal throughput.

- The absence of a dust collection system was a serious design oversight. This greatly reduced plant availability and added the potential for safety hazards (fires, explosions) within the facility.

- The primary product, ORFA fiber, was found to be marketable only as a shredded mixed paper product, making it worthless on the secondary materials market. The secondary product, granulate, was marketed/disposed as landfill cover at net cost. Moreover, the granulate likely would have had more value if some of its constituents, e.g., glass, had been recovered and sold as recyclables.

- The tipping fee of $50-55 per ton and revenues from the fiber that was sold were apparently inadequate to cover the facility operating costs, based on the fact that ORFA's U.S. subsidiary is in Chapter 11 bankruptcy.

The future viability of the technology will depend to some extent on the financial position of ORFA. Without additional investment, the ORFA process will have little chance for future success, and is not likely to be an available technology. Even with a financially viable developer, there are significant technical obstacles to the viability of this technology.

1.3.3 Research and Development Technologies

Thermal Oxidation

Thermal oxidation is a process by which MSW is volatilized into two products: fuel gas and ash residue. The process is similar to pyrolysis in that the MSW is heated but does not burn; rather its volume is reduced via a smoldering reaction. It differs from pyrolysis in that oxygen is allowed to enter the reaction chamber and in that neither fuel liquid, fuel gas, nor char residue is created. Only one vendor, the Entech Corporation, was found to be offering this technology. The Entech process may generate minimal heat energy for in-plant use but no evidence of its ability to produce large quantities of energy for outside sale has been demonstrated.

Advantages associated with thermal oxidation include:

- The process line is relatively simple, with little mechanical equipment. This absence of moving parts could decrease the likelihood of excessive downtime or interruptions in process flow.

- The weight reduction of the infeed waste is appreciable but it is uncertain that weight reduction of 90 percent or better can be accomplished in all system configurations and with all types of waste.

Disadvantages associated with thermal oxidation include:

- There are no commercial facilities in operation using the system and, therefore, the system data for full-scale operation are unavailable.

- The lack of operating experience results in a great deal of uncertainty surrounding the economics of the system.

Vermiculture - Vermicomposting

Vermiculture or vermicomposting uses earthworms or red worms to accelerate the decomposition and stabilization of the organic matter in the materials being composted. Although this process is being used on a small scale for yard waste and for mixed yard and agricultural or food waste, it has not been adequately tested for use with mixed MSW.

Ethanol Production from MSW

Ethanol can be produced biologically by yeast fermentation from any carbohydrate or cellulosic materials. Ethanol production from MSW uses a three-stage process to convert the cellulosic material in the organic portion of preprocessed MSW. The three steps include hydrolysis to convert the cellulose to glucose, fermentation to produce ethanol from the glucose, and distillation to remove the ethanol from the aqueous solution. Ethanol can either be burned alone to produce energy or added to gasoline to produce gasohol used for vehicle fuel. By-products include large quantities of contaminated water and a sodden mass of unconverted inorganics.

Thermal efficiency of the process has been low for MSW in laboratory tests. Since no pilot- or commercial-scale systems have been implemented anywhere in the world, production of ethanol from MSW is not yet a practical MSW management option.

Plasma Technology

Plasma technology is similar to pyrolysis in that it uses very high temperatures created by plasma energy to convert waste to a gas and a vitrified solid slag. Theoretically, the gas can be captured and used in steam generation. Plasma energy is generated by passing an electric current through a gas resulting in extremely high temperatures of up to 21,000 degrees Fahrenheit.

Plasma technology has not yet been applied to municipal solid waste on a large scale. Most existing operations using plasma energy have very little relationship to solid waste management and are not of a scale required to handle a municipal solid waste stream. There are uncertainties associated with the large-scale application of the plasma technology since it remains untested. Uncertainties also exist concerning the marketability of the gas and vitrified slag produced.

PART 2

INNOVATIVE TECHNOLOGIES

This report subsection will detail innovative solid waste technologies of anaerobic digestion, pyrolysis, and ORFA. The innovative technologies, for the purpose of this investigation, are those technologies that have been tested on a pilot scale or small demonstration scale only. For these technologies, there is little or no commercial experience with municipal solid waste.

SECTION 2

MUNICIPAL SOLID WASTE COMPOSTING

2.1 MSW Composting Description

Composting is the process of biological decomposition of solid organic materials by micro-organisms, such as bacteria and fungi. Composting is an aerobic (oxygen-dependent) process which occurs naturally in virtually all ecosystems. When biodegradable wastes are combined with sufficient moisture and oxygen, micro-organisms metabolize the organic matter, breaking it down and generating heat as a by-product. After the micro-organisms exhaust the readily available biodegradable matter, the composting process subsides, and a stable product is achieved.

Composting as a solid waste management option involves controlling the moisture, temperature, and availability of oxygen so that this natural process occurs in an efficient manner. This can be done in a variety of ways, ranging from very simple techniques which do little more than "let nature take its course" to sophisticated technologies which monitor and control the moisture, temperature, and aeration on a continuous basis. In general, more complicated processes are used for more heterogenous wastes such as unseparated MSW.

The most biodegradable components of municipal solid waste (MSW) are food and yard wastes. As a result, they are the easiest components of the waste stream to compost. Many people currently compost these materials in their backyards, and use the compost in their gardens. At one time, this was certainly the prevalent means for disposing of this material. Currently, in many cases, people do not have the ability or the desire to compost this material on their own. Therefore, centralized approaches to composting these materials are evolving.

The simplest form of composting, practiced throughout history, is placing material in a static pile, and waiting for composting to occur. This process has been used successfully for years in numerous communities that establish drop-off sites for leaves. This procedure works reasonably well for leaves, but it has not been demonstrated to be effective for other materials.

The static pile is the simplest process for composting, but it is not without drawbacks, that include:

- Long composting time for stable compost to develop.
- Odor formation due to the lack of aeration.
- A heterogeneous end product due to varying temperature, moisture, or aerobic condition within the static pile.

- Little experience with materials other than leaves, or a mixture of leaves and grass.

These drawbacks to one of the simplest forms of composting led to the development of more refined composting technologies. These refinements, in turn, led to the ability to compost a wider variety of materials into a more homogeneous product than the early static pile. Now many communities in the country are investigating the more sophisticated MSW composting technologies as a means of handling their MSW. This interest is due to the rising cost of MSW disposal, the desire to reduce landfill requirements, and the interest in reusing/recycling as much of the waste stream as possible.

2.2 Applicable Waste Streams

When composting of solid waste is discussed, care must be taken to identify the waste stream that is being considered. A wide variety of materials can be composted, and the requirements for composting vary with material. The major material types that can be composted are sludge, municipal solid waste, and organic wastes (food and yard wastes). Sludge composting is a fairly common practice as a means for managing wastewater sludges. This report will focus on the composting of mixed municipal solid waste, but the use of sludge as an additive in the composting of MSW is discussed.

2.2.1 MSW Composting

Municipal solid waste is obviously a very heterogeneous material, and this poses particular problems for composting. Since the composting process works on organic or biodegradable materials only, the inorganic materials that are in MSW must either be removed before or after composting, or be tolerated in the final product. As a result of this, composting MSW often requires a substantial amount of pre-processing to prepare the waste for composting. In addition, the level of contaminants in the final product is likely to be relatively high, which may limit the markets for the final product. Contaminants such as glass can create safety problems if the compost is handled, plastics can create litter problems due to their tendency to become airborne, and heavy metals or other pollutants can raise questions regarding public health if the compost is used in an agricultural application.

The major materials within MSW that are compostable are paper (of all types), food waste, and yard waste. There are other minor components that may be compostable, but these three major components usually comprise between 45 and 70 percent of MSW. The remaining material is generally non-compostable, consisting primarily of plastics, metals, and glass. One of the keys to the success of MSW composting is removing enough of these non-compostable materials in order to be able to produce an acceptable product.

2.2.2 Co-composting of MSW and Sludge

Sludge and MSW may be composted together. The material preparation and the fraction of the waste that is compostable are the same whether MSW is composted with sludge or without. The sludge that is used in co-composting is an end-product of wastewater

treatment. The effluent from wastewater treatment plants is generally dewatered, and the sludge that is produced is usually 2 to 30 percent solids. This sludge can be mixed with prepared MSW prior to composting. There are several reasons why sludge may be used in a composting process:

- Using sludge in a composting process along with MSW allows management of two waste products simultaneously.
- Sludge contains large quantities of water, which usually needs to be added to MSW to achieve ideal composting conditions.
- Sludge contains certain nutrients required for composting, thus reducing the need for adding these nutrients to compost MSW. These nutrients would include nitrogen, phosphorus, potassium, and carbon.

The addition of sludge is not without its drawbacks, however. The most obvious is the need to either site the composting facility near the wastewater treatment plant, or to transport the sludge. In addition, although sludge contains certain desirable components, it may also contain certain undesirable components, such as heavy metals or salts. Thus, an evaluation of the desirability of adding sludge to MSW for composting must be made on a case-by-case basis.

2.3 Composting Technologies

There are a number of different processes or technologies that can be used to compost solid waste. These processes vary according to the wastes that can be composted using each process, and the level of experience in applying each process. This section presents a generic, conceptual description of the major processes, and Section 2.4 describes the particular systems offered by various vendors. Sections 2.3.2 through 2.3.5 are organized according to complexity of the process, starting with the simplest processes, and going in order of increasing complexity.

2.3.1 Pre- and Post-processing

MSW must be prepared in some fashion prior to composting. The pre-processing systems for MSW are generally complex. The most common process employed in pre-processing systems is size reduction, since it is much easier to produce a uniform compost product from material that is more homogeneous in size. Different types of shredders or grinders can be used, depending on the nature of the material being composted. Other processes are usually incorporated to recover recyclables and remove non-compostable material which may otherwise end up as contaminants in the end products. Material recovery and removal is usually accomplished through some combination of size and density separation, as well as ferrous metal removal (by electromagnet). The degree of pre-processing required depends on the system and on the market for the product. If the market for the compost is landfill cover, the only process that may be required is size

reduction. However, for most other markets, it is likely that a number of processes would be required to achieve an acceptable compost.

The processes used to prepare material for composting resemble refuse derived fuel (RDF) processing systems, and in fact some composting processes incorporate RDF production for some part of the incoming waste. Section 3 of this report contains a discussion of RDF processes.

In many facilities, after composting takes place, the resulting material undergoes processing to remove oversized objects or undesirable contaminants. This can be done by simply screening the material to remove objects over a certain size, or using a more complicated removal process such as air classification or magnetic separation. There may also be a final curing process. The curing process usually consists of letting the material sit in static piles for some period of time so that the composting process subsides, and the material becomes stable. Depending on the markets, the compost may need to be dried and packaged prior to shipment.

2.3.2 Windrow Composting

The simplest composting process is to place the material in long rows, called windrows. Windrows are rows that are roughly triangular in cross-section, and can be as long as desired. The dimensions of the windrows are dependent on the equipment used to form and mix them. Windrows can be as high as 12 feet, or as low as 5 feet. Windrow composting usually employs some type of aeration process. Typically this is done by mechanically mixing the material in the windrows, which introduces air, and moves material to new parts of the windrow. Historically, this process has been used successfully for composting leaves, and reduces the amount of time necessary to produce compost from 2 to 3 years (in a static pile) to 16 to 26 weeks. There has, more recently, been success using windrow composting for MSW.

Composting MSW in windrows must be done in an enclosed building to control rodents and vectors. Windrow composting requires that the MSW be pre- and post processed. Therefore the facility will need to have a tipping floor, pre-processing area, composting area, post-processing area and curing area (which can be outdoors). In addition to the pre- and post-processing requirements, other equipment needed includes a front-end loader for forming and moving piles, and specialized equipment to mix and aerate the windrows. This equipment can be either an attachment to a front-end loader, or a self-propelled machine. Labor requirements depend on the amount of pre- or post-processing and whether self-propelled equipment is used.

Most of the experience with windrow composting is in composting leaves alone or a mixture of leaves and grass clippings. At this time, there is only limited experience applying this technology to composting MSW. However, five of seven currently operating facilities in this country are gaining experience composting MSW in windrows and, thus, experience is growing.

2.3.3 Windrow Composting with Forced Aeration

Another approach to windrow composting is to use forced aeration. In this process, air is forced through the windrows of material being composted using blowers and other equipment. This procedure allows the composting material to be aerated for extended periods of time, instead of periodically, as is the case with mechanical mixing. In many cases, forced aeration is used in the early stages of the composting process, and then windrow composting without forced aeration is used for the remainder of the process.

Forced aeration is used for windrow composting by forming the windrows over a concrete pad equipped with a plenum with a network of pipes. The plenum is connected to blowers which either draw air through the windrow, or force the air out through the windrow. When air is drawn through the windrow, and where odors are of concern, the air can be passed through some type of odor control device (usually a bio-filter) prior to release to the environment.

The advantage of forced aeration is that by forcing air through the material to be composted, the composting process will be accelerated. In addition, forcing air through the windrows allows the temperature of the composting material to be controlled. In fact, most forced air systems monitor the temperature of the windrows, and use a certain temperature as the trigger for activating the forced aeration system.

The advantages of forced aeration when compared with windrow composting without forced aeration include the following:

- Reduced time required for composting.
- A more uniform compost product due to temperature control in the windrows.
- Reduced odor formation due to reducing the occurrence of anaerobic conditions.
- An odor control system can be installed if odors are a problem.

The primary drawback associated with this process is the additional cost when compared with windrows without forced aeration. Windrow composting with forced aeration requires all the equipment necessary for windrow composting without forced aeration, plus the system for forced aeration. The system for forced aeration requires construction of the concrete pads for forming the windrows, which must be equipped with plenums, as well as the piping system, blowers, and a control system. An odor control system, if included, would obviously increase costs. Although a facility using forced aeration could operate without a specialized device for mixing and turning the windrows, it is likely that such a piece of equipment would be used to speed composting and improve the final product.

The other drawback of this system is that the experience using this technology is largely for yard and agricultural wastes. Since these systems are usually implemented outside, concerns about vectors probably precludes inclusion of food wastes. However, this system could be implemented within an enclosed structure, increasing the costs, but expanding the range of materials that could be composted. The experience applying this technology to MSW is still limited.

2.3.4 Enclosed Windrow Composting

This system is really a variation on windrow composting with forced aeration. Instead of forming windrows on top of a concrete pad, the waste to be composted is placed in long, open-top concrete troughs or bins placed side by side. Forced aeration is achieved in the same manner as with windrows - air is forced through the compost from below using blowers.

A specialized machine to mix and aerate the material rides on top of the trough walls. In some systems, the mixing and aerating equipment shifts the material from one trough to the next, until the final product is achieved and the compost is removed from the last trough. In other systems, the mixing/aerating equipment moves the material down the length of the trough so that during the composting time period, the material has travelled the full length of the trough, and finished compost is pushed out the end of the trough. This process is typically contained within a building. The exhaust air from the building can be passed through an odor control system if needed or desired.

This process is more controlled than windrow composting, thus resulting in production of compost in less time, and on a smaller land area. However, those advantages come with extra expense. The building, troughs, forced air system, and mixing/transferring equipment are all costly. This process has been used to compost combinations of sludge and yard waste, agricultural waste, or food processing waste.

2.3.5 In-vessel (Drum or Digester) Composting

In-vessel composting is generally the most technologically complex method of composting. It involves placing the material to be composted into a completely closed vessel. Within the vessel, mixing, moisture addition, and aeration take place in a controlled process. The material remains in the vessel for some period of time, during which all or a part of the composting process takes place. In some systems, the entire composting process occurs within the vessel, and a stable compost product is removed from the vessel. In other systems, the material that is removed from the vessel is placed in a static pile, an aerated static pile, windrows, or another vessel, for the final composting process (often called curing).

There are several different vessel types, such as drums, bins, and silos, but the key distinctions between them are means of mixing, and the type of feed system. The two different types of mixing are: 1) the vessel rotates (such as a horizontal rotating drum); and 2) the vessel remains stationary and contains an internal mixing device.

The feed systems for an in-vessel composting facility can operate in batch or continuous feed mode. In batch feed, a certain amount of material is placed in the vessel, and it remains for some period of time, until the vessel is emptied and the next batch of material is loaded. In continuous feed, small quantities of material are fed into and removed from the vessel either continuously or periodically, but the vessel is never emptied entirely and reloaded.

The advantage of in-vessel composting is that it is the most controlled of the composting processes. This control results in a relatively short composting period and a better quality end product. With in-vessel composting, temperature, moisture, and aeration control are excellent, and the conditions can be kept optimal for composting. Mixing is extensive, thus ensuring a homogeneous end product. A high degree of aeration minimizes odor generation. Land requirements may also be reduced, using in-vessel composting if no further curing or processing is required. The primary drawback with this process is the relatively high cost. The vessels and the control systems for maintaining the proper conditions within the vessels are expensive.

In-vessel systems are used for composting sludge and co-composting sludge with other solid wastes such as various yard and agricultural wastes, as well as MSW. There is some limited experience in composting MSW alone, using this technology.

2.4 Composting Technology Evaluation

This section discusses the factors that are important in evaluating a composting facility as a viable waste management option. Due to the wide variety of waste types and composting processes, this discussion will treat groups of processes or options together. The factors that are discussed herein are: 1) commercial viability; 2) environmental impacts; 3) market requirements; 4) costs; and 5) net landfill use reduction. The major criteria in each of these areas will be discussed.

2.4.1 Commercial Availability

Commercial availability is a function of the ability of the contractors to build and/or operate a facility properly and the ability of a project to be economically self-sustaining. Commercial availability can only be demonstrated through successful implementation and operation of facilities. There are currently seven commercially operating MSW composting facilities in the United States, as shown in Table 2-1. Most of these facilities are small (under 100 tons per day) and have commenced operation within the last two years. The operating histories of these facilities have been evolutionary in nature, going through a great deal of change to find the configuration of equipment required for proper operation.

TABLE 2-1

CURRENTLY OPERATING MSW COMPOSTING FACILITIES IN THE UNITED STATES

Location	Capacity (TPD of MSW)	Technology	Vendor Operator	Year Opened	Co-compost with Sludge
Wilmington, Delaware	1,350*	In-vessel Fairfield Digester	Raytheon	1984	Yes
Sumter County, Florida	75-100	Windrow	Amerecycle	1988	No
St. Cloud, Minnesota	50-60	In-Vessel (Eweson Digester)	Recomp	1988	No (1)
Fillmore County, Minnesota	15-25	Windrow	County owned and operated	1987	No
Portage, Wisconsin	30	In-Vessel/ Windrow	City owned and operated	1986	Yes
Lake of the Woods, Minnesota	5-10	Windrow	County owned and operated	1989	No
Dade County, Florida	800	Windrow	Agripost	1990	No

Notes:
* The majority of the MSW at the Delaware facility is converted to RDF.
(1) Urea and water is added to process.

Although the facilities are commercially operating, the processes used in the facilities are not necessarily available for purchase, since three of the seven facilities are run by public agencies (either the city or county) which are not necessarily in the business of selling composting systems. The experience in four of the publicly owned and operated facilities was built by simply finding the mix of equipment and processes that worked best for the community. The facility design, composting process, operating, and capital costs, and use of the compost differ widely in these facilities.

Three of the seven commercially operating MSW composting facilities are owned and/or operated by commercial vendors of composting systems. These are the Sumter County, St. Cloud, and Dade County facilities. The Sumter County facility is currently owned by the County and operated by Amerecycle. This is the only composting facility that Amerecycle operates. The facility uses hand-sorting and magnetic separation to recover recyclables such as aluminum, cardboard, ferrous metal, and plastic. The waste is shredded prior to being placed on impermeable compost pads outdoors. A proprietary formula of enzymes and bacteria is added to speed the composting process. Finished compost piles are screened after about six weeks of composting.

The St. Cloud, Minnesota composting facility is operated by Recomp, Inc. The facility employs in-vessel (Eweson Digester; an in-vessel system designed to accelerate the fermentation process of the organic materials) technology to compost approximately 60 tons per day of MSW. There is no removal of recyclables during the process, although St. Cloud

has a curbside recycling program in progress. Urea and water are mixed with the MSW in this facility.

The Agripost Facility in Dade County, Florida is the largest commercially operating facility in the U. S. When fully operational, the facility will compost 800 tons per day. Currently, the facility composts between 200 and 300 tons per day. The facility does very little front-end separation of recyclables; however, Dade County does have a curbside recycling program that removes some of the non-compostables from the waste stream. The waste is shredded prior to being windrowed. A proprietary inoculant is added to the shredded waste to speed the composting process. The windrows are formed inside a building. After the composting period, the compost is shredded, screened, and cured prior to shipment. Plant improvements are planned, based on operating experience, including the addition of magnetic separation after the primary shredder; addition of a large screen trommel after the secondary shredder; use of a custom-made pile turner to improve aeration; fine-screening after composting; and addition of an air collection and scrubbing system. This facility has only been in operation since early 1990; however, it accounts for a large portion of the U. S. operating experience in MSW composting.

There are many more MSW composting facilities outside of the United States. However, the experience at those facilities cannot be considered directly relevant, since the waste streams they are processing are much richer in organics than a typical United States MSW waste stream. Some European facilities that are labelled "composting facilities," in fact, are volume reduction facilities which process material prior to landfilling. There are also numerous MSW composting facilities in the planning and development stage. Although these reveal little about the actual ability of this technology to operate reliably over a long term, it is an indication that communities are viewing MSW composting as a commercially viable option for managing their solid waste.

Table 2-2 summarizes descriptions of the major MSW composting systems vendors. The vendors listed are those that market systems designed primarily to compost waste and have experience in composting MSW, as opposed to those marketing systems for processing mixed waste for recovery of recyclables, RDF production, or composting. These systems are discussed in Section 4 of this report. Only three vendors currently have operating MSW composting facilities in the U.S. as stated above. These vendors are still perfecting their systems, based on the operating experience that they are currently gaining. In addition, they are gaining experience in meeting state regulations and marketing the compost material. The other vendors of MSW composting systems may have experience in composting MSW in other countries or in implementing processing system similar to those used in pre-processing for composting.

TABLE 2-2

COMPOSTING VENDORS

Vendor	Licensor	Type of Technology	Materials Composted	Materials Removed	Pre/Post Processing	Products	# US Facilities Composting MSW	# Foreign Facilities Composting MSW
Reidel Waste Disposal Systems Portland, Oregon	DANO	In-Vessel Windrow	MSW or MSW and Sludge	Ferrous	Post Screening	Compost	0 (1)	16
Compost Systems Company Cincinnati, Ohio	Fairfield	In-Vessel	MSW or MSW and Sludge	Marketable Recyclables	Post Screening Drying, Pelletizing	Compost or Pelletized Compost	1 (2)	1
Ashbrook-Simon - Hartley Houston, TX	N/A	In-Vessel	MSW and/or Sludge	(3)	(3)	Compost	0	4
Bedminster Bioconversion Cherry Hill, NJ	Eweson	In-Vessel	MSW and/or Sludge	(3)	Pre-Hand Sorting & Magnetic Separation Post Screening	Compost	0 (4)	0
Amerecycle Sumterville, Florida	N/A	Windrow	MSW	Marketable Recyclables	Pre-Magnetic Separation Shredding, Post Screening	Compost	1	0
Recomp, Inc. Denver, CO	Bedminster (for Eweson)	In-Vessel	MSW and/or Sludge	Marketable Recyclables	Pre-Some Magnetic Separation Post Screen	Compost	1	0
Taulman Composting Systems Atlanta, GA	Weiss-Kneer	In-Vessel	Sludge (2 facilities) or Sludge and MSW (2 facilities)	(3)	(3)	Compost	0	2
Agripost Pompano Beach, FL		Windrow	MSW	Source Aluminum	Pre-Shredding Post Shredding Screening	Compost	1	0

(1) Dano facility is currently under construction in Portland, Oregon, and expected to be operating in January 1991.
(2) Marketed the Fairfield Digester System to the Delaware Reclamation Facility.
(3) Depends on waste stream being processed.
(4) Sludge composting facility in Big Sandy, TX does compost MSW periodically for demonstration and study purposes.

2.4.2 Technical Reliability and Availability

The ability of a solid waste management process to be technically available and reliable is critical. Municipal solid waste disposal is a daily responsibility of a municipality or county, so a facility that cannot be expected to operate reliably over a long period of time is unacceptable. Technical viability is a function of the physical reliability of the technology and the ability of the process to meet all environmental criteria. This type of analysis is the basis of financial feasibility reports, and can get very complex. However, an overall sense of technical viability can be derived based on past experience. In reality, past experience is the only reliable means for determining the likelihood of success of a project.

Since many processes which handle MSW to produce compost tend to be mechanically complex, the issue of mechanical reliability is a significant one. Pre-processing of MSW for composting is similar in some areas to systems that produce RDF. Complicated RDF processes which were used in the United States in the early 1970s had tremendous reliability problems. Design modifications were able to overcome some of these problems, but the general trend in RDF processes has been to simpler systems. Operating history in this area is growing but must be examined closely on a case-by-case basis. Technical reliability and availability associated with RDF systems is examined in Section 3. This discussion will address the percent availability of the RDF processes.

The technical reliability and availability of the actual composting process is a function of availability and reliability of mechanical equipment used during the process, and control over the variables that actually carry out the composting process. Mechanical equipment may include the vessel, drum or digester (in the case of in-vessel composting), or mixing and aeration equipment. Although the reliability of mixing and aerating equipment can be determined by the operation of similar equipment, the reliability of the vessels or drums for in-vessel composting is not as easily determined. Three of the seven MSW composting facilities in the U.S. use in-vessel technologies. However, each uses different manufacturers, and the operating data are limited.

The technical reliability and availability is also dependent on the control over the non-mechanical elements of the composting processes. These elements include the moisture content, oxygen content, carbon/nitrogen ratio, temperature, and pH. The levels of these elements will differ from process to process and, in fact, are the proprietary elements of a vendor's process. The measurement of the reliability of these elements would be a stable compost product.

2.4.3 Environmental Impacts

The environmental impacts of composting are the result of the composting process itself and the application of the compost product. The specific environmental effects of the

composting process itself will vary depending on the details of the process and the waste being composted. The environmental impacts of the composting process are likely to include some or all of the following:

- Air emissions due to formation of gases, airborne bacteria and pathogens, and volatilizing of compounds during processing.
- Potential groundwater impacts due to runoff.
- Occupational hazards, such as dust inhalation, noise exposure, safety hazards resulting from operation of equipment, and potential exposure to pathogens in the waste, or fungi generated during composting.
- Uptake in food plants.

Although there is little information concerning the environmental impacts of composting, it is expected that proper operation and housekeeping can keep any impacts to a minimum level. The one area that has been explored in some detail is the exposure of the public and workers to pathogens and fungi. Aspergillus fumigatus is a common fungus found in many materials, including compost, and can trigger allergic responses, and in severe cases, infections. Several studies have been done regarding the presence of aspergillus fumigatus in compost, and worker exposure. Although the fungus has been found in compost, and in the air surrounding composting facilities, there was no difference in antibody levels in workers at composting facilities and the general public. As a result, this is not generally considered to be a significant potential health impact.

Another potential health risk that has been raised regarding compost is endotoxins, which are substances produced by certain bacteria. Airborne endotoxins have been cited as one of the causes of occupational health problems in agricultural processing plants and animal processing plants, as well as at wastewater treatment plants. The levels of airborne endotoxins found in and around composting facilities have been lower than those measured in some office buildings. As a result, it has been concluded by researchers that the biological hazards posed by bacteria, fungi, or endotoxins are not significant for the general public, although certain hypersensitive individuals, or those predisposed to infections, may be at some risk.

The odor that is generated during composting does not pose a risk to public health, but it is an adverse impact on the environment. Although the amount of odor generated varies from material to material and from process to process, it is likely that odor would be raised as a potential problem during planning for a composting project, and it could be a source of complaints during operation. There are ways to mitigate odor generation. The first is to maintain aerobic conditions, since odor generation is much worse under anaerobic conditions. The second is to conduct some or all of the composting operations indoors, and

to use ventilation and bio-filters to reduce the odors escaping. In general, odor generation tends to be greatest during the early stages of composting, and, therefore, it is important that odors be controlled during that period. In addition, siting of a composting facility should take into account prevailing wind directions and proximity to residences.

Other environment-related impacts are aesthetics, noise and litter. The aesthetics of a composting facility depend on its type, but, in general, the buildings utilized would be similar to warehouses in appearance, and outdoor operations would appear agricultural in nature. Large land areas are necessary for most composting operations. Noise would result from any processes used to prepare the waste for composting, and from the turning and aeration procedures. With proper mitigation measures, the noise problem should not be significant. Litter could result from poor housekeeping, but in some circumstances, litter may be difficult to control. If plastics are not recovered prior to MSW composting, the pieces of plastic in the compost can easily become airborne and create a litter problem. This problem has been observed to be quite severe at MSW composting facilities in Europe.

The other aspect of environmental impacts posed by composting is the result of the use of the compost. Obviously, the impacts posed by the use of compost depend on the particular application; use of compost as an agricultural soil additive would have very different impacts than use of compost for landfill cover. In addition, the material being composted would affect the environmental impacts, since the nature of the waste affects the constituents in the compost. The greatest environmental impact would most likely result from using compost derived from MSW as a soil additive in growing food crops. This is because compost from MSW may contain some heavy metals, and these will be taken up by the plants grown in the soil/compost mixture. It has been found in some experiments that by controlling the amount of compost added to soil, the levels of heavy metals in the plants grown can be controlled to an acceptable level. However, it is unlikely that MSW compost would be used as a soil additive in a food crop growing situation.

Another significant potential environmental impact would be due to runoff. In other words, certain compounds could leach out of the compost and contaminate surface and groundwater. The actual impacts would, of course, depend on the concentrations of compounds of concern in the compost, the particular application, the meteorological conditions, and the rate at which the compost was applied. The potential for certain compounds to leach from the actual compost produced and the proposed application for the compost would have to be analyzed to determine the extent of potential environmental impact.

2.4.4 Economics

The costs associated with MSW composting are difficult to predict with any degree of accuracy since few projects have been implemented. In those projects that have been implemented, the capital and operating costs tend to vary widely.

The capital costs that have been cited for the Sumter County facility are approximately $7 million over the development of the 75 to 100 ton per day facility. For the 15-25 ton per day Fillmore County, Minnesota facility, the capital costs have amounted to approximately $750,000. The 30 ton per day facility in Portage, Wisconsin had capital costs of approximately $1.1 million. Lake of the Woods, Minnesota, used a $400,000 grant to build its 5-10 ton per day composting facility. The Agripost facility in Dade County, Florida had capital investments through start-up of $30 million. The above capital cost figures indicate a wide range of cost of between $30,000 to $70,000 per ton of daily design capacity.

Operating costs of the currently operating composting facilities are even harder to nail down than capital costs. Most of the facilities are subsidized to some degree by the cities and counties involved in the projects. Therefore, tipping fees charged at the facilities almost never reflect total costs. Tipping fees at the currently operating facilities range from $24 per ton to $69 per ton.

Pre-processing requirements for MSW composting alone have estimated costs (not including any of the equipment needed to actually compost the MSW) at $15 to $30 per ton. Our experience indicates that costs for MSW composting are likely to be at the high end of the range cited (or perhaps higher), unless relatively high revenue markets for the compost produced can be found.

Additional information is available regarding proposed facilities, or estimates cited in literature. However, these data usually cannot be verified during the development stages of any type of project. It may be difficult for the developers to anticipate the costs of capital and operation if the developer has not developed a similar project in the U.S. A 35 ton per day MSW composting facility proposed for Farmington, Minnesota was estimated to have a capital cost of approximately $4.5 million, and operating costs of $175,000 per year. The tipping fee at the facility was estimated in 1989 to be approximately $40 per ton. The DANO facility currently under construction in Portland, Oregon has a projected tipping fee of $46 per ton in the first year of operation.

Even with the uncertainty of costs associated with MSW composting, the recent financing for the construction of the Portland facility resulted in a bond issue with a triple A rating, the highest bond rating available. This indicates that the financial community will look favorably on a project that promises a good design, a guaranteed waste stream, and is well organized in terms of risk assignment and project responsibilities.

2.4.5 Markets for Compost

One of the critical aspects of the feasibility of MSW composting is the availability of markets for the compost produced. For the purpose of this report, a market is considered

a reliable outlet for compost which will accept that compost without charge (and in some cases, pay for the compost).

There are three aspects of markets that are vital to the success of composting projects. The first is the ability of the market to accept all of the material produced. The second issue is the ability of the market to accept the compost over a long period of time. Although it may be unlikely that long-term contracts for sale of compost can be obtained, for a market to be acceptable it should be clear that the market is not likely to evaporate quickly. For instance, there may be a high demand for compost during development of a housing project, but at the end of construction that market would go away. This type of market is not dependable. The last component of markets that is important is the price that the market will bear for the product. This last component obviously affects the economic viability of a project.

The market situation for MSW composted alone or in combination with sludge is unclear, and it is difficult to determine if long-term, large-scale markets can be developed for compost resulting from MSW. Because of the heterogeneous nature of MSW, the compost can be contaminated with undesirable materials. Several of the currently operating MSW composting facilities market their compost. The Delaware Reclamation facility markets its compost to landscapers for limited use since the compost has not been tested extensively enough to be used for crops or vegetable gardens. The St. Cloud, Minnesota facility markets its compost to both agricultural and horticultural markets. The remainder of the facilities either land apply the compost produced, use it as landfill cover or use it for landscaping parks and government buildings. Current research on the MSW compost should produce a better understanding of future market potential.

The Environmental Protection Agency (EPA) has proposed new guidelines for land application of composted sewage sludge, and these proposed regulations are of concern to facilities that currently compost sludge. These regulations may also impact the markets available for co-composted MSW and sludge. There have been numerous tests conducted using MSW compost as a fertilizer or soil supplement, and the results have shown some promise. However, the concern about pollutants contained in MSW compost remains to some extent, and this may be the biggest obstacle to market development. Thus, while some progress has been made towards developing markets for MSW compost, long-term, large scale markets depend on the region of the country, the regulations concerning compost, the quality of the compost, and the perception of the markets toward compost produced from MSW.

2.4.6 Net Landfill Reduction

Net landfill reduction due to composting depends on a number of variables including the portion of the waste stream that will be composted, the composition of the MSW being composted, and the composting process used. If a process is designed to produce compost

as its primary product (in other words, not produce refuse-derived fuel in addition to compost) then there will be some level of rejects or residues from the process that will have to be landfilled. Estimates of the amount of process residue and rejects resulting from MSW composting processes range from 5 to 45 percent by weight of incoming waste, but are most commonly found in the 30 to 45 percent range. This equates to approximately 20 to 30 percent by volume.

2.5 Summary of Evaluation: Advantages and Disadvantages

MSW composting can be summarized in terms of the advantages and disadvantages experienced:

Advantages

- MSW composting processes are commercially available. The technical availability and reliability associated with both the preprocessing of waste and the biological compost process itself is growing.
- Since MSW composting is a non-burn disposal alternative, public acceptance may be greater than thermal treatments.
- Potential environmental impacts can be minimal if the composting process is operated properly;
- A usable, potentially marketable product results.
- There will be a net landfill reduction from composting some or all of the MSW generated. The level of landfill reduction will depend on the size of the MSW composting facility.

Disadvantages

- Although there are commercially operating MSW composting facilities, there is still limited commercial availability of complete MSW composting systems.
- Research of the impact of uptake in food crops resulting from using MSW compost is still ongoing and currently non-conclusive.
- Potential environmental impacts due to compounds leaching out of compost produced form MSW are not fully understood. This may result in limited use or marketing of the compost.

- MSW composting operations could cause odor problems unless proper ventilation and air filtering are employed.

- The capital and operating costs associated with MSW composting operations are still difficult to predict with any degree of accuracy. Capital and operating costs vary widely for those facilities currently operating.

- Many vendors currently marketing MSW composting systems have experience only in Europe. This experience may not be directly applicable to the U.S. since the waste stream in the U.S. may differ significantly from that in Europe.

PART 3

RESEARCH AND DEVELOPMENT TECHNOLOGIES

This report subsection will detail research and development solid waste technologies of Entech's thermal oxidation process, vermiculture, ethanol production, and plasma technology. The research and development technologies, for the purpose of this investigation, are those technologies that have been tested in the laboratory or pilot scale only. For these technologies, there is limited experience with any feedstock and little or no experience with municipal solid waste.

SECTION 3

FLUIDIZED BED COMBUSTION/REFUSE-DERIVED FUEL

3.1 Description of Technology

3.1.1 Definition

Solid waste can be combusted in two forms: unprocessed and processed. If the waste is unprocessed prior to combustion, this technology is referred to as "mass-burn." If the waste is processed prior to combustion, the technology is most frequently labelled "refuse derived fuel" or "RDF." RDF technologies are those that process solid waste through a variety of size reduction and separation steps to produce a more homogeneous and more easily combusted fuel. Fluidized bed combustion is a combustion process which utilizes combustion air to suspend inert material and fuel particles in a fluidized state, while combustion occurs.

3.1.2 Technology Description

Solid waste can be turned into a more homogeneous fuel by changing the particle size, through shredding or grinding, and by removing certain components. The separation done to remove undesirable or incombustible components can be any combination of manual and mechanical processes. The mechanical processes typically employed include electromagnetic separation of ferrous metal, eddy-current separation of aluminum, size separation through use of screens and trommels, and density separation through use of air classifiers. Different RDF processes use different combinations of these processes.

Two examples of RDF systems are the Baltimore County Resource Recovery Facility and the Greater Detroit Resource Recovery Facility. These examples cover most of the processes employed at RDF facilities. At Baltimore County, waste is received on inclined infeed conveyers, which feed hammermill shredders. Following shredding, the waste is conveyed under an overbelt electromagnetic separator, for the removal of ferrous metals. Next, size classification takes place by means of rotating disk screens--spinning shafts with blades which allow particles under a certain size to fall through. Large pieces coming off the disk screens go through a secondary shredder, while undersized material is conveyed out as residue for landfilling. About 70 percent of the incoming waste ultimately becomes RDF. This fuel material is deposited into a storage area by means of a shuttle conveyer.

The Detroit facility has a similar processing line, but some of the specific stages are different. Size reduction of incoming waste is accomplished with a flail mill, which also opens any garbage bags. Steel and ferrous metals are extracted with a rotating drum magnet and the resulting ferrous stream is "cleaned" by an air classifier (light-weight combustibles are pulled out and returned to the RDF stream). Two stages of trommel

screens (rotating cylinders with holes) are used to remove fine and oversize materials. The oversize fraction is reshredded and returned to the RDF stream, while fines are directed to a trailer for transport to landfill. Finished RDF, by design about 76 percent of the input waste, is conveyed to a large storage hall.

Both the Baltimore County and Detroit facilities manufacture a loose RDF product, also known as "fluff" RDF. RDF may also be pelletized into small briquettes, which are burned in suspension like pulverized coal. The Reuter Company facility, in Eden Prairie, Minnesota, is an example of a facility making pelletized RDF.

Once RDF is produced through some combination of processes, it can be combusted in several ways. The most common is to use a combustion chamber and boiler very similar to that used for combusting pulverized coal. In this combustion process, the fuel is introduced into the combustion chamber, and air is used to suspend the fuel. The fuel combusts in suspension, and then continues to burn on a grate at the bottom of the combustion chamber. Another combustion process for RDF, which is just beginning to be employed for this type of fuel, is fluidized bed combustion.

Fluidized bed combustion is a process that can be used to burn almost any fuel that can be produced with a small particle size. In fluidized bed combustion, the combustion chamber is equipped with a grid of nozzles on the bottom of the chamber. The combustion chamber contains a large quantity of inert material of small particle size, usually sand. Air is introduced through the nozzles, and this causes the sand to become suspended, and the mixture of turbulent air and sand behaves like a fluid. To start up a fluidized bed combustor, the combustion chamber, and the sand, are heated up using an auxiliary fuel, and then the primary fuel is introduced into this fluidized bed of hot sand. The material combusts while in suspension along with the sand.

There are two basic types of fluidized bed combustors: bubbling bed and circulating bed. In a bubbling bed combustor, the bed essentially remains at the bottom of the furnace chamber. That is, the combustion air is introduced from underneath in such a quantity and at the appropriate velocity so that the bed material and the burning fuel are suspended in a layer at the bottom of the combustion chamber. The burning fuel and hot bed material transfer their heat energy to metal tubes, located either in the furnace walls or extending through the bed itself. These tubes carry water, which is turned into steam or hot water. Flue gases are extracted at the top of the combustion chamber, passed through a cyclone to remove any escaped bed materials, and channeled into the air pollution control (APC) equipment.

A circulating fluid bed combustor differs from a bubbling bed in that the bed travels through the entire chamber. A strong air stream pushes the bed material up from the bottom of the chamber, forcing burning fuel and combustion gases with it. When the flue gases exit the chamber at the top, they carry the bed material into a cyclone, which separates the sand, limestone, etc. from the gases. The bed materials are reinjected into the

lower portion of the combustion chamber, creating a circulatory system, as seen in Figure 3-1.

Because of its different characteristics, bubbling bed technology has certain advantages over circulating bed technology and vice versa. Advantages of bubbling bed technology are less electric power consumption, lower-cost cyclones for particulate removal, and potentially less boiler tube erosion. In a bubbling bed system, the water tubes may be located directly in the bed, thus insuring excellent heat transfer. This option may accelerate erosion of the tubes, however, because they are directly in the path of jiggling bed particles. Advantages of circulating bed systems include greater overall thermal efficiency. In a circulating-bed, waterwall design, the bed, burning fuel, and gases are in contact with the entire wall, from top to bottom. In a bubbling bed, waterwall furnace, this combustion zone is only in contact with about an 8-foot thick section of the walls. Hence, more of the heat created in the combustion reaction can be transferred to the working fluid (water) in the circulating bed system. Also, in a circulating bed furnace, the residence time of gases in the combustion chamber is longer--meaning higher in-situ removal of SO_2, hydrogen chloride, and dioxins. This minimizes the cost of the add-on APC system.

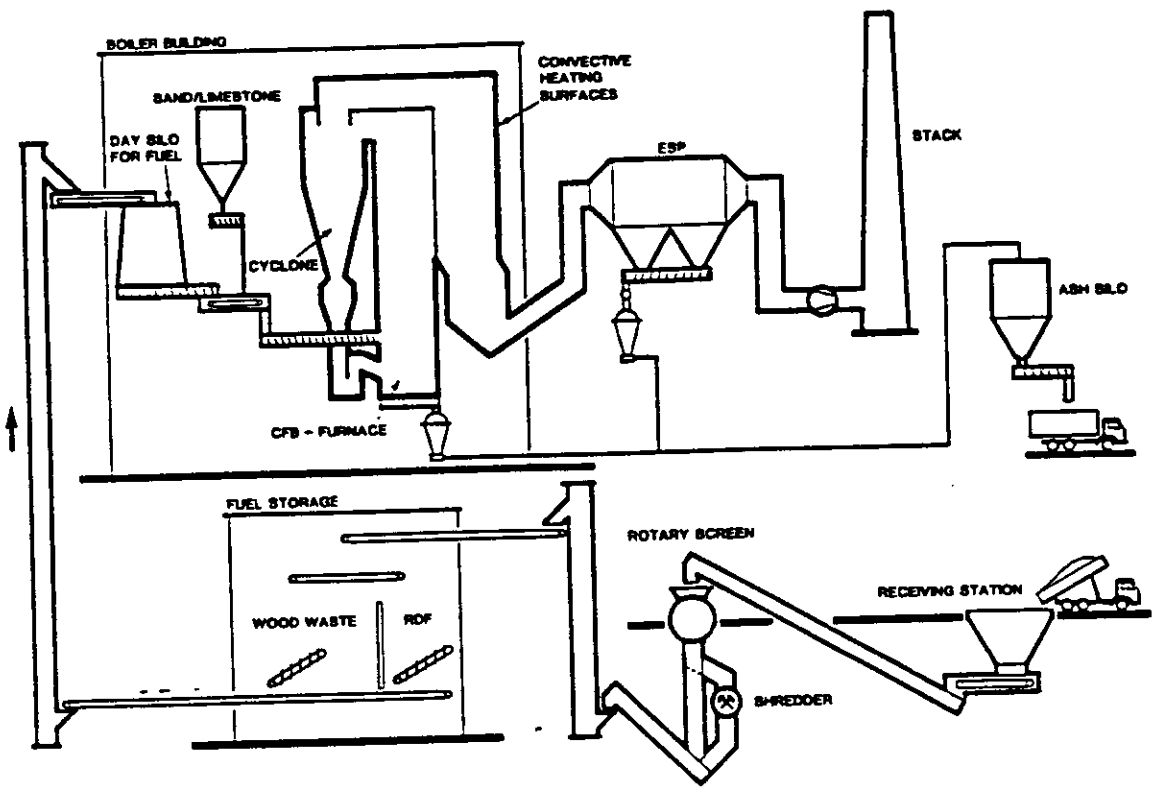
When fluidized bed combustion is applied to solid waste, the waste must be in the form of RDF, since a small particle size is required for the material to remain in suspension. As a result, we are discussing RDF processes and fluidized bed combustion within the same section. It is important to recognize, however, that RDF production processes can be used in conjunction with other combustion processes.

3.1.3 Applicable Waste Streams

RDF processes can usually handle the vast majority of residential and commercial waste. The wastes that would be rejected as non-processible are bulky items, such as white goods and large tree trunks. Other items which cannot be reduced in size, or are non-combustible, such as engine blocks, would also be removed prior to processing. Construction and demolition debris, specialized industrial wastes, and sludge would not be processed through an RDF system.

Fluidized bed combustion can be applied to virtually any type of solid waste, provided that the particle size is made appropriate. It is this applicability to a wide variety of fuel feedstocks that makes fluidized bed combustion so attractive. Thus, any RDF can be combusted in a fluidized bed combustion system. In addition to material resulting from an RDF process, there has been experience handling sludge and shredded tires in fluidized bed systems.

FIGURE 3-1



CFB-BOILER PLANT FOR RDF/WOOD WASTE AT SUNDSVALL, SWEDEN

3.1.4 History of Implementation

First generation RDF processing facilities emerged in the mid-to-late 1970s. These included, among others, installations at Cockeysville, Maryland; Ames, Iowa; and Milwaukee, Wisconsin. Such systems employed primary and secondary shredders for size reduction of the refuse, magnetic separators for recovery of ferrous metals, and air classifiers or disk screens for separation of combustible, light-weight materials from heavier materials. Some systems also included glass and aluminum recovery units, which rarely functioned with their designed effectiveness. Facilities designed during the 1980s have demonstrated improvements, resulting in greater availabilities and more consistent, better quality fuel products. Some of these systems, for example: Detroit, Michigan and Honolulu, Hawaii, have substituted flail mills for the primary shredders and trommel screens for the disk screens.

Fluidized bed combustion technology has been researched since the 1950s in the United States, Great Britain, and Scandinavia. However, Japan and the Scandinavian countries have taken more steps toward commercial applications. Japan, especially, has encouraged the use of the process with municipal solid waste (MSW) as a fuel--ever since the commissioning of its first facility in 1972. At present, more than 100 operating and planned facilities in Japan utilize or will utilize fluid bed technology.

3.2 Evaluation of Technology

3.2.1 Commercial Availability

3.2.1.1 Market Status

Currently on this continent, RDF processing is much more of an established technology than fluid bed combustion. As of April 1989, there were 15 RDF facilities operating in the United States, with capacities from 600 up to 3,000 tons per day (TPD) of MSW. Two more large facilities were then in the planning stages, and one (Detroit) has since commenced operation. Conversely, there are currently only three fluid bed facilities in operation in the United States, with a fourth just entering the design stage (Robbins, Illinois). Furthermore, since RDF technology has been in use since the 1970s, the cumulative operating years of experience are much greater vis-a-vis fluid bed combustion.

Two vendors currently marketing fluid bed technologies are Tenex and Gotaverken. Tenex apparently offers a bubbling bed system, while Gotaverken is one of the leading designers of the newer circulating bed technology. It is not known where the Tenex technology is being applied or if there are any bench-scale facilities. Gotaverken has a number of plants burning RDF, coal, and wood waste in Scandinavia, and it is the selected vendor for the Robbins project.

3.2.1.2 Existing and Planned Facilities

There are two facilities currently operating in the Midwest employing bubbling bed technology. The Western Lake Superior Sanitary District Plant (Duluth, Minnesota) burns 120 TPD of RDF together with 345 TPD of treated sewage sludge in two Copeland combustors. Both the RDF and sludge are obtained from processing facilities on-site: the sludge from a municipal sewage treatment plant and the RDF from a refuse processing plant employing shredding, magnetic separation, and air classification. Combustion occurs at 1,475°F in the boilers, which are both capable of manufacturing 49,000 lbs/hr of steam. APC devices include a cyclone, venturi-scrubber, tray scrubber, and a demister.

Northern States Power placed two bubbling bed units into operation in 1987 at its French Island Generating Station (LaCrosse, Wisconsin). These units each co-burn 288 TPD of RDF (with maximum 3-inch particle size) and 264 TPD of sludge. The Foster-Wheeler water tube boilers produce 150,000 lbs/hr of steam, which is used to generate 32 megawatts (MW) of electricity. The APC system consists of a gravel-bed electroscrubber and a baghouse.

The circulating fluid bed system will be employed at the planned Robbins, Illinois resource recovery plant, south of Chicago. This facility will accept 1,600 TPD of MSW, 400 of which will be sorted out for recycling. The remaining 1,200 tons will be burned in two circulating-bed, waterwall boilers, manufactured by Gotaverken Energy Systems A/S of Norway. The boilers will produce 240,000 lbs/hr of steam, which will turn a turbine to generate 48 MW of electricity. An extensive battery of APC equipment has been designed to meet current permissible emissions levels. It consists of a flue gas scrubber, baghouse, and a Selective Non-Catalytic Reduction Device (SNCR), the latter to purge NO_x emissions. The Robbins plant was scheduled to be under construction in the fall of 1990.

3.2.2 Technical Availability and Reliability

3.2.2.1 RDF Processing

First generation RDF plants often exhibited poor reliability. One example is the Ames, Iowa facility, which regularly operated at only 43 percent of rated capacity. This low availability was due to numerous mechanical problems, including drag conveyer jams, erosion and plugging of pneumatic conveyer lines, and explosions and fires inside the shredders. Problems with handling and movement of the RDF product were also experienced at Milwaukee, while Cockeysville had at least six explosions in their hammermill shredders.

In more recent facilities, availability has been increased through better equipment and process design and through redundancy. The RDF processing line at the Duluth facility has, over the last five years, exhibited an excellent availability of 95 percent. At Detroit, three identical processing lines, each with an expected availability of 87 percent, were

installed. Based on a normal 16 hours per day operating schedule, the plant can manage 4,200 TPD on all three lines. This is almost 1,000 TPD more than the facility guaranteed throughput of 3,269 TPD. Moreover, if one line is disabled, the plant can still process 2,800 TPD on the remaining two lines. The resulting shortfall of 469 TPD can be readily accommodated by operating extra hours or by holding MSW in the receiving area.

3.2.2.2 Fluidized Bed Combustion

Fluidized bed combustors are generally designed to operate round-the-clock, seven days per week. One source states that the combustion units are very reliable, and that there is more potential for breakdowns in the auxiliary systems (fuel handling, ash handling, fly ash collection). [Makansi, 1987]. Because of the dearth of facilities currently operating in the United States, data on availability are limited. It is known that the combustion system (independent of the RDF processing system) at the Duluth sludge/RDF facility reports an availability factor of 85 percent.

It should be noted that the availability of a fluidized bed facility burning RDF is a combination of the availability of the RDF processing system and the availability of the fluidized bed combustion system. In addition, the amount of storage for incoming refuse and for RDF can affect availability of the total system. Based on the data available, it appears that a long-term availability of 80 to 85 percent is achievable by a well-designed, well-operated RDF/fluidized bed combustion facility.

3.2.3 Environmental Impacts

3.2.3.1 RDF Processing

RDF systems potentially can impact the surrounding air, water (ground and surface), land, and general environs. Dust and small particles are created through the movement of RDF during processing and transfer operations. These particulate emissions can be controlled by dedicated baghouse filters, fed by dust collection ducts over the conveyers, shredders, and screens. Often, a negative pressure is established within the building to prevent dust from escaping.

Water pollution may occur either from water used in the facility or through landfilling of non-processible wastes. Water from washing down floors and equipment is typically treated on-site or held in a collection pond before being released into the municipal sewer system.

Noise, litter, and odor are common "nuisance" impacts of RDF facilities. They can be eliminated or controlled by fully enclosing the receiving and processing areas and by siting the facility in an industrial zone.

3.2.3.2 Fluidized Bed Combustion

One of the outstanding benefits of fluid bed systems is their ability to control emissions of major pollutants in situ, or within the combustion chamber. These pollutants include sulfur dioxide (SO_2), acid gas, nitrogen oxides (NO_x), and dioxins.

Sulfur dioxide and acid gas emissions are controlled through the addition of limestone as a component of the bed material. It should be recognized that for bubbling bed systems, in situ SO_2 and acid gas removal typically is not adequate to achieve required emissions reductions and, thus, additional control, through the use of scrubbers is required. The newer circulating bed designs approach the level of the removal that is necessary; however, flue gas scrubbers are typically installed to guarantee compliance with local air standards.

Fluid bed systems do an excellent job of controlling emissions of NO_x. Emissions of NO_x can be up to 70 percent lower than those from ordinary RDF stoker boilers. Emissions are lower because less NO_x is formed during the combustion process in the first place. This is due to two factors: lower combustion temperatures in fluidized bed systems and less excess air (which contains nitrogen) being supplied to the burning fuel.

Newer fluidized bed units will likely include SNCR as part of their standard APC. An example of this technology is Exxon's Thermal $DeNO_x$ system. In this process, ammonia injected into the flue gas reduces NO_x to nitrogen at temperatures between 1,600 and 1,800°F. The process has exhibited, in facility tests, NO_x destruction rates of between 44 and 69 percent. The longer residence time, five seconds versus two seconds in conventional furnaces, helps to destroy organics in the flue gases.

The other major emission from fluid bed facilities is the ash residue. Bottom ash and fly ash from the Sundsvall circulating fluid bed facility in Sweden were subjected to the EP Toxicity Test. For a series of commonly tested-for heavy metals, the ash samples were well under allowable limits set by the Environmental Protection Agency (EPA).

3.2.4 Economics

For the purpose of this analysis, the cost of the RDF processing and fluidized combustion systems will be combined. Two available reference cases are a proposed facility for Erie County, Pennsylvania and the proposed Robbins, Illinois project. The Erie facility was designed to burn a mixture of MSW and tires (varying composition but predominantly MSW). Projected construction costs are, for Erie, $52.8 million and for Robbins, slightly under $200 million. The RDF processing side of the Erie facility was sized to handle 480 TPD in a single shift, and the fluidized bed combustion side was sized to handle 468 TPD of MSW and 70 TPD of shredded tires. Similarly, the RDF side of the Robbins facility will process 1,600 TPD, while the fluidized bed boilers will burn 1,200 TPD. Based on the capacity of the RDF system, costs per daily tons of capacity are, for Erie, $110,000 and for

Robbins, $125,000. Because there are few examples of operating facilities in the United States, there are limited data available on yearly operating costs. For the year 1990, base case operating costs for the Erie facility, not including residue and ash disposal, equal $3.39 million or approximately $14 per ton.

Based on the limited data available, tipping fees may be expected to range from $40 per ton to $100 per ton. The Robbins facility is projected to have a tipping fee between $45 and $50 per ton of MSW.

3.2.5 Energy Production and Consumption

Fluidized bed combustors can supply energy in similar quantities to mass-burn incinerators: from 1,000 to 1,500 kilowatt-hours per ton. As such, they can generate enough electricity for industrial applications or for supplying power to a population in the tens of thousands.

3.2.6 Non-Processibles and Residues

Fluid bed furnaces are very versatile and can accept fuels with widely varying heating values. Despite this, certain items should be removed from the waste stream to create: 1) fewer difficulties in the shredding and screening processes on the RDF line; and 2) better combustion efficiency in the boiler. These "non-processibles" typically consist of batteries, automobile parts, white goods, and tires. According to national averages, together these make up about 4 percent of the MSW stream. Front-end separation of recyclables is becoming, and will continue to become, more widely applied. As an example, at the Tacoma, Washington facility, newspapers and yard waste are presorted, for recycling and composting, respectively.

The major residues of a fluid bed facility, like any combustor, are fly ash and bottom ash. For the proposed Erie facility, it was estimated about 4 percent of the incoming waste would be converted to ash. Investigations have been made into using ash as a substitute aggregate in concrete, but few facilities are implementing such a program.

3.3 Summary of Evaluation: Advantages and Disadvantages

The summary of RDF processing and fluidized bed combustion can be summarized by the following advantages and disadvantages:

Advantages

Converting waste to RDF and subsequently burning it in a fluidized bed combustor has the following positive aspects:

- Improved combustion efficiency. Combustion efficiency is improved by merely converting MSW into RDF, because RDF burns more uniformly and has a higher heat content than raw garbage. The fluidized bed method further enhances combustion because of the more turbulent conditions present in the boiler. Quantitatively, RDF combustion alone increases boiler efficiency from 70 percent (mass-burning) to 75 percent. Burning RDF in a fluidized bed boiler may further boost efficiency to over 80 percent.

- Reduced NO_x emissions. Because combustion is more efficient, less excess air is required for complete combustion (anywhere between 30 and 90 percent less). Excess air contributes to emissions of NO_x, so less excess air results in a lower level of this pollutant. Also, fluidized bed boilers operate at lower temperatures vis-a-vis conventional boilers, and this means that even less NO_x is produced during the combustion process.

- Fewer operational and maintenance problems in the boiler, in particular, less slagging. Slagging, or the depositing of molten ash on boiler walls and tubes, hampers boiler operation. Conversion of garbage to RDF can check this occurrence, providing that glass and metals are successfully removed during processing. Furthermore, since fluid bed combustors operate at lower temperatures, there is less chance that glass and metal that does make it to furnace will slag.

- The ability to remove sulfur through in situ scrubbing, thus curbing sulfur dioxide emissions. This makes fluid bed units very attractive for power generating stations which wish to burn cheaper, high sulfur coals.

- Very high heat transfer from the burning fuel to the working fluid. Due to the turbulent conditions in the chamber, the bed particles become very hot. When these sand particles collide with the boiler walls or tubes, they impart their heat energy directly to the water inside.

- Longer residence time for combustion gases; i.e., five seconds, compared to less than two seconds in conventional furnaces. As stated before, this facilitates destruction of organics.

- High turndown ratios. This means a fluidized bed unit can operate at substantially less throughput than it is designed to handle--for example, a 100 TPD unit might realistically be able to run at 25 TPD.

Disadvantages

The major disadvantages to the RDF/fluidized bed combustion technology are found in the RDF processing area:

- RDF processing lines have not been perfected or optimized, despite their being in existence almost 20 years.
- Explosions in the shredders have the potential to shut down the entire processing line.
- Facilities have also experienced shutdowns elsewhere in the line as a result of "mechanical jams or bridging of RDF at transfer points."

However, fluidized bed combustors do exhibit some problems, namely:

- Fuel slagging. Although RDF processing systems remove most of the glass and metal in the MSW stream, any remaining may slag within the bed and then solidify upon cooling. This "freezing up" of the bed adversely affects performance in two ways: the particles cannot move and cannot transfer their heat to the boiler walls, and the combustion gases cannot push the resulting "lumps" around as easily as tiny particles, causing the furnace conditions to become less turbulent. Again, slagging should be less prevalent than in ordinary mass-burn boiler.
- Erosion of the furnace and tubes. Erosion is caused by the sandblasting effect of bed particles impacting on the boiler tubes and walls. It can lead to frequent tube replacement or a shortened life for the whole unit.

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SECTION 4

MIXED WASTE PROCESSING

4.1 Description of Technology

4.1.1 Definition

Mixed waste processing is defined as any process that accepts mixed solid waste and converts the waste to at least two or more of the following products: recyclables, compost, or fuel. A process that produces only compost or only fuel would fit into the categories of technology discussed in the previous two sections. To further refine this definition for the process to be considered within this category, it must generate at least two of these end products as its main objective. For example, if ferrous metal is incidentally recovered as a by-product of generating a feedstock for compost, this would not be defined as mixed waste processing.

4.1.2 Technology Description

Mixed waste processing systems take unsorted municipal solid waste (MSW), sort out some recyclables, and prepare the rest for fuel, compost feedstock, or both. Most mixed waste processing systems recover recyclables manually, mechanically, or using a combination of the two approaches. The recyclables are then baled, densified, or granulated for transport to market. The most commonly recovered materials for recycling are those that have a high market value, like aluminum, or those that threaten the quality of the compost or fuel, like metal and plastic.

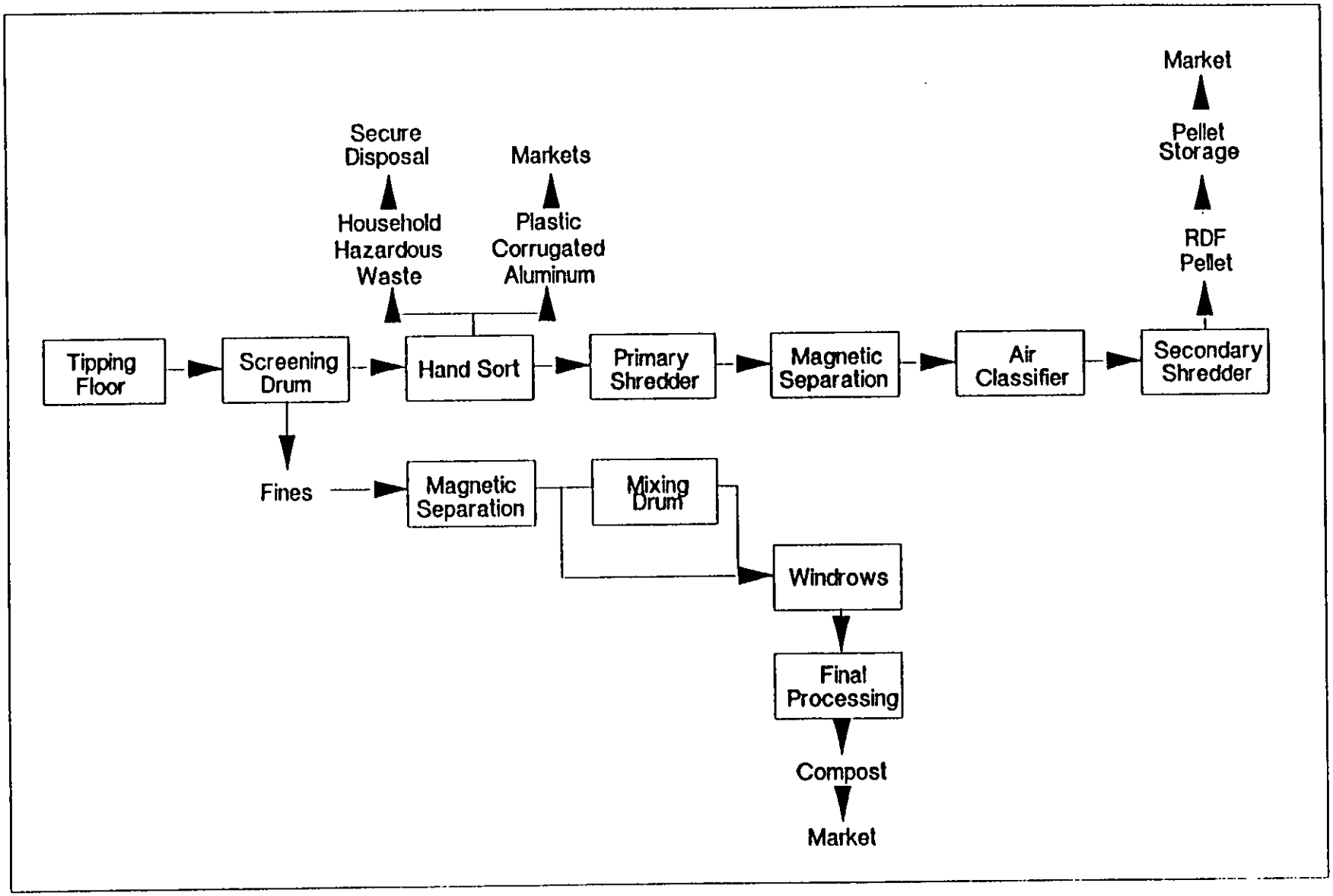
After recyclables are removed, the remainder of the waste is shredded and then further processed, perhaps pulverized or pelletized, to be used as compost feedstock or fuel. The technologies involved in producing feedstock for compost or fuel from mixed solid waste are often interchangeable. Figure 4-1 presents a probable process flow for a mixed waste processing facility. A more detailed description of the process of converting MSW to compost or fuel is in Sections 2 and 3, respectively.

Some manufacturers of mixed waste processing systems market their equipment in modules. A community can choose certain equipment to recover specific recyclables and produce either fuel, compost, or both.

4.1.3 Applicable Waste Streams

Mixed waste processing systems handle unsorted waste from both the residential and commercial sector. If one of the end products is compost, sludge is sometimes added in the process. Depending on the specific equipment and process, residential waste may be easier

FIGURE 4-1
TYPICAL MIXED WASTE PROCESS
FLOW DIAGRAM



to handle than commercial or industrial waste because it tends to be more homogenous and less bulky than commercial waste. For example, Reuter, Inc., a mixed waste processor in St. Cloud, Minnesota, estimates that its decision to stop accepting commercial waste will reduce the volume of material sent to the landfill from its facility by ten percent, since so many bulky items in the commercial waste could not be processed. On the other hand, certain commercial waste contains a higher proportion of waste paper, which is valuable to recycling, composting, and fuel generation.

Depending on the particular technology, mixed waste processing facilities may not accept specific materials because they may damage processing equipment or reduce the quality of the end product. White goods or other bulky material may be pulled out at the front end of the process or be rejected altogether. Hazardous waste and biomedical waste is usually rejected at these facilities.

4.1.4 History of Implementation

Most of the mixed waste processing systems currently in operation, operate outside of North America. A number of facilities in Europe including the Perugia processing plant in Italy, the Thumaide Waste Treatment Plant in Belgium, and the Zoetermeer Recycling Plant in the Netherlands processes mixed waste into recyclables (usually one of a combination of ferrous metals, plastics, and glass), compost, and an RDF. Ebara International, a Japanese corporation, has a facility in Yokohama that process 100 tons of mixed waste per day. A pulverizer removes 3 tons per day of ferrous metal and 25 tons per day of refined pulp, a pyrolytic gasifier recovers gas and oil from plastics, and a compost facility processes 28 tons per day of organic waste. The facility was built in 1929.

A 200 tons per day mixed waste processing facility has been operating in Bayonne-Anglet-Biarritz, France since 1988. This facility separates plastic, ferrous, and paper for recycling and composts 59 tons per day. Harbert Triga is marketing this system in the United States. Recently, local waste management companies have begun to market equipment that has been used successfully in other countries. Experience in other countries, though relevant, has limited applicability in the United States, where the waste stream and the markets for material are different.

4.2. Evaluation of Technology

4.2.1 Commercial Availability

There are only a handful of mixed waste processing facilities operating in the United States. Several other facilities, like the Delaware Reclamation facility, recover a small portion of materials for recycling, usually materials that do not compost or burn too well, and then make a compost feedstock or a fuel. Some others accept a very limited waste stream, like commercial loads with a high percentage of waste paper, and recover materials for recycling, composting or fuel. But few facilities take most residential and commercial

waste and pull out a large portion (over ten percent) for recycling and make a compost or fuel.

Several mixed waste processing facilities evolved when processing equipment was added on to the front end of a transfer station or landfill. This was the case in Crestwood, Illinois where XL Disposal, a local waste management company, had been operating a transfer station since 1981. In September 1989, XL added a system at the transfer station, designed and equipped by National Recovery Technology (NRT), to process mixed waste received at the facility. It processed an average of 304 tons per day in the first nine months of operation. Approximately twelve percent of the incoming tonnage, mostly paper, metal, and plastic, was recycled, and XL reports that this number is increasing as additional equipment is added to recover bulk ferrous and wood waste. Another twenty percent of the incoming waste, mostly consisting of yard waste, food waste, glass, and grit, was used as landfill cover and is now being screened further and marketed as topsoil for use around buildings and roads. The remaining waste is currently being disposed of in a landfill. But new equipment, including a hammermill and compressor, was recently installed and is now producing a pelletized fuel for testing. XL projects that 25 to 35 percent of the incoming waste will ultimately be converted to fuel.

One of the longest operating mixed waste processing systems is the Future Fuel facility in Thief River Falls, Minnesota. The facility, which was designed and equipped by Lundell, an equipment manufacturer, began operation in 1985. The plant has a stated capacity of 100 tons per day (TPD) but was processing an average of 45 TPD of commercial and residential waste as of 1990. In 1990, 73 percent of the incoming waste was converted to RDF and compost, 16 percent was recovered recyclables, and 11 percent was sent to the landfill.

The largest mixed waste processing system (aside from the Delaware Reclamation facility, which is described in a previous section since its primary product is RDF) is the Refuse Resource Recovery Systems (RRRS) facility in Omaha, Nebraska. The RRRS facility has a design capacity of 600 tons per day of residential and commercial waste. RRRS's facility is unique in that it accepts both mixed waste and bagged source-separated recyclables on the same processing line. Newsprint, corrugated and mixed paper, ferrous and non-ferrous metal, and plastic are pulled out for recycling. The remainder of the waste is composted.

Often, these facilities come on line in stages. A 400 ton per day facility in Escambia County, Florida now recovers glass, aluminum cans, and ferrous scrap from the waste stream. Waste Reduction Services (WRS), the designer, plans to add a plastic recovery system and equipment to produce a "Flaked Waste Fuel." WRS is also designing a similar mixed waste processing system for Brooklyn, New York.

4.2.2 Technical Reliability and Availability

The two main functions of mixed waste processing systems are to sort one component from another and to put each component in a form that is appropriate for market. Piece by piece, the equipment is not complex. But as more pieces of equipment are added to sort or prepare more products, the system can become increasingly complicated. In fact, several systems designed to sort and process mixed waste, usually to produce fuel, have failed to operate at capacity.

Although the lessons learned have resulted in more successful processing systems, developing a mixed waste processing system that operates at capacity with minimal downtime is often a process of tinkering. Therefore, there is not one common technology that is being marketed. Rather, operating systems are usually a product of trial and error.

For example, in the initial three months of operation, the XL facility used 1-1/2 shifts for processing and 1/2 shift for cleanup, preventive maintenances, and startup adjustments to the recycling line and procedures. Operations later expanded to two nine hour shifts, five days a week and a sixth day for cleanup and maintenance. The Future Fuel facility reports a 10 percent downtime.

One of the ways to ensure availability of a system is to offer redundant processing equipment, or at least a way to divert materials around inoperable equipment. Since some vendors of mixed waste processing systems offer their product in modules, redundant lines are possible, though it increases system costs.

4.2.3 Environmental Impacts

The environmental impacts of a mixed waste processing facility are the same as those described for composting and fuel production. The facility itself may be dusty or loud, if proper precautions are not taken. Composting may produce an odor. Most of the potential impacts would result from the use of the compost or fuel, rather than its production. These issues are discussed in previous sections. There is no additional process in the mixed waste processing system that would add any environmental impacts.

4.2.4 Economics

Generally, operating costs and capital costs per daily ton of processing capacity decrease with the capacity of the facility, at least to a point. Another cost factor is the level of mechanization of the system. A heavily mechanical system tends to have higher capital costs, while a heavily manual system tends to have higher operating costs. The reported capital cost of the Crestwood, Illinois facility is $16,500 to $17,500 per daily ton of processing capacity. The capital cost per daily ton of processing capacity is $33,333 for the Future Fuel Facility and $5,000 for the RRRS facility. The projected capital cost per daily ton of the WRS facility in Escambia County is $8,125.

The only operating cost estimates available are for the XL facility in Crestwood, Illinois and the Future Fuel facility in Thief River Falls, Minnesota. Operations and maintenance costs at the XL facility are estimated at $27 per ton, including residue disposal costs but not including debt service for financing of the capital costs. Operating costs at the Future Fuel facility are $35 to $45 per ton.

4.2.5 Market for Products

Markets for the recyclables vary by commodity. Generally, the products recovered out of a mixed waste stream are more contaminated than those that are source separated. Contamination can be the deciding factor regarding the marketability of all recovered materials in a market situation that is demanding higher quality. This may be especially true for paper since paper markets are currently weak in the Midwest. Markets for aluminum are relatively strong and stable. Markets for ferrous metals, glass, and plastic are usually available, but prices will fluctuate. Revenue from the sale of recyclables is rarely sufficient to cover the cost of operation.

The markets for refuse derived fuel and compost feedstock are less assured, primarily because they are products that require special marketing arrangement due to their varying characteristics, and their use often is regulated. Facilities operating in the United States have encountered problems marketing these end products. A more detailed description of the markets for fuel and compost is included in Sections 2 and 3.

4.2.6 Residue and Non-Processibles

The residue from mixed waste processing includes those materials that cannot be processed by the equipment (non-processibles), cannot or were not recovered, have no value as a component of the end products, or simply can not be marketed. This generally consists of components of the waste stream that are not recyclable, non-putrescible, and non-combustible.

Some mixed waste processors claim that they can reduce the amount of waste going to the landfill by 90 percent or more. In actuality, most operating mixed waste processing facilities realize a 30 to 80 percent reduction in the waste going to the landfill. Often, the reduction rates are low because some or all of the fuel or compost feedstock is not marketable. Most facilities that operate at less than projected reduction rates continue to operate, and sometimes alter operations, with plans to eventually market some of the material that is currently disposed of as residue.

4.2.7 Compatibility with Recycling

Some mixed waste processors claim that their system enhances source separation programs by offering another opportunity to recover recyclables from the waste stream. Depending on the system design, it may recover the same materials that are collected in a recycling program, capturing those that were originally missed, or it may recover other

recyclables that are not included in the source separation program. In an effort to gain the educational value from source separation programs, the City of Omaha has residents source separate their recyclables, placing them in a separate bag from the garbage. Even so, the bags of garbage and the bags of recyclables are collected by the same packer truck and processed on the same line at the Resource Recovery Systems facility.

Others claim that mixed waste processing eliminates the need for source separation programs. In fact, some mixed waste processors, including XL Disposal Corporation and Future Fuel, Inc., claim that their system makes source separation programs "obsolete". However, operating mixed waste processing facilities have not yet demonstrated a material recovery rate (not including compost and fuel) that will meet EPA's goal of 25 percent reduction, not to mention some of the more stringent state and local goals.

Source separation could interfere with a mixed waste processing system by pulling out materials that are valuable in compost or fuel, most notably paper. However, in most cases, there is enough paper in the waste stream so that source separation of certain grades of paper does not threaten the quality of the other mixed waste processing products. In addition, source separation of a high revenue recyclable, such as aluminum, could adversely impact the economics of a mixed processing system, if that material was intended to be recovered at the facility.

Whether source separation enhances or detracts from a mixed waste processing system, all vendors claim that they can accept waste from an area that has source separation programs in operation. Since source separation programs have the potential to change the composition of the waste being delivered to a facility, these programs need to be considered when a mixed waste processing facility is being designed and when costs and revenues from products are projected.

4.3. Summary of Evaluation

4.3.1 Advantages and Disadvantages of Technology

Advantages

- Mixed waste processing has the potential to significantly reduce the waste stream destined for disposal, although projected reduction rates of 90 percent or more have yet to be achieved.

- Combining the processes for extracting recyclables, compostables and combustibles from the waste stream in a single system can reduce total solid waste management costs because fewer facilities are needed, and a single delivery point for waste can be used.

Disadvantages

- A tried and true mixed waste processing system "package" is not commercially available. Most of the existing technology evolved often as a result of an entrepreneur recovering more and more components of the waste stream.

- Although individually each piece of equipment in these systems is usually simple, an entire system that produces a number of end products usually leads to a system with a complexity greater than the sum of its parts. Thus, the long term availability and reliability of these systems must be monitored.

- Markets for end products may be unstable.

4.3.2 Future Evaluation of Technology

The greatest stumbling block to implementing mixed waste processing is the uncertainty of markets for the products, especially compost and fuel. If no markets exist for the end products, the processing system accomplishes nothing more than slightly reducing the volume of the waste destined for disposal. One of the stumbling blocks to development of markets for compost and fuel from a mixed waste processing system is that no market will accept an untested product but the processing system must be in place, and thus an investment must be made, to produce the product, to be tested. Pilot-scale tests, or processing of waste from the area in a similar facility, can be used to at least partially overcome this obstacle.

Kane County should monitor the success of mixed waste processing systems, paying particular attention to the reliability of the system and the marketability of end products. Since several mixed waste processing systems are in the development stages, Kane County should have several examples to watch.

SECTION 5

ANAEROBIC DIGESTION

5.1 Definition of Technology

Anaerobic digestion is the controlled decomposition of waste in an oxygen-free environment. In this manner, it is similar to pyrolysis; however, it occurs at much lower temperatures and is a biological rather than a thermal process. The waste must first be processed to remove recyclable and/or inorganic materials and then shredded. A wet slurry is then produced from shredded waste mixed with water and is introduced into a closed digestion vessel. Depending on the type of process, the slurry can contain as little as 4 to 20 percent solids (wet anaerobic digestion) or as high as 30 to 35 percent solids (dry anaerobic digestion). Inside the vessel, bacteria which thrive in the absence of oxygen convert the slurry into methane gas, carbon dioxide, a liquid effluent, and a solid residue. The methane may be separated from the carbon dioxide to yield a high- or low-BTU fuel gas, while the residue may be burned or used as compost.

The quality of the solid residue can be controlled depending on the front-end process. The front-end process to prepare the waste for anaerobic digestion is similar to that described for mixed waste processing in Section 4. The screening and sorting equipment can be customized to divert different materials into the organic (digester feedstock) or inorganic (recyclables or RDF) waste streams depending on the use and desired quality of the solid residue, and market for recyclables and fuel.

The amount and quality of biogas products can be maximized to some extent depending on digester process variables such as temperature, pressure, percent solids, and retention time. The quality of the gases produced by the process can be maximized by separating the methane and carbon dioxide, and removing moisture and trace gases.

5.1.1 History of Implementation

Anaerobic digestion was developed as a technique for waste water treatment and treatment of animal manure, and in these applications it has been widely used since the beginning of the century. Anaerobic digestion of municipal solid waste has been a subject of research and development for over twenty years. Laboratory work has been carried out by a number of organizations. Larger-scale tests have been reported using a redundant sewage digester in Franklin, Ohio. Several pilot facilities were operated during the 1970s and 80s: a 100 ton/day facility in Pompano Beach, Florida; a 60 ton/day plant in France; and a dry anaerobic composter in Ghent, Belgium. The two European facilities are still operating.

The Pompano Beach installation opened in 1972, and soon experienced problems because of poor design. The major problem concerned the digesters, which were fabricated

from prestressed concrete. Hairline cracks formed in the digester walls, allowing methane to escape. Other problems were attributable to use of inadequately-designed, off-the-shelf equipment.

The facility was taken over in 1982 by the Gas Research Institute, which contributed about $30 million in research funds over the next several years. However, operations ceased permanently in 1984, due to a shrinking budget and the poor condition of the digesters.

The most recent tests conducted on dry anaerobic digestion were conducted at the University of Florida. More promising results were produced and are described more fully in Section 5.1.3.

5.1.2 Acceptable Waste Streams

Historically, anaerobic digesters have been primarily designed to decompose sewage sludge. More recently, with increasing awareness of diminishing landfill capacity, attention has focused on the potential to process other organic food and paper wastes, or pre-processed municipal solid wastes using anaerobic digestion. Since the pre-processing system would be similar to that for producing RDF, the unacceptable wastes would be the same, including oversized bulky wastes, white goods, construction and demolition debris, and certain industrial wastes. The major portion of commercial and residential waste would be acceptable waste. Wood waste should be acceptable, provided that large pieces (stumps, branches) were chipped or shredded beforehand.

RefCom, the company which developed the Pompano Beach process, stated that an optimum ratio of municipal waste to sludge was 20:1, on a dry basis. Testing completed at the University of Florida in mid-1990 found an optimal moisture content between 65 to 70 percent (30 to 35 percent solids).

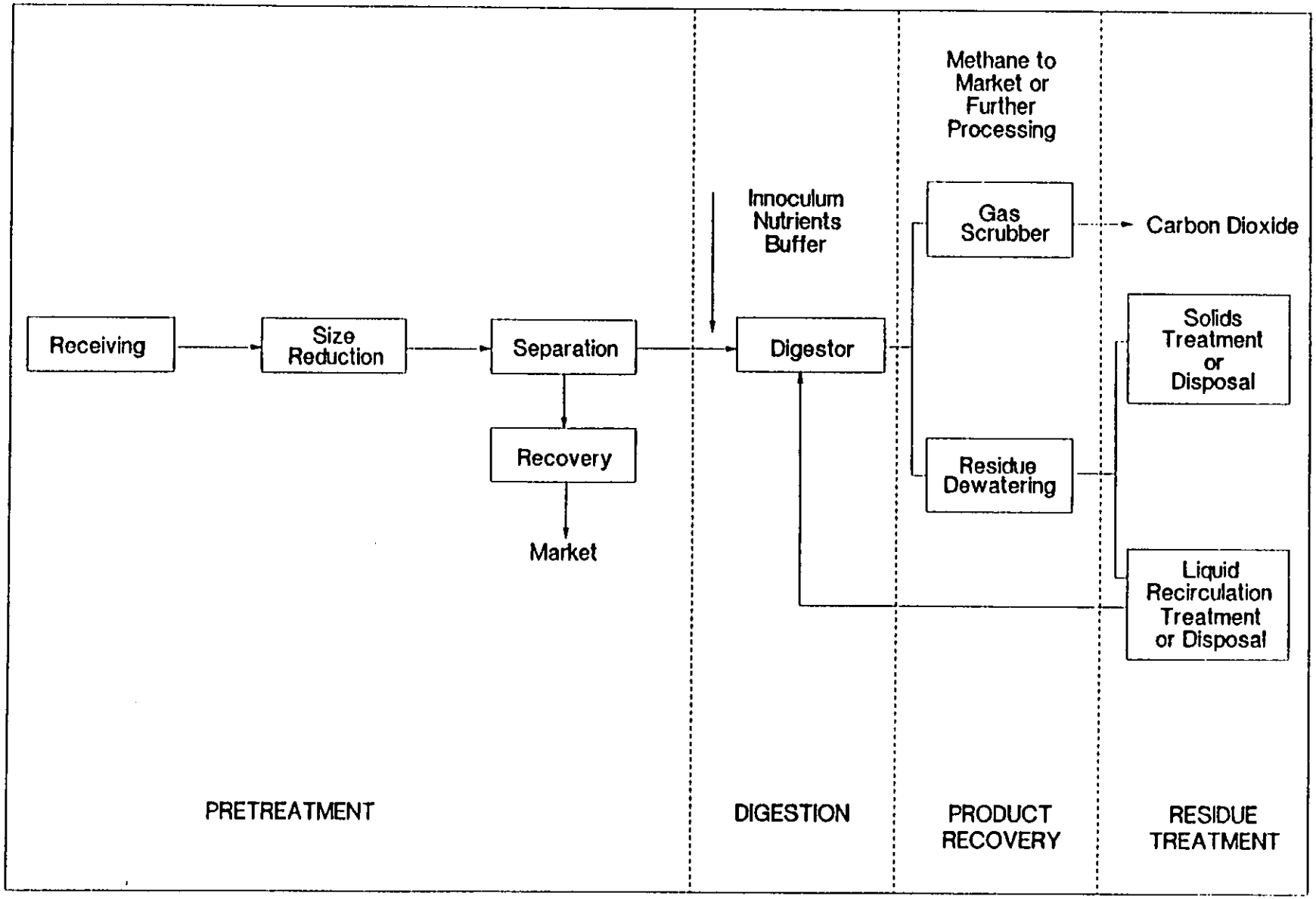
5.1.3 Process Description

Anaerobic digestion can be considered a four stage process: pretreatment of waste, digestion, product recovery, and residue treatment. These stages are shown in Figure 5-1. Pretreatment may include size reduction (shredding) and materials recovery, either through mechanical means (screens) or manual labor. The key goal of this stage is to remove inorganic materials, i.e., components of the waste stream that will not decompose.

The RefCom Pompano Beach facility used Rader disk screens to sort degradable organics from inorganic materials in the MSW. Ferrous metal was recovered using a magnetic separator, and the large organic fraction (e.g., paper) was reduced to nominal 3-inch particles in a shear shredder. The final stage of the pretreatment process was an air classifier, presumably used to remove some of the lighter materials.

FIGURE 5-1

PROCESSES INVOLVED IN ANAEROBIC DIGESTION



In the digestion stage, waste is loaded into an enclosed vessel, along with nutrients. Successful digestion requires control of: temperature; oxygen content; pH; nutrients; and toxicity of input waste. Waste normally remains in the digester for between 5 and 30 days. Many systems heat or mechanically mix the waste to accelerate the digestion process. Lime may also be introduced to balance the Ph level within the digester. Nutrients can be supplied by sewage sludge, ammonia, or potassium. In addition, process water is needed to maintain a solids content of 4 to 20 percent for conventional anaerobic digestion or 30 to 35 percent for dry anaerobic digestion.

Dry anaerobic digestion is the subject of most recent research of anaerobic processes. Dry anaerobic digestion has several advantages over wet anaerobic processes. Dry anaerobic processing takes place at a dry solids content of between 30-35 percent. This implies that the quantity of material treated is greater with dry processes and thus would require less capacity than a wet process for a given quantity of MSW. Additionally, water and waste water disposal needs are less with dry processes than wet processes. Finally, there may be less chance of stratification occurring and mixing required in a dry system since the substrate is not liquid as in a wet system.

The Pompano Beach system employed two cylindrical concrete digesters, each with a capacity of 50 tons per day. Specifically, these tanks were 50 ft. in diameter, 25 ft. high, and could hold 320,000 gallons of substrate. Agitation was provided by a simple propeller-like blade; the digesters themselves did not rotate. The digesters were batch-loaded, on a daily basis, and residue (effluent and solids) was also withdrawn daily.

Within the digester, the temperature was maintained at 60 degrees Centigrade, allowing the prevalence of thermophilic bacteria. Material was retained in the digesters for an average of 15 days. Experiments revealed that both weight reduction of the waste and gas production increased as retention time increased. A 15-day retention time resulted in a 65 percent volatile solids reduction, while a 30-day retention time resulted in an 80 percent volatile solids reduction. The RefCom process, after separating effluent from solid residue, recycled the liquid back into the digesters.

The removal of carbon dioxide and trace gases from the biogas is part of the product recovery stage. An adsorption process is commonly utilized to extract carbon dioxide and hydrogen sulfide, leaving almost pure methane. The residue is a slurry, which is further separated into a liquid effluent and a sludge-like solid residue. The effluent is either recycled into the digester or discharged into a sewer system. However, some on-site treatment of the effluent may be necessary before it is discharged. The solid may be landfilled, incinerated, or further composted aerobically.

Conventional anaerobic digestion has employed a single digester. However, anaerobic digestion research from 1976 to the present has focused on the development of multistage anaerobic digesters in which biologic processes (acidogenic and methanogenic) are optimized in separate reactors and aid stability of the system.

The most recent research was completed in June 1990 at the University of Florida. Researchers at the University developed and tested a sequential batch anaerobic composting (SEBAC) process for conversion of the organic fraction of MSW to methane and compost. The SEBAC process employs three stages for the conversion/digestion process. Shredded organic MSW is packed into the Stage 1 reactor and inoculated with recycled leachate from the active, aged, Stage 3 reactor for start-up. In the Stage 2 reactor, the inoculated refuse is processed in batch mode. Stage 3 then allows for complete conversion and serves as an active methane stage for conversion of organic acids.

The results of 19 trials in the pilot-scale tests demonstrated that the SEBAC system could successfully convert a major part of the organic fraction of shredded MSW to methane and carbon dioxide while producing a compost-quality residue. Even though the feedstock varied widely, there was little variability in the process, indicating (at least on a pilot scale) that it seemed to be an adaptable process.

5.2 Evaluation of Technology

5.2.1 Commercial Availability

The only commercially operating facilities employing anaerobic digestion for municipal solid waste management are in Europe. Because of the difference in waste stream composition between the U.S. and Europe, this experience may not be directly applicable. A dry anaerobic process, DRANCO, employed in the Ghent, Belgium facility, is currently being marketed by Laidlaw in the U.S. and Canada.

Anaerobic digestion in the U.S. has been tested in small pilot-scale facilities only. Although some of the testing has provided some promising results, none of the pilot-scale facilities have been adequately scaled up to provide a demonstration of commercial availability.

5.2.2 Potential Environmental Impacts

The potential environmental impacts associated with normally-operating anaerobic digestion facilities include:

- CO_2 air emissions.
- Potential groundwater impacts of leachate from landfill disposal of residue or further use of residue.
- Waste water discharge.

Although these environmental impacts have been studied, little conclusive evidence is available. CO_2 emissions could be eliminated by purifying the gas and exploring market possibilities.

If the solid residue were used as compost after further treatment, the environmental impacts would depend on the amount and nature of further treatment and the particular application. If the solid residue were landfilled, groundwater may be affected. The level of environmental impact depends to some extent on the material being fed to the anaerobic process since the nature of the waste affects the composition of both the aqueous and solid residues. A high level of preprocessing to remove metals and other non-degradables will improve the quality of the end product, but will result in potentially high total system costs.

The environmental impacts of waste water discharge depend on the level of treatment that the waste water receives both before and after discharge to the sewer system. Potential impacts of waste water could be reduced by recycling the process water. This has been the method used in the recent University of Florida pilot tests.

5.2.3 Technical Reliability

Anaerobic digestion technology has not been commercially demonstrated for municipal waste for a sufficient time period to yield certainty to predictions of reliability. Large scale tests at a digester in Franklin, Ohio indicate problems caused by stratification of the wet-pulped material in the digester. Heavy ash-like material settled, while plastics floated. Even in subsequent trials using a mechanical agitator, some stratification occurred. Research of dry anaerobic process may be overcoming some of these early problems.

The largest technical flaw in the RefCom system was clearly in the digester design. Had the vessels been fabricated from steel, the cracking might not have occurred. The pretreatment equipment was also inadequate in design. For example, it was discovered that only 70 percent of the incoming organic material was being properly directed to the digesters. Apparently some paper was becoming attached to plastic waste in the screening stage. This problem was remedied by installing a wet trommel, which improved the capture efficiency of organics to 95 percent.

The only components in the Pompano Beach system that were redundant were the digesters and some pumps. The pretreatment equipment, it seems, was not. RefCom recommends that for facilities greater than 1,000 ton/day, two pretreatment process lines be included. RefCom claimed to have realized a plant availability of between 80 and 85 percent. Nearly all of the downtime was due to problems with the pretreatment equipment.

The Pompano Beach facility did not monitor maintenance costs during its operation. Most maintenance that was required was for the pretreatment equipment, e.g., conveyers and screens. Preventative maintenance activities were normally performed during off-hours.

5.2.4 Economics

Since there have been no commercially operating facilities in the U. S., economic information regarding anaerobic digestion is very sketchy, and the information that is available must be viewed as providing only a rough estimate of economics.

The capital cost of the Pompano Beach pilot plant was estimated to be $12 million dollars (in 1990 dollars, this would be approximately $24 million). RefCom estimates that a 1,000 ton/day facility constructed today would cost approximately $35 million. Operating costs for Pompano Beach were not available.

The tests completed on the SEBAC system at the University of Florida evaluated economic as well as technical feasibility of the process. The University of Florida estimated a tipping fee of $30 per ton necessary to cover the cost of the anaerobic digestion process only (not including preprocessing of the MSW which would be expected to add significantly to the cost). The economic analysis indicated that a minimum economical size, based on average tipping fees in the state of Florida of approximately $27 per ton, for the SEBAC process is 30 tons per day based on a 7-day week. Economics were shown to be positively influenced by the biodegradability of the feedstock and marketability of the residue.

5.2.5 Energy Consumption and Production

The Pompano Beach facility was able to produce nearly pure natural gas (92 percent methane, with a heating value of 1,000 BTUs per cubic foot.) RefCom calculates that a 500 ton/day system could manufacture 3.9 million standard cubic feet of gas, with a heating value of 500 BTUs per cubic foot.

Additional energy can be obtained by burning the RDF fraction. In the case of a 500 ton/day facility, this would amount to 260 tons of RDF, which would generate, according to RefCom estimates, 2.5 Megawatts of electricity.

5.2.6 Markets for End Products

The principal applications for the solid residue appear to be either RDF (from the front-end of the process) or compost (from the digested refuse). The heating value of the RDF product should be relatively high, but influenced by the moisture content. The ability to combust RDF in an existing boiler depends on both the physical characteristics of the RDF and the feed system of the boiler. Marketability of the RDF is greatly influenced by the proximity of appropriate boilers.

The marketability of the digester residue as a compost feedstock also depends on its characteristics and the local markets. The markets for compost and RDF are discussed in Sections 2 and 3, respectively.

Non-processibles from the residential waste stream would mostly include bulky items, tires, and automobile and household batteries. Quantities of recovered recyclables, inorganic residue materials, and remaining organic material would depend on the level of separation employed in the front-end processing of MSW for anaerobic digestion. Actual volume reduction from the anaerobic digestion process depends on the type of anaerobic process (wet or dry). Additionally, the organic content of the feedstock will influence weight and volume reduction since only organic materials will be decomposed. Data available on DRANCO, a dry anaerobic process, report weight and volume reduction of MSW feedstock by 50 percent.

The solid digester residue material, as discussed above, could be marketed as an RDF or compost feedstock. Recyclables recovered in the front-end processing could be marketed also. However, net landfill abatement would depend on the size facility, the facility availability, reduction potential of the process, and the markets for residues.

5.3 Summary of Evaluation: Advantages and Disadvantages

The following advantages and disadvantages can be attributed to anaerobic digestion:

Advantages

- The fuel gas produced from the digestion process has potential to be a source of revenue or energy for a facility. However, optimizing fuel quantities produced can increase capital costs, because of the greater retention time and corresponding need for more reactor volume. Also, because low or medium BTU gas may not be saleable on the open market, the equipment required to produce pipeline quality gas could also increase up-front cost.

- Anaerobic digestion is highly compatible with existing curbside recycling programs. These programs tend to divert inorganics from the waste stream, and thus decrease the level of preprocessing required. It may be desirable, however, to leave leaf and yard waste in the waste stream both to save on collection and composting costs and to raise the organic material content in the digesters.

- The degradation process is completely enclosed, and potentially odorous gases can be collected and treated. A well-managed facility feeding a highly degradable feedstock to the process, trapping and treating gas, and recycling process water could prove to be environmentally benign. Public acceptance could potentially be greater than for an aerobic composting facility, with open-air or semi-enclosed piles or windrows.

Disadvantages

- There are currently no commercially operating anaerobic digestion facilities in the U.S. that process MSW; the process essentially remains in the research stage.

- The marketability of the residue solid fraction is unproven. If this material cannot be sold, a large percentage of the input waste will still require further disposal. On-site disposal would create additional costs and additional difficulties, as it would likely require incineration or composting. Implementing either of these techniques on-site can hinder public acceptance of the project.

- From RefCom's experience, it appears that substantial design work must be done on digesters to ensure reliability over a long term. At the least, appropriate materials of construction must be selected.

Pilot anaerobic digestion systems have not yet proven that large quantities of waste can be processed with this technique. Future interest in the system will likely be related primarily to technical reliability and availability. The state of the energy market may also affect future interest. Rising energy prices could help a facility more easily justify the cost of additional digester volume and biogas cleaning equipment. In summary, the following elements would be required for emergence of this technology: additional pilot and demonstration-scale testing of anaerobic digestion technology for processing MSW, a financially capable developer, political and community support, and the ability to keep net costs at levels competitive with other solid waste management options.

SECTION 6

PYROLYSIS

6.1 Definition of Technology

Pyrolysis is the thermal decomposition of materials in the absence of oxygen. Unlike complete combustion (incineration), material in the pyrolysis process does not burn in flames. Rather, through the direct or indirect application of heat, the materials are transformed in a reactor to yield solid, liquid, and gas products. The yield of the various products can be controlled by manipulating the complex chemistry within the reactor.

Pyrolysis is often used as a generic term to describe alternatives to conventional incineration. Pyrolysis, however, is in strictest terms, the thermal decomposition of materials in the absence of oxygen. When, within a thermal process, some waste is combusted in the presence of oxygen or air, gasification is the more proper term to describe the process.

6.1.1 History of Implementation

The application of heat to organic materials without complete combustion is not new. Wood has been carbonized for centuries to provide charcoal. During the industrial revolution coal was carbonized to produce gas and coke for towns and industries. In the more recent past, however, interest in thermal processes has resulted from an expected shortage of fossil fuels. Additionally, interest has grown in the potential for thermal treatment to convert tires, wood, plastic, agricultural wastes, municipal solid wastes and other "biomass" into useful products. Most of the experience to date has been in the laboratory or in small pilot-scale facilities. Occidental developed a 180-ton per day demonstration plant in El Cajon, California in the late 1970s. Union Carbide developed a small pilot plant to process 180 tons per day in South Charleston, West Virginia in 1974. Andco-Torrax began initial operation of several plants between 140 and 400 tons per day in the U. S. and Europe in the late 1970s. Most, however, have either completed demonstration or have failed to meet performance standards. Monsanto also operated a demonstration plant in Baltimore from 1975 to 1977.

6.1.2 Acceptable Waste Streams

Potentially acceptable waste streams for pyrolysis include:

- tires
- wood
- plastic
- agricultural wastes
- sludges
- municipal solid waste

Most of the experience with pyrolysis exists in processing homogeneous waste streams consisting of one material. Municipal solid waste has been processed in pilot scale tests only.

6.1.3 Options Offered in the Technology

Various types of reactors for pyrolysis exist. The varying types and designs of reactors have evolved to maximize the various process variables to yield certain desired products. Reactor design can be classified into two generic types:

- Vertical-flow reactors; and,
- Horizontal flow reactors.

One of the most common reactor designs is the vertical-flow reactor. The reactor is a simple cylinder with no moving parts, made of steel or steel lined with refractory material. Material, usually RDF if MSW is feed stock, enters at the top of the reactor, and char and/or ash are removed at the bottom of the reactor. Residence times vary depending on the method of heat transfer (external or internal), the size of the RDF and the control of other process variables. Figure 6-1 presents a basic high temperature vertical bed pyrolysis reactor. Figure 6-2 presents a vertical fluidized bed pyrolysis reactor.

The horizontal flow reactor is another common design for pyrolysis reactors. Figure 6-3 presents a horizontal pyrolysis system. The rotary kiln design used for pyrolysis is similar to that used in conventional combustion. The kiln consists of a cylindrical steel drum, perhaps refractory lined, and inclined a few degrees from the horizontal. Material enters the cylinder at the inclined end and is slowly moved through the chamber by gravity and the slow rotation of the reactor. The products formed and residence time again depend on the level of control over the process variables.

For pyrolytic processes, certain basic process characteristics can be manipulated to allow the varying yield of desired products. These basic process characteristics include method of heat transfer, flow of evolved gases, temperature profile, RDF particle size and operating pressure. Table 6-1 defines some of the components within each of the process characteristics.

6.2 Evaluation of Technology

6.2.1 Commercial Availability

A variety of pyrolytic processes have been proposed for the conversion of MSW into useful fuels. However, few of these processes have reached the pilot stage. Although some pyrolysis processes have been implemented in Europe, data regarding the commercial availability and technical reliability of these facilities is very limited. No pyrolysis projects have been successfully demonstrated on a large commercial scale in the U. S.

Four processes that have reached the most advanced stages of development in the U.S. are the following:

FIGURE 6-1

HIGH TEMPERATURE VERTICAL BED PYROLYSIS REACTOR

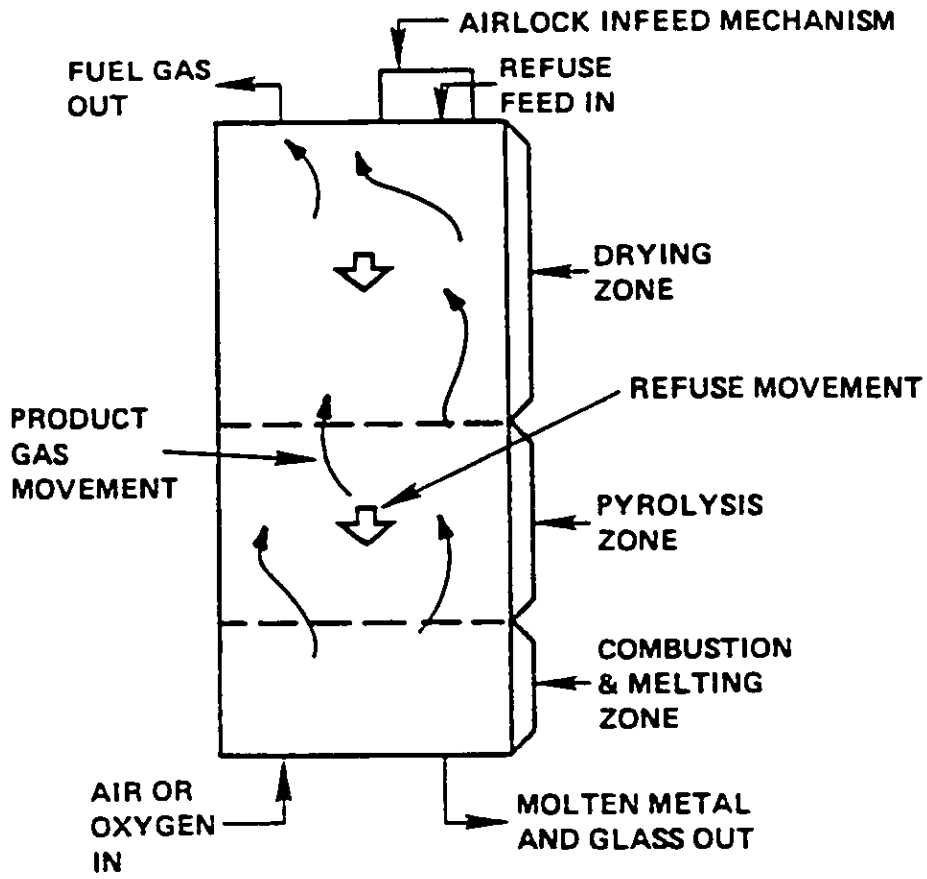


FIGURE 6-2

VERTICAL FLUIDIZED BED PYROLYSIS REACTOR

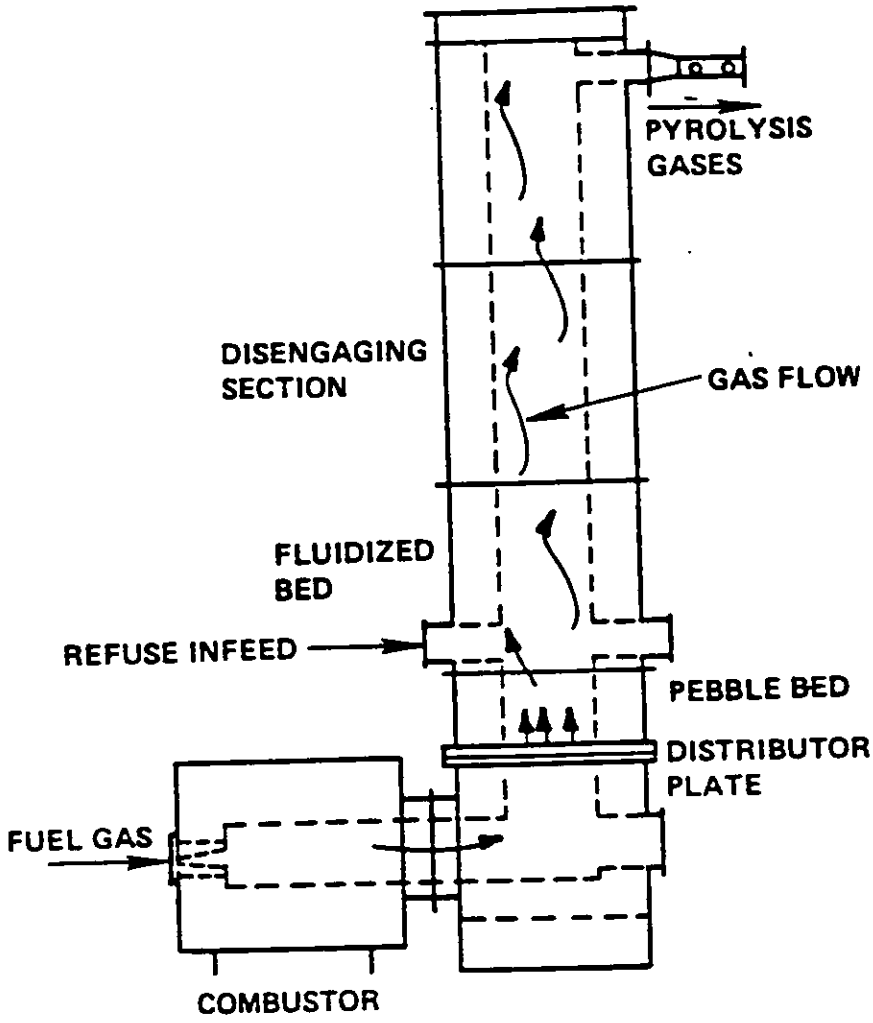
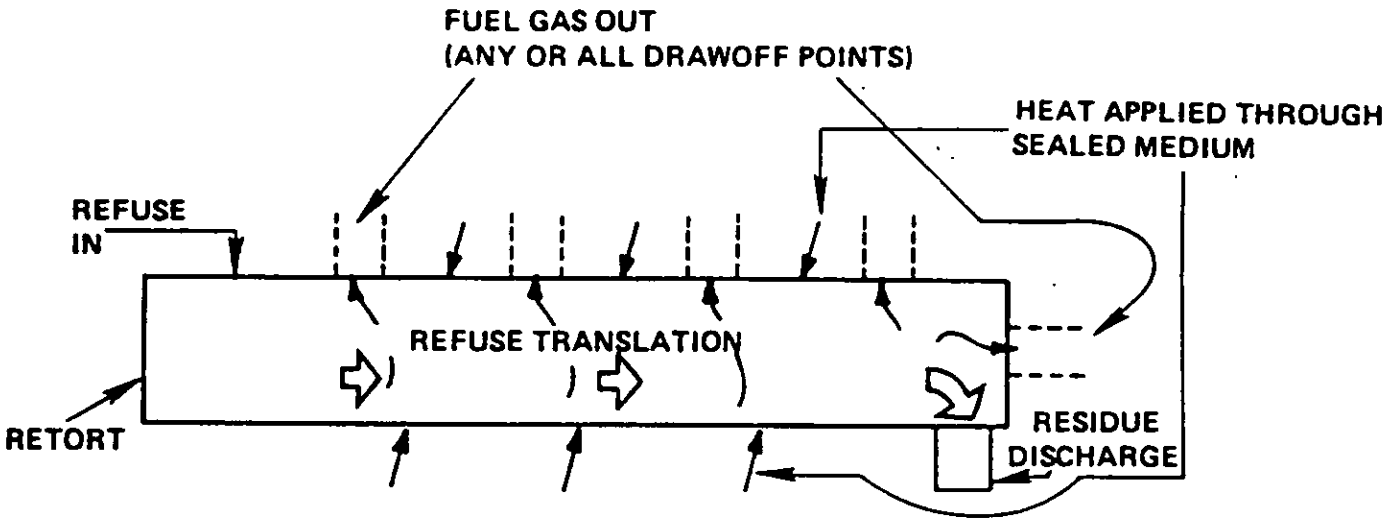


FIGURE 6-3

HORIZONTAL PYROLYSIS SYSTEM



- The Occidental flash-pyrolysis process. The process utilized a high quality RDF and entrained bed reactor to achieve rapid reaction at a temperature of 500° C. The product resulting is a pyrolytic oil.

- The Union Carbide Purox process. The process employs a vertical shaft reactor to process RDF. Process heat (160° C) is provided by combusting the char product at the base of the reactor with pure oxygen. The main product is a medium-heating value gas.

TABLE 6-1

BASIC PYROLYSIS PROCESS CHARACTERISTICS

Process Characteristics	Explanation
Method of Heat Transfer:	
• External Heating	Heat from combustion is transferred through the walls of the reactor. Low rate of heating.
• Internal Heating	Some of the pyrolysis product are processed (burnt externally) to yield more heat which is passed back through the reactor. The pyrolysis products are processed to preheat other products, to superheat steam, to gasify the char or to heat a liquid or solid, all are mixed or recirculated back through the reactor.
Evolved Gas Flow:	
• Counter-current	Gases flow against the RDF feed flow.
• Co-current	Gaseous and solid intermediate products flow in parallel, thus encouraging their chemical reaction.
• Cross	Gases flow at right angles to the RDF feed.
• Mixed	Fresh RDF feed and solid products are mixed throughout the reactor.
Other Process Characteristics:	
• Temperature Profile	Slow rate of heating and high reactor temperature result in predominantly stable gaseous products. High rate of heating and low reactor temperatures results in tars and oils being maximized.
• RDF Particle Size	Important in determining the rate of heat transfer and residence time.
• Operating Pressure	In most pyrolytic processes, pressure is about ambient.

- The Andco-Torrax process. Similar to the Purox process except waste is unprocessed and air is used as a source of oxygen for combustion.

- The Monsanto Landgard process. The process uses shredded waste as feedstock and a rotary kiln pyrolysis reactor. The shredded waste first goes through the pyrolysis reactor. Some of the solid residue remaining after

pyrolysis is then combusted in air to provide process heat. The low heating value gas produced from the process is burned on site to produce steam. The largest pyrolysis plant ever built was in Baltimore and employed this process. The plant was plagued with problems and was shut down. At that site now is the Baltimore Resource Recovery facility built by Wheelabrator.

Only the Occidental flash-pyrolysis process is a true pyrolytic process. The others are gasification reactions. For each process, demonstration plants have been built. Both the Monsanto and Occidental Systems have experienced severe technical problems in demonstration. The Andco-Torrax gasification system is the only system in commercial use. The system, however, is still experiencing operating difficulties.

More recent development work with pyrolysis has been in Europe and Japan. Work has been carried out in Denmark, Britain and West Germany. West Germany has several operating facilities financed partially by the West German government.

6.2.2 Technical Reliability and Availability

Pyrolysis systems are not commercially available, so assessment of technical availability and reliability is difficult. Operating experience at a useful scale is strictly limited. The reactions which occur during the pyrolysis process are very complex. Control over the process can be exercised via the process variables discussed in Section 6.1.3. The operating history of the pilot scale facilities indicates that more research and experience is necessary if pyrolysis is to become a technology with availability and reliability similar to that of other waste processing technologies.

6.2.3 Potential Environmental Impacts

Potential environmental impacts associated with pyrolysis include:

- Flue gas emissions due to formation of gases during the process.
- Potential groundwater impacts from disposal of residue.
- Quench water treatment and disposal if quench water is used in the system.

The nature of the pyrolysis process will directly affect the level of environmental impacts. In theory the lower temperature, low velocity pyrolysis processes should require little air pollution control equipment. Both the volume of gases and the level of particulate formation are lower than those for conventional combustion systems. There is, however, a lack of experience and data to prove this theory. For pyrolysis or gasification systems that use high temperatures to burn a portion of the product for process heat, air pollution control equipment similar to that for conventional MSW combustion systems will be required (i.e., particulate and acid gas controls). Impacts in this case would be the same as the impacts from conventional combustion.

Residues from pyrolysis processes also depend on the type of process. Some processes form inert residue that may mean reduced potential for groundwater contamination and may have potential to be used as aggregate. Limited research data comparing ash from conventional combustion and the residue from pyrolysis are available.

Quench water or waste water from a wet scrubbing system will require water pollution control. If controlled properly and treated before discharge, if necessary, waste water should result in minimal environmental impact.

6.2.4 Economics

Economic information regarding pyrolysis systems is limited, since there have been no commercially operating facilities in the U. S. What little data are available are dated. It is also important to note that the economics of pyrolysis processes would be affected by the markets for the end products, and these are uncertain.

6.2.5 Markets for Products

Since there is little experience with pyrolysis, there is little experience with marketing the gas product from pyrolysis processes. However, the factors that would influence the use of product gas include its temperature, pressure, quality of condensible oil, distance to user, pipeline conditions, amount, and other factors. Theoretically the gas can be used as a fossil fuel substitute by gas users located near a pyrolysis plant or internally for process heat or other utility use. Reluctance to use the gas off-site stems from lack of experience with the gas, skepticism of quality and consistency of the gas, or incompatible burner equipment.

Oil produced from various processes may exhibit corrosive properties. One remedy may be to mix the oil with other fuels. Again there is not enough experience with the oils produced through pyrolysis to have developed market data. Certainly if a consistent, high quality oil product similar to heating fuels, typically used by industry, can be developed, there is great potential for a product market. However, the ability to accomplish this has not been demonstrated.

Depending on the composition of the feedstock, the char solid residue may be further combusted for energy production. If char is combusted it is usually to produce more process heat. Other uses or markets for char remain unexplored. If the char is not processed further it must be landfilled along with the ash and other bypass from the pyrolysis process.

6.2.6 Residues, Non-Processibles, and Potential Landfill Abatement

Non-processibles for a pyrolysis facility would be similar to those described in Section 3 for fluidized bed combustion and RDF. Residues would consist of char, ash, or inert aggregate depending on the type of process. There is currently not enough operating experience to determine the level of long-term landfill abatement that pyrolysis would offer.

6.3 Summary of Evaluation: Advantages and Disadvantages

The pyrolysis process technical evaluation can be summarized by the following advantages and disadvantages:

Advantages

- Low temperature, low velocity pyrolysis systems would require less extensive air pollution control equipment than conventional combustion.
- Environmental impacts from landfilling inert residue may be less than landfilling the waste directly.
- If pyrolysis could be controlled to produce a high-quality and consistent product, markets would be promising as a fossil fuel substitute.

Disadvantages

- Although pyrolysis is a promising process, pilot and demonstration scale projects in the U.S. have been plagued with technical and economic difficulties.
- The pyrolysis processes are varied and complex. More research is needed for almost every aspect of the process, product refinement, and product marketing.
- Although there are U.S. vendors of pyrolysis and gasification processes, none have had demonstrated success with their systems.
- Very little reliable economic information is available to compare with other options.

SECTION 7

ORFA TECHNOLOGY

7.1 Technology Description

7.1.1 Definition of Technology

The ORFA system is a materials processing system that accepts mixed solid waste as input. This material does not need to be presorted or separated. The process, in theory, generates three useful products, the most abundant of which is an inert fluff, called ORFA fiber. In addition to this fiber, the system recovers ferrous metal and an inert granulated material.

The system is both equipment and capital intensive and is intended to be automated. A complete description of the process is given in Section 2.1.

7.1.2 History of Implementation

The ORFA technology originated in Switzerland and was developed over a period of 13 years. A small pilot facility has operated in the town of Leibstadt, near Zurich. ORFA's parent company, ORFA AG, is 65 percent owned by Uetikon, a Swiss chemical manufacturer.

ORFA has built and operated one facility in the United States, located in Philadelphia. This facility was intended to process up to 484 ton/day of mixed refuse, on three shifts, but has operated commercially for only short periods of time. In October, 1989, the facility was shut down completely and remains idle. The ultimate shutdown can be attributed both to technical difficulties and lack of demand for the process end products.

ORFA's U.S. subsidiary is currently in Federal Chapter 11 bankruptcy proceedings. Two other projects had been initiated by the company--one in Chicopee, Massachusetts and one in Delson, Canada. The Chicopee project is part of the bankruptcy proceedings; ground was never broken and the design was never completed. The Delson project was a 50-50 joint venture with Fluor-Daniel. Here, property was acquired to site the facility, but construction was never started.

7.1.3 Acceptable Waste Streams

The ORFA process is capable of handling all types of residential and commercial waste. It is not designed to process construction/demolition wastes or solid or liquid industrial and hazardous wastes.

7.1.4 Options Inherent in the Technology

It does not appear that any major variations on the ORFA technology have been offered, other than facility capacity. ORFA's literature states that the company offer six "standard" facility designs, ranging in capacity from 75 ton/day to 600 ton/day. Although ORFA may have planned to implement design changes based on the experience at the Philadelphia facility, the conceptual design, with an emphasis on producing ORFA fiber, is likely to remain the same.

7.2. Technology Evaluation

7.2.1 Commercial Availability

7.2.1.1 System Description

The ORFA Philadelphia facility is the only operating full-scale facility and will be used here as a reference. The Philadelphia ORFA facility occupies a 71,000 square-foot building, on a 7.9 acre site. Operations commenced in June, 1988, on a one-shift basis; the desired three-shift operation was achieved later that year. In December, 1988, the facility was shut down completely in order to install surge boxes in the process line and baghouses for air pollution control. It remained idle for approximately three months, was restarted, and gradually worked back up to three-shift operation. Due to lack of demand for its products, hours were again reduced to one shift in July, 1989, and operations were terminated completely in October, 1989.

The Philadelphia Facility was designed to process 484 ton/day of solid waste (22 ton/hour over a 22-hour day). Material enters the facility in standard refuse collection vehicles and is unloaded onto a tipping floor. All deliveries are inspected for bulky, toxic, liquid, or construction wastes, all of which cannot be processed through the ORFA system. Up to three days worth of waste deliveries can be stored on the 200' x 150' tipping floor. Air is drawn into the enclosed tipping area and through the facility's air pollution control equipment to prevent odors from escaping.

The waste is first transferred to one of two infeed conveyors by a front-end loader. (The front-end loader is also used to remove and stow non-processible wastes for shipment to appropriate disposal sites.) All waste is fed through a two-stage shredding and magnetic separation line. A low-speed shredder first rips the material into 5-inch diameter pieces. Ferrous metal is next extracted with a magnetic separator. The remaining material is conveyed to a second shredder, where it is reduced to 1-1/2 inch pieces, and finally to a second magnetic separator.

Following shredding, material is conveyed into a storage bin or "buffer box." This box is necessary because the shredders have a much greater throughput capacity than the vibrating screens, which are the next stage. The vibrating screens are designed to separate the shredded waste by particle size. The buffer box controls the flow of material onto two

vibrating screens. These machines are double-decked screens, capable of separating the waste into three fractions. The smallest particles (< 1/4 inch diameter) are directly carried to another surge box, the "dryer storage box." The medium and large-size fractions are passed through an air classification device, which separates light materials (paper, textiles, film plastic) from heavy materials (glass, ceramic, metals). The lights are carried to six high-speed cutting mills, while the heavy materials are further pulverized in a ring crusher (a device similar to a hammermill shredder, but with rings instead of hammers).

All remaining light and heavy materials are recombined in the dryer storage box. This box feeds the rotating drum dryer, which is employed to lower the moisture content of the waste to between five and seven percent. Drying is accomplished by hot air, supplied from a natural gas-fired heater. After exiting the drying drum, the hot air and refuse enter a cyclone separator, where the refuse settles out. Some of the dryer gases are recirculated to help control temperature in the drying drum. The gases from the dryer are treated, prior to discharge, in beds of tree bark and wood chips (biofilters) to remove odors.

The dried material that exits the drying drum is next treated in an ozone mixing drum, to render it odorless and sanitary. Ozone is created by introducing a high-voltage electrical discharge to pure oxygen, causing the molecules to recombine and form ozone. The ozone, in turn, enters into an oxidation reaction with fatty acids, butyric acids, and similar complex organic compounds. This reaction creates simpler compounds which do not emit odors.

The sanitized product from the ozone drum is sorted into two component parts: ORFA fiber and granulate. This is accomplished with Rotex screens--screens which oscillate in a oval trajectory, within one plane. Once again, the waste stream is divided into three size fractions, which are then each passed through an air classifier. Medium and large particle fiber fractions are recombined and may be baled. Fine fiber is kept distinct, as it is intended for other markets. Granulate and fine fiber are placed into storage bins while awaiting shipment to market.

Typical product yields from the process, by weight percent, are:

Ferrous Metal	4.0 %
ORFA fiber	47.5 %
Dust/fine fiber	2.5 %
Granulate	18.0 %
Moisture	28.0 %
	100.0 %

These figures, supplied in the literature by an ORFA official, do not account for non-processible bulky wastes. Another source indicated that less than 1 % by weight of input waste would be in this category.

7.2.2 Environmental Impacts

ORFA's literature claims that its system emits no noxious gases, waste water, or particulates. The technology has no inherent incineration or composting processes; hence, the potential air and odor emissions associated with these technologies should not be present in the same fashion or to the same degree as incineration or composting. Some odor will be generated from the storage and handling of refuse within the facility. Also, water vapor from the drying process is discharged into the atmosphere, although it is first treated by the biofilters and baghouse. Waste water will be generated from normal washdown of the receiving and storage areas.

In theory, the process creates no residue for landfill disposal. Nonetheless, much of the end product has been disposed of because of lack of markets. If landfilled, ORFA fiber may produce a more manageable leachate than raw waste, due to its prior sterilization/sanitization in the ozone drum.

A factor which has seriously affected the internal environment of the ORFA facility has been excessive dust. Dust buildup on equipment and structural elements has been a great problem, likely due to faulty conveyer design and lack of a dust collection system. In fact, dust accumulation caused numerous plant shutdowns and at times posed a fire hazard.

Little is known about the impacts of the ORFA fiber product when used in beneficial applications. The fiber was tested by Pennsylvania State University as a soil additive for mushroom plants; however, the results of that testing are not known.

The ORFA facility received a processing/transfer station permit from the Pennsylvania Department of Environmental Resources in 1986. This permit is still valid. In addition, ORFA had obtained D.E.R. approval for use of the granulate as daily cover material at a nearby landfill.

7.2.3 Technical Reliability and Availability

The ORFA system installed at the Philadelphia facility is technologically quite complex. Many of the system components are duplicated; however, the process line is not completely redundant. While fully operational, the plant required a staff of five maintenance personnel, with at least one on duty each shift. The actual dollar figure spent on maintenance could not be obtained.

7.2.4 Economics

Construction of the ORFA facility was financed with $32 million of industrial development bonds. Based on three-shift operation, this is equivalent to approximately $66,000 per ton/day of installed capacity. Based on one-shift operation, which was more commonly realized over the Philadelphia facility's lifetime, this translates to approximately $198,000 per ton/day of installed capacity. Operating and maintenance costs ranged between $70 and $80 per ton.

7.2.5 Markets for End Products

ORFA has been quite ambitious in seeking potential markets, particularly for the ORFA fiber. Unfortunately, very few of these markets have proved to offer much potential in the U.S. The three most promising applications for ORFA fiber are: paper manufacturing, particle board, and as a fertilizer additive.

The paper industry was the original target market for fiber from the Philadelphia facility. From the time the facility was planned (in the mid-1980s) to the time it began operating, the waste paper market became very soft, due to great available supply. To compound problems, the fiber actually produced in the facility contained a high concentration of contaminants (15-20 percent). Ultimately, between 600 and 700 tons of fiber were sold to a chipboard paper mill, at revenues of $25-30 per ton. This was the only fiber successfully marketed during the facility's operating history.

ORFA's literature claims that one metric ton of refuse can yield 1,365 lbs. of particle board, equivalent to 450 square feet of 3/4-inch sheet. It further claims this wallboard will be heavier and supply four times the fire resistance of ordinary wallboard. In this product, the coarser ORFA fibers form the inside layers of the board, while the finer fibers form the outside layers.

ORFA fiber may have use as a soil additive. All fiber from the pilot facility in Switzerland is marketed to Migros, a $4.2 billion dollar Swiss fertilizer manufacturer and conglomerate. ORFA has also experimented substituting fiber for corn cobs and cottonseed hulls in mushroom cultivation. This market, however, never materialized in the U.S.

7.2.6 Non-Processibles and Residues

Non-processible wastes for the ORFA process include bulky wastes (furniture, appliances), tires, and light industrial wastes. Bulky wastes, in particular, cannot be reduced by the shredding equipment. As mentioned before, the total weight of bulky wastes is normally low (less than one percent).

The actual quantity of residues from the process is highly variable and is a function of how much of the end products can be marketed. Assuming the fiber can be marketed, the only residues would be granulate and fine fiber. ORFA has suggested the use of fine

fiber as a bulking agent for sludge composting, although it is not clear this has been attempted. During the Philadelphia facility's operation, some or all of the granulate was being shipped, at net cost to ORFA, to a local landfill for use as daily cover material. The total residue fraction by weight can thus range from 15 percent (only fine fiber, fine granulate, and non-processibles being landfilled) to 71 percent (all except ferrous metal being landfilled), in which case most of the weight reduction is due to the removal of moisture.

Based on the range of residue fractions, landfill abatement (the fraction of the total waste stream diverted from landfill) could range from 29 to 85 percent. In reality, landfill abatement could be even lower than 29 percent, due to lower than expected facility availability. Assume that an ORFA facility is designed to process 484 tons per day of waste on three shifts, but because of process line difficulties, only operates only on one shift (161 ton/day). Furthermore, assume that no market can be secured for the ORFA fiber, and hence 71 percent of the end product must be landfilled. This results in a total landfill diversion of 47 tons per day, or 9.6 percent of the waste stream. This is obviously something approaching a worst case scenario, but it must be recognized that an approximate total of only 700 tons of ORFA fiber was ever marketed, and high availability was never demonstrated.

7.3 Summary of Evaluation: Advantages and Disadvantages

Based on the above analysis, conversations with a former ORFA employee, and observations of visitors to the facility, the following advantages and disadvantages can be attributed to the ORFA system:

Advantages

- The system requires no source separation of refuse. While not a materials recovery process, it is designed to incorporate nearly all components of the municipal waste stream into the end products. Source separation, particularly of ferrous and non-ferrous metals, would probably improve system performance and increase system availability.

- The system has a high degree of redundancy in individual stages of the process. While two completely identical processing lines do not exist, most of the major pieces of equipment exist in duplicate.

- When functioning properly, the system should be able to process the entire municipal (residential and commercial) waste stream. However, the process may be more efficient when loaded with purely commercial waste or waste with a higher-than-average paper content.

Disadvantages

- The process line is technically very complex, which has, in the past, contributed to lengthy shutdowns and below-normal throughput. Transfer points (conveyor-to-conveyor) were apparently not well designed, and few guards were provided to prevent waste spillage from the conveyors. Also, some equipment in the process have much higher capacities than others. For example, the shredders have more than three times the throughput capacity of the screens which follow them. As a result, surge boxes had to be installed, which both increased capital cost and delayed operations. The process will always have the capacity of the lowest-capacity piece of equipment, so excess capacity in individual pieces of equipment results in additional costs with little technical advantage.

- The absence of a dust collection system was a serious design oversight. This greatly reduced plant availability and added the potential for safety hazards (fires, explosions) within the facility.

- The primary product, ORFA fiber, was found to be marketable only as a shredded mixed paper product, making it worthless on the secondary materials market. The secondary product, granulate, was marketed/disposed as landfill cover at net cost. Moreover, the granulate likely would have had more value if some of its constituents, e.g., glass, had been recovered and sold as recyclables.

- The tipping fee of $50-55 per ton and revenues from the fiber that was sold were apparently inadequate to cover the facility operating costs, based on the fact that ORFA's U.S. subsidiary is in Chapter 11 bankruptcy.

The future viability of the technology will depend to some extent on the financial position of ORFA. Without additional investment, the ORFA process will have little chance for future success, and is not likely to be an available technology. Even with a financially viable developer, there are significant technical obstacles to the viability of this technology. Two key areas that would need to be addressed are:

- Improving the process design in the areas of throughput, safety, and production of a contaminant-free product.

- Locating reliable, revenue-bearing markets for the fiber.

Marketing the granulate will also be important to avoid excessive disposal charges.

SECTION 8

THERMAL OXIDATION: ENTECH

8.1 Definition of Technology

Thermal oxidation is a process by which municipal solid waste, or other wastes, is volatilized to achieve substantial weight and volume reduction. The two end products of the reaction are an unburned gas (approximately 92 percent by weight) and an ash residue. Unlike complete combustion (incineration), the material does not burn in flames; rather, it changes to gas and ash by a slow smoldering reaction. This is essentially a pyrolysis process. However, thermal oxidation is unlike pyrolysis in two ways:

(1) Oxygen is allowed to enter the reaction chamber.

(2) Neither fuel liquid, fuel gas, nor char residue is created.

The Entech Corporation was the only vendor found to be offering this technology; hence, its system is used as a representative example.

8.1.1 History of Implementation

The Entech process was invented by two individuals, working for NASA, around 1978. It was originally designed to convert corn to ethanol, but the process was adapted for wastes when the original concept proved too costly. During this testing, which has taken place over most of the past decade, the current design was developed. This design consists of a primary oxidation chamber, where waste is volatilized under high temperatures and a secondary gas treatment unit for removal of organic pollutants. The designs for both devices are patented.

8.1.2 Acceptable Waste Streams

Test results from the process's pilot facility exist for at least the following feedstocks:

- Wet municipal waste (3,500 lb. of MSW with "several hundred gallons" of water added).
- Dry municipal waste.
- Tires.
- Wood, cardboard, hay, and leaves.

- Industrial waste (a mixture of synthetic rubber, carbon black, flash tank popcorn polymer, incinerator bottom ash, wood, and cardboard).

Materials rejected from the process (presorted in the receiving area) include bulky waste (white goods, furniture) and batteries. An Entech representative claims batteries are rejected solely for their value as recyclables, not because they cannot be processed.

8.1.3 Options Offered in the Technology

Apparently, the system offered by Entech is rather basic, and no variations are presented in the two-chamber oxidation design. The two options mentioned are: (1) presorting and recovery of recyclables prior to the waste being oxidized and (2) useful applications for the hot gas. Heat could be recovered from this gas for the purposes of space heating, heating greenhouses, hot water production, or in the case of large systems (above 500 tons per day), used for electric power generation.

8.2 Technology Evaluation

8.2.1 Commercial Availability and System Description

Entech has no operating commercial-scale facilities--only a pilot research system operating at Western Research Institute, in Laramie, Wyoming. This unit can process 5 tons per day of waste, and has been operating for five years. Capital costs could not be obtained, but operating costs are in the range of $3-5 per ton. The only difference between the pilot system and the commercial system Entech offers is in the chamber design. The pilot system uses a square primary chamber, while on a commercial system, it would be hexagonal.

Entech currently has seven facilities in the design stage, the largest of which would be 1,000 tons per day. Apparently, these include both private and municipal customers. At least two would be located in the Lake County, Illinois area. A 100 ton/day Entech system should occupy 30,000 square feet, and to site a system of this size would require four to five acres. The actual building would be roughly two stories high.

Waste would be received, presorted, and deposited in a pit by a skidsteer loader. It would be conveyed by a four-foot wide inclined belt to two shorter belt conveyors, which would in turn feed the primary oxidation chambers. A variation on this receiving system would involve locating the primary chamber below ground and loading the waste directly from above. No shredding or presorting of waste is performed prior to it being charged into the distillation device.

Waste would be distilled in one of two 100 ton/day primary oxidation chambers. Natural gas, propane, or methane burners, located on top of the chamber, would be used to initiate the smoldering process. Air would be allowed to enter through vents at the bottom of the chamber; no blowers would be employed. A temperature of approximately 900 degrees Fahrenheit is maintained in the primary chamber.

The distillation process in the primary chamber takes 8-9 hours to complete. The normal operating procedure would be to run each chamber on alternate days, using the "off-day" for preventative maintenance and cleaning.

Following oxidation, the gases enter the secondary gas processing unit, where they are burned in a series of combustion and expansion chambers. Temperatures in this unit typically range between 1600 and 2500 degrees Fahrenheit. This unit presumably serves to destroy complex organic compounds, such as methane, in the gas.

Total mass reduction of the infeed waste is expected to be greater than 90 percent. Ash residue is captured in a basket, which is removed from the primary chamber using a crane. Recyclable glass, aluminum, and ferrous metal are recovered, and the remaining ash is either marketed or landfilled.

An Entech facility would be operated on two shifts. During the day shift, two individuals are employed. One is a technician trained to operate the equipment, monitor the process, and perform preventative and incidental maintenance. The other is a laborer, who operates any mobile equipment, e.g. skidsteer loader, and performs other tasks, as required. During the second shift, only a staff of one technician is required.

8.2.2 Potential Environmental Impacts

The only emissions from the Entech process are the secondary gas product and the ash residue. The gas appears to meet Federal and state pollution control limits (see Table 1), but it is cautioned that the sources of these data are still being investigated. The ash residue has been studied using the EPA's TCLP Test for heavy metals and other hazardous chemicals. Upon preliminary investigation, the ash seems to satisfy these standards (see Table 2).

8.2.3 Permitting Experience

Entech currently does not hold any permits for operation of a commercial facility. It is not yet known what kinds of permits the WRI pilot facility maintains.

8.2.4 Technical Reliability

Entech's representative stated that a commercial system would likely be designed with 25 percent excess capacity. Redundant elements in the system include the two primary distillation chambers and the two conveyers that feed them. However, the main infeed belt conveyer and secondary gas processing unit are not duplicated. Since the waste must reside for a day in the primary chamber, temporary shutdown of the infeed conveyer could probably be tolerated. By contrast, the secondary gas processing unit must operate continuously and could shut down the whole system when it malfunctioned.

Entech stated that its system is designed to be 100 percent available, during a normal week's schedule. It estimates that maximum downtime would be 1.5 hours, for example, to replace a conveyer belt or blower in the secondary gas unit. The representative also stated that to his knowledge, there had never been any major shutdowns at the WRI pilot facility.

8.2.5 Maintenance Requirements

The operator/technician stationed in the plant during operation is responsible for performing basic maintenance. Preventative maintenance chores would include oiling of mechanical parts and regular checks of motors and blowers. Entech stated that its system uses standard components, for which replacement parts are easily obtained. The Entech literature states that maintenance costs for a 100 ton/day facility would be $225 per month, but no breakdown of this figure could be acquired.

8.2.6 Economics

The costs associated with this system are somewhat ambiguous to date. The Entech literature, dated 1990, states that a 100 ton/day facility should cost $2.13 million, installed. Nonetheless, an Entech product representative indicated this cost would probably be considerably higher. The literature states that corresponding operating costs would be about $16 per ton, leading to a total processing cost of $23 per ton.

Entech revealed that its pricing strategy is based on landfill tipping fees in the area of interest. For example, if the landfill price in a given region were $30 per ton, it would attempt to price their system below it. In addition, it would offer a fixed price contract (with no escalation factor) for a maximum of four years.

8.2.7 Energy Consumption and Production

Unlike a pyrolysis process, thermal oxidation does not produce large quantities of energy or combustible fuels. Entech believes that electric power generation would only be sensible for systems in the range of 500 to 1,000 tons per day. Net energy production from a 100 ton per day facility would perhaps be capable of supplying some of the facility's own space heating needs.

It is not known what the total connected kilowatt requirements of a 100 ton per day facility would be. The product literature lists a monthly costs of $3,800 for "utilities," but, as with the other costs, this probably should be adjusted upwards.

8.2.8 Markets for End Products

Marketable recyclables from the process include glass (1-2 percent of input waste), ferrous metal (2-3 percent), and aluminum (< 1 percent). Markets for these items vary depending on material quality and overall recovered material market conditions. The material does not get shredded in the process, which increases ease of separation and

marketability. The biggest question is to what extent are the materials contaminated or otherwise affected by being heated in the distillation chamber.

8.2.9 Non-Processibles and Residues

Some non-processibles, such as white goods, have the potential to be marketed for recycling: other oversized materials would be disposed of in a sanitary landfill. The residue ash, after removal of recyclables, would constitute anywhere from 3 percent to 6 percent of the input waste, depending on the efficiency of glass and aluminum recovery. The remaining ash has potential use, Entech believes, in aggregate or plastic manufacturing. It claims it has a commitment from a company in Iowa to take all ash it generates, and convert it into cement blocks and plastic lumber. It should be noted that regulatory constraints might prevent use of the ash in this manner.

8.3 Summary of Evaluation: Advantages and Disadvantages

Based on available information, the following advantages and disadvantages can be attributed to the Entech system:

Advantages

- The process line is relatively simple, with little mechanical equipment. This absence of moving parts could decrease the likelihood of excessive downtime or interruptions in process flow.

- The weight reduction of the infeed waste is very appreciable. It remains to be seen if weight reduction of 90 percent or better can be accomplished in all system configurations and with all types of waste.

Disadvantages

- There are no commercial facilities in operation using the system. This means the system does not come with any of the data or operating experience of a viable technology. Data from the pilot facility are available, but it may or may not be realistic to extrapolate it to a full-scale facility.

- There is a great deal of uncertainty surrounding the economics of the system. This is related to the lack of operating experience.

SECTION 9

OTHER RESEARCH AND DEVELOPMENT TECHNOLOGIES

9.1 Introduction

Some of the research and development technologies discussed in this section are: vermiculture; methanol production from MSW; ethanol production from MSW; and plasma technology or vitrification.

9.2 Vermiculture - Vermicomposting

Conventional composting processes rely on microorganisms such as bacteria and fungi for compost decomposition and stabilization. Vermiculture or vermicomposting uses higher order organisms such as the earthworm or the red worm in the process. The worms accelerate the decomposition and stabilization of the organic matter in the materials being composted. Worm castings resulting from the worms' consumption of the organic matter have naturally high water retention capacity and are rich in nutrients. Although this process is being used for small scale yard waste and small scale mixed yard and agricultural or food waste, it has not been adequately tested for use with mixed MSW.

9.3 Ethanol Production from MSW

In recent years, ethanol produced from corn or other grain has been considered as an additive to gasoline to produce gasohol. Pure ethanol has a higher heating value of 12,790 Btu per pound, whereas unprocessed MSW has an average higher heating value of approximately 5,000 Btu per pound.

Ethanol can be produced biologically by yeast fermentation from any carbohydrate (starchy or cellulosic materials require a pretreatment step of hydrolysis, or the chemical process of decomposition involving addition of the elements of water, before fermentation can take place). Cellulose represents more that 75 percent of the total weight of organic material in MSW. Therefore, to produce ethanol from MSW, hydrolysis pretreatment is required to convert the cellulose substance in the MSW to sugar solutions (glucose). The two methods available today are acid hydrolysis and enzymatic hydrolysis.

Acid will catalyze the hydrolysis of cellulosic materials to glucose. Serious attempts were made during World Wars I and II for large scale production of ethanol; but at the end of both wars, the abundant supply of crude oil made ethanol production uneconomical. A major problem with all acid hydrolysis is product degradation. As hydrolyzed sugars appear in the presence of an acid solution, they start to degrade so that the maximum practical yield of the glucose solution is about 55 percent of that theoretically obtainable.

Certain stains of enzymes can be effectively used to catalyze the conversion of cellulose to glucose. However, enzymatic processes are prone to contamination. High levels of cleanliness must be maintained. Refuse, by its very nature, is contaminated and unclean. In addition, reaction times are measured in days necessitating huge reactor vessel capacity. Even with the required reactor vessel capacity, the cellulosic particles must be finely divided to make the cellulose accessible to attack by the enzymes, and the bulk of metallic and glass components should be removed. Thus, extensive pre-processing of the MSW would be required to prepare the material for the enzymic hydrolysis.

Once the hydrolysis process is complete, glucose is fermented to ethanol. Fermentation is an aqueous process, or a process involving water. The maximum level of ethanol in the aqueous solution is about 14 percent, otherwise the ethanol destroys the yeast. Once fermentation is complete, ethanol is distilled from the aqueous solution. Even with this controlled process and a homogeneous feedstock, the thermal efficiency with respect to the ethanol produced is only 46 percent of the chemical energy available. It is not difficult to understand that thermal efficiencies will have to be significantly less when MSW is the feedstock because of the significant portions of the organic material in MSW that is noncellulosic and unaffected by hydrolysis and fermentation. The by-product left behind will include large quantities of contaminated water and a sodden mass of unconverted cellulose, plastics, rubber, synthetic fibers, and inorganic material. Figure 9-1 presents a probable flow for the production of ethanol.

Considering all of the above, and knowing that production of ethanol from MSW on a large scale would be a pioneering effort, since there are no commercial scale systems operating anywhere in the world using municipal solid waste as feedstock, ethanol production is not yet a practical MSW management option.

9.4 Plasma Technology

9.4.1 Technology Description

Plasma technology is similar to pyrolysis in that it uses very high temperatures created by plasma energy to convert waste to a gas and a solid. Plasma energy is generated by passing an electric current through a gas resulting in extremely high temperatures of up to 21,000 degrees Fahrenheit. Lightning and the Aurora borealis are examples of naturally occurring plasma energy.

Plasma technology is just beginning to be applied to waste management. Proponents claim that plasma technology can convert municipal solid waste, hazardous waste, hospital waste, asbestos, tires, liquid waste, or sludge to a harmless gas and an inert, vitrified slag. EP toxicity tests on slag leachate from plasma energy waste disposal tests show concentrations for all components were below EPA's allowed concentrations. No test results on the gas were readily available.

ETHANOL PRODUCTION FROM MSW

Acid Hydrolysis

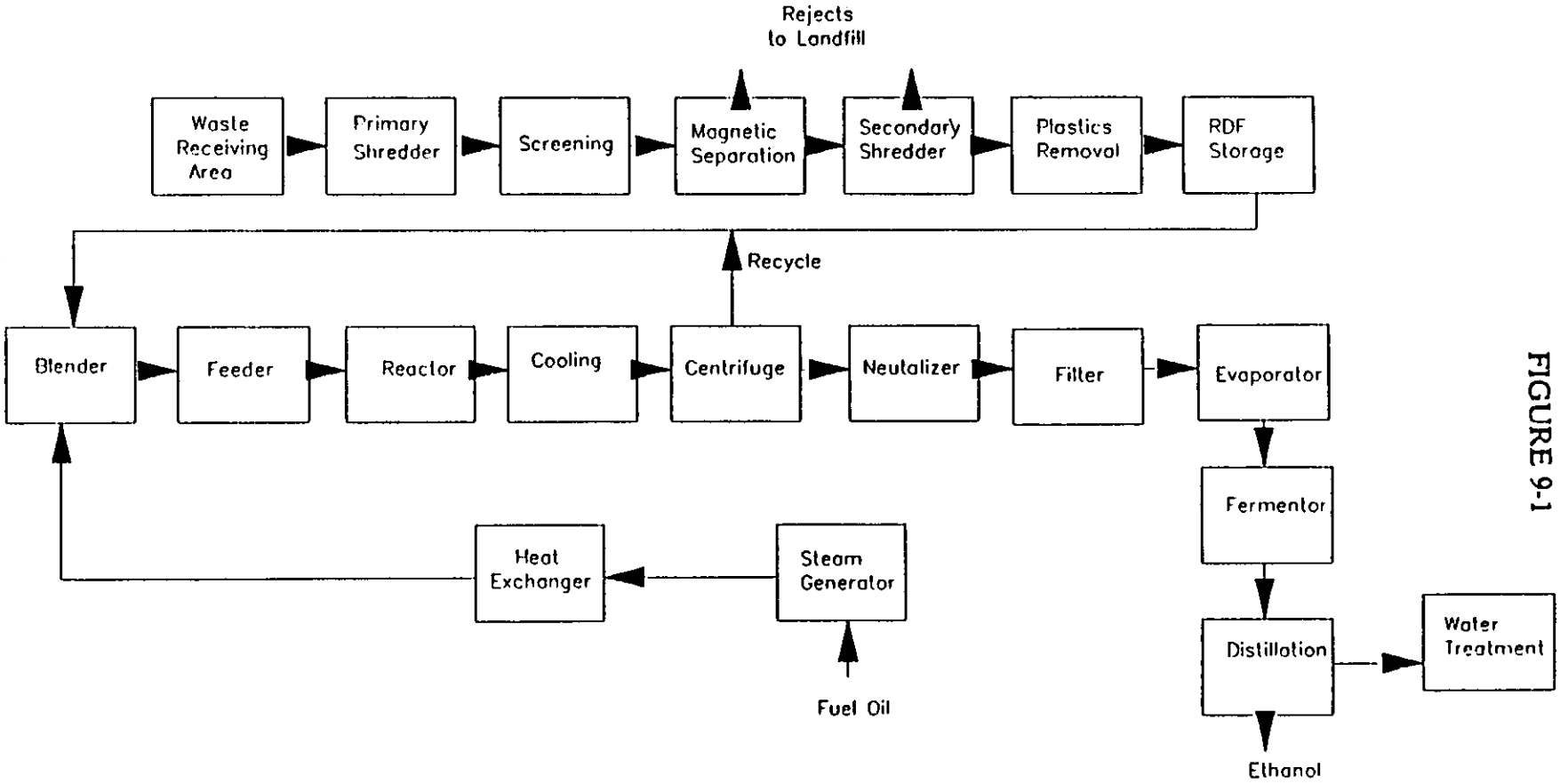


FIGURE 9-1

A simple diagram of the basic components of a plasma energy waste processing system is included as Figure 9-2. Municipal solid waste is shredded, sized and distributed in a chamber with rakes. Slag from previous burning is heated with a plasma torch. Indirect heat from the slag converts the organics and the moisture in the waste stream to gas, which is either flared as it leaves the chamber or is captured for steam generation. The inorganics in the waste stream melt and form metals and vitrified slag at the bottom of the chamber. Vitrified slag can be landfilled or molded into construction blocks or gravel.

9.4.2 Availability

Plasma energy was initially used by NASA 20 years ago to stimulate the high temperatures of re-entry into the earth's atmosphere. Today it is used most commonly in the metal and chemical industries.

Plasma Energy Corporation (PEC), a company which manufactures and supplies plasma technology, markets three sizes of furnaces with capacities ranging from 40 to 1,200 pounds per hour and higher. PEC has eleven (disclosed) plasma energy installations in this country and about two dozen installations internationally. Only one of these facilities, in Japan, uses plasma energy for mixed municipal solid waste management, specifically, ash treatment.

9.4.3 Evaluation

PEC claims that since plasma energy requires negligible mass, it simplifies waste processing and allows more efficient operation than conventional incineration. Furnaces are smaller than those for fossil-fuel burning facilities and thus, capital costs are lower. One of the disadvantages of plasma technology is its high and costly energy requirements.

Plasma technology has not yet been applied to municipal solid waste on a large scale. Most existing operations using plasma energy have very little relationship to solid waste management and are not of a scale required to handle a municipality's waste stream. The applicability of plasma technology to solid waste management will depend, in large part, on the markets for the end products. End use markets will depend on future environmental regulations regarding the use of slag and the fuel gas. Because of these uncertainties, plasma technology is not yet a feasible option for managing municipal waste.

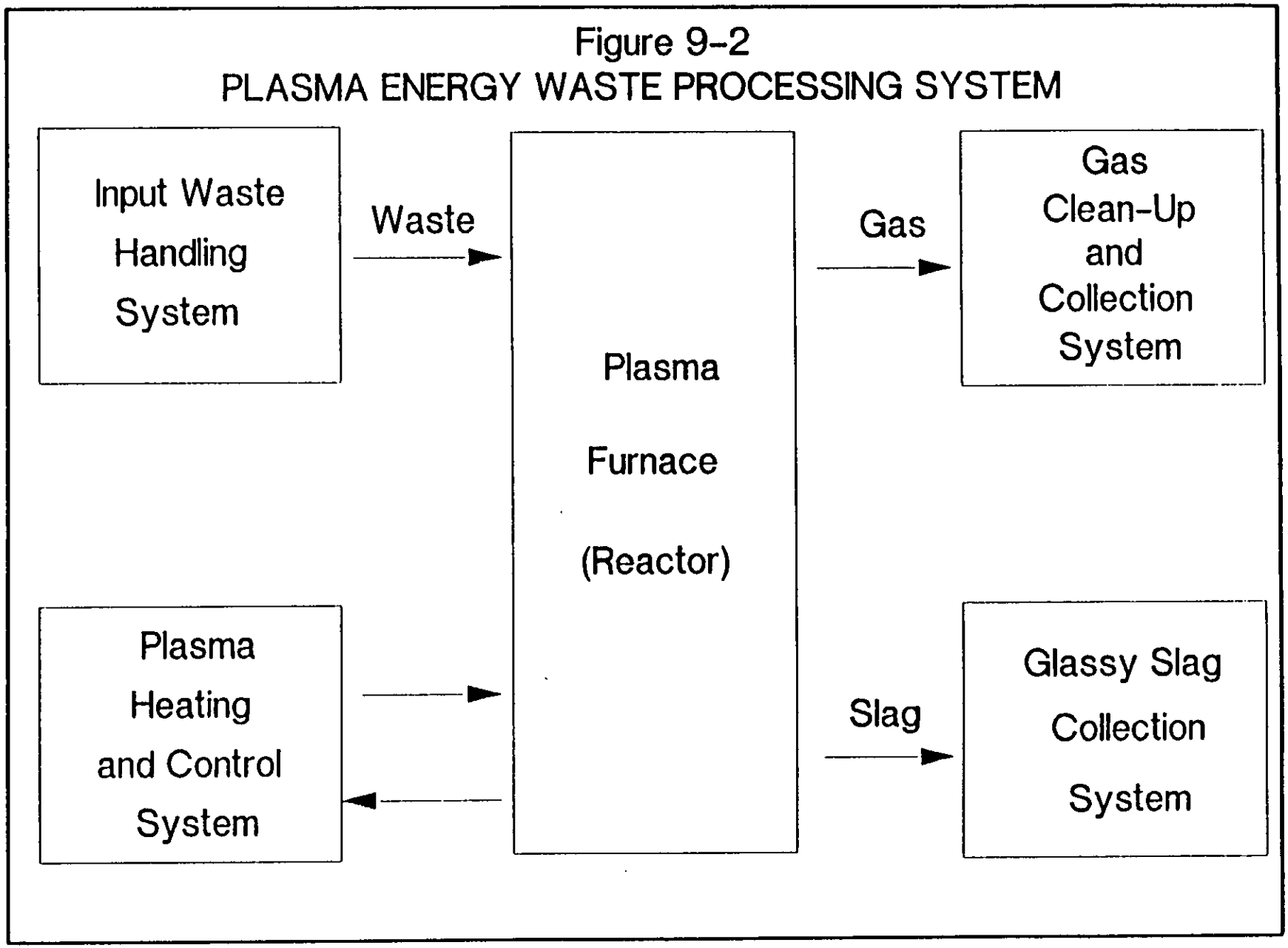


Figure 9-2
PLASMA ENERGY WASTE PROCESSING SYSTEM
Input Waste Handling System
Waste
Plasma Furnace (Reactor)
Gas
Gas Clean-Up and Collection System
Plasma Heating and Control System
Slag
Glassy Slag Collection System

APPENDIX J

FEASIBILITY STUDY FOR MUNICIPAL SOLID WASTE COMPOSTING

Prepared by:

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February 1992

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Section 1

INTRODUCTION

The management of municipal solid waste (MSW) has become one of the most important priorities for many cities and counties across the country. As landfills are closed, and incinerators and new landfills become more and more difficult to site, costs for transportation and final disposition are increasing dramatically. In response to this situation, individuals responsible for the management of MSW are actively seeking viable and socially acceptable alternatives for dealing with the wastes generated in their communities.

Municipal solid wastes contain a variety of materials, which include both organic and inorganic items. Some of the inorganic materials (such as metal and glass containers) can be removed and recycled. Similarly, a portion of the organic matter (especially the paper fraction) can be recovered and reused. Most municipal solid wastes contain a relatively high concentration of organic matter that can be treated by composting. Composting programs can be designed to treat either specific portions of MSW or the entire organic fraction.

In response to the pressing need of finding acceptable solutions to the treatment of solid waste, Kane County awarded a contract to CalRecovery Inc. and Becker Associates, Inc. to assist the County in determining the feasibility of implementing a MSW composting program.

The results of the feasibility study are presented in this report, which has been divided into seven sections. Section 2 briefly discusses existing waste management conditions in the County as well as the estimated quantity and composition of the material that would be available for composting. Section 3 presents a review of the full-scale composting facilities that are currently operating in the U.S. This discussion also presents technical, financial, and environmental conditions whenever they were available. Section 4 discusses the technological options that may be available to the County. In Section 5 of the report is discussed the various regulatory aspects of siting, permitting, and operating a municipal solid waste composting facility. Section 6 presents the procedure and results of a survey conducted to evaluate the feasibility of marketing the finished compost. Section 7 presents our recommendations including estimated capital as well as operating and maintenance costs. The last section (Section 8) presents an implementation schedule.

Section 2

EXISTING CONDITIONS

STUDY AREA

Kane County is one of six counties in the Chicago metropolitan area. It is surrounded by McHenry County to the north, Cook and DuPage Counties to the east, Kendall County to the south, and DeKalb County to the west.

Kane County is comprised of 19 municipalities and 16 townships. Another three municipalities are partially within the County limits. About 66% of the County's 522 square miles is farm land.

The population in Kane County has increased from 278,405 in 1980 to an estimated 320,000 in 1989. The population has been forecast to reach 434,000 by the year 2010. Approximately 72% of the population is found in communities along the Fox River, and nearly 20% live in unincorporated areas.

In 1989 there were an estimated 87,526 single-family dwellings and 31,016 multiple-family housing units in the County. About 17% of the single-family dwellings are located in unincorporated areas while only 0.5% of multi-family units were outside municipal boundaries. The average household size declined from 2.85 in 1980 to 2.70 in 1989.

EXISTING SOLID WASTE COLLECTION AND DISPOSAL SYSTEM

Residential Collection

According to available information, 10 firms provide collection services for residential solid waste. The primary arrangement in incorporated areas is to have a contract between the municipality and a single hauler. Collection costs are paid either directly by the homeowner or through the municipal general fund. The typical duration of these contracts is three years. Homeowners in unincorporated areas typically contract individually for hauling services. Single-family residences and buildings having two to five living units are generally included in the municipal waste contract. Multi-family dwellings, with more than four or five units, contract individually for waste collection.

The average cost for residential collection services in 1989 was $8.39/month. Costs in Kane County tend to be higher in rural areas due to the long distances between stops and from existing landfills. During the past three years, residential collection costs have increased at an average rate of 6.7%/year.

Commercial Collection

Collection practices in the commercial, institutional, and industrial sectors differ from the residential sector. Commercial accounts contract directly with 1 of 16 collection companies in

the County. Waste is stored in dumpsters or roll-offs ranging in size from 2 to 40 cu yd. The smaller containers are collected by front loaders. The larger containers are usually transported directly to the landfill. Businesses are charged according to the size of the container and frequency of service.

Generation and Collection of Landscape Waste

Landscape waste is defined as all accumulations of grass or shrubbery cuttings, leaves, tree limbs, and other materials accumulated as the result of the care of lawns, shrubbery, vines, and trees. Certain related materials, such as tree trunks and stumps with a diameter greater than 3.5 in. and sod, are exempt from the ban. State law (Public Act 85-1430) prohibits the disposal of landscape waste in landfills, effective July 1, 1990.

Public and private entities have implemented a variety of approaches for the separate collection of landscape waste in response to the landfill ban. Typically, homeowners place their yard debris in 30-gal kraft paper bags or in 33-gal containers for separate collection. Most municipalities require a sticker to be placed on the container. The sticker costs between $0.45 and $1.00 and is intended to cover additional costs for separate collection and handling.

The relatively high cost of landscape waste collection and treatment has encouraged homeowners to implement backyard compost piles and discontinue the practice of bagging grass clippings. Hauling companies report that, in towns with sticker programs, 60% to 70% of homes do not set out grass clippings on a regular basis. A recent poll found that 69% of suburban homeowners are leaving more grass clippings on the lawn than a year ago, and about 31% have compost piles.

In addition to the bagged collection service, several municipalities use vacuum equipment operated by city crews to pick up leaves that have been raked to the curb. Leaf burning still is allowed in Carpentersville, East Dundee, and unincorporated areas. Bundled and bagged brush are accepted in the separate waste hauler pickups. Several municipalities offer free brush collection service to their residents, financed by the town's general fund. This brush is chipped and used in public facilities and provided to local residents.

An estimated 20% of all landscape waste generated in the County is collected by private landscaping companies that service commercial properties, multi-family buildings not covered by municipal waste contracts, and homeowners who contract for landscape maintenance services.

The total amount of landscape waste collected during the first 12 months of the landfill ban has been estimated to be 67,925 cu yd, or 21,916 tons. In addition, the results of 1990 landfill gate surveys indicated that an average of 59 cu yd of exempt landscape waste were accepted from Kane County sources each day. Extrapolated to an 8-month period, 3,800 tons of large woody material and other exempt material still is being disposed in the landfills.

The total amount of landscape waste generated can be estimated using generation rates and number of dwellings. The estimated amount of landscape waste generated in the County is estimated to be on the order of 38,687 tons/year or about 884 lb/household/year.

Landfill Disposal

Currently, there are two permitted sanitary landfills operating in Kane County: Settler's Hill near Geneva and Woodland near South Elgin. The Settler's Hill landfill began operation in 1967.

Settler's Hill covers a total area of approximately 397 acres. About 75%, or 297 acres, are available for landfilling. The remainder serves as buffer space and to support landfill operations. Fill heights average 30 to 40 ft. According to the Fourth Annual Report on Available Disposal Capacity for Solid Waste in Illinois, Settler's Hill accepted 1,900,151 cu yd of solid waste for disposal between April 1, 1989 and March 31, 1990. The document also reports a remaining capacity of 21,338,258 cu yd, or 11.2 years, at current disposal rates.

The Woodland landfill began operation in 1976. The site covers an area of approximately 236 acres, of which 121 acres have been and are being used for waste disposal. The remainder is used for buffer, roadways, buildings, and other support activities.

In the period 1989 to 1990, the Woodland landfill received 820,442 cu yd of waste. It has been estimated that Woodland has a remaining life of 15.1 years at current disposal rates. However, Waste Management officials have reported that the volume of waste accepted will likely increase from 4,500 to 7,000 cu yd/day over the next year.

Amount and Source of Landfilled Solid Waste

According to reports made to the County by the landfill operators, Settler's Hill received 2,100,765 gate cu yd of waste and Woodland received 759,333 gate cu yd during 1989. Gate yards are a gross measure of the amount of material delivered to the facility's gate and include both loose and compacted waste.

In order to normalize this information, loose cubic yards are converted to compacted yards by using a factor of 3.2 loose yards per compacted yard. An average density of 667 lb/compacted cu yd, as generally reported in the literature, was used to convert compacted cubic yards to tons. The calculations for both landfills are summarized in Table 2-1.

In addition to waste generated in Kane County, both landfills also received waste from other counties in 1989.

Kane County also exports solid waste to landfills in DuPage and DeKalb Counties. Exports to Green Valley and Mallard Lake landfills in DuPage County were estimated to be 35,725 tons during 1989. The amount of waste exported to DeKalb County for landfilling was estimated to be 600 tons in 1989. This information is summarized in Table 2-2.

Waste Types

The results of surveys conducted during 1989 indicated that 37.9% of the waste accepted during the survey period was classified as residential. This percentage was corrected for seasonal variations in the amount of residential waste, as reported in the municipal surveys. The adjusted residential percentage (40.5%) was multiplied by the total annual receipts from Kane County at both facilities. This resulted in an amount of 162,780 tons of Kane County residential waste disposed of in Kane County landfills.

Table 2-1. Solid Waste Amounts Received at Settler's Hill and Woodland Landfills (1989)

	Settler's Hill	Woodland	Total
Gate Yards	2,100,765	759,333	2,860,098
Compacted Yards	1,604,088	577,852	2,181,940
Tons	534,963	195,603	703,566

Table 2-2. Location of Landfills Receiving Kane County Waste (1989)

Location	Amount
Kane County	401,890 tons
Other Counties	36,325 tons
TOTAL	438,215 tons

Quantities of non-residential waste could not be accurately determined from the results of the gate survey. The results of surveys of waste haulers indicated that, for the non-residential solid waste amounts handled during 1989, 43.8% was from the commercial sector, 32.8% from the industrial sector, and 23.4% was construction and demolition debris. These percentages were multiplied by the amount of non-residential waste received at both landfills from Kane County.

This methodology resulted in estimated amounts of 117,387 tons from the commercial sector, 86,934 tons from industrial sources, and 34,789 tons of construction and demolition debris. The quantities of each type of waste sent to out-of-county landfills were estimated from gate surveys in DuPage County and from hauler surveys in DeKalb County.

EXISTING RECYCLING PROGRAMS

Recycling programs were identified and quantified from the results of surveys sent to various public and private entities.

Residential

Curbside recycling was introduced in Kane County in 1989. The recycling programs were initiated in East Dundee, Sleepy Hollow, and St. Charles. East Dundee and Sleepy Hollow began their programs in April, while St. Charles started recycling in October, in conjunction with a volume-based billing approach to refuse collection. A total of approximately 9,850 households are served by all these programs.

St. Charles has reported a 96% participation rate due in large part to the financial incentive created by their innovative billing system. Quantities on the order of 39 lb/household/month have been reported. Survey results for the other two programs are incomplete. Consequently, average results of nearby communities, 40.7 lb/household/month, have been used to estimate their effectiveness. Accordingly, during 1989, it is estimated that a total of 845 tons of recyclable material were collected by the three existing curbside programs.

Citizens of Kane County recycled substantial amounts of solid waste at commercially-operated buy-back and drop-off facilities. The estimated amounts of residential materials handled by recycling centers total 6,497 tons for 1989.

During 1989, at least two communities, Elgin and St. Charles, collected leaves separately and diverted this material from local landfills. An estimated 854 tons of leaves were recycled by these two programs.

Three communities, Aurora, South Elgin, and St. Charles, reported that they collected brush separately and chipped this material for local re-use. This amount of material is estimated at 4,750 tons, resulting in a total of at least 5,604 tons of landscape waste material diverted in 1989.

In 1990, eight new curbside collection programs were begun in the municipalities of Carpentersville, Elgin, Burlington, Geneva, Gilberts, Maple Park, Hampshire, and South Elgin. Curbside programs were also initiated in Algonquin, Barrington Hills, and Wayne. In addition, at least four haulers, Acorn Disposal, Marengo Disposal, Monarch Disposal, and Valley

Sanitation, began offering curbside recycling service to their residential customers in unincorporated areas.

Several new drop-off programs were initiated in 1990. These include municipally-sponsored programs in West Dundee and Aurora. Acorn Disposal and Elgin-Wayne Disposal have also provided drop-off recycling bins in various locations around the County.

The most significant development in 1990, in terms of impact on the residential waste stream, was the statewide ban on landfilling of landscape waste. One permitted landscape waste composting facility, operated by Waste Management adjacent to the Settler's Hill landfill, was established in the County. Four other nearby sites may also accept some material from Kane County. These include a DuPage County facility near West Chicago, and privately-owned facilities in Kendall County (Browning-Ferris), DeKalb County (DeKalb County Disposal), and McHenry County (Marengo Disposal).

Commercial and Industrial

The level of recycling in businesses and industries can be estimated from the results of waste hauler and recycler surveys. A major area of recycling in the commercial sector is the collection and marketing of old corrugated containers. The amount of corrugated recycled by haulers in 1989 was estimated at 5,208 tons.

Recycling of materials from the commercial/industrial sector were also reported by four businesses, including two scrap dealers, and estimated for two non-responding scrap dealers. Eagle Recycling reported volumes of corrugated paper, high-grade office paper, and metals collected from the commercial sector. Euclid Beverage reported recycling approximately 9 tons of aluminum cans from its commercial customers.

Two scrap dealers reported that 90% of their total volumes originated from businesses. The vast majority of this material is ferrous and non-ferrous metals. It is estimated that about 90% of the scrap metal which is recycled originates from large industrial generators. Therefore, recycling centers collected an estimated 3,404 tons from the commercial sector and 23,070 tons from the industrial sector.

The information presented above results in the following quantities of materials being recycled: 12,946 tons in the residential sector, 8,612 tons in the commercial sector, and 23,070 tons in the industrial sector. A summary of 1989 recycling amounts by sector and type of program is presented in Table 2-3.

Landscape Waste

During the first year of the landfill ban, several methods have been used to manage the collected landscape waste. Although the majority of material has been delivered to composting facilities, some has been directly land-applied and municipally collected brush has been chipped for use locally.

The majority of leaves collected by municipal programs in St. Charles, Geneva, and Batavia has been delivered to farmers for incorporation into the soil. Most leaves collected by the City of Elgin have been taken to a City-owned composting site.

Table 2-3. Summary of 1989 Recycling Amounts by Sector (Tons)

Residential	
Curbside Collection	845
Recycling Centers	6,497
Landscape Waste	5,604
Subtotal	12,946
Commercial	
Waste Haulers	5,208
Recycling Centers	3,404
Subtotal	8,612
Industrial	
Recycling Centers	23,070
TOTAL	44,628

Most collected material has been delivered to compost facilities. Available data suggests that of the total 21,916 tons collected by municipalities, haulers, and landscapers, 77% (16,772 tons) was delivered to a compost facility during the 1990-91 season.

From July to November 1990, almost all non-land applied landscape waste collected in Kane County was taken to a Waste Management facility at Settler's Hill landfill. There, Waste Management attempted a modified land application operation, where incoming material was processed through a tub grinder and thickly spread on vacant land at the landfill. However, a combination of wet weather (which prevented access to the fields for spreading and incorporation) and lack of experience with this type of operation resulted in significant odor problems. The operation was permanently closed in January 1991.

In the spring of 1991, Kane County material was delivered to the DuPage County composting facility. In early April, the DuPage facility experienced large increases in the amount of material delivered to the site -- as much as 2,100 cu yd/day, versus a peak of 800 cu yd/day in 1990. Subsequently, DuPage County limited acceptance to 800 to 1,000 cu yd/day and restricted acceptance of loads from other counties.

At this time, material from Aurora was still being accepted by DuPage County, since a portion of the City is in DuPage County. All other collected material from Kane County communities was then taken to two privately-owned facilities in DeKalb County. Higher costs were incurred by haulers and municipalities due to higher tipping fees at the DeKalb sites and increased transportation costs.

Yard waste generation dropped significantly during the 1991 summer due to climactic conditions, which allowed DuPage County to resume accepting out-of-county material. In late summer and early fall 1991, the majority of collected Kane County material was again being delivered to the DuPage County facility.

WASTE QUANTITIES AND COMPOSITION

Quantities

The total amount of wastes generated in Kane County has been estimated based on quantities disposed (in landfills) and quantities diverted through recycling. The quantities disposed at the landfills were calculated based on volumetric estimates. A summary of the quantities of wastes generated in the County is presented in Table 2-4. The data in the table show that the total amount of waste generated is on the order of 490,820 tons/year or about 8.4 lb/capita/day.

In this analysis, it is assumed that only the wastes generated by the residential and commercial sectors would be readily available for composting. Some industrial wastes may also be suitable for inclusion as feedstock to the composting operation. A better understanding of the composition of this waste stream would be required prior to inclusion of it in the program. According to the data in Table 2-4, approximately 318,237 tons of waste/year are generated by these sectors.

Table 2-4. Summary of Solid Waste Generated in Kane County in 1989 (Tons)

Sector	Landfill	On-Site	Recycling	Subtotal	Total
Residential	166,309	1,244	12,946	180,499	
Commercial	122,952	6,174	8,612	137,738	
					318,237
Industrial	86,894	559	23,070	110,563	
Construction/ Demolition	62,020	--	--	62,020	
					172,583
TOTAL	438,215	7,977	44,628		490,820

Composition

Based on available information and results of waste characterization studies conducted by CalRecovery, the composition of residential/commercial waste in Kane County has been estimated. The results of the analysis are presented in Table 2-5. The data in the table show that the waste, as expected, contains relatively high concentrations of paper products and other organic matter. Our estimates also show that the concentration of landscape wastes in the waste stream is substantially lower than the quantities estimated by the County.

Based on the quantities of waste disposed and composition predicted in Table 2-5, the quantity generated (by component) is presented in Table 2-6. In addition, the data in the table show the percent and quantity of materials currently recycled as well as the percent and quantity of materials expected to be recycled in the near future. The data show that the amount of recycled materials would reach 104,849 tons/year or about 33% of the waste generated.

Finally, quantities available for composting are presented in Table 2-7. These quantities are estimated based on current waste generation rates and assuming that increased efforts by the County will result in recycling rates similar to those indicated in Table 2-6.

As shown in the table, about 213,388 tons/year or 820 tons/day would be available for composting.

Table 2-5. Estimated Composition of Residential/ Commercial Waste in Kane County

Component	Weight Percent
Paper	
High Grade	4.3
Newspaper	8.4
Corrugated	14.5
Mixed Paper	17.4
Plastics	
HDPE	1.3
PET	0.3
LDPE	3.0
Other	4.6
Glass	6.0
Landscape Waste	11.0
Food Waste	6.6
Wood Waste	5.2
Textiles	3.8
Other Organics	4.1
Other Inorganics	3.6
Special Waste	-
Metals	
Aluminum Cans	0.8
Other Aluminum	0.3
Bi-Metal Beverage	1.9
Other Ferrous	2.7
Other Non-Ferrous	0.2
Total	**100.0**

Table 2-6. Estimated Quantities of Waste Generated and Recycled in Kane County

Component	Average Composition Generated (%)	Quantity Generated (TPY)	Quantities Recycled			
			Current		Future	
			(%)	(TPY)	(%)	(TPY)
Paper						
High Grade	4.3	13684	9.4	1293	50	6842
Newspaper	8.4	26732	24.6	6578	70	18712
Corrugated	14.5	46106	17.8	8204	60	27664
Mixed Paper	17.4	55373	0.0	0	5	2769
Plastics						
HDPE	1.3	4137	0.0	0	7	290
PET	0.3	955	11.0	105	25	239
LDPE	3.0	9547	0.0	0	0	0
Other	4.6	14639	0.0	0	0	0
Glass	6.0	19094	18.4	3518	50	9547
Landscape Waste	11.0	35044	47.9	16772	100	35044
Food Waste	6.6	21004	0.0	0	0	0
Wood Waste	5.2	16548	0.0	0	0	0
Textiles	3.8	12093	0.1	16	2	242
Other Organics	4.1	13048	0.0	0	0	0
Other Inorganics	3.6	11457	0.0	0	0	0
Special Waste	-	-		-		
Metals						
Aluminum Cans	0.8	2546	63.1	1608	90	2291
Other Aluminum	0.3	955	0.0	0	5	48
Bi-Metal Beverage	1.9	6047	0.0	0	5	302
Other Ferrous	2.7	8592	2.7	236	10	859
Other Non-Ferrous	0.2	636	0.0	0	0	0
Total	**100.0**	**318237**		**21558**		**104849**

Table 2-7. Estimated Quantities of Waste Available for Composting in Kane County

Component	Quantities (TPY)		
	Generated	Recycled In Future	Available for Composting
Paper			
High Grade	13684	6842	6842
Newspaper	26732	18712	8020
Corrugated	46106	27664	18442
Mixed Paper	55373	2769	52605
Plastics			
HDPE	4137	290	3847
PET	955	239	716
LDPE	9547	0	9547
Other	14639	0	14639
Glass	19094	9547	9547
Landscape Waste	35044	35044	0
Food Waste	21004	0	21004
Wood Waste	16548	0	16548
Textiles	12093	242	11851
Other Organics	13048	0	13048
Other Inorganics	11457	0	11457
Special Waste			
Metals			
Aluminum Cans	2546	2291	255
Other Aluminum	955	48	907
Bi-Metal Beverage	6047	302	5744
Other Ferrous	8592	859	7733
Other Non-Ferrous	636	0	636
Total	**318237**	**104849**	**213388**

Section 3

OPERATIONAL MSW COMPOSTING FACILITIES

Based on available information, currently there are 18 full-scale composting facilities operating in the U.S. Seven of the facilities are located in the State of Minnesota, three are located in the State of Florida, and the others are located in different states throughout the country. A summary of basic information about the facilities is presented in Table 3-1. A description of each of the facilities follows. In some cases, information pertinent to environmental conditions and costs is not readily available or is considered proprietary.

PINETOP-LAKESIDE, ARIZONA

The Pinetop-Lakeside facility is located approximately 170 miles northeast of Phoenix and it was developed in response to the impending closure of the county landfill. Sludge from the local wastewater treatment facility was disposed at the landfill. The composting plant was designed to process 5 tons of sludge mixed with 12 tons of MSW. The facility is housed in an existing building on the grounds of the Pinetop-Lakeside Sanitary District wastewater treatment plant. At the present time no tipping fee is charged for the MSW. The MSW is used as a bulking agent for composting the sludge. The composting plant is of the in-vessel type and utilizes a Eweson reactor.

In the process, the incoming mixed waste is discharged from the collection vehicles onto the tipping floor. Large, non-compostable materials such as bicycle frames, tires, and rolls of carpeting are manually removed from the waste stream at the tipping area. The remainder of the waste is charged into a receiving hopper by means of a front-end loader. A loading box introduces the MSW into the digester. Sewage sludge is added to the MSW to increase the moisture content to about 50% and to adjust the C:N ratio to about 35:1 or less. One ton of sewage sludge is added for every two tons of refuse. Eventually, the sludge will be pumped into the digester directly from the sludge processing area of the wastewater treatment facility.

The digester is divided into three compartments and rotates by means of an electrically driven bullgear. The first compartment is equipped with internal protrusions which help to break up bags and other large objects during the tumbling action. Air is circulated through the digester in a direction counter current to the motion of the waste and at controlled flow rates. The digester is operated such that the composting mass is maintained at temperatures between 140° and 150°F. According to the manufacturer, temperatures of up to 160°F may be reached in the first compartment. The composting material remains in the digester for about 4.5 days. After one to two days in the first compartment, a transfer door is opened and approximately 85% of the composting material is allowed to flow by gravity to the second compartment. The remaining 15% serves as mass inoculum for the incoming load. In compartment 2, the waste continues to decompose. After one to two days, the waste is transferred from the second to the third compartment. Approximately 15% of the mass is, once again, allowed to remain in the second compartment to maintain a high bacterial population. In the third and final

Table 3-1. Operational MSW Composting/Co-composting Facilities in the U.S. (January 1992)

Location/Name of Facility	Start Date	Composting Method/ Proprietary Technology or System	Type of System	Type of Feedstock	Throughput Capacity (TPD) Design	Actual	Capital Cost ($)	Annual Operating Costs ($)
Arizona								
Pinetop-Lakeside	1991	Bedminster Bioconversion	Ewesor/co-composting	MSW, sludge	12 MSW 5 sludge	12 MSW 5 sludge	4.2 M	
Delaware								
New Castle	1984	Fairfield digesters	Fairfield	Processed MSW, sludge		250-350 processed MSW 70 sludge (dry)	65.0 M	
Florida								
Escambia County	1991	--	Windrow/co-composting	Leachate, septage, processed MSW	400	130 MSW, septage		
Pembroke Pines	1991	Buhler, forced aeration windrow	Buhler	Processed MSW	660	100-660 MSW	48.5 M	
Sumter County	1988	--	Windrow	MSW	260	50-70 MSW	2.75 M	220,000
Iowa								
Des Moines	1991	TRS Industries	Windrow	MSW, wet sludge	192 MSW, 115 sl, 38 yard	192 MSW, 115 sludge (wet)	4.2 M	
Kansas								
Coffeyville	1991	--	Windrow Raw MSW	MSW	300	80 MSW	confidential	confidential
Minnesota								
More (ECSWC)	1991	Daneco, static aerated pile	Daneco	MSW	250	210-250 processed MSW	11.0 M	1.3 M (est)
Fillmore County	1987	--	Windrow	MSW		18 MSW	1.0 M	278,000
Lake of the Woods County	1989	--	Windrow	MSW		5-10 MSW	0.5 M	150,000
Pennington County	1985	Lundell	Lundell w/ windrows	RDF residues		10 (RDF residuals)		
Truman/PrairielandSWB	1991	OTVD, Sliods composting technology	OTVD w/agitated bed	Mixed MSW		100 MSW	7.0 M	
St. Cloud	1988	Ewesor digesters/Royer agitated bed	Ewesor w/agitated bed	MSW		100 MSW		
Swift County	1990	--	Windrow	MSW		18-25 MSW	1.7 M	
Oregon								
Portland	1991	Dano/Riedel	Dano w/windrows	MSW	600	600 MSW	30.0 M	
Texas								
Hidalgo County	1991	--	Windrow	MSW	150	150 MSW	2.0 M	266,000 (est)
Washington								
Ferndale	1991	Ewesor digester/Royer agitated bed	Ewesor w/agitated bed	MSW		100-300 MSW	8.0 M	
Wisconsin								
Portage	1988	--	Digester w/windrows	MSW, sludge		18 MSW, sewage sludge	1.0 M	

compartment, the bacterial activity is less intense than in the others. The material remains in this compartment for about one to two days. A certain amount of drying also takes place in this compartment.

The material leaving the digester consists primarily of finely decomposed organic matter mixed with inorganic material. Plastics and larger pieces of wood are present in the compost, nearly in the same form as they entered. Film plastic materials such as garbage bags are torn in the tumbling action of the digester and show up in the finished compost in the form of very thin strips. Similarly, it is reported that glass particles in the finished compost are relatively small with rounded edges.

The composted material is passed through a trommel screen to remove large particles. The trommel is equipped with a 1-1/2-in. mesh. Materials that remain on the screen (approximately 30% of the incoming MSW stream) are stored for eventual transfer to the county landfill.

The material that passes through the screen (unders) is taken to an enclosed composting area and formed into 6- to 7-ft high windrows. The windrows are aerated by means of a forced aeration system. Automatic timers allow for intermittent aeration. The piles are turned every two days. Water is added by means of an overhead sprinkler system. At the end of 30 days, the material is processed through a trommel screen equipped with 1/4-in. openings. After screening, the compost may be stored in curing piles, shipped directly to market in bulk, or blended with fertilizers. Plans have been made to sell the compost to vendors of soil amendments in the area.

Oversized organic material removed in the screening process may be sent to a landfill or reintroduced into the digester.

It has been estimated that 10 tons of municipal solid waste combined with 5 tons of sewage sludge and water, result in the production of between 5 to 7 tons of compost and about 2 to 3 tons of reject materials. The wet compost output has a volume about one-third the volume of the incoming waste.

The Pinetop-Lakeside facility was built for a cost of $4.2 million in 1991.

NEW CASTLE, DELAWARE

The Delaware Reclamation Plant in Wilmington has been in operation since 1984. The facility was designed to mechanically process 1,000 TPD of municipal and commercial solid waste and produce a refuse derived fuel (RDF). The types of unit processes in the design include size reduction, air classification, magnetic separation, and screening for the recovery of metals and glass in addition to the RDF. The recovery process generates about 225 tons of residue (mainly paper and plastic) per day. The residue is mixed with approximately 225 tons of sewage sludge (about 80% moisture content) and then introduced into one of four Fairfield digesters. Each of the digesters has a diameter of 100 ft. The organic matter to be composted is stacked in the digesters to a height of 6 ft. Each digester has a capacity of about 175 tons of organic matter. The composting mass in the digester is mixed and aerated periodically. The material is maintained in the digesters for about seven days. Each year, about 60,000 tons of composting material is removed from the digesters. Approximately 75% is shipped directly to a

nearby Delaware Solid Waste Authority's landfill and used as cover material. The remainder of the digested material is cured in windrows (outdoors) for a maximum period of 30 days and then passed through 1/4-in. screens. Approximately 60% of the screened compost is marketed. The remainder of the screen's output also is transported to the landfill for use as cover.

Early analysis of the finished compost indicated that the material contained concentrations of PCBs ranging between 4 and 5 parts per million. These concentrations did not allow the company to carry out the original plan of marketing the compost as poultry litter. Current markets under development include horticulture, lawn fertilizer, and hydroseeding operations. The finished compost was introduced into the market under the name FairGrow. The facility has secured a permit from the State's Department of Natural Resources and Environmental Control to market the compost to qualified professionals. Qualified professionals include landscapers, nurserymen and groundskeepers at golf courses, cemeteries, schools, large corporations, etc. The finished product is not permitted for resale to the public and cannot be used on vegetable gardens. The price for the compost is $4.50/cu yd. Delivery charges are in addition to the basic price. In order to encourage first-time users, the first truckload (up to 20 cu yd) is delivered free of charge.

In the spring of 1991, the Authority attempted to market bagged material. Unfortunately, this marketing effort had to be discontinued because some of the compost had not been properly cured, causing it to mold. The option of bagging compost may be renewed in the spring of 1992. Despite the problems experienced with the bagged material, sales of the compost reached between 8,000 and 9,000 tons in 1991.

The composting plant has had some difficulties. These difficulties have been primarily associated with maturity of the compost (curing) and unpleasant odors.

The Delaware Reclamation Plant was built for a total capital cost of $65 million in 1983. The cost included all the equipment associated with the production of RDF.

ESCAMBIA COUNTY, FLORIDA

The composting facility in Escambia County treats municipal solid waste from the City of Pensacola and from about 80% of the unincorporated areas in the county. Approximately 1,000 TPD of mixed waste are transported to the facility in collection vehicles. Waste is discharged on a tipping floor. Once on the tipping floor, bags are opened and recyclables are manually removed. The sorters have been capable of removing an average of 30 tons of ferrous metals, 25 tons of plastic (sorted into HDPE, PET, and mixed plastics), 7 tons of aluminum beverage containers, and 80 tons of glass (sorted into three colors) each month. Until recently, material remaining after sorting was simply shredded and landfilled. Currently, about 130 tons of feedstock are processed each day. Eventually, the throughput will be increased to 400 TPD.

The county had always intended to compost the shredded material instead of putting it directly into the landfill. The tipping fee at the landfill currently is $18.95 per ton. Permitting issues, combined with an unusually high rainfall early in 1991, delayed completion of a composting pad. The pad is supposed to have an area of about 15 acres. In mid-September of 1991, about one-third of the pad was completed, and the composting program was started.

The compost pad was built on a clay base, using crushed recycled concrete for the surface. A mechanical windrow turner is used to manage the windrows. Treated septage and leachate from the landfill are sprayed onto the windrows to control the moisture content of the composting material. Leachate from the compost pad will be collected and treated.

Since the county planned to use the finished compost as daily and final cover in the landfill, no provisions have been made to mechanically process the composted material.

PEMBROKE PINES, FLORIDA

The composting plant in Pembroke Pines (Broward County) was designed to process on the order of 660 TPD of mixed municipal solid waste. The plant is located in a 440,000 sq ft site and serves the communities of Pembroke Pines, Pompano Beach, Hallandale, and Dania. The plant is owned and operated by Reuter Recycling of Florida, Inc. The facility uses a Buhler processing and composting system. The capital cost was $48 million (1991). The system includes a series of mechanical processes all housed within a building. In the system, nonprocessible materials are removed from the tipping floor. The remainder of the material is screened. Material that passes through the screen (fines) is removed. The remaining fraction (screen overs) is manually separated into recyclable materials (e.g., corrugated cardboard, film plastics, bottles, and cans). After the recyclable materials are removed, the remainder of the waste stream is size reduced, undergoes magnetic separation, and is transported to a mixing drum. Moisture is added in the drum. From the mixer, the material is processed through a screening operation. The screen is equipped with 2- and 6-in. openings. The fraction smaller than 2 in. is transported to the composting line. Material having a size distribution that varies between 2 and 6 in. in size is shredded and then screened once again using 2.5-in. openings. The fraction under 2.5 in. is combined with the 2-in. minus material and is taken to a composting hanger. The composting hanger has an area of about 288,000 sq ft. In the hanger, the material is formed into windrows. The windrows are aerated using forced aeration and allowed to compost for a six-week period.

Prior to distribution, the finished compost is refined by processing it through a hammermill, a screen, and a stoner. It is expected that the facility will produce on the order of 200 tons of compost each day. It has been reported that the operator of the plant has negotiated a contract with another company to market the compost produced by the facility.

This facility has just begun operating and therefore does not have a history.

SUMTER COUNTY, FLORIDA

A few years ago, representatives from the county began searching for alternatives to landfilling. Eventually, the decision was made to build a composting facility. The plant cost about $2.75 million.

At the present time, Sumter County does not have a curbside recycling program for the collection of recyclable materials. In the process, about 50 to 70 tons of mixed wastes are delivered to the facility by municipal haulers and residential users.

The wastes are discharged on the tipping floor of the processing building. The waste materials are pushed onto an inclined conveyor. The conveyor transports the waste to a flail mill. The mill is designed to break open bags and similar materials and therefore allow their contents to mix with the rest of the waste. After size reduction, the material is subjected to magnetic separation to remove ferrous metals. Handpickers remove aluminum and other recyclable materials. The remainder of the waste is transported to a hammermill for additional size reduction. The shredded material is discharged onto small dump trucks. The trucks transport the material to a composting area where it is formed into windrows. The composting area consists of a 400 ft by 200 ft concrete pad. The pad drains into a leachate holding pond. The windrows are turned by means of a mechanical turner. The turner has the capability of adding water and/or inoculum to the windrows. After three to six weeks in the composting area, the material is considered to be mature. Compost is expected to be used by nurseries and sod farms.

The Sumter County plant has experienced some problems primarily dealing the separation and contamination of the finished product. Difficulties with separation are associated with improper equipment selection. Inadequate equipment selection and performance has a severe negative impact on the quality of the finished product.

Operating and maintenance costs for the facility are about $220,000 per year.

DES MOINES, IOWA

Sludge from the city's wastewater treatment plant was the motivating force for the design and implementation of the co-composting facility.

In the past, much of the city's wastewater sludge was applied on the land. However, another option was necessary due to local weather conditions which occasionally make it extremely difficult for trucks to access the areas for land application. Representatives from the Sanitation Department estimate that the co-composting plant will be able to treat about 50% of the total sludge production, and therefore direct land application of sludge will continue to play a major role in the city's residuals management program.

This facility evolved from a one-year pilot project. During the pilot, 60 TPD of MSW were composted with 25 TPD of sludge.

The full-scale composting plant was designed to process 192 TPD of MSW and 115 wet TPD of sewage sludge. The tipping fee is $21.63/ton for the MSW and sludge. The 30% to 35% rejects and residuals from the composting plant are disposed in a landfill owned by the Des Moines Metro Agency.

The facility is accomplishing a 65% reduction in the amount of material going to the area landfill. Iowa allows composting to count toward the state's recycling goal of 50% by the year 2000. Representatives from the Sanitation Department estimate that the composting plant is exceeding the 50% goal.

The facility is located on a 17-acre site. The full-scale plant has been designed to be compatible with Des Moines' recycling program. Currently the city requires that individuals place HDPE

and PET in yellow plastic bags. The bags are collected with the rest of the waste. The collected waste is then taken to the processing plant.

At the plant, the waste is passed by a picking station. At this station sorters remove the yellow bags. The remainder of the waste is conveyed to a series of trommel screens. The first screen is equipped with 6-in. openings. The "overs" (i.e., material larger than 6 in.) are conveyed to another picking station for the removal of large, non-compostable items. The "unders" are taken to a second trommel. This trommel has 2-1/2-in. holes and is intended to remove grit and other inorganic matter as undersize. The overs from the 2-1/2-in. trommel are transported to a third picking station for the removal of additional non-compostable materials. The remainder of the waste stream is size reduced in a specially designed vertical shredder. The shredded material is mixed with sewage sludge in a 3 to 2 ratio (MSW:sludge) by weight. The mixture is stacked into windrows. The windrows are about 16 ft wide, 7 ft high, and 300 ft long.

The windrows are aerated with a mechanical turner. Initially, the composting mass is turned two to three times per week in order to meet EPA's PFRP requirements for sludge composting.

The finished compost is processed through a 3/8-in. screen. The screened compost has been licensed by the state's agriculture department as a soil conditioner for use on agricultural land. The city, which has marketing responsibility for the compost, intends to provide compost to some of the same farmers who participate in the land application program. Thus far, the compost from the full scale facility has been used as cover for a closed landfill. The city also is planning to use the compost in municipal landscaping projects.

COFFEYVILLE, KANSAS

The design of the facility in Coffeyville utilizes a low technology approach to waste processing. In the process, about 80 TPD of raw MSW are discharged on a 20-acre composting pad. The pad consists of thick layers (30 ft) of clay. The raw MSW is then formed into windrows which are mixed and fluffed by means of a custom built machine powered by a front-end loader. Since the waste is not processed prior to composting, the composted mass is screened using a trommel equipped with 2-in. openings. The screen is designed to remove inorganic material from the composted mass prior to stockpiling. The reject material (overs) from the screen is transported to a landfill, which is located adjacent to the composting plant. The tipping fee at the facility is $15/ton.

No compost has been marketed as of the fall of 1991, pending further study of the product and potential markets. Although agriculture is one potential market, the processors are interested in having the compost used in the reclamation of over 800 acres of barren land near Joplin, Missouri. The City of Joplin is located about 60 miles east of Coffeyville. Former zinc mining operations left large piles of mine tailings, which are now part of an EPA Superfund site that the U.S. EPA and the Bureau of Mines are seeking to have cleaned up.

This facility's approach to composting can only lead to difficulties in producing a good quality compost.

EAST CENTRAL SOLID WASTE COMMISSION, MINNESOTA

The East Central Solid Waste Commission (ECSWC) is comprised of five rural counties located 60 miles north of Minneapolis, Minnesota.

In 1990, the (ECSWC) contracted with Daneco USA to construct and operate a 250 TPD solid waste composting facility adjacent to the regional solid waste landfill in Mora, Minnesota. Construction was completed in September 1991 and is now in commercial operation.

The facility consists of three buildings, each with a separate function: tipping area, primary processing, and composting/refining. All buildings are totally enclosed steel structures. The storage area is located outdoors and consists of a clay-lined asphalt pad.

The tipping floor area is 15,000 sq ft and has a storage capacity of approximately 400 tons of solid waste. Waste is fed to the primary processing system using a front loader at a rate of 35 TPH.

Primary processing is initiated by separating the solid waste by size in a 36 ft by 9 ft trommel screen (aperture size of 6 in.). The oversize fraction is then transferred to a specially enclosed and ventilated sorting room where five or six sorters remove OCC for recycling and film plastics for landfilling. Other problem wastes such as household hazardous wastes (HHW) and materials which may damage process equipment are also removed. OCC is baled for sale and the film plastics are baled prior to disposal. Remaining oversize materials then pass a magnetic separator and are size-reduced by two 400-hp shear shredders.

The undersize fraction is not sorted, but passes through a magnetic separator for ferrous removal and a vibrating conveyor/eddy separator for aluminum recovery. The undersize fraction then enters a low RPM flail mill and a secondary trommel screen (1-1/2-in. aperture size). Undersize material from the secondary trommel is transferred to Daneco's patented wet separator where heavy, inert particles are removed and transferred to outdoor storage. The ECSWC hopes to use the inerts for roadbed construction or landfill cover if approval can be obtained from state regulatory agencies.

All remaining wastes are then combined in a cone-auger mixer where water from the wet separator is added for final conditioning and transport to the composting building.

The compost feedstock has a relatively large particle size (up to 6 in. in two dimensions) and contains significant quantities of non-compostables (e.g., plastic bottles) and paper due to removal by sorting only.

Composting is performed through static pile aeration in an enclosed steel building (62,000 sq ft). After two weeks of intensive aeration, the material is subjected to trommeling at 1 1/2 in. Oversize materials are removed for disposal. The undersize fraction is reformed and aerated for another four weeks.

After active aeration is completed, the compost is subjected to a 10-mm Liwell screen. The oversize fraction is recirculated to the aeration process while the undersize is transferred to the storage pad for maturation.

The system design produces relatively little residue. The use of a flail mill and shear shredders produces a very coarse compost feedstock. As a result, the finished compost contains relatively large amounts of uncomposted paper and may not be aesthetically pleasing to certain potential markets. The recirculation of oversize materials from final screening does not eliminate this concern and may cause the concentration of inert materials over time.

The capital cost was $11 million. The facility is operated by Daneco for a fee of $1 million/year excluding landfill disposal costs. The tipping fee at the facility is $67/ton.

The East Central plant is relatively new and therefore does not have an operating history.

FILLMORE COUNTY, MINNESOTA

The Fillmore County Resource Recovery Center began operation in September 1987. The main reason for designing and building the center was to reduce the county's reliance on disposal at landfill.

Fillmore County has implemented a source separation program that requires that the waste stream be segregated into three fractions: organic matter (compostables), recyclables, and a residue. The compostables and recyclables are transported to the county's Resource Recovery Center and the residue is landfilled.

Fillmore County also has a mandatory recycling ordinance. The ordinance includes paper products (newspaper, corrugated, white paper), HDPE/PET bottles, aluminum and tin cans, glass bottles and jars, used oil, scrap metal, and appliances. In addition, in order to encourage source separation, a differential tipping fee is used at the county's Resource Recovery Center. If waste is delivered to the facility in mixed form (i.e., not separated into the three categories), the tipping fee is $70/ ton. On the other hand, if the waste is delivered properly sorted, the tipping fee is reduced to $30/ton. Commingled recyclables may also be dropped off at no charge.

It has been estimated that public participation in the recycling program is approximately 75%. Because of the relatively high participation rate, most recyclable and oversize materials are removed from the waste stream before composting.

Representatives from the county indicate that approximately 40% of the total waste delivered to the facility, or about 2,400 tons/year, consist of compostable matter. An average of about 10 tons of material per day are composted.

The Resource Recovery Center is located on a 10-acre parcel approximately 1/2 mile from a residential area. The Center was designed to receive source separated recyclable materials as well as segregated organic matter. The processing system is located in a 20,000 sq ft building. The system involves two lines. One line is devoted to processing the recyclables and the other line is designed to deal with the compostable materials.

The organic matter is deposited on the tipping floor. A front-end loader is used to load the material onto feed conveyors. Inorganic materials are manually removed from the feed conveyors. The remainder of the waste is size reduced in a low-speed shredder. After size reduc-

tion, ferrous metals are removed through magnetic separation. The processing building uses fans for dust control. The feedstock is mixed with water using a feed mixer and then formed into windrows. The windrows are about 8 to 10 ft at the base and 10 ft high. The windrows are aerated by means of a mechanical turner. The material is composted for approximately 60 days. The finished compost is refined in an auger-drum screen. The compost has been successfully marketed to farms, landscapers, and nurseries. No odor problems have been experienced whenever the specified turning schedule was followed.

The capital costs for the Center were on the order of $1 million. The Center was financed through a grant from the state, a loan from the state, and from the county's general fund.

The annual operating and maintenance costs are on the order of $278,000. The labor force consists of 15 employees, including a manager, machine operators, laborers on the sorting line for compostable materials, and mentally and physically handicapped workers on the recyclables sorting line, and a supervisor. Labor costs are about $105,000 per year. Utilities amount to $12,000 and the cost for insurance is $17,000.

The Center's annual revenues are on the order of $191,000 due to tipping fees and the sale of recyclable materials.

The Resource Recovery Center has undergone several modifications. Some of the changes have dealt with structures while others involved processing. The quality of the compost has not been satisfactory.

LAKE OF THE WOODS, MINNESOTA

Lake of the Woods is a rural county in northern Minnesota. The county has been operating a composting facility since 1989. The facility is capable of processing 10 tons of mixed MSW per day into a feedstock for composting. Originally the plant functioned as follows. Processing took place in a metal-sided building which was divided into three areas. The first was the staging area where the waste was delivered and discharged on the floor. The material was lifted by means of a front-end loader onto a hopper. The hopper fed a conveyor which transported the material to the next area where sorters removed recyclable items. The rest of the material was introduced into a 50-hp low speed shredder. A magnetic pulley attached at the end of the conveyor removed ferrous metals. After size reduction, the waste was conveyed to a mixer. In the mixer sufficient water was added to increase the moisture content of the material to optimum conditions. From the mixer the material was conveyed to the composting area where it was formed into windrows. The windrows were about 15 ft wide by 6 ft high. The windrows were not turned. After a certain amount of time, the material was moved to an open-sided building adjacent to the composting area. The finished compost was refined by means of a locally made trommel screen. The screen had openings of about 1-in. by 3/4-in. and rotates at about 5 RPM.

Representatives from the county recognize that the original design had some shortcomings. In particular, the design needed a windrow turner as well as an additional covered composting area. Originally, the compost was supposed to be used for landfill cover. State regulators de-

cided that the compost initially produced was insufficiently stabilized to be used for landfill cover.

Since then, some modifications have been implemented. A windrow turner has been acquired and is used to aerate the composting mass every four days. In addition, the curing area will be extended to give a total covered area of 15,000 sq ft. Eventually, the composting operation will be conducted entirely under roof. The county also is experimenting with forcing heated air from the outside windrows into the composting building in order to evaluate whether or not the fresh compost can be dried and the building can be partially heated. The screening operation has been moved into this room to minimize problems with freezing during the winter.

The county has implemented an ordinance for source separated recyclables. In addition, the capital improvements to the composting and recycling facilities have been made without having to increase the per household service fee of only $40/year. The latest capital costs were covered by the county's annual capital budget and state recycling grant funds, and were therefore not amortized.

PENNINGTON COUNTY, MINNESOTA

This plant is located in Thief River Falls (Pennington County), Minnesota. The facility in Pennington County was originally designed to process about 80 tons per day of municipal solid waste for the production of refuse derived fuel (RDF). The plant shifted its emphasis to composting over the last few years due to regulations that restrict the use of RDF produced in Minnesota. Approximately 10 of the 80 tons delivered to the plant are composted. Recently enacted legislation in Minnesota, however, will allow up to 30% of the fuel source in heating system boilers to be RDF.

At the present time, the material is windrowed on an unpaved composting pad. The composting material is turned with a leased mechanical turner. Equipment for refining the finished compost is not available. The lack of screening equipment limits markets for the compost. Therefore composted material is being stored on site for future processing.

The county has applied to the State of Minnesota for a grant of about $683,600 for the installation of a composting pad with leachate collection, purchase of a windrow turning machine, and purchase of screening equipment for processing the finished compost. Without these improvements, the facility will not be able to become a permitted composting plant in the state.

ST. CLOUD, MINNESOTA

This facility was built by Microbe Waste Technology and began shakedown in 1984. The St. Cloud facility began operation under its present owners in the second quarter of 1988. The plant was originally designed to process 50 TPD of mixed municipal solid waste. In the first design, the waste was discharged on the tipping floor. Large, nonprocessible materials are removed from the tipping floor and taken to a landfill. The rest of the waste is loaded onto a conveyor by means of a front-end loader. A mechanical bag opener at the end of the conveyor line was used to split the bags open. The material was screened to remove large items. Manual sorting was used to remove metal and other recyclable materials. After sorting, the material

was mixed with sewage sludge and placed in a digester (Eweson). The detention time in the digester was about three to four days. Final composting and maturation took place in windrows.

Recently, the facility has undergone a series of modifications. Some of these modifications include the incorporation of an agitated bed composting system. This system is entirely enclosed and is intended to aid in the control of odors at the site. The design modifications also include the addition of a wet scrubber and a biofilter for odor control. The enclosed agitated bed is intended to replace the open windrows.

Due to the modifications at the plant, the only compost made during 1991 has been for internal use. The fraction of the waste stream normally used as feed for the composting system has been processed through the digester to achieve a certain amount of volume reduction and then transported to the landfill for a reduced tipping fee.

Recyclables are not segregated at the plant. Under normal circumstances, about 100 tons of MSW are processed through a trommel screen. The "overs" from the screen (about 40 tons per day) are taken to an incinerator. The "unders" are introduced into the Eweson digesters. The feed to digesters is on the order of 60 tons per day. An additional 20 tons per day of compost feed is delivered from other sources, primarily a trailer load consisting of the wet fraction from an RDF plant.

Once the composting portion of the plant is put back into full scale operation, the material will be screened after it leaves the digesters and prior to being taken to the agitated bed system. In addition, after composting the material will be screened and passed through a stoner. Representatives of the facility expect that material designated for higher end uses will undergo additional curing. Ultimately, about 45 tons of compost will be made from over 100 tons of material that enters the digesters.

Operators of the plant currently are working on "pre-sales" for the spring of 1992. The processors currently are on the Minnesota Department of Transportation's "preferred" vendor list. The processors also are trying to penetrate the agriculture market. The facility has also successfully marketed compost to farms, landscapers, and nurseries.

The capital cost of the original plant has been reported to be on the order of $250,000 to $3,000,000. The costs for the modifications are not available at this time.

The facility in St. Cloud also has had some difficulties. Apparently, the difficulties were related to maturity and the generation of offensive odors.

SWIFT COUNTY, MINNESOTA

Swift County, Minnesota is located 120 miles west of Minneapolis and has a total population of 15,000. In 1987, as the county's landfill was near closure, the County Commission decided to proceed with the development of a composting/recycling facility.

During the conduct of the facility feasibility study, it was determined that a capital-intensive processing system would not be cost-effective due to the small amount of waste generated in the

county (18 TPD). The recommended system included the integration of a comprehensive source separation system with a relatively simple processing facility. Residents and businesses were to separate wastes into three categories: recyclables, compostables, and nonprocessibles.

The facility was constructed during late 1989 and early 1990 on a 5-acre site in Benson, Minnesota. Total facility capital cost was $1.8 million, of which $721,000 was financed through a grant from the Minnesota Office of Waste Management. Processing, composting, and storage occurs in a totally enclosed steel structure with an area of 36,000 sq ft (300 ft by 120 ft). Facility operations began in April 1990.

Compostables and nonprocessibles are separately bagged by residents and delivered to the facility in the same collection vehicle. Recyclables are collected with a different vehicle and are delivered to a dedicated tipping area.

Nonprocessibles and cardboard are manually separated from compostables prior to processing. Compostables are then shredded in a hammermill to a nominal particle size of approximately 1-1/2 in. Moisture may be added in the shredder chamber via spray nozzles. The shredded material then passes a magnetic head pulley and is screened using a trommel with 1-1/2-in. apertures. The undersize conveyor is reversible and allows for either the recombination of both fractions if the feedstock is relatively free of contaminants, or separate transfer of the oversize for landfilling and undersize to composting. The processing system can also be used for refining mature compost.

The compost feedstock is piled over perforated tubing and is turned periodically by a front-end loader. The active aeration area is capable of retaining material for up to 45 days and has storage for up to six months of refined product. Aeration and storage space area is about 20,000 sq ft.

Recyclables processing equipment consists of a sorting conveyor, glass breaker, can flattener, vertical baler, and an animal bedding system. Product storage capacity is approximately 40 tons, or about 21 days of deliveries.

The plant at Swift has had some problems primarily dealing with the composting portion of the process. In addition, the source separation program has not been as effective as expected and therefore the mechanical separation process has not been as effective as predicted.

Starting in September 1991, Swift County has mandatory recycling. The tipping fee at the composting plant will be doubled if more than 20% of the processibles in a load are determined to be landfill items. The ordinance will be enforced by periodic spot checking. The ordinance includes a formula for composite sampling of 240 lb of bags from a 4-ton load (3% of load) to determine if more than 48 lb (20% of sample) are nonprocessible, or landfill items.

TRUMAN/PRAIRIELAND, MINNESOTA

This facility was designed to process on the order of 100 tons of mixed MSW per day. The facility is located in Truman, Minnesota. The plant uses a system manufactured in France for OTVD of Paris/New York (OTVD has the patented Siloda composting technology). The main

unit operations include size reduction, magnetic separation, screening, and air classification. In addition, the facility incorporates mechanical mixing, aeration of the composting mass, and refining of the finished compost. In the process, the MSW is discharged on the tipping area. The tipping building is about 12,000 sq ft in size. Large, nonprocessible materials are removed either manually or by means of a front-end loader. Processible material is loaded onto a shredder infeed conveyor. The waste material is then shredded in a vertical shredder. The shredder is designed to remove by ballistic separation items that would be difficult to size reduce.

The shredded material is processed through a magnetic belt to remove ferrous metals. After magnetic separation, the material is processed through a trommel screen. The screen has two size openings. The upstream section consists of 1-in. openings and the downstream section consists of 3-in. openings. The intent of the smaller openings is to remove and concentrate organic matter. The larger openings are designed to remove non-biodegradable materials such as plastics. The middle fraction (i.e., -3 and +1 in.) is transported to a mixer where water is added. Similarly, the fraction smaller than 1 in. is air classified, screened, and transported to mixer. Mechanical processing takes place in a pre-finished metal building having an area of about 8,400 sq ft. After mixing, the compostable matter is transported to the composting area for aeration. This area is approximately 27,000 sq ft and houses 10 horizontal bins (5 ft by 13 ft by 136 ft). The composting process uses the Siloda system. The system consists of parallel bins in which the feedstock is aerated by means of forced aeration as well as mechanical mixing. Mechanical mixing is accomplished through a device that looks much like a paddle wheel and travels the length of the bins. After a detention time of about 28 days, the composted mass is removed from the Siloda area and placed into storage. The storage area is on the order of 36,000 sq ft. After storage, the material is refined by means of size reduction and screening. The undersize of the screening operation is considered the finished product. The oversize fraction consists of primarily plastic contamination and is considered process residue. It is expected that 32 to 35 tons of compost will be produced each day. About 35 TPD of residue is expected. The residue will be transported to a landfill in Watonwan County. The finished compost will probably be sold to local horticultural and agricultural markets.

The facility cost is approximately $7 million. The plant is both publicly owned and operated. The tipping fee is $50/ton. An additional service fee is assessed on residents within Prairieland Solid Waste Board's two counties in order to make up the difference between tipping fees and the estimated $72 to $75/ton in operational costs.

The Prairieland Solid Waste Board has initiated a curbside collection program in its two counties that reportedly is achieving an 80% participation rate. Materials collected include newspaper, office paper, aluminum and tin cans, and glass and plastic bottles.

PORTLAND, OREGON

The composting facility in Portland began operation in early 1991. The plant was designed to process about 600 tons of mixed municipal solid waste per day.

Collection vehicles discharge the waste in the tipping area. The receiving area has sufficient area for the storage of 1800 tons of waste. Large, unprocessible materials are removed man-

ually, stored, and eventually transported to the landfill. The waste is then pushed into either one of two processing lines. Each line consists of an inclined conveyor belt which transports the material to an elevated sorting area. The sorting area is enclosed and has a controlled environment. In this area, laborers tear open bags, recover some recyclable materials, and remove hazardous materials. The remainder of the waste stream is introduced into either one of two DANO digesters. Each digester is about 12 ft in diameter and approximately 80 ft long. The digesters rotate at about 3 revolutions per minute. Oxygen and moisture contents are controlled inside the digesters. The digesters rotate and are inclined such that after about 6 to 8 hours the composting mass leaves the units. The material is then processed through a trommel screen (6- and 2-in. openings) attached to the end of the digester. The screen overs are conveyed to another sorting station for the removal of potentially recyclable materials. The screen unders are conveyed to an open-sided composting building. The material is formed into windrows, aerated by means of forced aeration, and allowed to break down for about 21 days. The aeration area is about 175 ft by 350 ft in size. After 21 days, the compost is transferred to a maturation area for an additional 21 days. The maturation area also is on the order of 175 ft by 350 ft in size. The finished compost is screened.

The plant is operated in two shifts per day. Each shift has 25 to 30 employees. The composting plant cost on the order of $30 million. The tipping fees at the facility are $68/ton.

Operators of the facility at Portland have been faced with a number of issues. Apparently, some of these issues involve separation, processing, and throughput and have been severe enough to keep the plant from passing the acceptance test. In addition, management practices with the composting and curing piles have led to the generation of unpleasant odors. The facility has received several complaints about odors from nearby residents.

HIDALGO COUNTY, TEXAS

This composting facility is located in Edinburg, Texas. The plant was originally developed by a private contractor to process a fraction of the wastes generated in the county. The total waste generation in the county is on the order of 1000 TPD. The plant began operations in February 1991. The facility was designed to process about 150 TPD of mixed municipal solid waste. The county was the applicant for the permit of the composting facility. After observing the facility operate for more than six months, representatives from the county voted, in mid-September 1991, to purchase the facility. The total cost for the compost facility's building, shredder, associated landfill, and 213 acres of land was $2 million.

The current tipping fee at the compost facility is $9/ton. This fee may need to be increased in order to make the operation financially viable.

The facility consists of one large building which encloses a tipping/picking area. In this area, large items, particularly metal objects which could damage the shredder, are removed. A conveyor then takes the waste into a vertical, gyroscopic mill. The shredded waste discharges into a pressurized staging room/baghouse equipped with a dust collection system. From the staging room, a conveyor loads the waste into a truck which transports the material to an outdoor composting pad. A mechanical windrow turning machine is used to aerate the composting mass.

Contamination in the form of plastic pieces in the finished compost is causing end use problems. Representatives from the county indicate that the county intends to install screening equipment to remove the plastic. Once in place, stockpiled compost will be screened and possibly used as a soil amendment in county projects. Another potential use, subject to state approval, is to fill gravel pits.

Markets for recyclable materials are not readily available in the area. Consequently, very little recycling takes place in the county. Currently, only aluminum and cardboard have any markets in Texas.

It has been estimated that the annual operating cost for the facility is about $266,000 per year.

FERNDALE, WASHINGTON

This facility is located on a 20-acre site north of the City of Bellingham. The facility serves Whatcom County in the northwestern portion of the State of Washington. The facility consists of a materials recovery and a composting plant, a waste-to-energy plant, ash storage, leachate control lagoon, a drop-off center for recyclable materials, administrative offices, and a scale house. The materials recovery/composting facility currently processes approximately 220 TPD of MSW. Waste is delivered to the facility seven days a week by both commercial and private haulers and is unloaded onto a tipping floor. Nonprocessible materials are manually removed before the waste is loaded onto a conveyor. Cardboard and other large items are removed and the waste is then passed through a bag slicer. The slicer opens the bags and exposes their contents before the waste materials are introduced into a trommel screen. The trommel is equipped with 3- and 8-in. openings. Consequently, the waste is divided into three streams (under 3 in., 3 to 8 in., and over 8 in.).

Waste material smaller than 3 in. falls through the trommel's openings and passes through a magnetic separator for the removal of ferrous metals. The remainder of this stream is loaded directly into one of the two compost digesters. Material in the size range of 3 to 8 in. is passed through a picking area. In this area, sorters manually remove PET and HDPE plastics for recycling. Bulky items and certain household hazardous wastes also are removed for incineration or special disposal. The remainder of the material is passed through a magnetic separator for ferrous removal and an eddy current separator for the recovery of aluminum beverage containers. The remainder of this fraction is then loaded into the digesters.

The facility uses an in-vessel approach to begin the composting process. There are two Eweson digesters in the facility. Each digester is 150 ft long and 12 ft in diameter. The combined capacity of these units is 300 tons. Approximately 50 tons of processed organic matter are loaded into each digester and mixed with water and nitrogen, in the form of powdered urea, each day. Mass inoculum is already present in the digesters. The temperature, carbon dioxide level, pH, and moisture content are carefully monitored. The material remains in the digester for approximately three days. The composting mass reaches average temperatures on the order of 130°F inside the digesters. Level detectors, located alongside the digesters, measure the amount of compost inside the digesters.

Once the compost is removed from the digester, it is conveyed to a trommel screen with 1-1/2-in. openings to remove contaminants from the finished material. The fraction larger than 1-1/2 in. is considered a reject and deposited back on the tipping floor for incineration. The fraction smaller than 1-1/2 in. is passed through a magnetic separator for the removal of small metal items and is then conveyed to a curing building.

The curing building consists of a series of eight concrete troughs. Each trough is 9 ft high by 9 ft wide by 195 ft long. The compost is placed in the troughs for curing. A mechanical compost turner moves through each trough, mixing and turning the compost and moving it forward. A transfer dolly moves the compost turner from trough to trough. The walls of each trough are lined with temperature sensors. Blowers are located underneath grating in the bottom of each trough. The blowers are regulated by the temperature sensors and turn on and off depending on the temperature of the composting mass. After approximately three weeks of curing the compost is removed from each trough and moved to a screening area. In this area, the compost is passed through a 1/2-in. trommel screen to remove any remaining contaminants. After the trommel screen, the compost is processed through an air classifier designed to separate compost from inert materials and a cyclone for removing film plastics. After final screening, the compost is tested for pathogens, heavy metals, and trace organics. Once mature, the compost can be used in a variety of applications including landscaping, construction projects, and land reclamation.

The Ferndale facility employs 40 people. The capital cost of the facility has been reported to be $80 million.

PORTAGE, WISCONSIN

The City of Portage is located about 50 miles northwest of Madison. The facility has been operating since 1986 and is capable of processing about 25 tons of MSW per day.

The plant is located at the landfill just outside the city. The plant has an enclosed receiving area about 150 ft x 80 ft in size. Collection trucks discharge the waste. Bulky items are segregated manually, loaded onto a dump truck, and landfilled. The rest of the material is pushed into a hopper which feeds into a cement kiln that has been adapted for this purpose. The kiln is about 160 ft long and 10 ft in diameter, and weighs 220 tons. It is set at a 3 degree slope such that the material flows by gravity. Both ends of the kiln are closed off by hydraulically operated gates. The drum turns at about 30 to 35 revolutions per hour. The drum is rotated by means of a motor attached to a gear (direct drive). Raw sludge (approximately 4% total solids) is stored in a tank and added to the drum at the inlet. The drum is supported on three pillow blocks.

The throughput is about 25 TPD (5 days per week). About twice per week, the end of the drum is opened and some material is allowed to discharge into a trommel screen (made of wire mesh) attached to the end of the drum. The trommel is about 12 ft long and has two size openings (2 in. and 3/4 in.). The material passing the 3/4 in. opening is considered compost; the rest is considered rejects. It is reported that the rejects amount to 6% to 10% by weight. The rejects are conveyed into a shed where they are discharged into a container for disposal.

The compost continues on into a storage shed. From there the compost is moved to a curing pad where it stays for six months.

Structural problems with the drum led to a shutdown of the facility. Construction at the plant was completed in early October, and composting has resumed. Compost will be used in a city-owned industrial park.

The capital cost of the facility has been reported at $1 million (1986).

Since this plant processes mixed MSW without any prior separation, the quality of the finished product has been lower than expected. Furthermore, the incorporation of sewage sludge into the composting mass has led to the generation of odor (within the plant) and attraction of flies.

CONCLUSIONS

These conclusions are based on available information as well as site visits made to facilities by members of CalRecovery. In general, the technologies used for composting MSW range from simply windrowing unsorted materials to utilizing a series of mechanical unit processes to both segregate and compost the organic fraction of the waste stream.

In general, most operating facilities have experienced problems. The majority of the problems seem to be associated with a serious lack of understanding of the performance of mechanical and biological processes. In addition, the majority of the facilities are under-financed. Insufficient financial resources seem to be related to the fact that justification for the construction of MSW composting facilities is made by comparing the facility with land disposal. In most cases, the tipping fee for land disposal is relatively low, making it very difficult to justify a high investment.

Designers of these facilities seem to have the tendency to oversimplify the composting process and overlook scale-up factors. Problems associated with treating hundreds of tons of MSW on a daily basis are substantially different from composting a few yards of leaves.

Scale-up also plays a role in the generation of odors. Composting several tons of organic wastes per day requires continuous management. Improper aeration, insufficient mixing, and excessive moisture content can all lead to anaerobic conditions and thus the production of foul odors. In addition, operators of these facilities do not seem to understand the fact that even a well-managed facility will be the source of odors. Although the odors may not be foul, they may be offensive to some.

In conclusion, most facilities seem to be improperly designed, inadequately sited, and underfinanced. Experiences gained with existing facilities will be helpful in siting and designing the next generation of MSW composting plants.

Section 4

TECHNOLOGICAL OPTIONS

INTRODUCTION

Composting, as applied to solid waste management, is the controlled biological decomposition of organic waste materials into a stable, humus-like soil amendment. Decomposition of organic materials is a natural process of decay that both stabilizes and reduces the volume of an organic waste. The composting process adds control to that natural decomposition process by monitoring and adjusting parameters such as temperature, moisture content, and oxygen content. Compost material that is produced is usually dark in color, has an earthy smell, and can be used as an organic soil amendment.

There are many benefits to implementing a composting program for managing organic solid wastes. Three primary benefits are: 1) production of a useful product, namely compost; 2) conservation of landfill space; and 3) its role in an integrated waste management program.

The end product of a properly conducted composting program is a rich, humus-like material. A high-quality compost can be used as a soil amendment (adding organic material to the soil, increasing water retention capacity, and nutrient content of the soil); as a mulch (promoting water retention, inhibiting weeds, and adding organic matter to the soil); and as a top dressing (improving appearance and adding organic matter to the soil).

In addition, if the wastes are composted, they are, in effect, removed from their normal flow toward disposal.

Increasingly, composting is being viewed as an important element in a range of options that act to divert waste from landfills. In some areas the impetus for landfill waste diversion is economic. At the level of the local decision makers, however, the impetus for landfill diversion is increasingly legislative. For example, several states (such as Illinois) have banned the landfilling of landscape wastes. Other states have established ambitious landfill diversion goals.

FEEDSTOCKS

Since composting is a biological decomposition process, it is used to treat organic materials of biological origin. Composting can use as feedstocks a variety of components of the municipal solid waste stream, either separately or mixed, including landscape wastes (leaves, grass clippings, brush), food wastes, wastepaper, and wood waste. Composting can also be used as a means of treating other types of wastes such as sewage sludge, agricultural wastes, animal manures, food processing wastes, and forest industry wastes. The choice of a feedstock affects the design of the composting system, from collection method to processing design.

COLLECTION METHOD

The implementation of a decision to institute a composting program must be considered within the broader context of the management of the total municipal solid waste stream. The ease, cost, and effectiveness of the implementation of a composting program is affected by the particular collection methods adopted for the compost feedstocks. The collection methods can either simplify or complicate the processing of compost feedstocks. The type and degree of separation before and during collection have an impact on the quality of the finished compost.

Because of the many benefits accruing from its use, source separation usually is associated with resource recovery (recycling) programs. For example, separated items are less contaminated and thus command better markets, and the quality of the compost product is improved. However, source separation adds to the cost of collection. The cost increase is due to the fact that additional storage containers as well as separate collection vehicles generally are required.

At the residential level, practical and economic feasibility sharply limit the permissible number of categories for source separation to about three or four. The categories include organic materials, mixed containers (metal, glass, plastic), uncontaminated paper and paper products, newsprint, and mixed refuse.

There are various types of containers in which wastes are stored at the point of generation until collection. The type of containers generally include the conventional garbage can (20- to 30-gallon), wheeled collection carts, plastic bins, and plastic or paper bags. The same type of container may be used for landscape waste, organic waste, and mixed MSW. In practice, container type is varied to suit a particular recycling program.

In order to minimize odor and fly problems when food wastes are involved (e.g., landscape waste mixed with food waste), bags and all other types of containers must be especially durable, leak-proof, and tightly sealed during storage and collection.

Leaves may be managed (stored and collected) solely as landscape wastes and thereby become the resident's responsibility. On the other hand, they may be gathered and collected with the use of specially designed collection vehicles (e.g., vacuum collection).

Source-separated organic wastes may be collected mixed with landscape wastes by means of a conventional open-body truck. If a significant fraction of the organic wastes consists of food waste, the collection vehicle should have a leakproof truck bed and its contents should be covered.

If organic wastes are one of the categories in a source separation program, they may be collected with the use of a specially designed collection vehicle that is partitioned to accommodate one or more other categories.

PROCESSING TECHNOLOGIES

Many different compost system configurations are in use throughout the world today. Each of these systems typically consists of two or three subsystems. The subsystems include pre-processing, composting, and post-processing. In the pre-processing step, the waste feedstock

is prepared and non-compostables are separated from the organic material. In the composting phase, the organic wastes are biologically stabilized. Post-processing is an optional subsystem used for further physical refinement of the compost into a material suitable for the intended market.

The degree of technology and intensity of labor applied in each of the three composting subsystems depends upon a number of important (and sometimes conflicting) factors. These factors may include: availability of low-cost labor, degree of development and success of source separation programs, the quality of compost required by local markets, available landfill space, regulatory constraints, and facility capital and operating cost.

Each of these factors must be carefully considered prior to the selection of an appropriate composting system.

PRE-PROCESSING

In practice, pre-processing refers primarily to two general steps. The first one involves the removal of desired recyclable and objectionable materials. The second step deals with the processing (treatment) needed to render the physical characteristics of the particular waste (landscape, organic, or mixed MSW) suitable as a feedstock for the compost process. Preprocessing can be done either manually or mechanically or using a combination of both. For various reasons, both manual and mechanical methods are usually used at present.

Manually sorting the waste before subjecting it to mechanical sorting has certain advantages, among which are: 1) intact beverage containers (glass, metal, plastic) are more easily removed than are fragments of the materials after size reduction; 2) materials that might damage unit process equipment, especially grinders, are more certain to be removed; and 3) the corresponding reduction of input reduces equipment wear and tear, and maintenance. Removal of oversize material by passing the hand-sorted waste stream through a trommel screen further reduces input to the grinder. The majority of pre-processing systems in the United States generally include some type of manual separation. The degree of intensity of labor depends upon the location as well as the specific vendor involved. Currently, manual separation takes place in a wide range of situations. These range from individuals simply manually removing the recyclable and non-processible materials from the tipping floor, to the removal of the items from conveyor belts in climate-controlled sorting rooms.

Other systems de-emphasize manual separation at the facility (or rely on source separation by the householder). These systems involve: 1) removal of contaminants (metal, glass, plastics, hazardous materials) through mechanical means; 2) adjustment of particle size (maximum, 2 to 3 in.) by way of size reduction (shredding, grinding) and screening; and 3) making other substrate adjustments that may be needed. Types of substrate adjustments could be moisture content and the increase of porosity. Adjustments needed to improve other physical characteristics and the chemical quality with respect to the compost process are made at the time of composting. Examples are raising or lowering the carbon-to-nitrogen ratio (C/N), and raising or lowering the pH.

In the event that processing is necessary for a mixture of organic residues with landscape wastes, the particle size of some of the constituents must be adjusted. The landscape fraction of the wastes, particularly the woody fraction (i.e., tree and shrubbery prunings, branches, etc.), must be and generally is, size reduced to 2- to 3-in. particles. The equipment used in the process involves a shredder (grinder) or chipper. Small chippers tend to clog when herbaceous plants (and those with a high moisture content) are size reduced, and the blades are soon dulled by the dirt clinging to plant roots. Another type of size reduction device that has become fairly popular for processing landscape wastes is the tub grinder. This type of grinder was originally developed for shredding hay and similar materials. Because of the unit's portability, it was adapted to shredding landscape wastes at landfills. The tub grinder is well-suited for processing combined landscape wastes and organics.

Porosity of the feedstock may be a problem when dealing with landscape wastes due to of the presence of grass clippings which tend to mat. However, this problem is readily avoided by adequately mixing the clippings with the chipped woody fraction (i.e., bulking the clippings).

In the event that the organic fraction of the waste stream is treated without landscape wastes, the need for size reduction is minimal. Maximum size is dictated by handling requirements and compost equipment (e.g., conveyor belts, loaders, turning equipment).

Particular care must be taken not to reduce the particle size such that the organic mass loses its porosity and becomes a slurry. Porosity inadequacy can be adjusted by adding a bulking agent such as chipped woody landscape wastes, dry leaves, or straw.

One of the most, if not the most, important requisites for the successful composting of mixed MSW is adequate pre-processing. It is not surprising that this phase is the most expensive, if properly conducted. While it is possible to compost mixed MSW without any pre-processing (in some of the facilities currently operating in the U.S., separation of objectionable material, contaminants, is reserved for the finished compost product, i.e., during the post-processing stage), the general experience has been that such a course is significantly less suitable in terms of efficiency of the compost process and quality of the compost product.

Unit processes involved in mechanical pre-processing of mixed MSW generally include size reduction, screening, magnetic separation for ferrous removal, glass removal, plastics removal, and separation of "lights" (paper, low-density plastics) and "heavies" (metals, glass, high-density plastics, organics, inerts). The position of each unit process in pre-processing depends upon the design objective and the particular approach taken by each vendor or designer.

Although size reduction may be done with the use of a flail, a ball mill, or a hammermill, the unit of choice typically is the hammermill because it has proven to be the best suited to MSW. Properly selected hammermills can reduce the material to a desirable size with minimum energy consumption. The types of hammermills typically used in the industry include the vertical and the horizontal. Both types have their respective advantages and disadvantages. Regardless of type, it is essential that the mill be rugged and reliable, and designed such that it can be repaired and maintained with a minimum of downtime. Principal expense items are energy, and wear and tear of the hammers, and screen or grate bars.

Particle size classification not only provides the particle size best suited to efficient composting, but also to the satisfactory performance of the pre-processing equipment. Unfortunately, this is one critical aspect of process design that often is overlooked. Control of particle size not only has an impact on the size reduction device, but also on other unit processes and on the quality of the finished compost. In most contemporary designs, particle size classification is carried out by means of screens. Of the several types of screens, the trommel and the shaker (flat bed) screen have been found to be the most common and effective. Usually, both types are used in a given operation. A type of screen, often termed a stoner, may be useful in separating glass and some of the more dense components (e.g., inerts, organics) from the waste stream. The stoner is an inclined shaker screen across the surface of which an air stream is directed. The air flow fluidizes the light material and allows for segregation of the light organic matter from the more dense inorganic materials.

Ferrous material is removed by passing the wastes under, over, or around a magnet. The passing is done by spreading the material on a conveyor belt or belts. The magnet usually is positioned: 1) a few inches above the belt; or 2) as a roller around which the belt is passed. A combination of the arrangements may be used.

Air classification is a unit process that depends upon the interaction between a moving air stream and shredded material within a column. This interaction leads to the generation of drag forces on the particles. Drag forces are simultaneously opposed by gravitational force. As a result of the interplay of the two forces, refuse components characterized by a large drag-to-weight ratio are suspended in the air stream ("lights"), whereas those characterized by small ratios ("heavies") tend to settle out of the stream. The unit in which air classification takes place is called an air classifier. In air classification, paper and film plastic tend to be concentrated in the light fraction. Metals and glass constitute the principal components of the heavy fraction, as do inerts and heavy organic materials (such as food wastes). Despite the considerable number of air classifier designs, they are all based upon identical fundamental principles and can be fitted into one of three broad groups, horizontal, vertical, and inclined. Each type has advantages and disadvantages.

In contrast to ferrous removal, existing methods for non-ferrous removal are as yet in the developmental stage. Some composting facilities incorporate aluminum separation that involves a combination of magnetic induction and eddy currents over an inclined plane. However, the permissible rate of throughput and removal efficiency are low. Some of these units require a relatively clean aluminum fraction; otherwise the recovered material is "contaminated" with other non-ferrous metals (such as brass and copper) commonly found in the waste stream.

Flotation in water and sometimes in other liquids is one means for separating glass from other materials in the waste stream. Flotation is being used by one facility to remove inorganic matter from the compost feedstock. The water used in the flotation process is used to control the moisture of the composting mass. The grit removed in the process may be used as road construction material.

COMPOSTING

Composting takes place in two stages, although the transition from the first to the second stage is gradual and may be interrupted. The first is the active stage. Readily biodegradable material is decomposed to less readily degraded intermediates. During the active stage, biological activity proceeds at its highest rate, and the temperature of the composting mass rises rapidly.

The second stage is known as the curing stage. With the decomposition of the readily biodegradable materials and consequent disappearance of the readily available nutrients, microbial activity slows and the temperature of the composting mass drops. The second stage ends when the compost material reaches the required degree of stability.

Available composting processes may be classified as either windrow or in-vessel. Windrow composting may be further sub-divided into static or turned windrow.

Windrow

Oxygen is required for microbial activity in the composting process. The main source of oxygen is the air entrapped in the spaces between particles (interstices). The diffusion into the outermost layer of the windrow from the ambient air provides some, but much less, oxygen than the entrapped air. The various types of windrow composting are divided into two broad types on the basis of method of renewing the interstitial air in the windrow. The types are: 1) turned windrow; and 2) static windrow.

Areas where the windrows are constructed should be contoured such that they do not receive runoff from surrounding areas and that runoff and leachate from the windrow area can be collected for treatment or be discarded into a sewer. All-weather access should be available to all windrows. Surfaces on which material preparation takes place and where piles are being actively worked should be paved.

For facilities that operate year round (i.e., organics and mixed MSW), processing areas and windrows should be sheltered from rain and snow during the active composting stage. In some instances, the shelters may consist of only roofs.

Turned Windrow

In the turned windrow, interstitial air is renewed by tearing down the windrow and immediately reconstructing it.

The cross section of the windrow generally takes a trapezoidal shape. In some instances, the tip of the windrow may be flattened in order to allow for the easy flow of rainfall from the material.

The height of the windrow usually is between 5 and 8 ft, or that determined by the clearance of the turning equipment. The width generally fluctuates between 12 and 15 ft, or that determined

by the turning equipment. The maximum length of the windrows is a function of the land area available for composting.

Any convenient method is followed for the construction of the windrows. One approach is to spread the waste in a 2-ft layer and then stack it to form a windrow with the use of a front-end loader (or other suitable machine). Compression and compaction of the material should be kept at a minimum during the construction.

Frequency of turning is ideally determined by the oxygen needs of the microbial population. A number of factors influence this frequency, namely, degradability and chemical composition of the waste, structural strength of waste particles (maintenance of pile porosity), moisture content, and various environmental factors. Within limits, frequency of turning determines speed of decomposition (i.e., the more frequent the turning, the shorter the required detention or residence time). Unfortunately, in practice, frequency of turning generally is dictated by availability of turning equipment, availability of personnel, and area constraints.

For smaller operations (on the order of 10 tons per day or less), a front-end loader is sufficient to turn the piles. The process, however, must rely on the ability and dedication of the front-end loader operator. For large operations, a mechanical turner typically is used.

One of the disadvantages generally mentioned about windrow composting is the relatively large area requirement. Most operations use on the order of 0.06 to 0.12 acres per ton per day of incoming waste. Numerical values are highly approximate because requirements depend upon specific circumstances of the given operation.

Static Pile (Forced Aeration)

In the static windrow, interstitial air is continually or periodically replenished by forcing air into the windrow. Hence, the static windrow method is also known as the "forced aeration" method.

In some cases, air renewal is carried out only by way of diffusion of external air into the windrow. Cylinders of wire or plastic mesh are inserted into the pile in the hope that air will diffuse from the cylinders into the surrounding material. Despite claims to the contrary, this method is not as effective as the others and therefore the composting process is slowed down considerably.

In the static pile, the windrows are underlain with a network of perforated ducts connected to a blower (fan). The system is designed such that air either can be forced (positive pressure) through the composting waste or can be drawn (negative pressure) through the mass. The direction of air flow is a function of type of waste and degree of decomposition, as well as general location of the facility.

The general shape and dimensions of the windrow are much the same as for the turned windrow. Area requirements for the static pile are much the same as those for the turned windrow approach, except that space is not required for the reconstructing of windrows.

In-Vessel Composting

In-vessel systems involve the use of a reactor in which the active stages of the compost process theoretically take place under ideal conditions. Because of the costs involved, residence time in the reactor is as short as is feasible. Consequently, the necessary maturation and curing is generally accomplished in a windrow.

At the present time there are four general types of reactors used for composting the organic fraction of MSW. A brief discussion of each follows.

The first type discussed is the **rotating horizontal drum.** This type of system has been applied to the treatment of waste materials for a number of years. The interior of the drum is equipped with vanes to impart a tumbling action to the composting mass as the drum rotates. Examples are the Dano and Eweson drums. The Eweson drum is divided into compartments.

The **vertical silo digester** may be cylindrical, square, or rectangular in cross section. The silo may be divided into a series of levels or floors. Air is introduced at the base of the silo and exits from the top. The silo is loaded by way of the top and processed material is discharged at the bottom. Vertical silos have not been applied to the composting of MSW in the U.S. and have been mostly used for composting sewage sludge.

The **horizontal tank** consists of a rectangular structure. The structure generally involves either concrete or metal flooring and concrete walls. The structure is not covered. The tank has a perforated floor through which air is forced into the composting waste. The contents are mixed and further aerated by way of a specially designed endless conveyor belt or a paddle wheel mounted on wheels. The mixers move along the length of the tank on rails placed either on the bottom of the tank or on the top of the walls. The composting mass is kept in the tank anywhere between 15 and 21 days. After removal from the tank, the material is stacked in windrows for a 5- to 6-week detention period.

Another type of composting unit is the **cylindrical tank.** The tank is built of masonry or steel with a structural steel carriage pivoted in the center. Drive wheels located at the perimeter end of the carriage ride on a track around the top of the circular wall. Multiple augers supported from the carriage extend down into the reactor tank. The augers are perforated for aeration purposes. Waste is introduced from the top of the unit. The Fairfield digester is an example of this type of composting system.

POST-PROCESSING

In general, post-processing is used only to the extent and degree dictated by the intended use of the product and by the market for it. It might involve some size reduction, and certainly would require screening. In some cases, even bagging is required. Equipment used for post-processing usually is the same as that used in pre-processing.

CO-COMPOSTING WITH SEWAGE SLUDGE

In some instances, consideration may be given to composting a mixture of MSW and sewage sludge. This process is usually known as co-composting. Co-composting of MSW and sludge has been seriously considered by several communities for three primary reasons. The first one involves the availability of a readily available bulking agent (MSW) to treat the sludge. The second reason deals with the potential to simultaneously treat two residues and produce a usable product. The third reason is that sludge is highly biodegradable and is rich in microbial and plant nutrients (the exception is potassium). Hence, its addition to MSW would enhance the compost process and result in a nutritionally improved compost product.

In order to avoid endangering the public health and lowering the quality of the environment, the sludge must have been digested either anaerobically or aerobically or both, and dewatered to at least 20% solids (preferably higher). The dewatering is needed to avoid excessive moisture and the problems that accompany that condition. In fact, the higher the solids content of the sludge cake, the better in terms of trouble-free composting.

Perhaps the gravest disadvantage to co-composting sludge with other solid wastes is the fact that in most states, the addition of sludge *ipso facto* places additional regulatory requirements on the process and may restrict the use of the finished product. As such, its marketability may be reduced.

The regulatory restrictions are based on the fact that sewage sludge is likely to be contaminated with pathogens, heavy metals, and/or toxic organic chemicals. The pathogen problem can be eliminated by sterilizing the sludge. Pathogen destruction is regulated by requiring that the composting material be exposed to certain temperatures for specific lengths of time. The heavy metal and toxic organic problems are more difficult to overcome. Moreover, the metal and toxic chemical concentration of some industrial sludges may be sufficiently great as to relegate the co-compost product to the lowest grade of use.

A lesser argument is that the user acceptance of the co-compost product may be adversely affected simply because of the fact that sludge is a human body waste. Among the other contrary arguments are objectionable odors and that vectors attracted to the composting waste could become carriers of organisms pathogenic to human beings.

The conclusion is that when sludge is involved, housekeeping becomes important. Proper sanitation is essential.

GENERAL OBSERVATIONS

Because of the relatively high capital, maintenance, and operational costs of the equipment required in composting operations of any appreciable magnitude, the tendency toward underdesign becomes pronounced. The unavoidable and hence, inevitable, consequences of underdesign are unsatisfactory performance and ultimate failure. For the same economic reasons, combined with a severe lack of understanding of the operational features of the unit processes used for treating MSW, some of the facilities are grossly overdesigned. This unfortunate situation also leads to failure.

The relatively high capital and operating costs involved in the implementation of an MSW composting operation make it imperative that financial resources be sufficient to allow some latitude for making minor changes and for unexpected reverses.

Section 5

SITING, PERMITTING, AND OPERATING REGULATIONS

INTRODUCTION

This section identifies and discusses pertinent regulatory requirements for municipal solid waste (MSW) composting facilities at the federal, state, and local levels. It describes regulations that affect siting, permitting, facility design, facility operation, and end use of the finished compost product.

Some facilities mix sludge with municipal solid waste, a process known as co-composting. Regulations that affect the management and disposal of sludge vary according to the source of the sludge. Municipal sludge from publicly-owned treatment works is treated differently in the regulations than industrial sludge and sludge from privately-owned treatment facilities. This section does not describe, in detail, these various regulations.

FEDERAL REGULATIONS

At the federal level, facilities must comply with 40 CFR Part 257, which contains general requirements for all solid waste disposal facilities, excluding landfills. Part 257 is presented in Appendix A. Examples of regulations found within Part 257 include:

- facilities or practices in floodplains shall not restrict the flow of the base flood, reduce temporary water storage capacity of the floodplain, or result in washout of solid waste;
- facilities or practices shall not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife nor shall they destroy or adversely modify the critical habitat of such species;
- a facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System under section 402 of the Clean Water Act;
- a facility or practice shall not contaminate an underground drinking water source beyond the solid waste boundary;
- the facility or practice shall not engage in open burning of residential, commercial, institutional, or industrial solid waste;
- in relation to the Clean Air Act, the facility shall not violate applicable requirements developed under a State Implementation Plan.

If sewage sludge or septic tank pumpings are mixed with the MSW and if the finished compost is subsequently applied to the land surface or is incorporated into the soil, the sludge or pumpings must be treated by one of two processes: Process to Significantly Reduce Pathogens (PSRP) or Process to Further Reduce Pathogens (PFRP).

The PSRP method, as applied to composting, requires that solid waste be maintained at minimum operating conditions of 40°C for 5 days. In addition, the temperature must exceed 55°C for 4 hours during this period. This requirement applies to in-vessel, static aerated pile, or windrow composting methods. The PSRP method is applicable if the land to which the material is going to be applied is not used to grow crops for direct human consumption within 18 months subsequent to application.

The PFRP method, as applied to composting, requires that, using the in-vessel or static aerated pile composting methods, the solid waste is maintained at operating conditions of 55°C or higher for three days. Using the windrow composting method, the solid waste shall attain a temperature of 55°C or higher for at least 15 days during the composting period. Also, during the high temperature period, there shall be a minimum of 5 turnings of the windrow. The PFRP method applies if the sludge compost is applied to lands where crops for direct human consumption are grown within 18 months subsequent to application of the material.

Other federal regulations that apply to air emissions, wastewater discharge requirements, and construction within a wetland may also apply, depending upon the specific site chosen.

LOCAL REGULATIONS

At the local level, MSW compost facilities are not regulated by the Kane County Zoning Code. According to the Illinois Environmental Protection Agency, any MSW compost facility which serves more than one municipality is considered a regional pollution control facility. Such facilities are exempt from local zoning, and therefore Kane County's zoning regulations are not applicable. According to representatives from the Kane County Zoning Department, appropriate locations for an MSW composting facility would be in areas zoned industrial, light industrial, or, in some cases, commercial. Local building codes may apply to any structures constructed upon the site. Additionally, certain soil and erosion control ordinances may apply to "non-active" portions of sites. No other local governmental regulations are known to be applicable.

STATE REGULATIONS

State regulations of MSW compost facilities are more specific than federal or local regulations; therefore, the remaining sections of this report describe state regulations.

SITING

Local Siting Approval

Under state law, an MSW compost facility receiving waste from more than one jurisdiction is considered a regional pollution control facility and, therefore, must obtain local siting approval.

Regional Pollution Control Facilities are defined by the Illinois Environmental Protection Act (Ill. Rev. Stat. ch 111½, 1001 et seq) as those "waste storage sites, sanitary landfills, waste disposal sites, waste transfer stations, waste treatment facilities, or waste incinerators that accept waste from or that service an area that exceeds or extends over the boundaries of any local general purpose unit of government."

In order for a public or private entity to build and operate an MSW compost facility within Kane County, it would first need to obtain local siting permission under the process that is commonly known as SB 172 (Ill. Rev. Stat. ch 111½, 1039.2). SB 172 requires that a regional pollution control facility application be approved if it meets the following criteria:

1) the facility is necessary to accommodate the waste needs of the area it is intended to serve;

2) the facility is so designed, located, and proposed to be operated that the public health, safety, and welfare will be protected;

3) the facility is located so as to minimize incompatibility with the character of the surrounding area and to minimize the effect on the value of the surrounding property;

4) the facility is located outside the boundary of the 100 year floodplain or the site is flood-proofed;

5) the plan of operations for the facility is designed to minimize the danger to the surrounding area from fire, spills, or other operational accidents;

6) the traffic patterns to or from the facility are so designed as to minimize the impact on existing traffic flows;

7) if the facility will be treating, storing, or disposing of hazardous waste, an emergency response plan exists for the facility which includes notification, containment, and evacuation procedures to be used in case of an accidental release;

8) if the facility is to be located in a county where the county board has adopted a solid waste management plan, the facility is consistent with that plan; and

9) if the facility will be located within a regulated recharge area, any applicable requirements specified by the Board for such areas have been met.

Each of these (applicable) criterion must be proven by the applicant before the Kane County Board or by the governing board of the municipality if located within municipal boundaries. Failure to satisfy the hearing board of any one of these SB 172 criterion will result in the denial of the local siting approval. The local hearing board may also consider the applicant's previous operating history with regard to criteria 2 and 5 above.

The local hearing board must hold at least one public hearing on which to base their decision. That initial hearing must take place no sooner than 90 days after the application was filed, but no later than 120 days from the date of filing. A 30-day public comment period must be provided between the last public hearing and the decision of the local hearing board. The final decision of the local hearing board must be given within 180 days of the date of application (unless extended). The applicant shall have the right to file one amended petition during the course of the petitioner's presentation. Such an amended application will extend the final local decision deadline by 90 additional days.

Under the SB 172 process, Kane County could be the applicant for an MSW compost facility, should the County decide to own or sponsor one. The County would either be applying to itself or to the board of a municipality within the planning area to obtain site approval.

Historically, most local decisions, whether granting or denying local approval, have ultimately been upheld on review by the Pollution Control Board (PCB) or the Appellate Courts. Denial of local siting has typically centered around the first two criteria: the "need" criterion and the "health, safety, and welfare" criterion. The PCB and the Appellate Courts have given great deference to those jurisdictions that have denied local siting on the basis that no need exists, when that local jurisdiction was currently undertaking planning efforts. In Kane County's case, the need for an MSW compost facility would depend, in part, on available landfill capacity within the County and the extent to which other waste management methods, such as recycling, were managing the municipal waste stream.

The most common criterion used to deny local siting approval is that the proposed facility failed to be "designed, located, and proposed to be operated that the public health, safety, and welfare would be protected." The Pollution Control Board, on review, has upheld locally different standards for landfill applications. It is difficult to predict what difficulties may be encountered by an MSW compost facility application, when attempting to meet this criterion.

Upon the receipt of local site approval, a party wishing to construct a regional pollution control facility must then proceed to apply for the requisite state and federal permits (if applicable) within a period of two years after receiving final local approval.

Facility Siting Requirements

The Illinois Environmental Protection Agency (the Agency) has specific siting requirements for an MSW compost facility. According to instructions attached to the Solid Waste Composting

Facility Permit application LPC-PA6 (see Appendix A), the site must meet the following locational requirements:

- 200-ft setback between the boundaries of the site and any potable water supply well;
- outside the 10-year floodplain or the site shall be flood-proofed;
- location of the site shall minimize incompatibility with the character of the surrounding area;
- 200-ft setback between the boundaries of the site and any residence; and
- design of the facility is such that no compost is placed within 5 ft of the water table.

These are minimum requirements. Stricter requirements may apply. For example, in the case of a landscape waste compost facility which is developed or expanded after 1991, the composting area must be located at least 1/8 mile (660 ft) from the nearest residence (other than a residence located on the same property as the facility). It is probable that an MSW compost facility would be required to meet or exceed this same standard. In fact, MSW compost facilities are now being considered transfer stations by the Agency, because they accept mixed waste and transfer a portion of it to landfills. According to Ill. Rev. Stat. ch 111½, 1022.14, any regional pollution control facility which is used as a garbage transfer station must not be located less than 1000 ft from the nearest property zoned for primarily residential uses or within 1000 ft of any dwelling. These requirements are much more restrictive than the 200 ft setback listed on the MSW compost facility permit application.

The floodplain standard offers another example of potentially stricter siting standards. According to the Agency, if an MSW compost facility qualifies as a regional pollution control facility, then the 100-year floodplain standard applies rather than the 10-year floodplain standard. In other words, the facility must be located outside the boundary of the 100-year floodplain or the site must be flood-proofed.

Desirable Site Requirements

Additional siting criteria which are recommended for use when selecting a site are presented in Table 5-1. The first column lists major siting factors. The second column lists siting criteria which are established in state, federal, or local regulations. Most of these have been discussed previously. Three of these criteria are exclusionary under Illinois law: 200 ft setback from potable water supply; 200 ft setback from any residence; and no compost within 5 ft of water table. The other criteria, such as location in a floodplain or wetland, are not exclusionary but require mitigation. Due to difficulties in adequately mitigating impacts associated with facility siting, it is desirable to avoid sensitive natural and institutional features.

Table 5-1. Siting Factors For Municipal Solid Waste Composting Facilities

Siting Factors	Minimum Existing (E) and Proposed (P) Requirements	Additional Siting Considerations
Natural Features - floodplain - wetland - endangered species - soils - surface water	floodplain development permit may be required by IDOT if in floodplain; USEPA and Army Corps permits required if in wetland (E); outside 10 year floodplain or floodproofed (E); no compost within 5 ft of water table (E)	avoid siting in floodplain, wetland or near surface water; select well-drained, low-clay soils suitable for road and building construction; avoid endangered species habitat
Institutional Features - historical - archeological - paleontological - schools/hospitals - municipal wells - private wells	200 ft setback between site boundary and any potable water supply (E)	avoid hist, arch, and paleo sites; a minimum of 500 ft from schools/hospitals suggested, minimize truck routing near schools and hospitals
Land Use - existing residential - existing commercial - forest preserves/parks	200 ft setback between site boundary and any residence (E)	relatively flat terrain located in agricultural or vacant land area; avoid residential areas; may be incompatible with some commercial uses; recommend a minimum 500 ft setback between active compost areas and residences
Traffic Patterns - access - weight limits - visibility from public roads - haul distance	must comply with municipal township, or County road requirements; if enter on U.S. or State road may need permit from Department of Transportation	access on four-lane 9 or 10 ton road with traffic controls or turning lane at entrance desirable
Other - size - proximity to waste shed - utilities	no other State or Federal requirements for MSW composting facilities	6 to 12 acres per 100 tons of daily composting capacity suggested; depends on technology and expected expansions; should be located near center of wasteshed; minimize haul distance for distributing compost; access to water, sewage treatment, and electrical utilities desirable

The third column of the table lists desirable siting criteria. The facility should be buffered from sensitive odor receptors (residential areas, hospitals, schools). It should not impact surface water, floodplains, and wetlands. It should be accessible by a road with a minimum 9 or 10 ton per axle weight limit. It should have access to potable water, sewage treatment, and electrical utilities. It should have suitable hydrology and geology and it should be relatively flat and large enough to provide adequate working and storage area. In addition, it is desirable that the site include a 200-ft buffer in order to ensure adequate distance between the facility and neighboring land uses.

PERMIT REQUIREMENTS

The following State permits (see Appendix A) are required prior to operation of an MSW composting facility in Illinois:

(i) General Application for Permit (LPC-PA1).

(ii) Certification of Siting Approval (LPC-PA8). This certification is only required if the facility is defined as a regional pollution control facility under SB 172.

(iii) Permit to Develop a Solid Waste Composting Facility (LPC-PA6).

(iv) Operating Permit (LPC-PA4).

(v) Closure Plans and Post-Closure Care Plans (LPC-PA11).

(vi) Notice of Application for Permit to Manage Waste (LPC-PA16).

Water pollution control and air emission permits may also be required, depending upon facility design and operation. Permits may be required from the Illinois Divisions of Land Pollution Control, Air Pollution Control, and Water Pollution Control. The state has a coordinated permit review process under Ill. Rev. Stat. Chap. 111½, 1039. All permit applications should be submitted to the Agency at the same time.

On or before the applicant files an MSW composting permit application with the Agency, the following persons must be sent written notices of intent to file a permit (Permit LPC-PA16): State's Attorney, Chairman of the County Board in which the facility is located, all members of the General Assembly from the legislative district in which the site is located, and the clerk of each municipality, any portion of which is within 3 miles of the boundary of the facility. The notice must provide a clear and concise description of the project.

The Solid Waste Composting Permit application (LPC-PA6) requests the following types of information:

- topographic map of the site and the surrounding area within 500 ft of site boundaries;

- a legal description of the proposed or developed waste management area;
- indication of the elevation of the water table, location of the 10-year floodplain, and location of the 100-year floodplain;
- description of the types of waste that are proposed to be handled by the facility;
- estimates of weights and volume of materials to be accepted at the site and an estimate of the maximum annual volume of waste the facility will be able to process;
- the area to be served by the facility;
- description of design and operation of the site;
- end uses of the compost;
- closure and post closure plans; and
- a description of the record keeping procedures that will be used.

The applications should be reviewed for a complete list of all information that is required for submittal.

According to the Agency, it takes a minimum of six months to obtain a development permit. The Agency is allowed up to 90 days to review an application for a development permit. On a new facility, it usually takes two submittals of the application before a permit for construction is issued. After the facility has been developed, the operator must apply for an operating permit. The Agency is allowed up to 45 days to review an operating permit application.

FACILITY DESIGN AND OPERATION

General Requirements

The compost site must be designed and operated in such a way as to not cause or allow the open dumping of any waste in a manner which results in any of the following occurrences at the compost site: litter, scavenging, open burning, deposition of waste in standing or flowing waters, proliferation of disease vectors, or standing or flowing liquid discharge from the site.

According to the Solid Waste Composting Facility permit application, the permittee shall implement best management practices to control runoff from areas where materials are loaded, unloaded, stored, and composted. Runoff from the permitted facilities shall not cause or contribute to a violation of the water quality standards contained in 35 IAC 302. Sampling for BOD, Total Suspended Solids, Ammonia as N, pH, or other parameters may be required. If any water is to be discharged, the Division of Water Pollution Control Section must be contacted. Any other leachate generated on site in addition to runoff must also be collected and managed.

It is probable that the Agency will utilize additional operating standards in the evaluation of an MSW composting permit application. For example, the Environmental Protection Act (Ill. Rev. Stat. ch 111½, 1039) establishes operating standards for landscape waste compost facilities; these same standards may also be applied to MSW compost operations.

These standards state that, "the operation of such [landscape waste] facility shall include appropriate dust and odor control measures, limitations on operating hours, appropriate noise control measures for shredding, chipping, and similar equipment, management procedures for composting, containment and disposal of non-compostable wastes, a description of procedures to be used for terminating operations at the site, and record keeping sufficient to document the amount of materials received, composted, and otherwise disposed. The operator must submit a written annual statement to the Agency on or before April 1 of each year that includes an estimate of the amount of materials, in tons, received for composting."

As of December 1991, no specific regulations governed the operation of MSW composting facilities in Illinois, other than those described above. An Agency representative indicated that provisions and requirements of the Environmental Protection Act, and regulations adopted thereunder, would be applied during review of a compost site application, with particular attention given to groundwater monitoring, surface water control, and odor control provisions. Current regulations concerning the siting and operating of landfills, transfer stations, and landscape waste compost facilities would be taken into consideration during the review.

Freeport Facility Requirements

Only one permit has been issued by the Agency for operation of an MSW compost facility thus far. This facility, located in the City of Freeport in Stephenson County, received a permit on October 25, 1991. It is a transfer/recycling station and solid waste compost site, utilizing Eweson digesters. The 7 acre, 75 ton per day facility will be constructed and operated by Recomp of Illinois.

Special conditions attached to the Agency permit for this facility are indicative of what the Agency may expect of other similar compost facilities. Therefore, the permit is included in Appendix A and key design and operating requirements are listed below:

- Measures shall be taken to ensure that the waste does not become wind strewn or ignited and that no other provisions of the Environmental Protection Act are violated.

- The facility shall be operated to prevent problems with odor and to maximize the decomposition process.

- Material may be received at the composting unit from 8:00 a.m. to 5:00 p.m., Monday through Friday, and 8:00 a.m. to noon on Saturday.

- Fire safety equipment (fire extinguishers) shall be maintained in accordance with recommended practice.

- At the end of each day of operation, all waste shall be removed from the tipping floor. The tipping floor shall be swept to remove all waste. Waste may be left at the site overnight; however, it shall be in a covered container or waste collection vehicle.

- All waste as received shall be recycled, placed in the vessel digester, or removed from the site within 48 hours of receipt. All rejects from downloading of the vessel digester shall be removed in covered trucks as soon as practicable.

- A vector control specialist shall inspect the transfer station building at least quarterly. If necessary, vector control measures shall be taken.

- This facility shall not accept, receive, store, transfer, or otherwise manage any liquid or special waste which is not generated on site.

- Runoff from the permitted facilities shall not cause or contribute to a violation of the water quality standards contained in Ill. Adm. Code 302. The permittee shall implement best management practices to control runoff.

- The by-products from this facility, including residuals and recyclables, must be stored to prevent vector intrusion and aesthetic degradation. Materials that are not composted must be removed at least once per week.

- Runoff water that has come in contact with composted waste, materials stored for composting, or other residual waste must be handled as leachate.

- The temperature and retention time for all material being composted must be monitored and recorded each working day. These records shall be kept on site for 3 years and made available to Agency personnel upon request.

- The compost shall be monitored at least once per week and tested for the following parameters: percent of total solids; volatile solids as a percent of total solids; pH; Kjeldahl ammonia, and nitrate nitrogen; total phosphorus; cadmium; chromium; copper; lead; nickel; zinc; mercury; and polychlorinated biphenyls (PCBs). All analyses must be reported on a dry weight basis in parts per million.

- Quarterly reports shall be submitted to the Agency within 30 days after the end of each calendar quarter (required contents of the report are listed in the permit in Appendix A).

- The composting process shall use one of the acceptable methods listed below to reduce pathogens:

  a. The static aerated pile method for reducing pathogens consists of an unconfined composting process involving mechanical aeration of insulated

compost piles. Aerobic conditions must be maintained during the compost process. The temperature of the compost pile must be maintained at 55°C for at least seven days.

b. The enclosed vessel method for reducing pathogens consists of a confined compost process involving mechanical mixing of compost under controlled environmental conditions. The retention time in the vessel must be at least 24 hours with the temperature maintained at 55°C. A stabilization period of at least seven days must follow the decomposition period. Temperature in the compost pile must be maintained at least at 55°C for three days during the stabilization period.

- The permittee shall submit an annual report to the Agency (required contents of the report are listed in the permit).

- The operator shall initiate implementation of the closure plan within 30 days after the site receives its final volume of waste.

- The maximum amount of waste which can be received at this compost facility is 75 tons per day based upon the digestion vessel size; a supplemental permit is required to increase daily capacity.

- The operator of this facility shall provide information to this Agency after 120 days of operation, that demonstrates that no significant odor problems are associated with the compost operation. A supplemental permit application is necessary to fulfill this permit condition.

- The operator shall record the temperature within the digester vessel each 4 hours of operation and maintain a record. If the digester temperature fails to reach 120°F after 8 hours of operation each day, a new operating plan to destroy pathogens and manage the compost must be approved by the Agency, by supplemental permit.

- Management of unacceptable waste

  a. Landscape waste which contains large material and is not processed such that it would be rejected by the screening process which follows downloading of the "in-vessel digester" may not be placed into the digester. It must be removed the same day as received and transported to a facility that is operating in accordance with the Environmental Protection Act, Title V, Sections 21 and 39.

  b. Lead-acid batteries will be removed the same day and transported either to a drop-off center handling such waste, or to a lead-acid battery retailer.

c. Special wastes including hazardous waste, non-hazardous special waste, and hazardous hospital waste shall be containerized separately and removed as soon as possible by a licensed special waste management facility that has obtained authorization to accept such waste. The operator shall maintain a contract with haulers so that the immediate removal is ensured. The operator shall develop an emergency response/action plan for such occurrences. (See permit for additional regulations concerning removal of unacceptable waste.)

END USE OF COMPOST

Representatives from the Agency indicate that compost would be considered a soil amendment and that the Agency may regulate its use more stringently than it does compost from landscape waste compost facilities. If sludge is included in the composting process, then regulations that apply to sludge disposal would be applicable.

Ill. Rev. Stat. ch 111½, 7053 states that "all State agencies responsible for the maintenance of public lands in the State shall, to the maximum extent feasible, give due consideration and preference to the use of compost materials in all land maintenance activities which are to be paid for with public funds." In response to this directive, the Illinois Department of Transportation has prepared general guidelines for the use of compost. These guidelines were mentioned by several public sector representatives during the Kane County compost market survey. The guidelines are presented in Appendix A.

The guidelines state that all compost must be produced at an Agency registered composting facility. The compost shall be placed to the lines, grades, and depths specified on the plans. After the Engineer verifies that the proper compost depth has been applied, the Contractor shall completely incorporate the compost into the soil to a minimum depth of six (6) in. by raking, discing, or tilling. After the compost has been incorporated into the soil, any debris or piles of unincorporated material shall be immediately removed from the right of way and the area finished to the lines and grades shown on the plans.

No other regulations are known to exist at the State level which regulate the use of finished compost. Also, there are no known material specifications for compost that are uniformly used by public agencies in Illinois.

Table 6-1. MSW Composting Market Survey

Business Type	Contacts Attempted	Surveys Completed *
Nurseries/Landscapers	43	18
Sod Producers	17	2
Topsoil Suppliers	17	4
Park Districts	6	6
Public Works Agencies	15	12
Other Agencies	5	2
Total	**103**	**44**

* Excludes businesses and agencies that do not currently use compost or soil amendments.

Nurseries/Landscapers

Compost can be utilized in a wide variety of nursery applications. Examples are bare roots nurseries, Christmas tree farms, production of plants in containers, and forest seedling nurseries. Significant quantities of organic soil amendments are used by landscapers and gardeners. New construction projects (e.g., residential housing developments and commercial buildings) create a high demand for the products. The 18 nurseries/landscapers that responded to the survey indicated that the soil amendments used most often are: bark (61%), mushroom compost (61%), landscape compost (39%), peatmoss (39%), perlite (39%), and woodchips (33%). Other soil amendments used are manure, sawdust and shavings, topsoil, fish meal, and straw.

Nurseries use the bark and mushroom compost for either wholesale or retail sales and primarily purchase the materials in bulk. Landscapers use the bark and mushroom compost in their landscaping projects.

Sod Producers

Sod producers use significant quantities of soil amendments and topsoil inasmuch as the sod they distribute includes soil, which must be replenished. Two sod farms responded to the survey. The following soil amendments were reported as being used by one of the respondents: landscape compost, manure, peatmoss, perlite, topsoil, and biostimulants.

Topsoil Producers

Topsoil producers use a variety of soils and soil amendments to produce topsoil and other blends for wholesale and retail sales. The four topsoil producers responding to the survey indicated that the soil amendments used most often are topsoil (75%), manure (50%), woodchips (50%), and mushroom compost (50%). Other soil amendments used are landscape waste compost, peatmoss, and sand. These materials are primarily used to blend into various types of topsoils.

Municipal Agencies

Municipalities and other government agencies often require organic soil amendments for use as a soil conditioner or top dressing. Examples of uses are: parks, recreation areas, landscaping, turf repair, landfill cover, land reclamation, and highway construction and maintenance. The 12 public works departments responding to the survey indicated that the soil amendments used most often are topsoil (100%), woodchips (75%), and straw (67%). Other soil amendments used are the following: landscape waste compost, bark, peatmoss, perlite, sawdust and shavings, sludge compost, and mushroom compost. Public works departments use topsoil for landscaping, restoration, and repair projects. Woodchips and straw are used for landscaping and erosion control. These materials typically are purchased in bulk.

Six parks districts responded to the survey, indicating that topsoil (100%), woodchips (100%), straw (83%), and peatmoss (67%) are used most often as soil amendments. Other materials used include: landscape waste compost, bark, manure, perlite, and mushroom compost. Parks districts primarily use topsoil, woodchips, and straw for landscaping, restoration, and erosion control. The materials are purchased in bags or in bulk depending upon the quantities required.

The Illinois Department of Transportation uses topsoil and straw, and the Forest Preserve uses manure, peatmoss, perlite, topsoil, straw, and woodchips. These materials are primarily used for landscaping and mulching.

Summary

The soil amendments used most frequently by the respondents to the survey are: topsoil (61%), woodchips (55%), straw (45%), and peatmoss (41%). The percentage of respondents using each of the soil amendments is presented in Table 6-2.

A summary of the use of soil amendments divided by market segment is presented in Table 6-3. The information in the table shows that relatively large quantities of topsoil and woodchips are reported to be used in the Kane County area. The information in the table also indicates that although there are several users of landscape waste compost, the quantities used are not monitored. In addition, the results show that public agencies represent good potential markets for MSW compost.

Estimated quantities of soil amendments used by each market segment surveyed are presented in Table 6-4. The estimates are based on quantities reported by users and available data from other municipalities. The information in Table 6-5 indicates that current uses of topsoil could reach more than 50,000 tons/year. Landscape waste compost use is about 20,000 tons/year and mushroom compost use is approximately 12,000 tons/year. Other soil amendments are used in lower quantities.

Potential Use of Compost

The results of the survey indicate that 95% of the respondents are aware that compost can be produced from recycled wastes. However, 76% of the respondents indicated that they would have specific requirements for the compost product. The requirements mentioned most frequently were: contaminants, particle size, pH, heavy metals, and odor. The requirements mentioned by respondents are summarized in Table 6-5.

Based on the results of the market survey and information collected elsewhere, it can be estimated that the market could absorb about 40,000 tons of MSW compost per year. The compost would complement landscape waste compost and topsoil. This is a conservative estimate which could be increased by producing a high quality compost (free of contaminants) combined with an aggressive education and demonstration program aimed at the largest potential users such as the various public agencies.

Since the composting facility is expected to produce about 53,000 tons of compost per year, the projected demand of 40,000 tons/year would leave a surplus of approximately 13,000

Table 6-2. Current Use of Soil Amendments

Soil Amendment	% of Respondents
Landscape compost	32
Bark	34
Manure	20
Peatmoss	41
Perlite	27
Sawdust and shavings	5
Topsoil	61
Fish meal	2
Straw	45
Woodchips	55
Sewage sludge compost	5
Mushroom compost	38
Other	9

Table 6-3. Summary of Use of Soil Amendments by Market Segment

		Nurseries/ Landscapers	Sod Producers	Topsoil Producers	Public Works	Parks Dept	Forest Preserve	DOT
Landscape Waste Compost	Usage (%)	39	50	25	33	17	0	0
	Qty reported (TPY)	0	0	0	6867	0		
	Users reporting (%) a)	0			75			
Bark	Usage (%)	61	0	0	17	33	0	0
	Qty reported (TPY)	2525			0	0		
	Users reporting (%)	73						
Manure	Usage (%)	17	50	50	0	33	100	0
	Qty reported (TPY)	124	1440	480		160	0	
	Users reporting (%)	100	100	100		50		
Peatmoss	Usage (%)	39	50	25	33	67	100	0
	Qty reported (TPY)	45	210	60	0.2	13.3	0.2	
	Users reporting (%)	86	100	100	25	100	100	
Perlite	Usage (%)	39	50	0	8	33	100	0
	Qty reported (TPY)	40	0		0	18.5	0.8	
	Users reporting (%)	43				100	100	
Sawdust and Shavings	Usage (%)	6	0	0	8	0	0	0
	Qty reported (TPY)	0			0			
	Users reporting (%)	0						
Topsoil	Usage (%)	17	50	75	100	100	100	100
	Qty reported (TPY)	150	14400	9600	5760	794	60	0
	Users reporting (%)	33	100	33	92	100	100	
Fish Meal	Usage (%)	6	0	0	0	0	0	0
	Qty reported (TPY)	0						
	Users reporting (%)							
Straw	Usage (%)	28	50	0	67	83	100	100
	Qty reported (TPY)	37	240		1	4.8	2	0
	Users reporting (%)	80	100		50	60	100	
Woodchips	Usage (%)	33	50	50	75	100	100	0
	Qty reported (TPY)	466	3000	38	974	238	15	
	Users reporting (%)	83	100	50	89	100	100	
Sludge Compost	Usage (%)	0	0	0	17	0	0	0
	Qty reported (TPY)				138			
	Users reporting (%)				100			
Mushroom Compost	Usage (%)	61	0	50	17	33	0	0
	Qty reported (TPY)	10268		208	0	56		
	Users reporting (%)	91		50		100		

a) Percentage of users providing quantity data.

Table 6-4. Estimated Quantities of Soil Amendments Used by Market Segment (Tons/Year)

	Nurseries/ Landscapers	Sod Producers	Topsoil Producers	Public Works	Parks Dept	Forest Preserve	DOT	Total
Landscape Waste Compost	1000	3000	4000	11000	1000			20000
Bark	3600			500	200			4300
Manure	170	1580	530		380	20		2680
Peatmoss	63	230	75	1	14	0.5		383.5
Perlite	100	10		0.5	22	1		133.5
Sawdust and Shavings	50			2				52
Topsoil	570	15840	30600	5760	800	60	4000	30600–57630
Fish Meal	20							20
Straw	60	260		2	8	2	1	333
Woodchips	1700	3300	84	1150	238	15		6487
Sludge Compost				170				170
Mushroom Compost	11300		460	100	70			11930

Table 6-5. Specific Requirements for Compost Product

Requirement	% of Respondents
Contaminants	28
Heavy metals	28
Particle size	21
pH	21
Product tested	21
Odor	17
Cost	17
NPK	14
Maturity	10
Meets regulations	10
Compaction	10
Herbicides, pesticides	10
Appearance	7
Liability	7
No sewage sludge	7
No pollutants	7
Salinity	7
Close proximity	3
Pathogens	3
Moisture content	3

tons/year. This surplus could initially be absorbed by the County in land reclamation or as landfill cover.

Section 7

RECOMMENDATIONS

Based on the results of the feasibility study, it is recommended that Kane County consider the implementation of MSW composting. As shown in Table 7-1, the total quantity of MSW that would be available for processing is approximately 213,388 tons/year. This quantity only includes wastes generated in the residential/commercial sector. A close assessment of industrial wastes may increase the quantities that could be processed. The information in the table also shows that organic waste materials comprise a relatively high fraction of the municipal solid waste stream in Kane County.

As has been discussed in previous sections, composting is one of the most benign alternatives capable of stabilizing the most common types of organic wastes present in the waste. It is important, however, to stress that the MSW composting program be considered as only one component of a comprehensive (integrated) solid waste management plan in Kane County. The composting program would be most effective if implemented in conjunction with an aggressive source separation program (curbside recycling) as well as home composting and waste reduction programs. The overall plan should not rely on any one system to achieve the County's goals for diverting wastes from the landfill. Furthermore, the plan must take into consideration other important factors such as cost, social acceptance, and environmental impacts.

At the present time, we recommend that landscape wastes continue to be collected and processed separately. This would allow for the continued production of a high quality soil conditioner that meets the needs of the market.

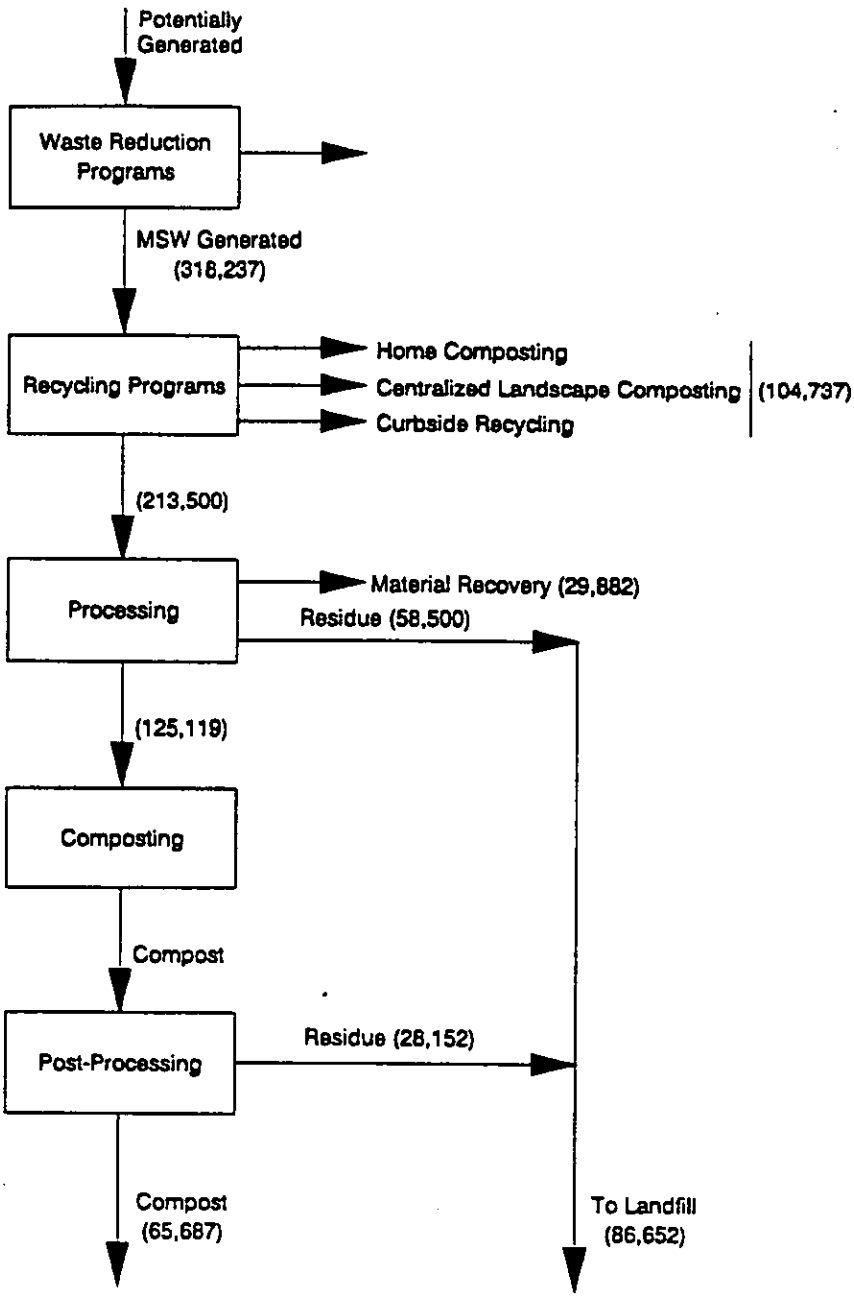
The results of the market survey, conducted as part of this study, demonstrate that the main competing materials for the compost that would be produced from MSW are: 1) compost produced from landscape wastes; and 2) spent mushroom compost. These materials are either given away for free or sold at a relatively low price. The results of the survey also indicate that, at the present time, there is a demand for topsoil. Compost made from MSW can fill that demand. In order to do so, the facility must be carefully designed and operated such that a high quality compost can be produced.

A schematic diagram of the overall program is presented in Figure 7-1. As shown in the figure, waste reduction and home composting efforts should be designed to help maintain, at the very least, the quantities of waste requiring collection at levels similar to those in 1991. That is, increases in waste quantities due to population growth and similar factors would not be realized in the next few years. In addition, curbside recycling programs would be encouraged and expanded to deal with other materials as practicality and marketability would allow.

The remainder of the waste stream would be transported to a processing facility. Depending upon the pattern and levels of urbanization in the county in the next few years as well as availability of sites, it may be advisable to consider the implementation of two sites. Two sites would reduce both the costs due to transportation and the land area requirements.

Table 7-1. Estimated Quantity and Composition of MSW Available for Composting

Component	Quantity (TPY)
Paper	
High Grade	6,842
Newspaper	8,020
Corrugated	18,442
Mixed Paper	52,605
Plastics	
HDPE	3,847
PET	716
LDPE	9,547
Other	14,639
Glass	9,547
Landscape Waste	0
Food Waste	21,004
Wood Waste	16,548
Textiles	11,851
Other Organics	13,048
Other Inorganics	11,457
Metals	
Aluminum Cans	255
Other Aluminum	907
Bi-Metal Beverage	5,744
Other Ferrous	7,735
Other Non-Ferrous	636
Total	213,388



*Quantities in tons per year

Figure 7-1. Schematic Diagram of Proposed Program (without Combustion)

In this particular case, we have assumed implementation of a single facility having a throughput capacity of about 850 tons/day. In addition, it is assumed that both the land and the facility would be publicly owned.

Due to changes that currently are taking place in waste processing and the expectation that new technologies will be developed within the next 4 to 8 years, the system is only described in terms of basic modules.

Waste materials would be delivered to the facility by collection vehicles. Each one of the vehicles would be weighed on a truck scale. The scale would be part of a complete data management system that would allow monitoring of all incoming and outgoing materials. After weighing, the waste materials would be discharged from the collection vehicles onto a covered, tipping area. Operators would remove large items that would be difficult to process mechanically and place them into bins. The remainder of the material would undergo a series of steps (manual and/or mechanical) aimed at recovering recyclable materials and at preparing a feedstock for composting. These steps are critical to the success of the composting facility. The processing would be divided into three lines. Each line would be capable of treating approximately 283 tons of material per day. The material separation portion of the facility would operate for two 8-hr shifts per day. The use of three lines provides sufficient redundancy for the facility to continue operations even if there is equipment malfunction in two processing lines. The type of unit processes in this operation include: two stages of trommel screening, size reduction, magnetic separation, and eddy current separation. In addition, a tin can flattener and a baler would be installed for preparing recovered materials for shipment. Recyclable materials would be shipped to market. The remainder of the output from this module would become the input to the composting area. Residues from this process would be transported to the landfill. A dust control system would be incorporated throughout the entire facility.

The composting process would be carried out using a modification of the bin system. In the system the material to be composted would be placed in concrete bins about 8 ft wide by 8 ft high and 200 ft long. The material would be mechanically agitated and would incorporate a certain amount of forced aeration. The bins would be placed inside a totally enclosed structure. In addition, the composting material would be properly managed and follow a strict regime of aeration, moisture addition, and monitoring in order to achieve accelerated degradation. The (initial) active composting stage should be completed in about 15 days. A fully enclosed structure would allow the control of dust and odors. Odor would be managed by means of an odor control system. Systems similar to this one are commercially available.

After the active stage of composting, the material would be transported to another enclosed structure for maturation. The maturation phase would be conducted for a minimum of 30 days.

After maturation, the finished product would be refined, aiming for the highest quality materials. Post-processing would involve additional size reduction, screening, and removal of inert materials by means of a stoner.

A mass balance for the composting facility is presented in Table 7-2. The data in the table show that of the total input to the facility of 213,500 tons of waste per year, approximately

Table 7-2. Estimated Mass Balance for Composting Facility

			Quantity (TPY)*
Material Recovery Module			
Input MSW:			213,500
Recovered Materials:			
	Paper	9,991	
	Glass	6,301	
	Metals	4,392	
	Plastics	4,233	
	Wood	4,964	
	Subtotal		29,882
Rejects:			
	From tipping area	13,500	
	From processing	45,000	
	Subtotal		58,500
Feedstock to Composting			125,119
Composting Module			
Input:			
	Feedstock	125,119	
	Water	62,559	
	Subtotal		187,678
Losses:		93,839	
Output:			
	Residue	28,152	
	Compost	65,687	

* Quantities may not add up due to rounding.

29,882 tons of materials would be recovered and about 65,687 tons of compost would be produced each year. The total amount of residue would be about 86.652 tons/year. A summary of the inputs and outputs to and from the facility is presented in Table 7-3. The data in the table show that about 45% of the incoming material would be recovered and 41% would require final disposition.

The results of the market survey indicate that about 40,000 tons of compost per year could be used initially. The remainder of the compost could be used for lower value uses (land reclamation) until new markets are developed.

The estimated cost for the facility is presented in Table 7-4. Cost estimates have been developed assuming that public funds would be used for the implementation of the facility. Specific assumptions are described in the table. The information has been divided into various activities and shows that the total capital cost would be about $62,770,635.

The estimated operating and maintenance (O&M) costs are given in Table 7-5. The information in the table show that the operating and maintenance cost is about $9,940,865/year. Approximately 32%, or $3,187,800, is due to labor and overtime costs. The annual capital costs are $6,031,602. The data in the table indicate that the total annual costs would be about $15,972,467, or about $74.82/ton of input MSW.

A summary of the unit costs for the various activities is presented in Table 7-6. The data in the table indicate that the net tipping fee for the facility would be about $73.60/ton of input MSW. The tipping fee includes a revenue for the sale of recyclable materials. The calculation also assumes that, initially, no revenue would be derived from the sale of the compost. The tipping fee calculation also takes into consideration those costs associated with transportation and disposal of process residues.

In order to increase the quantity of materials diverted from the landfill, a second alternative has been developed. In this alternative, the residue from the facility is segregated and further processed to recover combustible materials. The estimated composition, quantity, and heating value of the combustible fraction is presented in Table 7-7. As shown in the table, an additional 40,055 tons of materials could be diverted from the landfill each year. This amount of combustible matter is the equivalent of about 100 tons/day (based on 365 days/year) that would have to be processed in a combustion unit. The total gross heat energy that would be released from this fraction would be on the order of 92×10^{10} Btu/year. There are combustion units available in the market place that can deal with this quantity of material. A diagram of this option is presented in Figure 7-2.

The diagram in Figure 7-2 shows the estimated amount of residues that would still require final disposition. The figure also shows the quantity of ash that would be generated in the combustion module.

A summary of the inputs and outputs of this option is presented in Table 7-8. As shown in the table, the total amount of residue requiring disposal would be approximately 52,605 tons/year, or about 35% (by weight) of the MSW available for processing.

Table 7-3. Summary of Inputs and Outputs (Without Combustion)

	Quantity (TPY)	% by Weight
Input MSW	213,500	100
Recovered Materials	29,882	14
Compost*	65,687	31
Residue	86,652	41

* It has been estimated that about 40,000 TPY of compost can be marketed at present time.

Table 7-4. Estimated Capital Cost

Item	1991 $	Annual Cost ($)	Unit Cost ($/Ton)
Site Development	1,619,277		
Scale/Scalehouse	320,000		
Structures	31,625,900		
Utilities	2,622,722		
Miscellaneous	140,818		
Engineering	2,361,367		
Contingency	5,449,308		
Permitting	100,000		
Subtotal Site and Construction	$44,239,391	$4,175,886	$19.56
Fixed Equipment, Spares, Engineering	15,494,669		
Contingency	2,324,200		
Subtotal Equipment, Spares	$17,818,869	$1,681,975	$7.88
Rolling Equipment and Spares	712,375	173,742	0.81
Subtotal Equipment	$18,531,244	$1,855,717	$8.69
Total Capital Costs	$62,770,635	$6,031,602	$28.25

Amortization:
- Site and Construction: 20 years at 7%
- Fixed Equipment: 20 years at 7%
- Rolling Equipment: 5 years at 7%

Facility located on public land (43 acres)

Table 7-5. Estimated Operating Costs
(1991 $)

Operating Costs	Annual Cost	$/Ton
Labor and Overtime	$3,187,800	14.93
Fringes and Overhead	1,449,000	6.79
Electricity	494,805	2.32
Water and Sewage	30,192	0.14
Fuel	124,800	0.58
Insurance	512,702	2.40
Miscellaneous	144,900	0.68
Gas	97,327	0.46
Subtotal Operations	$6,041,525	$28.30
Residue Haul[1]	1,299,780	6.09
Residue Disposal[2]	2,599,560	12.18
Total Operating Costs	$9,940,865	$46.57
Annual Capital Cost	$6,031,602	$28.25
Annual Capital and Operations	$15,972,467	$74.82

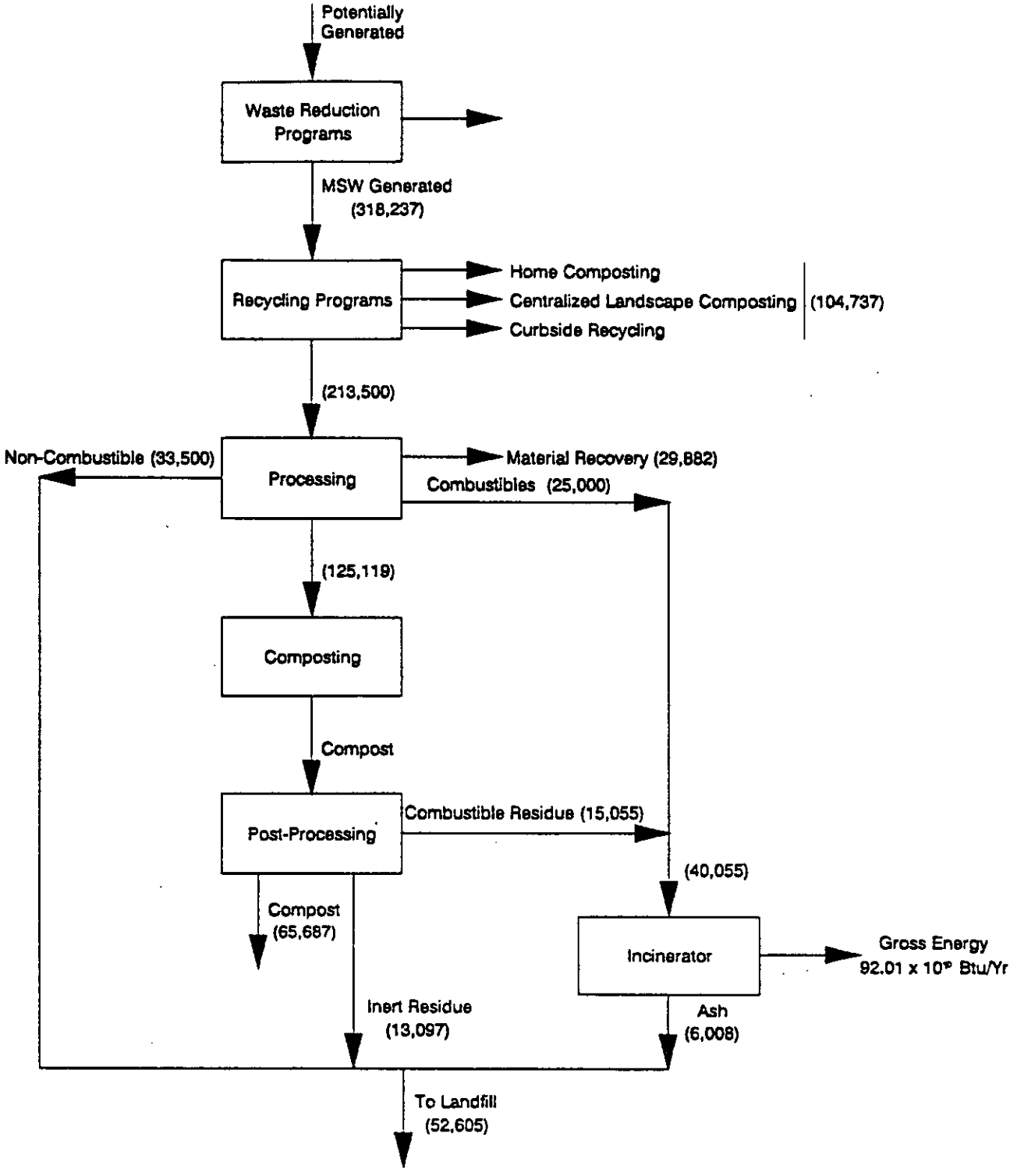
[1] Residue Haul at $15/ton.
[2] Residue Disposal at $30/ton.

Table 7-6. Summary of Unit Costs

	$/Ton MSW
Capital Costs	$28.25
Operating costs	46.57
Subtotal	$74.82
Less Revenues from Recyclables	1.22
Less Revenues from Compost	0.00
Total Tip Fee	$73.60

Table 7-7. Estimated Quantities of Combustible Residue

Material	Quantity (TPY)	Heating Value (Btu/yr x 10^{10})
Paper	15,940	24.2
Textiles	1,422	2.3
Plastics	19,613	58.8
Wood	2,100	3.62
Rubber	698	2.65
Leather	282	0.45
Total	40,055	92.01



*Quantities in tons per year

Figure 7-2. Schematic Diagram of Proposed Program (with Combustion)

Table 7-8. Summary of Inputs and Outputs (With Combustion)*

	Quantity (TPY)	% by Weight
Input MSW	213,500	100
Recovered Materials	29,882	14
Compost**	65,687	31
Residue	52,605	25

* Gross Energy Output is about 92 x 10^{10} Btu/year.

** It has been estimated that about 40,000 TPY of compost can be marketed at present time.

Section 8

IMPLEMENTATION SCHEDULE

A schedule for implementing a refuse composting project in Kane County is presented in Figure 8-1. Shown in the figure are time estimates for conducting a series of key work phases leading to commercial operation.

The schedule shows a project development phase of 8 months. Project development would include general planning, a thorough marketing analysis for the MSW compost, as well as preparation either an RFP, bid, or selection of a design engineer.

The time allocated for site acquisition assumes that the County would have to select and purchase a lot. We estimate that this process would require about 6 months.

The permitting phase requires about 10 months to complete. This time period includes about 8 months to secure a development permit and an additional 2 months to apply for and obtain an operating permit.

Following the project development phase, a period of approximately 32 months would be required to reach the stage of an operational facility.

Time requirements for the design and construction have been estimated based on the assumption that the site would not pose any unusual constraints.

The schedule shows that the implementation of a MSW composting facility may require a approximately 42 months from project development to commercial operation.

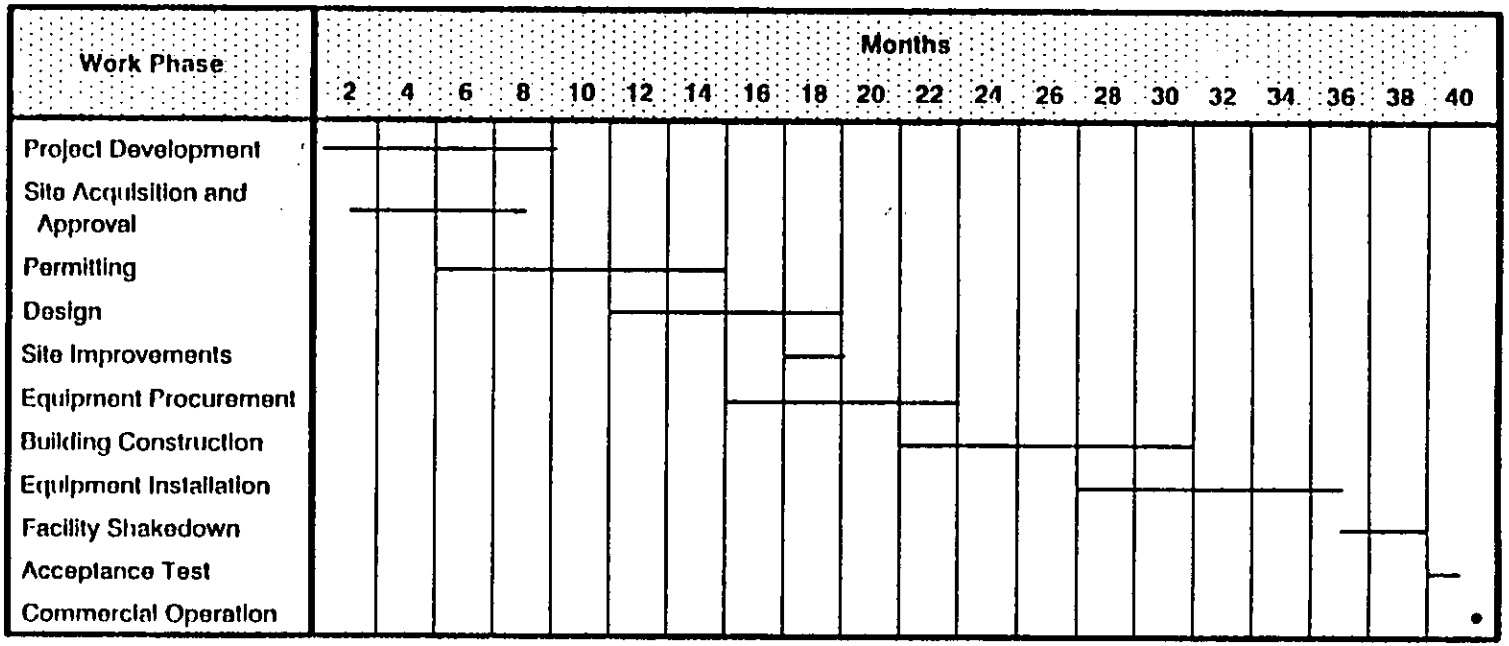


Figure 8-1. Implementation Schedule

Appendix A

REGULATIONS

Contents

A-1 Environmental Protection Agency, 40 CFR Part 257, Criteria for Classification of Solid Waste Disposal Facilities and Practices

A-2 Illinois Environmental Permit Applications for a Municipal Solid Waste Compost Facility

- LPC-PA1 General Instructions for Applying for Permits
  General Application for Permit
- LPC-PA4 Application for Operating Permit
- LPC-PA6 Instructions for Composting Facility Permit
  Application for Permit to Develop a Solid Waste Composting Facility
- LPC-PA8 Certification of Siting Approval
- LPC-PA11 Closure Plans and Post-Closure Care Plans
- LPC-PA16 Instructions for Public Notice
  Notice of Application for Permit to Manage Waste

A-3 Illinois Environmental Protection Agency Permits for the Recomp of Illinois compost facility in Freeport, Illinois, October 25, 1991

A-4 Illinois Department of Transportation Regulations concerning disposal of organic waste and compost placement

y determines there is sufficient st.
The State shall comply with the ements of Office of Manage- and Budget Circular No. A-95.
Copies of the final work program be placed in the State informa- depositories maintained under 80(a)(2).

3 Requirements for public partici- tion in State regulatory development.

The State shall conduct public ngs (and public meetings where State determines there is suffi- interest) on State legislation and ations. In accord with the State istrative procedures act, to solic- ctions and recommendations. Fol- t the public hearings, a respons- ss summary shall be prepared nade available to the public in l with 40 CFR 25.8.
In advance of the hearings and ngs required by paragraph (a) of ection, the State shall prepare a heet on proposed regulations or ation, mail the fact sheet to agen- organizations and individuals on list maintained under 80(a)(1) and place the fact sheet e State information depositories ained under § 256.60(a)(2).

3 Requirements for public partici- tion in the permitting of facilities.

Before approving a permit appli- n (or renewal of a permit) for a rce recovery or solid waste dis- facility the State shall hold a - hearing to solicit public reac- and recommendations on the pro- permit application if the State mines there is a significant s of public interest in the pro- permit.
This hearing shall be held in d with 40 CFR 25.5.

4 Requirements for public partici- tion in the open dump inventory.

The State shall provide an oppor- y for public participation prior to ission of any classification of a ty as an open dump to the Feder- overnment. The State shall ac- lish this by providing notice as fied in § 256.64(b) or by using State administrative procedures which provide equivalent public par- ticipation.
(b) The State may satisfy the re- quirement of § 256.64(a) by providing written notice of the availability of the results of its classifications to all parties on the list required under § 256.60(a)(1) at least 30 days before initial submission of these classifica- tions to the Federal Government. For those parties on the list required under § 256.60(a)(1) who are owners or operators of facilities classified as open dumps, such notice shall indicate that the facility has been so classified.

[46 FR 47052, Sept. 23, 1981]

§ 256.65 Recommendations for public par- ticipation.

(a) State and substate planning agencies should establish an advisory group, or utilize an existing group, to provide recommendations on major policy and program decisions. The ad- visory group's membership should re- flect a balanced viewpoint in accord with 40 CFR 25.7(c).
(b) State and substate planning agencies should develop public educa- tion programs designed to encourage informed public participation in the development and implementation of solid waste management plans.

[44 FR 45079, July 31, 1979. Redesignated and amended at 46 FR 47052, Sept. 23, 1981]

PART 257—CRITERIA FOR CLASSIFI- CATION OF SOLID WASTE DISPOS- AL FACILITIES AND PRACTICES

Sec.
257.1 Scope and purpose.
257.2 Definitions.
257.3 Criteria for classification of solid waste disposal facilities and practices.
257.3-1 Floodplains.
257.3-2 Endangered species.
257.3-3 Surface water.
257.3-4 Ground water.
257.3-5 Application to land used for the production of food-chain crops (interim final).
257.3-6 Disease.
257.3-7 Air.
257.3-8 Safety.
257.4 Effective date.
APPENDIX I
APPENDIX II

AUTHORITY: Secs. 1008(a)(3) and 4004(a), Pub. L. 94-580, 90 Stat. 2803 and 2815 (42 U.S.C. 6907(a)(3) and 6944(a)); sec. 405(d), Pub. L. 95-217, 91 Stat. 1606 (33 U.S.C. 1345(d)).

SOURCE: 44 FR 53460, Sept. 13, 1979, unless otherwise noted.

§ 257.1 Scope and purpose.

(a) These criteria are for use under the Resource Conservation and Recov- ery Act (the Act) in determining which solid waste disposal facilities and practices pose a reasonable proba- bility of adverse effects on health or the environment. Unless otherwise provided, these criteria are adopted for purposes of both sections 1008(a)(3) and 4004(a) of the Act.
(1) Facilities failing to satisfy crite- ria adopted for purposes of section 4004(a) will be considered open dumps for purposes of State solid waste man- agement planning under the Act.
(2) Practices failing to satisfy crite- ria adopted for purposes of section 1008(a)(3) constitute open dumping, which is prohibited under section 4005 of the Act.
(b) These criteria also provide guide- lines for sludge utilization and dispos- al under section 405(d) of the Clean Water Act, as amended. To comply with section 405(e) the owner or oper- ator of any publicly owned treatment works must not violate these criteria in the disposal of sludge on the land.
(c) These criteria apply to all solid waste disposal facilities and practices with the following exceptions:
(1) The criteria do not apply to agri- cultural wastes, including manures and crop residues, returned to the soil as fertilizers or soil conditioners.
(2) The criteria do not apply to over- burden resulting from mining oper- ations intended for return to the mine site.
(3) The criteria do not apply to the land application of domestic sewage or treated domestic sewage. The criteria do apply to disposal of sludges gener- ated by treatment of domestic sewage.
(4) The criteria do not apply to the location and operation of septic tanks. The criteria do, however, apply to the disposal of septic tank pumpings.
(5) The criteria do not apply to solid or dissolved materials in irrigation return flows.
(6) The criteria do not apply to in- dustrial discharges which are point sources subject to permits under sec- tion 402 of the Clean Water Act, as amended.
(7) The criteria do not apply to source, special nuclear or byproduct material as defined by the Atomic Energy Act, as amended (68 Stat. 923).
(8) The criteria do not apply to haz- ardous waste disposal facilities which are subject to regulation under sub- title C of the Act.
(9) The criteria do not apply to dis- posal of solid waste by underground well injection subject to the regula- tions (40 CFR part 146) for the Under- ground Injection Control Program (UICP) under the Safe Drinking Water Act, as amended, 42 U.S.C. 3007 et seq.

[44 FR 53460, Sept. 13, 1979, as amended at 46 FR 47052, Sept. 23, 1981]

§ 257.2 Definitions.

The definitions set forth in section 1004 of the Act apply to this part. Spe- cial definitions of general concern to this part are provided below, and defi- nitions especially pertinent to particu- lar sections of this part are provided in those sections.

Disposal means the discharge, de- posit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

Facility means any land and appur- tenances thereto used for the disposal of solid wastes.

Leachate means liquid that has passed through or emerged from solid waste and contains soluble, suspended or miscible materials removed from such wastes.

Open dump means a facility for the disposal of solid waste which does not comply with this part.

Practice means the act of disposal of solid waste.

Sanitary landfill means a facility for the disposal of solid waste which com- plies with this part.

Sludge means any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect.

Solid waste means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

State means any of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

[44 FR 53480, Sept. 13, 1979; 44 FR 59010, Oct. 12, 1979]

§ 257.3 Criteria for classification of solid waste disposal facilities and practices.

Solid waste disposal facilities or practices which violate any of the following criteria pose a reasonable probability of adverse effects on health or the environment:

§ 257.3-1 Floodplains.

(a) Facilities or practices in floodplains shall not restrict the flow of the base flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste, so as to pose a hazard to human life, wildlife, or land or water resources.

(b) As used in this section:

(1) "Based flood" means a flood that has a 1 percent or greater chance of recurring in any year or a flood of a magnitude equalled or exceeded once in 100 years on the average over a significantly long period.

(2) "Floodplain" means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, which are inundated by the base flood.

(3) "Washout" means the carrying away of solid waste by waters of the base flood.

[44 FR 53480, Sept. 13, 1979; 44 FR 64708, Sept. 21, 1979]

§ 257.3-2 Endangered species.

(a) Facilities or practices shall not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife.

(b) The facility or practice shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species as identified in 50 CFR Part 17.

(c) As used in this section:

(1) "Endangered or threatened species" means any species listed as such pursuant to section 4 of the Endangered Species Act.

(2) "Destruction or adverse modification" means a direct or indirect alteration of critical habitat which appreciably diminishes the likelihood of the survival and recovery of threatened or endangered species using that habitat.

(3) "Taking" means harassing, harming, pursuing, hunting, wounding, killing, trapping, capturing, or collecting or attempting to engage in such conduct.

§ 257.3-3 Surface water.

(a) For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES) under section 402 of the Clean Water Act, as amended.

(b) For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of dredged material or fill material to waters of the United States that is in violation of the requirements under section 404 of the Clean Water Act, as amended.

(c) A facility or practice shall not cause non-point source pollution of waters of the United States that violates applicable legal requirements implementing an areawide or Statewide water quality management plan that has been approved by the Administrator under section 208 of the Clean Water Act, as amended.

(d) Definitions of the terms "Discharge of dredged material", "Point source", "Pollutant", "Waters of the United States", and "Wetlands" can be found in the Clean Water Act, as amended, 33 U.S.C. 1251 et seq., and implementing regulations, specifically 33 CFR Part 323 (42 FR 37122, July 19, 1977).

[44 FR 53480, Sept. 13, 1979, as amended at 46 FR 47052, Sept. 23, 1981]

§ 257.3-4 Ground water.

(a) A facility or practice shall not contaminate an underground drinking water source beyond the solid waste boundary or beyond an alternative boundary specified in accordance with paragraph (b) of this section.

(b)(1) For purposes of section 1008(a)(3) of the Act or section 405(d) of the CWA, a party charged with open dumping or a violation of section 405(e) may demonstrate that compliance should be determined at an alternative boundary in lieu of the solid waste boundary. The court shall establish such an alternative boundary only if it finds that such a change would not result in contamination of ground water which may be needed or used for human consumption. This finding shall be based on analysis and consideration of all of the following factors that are relevant:

(i) The hydrogeological characteristics of the facility and surrounding land, including any natural attenuation and dilution characteristics of the aquifer;

(ii) The volume and physical and chemical characteristics of the leachate;

(iii) The quantity, quality, and direction of flow of ground water underlying the facility;

(iv) The proximity and withdrawal rates of ground-water users;

(v) The availability of alternative drinking water supplies;

(vi) The existing quality of the ground water, including other sources of contamination and their cumulative impacts on the ground water;

(vii) Public health, safety, and welfare effects.

(2) For purposes of sections 4004(a) and 1008(a)(3), the State may establish an alternative boundary for a facility to be used in lieu of the solid waste boundary only if it finds that such a change would not result in the contamination of ground water which may be needed or used for human consumption. Such a finding shall be based on an analysis and consideration of all of the factors identified in paragraph (b)(1) of this section that are relevant.

(c) As used in this section:

(1) "Aquifer" means a geologic formation, group of formations, or portion of a formation capable of yielding usable quantities of ground water to wells or springs.

(2) "Contaminate" means introduce a substance that would cause:

(i) The concentration of that substance in the ground water to exceed the maximum contaminant level specified in Appendix I, or

(ii) An increase in the concentration of that substance in the ground water where the existing concentration of that substance exceeds the maximum contaminant level specified in Appendix I.

(3) "Ground water" means water below the land surface in the zone of saturation.

(4) "Underground drinking water source" means:

(i) An aquifer supplying drinking water for human consumption, or

(ii) An aquifer in which the ground water contains less than 10,000 mg/l total dissolved solids.

(5) "Solid waste boundary" means the outermost perimeter of the solid waste (projected in the horizontal plane) as it would exist at completion of the disposal activity.

[44 FR 53480, Sept. 13, 1979, as amended at 46 FR 47052, Sept. 23, 1981]

§ 257.3-5 Application to land used for the production of food-chain crops (interim final).

(a) *Cadmium.* A facility or practice concerning application of solid waste to within one meter (three feet) of the surface of land used for the production of food-chain crops shall not exist or occur, unless in compliance with all requirements of paragraphs (a)(1) (i) through (iii) of this section or all requirements of paragraphs (a)(2) (i) through (iv) of this section.

(1)(i) The pH of the solid waste and soil mixture is 6.5 or greater at the time of each solid waste application, except for solid waste containing cadmium at concentrations of 2 mg/kg (dry weight) or less.

(ii) The annual application of cadmium from solid waste does not exceed 0.5 kilograms per hectare (kg/ha) on land used for production of tobacco, leafy vegetables or root crops grown for human consumption. For other food-chain crops, the annual cadmium application rate does not exceed:

Time period	Annual Cd application rate (kg/ha)
Present to June 30, 1984	2.0
July 1, 1984 to December 31, 1986	1.25
Beginning January 1, 1987	0.5

(iii) The cumulative application of cadmium from solid waste does not exceed the levels in either paragraph (a)(1)(iii)(A) or (B) of this section.

(A)

Soil cation exchange capacity (meq/100g)	Maximum cumulative application (kg/ha)	
	Background soil pH less than 6.5	Background soil pH more than 6.5
Less than 5	5	5
5 to 15	5	10
More than 15	5	20

(B) For soils with a background pH of less than 6.5, the cumulative cadmium application rate does not exceed the levels below: *Provided,* That the pH of the solid waste and soil mixture is adjusted to and maintained at 6.5 or greater whenever food-chain crops are grown.

Soil cation exchange capacity (meq/100g)	Maximum cumulative application (kg/ha)
Less than 5	5
5 to 15	10
More than 15	20

(2)(i) The only food-chain crop produced is animal feed.

(ii) The pH of the solid waste and soil mixture is 6.5 or greater at the time of solid waste application or at the time the crop is planted, whichever occurs later, and this pH level is maintained whenever food-chain crops are grown.

(iii) There is a facility operating plan which demonstrates how the animal feed will be distributed to preclude ingestion by humans. The facility operating plan describes the measures to be taken to safeguard against possible health hazards from cadmium entering the food chain, which may result from alternative land uses.

(iv) Future property owners are notified by a stipulation in the land record or property deed which states that the property has received solid waste at high cadmium application rates and that food-chain crops should not be grown, due to a possible health hazard.

(b) *Polychlorinated Biphenyls (PCBs).* Solid waste containing concentrations of PCBs equal to or greater than 10 mg/kg (dry weight) is incorporated into the soil when applied to land used for producing animal feed, including pasture crops for animals raised for milk. Incorporation of the solid waste into the soil is not required if it is assured that the PCB content is less than 0.2 mg/kg (actual weight) in animal feed or less than 1.5 mg/kg (fat basis) in milk.

(c) As used in this section:

(1) *Animal feed* means any crop grown for consumption by animals, such as pasture crops, forage, and grain.

(2) *Background soil pH* means the pH of the soil prior to the addition of substances that alter the hydrogen ion concentration.

(3) *Cation exchange capacity* means the sum of exchangeable cations a soil can absorb expressed in milli-equivalents per 100 grams of soil as determined by sampling the soil to the depth of cultivation or solid waste placement, whichever is greater, and analyzing by the summation method for distinctly acid soils or the sodium acetate method for neutral, calcareous or saline soils ("Methods of Soil Analysis, Agronomy Monograph No. 9." C. A. Black, ed., American Society of Agronomy, Madison, Wisconsin. pp 891-901, 1965).

(4) *Food-chain crops* means tobacco, crops grown for human consumption, and animal feed for animals whose products are consumed by humans.

(5) *Incorporated into the soil* means the injection of solid waste beneath the surface of the soil or the mixing of solid waste with the surface soil.

(6) *Pasture crops* means crops such as legumes, grasses, grain stubble and slover which are consumed by animals while grazing.

(7) *pH* means the logarithm of the reciprocal of hydrogen ion concentration.

(8) *Root crops* means plants whose edible parts are grown below the surface of the soil.

(9) *Soil pH* is the value obtained by sampling the soil to the depth of cultivation or solid waste placement, whichever is greater, and analyzing by the electrometric method. ("Methods of Soil Analysis, Agronomy Monograph No. 9," C.A. Black, ed., American Society of Agronomy, Madison, Wisconsin, pp. 914-926, 1965.)

[44 FR 53460, Sept. 13, 1979; 44 FR 54708, Sept. 21, 1979]

§ 257.3-6 Disease.

(a) *Disease Vectors.* The facility or practice shall not exist or occur unless the on-site population of disease vectors is minimized through the periodic application of cover material or other techniques as appropriate so as to protect public health.

(b) *Sewage sludge and septic tank pumpings (Interim Final).* A facility or practice involving disposal of sewage sludge or septic tank pumpings shall not exist or occur unless in compliance with paragraphs (b) (1), (2) or (3) of this section.

(1) Sewage sludge that is applied to the land surface or is incorporated into the soil is treated by a Process to Significantly Reduce Pathogens prior to application or incorporation. Public access to the facility is controlled for at least 12 months, and grazing by animals whose products are consumed by humans is prevented for at least one month. Processes to Significantly Reduce Pathogens are listed in Appendix II, Section A. (These provisions do not apply to sewage sludge disposed of by a trenching or burial operation.)

(2) Septic tank pumpings that are applied to the land surface or incorporated into the soil are treated by a Process to Significantly Reduce Pathogens (as listed in Appendix II, Section A), prior to application or incorporation, unless public access to the facility is controlled for at least 12 months and unless grazing by animals whose products are consumed by humans is prevented for at least one month. (These provisions do not apply to septic tank pumpings disposed of by a trenching or burial operation.)

(3) Sewage sludge or septic tank pumpings that are applied to the land surface or are incorporated into the soil are treated by a Process to Further Reduce Pathogens, prior to application or incorporation, if crops for direct human consumption are grown within 18 months subsequent to application or incorporation. Such treatment is not required if there is no contact between the solid waste and the edible portion of the crop; however, in this case the solid waste is treated by a Process to Significantly Reduce Pathogens, prior to application; public access to the facility is controlled for at least 12 months; and grazing by animals whose products are consumed by humans is prevented for at least one month. If crops for direct human consumption are not grown within 18 months of application or incorporation, the requirements of paragraphs (b) (1) and (2) of this section apply. Processes to Further Reduce Pathogens are listed in Appendix II, Section B.

(c) As used in this section:

(1) "Crops for direct human consumption" means crops that are consumed by humans without processing to minimize pathogens prior to distribution to the consumer.

(2) "Disease vector" means rodents, flies, and mosquitoes capable of transmitting disease to humans.

(3) "Incorporated into the soil" means the injection of solid waste beneath the surface of the soil or the mixing of solid waste with the surface soil.

(4) "Periodic application of cover material" means the application and compaction of soil or other suitable material over disposed solid waste at the end of each operating day or at such frequencies and in such a manner as to reduce the risk of fire and to impede vectors access to the waste.

(5) "Trenching or burial operation" means the placement of sewage sludge or septic tank pumpings in a trench or other natural or man-made depression and the covering with soil or other suitable material at the end of each operating day such that the wastes do not migrate to the surface.

[44 FR 53460, Sept. 13, 1979; 44 FR 54708, Sept. 21, 1979]

§ 257.3-7 Air.

(a) The facility or practice shall not engage in open burning of residential, commercial, institutional or industrial solid waste. This requirement does not apply to infrequent burning of agricultural wastes in the field, silvicultural wastes for forest management purposes, land-clearing debris, diseased trees, debris from emergency clean-up operations, and ordnance.

(b) For purposes of section 4004(a) of the Act, the facility shall not violate applicable requirements developed under a State Implementation Plan (SIP) approved or promulgated by the Administrator pursuant to section 110 of the Clean Air Act, as amended.

(c) As used in this section "open burning" means the combustion of solid waste without (1) control of combustion air to maintain adequate temperature for efficient combustion, (2) containment of the combustion reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion, and (3) control of the emission of the combustion products.

[44 FR 53460, Sept. 13, 1979; 44 FR 54708, Sept. 21, 1979, as amended at 46 FR 47053, Sept. 23, 1981]

§ 257.3-8 Safety.

(a) *Explosive gases.* The concentration of explosive gases generated by the facility or practice shall not exceed:

(1) Twenty-five percent (25%) of the lower explosive limit for the gases in facility structures (excluding gas control or recovery system components); and

(2) The lower explosive limit for the gases at the property boundary.

(b) *Fires.* A facility or practice shall not pose a hazard to the safety of persons or property from fires. This may be accomplished through compliance with § 257.3-7 and through the periodic application of cover material or other techniques as appropriate.

(c) *Bird hazards to aircraft.* A facility or practice disposing of putrescible wastes that may attract birds and which occurs within 10,000 feet (3,048 meters) of any airport runway used by turbojet aircraft or within 5,000 feet (1,524 meters) of any airport runway used by only piston-type aircraft shall not pose a bird hazard to aircraft.

(d) *Access.* A facility or practice shall not allow uncontrolled public access so as to expose the public to potential health and safety hazards at the disposal site.

(e) As used in this section:

(1) "Airport" means public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities.

(2) "Bird hazard" means an increase in the likelihood of bird/aircraft collisions that may cause damage to the aircraft or injury to its occupants.

(3) "Explosive gas" means methane (CH_4).

(4) "Facility structures" means any buildings and sheds or utility or drainage lines on the facility.

(5) "Lower explosive limit" means

propagate a flame in air at 25°C and atmospheric pressure.

(6) "Periodic application of cover material" means the application and compaction of soil or other suitable material over disposed solid waste at the end of each operating day or at such frequencies and in such a manner as to reduce the risk of fire and to impede disease vectors' access to the waste.

(7) "Putrescible wastes" means solid waste which contains organic matter capable of being decomposed by microorganisms and of such a character and proportion as to be capable of attracting or providing food for birds.

§ 257.4 Effective date.

These criteria become effective October 16, 1979.

APPENDIX I

The maximum contaminant levels promulgated herein are for use in determining whether solid waste disposal activities comply with the ground-water criteria (§ 257.3-4). Analytical methods for these contaminants may be found in 40 CFR Part 141 which should be consulted in its entirety.

1. *Maximum contaminant levels for inorganic chemicals.* The following are the maximum levels of inorganic chemicals other than fluoride:

Contaminant	Level (milligrams per liter)
Arsenic	0.05
Barium	1
Cadmium	0.010
Chromium	0.05
Lead	0.05
Mercury	0.002
Nitrate (as N)	10
Selenium	0.01
Silver	0.05

The maximum contaminant levels for fluoride are:

Temperature[1] degrees Fahrenheit	Degrees Celsius	Level (milligrams per liter)
53.7 and below	12 and below	2.4
53.8 to 58.3	12.1 to 14.6	2.2
58.4 to 63.8	14.7 to 17.6	2.0
63.9 to 70.6	17.7 to 21.4	1.8
70.7 to 79.2	21.5 to 26.2	1.6
79.3 to 90.5	26.3 to 32.5	1.4

[1] Annual average of the maximum daily air temperature.

2. *Maximum contaminant levels for organic chemicals.* The following are the maximum contaminant levels for organic chemicals:

	Level (milligrams per liter)
(a) Chlorinated hydrocarbons:	
Endrin (1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo, endo-5,8-dimethano naphthalene)	0.0002
Lindane (1,2,3,4,5,6-Hexachlorocyclohexane, gamma isomer)	0.004
Methoxychlor (1,1,1-Trichloro-2,2-bis (p-methoxyphenyl) ethane)	0.1
Toxaphene ($C_{10}H_{10}Cl_8$-Technical chlorinated camphene, 67 to 69 percent chlorine)	0.005
(b) Chlorophenoxys:	
2,4-D (2,4-Dichlorophenoxy-acetic acid)	0.1
2,4,5-TP Silvex (2,4,5-Trichlorophen oxy-propionic acid)	0.01

3. *Maximum microbiological contaminant levels.* The maximum contaminant level for coliform bacteria from any one well is as follows:

(a) using the membrane filter technique:

(1) Four coliform bacteria per 100 milliliters if one sample is taken, or

(2) Four coliform bacteria per 100 milliliters in more than one sample of all the samples analyzed in one month.

(b) Using the five tube most probable number procedure, (the fermentation tube method) in accordance with the analytical recommendations set forth in "Standard Methods for Examination of Water and Waste Water", American Public Health Association, 13th Ed. pp. 662-668, and using a Standard sample, each portion being one-fifth of the sample:

(1) If the standard portion is 10 milliliters, coliform in any five consecutive samples from a well shall not be present in three or more of the 25 portions, or

(2) If the standard portion is 100 milliliters, coliform in any five consecutive samples from a well shall not be present in more portions in any of five samples or in more than fifteen of the 25 portions.

4. *Maximum contaminant levels for radium-226, radium-228, and gross alpha particle radioactivity.* The following are the maximum contaminant levels for radium-226, radium-228, and gross alpha particle radioactivity:

(a) Combined radium-226 and 228

(b) Gross alpha particle activity (including radium-226 but excluding radon and uranium) - 15 pCi/l.

Appendix II

A. Processes to Significantly Reduce Pathogens

Aerobic digestion: The process is conducted by agitating sludge with air or oxygen to maintain aerobic conditions at residence times ranging from 60 days at 15° C to 40 days at 20° C, with a volatile solids reduction of at least 38 percent.

Air Drying: Liquid sludge is allowed to drain and/or dry on under-drained sand beds, or paved or unpaved basins in which the sludge is at a depth of nine inches. A minimum of three months is needed, two months of which temperatures average on a daily basis above 0° C.

Anaerobic digestion: The process is conducted in the absence of air at residence times ranging from 60 days at 20° C to 15 days at 35° to 55° C, with a volatile solids reduction of at least 38 percent.

Composting: Using the within-vessel, static aerated pile or windrow composting methods, the solid waste is maintained at minimum operating conditions of 40° C for 5 days. For four hours during this period the temperature exceeds 55° C.

Lime Stabilization: Sufficient lime is added to produce a pH of 12 after 2 hours of contact.

Other methods: Other methods or operating conditions may be acceptable if pathogens and vector attraction of the waste (volatile solids) are reduced to an extent equivalent to the reduction achieved by any of the above methods.

B. Processes to Further Reduce Pathogens

Composting: Using the within-vessel composting method, the solid waste is maintained at operating conditions of 55° C or greater for three days. Using the static aerated pile composting method, the solid waste is maintained at operating conditions of 55° C or greater for three days. Using the windrow composting method, the solid waste attains a temperature of 55° C or greater for at least 15 days during the composting period. Also, during the high temperature period, there will be a minimum of five turnings of the windrow.

Heat drying: Dewatered sludge cake is dried by direct or indirect contact with hot gases, and moisture content is reduced to 10 percent or lower. Sludge particles reach temperatures well in excess of 80° C, or the wet bulb temperature of the gas stream in contact with the sludge at the point where it leaves the dryer is in excess of 80° C.

Heat treatment: Liquid sludge is heated to temperatures of 180° C for 30 minutes.

Thermophilic Aerobic Digestion: Liquid sludge is agitated with air or oxygen to maintain aerobic conditions at residence times of 10 days at 55-60° C, with a volatile solids reduction of at least 38 percent.

Other methods: Other methods or operating conditions may be acceptable if pathogens and vector attraction of the waste (volatile solids) are reduced to an extent equivalent to the reduction achieved by any of the above methods.

Any of the processes listed below, if added to the processes described in Section A above, further reduce pathogens. Because the processes listed below, on their own, do not reduce the attraction of disease vectors, they are only add-on in nature.

Beta ray irradiation: Sludge is irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (ca. 20° C).

Gamma ray irradiation: Sludge is irradiated with gamma rays from certain isotopes, such as ^{60}Cobalt and ^{137}Cesium, at dosages of at least 1.0 megarad at room temperature (ca. 20° C).

Pasteurization: Sludge is maintained for at least 30 minutes at a minimum temperature of 70° C.

Other methods: Other methods or operating conditions may be acceptable if pathogens are reduced to an extent equivalent to the reduction achieved by any of the above add-on methods.

PART 259—STANDARDS FOR THE TRACKING AND MANAGEMENT OF MEDICAL WASTE

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Sec.
259.1 Purpose, scope, and applicability.
259.2 Effective dates and duration of the demonstration program.

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Appendix I to Part 259 Medical Waste Tracking Form and Instructions
Appendix II to Part 259 On-Site Incinerator Report Form and Instructions
Appendix III to Part 259 Transporter Report and Instructions
Appendix IV to Part 259 Recommended Medical Waste Transporter Notification Form and Instructions

Authority: 42 U.S.C. 6912, 6992 *et seq.*

Source: 54 Fit 12371, Mar. 24, 1989, unless otherwise noted.

Subpart A—General

§ 259.1 Purpose, scope, and applicabilit

(a) The purpose of this part is to tablish a demonstration program tracking medical waste shipments p suant to the Medical Waste Track Act of 1988.

(b) The regulations in this p apply to regulated medical waste defined in Subpart D of this part t is generated in a Covered State as fined in Subpart C of this part.

(c) Generators, transporters, a owners or operators of intermedi handling facilities (e.g., treatment destruction facilities) or destinati facilities (e.g., disposal facilities) w transport, offer for transport, or o erwise manage regulated medi waste generated in a Covered St must comply with this part even such transport or management occ in a non-Covered State.

(d) *Regulatory presumptions.* T transportation and management regulated medical waste, as defined Subpart D of this part, in a Cover State is subject to regulations un this part, unless a person claiming non-regulated status can demonstr by a preponderance of the eviden through shipping papers or other d umentation, that the regulated me cal waste was generated in a non-C ered State.

§ 259.2 Effective dates and duration of demonstration program.

(a) Except for records and repo required to be maintained or subm ted under this part, the demonstrati program will be effective for t period June 22, 1989, to June 22, 19 in the Covered States of Connecti New Jersey, and New York. The de onstration program will be effecti for the period of July 24, 1989, to Ju 22, 1991, in the State of Rhode Isla

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General Instructions for Applying for Permits from the Division of Land Pollution Control LPC-PA1

Because of the many different types of permit requirements, and the numerous types of facilities being permitted, it is necessary to utilize several different permit forms. Most applications will only require one or two forms be used, however, in some instances, more may be necessary. In all cases, (except for waste stream permits and permits for the composting of landscape waste only) it will be necessary to complete the General Application for Permit (LPC-PA1). It is important that this form be filled out with other applications since it readily identifies the type of application, facility and waste. This will insure proper administrative processing. This form also identifies many completeness requirements. This will enable the Agency to quickly identify whether the application can be processed, or whether the applicant has to submit additional information. Finally, since applicant signature requirements have been included, this will be the only form that is necessary for many supplemental applications. None of the forms below are intended to be used for RCRA Part B permitting. A discussion of many of the forms is presented below.

1. Landfill Development (LPC-PA2)

   To be used for the initial development of a landfill, a major expansion that is beyond the boundaries of areas previously approved on a development permit or for major revisions (i.e., gas collection, leachate collection, etc.) that may impact the development permit. Other modifications to existing facilities would only require a supplemental permit and use of the General Form (LPC-PA1). If the closure/post-closure care plans change you should also use LPC-PA11.

2. Application for a Solid Waste Management Permit to Develop Treatment and/or Storage Facilities (LPC-PA3).

   Persons requesting a permit to develop a new solid waste treatment, storage, incineration, recycling, or land treatment site or requesting a permit for the first time for such a facility should use this application form. Facilities that are expanding, or adding new units (i.e., new storage area, new treatment units, etc.) should utilize this application. When application is made for these types of activities (expansions, etc.) the applicant should address each area with respect to the original application to see whether changes are necessary. If no changes are necessary, that fact should be so indicated. For example, if a new storage area is proposed, it may not be necessary to change waste analyses or waste characterization plans, but the contingency and closure plans would have to be changed. Applicants should not use the form if they are not expanding, but rather only making modifcation to existing facilities. In this case, the general application form is the only form needed for a supplemental permit.

3. Application for Operating Permit (LPC-PA4)

   This form is to be used when requesting permission to operate under a previously approved permit. If other changes are to be made to the facility a supplemental request must also be made, and a waiver to the 45 day review period given. If any certifications, reports, test results etc., are required by the development permit prior to operation these must accompany the operating permit (OP) application.

4. Supplemental Permit Applications

   An application of this type need generally include the General Form (LPC-PA1). Any changes to a previously permitted facility which do not involve expansion, significant changes to the development permit or additions of new forms of waste management (e.g., like adding an incinerator at a landfill) are considered supplemental but still require a thorough explanation, supplemented by plans and specifications as necessary.

5. Application for Permit -- Non-Special Municipal Waste Storage/Transfer Station (LPC-PA5)

This form is to be used by persons requesting a permit to develop a general municipal refuse waste handling facility. This form is only for the storage or transfer of non-special general refuse. For special waste storage or transfer stations use LPC-PA3. Form LPC-PA5 applies to new sites as well as adding this type of operation to an existing site. Minor changes to an existing facility need only follow the procedures for a supplemental permit.

6. Application for a permit to Develop a Composting Facility -- (LPC-PA6)

Persons requesting a permit to develop a site for the composting of materials other than landscape waste only should use this form. Applicants wishing to compost landscape waste only should use form LPC-PA12. Form LPC-PA1 should accompany LPC-PA6.

7. Application for the Transfer of Solid Waste Permits (LPC-PA7)

This form is to be used when the owner or operator of any existing permitted facility wishes to transfer ownership or the right to operate to another entity. Sale or transfer of the stock of a corporation does not require a permit transfer, however, the Agency must be notified of the sale or transfer of stock which changes the controlling interest of the facility. The General Form (LPC-PA1) must accompany the Permit Transfer form (LPC-PA7).

8. Siting Certification (LPC-PA8)

This form is to be used to demonstrate compliance with the siting requirements of the Act for regional pollution control facilities. Failure to submit this form when required is cause for an application to be deemed incomplete or denied.

9. Signatures of All Beneficiaries of a Land Trust (LPC-PA9)

This form is to be used by solid waste disposal facilities to demonstrate compliance with Sec. 22.19(b) of the Act.

10. Request for Authorization to Deposit Hazardous Waste under Section 39(H) of the Act (LPC-PA10)

For use by hazardous waste generators proposing to land dispose their waste. It is not necessary that LPC-PA1 accompany this form since it will normally be attached to a supplemental waste stream application.

11. Closure Plans and Post-Closure Care Plans (LPC-PA-11)

Any facility which is required to have a closure plan or post-closure care plan as well as any modification or supplemental permit request which results in a change or update to an existing closure or post-closure care plan should use this form.

12. Landscape Waste Composting (LPC-PA12)

This form is to be used by persons requesting a permit to compost landscape waste in accordance with Sec. 39M of the Act (HB 3800). Siting pursuant to Sec. 39.2 of the Act will not be required in this case. Persons wishing to compost other wastes may use form LPC-PA6 but they will be subject to siting, and will have to submit other information as determined by the Agency. Applicants should contact the Agency prior to preparing their application for assistance if necessary.

13. Application for a Permit to Develop a Used Oil Storage Facility (LPC-PA13)

This form may be used only if the site operator accepts used oil from individuals who have drained the used oil from vehicles which they own or lease. Form LPC-PA1 must accompany this form.

LWE:ts/3517j.2-3

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General Application for Permit (LPC-PA1)

This form must be used for any application for permit from the Division of Land Pollution Control, except for waste stream permits and permits for the composting of landscape waste only. Attach any necessary plans, specifications, reports, etc. to fully support and describe the activities or modifications being proposed. If necessary, attach sufficient information to demonstrate compliance with all applicable RCRA requirements.

SITE IDENTIFICATION

Name: _____ Site # (IEPA): _ _ _ _ _ _ _ _ _ _ _ _

City: _____ County: _____

Existing DE/OP Permit Nos. (if applicable): _____

	OWNER	OPERATOR
Name:		
Address:		
Contact Name:		
Phone #:		

TYPE SUBMISSION:

Developmental	___
Operating	___
Supplemental	___
Permit Transfer	___
Name Change	___
Closure/Post Closure Certification	___

TYPE FACILITY:

Landfill	___
Land Treatment	___
Transfer Station	___
Treatment	___
Storage	___
Incinerator	___
Composting	___
Recycling/Reclamation	___
Other	___

TYPE WASTE:

General Municipal Refuse	___
Hazardous	___
Special (Non-Hazardous)	___
Demo Debris (ex. putrescible)	___
Demo Debris (incl. putrescible)	___
Used Oil	___
Solvents	___
Landscape/Yard Waste	___
Other (Specify _____)	___

DESCRIPTION OF PROJECT: (Include a brief narrative description here.)

_____

_____

_____

COMPLETENESS REQUIREMENTS

The following items must be submitted unless they are either not required, or have previously been approved. Any items marked "N/A" must be fully explained. For example, a treatment facility may indicate "N/A" for prior conduct certification and explain that certification is not required for treatment facilities. Please refer to the instructions for further guidance.

1. Have all public notice letters been mailed and is documentation enclosed? ___ Yes ___ No ___ N/A

This Agency is authorized to require this information under Ill. Rev. Stat., 1979, Chapter 111 1/2 Section 1039. Disclosure of this information is required and failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

2.a. Is the Siting Certification Form (LPC-PA8) completed and enclosed? ___ Yes ___ No ___ N/A

b. Is siting approval currently under litigation? ___ Yes ___ No ___ N/A

3. Is a closure, and if necessary a post closure, plan covering these activities being submitted, or has one already been approved? (Provide permit number _____.) ___ Yes ___ No ___ N/A

4. Are financial assurance documents being submitted? ___ Yes ___ No ___ N/A

5. Is a request for prior conduct certification for the chief operator being submitted, or is the chief operator currently certified? (Provide OC # _____ and date of certification __ __ / __ __ / __ __.) ___ Yes ___ No ___ N/A

6.a. Is land ownership held in beneficial trust? ___ Yes ___ No ___ N/A

b. If yes, is a beneficial trust certification form (LPC-PA9) completed and enclosed? ___ Yes ___ No ___ N/A

SIGNATURES

All applications shall be signed by the person designated below or by a duly authorized representative of that person:

Corporation - By a principal executive officer of at least the level of vice-president.
Partnership or Sole Proprietorship - By a general partner or the proprietor, respectively.
Government - By either a principal executive officer or a ranking elected official.

A person is a duly authorized representative only if:

1. the authorization is made in writing by a person described above; and
2. is submitted with this application (a copy of a previously submitted authorization can be used).

I hereby affirm that all information contained in this Application is true and accurate to the best of my knowledge and belief.

Owner Signature: _____ _____ (Date)

Title: _____

Operator Signature: _____ _____ (Date)

Title: _____

Engineer Signature: _____ _____ (Date)

Engineer Name: _____ Engineer Seal:

Engineer Address: _____

_____

_____

Engineer Phone No.: _____

All information submitted as part of the Application is available to the public except when specifically designated by the Applicant to be treated confidentially as a trade secret or secret process in accordance with Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Agency rules and guidelines.

LWE:tk:5/11/49-6(10/25/89)

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APPLICATION FOR OPERATING PERMIT (LPC-PA4)

I. Facility Identification:

Name of Facility: _____

Site Number: _ _ _ _ _ _ _ _ _ _ _ _

Developmental Permit Number: _____ Date Issued: _____

II.A. Applicant Identification:

Operator	Owner
Name: _____	Name: _____
Phone Number: (_____) _____	Phone Number: (_____) _____

Agency correspondence mailed to: ____ Owner ____ Operator ____ Other (Explain)

_____

_____

B. Site Ownership:

____ Presently Owned by Applicant
____ Presently Owned by Trust
____ Presently Owned by Corporation

____ To be Leased by Applicant for _____ years
____ Years of Lease Remaining: _____
____ Beginning Date of Lease: _____
____ Expiration Date of Lease: _____

Operated by: ____ Illinois Corporation ____ Partnership ____ Government ____ Individual
____ Trust ____ Other: _____

III. Location Information:

Attach a copy of the United States Geological Survey (USGS) quadrangle map.

Describe the exact area or unit which is being requested to operate: _____

_____

_____

_____

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

IV. Financial Assurance:

Are financial assurance documents included? ____ Yes ____ No ____ N/A
(Use **Original** Agency Forms).

V. Documentation:

Are all necessary reports and information required in the Developmental permit(s) provided? ____ Yes ____ No ____ N/A

VI. Certification:

I hereby certify that the facility has been developed in accordance with IEPA Development Permit No. _____ and any applicable supplemental permit(s).

Engineers: Seal:

Name: _____

Address: _____

_____

Phone No.: ( ) _____

Signature: _____

EB:tk:5/13/35(12/6/89)

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Application for a Permit to Develop a Composting Facility LPC-PA6 Instructions

General Information

This form is for composting waste other than landscape waste. If you plan to only compost landscape waste, use form LPC-PA12.

In accordance with the Environmental Protection Act all information submitted as part of the Application is available to the public except when specifically designated by the Applicant to be treated confidentially as regarding a trade secret or secret process in accordance with Section 7(a) of the Environmental Protection Act.

Read the enclosed instructions carefully to acquire an understanding of permit application requirements. The Application form is to be supplemented by plans and reports which are required to describe the development and/or operation of the site. The information submitted by the Applicant must provide the Illinois Environmental Protection Agency with assurance that no violation of the Environmental Protection Act or Regulations adopted thereunder will result as a consequence of the development or operation of the site.

All data and information should be typed or legibly printed in ink.

THIS FORM MUST BE ACCOMPANIED BY THE "GENERAL APPLICATION FOR PERMIT" (LPC-PA1).

For any information requested but not provided, justification demonstrating the reasons for not doing so must be stated. The letters "NA" may be used if requested information is not applicable.

Submit the original and two copies of all information requested in the application to:

Illinois Environmental Protection Agency
Division of Land Pollution Control - #24
Permit Section
2200 Churchill Road
Post Office Box 19276
Springfield, Illinois 62794-9276

It is recommended that the applicant retain a record copy of all application and correspondence sent to the Agency. Plans and reports must be certified by a professional engineer registered to practice in Illinois and must bear his seal and signature along with the signature and/or seal of any Registered Land Surveyor who has supplied data contained in the submittal. When such data is obtained from published sources, references are to be included.

Siting

The applicant must determine if the facility is a new regional pollution control facility and subject to site location approval as specified in Section 39.2 of the Environmental Protection Act.

Refer to the item 2a of the "General Application For Permit" (LPC-PA1).

Operation

The Applicant must notify the Illinois Environmental Protection Agency in writing that the development of the site has been completed in accordance with the Development Permit before a pre-operation site inspection can be conducted or an Operating Permit issued.

Instructions

I. Site Identification

For new operations located within the boundaries of existing facilities or for expansions of existing operations, fill in both the site name and the IEPA Site Number. For new, independent operations, simply give the name of the site; the Agency will assign a site number.

II. Applicant Identification and Site Ownership

Fill in:

A. Applicant (owner/operator) name, title, street address (post office box if applicable) city, state and telephone number.

B. Check one or more boxes to indicate by whom the site is owned or operated. If other, explain.

III. Location Information

Provide a topographic map or maps of the site drawn to the scale of 200 feet to the inch or larger, containing 5-foot contour intervals where the relief exceeds 20 feet, and 2-foot contour intervals where the relief is 20 feet or less, and referenced to a United States Geological Survey datum; include the boundaries and a legal description of the proposed or developed waste management area. (The area may be all or a portion within the legal boundaries.)

Owners and operators of all facilities must provide an identification of whether the facility is located within a 100-year floodplain. This identification must indicate the source of data for such determination and must include a copy of a relevant Federal Insurance Administration (FIA) flood map, if used, or the calculations and maps used where a FIA map is not available.

Item 1. A U.S. Geologic Survey Quadrangle map with the boundaries of the composting facility operation drafted on it must be provided. These maps may be obtained by contacting:

Illinois State Geological Survey
Natural Resources Building
615 East Peabody Drive
Champaign, Illinois 61820
Phone #217/333-4747

Please be aware that there is a cost for these maps and handling and that you will need to be able to identify the location of the site by Township, Range and Section Number in order for the Survey to determine which map shows your site.

Item 2. The applicant will need to have a larger scale map or maps (1" = 200' or greater) prepared. The scope of the map(s) must include the site and the surrounding area within 500' of site boundaries. Include all buildings and current uses.

The map(s) should show the site boundaries, the location of on-site buildings, the composting operation boundaries, the location of potable water wells, the types of land use, the topographic contours and drainage patterns. These are subparts 1 - 8 of Item III in the application.

On the map(s) you should also indicate the elevation of the water table and the location of the 10 year flood plain. As indicated on the form, if the 10 year flood plain is not present within the scope of the large scale map(s) (or is not well represented), the flood plain should be drafted on the Quadrangle Map.

IV. Facility Background

Check the box(es) that most accurately describe the facility. Provide all existing permit numbers for the facility.

V. Facility Information

A. A narrative must be provided describing how the facility will operate. Each of the elements listed under this item must be included.

In describing the recordkeeping procedures (for Item V.A.11) that will be used at the facility. The operator must submit an annual report to the Agency including:

a. Estimates of weights (tons) and volume (cubic yards) of materials accepted at the site

b. End uses of compost (e.g. nurseries, landscapers, general public, as cover on landfill, farmers, forest preserve, etc.)

B. In order to operate a composting facility, two permits are necessary. First, the operator needs to obtain a development permit, using this application form. Then after the facility has been developed, the operator must apply for an operating permit. The application for an operating permit consists of a General Application for Permit and an Application for Operating Permit to certify that the facility has been developed in accordance with the development permit.

The Agency is allowed up to 90 days to review an application for a development permit and 45 days for an operating permit application. A facility cannot be operated until an operating permit has been issued.

In Item V.B. the applicant needs to list all the development activities that will be completed before an application for an operating permit is submitted. This should include everything that needs to be done before the facility can operate.

C. The documentation needed for this item should be in the form of a narrative supplementing the maps of Item 3. As indicated in the form, the applicant must document that:

a. There is a 200 foot setback between the boundaries of the site and any potable water supply well.

b. The site is outside the 10 year floodplain or the site shall be flood proofed, in which case the flood proofing plans must be provided.

c. The location of the site shall minimize incompatibility with the character of the surrounding area.

d. There is a 200 foot setback between the boundaries of the site and any residence.

e. The design of the facility is such that:

i. No compost will be placed within 5 feet of the water table.

ii. The permittee shall implement best management practices to control runoff from areas where materials are loaded, unloaded, stored, or composted.

Runoff from the permitted facilities shall not cause or contribute to a violation of the water quality standards contained in 35 IAC 302.

Sampling for BOD_5, Total Suspended Solids, Ammonia as N, pH or other parameters may be required.

If any water is to be discharged, contact the Division of Water Pollution Control Section.

iii. Any other leachate generated on site in addition to runoff must also be collected and managed.

The sources of information used in the documentation process must be referenced.

VI. Closure/Post-Closure Care

A. A completed Closure Plans and Post-Closure Plans form (LPC-PA11) must be provided. All composting facilities must provide the site identification and closure information (including cost estimates) for non-disposal facilities as required by the form.

B. Indefinite storage is defined as "treatment" or "storage" in such a manner that a person would face technical difficulties or high costs in removing the wastes or waste residues from the treatment or storage unit to a disposal unit, such that it may become necessary to close the treatment or storage unit as a disposal unit. A treatment or storage unit in which wastes or waste residues remain for more than one year is assumed to be "indefinite storage" unless the operator demonstrates that it will be technically feasible and economically reasonable to remove the waste for ultimate disposal prior to or upon closure. Applications for development permits for indefinite storage facilities must include post-closure care plans. Therefore, an application for a development permit for a composting facility must include either:

a. A demonstration that the proposed operation is not an indefinite storage facility, or

b. A post-closure care plan (including cost estimates).

C. a. Financial assurance for closure and post-closure care of a composting facility is generally not required unless:

1. the composting activity constitutes "indefinite storage" and

2. the operator is non-governmental as described in 35 IAC 807.601.

b. Financial assurance for closure of a composting facility which is not an indefinite storage is generally not required unless:

1. the composting operation is being permitted for development as a unit within the boundaries of a landfill, and

2. the landfill is required to post financial assurance.

In cases when financial assurance is required, the instrument of financial assurance must be included with the application for an operating permit. The acceptable instruments of financial assurance for closure and post-closure care are described in 35 Ill. Adm. Code, Part 807, Subpart F.

CJL/EB/mls/sp0529k/2-5

Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

APPLICATION FOR PERMIT TO DEVELOP A SOLID WASTE COMPOSTING FACILITY (LPC-PA6)

I. Site Identification:

Name of Facility: _____ Site Number: _ _ _ _ _ _ _ _ _ _ _ _

II.A. Applicant Identification:

	Operator	Owner
Name:	_____	_____
Phone:	( ) _____	( ) _____

Mail Agency correspondence to: ____ Owner ____ Operator ____ Other (Explain) _____

_____

_____

II.B. Site Ownership:

____ Presently Owned by Applicant
____ Presently Owned by a Trust
____ Presently Owned by a Corporation
____ To be Leased by Applicant for _____ years
____ Years of Lease Remaining
____ Beginning Date of Lease: _____
____ Expiration Date of Lease: _____

Operated by: ____ Illinois Corporation ____ Partnership ____ Government
____ Individual ____ Trust ____ Other: _____

III. Location Information:

Attach a copy of the United States Geological Survey (U.S.G.S.) quadrangle map (7.5 minute quadrangle, if published) and a topographic map of the area which contains the site. Also provide a legal description of the site including the size in acres, present zoning classification and restrictions (if any).

Quadrangle map provided _____ (Name) _____ (Date)

The topographic map should depict the following aspects of the site:

1. The property boundaries of the facility.
2. The location of all buildings on the site and any other pertinent data with respect to the operation of the proposed facility (i.e., utilities, etc.).
3. The boundaries of the area that will be used for operations including the location of the windrows within those boundaries.
4. The locations of all potable water supply wells within 500 feet of the boundaries of the site.
5. The types of land use for the properties immediately adjacent to the facility (i.e., residential, commercial, industrial, agricultural, etc.). This should include the zoning codes of these properties and the location (and the function) of all buildings within 500 feet of the site.

This Agency is authorized to require this information under Ill. Rev. Stat. 1979, Chapter 111 1/2 Section 1039. Disclosure of this information is required and failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

6. The topography of the area using 2 foot contour intervals.

7. The drainage patterns of the site and surrounding areas. This should identify the direction of both on and off site drainage as well as the location of any ditches, swales, berms or other structures that exist or will be constructed to control runoff and leachate generated by the compost operation.

8. The location of the 10-year floodplain in the vicinity of the site. If the 10-year floodplain cannot be well represented on a 1" = 200' scale map, it should be shown on the Quadrangle Map.

IV. Facility Background:

_____ This is an existing operation begun _____ (month) _____ (year).
_____ This is a proposed operation.
_____ This is a proposed extension to an existing operation.

V. Facility Information:

The following must accompany the application. In the space provided, identify the page number or location in the supporting documentation where this information can be found.

Information Location

A. Operating Plan:

_____ 1. The types of waste that are proposed to be handled by the facility.

_____ 2. The area to be served by this facility (i.e., the municipalities, townships, counties, etc.).

_____ 3. An estimate of the maximum annual volume of waste the facility will be able to process.

_____ 4. The management procedures that will be used in composting. This should include:

i. A description of any treatment the wastes will receive prior to windrowing (e.g., pre-shredding).

ii. The specifications to which the windrows will be constructed, that is, their width, height and length. The calculations of the maximum capacity of the facility should also be provided.

iii. A list of any additives that will be used to adjust the moisture and/or nitrogen content of the composting material (if applicable). The rates and methods of application should also be provided.

iv. The method and frequency of aerating the windrows as well as a description of the equipment that will be used for this purpose.

v. An estimate of length of time that will be necessary to complete the composting process.

vi. The criteria for determining when the composting process is complete.

Information Location

5. Descriptions of the storage areas (including their capacities) that will be used to stage the waste before windrowing and to store the finished compost product.

6. Management procedures for containment and disposal of non-compostable wastes received at the facility.

7. Descriptions of the measures that will be taken to control dust, odor and noise generated by the facility's operations (e.g., chipping, shredding, and turning the windrows).

8. The planned operating hours of the facility.

9. A description of the access controls to be employed at the facility (e.g., fencing).

10. A description of how the finished compost product will be used or disposed.

11. A description of the recordkeeping procedures that will be used.

B. Description of Facility Development that will be Completed Before Submittal of an Operating Permit Application (Development Plan)

C. Documentation:

Documentation that the proposed site meets the following requirements must be provided. The sources of information used in the documentation process need to be referenced.

1. There is a 200 foot setback between the boundaries of the site and any potable water supply well.

2. The site is outside the 10-year floodplain or the site shall be flood proofed, in which case the flood proofing plans must be provided.

3. The location of the site shall minimize incompatibility with the character of the surrounding area.

4. There is a 200 foot setback between the boundaries of the site and any residence.

5. The design of the facility is such that:

   i. No compost will be placed within 5 feet of the water table;
   ii. Best management practices used to control runoff; and
   iii. Other leachate generated on-site will be collected and managed.

VI. Closure Plan and Post-Closure Care:

Include the separate form "Closure Plans and Post-Closure Care Plans" (LPC-PA11). The portions pertaining to post-closure care need to be completed only if composting operations are indefinite storage facilities. For operations that do not meet the definition of indefinite storage, include a narrative explaining why it is not an indefinite storage facility.

Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

CERTIFICATION OF SITING APPROVAL (LPC-PA8)

Name of Applicant: _____

Address of Applicant: _____

Name of Site: _____

Site Information: Nearest City _____

County: _____

1. On _____, 19 __, the _____ of _____
(governing body of county or municipality) (county or municipality) _____ approved the site location suitability of _____
(name of site)
as a new regional pollution control facility in accordance with Section 39.2 of the Illinois Environmental Protection Act, Ill. Rev. Stat., ch. 111 1/2, Secion 1039.2.

2. The facility was approved for the following activities:

waste storage (___), landfill (___), waste disposal (___), waste transfer station (___),

waste treatment (___), waste incinerator (___).

3. Attached to this certification is a true and correct statement of the legal description of the site as it was approved by the aforementioned local governing body.

4. Attached to this certification is a true and accurate statement of conditions, if any, under which the approval was provided. (Note: These conditions are provided for information only to the IEPA. The IEPA is not obligated to monitor or enforce local conditions.)

5. The undersigned has been authorized by the _____ of
(governing body of county or municipality)
_____ to execute this certification on behalf of
(county or municipality)

_____
(county or municipality)

NAME: _____

TITLE: _____

SUBSCRIBED AND SWORN TO BEFORE ME
this _____ day of _____, 19___

_____
Notary Public

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms

Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

CLOSURE PLANS AND POST-CLOSURE CARE PLANS
(LPC-PA11)

Name of Facility: _____ Site Number: _ _ _ _ _ _ _ _ _ _ _ _

County: _____

Permit No.: _____ for original DE, if obtained.

GENERAL INFORMATION:

1. Facilities included in closure plan (check all that are applicable):

____	Disposal Unit(s)	____	Indefinite Storage Unit(s)
____	Storage/Transfer Unit(s)	____	Composting

Provide a map or plan that clearly delineates each of the above. If more than one (1) unit exists for each category, make sure to clearly designate each individual unit.

2. Was the interim formula of 35 IAC 807.624 previously used to prepare a cost estimate and provide financial assurance? ____ Yes ____ No

3a. Do the submitted closure plan, post-closure care plan and cost estimates include all facilities that were previously covered by the interim formula? ____ Yes ____ No

If no, explain in detail why all facilities have not been included.

b. Is this a biennial revision of the closure and post-closure cost estimates as required by 35 IAC 807.623? ____ Yes ____ No. Provide date of recently approved closure/post-closure plan and permit number.

If yes, provide details below in any areas which have been revised.

c. Does this modify a previously approved closure plan? ____ Yes ____ No

If yes, provide details on the revision in the applicable area below.

If the answer to any of the above is yes, provide a copy of the old and new closure and post-closure plan and estimates.

4. Will any of the closed units require post-closure care? ____ Yes ____ No

If yes, also complete applicable portions of Items 9-16.

COVER INFORMATION:

5. For disposal unit(s) provide a map which clearly indicates the following areas (final cover is as defined in 807.305(c)):

A. Those areas (or units) which are documented as having final cover applied. Provide date(s) when final cover completed. _____

B. Those areas which are documented as having intermediate cover in place. Provide date(s) when intermediate cover completed. _____

C. Any areas currently permitted, or proposed to be permitted, which will require any additional cover.

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

6. For each area described under #5 provide:

   A. The estimated date that cover was/will be applied. _____

   B. The total area (in acres). _____

   C. The average depth of refuse in each area. Provide bottom elevation (MSL) and final elevation (MSL). _____

   D. Estimated date of final closure (35 IAC 807.503(c)(6)). _____

The following must accompany the application. In the space provided, identify the page number or location in the supporting documentation where this information can be found.

CLOSURE
(Refer to 35 IAC 807.502 and 807.503)

Information Location

_____ 7. For disposal and/or indefinite storage units, provide a closure plan which addresses or provides the following:

_____ A. The location of the source and type of cover material to be used. Provide information for the quality and quantity to be used.

_____ B. The design specifications to be used in construction of the cap to include compacted depth of each lift, total depth, etc.

_____ C. The testing and documentation procedures to be used to insure the approved design specifications have been met.

_____ D. Recordkeeping and certification of test results.

_____ E. The source and type of material to be used for a vegetative layer (on top of the compacted layer).

_____ F. The total depth of the vegetative layer. The depth selected for the vegetative layer must be accompanied by a discussion demonstrating it will be adequate to:

_____ 1. Provide moisture for cover species;

_____ 2. Prevent root penetration into the cover based on the species of vegetation selected; and

_____ 3. Support the planted species without continued maintenance.

_____ G. Any gas control system that will be provided prior to post-closure care. Include monitoring and collection or venting systems.

_____ H. Calculations and cross-sections for the design of the system that will prevent run-on and run-off from affecting the closed unit(s) during the post-closure care period. Include a map showing the drainage and erosion control system design for control of run-on and run-off.

Information Location

_____ I. A plan to be followed in case of premature final closure and temporary shutdown of the unit(s). This should identify the specific differences between routine and premature closure.

_____ J. A description and justification of any waste to be accepted for use in closure or post-closure care.

_____ K. A schedule of the closure activities to include:

_____ 1. Placement of final cover;

_____ 2. Placement of vegetative layer; and

_____ 3. Seeding, fertilizing and mulching.

_____ L. A procedure to evaluate all monitoring data collected during the active life. This should be able to demonstrate that facility at closure is not causing nor contributing to violations of the Act or 35 IAC Part 807.

8. For composting or storage/transfer units, provide a closure plan which addresses the following:

_____ A. The maximum amount of waste that could be at the facility at the time of closure.

_____ B. The plan for removal of the waste material.

_____ C. The methods to decontaminate any remaining facilities or equipment.

_____ D. A schedule and recordkeeping procedures to be followed.

_____ E. A plan to be followed in case of premature final closure and temporary shutdown of the unit(s). This should identify the specific differences between routine and premature closure.

POST-CLOSURE (applicable to disposal and indefinite storage facilities)
(Refer to 35 IAC 807.523 and 807.524)

9. Indicate the number of years post-closure care will be provided. _____

_____ 10. Describe the inspection program that will be followed to monitor the site for subsidence, cracks, erosion, establishment of vegetation and gas migration. This should include frequency of inspections, and what procedures will be followed during the inspection. The frequency should be quarterly at a minimum and additional inspections when needed.

Information Location

_____ 11. Describe the quantitative criteria which will be used to determine what problems discovered during the inspection will require corrective action.

_____ 12. Describe what corrective actions will be taken to correct each type of problem that is discovered.

_____ 13. Discuss any proposed changes to the groundwater monitoring program applicable during closure/post-closure.

_____ 14. Describe what recordkeeping procedures will be used to document site inspections, problems found, corrective actions taken, groundwater monitoring results, leachate monitoring, impact of the site on groundwater, etc.

_____ 15. Describe the security measures that will be provided to prevent unauthorized entry to the site during the post-closure care period.

_____ 16. Provide a procedure to evaluate all data collected during the post-closure care period. This should be able to demonstrate that the site will not cause future violations of the Act or 35 IAC 807.

CLOSURE COST ESTIMATES: (Note: Pursuant to 35 IAC 807.621(d) the cost provided below must be based on the assumption that the Agency will contract with a third party for implementation of the closure plan and post-closure plan.) (Refer to 35 IAC 807 Subpart F).

Provide a cost estimate of the following elements required under the closure plan. (Note: If closure plan is for more than one unit provide separate cost estimates for each unit.) Each estimate must provide details as to how the estimate was derived.

_____ 17. For disposal and indefinite storage facilities, provide:

_____ A. The costs to obtain, move and place the cover material (this should include an estimate of the total area requiring final cover).

_____ B. The cost for inspection and certification of final cover construction details.

_____ C. The cost to obtain, move and place the vegetative cover (top soil).

_____ D. The cost to monitor for gas and install any gas control system.

_____ E. The cost to install the run-on and run-off control system.

_____ F. The cost of fertilizing, seeding and mulching the vegetative layer.

_____ G. The cost for certification of closure, utilizing the Agency closure certification forms.

_____ H. Total cost of the above.

Information Location

18. For storage/transfer or composting involving indefinite storage units, provide:

_____ A. The cost to dispose of, or complete composting of the waste.

_____ B. The cost to remove all waste and decontaminate the facility.

_____ C. The cost to certify completion of closure activities utilizing closure certification forms.

_____ D. Total cost of the above.

19. Post-Closure Cost Estimates:

For facilities requiring post-closure care, provide:

_____ A. The cost for inspection and recordkeeping for subsidence, cracks, erosion, establishment of vegetation, gas migration and leachate collection monitoring.

_____ B. The estimated frequency and cost of repairing any problems discovered.

_____ C. The cost to monitor the groundwater and leachate (include sample collection and analytical costs). Leachate removal and disposal costs should also be provided, if applicable.

_____ D. The cost to review groundwater data and assess impacts.

_____ E. The cost of recordkeeping for all data.

_____ F. The cost for annual mowing of the site.

_____ G. The cost to maintain a gas control system.

_____ H. The cost to certify the end of post-closure care utilizing the post-closure care certification form.

_____ I. Total cost of the above.

_____ 20. Based on the cost estimates for closure and, if applicable, post-closure care provided above, attach a new/revised financial assurance document for these costs. **Use ORIGINAL Agency forms**.

_____ 21. If providing trust funds, submit a current status report, including any calculations for annual reports.

Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

INSTRUCTIONS FOR PUBLIC NOTICE FOR PERMIT APPLICATIONS SUBMITTED TO THE ILLINOIS EPA, DIVISION OF LAND POLLUTION CONTROL, FOR WASTE DISPOSAL, STORAGE OR TREATMENT

1. The form "Notice of Application For Permit To Manage Waste (LPC-PA16)" must be completed by the applicant and forwarded to the appropriate officials identified below. FAILURE TO DO THIS WILL RESULT IN THE REJECTION OF THE APPLICATION.

   The following persons must be sent notices:

   a. State's Attorney;

   b. Chairman of the County Board in which the subject facility is located;

   c. All members of the General Assembly from the legislative district in which the site is located; and

   d. Clerk of each municipality, any portion of which is within 3 miles of the boundary of the facility.

   All blanks must be filled out. the description shall be in sufficient detail to identify the activities being proposed.

   The forms shall be mailed on or before (within three days) the date the application is filed with the Agency. As part of the application include a copy of the form which was sent and a list of those persons to whom it was sent, or copies of the completed forms.

2. Under "Site Identification", use the site name shown on existing permits. For new sites, use the proposed site name. The site number is the ten digit number which is on the operating permit. Call IEPA if you don't know it. For new sites, omit the number.

3. When identifying the type of submission, the facility and the waste, check as many spaces in each column as is appropriate. Check at least one item in each column.

4. Please note that waste stream permits are covered by this form. For a single application for a waste stream permit, include a waste stream description or the generic waste name under "Description of Project". For multiple applications, put the identification on the reverse side of the form.

5. The project description should be clear and concise so the general public can understand. Avoid overly general statements (such as "landfill modification") as well as overly technical ones.

Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

NOTICE OF APPLICATION FOR PERMIT TO MANAGE WASTE (LPC-PA16)

Date: _____

To Elected Officials and Concerned Citizens:

The purpose of this notice is to inform you that a permit application has been submitted to the IEPA, Division of Land Pollution Control, for a solid waste project described below. You are not obligated to respond to this notice, however, if you have any comments, please submit them in writing to the address below, or call the Permit Section at 217/782-6762, within twenty-one (21) days.

Illinois Environmental Protection Agency
Permit Section, Division of Land Pollution Control (#24)
2200 Churchill Road, Post Office Box 19276
Springfield, Illinois 62794-9276

The permit application, which is identified below, is for a project described at the bottom of this page.

SITE IDENTIFICATION

Site Name: _____ Site # (IEPA): _ _ _ _ _ _ _ _

Address: _____

City: _____ County: _____

TYPE PERMIT SUBMISSION:		TYPE FACILITY:		TYPE WASTE:	
Development	___	Landfill	___	General Municipal Refuse	___
Operating	___	Land Treatment	___	Hazardous	___
Supplemental	___	Transfer Station	___	Special (Non-Hazardous)	___
Transfer	___	Treatment Facility	___	Demo Debris (ex. putrescible)	___
Name Change	___	Storage	___	Demo Debris (incl. putrescible)	___
Waste Stream	___	Incinerator	___	Used Oil	___
		Composting	___	Solvents	___
		Recycling/Reclamation	___	Landscape/Yard Waste	___
		Other	___	Other (Specify _____)	___

DESCRIPTION OF PROJECT: (For multiple waste stream applications, see reverse side.)

_____

_____

_____

_____

_____

Date: _____

	Generator Name	Waste Stream Identification Generic Name	Waste Class Hazardous/ Non-Hazardous
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Please retain a copy for your own use.

LWE:CA:tk:5/12/22-5(9/29/88)

Illinois Environmental Protection Agency · P. O. Box 19276, Springfield, IL 62794-9276

217/782-6762

October 25, 1991

DLPC Site No.: 1770200015
County:
Name of Site: Freeport Muni #4
Log No.: 1991-164
LPC Permit No.: 1991-017-DE
Date Received: May 3, 1991
Permit File

RECD
OCT 28 9
CC: Gubelman

DWPC Log No.: 4087-91
DWPC Permit No.: 1991-HB-9087
Subject: Freeport Muni #4
Date Received: September 27, 1991

DAPC Facility I.D.: 177020ACT
DAPC Application No.: 91090028
Date Received: September 11, 1991

Recomp of Illinois, Inc.
Attn: Mr. James P. Butler
Post Office Box 842
Freeport, Illinois 61032

City of Freeport
230 West Stephenson Street
Freeport, Illinois 61032

Gentlemen:

Please find enclosed Agency permits that have been granted to Recomp of Illinois, Inc. by the Divisions of Land Pollution Control, Air Pollution Control and Water Pollution Control for a solid waste management site pursuant to the coordinated permit review process under Section 39 of the Environmental Protection Act (Illinois Revised Statutes, Chapter 111 1/2, Paragraph 1039).

This coordinated approval contains the Division of Water Pollution Control Log No. 4087-91, Permit No. 1991-HB-4087, Division of Air Pollution Control Application No. 91090028 and the Division of Land Pollution Control Log No. 1991-164, Permit No. 1991-017-DE. The Agency will assist you in interpreting any of the conditions of approval of any permit as they relate specifically to your facilities.

Should you have questions concerning the coordinated permit, please contact Agency Project Coordinator James D. Schoenhard, P.E. at 217/782-6762.

Sincerely,

for Bernard P. Killian

Mary A. Gade
Director

MAG:dks/3107q, 93-94

Enclsoures

cc: Rockford Region
Division File
DLPC -- Jim Schoenhard
DWPC -- Steve Nightingale
DAPC -- Jim Cobb

Illinois Environmental Protection Agency · P. O. Box 19276, Springfield, IL 62794-9276

217/782-6762

Refer to: 1770200015 -- Stephenson County
Freeport Muni. #4
Permit No. 1991-017-DE
Log No. 1991-164
Permit File

October 25, 1991

Recomp of Illinois, Inc.
Attention: Mr. James P. Butler
Post Office Box 842
Freeport, Illinois 61032

City of Freeport
230 West Stephenson Street
Freeport, Illinois 61032

Gentlemen:

Permit is hereby granted to Recomp of Illinois, Inc., owner and operator of this solid waste management unit and the City of Freeport, Illinois, land owner, to develop a transfer/recycling station and solid waste compost site consisting of approximately 7 acres in SW 1/4 of the NE 1/4 of Section 7, T26N, R8E of the 4th P.M., Stephenson County all in accordance with the application and plans prepared by Mr. Tracy Johnson of Recomp, Inc. and Mr. Mark Young, P.E. of Fehr-Graham and Associates. Final plans, specifications, application and supporting documents as submitted and approved shall constitute part of this permit and are identified on the records of the Illinois Environmental Protection Agency, Division of Land Pollution Control by the permit number(s) and log number designated in the heading above.

The permit is issued subject to the standard conditions attached hereto and incorporated herein by reference, and further subject to the following special conditions. In case of conflict between the application and plans submitted and these special conditions, the special conditions of this permit shall govern.

1. Operation may not begin until completion of development and an operating permit is issued in accordance with 35 IAC 807.202.

2. The Applicant must notify the Agency in writing that the development of the site has been completed in accordance with the development permit before a pre-operation site inspection can be conducted or an Operating Permit issued. All construction test results and reports shall be submitted with the application for operating permit.

3. This permit allows for the development of a regional pollution control facility to sort, salvage, recycle, compost and transfer non-special, solid, municipal waste.

4. The type of waste that may be composted at this facility shall be limited to municipal waste as defined in Section 3.21 of the Illinois Environmental Protection Act.

5. Measures shall be taken to ensure that the waste does not become wind strewn or ignited and that no other provisions of the Environmental Protection Act are violated.

6. The facility shall be operated to prevent problems with odor and to maximize the decomposition process.

7. Material may be received at the composting unit from 8:00 a.m. to 5:00 p.m., Monday through Friday, and 8:00 a.m. to noon on Saturday.

8. Fire safety equipment (fire extinguishers) shall be maintained in accordance with recommended practice.

9. At the end of each day of operation, all waste shall be removed from the tipping floor. The tipping floor shall be swept to remove all waste. Waste may be left at the site overnight, however, it shall be in a covered container or waste collection vehicle.

10. All waste as received shall be recycled, placed in the vessel digester or removed from the site within 48 hours of receipt. All rejects from downloading of the vessel digester shall be removed in covered trucks as soon as practicable.

11. A vector control specialist shall inspect the transfer station building at least quarterly. If necessary, vector control measures shall be taken.

12. This facility shall not accept, receive, store, transfer or otherwise manage any liquid or special waste which is not generated on site.

13. Runoff from the permitted facilities shall not cause or contribute to a violation of the water quality standards contained in Ill. Adm. Code 302. The permittee shall implement best management practices to control runoff.

14. The by-products from this facility, including residuals and recyclables must be stored to prevent vector intrusion and aesthetic degradation. Materials that are not composted must be removed at least once per week.

15. Run-off water that has come in contact with composted waste, materials stored for composting, or other residual waste must be handled as leachate.

16. The temperature and retention time for all material being composted must be monitored and recorded each working day. These records shall be kept on site for 3 years and made available to Agency personnel upon request.

17. The compost shall be monitored at least once per week and tested for the following parameters: percent of total solids; volatile solids as a percent of total solids; pH; Kjeldahl ammonia, and nitrate nitrogen; total phosphorus; cadmium; chromium; copper; lead; nickel; zinc; mercury; and polychlorinated biphenyls (PCB). All analysis must be reported on a dry weight basis in parts per million.

18. Quarterly reports shall be submitted to the Agency within 30 days after the end of each calendar quarter and must include: the results of the analysis required in Condition No. 18 (above); the quantity of solid waste delivered to the facility; sources and quantities of other materials used in the compost process; an assessment of the process to reduce pathogens; temperature readings; retention time; the quantity of compost produced; quantity and type of by-products removed; and a description of the end-product distribution and disposal system.

19. The composting process shall use one of the acceptable methods listed below to reduce pathogens:

    1. The static aerated pile method for reducing pathogens consists of an unconfined composting process involving mechanical aeration of insulated compost piles. Aerobic conditions must be maintained during the compost process. The temperature of the compost pile must be maintained at 55 degrees Celsius for at least seven days.

    2. The enclosed vessel method for reducing pathogens consists of a confined compost process involving mechanical mixing of compost under controlled environmental conditions. The retention time in the vessel must be at least 24 hours with the temperature maintained at 55 degrees Celsius. A stabilization period of at least seven days must follow the decomposition period. Temperature in the compost pile must be maintained at least at 55 degrees Celsius for three days during the stabilization period.

20. The permittee shall submit an annual report to the Agency. The permittee shall report on or before April 1 of each year for the life of the compost unit. The report shall include an estimate of weight (tons) and volume (cubic yards) of landscape waste and other solid waste material accepted at site for composting.

21. Any modification to the facility shall be the subject of an application for supplemental permit for site modification submitted to this Agency.

22. The closure plan, received by the Agency on October 10, 1991 with a cost estimate in the amount of $45,800.00 is hereby approved in accordance with 35 Ill. Adm. Code, Subtitle G, Part 807.

23. The operator shall initiate implementation of the closure plan within 30 days after the site receives its final volume of waste.

24. The operator shall not file any application to modify the closure plan less than 180 days prior to receipt of the final volume of waste.

25. Upon completion of closure activities, the operator will notify the Agency that the site has been closed in accordance with the approved closure plan utilizing the Agency's "Affidavit for Certification of Completion of Closure of Non-Hazardous Waste Facilities."

26. The Agency shall be notified in writing of site closure within thirty days of termination of operation. A Final Composting Report shall be submitted to the Agency, and shall include the information in the Annual Report for the time elapsed since the end of the last report period.

27. Permittee shall notify the Agency of any changes from the information submitted to the Agency in its application for a developmental and operating permit for this site. Permittee shall notify the Agency of any changes in the names or addresses of both beneficial and legal titleholders to the herein-permitted site. Such notification shall be made in writing within fifteen (15) days of such change and shall include the name or names of any parties in interest and the address of their place of abode; or, if a corporation, the name and address of its registered agent.

28. At the time of closure, any landscape waste material not fully composted shall be managed at a composting facility operating in accordance with Section 21(r) of the Illinois Environmental Protection Act.

29. The maximum amount of waste which can be received at this compost facility is 75 tons per day based on the digestion vessel size, a supplemental permit is required to increase daily capacity.

30. The operator of this facility shall provide information to this Agency after 120 days of operation, that demonstrate no significant odor problems are associated with the compost operation. A supplemental permit application is necessary to fulfill this permit condition.

31. The operator shall record the temperature within the digester vessel each 4 hours of operation and maintain a record. If the digester temperature fails to reach 120°F after 8 hours of operation each day, a new operating plan to destroy pathogens and manage the compost must be approved by this Agency, by supplemental permit.

32. Management of unacceptable waste

    a. Landscape waste which contains large material and is not processed such that it would be rejected by the screening process which follows downloading of the "in vessel digester" may not be placed into the digester. It must be removed the same day as received and transported to a facility that is operating in accordance with the Environmental Protection Act, Title V, Sections 21 and 39.

    b. Lead-acid batteries will be removed the same day and transported either to a drop-off center handling such waste, or to a lead-acid battery retailer.

c. Special wastes including hazardous waste, non-hazardous special waste, and hazardous hospital waste shall be containerized separately and removed as soon as possible by a licensed special waste management facility that has obtained authorization to accept such waste. The operator shall maintain a contract with haulers so that the immediate removal is ensured. The operator shall develop an emergency response/action plan for such occurrences.

d. With the application for operating permit, the operator shall demonstrate compliance with HB2491 when effective regarding potentially infectious medical waste.

e. Asbestos debris from construction-demolition shall be managed in accordance with the National Emission Standards for Hazardous Air Pollutants (NESHAPS) regulations.

f. After the unauthorized waste has been removed from the transfer station, a thorough clean-up of the affected area will be made according to the type of unauthorized waste managed. Records shall be kept and will be made available to the IEPA.

The original and two (2) copies of all certifications or reports which are required to be submitted to the Agency by the permittee should be mailed to the following address:

Illinois Environmental Protection Agency
Planning and Reporting Section
Facilities Reporting Unit
Division of Land Pollution Control -- #24
2200 Churchill Road
Post Office Box 19276
Springfield, Illinois 62794-9276

Very truly yours,

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:JDS:jk/3265q,1-5

cc: Rockford Region
Mike Walwer
John Taylor
Mark Young -- Fehr-Graham & Assoc.
Division File

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

July 1, 1979

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) grants the Environmental Protection Agency authority to impose conditions on permits which it issues.

These standard conditions shall apply to all permits which the Agency issues for construction or development projects which require permits under the Divisions of Water Pollution Control, Air Pollution Control, Public Water Supplies, and Land and Noise Pollution Control. Special conditions may also be imposed by the separate divisions in addition to these standard conditions.

1. Unless this permit has been extended or it has been voided by a newely issued permit, this permit will expire two years after date of issuance unless construction or development on this project has started on or prior to that date.

2. The construction or development of facilities covered by this permit shall be done in compliance with applicable provisions of Federal laws and regulations, the Illinois Environmental Protection Act, and Rules and Regulations adopted by the Illinos Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification of the project, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The permittee shall allow any agent duly authorized by the Agency upon the presentation of credentials:

   a. to enter at reasonable times the permittee's premises where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit.

   b. to have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit.

   c. to inspect at reasonable times, including during any hours of operation of equipment constructed or operated under this permit, such equipment or monitoring methodology or equipment required to be kept, used, operated, calibrated and maintained under this permit.

d. to obtain and remove at reasonable times samples of any discharge or emission of pollutants.

e. to enter at reasonable times and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located;

b. does not release the permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities;

c. does not release the permittee from compliance with other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations;

d. does not take into consideration or attest to the structural stability of any units or parts of the project;

e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. Unless a joint construction/operation permit has been issued, a permit for operating shall be obtained from the Agency before the facility or equipment covered by this permit is placed into operation.

7. These standard conditions shall prevail unless modified by special conditions.

8. The Agency may file a compliant with the Board for modification, suspension or revocation of a permit:

a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed; or

b. upon finding that any standard or special conditions have been violated; or

c. upon any violation of the Environmental Protection Act or any Rule or Regulation effective thereunder as a result of the construction or development authorized by this permit.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WATER POLLUTION CONTROL PERMIT

OCT 28

LOG NUMBERS: 4087-91

PERMIT NO.: 1991-HB-4087

FINAL PLANS, SPECIFICATIONS, APPLICATION AND SUPPORTING DOCUMENTS
PREPARED BY: Fehr-Graham and Associates

DATE ISSUED: October 25, 1991

cc: Rec
cc: City Engineer

SUBJECT: RECOMP, INC. - Sanitary Sewer Connection and Industrial Connection -- Freeport Wastewater Treatment Plant

PERMITTEE TO CONSTRUCT CONNECTION AND EXTENSION
Recomp, Inc.
Post Office Box 842
Freeport, Illinois 61032

PERMITTEE TO OPERATE EXTENSION
City of Freeport
230 W. Stephenson Street
Freeport, Illinois 61032

Permit is hereby granted to the above designated permittee(s) to construct and/or operate water pollution control facilities described as follows:

Sewer Extension

1200 linear feet of 8 inch PVC pipe, 3 manholes, and all necessary appurtenances required to complete a sanitary sewer extension to serve the proposed Recomp, Inc. facility which is to be located along South Walnut Street, Freeport, Illinois in Township 26 North, Range 8 East, Section 7. Discharge will be to the Freeport Wastewater Treatment Plant via an existing 18 inch interceptor south of the existing landfill.

Sewer Connection

150 linear feet of 6 inch PVC pipe and all appurtenances required to serve the proposed Recomp, Inc. composting facility located in Freeport, Illinois. Discharge (DAF = 420 gpd, PE = 5) along with stormwater overflow resulting from a 25 year frequency storm event from the leachate collection system will be to the Freeport Wastewater Treatment Plant via the above sewer extension.

This Permit is issued subject to the following Special Condition(s). If such Special Condition(s) require(s) additional or revised facilities, satisfactory engineering plan documents must be submitted to this Agency for review and approval for issuance of a Supplement Permit.

(continued on page 2)

THE STANDARD CONDITIONS OF ISSUANCE INDICATED ON THE REVERSE SIDE MUST BE COMPLIED WITH IN FULL. READ ALL CONDITIONS CAREFULLY.

TGM:SN:ct,3111q,43
cc: EPA - Region - Rockford
Fehr-Graham and Associates
City of Freeport
Record
Binds

DIVISION OF WATER POLLUTION CONTROL

Thomas G. McSwiggin, P.E.
Manager, Permit Section

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WATER POLLUTION CONTROL PERMIT

LOG NUMBERS: 4087-91

PERMIT NO.: 1991-HB-4087

FINAL PLANS, SPECIFICATIONS, APPLICATION AND SUPPORTING DOCUMENTS
PREPARED BY: Fehr-Graham and Associates

DATE ISSUED: October 25, 1991

SUBJECT: RECOMP, INC. - Sanitary Sewer Connection and Industrial Connection -- Freeport Wastewater Treatment Plant

SPECIAL CONDITION 1: The issuance of this permit does not relieve the permittee of the responsibility of complying with 35 Ill. Adm. Code, Part 307 and/or the General Pretreatment Regulations (40 CFR 403) and any guidelines developed pursuant to Section 301, 306, or 307 of the Federal Clean Water Act of 1977.

SPECIAL CONDITION 2: The issuance of this permit does not relieve the permittee of the responsibility of complying with any limitations and provisions imposed by the City of Freeport or their wastewater treatment plant ordinance.

SPECIAL CONDITION 3: Any additional connections to this sanitary sewer extension must be in accordance with this permit and the latest Revisions of Subtitle C, Chapter 1. Permits must be obtained if required by said regulations.

SPECIAL CONDITION 4:

a) Liquids, solids, or gases which by reason of their nature or quantity may cause fire or explosion; or be injurious in any other way to sewers, treatment works, structures or to the operation of the treatment works, or cause a safety hazard to the personnel operating the treatment works, or cause the effluent from the treatment works to violate applicable effluent standards are prohibited;

b) Solid or viscous wastes which cause obstruction to the flow in sewers or other interference with the proper operation of any sewer or treatment works are prohibited.

!(8417/r)!
1-M-201#02
Disposal of Organic Waste.
Effective: August 15, 1990

Article 201.08 of the Standard Specification shall be revised to read:

Disposal of Materials. Non organic materials shall be disposed of in accordance with Article 202.03. Organic materials shall be disposed of as follows:

Pursuant to State law, no organic landscape waste that is not excluded by the law shall be disposed of in a landfill facility after July 1, 1990. Organic waste, originating within the right of way limits, shall be removed for reuse, chipped/shredded and placed as mulch around landscape plantings on the right of way, or taken to an Illinois Environmental Protection Agency registered composting facility for proper disposal. When specified, disposal within the right of way shall be required at the locations shown in the plans. Chipped/shredded material to be placed as mulch shall not exceed a depth of six (6) inches.

The Contractor shall provide the Engineer a written proposal for disposal of organic waste generated during construction. The proposal shall indicate where organic waste will be disposed and how the areas affected within the right of way will be restored. All proposals for organic disposal must be approved by the Engineer prior to beginning work items that generate the waste.

The Department considers trees, and other plant materials to be a valuable natural source. When these materials are required to be removed because of construction activities, the Department encourages reuse of the material (i.e. salvage and transplant, saw timber, wood chip mulch or fuel timber) as the first preference of disposal.

Disposal of organic waste will not be paid for separately, but shall be considered incidental to the contract pay items that generate the organic waste. No credit will be required for reuse of plant materials that are required to be removed.

!(8417/C)!
1-M-216#01
Compost Placement.
Effective August 15, 1990

This work shall consist of furnishing, transporting, spreading and incorporating compost into soil in areas shown on the plans and as directed by the Engineer.

Materials. All compost used must be produced at an Illinois Environmental Protection Agency registered composting facility. A copy of certification of registration shall be provided to the Engineer with each shipment.

Compost Placement. Compost shall not be placed until the area designated has been shaped, trimmed and finished in accordance with Section 217 of the Standard Specifications and any required placement of Hydric Soil or Topsoil has been completed. Prior to compost placement, the area shall be disked or raked to a minimum depth of four (4) inches and all debris and loose stones removed. The grades and condition of the area must be approved by the Engineer prior to compost placement.

The compost shall be placed to the lines, grades and depths specified on the plans. After the Engineer verifies that the proper compost depth has been applied, the Contractor shall completely incorporate the compost into the soil to a minimum depth of six (6) inches by raking, discind or tilling.

After the compost has been incorporated into the soil any debris or piles of unincorporated material shall be immediately removed from the right of way and the area finished to the lines and grades shown on the plans and approved by the Engineer.

Method of Measurement. Compost placement will be measured in square yards at the locations shown in the plans prior to incorporation into the soil.

Basis of Payment. This work will be paid for at the contract unit price per square yard for COMPOST PLACEMENT of the thickness specified. Payment shall include all costs for materials, equipment and labor required to complete the work specified herein, including the cost of removing and disposing of any debris.

Appendix B

MARKET SURVEY FORM AND LIST OF CONTACTS

Contents

Survey Form
List of Kane County Contacts
List of Other County Contacts

KANE COUNTY MSW COMPOSTING MARKET SURVEY, BECKER ASSOCIATES, INC. P. 1
DEC. 11, 1991

Kane County is studying composting solid waste. For a program to be feasible, there needs to be a market for the finished compost. Please help us with the following information on your use of soil amendments and the market for compost products:

1. Company/Agency Name:
   Contact Person: Telephone:

2. Do you use compost or other types of soil amendments? Which ones? How much do you use? What do you use them for? What is their approximate price? (if they don't know the price, ask if they buy by the bag or in bulk).

	We Use	Annual Quantities (cu. yd. or tons)	Use for the product	Approx. Price Paid (bulk or bagged)
Yard Waste Compost				
Bark				
Manure				
Peatmoss				
Perlite				
Sawdust & Shavings				
Top Soil				
Worm castings				
Fish meal				
Straw				
Woodchips				
Sewage sludge compost				
Other compost				
Other				

Please turn page over

3. Did you know that compost can be produced from recycled wastes?

4. Do you have any concerns about using compost from:
   a. yard wastes?

   b. the organic portion of municipal solid wastes?

5. What quantities of compost from yard wastes or municipal solid wastes would you use each year and for what purpose? Indicate if your use is seasonal.

	Yard Waste Compost	MSW Compost	What seasons?
Landscaping & Ornamentals			
Home Vegetable Gardening			
Agriculture			
Other			

6. Do you have any specific requirements for the compost? _____ If yes, indicate specific requirements in the table below:

Particle Size
pH (acid or alkanine)
C/N (Carbon/Nitrogen) Ratio
NPK (Nitrogen, Phosphorus, Potassium)
No contaminants
Maturity of the Compost
Heavy metal limits
Other

7. Any Comments?

Date Interviewed: Initials:

Top Soil Suppliers

1. Christian Construction - out of business
   14N465 Sleepy Hollow Rd., W. Dundee 60118 --- 742-6700
** 2. Curly's Inc.
   8751 Schoger Rd., Aurora 60504 ---------- 898-5353
3. Illinois Top Soil - no answer
   7N904 Rt. 25, Elgin 60123 ---------- 695-0467
** 4. Landmier's Top Soil
   13N175 Randall Rd., Elgin 60123 ---------- 931-9145
* 5. Montgomery Landscaping
   1359 Carol Pl., Montgomery 60538 ---------- 851-5426

Park Districts

** 1. Batavia Park District - Ralph Voris, Director
   327 W. Wilson St, Batavia 60510 ---------- 879-5235
** 2. Dundee Park District - Richard Bemm, Director
   21 N. Washington, Carpentersville 60110 ----- 551-4300
** 3. City of Elgin Parks Dept. - Ross Ricks, Director
   150 Dexter Ct., Elgin 60120 ---------- 931-6120
** 3. Fox Valley Park District - Charles Hoscheit, Director
   P O Box 818, Aurora 60507 ---------- 897-0516
** 5. Geneva Park District - Stephen Persinger, Director
   710 Western Ave, Geneva 60134 ---------- 232-4542
** 6. St. Charles Park District - James Breen, Director
   101 S. 2nd St., St. Charles 60174 ---------- 584-1055

Municipalities

** 1. City of Aurora - Public Works Dept.
   44 E. Downer Pl., Aurora 60507 ---------- 844-3621
** 2. City of Batavia - Public Works Dept.
   101 N. Island Av., Batavia 60510 ---------- 879-1424
** 3. Village of Carpentersville - Public Works Dept.
   1200 Besinger Dr., Carpentersville 60110 ---- 551-3495
** 4. Village of E. Dundee - Public Works Dept.
   120 Barrington Av., Dundee 60118 ---------- 426-2822
** 5. Village of W. Dundee - Public Works Dept.
   102 S. 2nd St., Dundee 60118 ---------- 551-3800
** 6. Village of Elburn
   P O Box AF, Elburn 60119 ---------- 365-9441
** 7. City of Elgin - Public Works Dept.
   150 Dexter Ct., Elgin 60120 ---------- 697-3160
** 8. City of Geneva - Public Works Dept.
   22 S. 1st St., Geneva 60134 ---------- 232-7494
* 9. Village of Gilberts
   P O Box 175, Gilberts 60136 ---------- 428-2861
* 10. Village of Hampshire
   P O Box 457, Hampshire 60140 ---------- 683-2181
** 11. Village of Montgomery
   1300 S. Broadway, Montgomery 60538 ---------- 896-6238
** 12. City of St. Charles - Public Works Dept.
   2 E. Main St., St. Charles 60174 ---------- 377-4405
** 13. Village of Sleepy Hollow
   1 Thorobred Ln., Sleepy Hollow 60118 -------- 426-6700

Notes:

* Contacted, but no current use of compost or soil amendments

** Survey completed

** 14. Village of South Elgin Public Works Dept.
10 N. Water St., South Elgin 60177 ---------- 742-5780

15. Village of Sugar Grove - unavailable
P O Box 49, Sugar Grove 60554 ---------- 466-4507

Kane County Departments

** 1. Highway/Transportation Dept. - Nabi Fakroddin, Director
41W011 Burlington Rd., St. Charles 60175 ---- 584-1170

** 2. Forest Preserve Commission - Jon Duerr, Superintendent
719 Batavia Av., Geneva 60134 ---------- 232-5980

Notes:
* Contacted, but no current use of compost or soil amendments
** Survey completed

Additional Contacts for Market Survey

December 9, 1991

Kane County Cooperative Extension Service - unavailable last 3 weeks of Dec. until Jan. 6
535 S. Randall Road
St. Charles, Il 60174
(708) 584-6166

* Kane County Farm Bureau
2N710 S. Randall Road
St. Charles, Il 60174
(708) 584-8660

* Kane-DuPage Soil & Waste Conservation District
545 S. Randall Road
St. Charles, Il 60174
(708) 584-7961

Notes:
* Contacted, but no current use of compost or soil amendments

Potential Compost End Users in the Kane County Area
12/16/91

Nurseries

IL 708 area code

	1.	Adam Fritz Landscaping - no answer 24838 Old McHenry Rd., Lk. Zurich	438-5101
**	2.	Barn Nursery & Landscape 8109 Rt. 31, Cary	658-3883
**	3.	Bartlett Nursery & Landscaping 1681 Gerber Rd., Bartlett	837-0101
**	4.	Bruss Nursery & Landscaping 1607 E. Roosevelt Rd., Wheaton	665-1600
**	5.	Cedar Hill Nursery Rt. 22 & Quinten Rd., Lk. Zurich	540-8474
	6.	Chas Klehm & Son Nursery - no answer Rt. 59 1/4 Mi N. of Rt. 72, Barrington Hills	551-3720
	7.	Des Plaines Sod Center Inc. - no answer 920 W. Algonquin Rd., Algonquin	658-5624
	8.	Faith Nursery - no answer 26W180 W. North Ave., Wheeling	665-2723
*	9.	Franks Nursery 1520 Aurora Ave., Naperville	983-7277
	10.	Gutmann A Nursery - no answer Darrell Rd., Waconda	526-8370
	11.	Herbal Harvest Nursery & Gardens - not available 723 Grand, Aurora	896-4759
	12.	Home Landscape Materials Inc. - not available 10S550 Route 53, Naperville	759-1205
*	13.	Hook's Nursery 1005 W. Hwy. 22, Lk. Zurich	438-7190
	14.	Iverson Ronald Perennial Gardens - no answer N Rt. 53, Long Grove	359-3500
	15.	Kaknes Landscape Supply Co. - no answer 31W545 W. Diehl Rd., Naperville	416-9999
**	16.	Manchester Nursery 1022 Manchester, Wheaton	668-2823
	17.	Old Mill Flower & Garden Center - no answer Rand & Cuba Rds., Lake Zurich	438-5671
	18.	Ornamental Growers Assoc. - no answer Batavia	879-0520
	19.	Stibbe's Nursery Inc. - no answer 4S212 N. Mill, Naperville	357-0389
	20.	Stonegate Farm Nursery Center - no answer 2001 W. Algonquin Rd., Algonquin	658-5354
	21.	Straus Nursery Inc. - disconnected Palatine Rd., Barrington	381-0150

Notes:
* Contacted, but no current use of compost or soil amendments
** Survey completed

Nurseries

		IL 708 area code
	22. Straus Tree Farms Inc. - no answer 8101 Rt. 31, Cary	658-8843
*	23. Suburban Floral 29W036 Butterfield Rd., Warnvl	393-1968
	24. Weiler Arthur Nursery - no answer Rt. 22 Lk. Zurich	438-8287
	25. Wheaton Nurseries - no answer 626 E. Roosevelt Rd., Wheaton	668-0947

Sod Farms

	1. American Sod Corp - no answer 331 W. NW Hwy., Palatine	358-0144
	2. Brandt Sod Farm Inc. - no answer 231 N. Wms. Dr., Palatine	359-8840
	3. Central Sod Farms Inc. - no answer 20152 N. Rand Rd., Palatine	934-7774
*	4. Central Sod Farms 24803 W. 111th, Naperville	904-1017
	5. Deak Sod Farms - disconnected 1020 W. NW Hwy., Palatine	359-8873
	6. Des Plaines Sod Center Inc. - not available 920 W. Algonquin Rd., Algonquin	658-5624
	7. Doherty Landscaping Contractor - not available Schaumburg	882-0348
	8. Nauman Sod - not available Naperville	983-1080
	9. Ruggles Landscaping - not available Elgin	289-2070
	10. Suburban Lawn Inc. - not available 29W036 Butterfield Rd., Warnvl	393-1966
*	11. Wiesbrock Turf Farms 2S555 Wms Rd., Warnvl	393-7334
	12. Wildflower Ranch Inc. - not available 3S316 Rt. 59, Warnvl	393-1144

Topsoil

	1. E. C. Rizzi & Sons Inc. - not available 31W310 Schoger Rd., Naperville	898-3333
	2. Fellman Trucking - no answer 905 S Dawn, Glen Elyn	858-9124
	3. Frenzer Henry Inc. - not available 620 Webster, Algonquin	658-5303
	4. Good Earth Inc. - disconnected Des Plaines	358-8558
**	5. Herron Topsoil 26433 Anderson Rd., Wauconda	526-8500

Notes:

* Contacted, but no current use of compost or soil amendments

** Survey completed

Topsoil

6. Leibforth Landscaping - no answer
   Palatine ---------- 358-6790
7. Naperville Topsoil Landscape - no answer
   31W066 91st, Naperville ---------- 820-8998
8. Prairie Top Soil - no answer
   20316 N. Rand Rd., Palatine ---------- 540-7645
** 9. R C Topsoil
   27 W. 930 Industrial Ave., Lake Barrington --- 382-7645
10. Thomas Landscaping - out of business
    21183 N Hart Rd., Barrington ---------- 382-6232
11. W D S Topsoil - out of business
    Aurora ---------- 898-6250
12. Zaininger Concrete - out of business
    Naperville ---------- 691-2668

Notes:
* Contacted, but no current use of compost or soil amendments
** Survey completed

APPENDIX K

DEFINITION OF POTENTIAL INTEGRATED SOLID WASTE MANAGEMENT SYSTEMS

Prepared by:

Kane County Development Department

February 1992

DEFINITION OF POTENTIAL INTEGRATED SOLID WASTE MANAGEMENT SYSTEMS

I. Introduction

The initial phases of a solid waste planning process involve assessing the size of the total waste stream and major components, developing a recycling program which must be included in any plan according to state law, and assessing the various technologies which are available to manage and/or dispose of non-recyclable waste amounts. Once this information has been compiled, comprehensive systems which utilize two or more approaches (including recycling) can be defined.

The definition of potential management systems must consider both the amount and type, or source, of solid waste to be managed. After potential systems have been assembled, the size of individual components of each system can be determined by considering the characteristics of the waste stream at the point in time at which additional management capacity is required, and the service life of the systems. Each system, and component thereof, can then be evaluated by applying a uniform set of criteria to each case. The entire process is designed to provide a thorough evaluation of alternative approaches and a strong foundation for informed decision-making.

II. DEFINITION OF SYSTEMS

Each system to be defined will consist of a recycling and waste reduction component and at least one other waste management technique. Each system provides an integrated management program for the entire waste stream, where individual components are applied to specific portions of the waste stream and then assembled into a comprehensive and inter-related system.

Specific waste management approaches selected for inclusion in candidate systems include:

1. Waste Reduction. Efforts by waste producers to reduce the amount of waste which requires management will be strongly encouraged by a County program which includes vigorous educational efforts, financial

incentives, and support for state and federal legislative initiatives.

2. Recycling. A comprehensive program designed to recycle 47.3 percent of the total waste stream has been proposed earlier in the planning process and is included in each of the defined systems. The recycling component includes landscape waste composting efforts.
3. Incineration with Energy Recovery. This technology is commercially available and is being utilized in various locations across the country.
4. Landfilling. This approach is currently employed to manage the majority of solid waste in Illinois and other states.
5. Transfer Stations. An intermediate step in solid waste systems, transfer stations can increase transportation efficiencies and serve as locations for certain mixed-waste processing functions, including separation for recycling purposes.
6. Municipal Solid Waste (MSW) Composting. Although a relatively new approach, MSW composting facilities are being developed in an increasing number of jurisdictions.

Numerous other technologies were considered but have not been selected for inclusion in systems to be further evaluated. These technologies include:

1. Incineration without energy recovery, which does not provide the resource or economic benefits available from waste-to-energy incinerators.
2. Fluidized Bed Combustion which, based on available information, is basically a refined version of incineration with energy recovery, providing lower levels of air emissions at a somewhat higher cost. This technology has been applied to solid waste in few facilities in this country.
3. Refuse-Derived Fuel (RDF). While there are several commercially-available systems to produce RDF, the use of this fuel is generally considered in fluidized bed combustion (see above) or mixed with other fuels in non-dedicated boilers. Market and environmental uncertainties

about these non-dedicated facilities preclude further consideration.

4. A wide range of innovative technologies including anaerobic digestion, pyrolysis, ORFA, thermal oxidation, vermiculture, ethanol production, and plasma technology were found to have various degrees of technical merit but are not commercially available for large scale applications.

The six approaches identified as having substantial merit for further consideration have been configured into four distinct systems. The components of each alternative system are presented in Table 1.

Table 1

DEFINITION OF SYSTEMS PROPOSED FOR FULL EVALUATION

Alternative #1:	Waste Reduction/Recycling Incineration with Energy Recovery Landfilling
Alternative #2:	Waste Reduction/Recycling Landfilling
Alternative #3:	Waste Reduction/Recycling MSW Composting Landfilling
Alternative #4	Waste Reduction/Recycling MSW Composting Incineration with Energy Recovery Landfilling

Transfer stations provide an opportunity for increased transporatation efficiencies and a potential location for any desired secondary processing of mixed waste, for recycling, or other processes. They may also serve as locations for processing of separated recyclables.

The potential transportation benefit depends entirely on the location of recommended facilities, which will not be considered in this planning effort. The other

benefit of transfer stations, providing flexibility to the total system for processing purposes, depends on the remaining opportunity for recycling after the 47.3 percent primary goal has been achieved.

For the purposes of this planning effort, transfer stations will be considered as a subset of each defined system, and will be evaluated by using the uniform criteria. However, a final recommendation on their inclusion in a comprehensive solid waste management system will not be possible until facility locations are determined and the potential for recycling from a mixed waste stream is more thoroughly considered.

The recycling component in each of the three systems consists of the programs previously proposed to achieve and overall recycling rate of 47.3 percent. The distribution of non-recycled solid waste in each syystem is described below:

Alternative #1:

All residential and commercial waste is directed to the combustion facility. One-half of the industrial waste is assumed to be combustible, with the remainder directed to the landfill. All remaining construction and demolition debris is assumed to be non-combustible and directed to the landfill. Operation of the incinerator will result in an estimated 20 percent residue, primarily ash, which will require landfilling.

Alternative #2:

All waste not recycled will be directed to a landfill.

Alternative #3:

All residential and commercial waste is directed to a MSW composting facility. The remaining amounts are sent directly to a landfill. Of the amounts sent to the composting facility an estimated 14 percent can be recovered for recycling, and another 41 percent will be non-compostable and require landfilling.

Alternative #4:

All residential and commercial waste is directed to a MSW composting facility. One-half of the industrial waste is sent to a combustion facility. The remaining industrial waste and C/D waste is sent directly to a landfill.

Of the waste amounts received at the composting facility, 14% will be

recycled, 19% will be diverted to the combustion facility, and 22% will require landfilling. Of the waste amount received at the combustion facility, 15%, in the form of ash, will require landfilling.

III. TIMING AND WASTE DISTRIBUTION FOR EACH SYSTEM

The total amount of solid waste requiring management by each of the defined systems can be estimated by considering the amount of waste generation projected in the Assessment of Solid Waste Needs report, the impact of proposed recycling programs, and the estimated time at which new management capacity will be required. The amounts generated, recycled, and remaining for further management through year 2012 are presented in Table 2 and Figure 1.

According to the October 1991 Illinois EPA report Available Disposal Capacity for Solid Waste in Illinois, Settlers Hill landfill has an estimated 11 years of remaining capacity and Woodland landfill has an estimated 10 years remaining. If current trends continue, Settlers Hill's capacity will be exhausted in early 2002, and Woodland in early 2001.

A strong potential exists for a horizontal expansion of Settler's Hill landfill which would provide an estimated additional five years of capacity. However, until all acquisition, siting approval and permitting activities are completed, this additional capacity cannot be reliably considered for planning purposes.

In addition, the County's contractual agreement with the operator of Settler's Hill essentially requires delivery of a fixed amount of waste each year. This provision creates a situation where the immediate development of a non-landfill facility (incinerator or MSW composting plant) would not extend the lifetime of the landfill.

Table 2

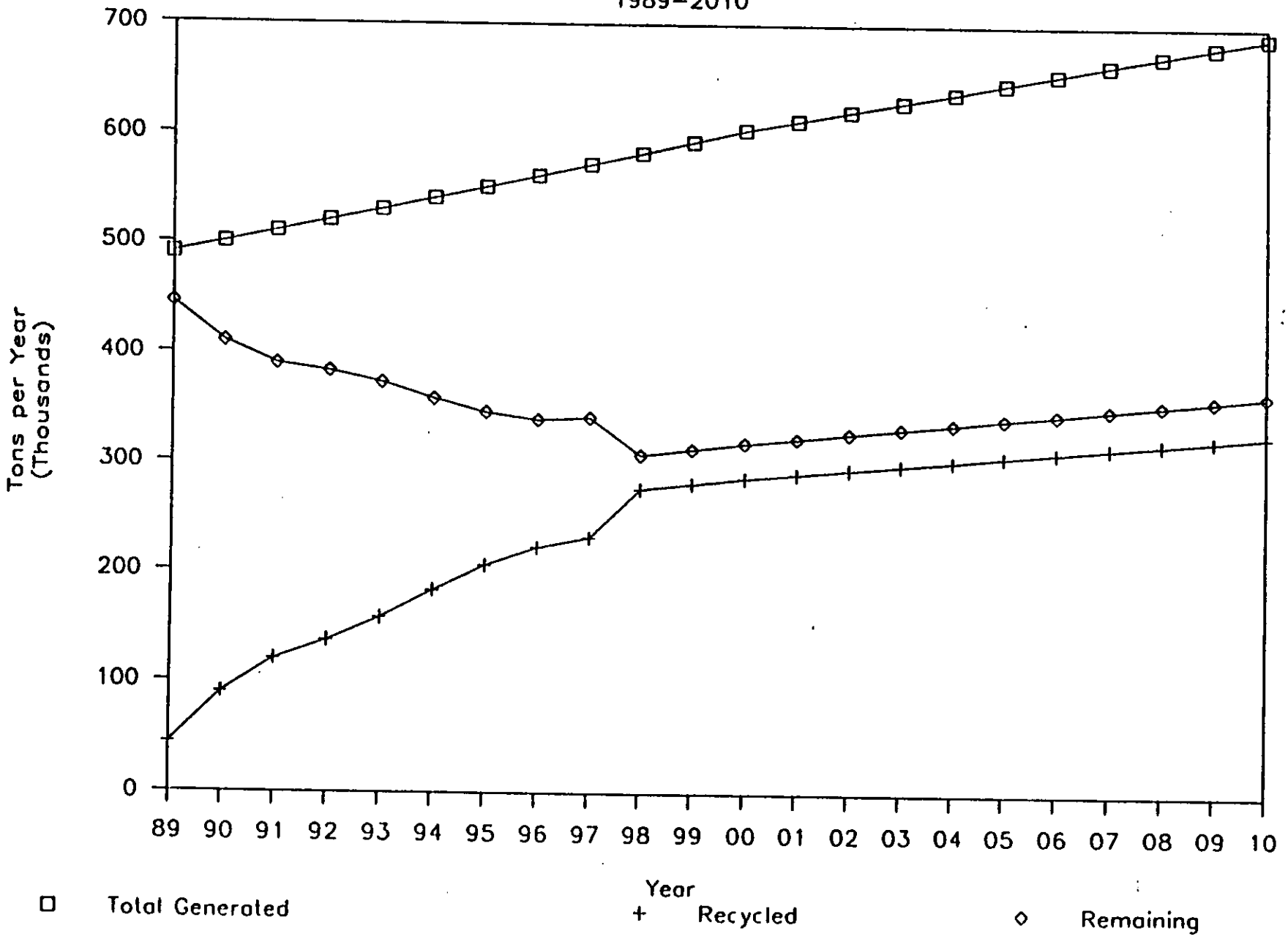
PROJECTED SOLID WASTE AMOUNTS
1989-2012

	Total Generation	Recycling		Waste Remaining
Year	Tons	%	Tons	Tons
1989	490,820	9.1	44,628	446,192
1990	500,664	18.0	90,120	410,544
1991	510,827	23.6	120,555	390,272
1992	521,050	26.4	137,557	383,493
1993	530,707	29.7	157,620	373,087
1994	541,040	33.7	182,330	358,710
1995	551,430	37.2	205,132	346,298
1996	561,881	39.5	221,943	339,938
1997	572,390	40.3	230,673	341,717
1998	582,960	47.3	275,740	307,220
1999	593,588	47.3	280,767	312,821
2000	604,277	47.3	285,823	318,454
2001	612,915	47.3	289,909	323,006
2002	621,555	47.3	293,996	327,559
2003	630,193	47.3	298,081	332,112
2004	638,832	47.3	302,168	336,664
2005	647,471	47.3	306,254	341,217
2006	656,110	47.3	310,340	345,770
2007	664,748	47.3	314,426	350,322
2008	673,388	47.3	318,513	354,875
2009	682,028	47.3	322,599	359,429
2010	690,668	47.3	326,686	363,982
2011	695,220	47.3	328,839	366,381
2012	699,772	47.3	330,992	368,780

FIGURE 1

WASTE GENERATED/RECYCLED/REMAINING

1989-2010



Therefore, it is estimated that additional capacity will be required, and facilities developed to provide that capacity, in the year 2001. The projected 2001 waste stream is presented in Table 3. These waste amounts have been allocated among the components of the four alternative systems being considered. For each system, the waste distribution to each component is presented in Tables 4, 5, 6, and 7. The four systems are summarized in Table 8.

Table 3

Projected Waste Stream, 2001 (tons)

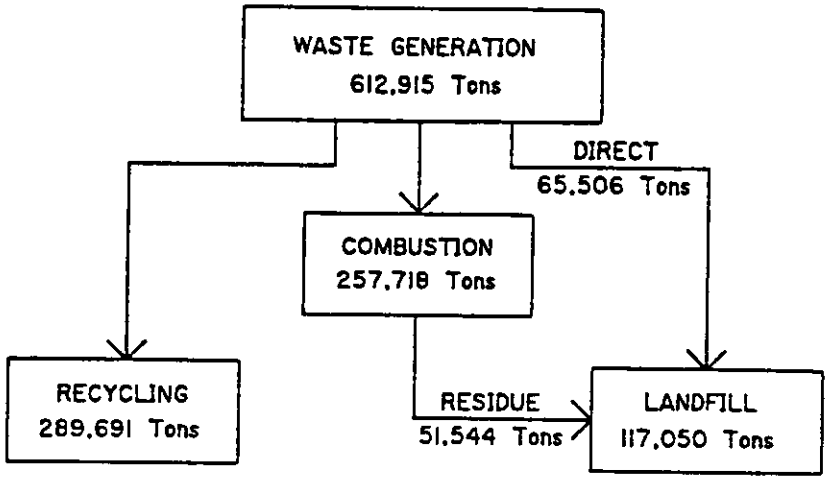
Sector	Percent	Generation	Recycling*	Remaining
Residential	36.8	225,553	118,339	107,214
Comm/Inst	28.1	172,229	67,923	104,306
Industrial	22.5	137,906	45,509	92,397
C/D Debris	12.6	77,227	57,920	19,307
Total	**100.0**	**612,915**	**289,691**	**323,224**

* includes landscape waste

TABLE 4

ALTERNATIVE #1

WASTE DISTRIBUTION (2001)



(All figures in Tons/Year)

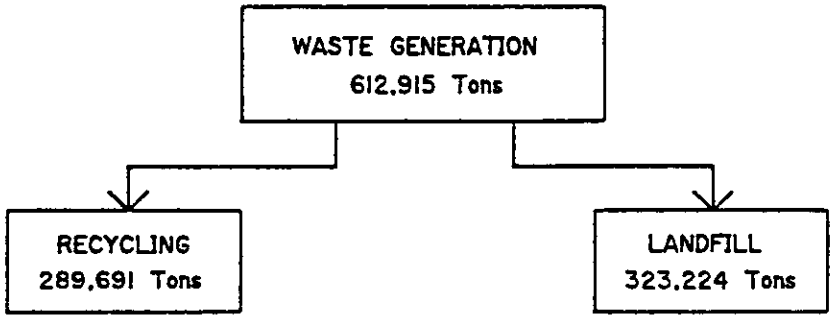
	Recycling	Combustion	Landfill
Residential	118,339	107,214	-
Comm./Inst.	67,923	104,306	-
Industrial	45,509	46,198	46,199
C/D Debris	57,920	-	19,307
Subtotal	289,691	257,718	65,506
Residue*	-	(51,544)	51,544
TOTAL	289,691	206,174	117,050
Percent	47.3%	33.6%	19.1%

*Residue=20% of combustion waste stream

TABLE 5

ALTERNATIVE #2

WASTE DISTRIBUTION (2001)

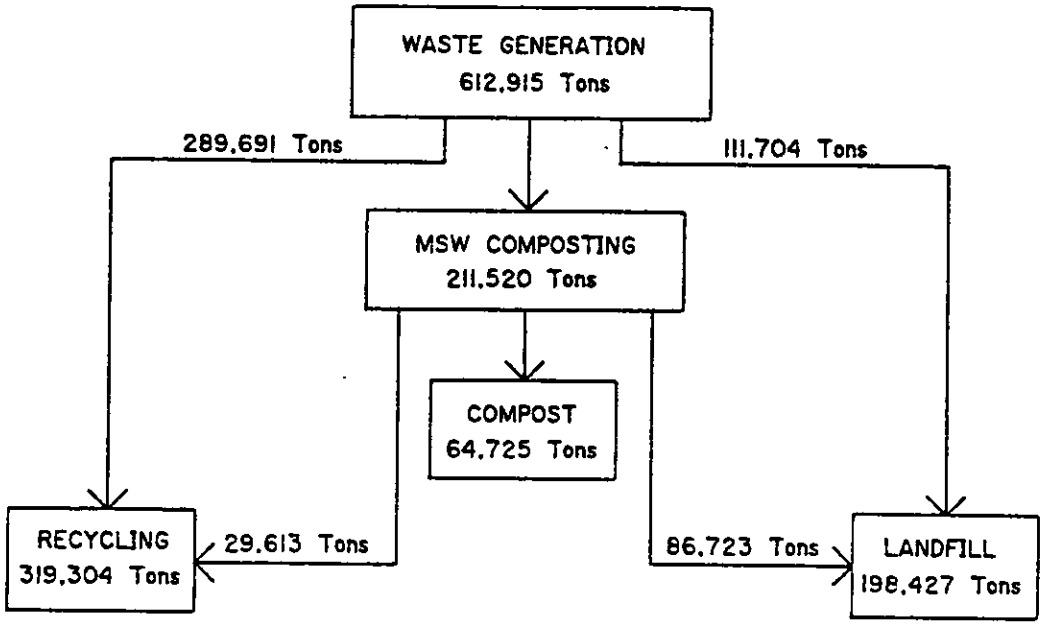


(All figures in Tons/Year)	Recycling	Landfill
Residential	118,339	107,214
Comm./Inst.	67,923	104,306
Industrial	45,509	92,397
C/D Debris	57,920	19,307
TOTAL	289,691	323,224
Percent	47.3%	52.7%

TABLE 6

ALTERNATIVE #3

WASTE DISTRIBUTION (2001)



(All figures in Tons/Year)

	Recycling	MSW Compost	Landfill
Residential	118,339	107,214	-
Comm./Inst.	67,923	104,306	-
Industrial	45,509	-	92,397
C/D Debris	57,920	-	19,307
Subtotal	289,691	211,520	111,704
Recycling*	29,613	(29,613)	-
Residue**	-	(86,723)	86,723
TOTAL	319,304	95,184	198,427
Percent	52%	16%	32%

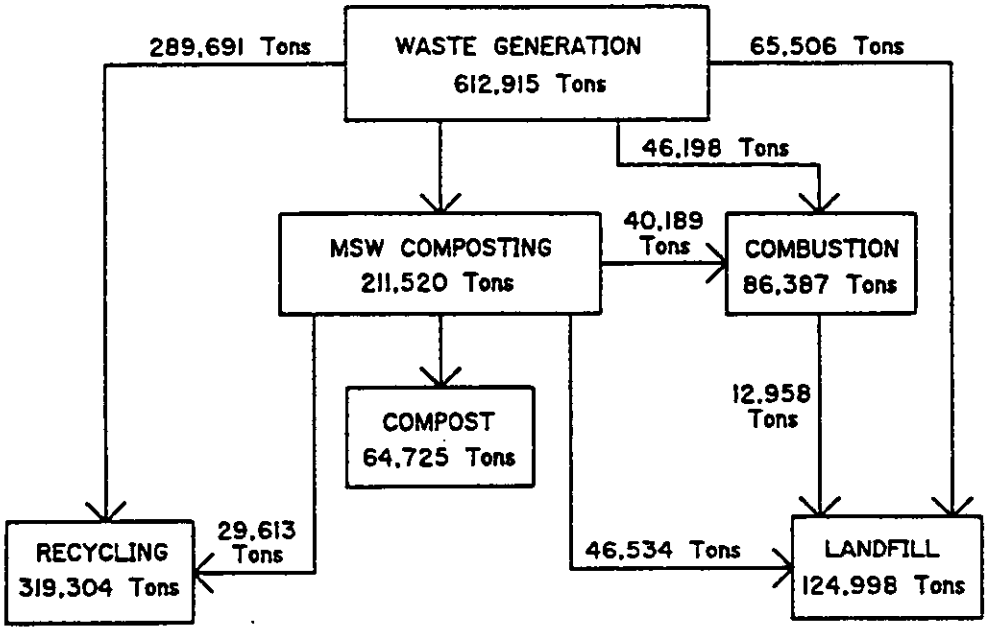
*Assumes 14% recycling at compost facility.

**Assumes 41% residue at compost facility.

TABLE 7

ALTERNATIVE #4

WASTE DISTRIBUTION (2001)



(All figures in Tons/Year)

	Recycling	MSW Compost	Combustion	Landfill
Residential	118,339	107,214	-	-
Comm./Inst.	67,923	104,306	-	-
Industrial	45,509	-	46,198	46,199
C/D Debris	57,920	-	-	19,307
Subtotal	289,691	211,520	46,198	65,506
Recycling*	29,613	(29,613)	-	-
Combustibles**	-	(40,189)	40,189	-
Residue***	-	(46,534)	-	46,534
Ash****	-	-	(12,958)	12,958
TOTAL	319,304	95,184	73,429	124,998
Percent	52%	16%	12%	20%

*Assumes 14% recycling at compost facility.

**Assumes 19% combustibles separated at compost facility.

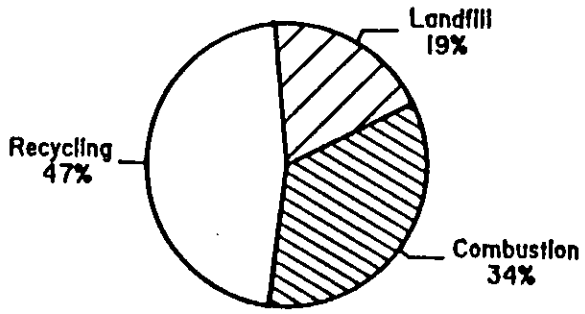
***Assumes 22% residue from compost facility.

****Assumes 15% ash from combustion facility.

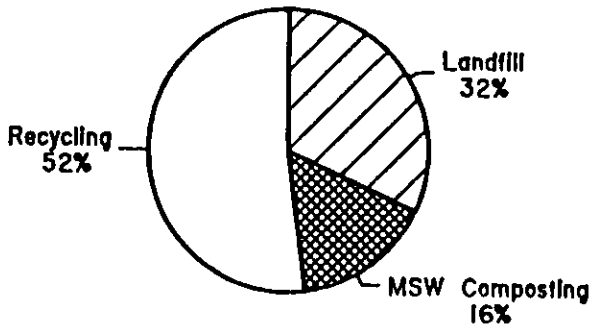
TABLE 8

SUMMARY OF SYSTEM ALTERNATIVES

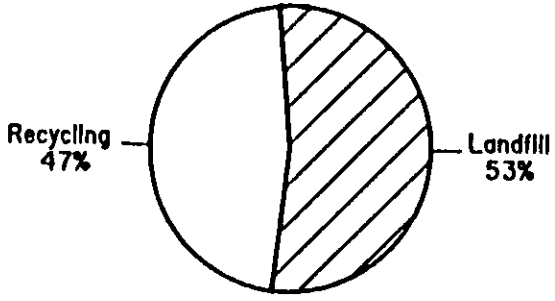
ALTERNATIVE #1



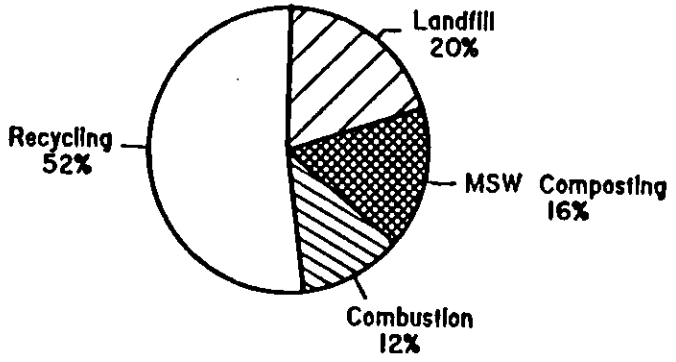
ALTERNATIVE #3



ALTERNATIVE #2



ALTERNATIVE #4



IV. COMPONENT SIZE

The size of each component, in terms of tons per day through-put, can be estimated by dividing the amount of waste directed to each component in 2001 by 365 days. For MSW composting and combustion facilities, an 85 percent availability factor is applied to reflect maintenance periods and unscheduled downtime. Component sizes are shown in Table 9.

These estimates will require review as part of an engineering study before facility development would commence. The compost and combustion facilities are designed to receive a fixed amount of waste each year. Their capacity cannot be readily increased to handle greater amounts of waste which may result from growth in the waste stream, inability to achieve recycling goals, or other factors.

Table 9

SYSTEM COMPONENT SIZES

	Alternatives			
Component	#1	#2	#3	#4
MSW Compost	-	-	682 TPD	682 TPD
Combustion	830 TPD	-	-	-
Landfill	321 TPD	885 TPD	544 TPD	342 TPD

Notes:

1. TPD is tons per day
2. All figures based on 365 days per year.
3. Compost and combustion figures include an 85% availability factor.

Any growth in the waste stream beyond the year 2001 must be directed to a landfill, which is inherently capable of accepting variable waste amounts. The pre-development engineering study for a future landfill will need to account for waste stream growth when determing design capacity of the facility.

V. Area Requirements

The feasibility study of MSW composting estimated that a facility for Kane County would require about 43 acres. A combustion facility would likely require about 30 acres.

The size of a future landfill component is dependent upon several site-specific factors, including: (1) site topography; (2) depth and height of the fill space; and (3) amount of buffer space required to achieve compatibility with adjacent land uses. Area requirements cannot be accurately determined until site-specific studies are conducted.

APPENDIX L

EVALUATION OF DEFINED

SOLID WASTE MANAGEMENT SYSTEMS

Prepared by:

Kane County Development Department

February 1992

EVALUATION OF DEFINED SOLID WASTE MANAGEMENT SYSTEMS

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V. Technical Reliability	15
VI. Market Reliability	16
VII. Flwxibility	17

Each defined system, and component thereof, will be evaluated in this report, by applying the following criteria:

I. Economic Impact

II. Environmental Impact

III. Energy Considerations

IV. Compatibility with Recycling

V. Technical Reliability

VI. Market Reliability

VII. Flexibility with regard to waste stream and technology changes.

Under each criterion, the components of each system will be considered individually, and also from a total system perspective where appropriate.

I. ECONOMIC IMPACT

There are three useful methods of presenting cost information for each component and total system: capital costs, total annual cost, and cost per ton (tipping fee). Capital costs may be borne by either the County, as owner of facilities, or the facility operator. Total annual cost includes debt service, operating and maintenance costs, and governmental surcharges. The tipping fee is simply a statement of total annual costs divided by the total tons of waste handled each year.

The following analyses present all costs in current dollars. In addition, total annual costs and tipping fees are presented only for the first year of operation. If is assumed that increases in operating costs will be identical for each system component.

A. Recycling Component

The amount of recycling proposed for each system is essentially identical, although MSW composting and transfer station facilities may provide some opportunity for recycling additional amounts. Implementation of the proposed programs will be the responsibility of individual business generators, waste haulers and recycling companies and, for single-family residences, municipalities.

Recycling can result in either revenue production or net costs, depending on the

type of program considered. The economic impact of recycling is best considered on a sector-by-sector basis.

In the residential sector, curbside collection programs currently average about $1.50 in net cost per household per month. The average curbside household currently recycles about 40 pounds per month, resulting in a program cost of $75 per ton. About 90 percent of eligible County households are already served by curbside programs.

The plan calls for curbside collections to increase to 60 pounds per household per month, through increased educational efforts and the collection of additional materials. The collection of more materials is expected to increase the cost to about $2.50 per household per month, or about $83 per ton. The current cost of residential refuse collection and disposal averages $54-67 per ton, and in some communities is $65-80 per ton.

The cost of multi-family recycling programs cannot be accurately assessed, due to the lack of program experience in this area. However, the establishment of mini-dropoff centers at each complex would not likely exceed the cost of curbside collection. The costs of landscape waste recycling programs are even more difficult to assess, due to the variety of services and billing methods in Kane County communities, and the apparently large impact of source reduction efforts by homeowners.

In the commercial sector, recycling can actually be profitable in some cases. For example, stores which generate large volumes of old corrugated containers often bale and sell this material, realizing revenue from the corrugated paper and savings on refuse costs. Corrugated from small business can be separated by the hauler, a practice which can be less expensive to the hauler than paying disposal fees for the mixed loads.

Office paper programs can produce a net revenue to the generator, although the trend in recent, full-service programs is toward a net cost to the generator. Sufficient information is not yet available to accurately assess these costs.

In the few construction debris recycling programs across the country for which

reports are available, wood, concrete, and other similar materials have been recycled for less than the tipping fee at landfills. Again, reported experience is not sufficient to accurately predict the cost of these programs, although it is anticipated that program costs would be competitive with conventional disposal costs.

B. Incineration Component

A 1990 survey of 83 waste-to-energy incineration facilities scheduled for start-up between 1983 and 1994, conducted by the National Solid Waste Management Association (NSWMA), found an average capital cost of $114,000 per daily design ton. Using this figure, the capital cost of the 830 tons per day (TPD) incinerator included in System #1 can be estimated at $94,620,000. The capital cost of the 278 TPD incinerator in System #4 would be $31,692,000.

Tipping fees were found by the NSWMA survey to range from $40 to $100 per ton. The lower tipping fees are usually associated with older facilities and/or those receiving some type of government subsidy. Given this wide range, the current electricity buyback rate from Commonwealth Edison of approximately $0.022 per kilowatt-hour, and costs of increased regulatory efforts, $90 per ton appears to be a reasonable estimate for facilities constructed during the next 5-10 years.

The 830 TPD incinerator in System #1 is designed to accept 257,718 tons of waste per year. A tipping fee of $90 per ton would result in total annual costs of $23,194,620. The 278 TPD incinerator in System #4 would have a total annual cost of $7,774,830.

C. MSW Composting Component

The feasibility study for MSW composting prepared by CalRecovery, Inc. estimated total capital costs of $62,770,635. The study also estimated tipping fees at $74.82 per ton. After including $8 per ton to reflect government surcharges, the total tipping fee would be $82.82 per ton.

The compost facilities in Systems #3 and #4 are designed to handle 211,520 tons per year; a tipping fee of $82.82 per ton results in total annual costs of $17,518,086.

D. Landfilling Component

The capital cost of landfills, as summarized from five different studies in the Landfill Report, ranges from $5,090 to $28,885 per daily design ton, with an average cost of $12,500 per daily ton.

The cost of land was itemized in only one of the five studies, the one with the lowest cost of $5,090 per ton. In this study, land was assumed to cost $1,500 per acre - an unreasonable level for the Kane County area. By using a land cost of $7,500 per acre, the capital cost of that study would rise to $5,985 per daily ton. At $10,000 per acre, the capital cost would be $6,360 per daily ton, well below the average capital cost of $12,500 per ton calculated from the five studies. On the basis of this analysis, the figure of $12,500 per daily design ton appears to be a reasonable estimate of capital costs.

Landfill facilities are included in all four of the defined systems. The total cost per ton, or tipping fee, for landfills was presented in the Landfill Report as ranging from $15.89 per ton to $29.98 per ton, with an average cost of $20.64 per ton. However, the new regulations for landfills adopted by the Illinois Pollution Control Board in August, 1990 will result in increased costs. The Economic Impact Statement prepared for the new regulations estimates that landfill costs will rise approximately $3.58 per ton in response to these regulations.

Adding this regulatory cost to the previously determined average cost of $20.64 per ton results in a total estimated cost of $24.22 per ton, exclusive of ownership royalties or government surcharges. For comparative purposes, existing prices at Settler's Hills Landfill are approximately $30.00 per ton, with about $8.00 of that amount going for governmental surcharges and ownership royalties. The existing landfill operation is already in compliance with the most costly of the new regulations. Accordingly, the $30.00 cost will be used hereafter.

Total annual costs can be estimated by applying the $30.00 per ton figure to the number of annual tons handled by each facility. Total capital and annual costs for landfills in each defined system are presented on the following page in Table 1.

Table 1

Estimated Capital and Total Annual Costs For Landfills

System	Landfill Size	Capital Cost	Annual Cost
#1	321 TPD	$ 4,012,500	$1,965,180
#2	885 TPD	$11,062,500	$9,696,720
#3	544 TPD	$ 6,800,000	$3,351,120
#4	342 TPD	$ 4,275,000	$1,965,180

E. Summary

Capital costs, total annual costs, and cost per ton for each component and for each defined system are summarized in Table 2.

F. Impact on Refuse Bills

According to information provided by local haulers, landfill tipping fees presently account for an estimated 35% of residential refuse bills, 26% of refuse bills for small commercial customers, and 62% of refuse bills for large commercial customers who use large roll-off containers which require a single, dedicated trip by the hauler.

The estimated tipping fees for the four defined systems are significantly higher than current landfill fees, as shown in Table 3.

Table 3

	Tipping Fee	Increase Over Current Fee
Current	$30.00/ton	-
System #1	$77.84/ton	159%
System #2	$30.00/ton	-0-
System #3	$64.57/ton	115%
System #4	$84.33/ton	181%

Table 2

COST SUMMARY FOR FACILITIES AND SYSTEMS

	System #1	System #2	System #3	System #4
CAPITAL COSTS				
Incinerators:	$94,620,000	-	-	$31,692,000
MSW Compost:	-	-	$62,770,635	$62,770,635
Landfill:	$4,012,500	$11,062,500	$6,800,000	$4,275,000
Total:	**$98,632,500**	**$11,062,500**	**$69,570,635**	**$98,737,635**
ANNUAL COSTS				
Incinerator:	$23,194,620	-	-	$6,047,090
MSW Compost:	-	-	$17,518,086	$17,518,086
Landfill:	$1,965,180	$9,696,720	$3,351,120	$1,965,180
Total:	**$25,159,800**	**$9,696,720**	**$20,869,206**	**$27,258,096**
COST PER TON				
Incinerator:	$ 90.00	-	-	$ 90.00
MSW Compost:	-	-	$ 82.82	$ 82.82
Landfill:	$ 30.00	$ 30.00	$ 30.00	$ 30.00
System Cost/Ton:	**$ 77.84**	**$ 30.00**	**$ 64.57**	**$ 84.33**

However as noted above, tipping fees account for only a portion of total refuse bills. The remainder of the refuse bill covers collection and overhead costs, which should not be significantly affected by any of the four systems under consideration.

The higher tipping fees resulting from the proposed systems will only affect a portion of bills. For example, the System #1 tipping fee will increase 35 percent of a residential bill by 159 percent, a total increase of 56 percent. The impact of higher tipping fees on selected residential and commercial bills is shown in Table 4.

Table 4

	Residential	Small Commercial	Large Commercial
System #1	+56%	+41%	+99%
System #2	-0-	-0-	-0-
System #3	+40%	+30%	+71%
System #4	+63%	+47%	+112%

II. ENVIRONMENTAL IMPACT

Each component of the four proposed systems has environmental concerns associated with its operation. Factors to be considered include air quality, surface water and ground water quality, land surface impacts, odor, noise, vectors, and traffic impacts.

The environmental impact of each component can be minimized through appropriate siting, design, operating, and monitoring procedures. Federal and State requirements for siting and permitting also act to minimize any potential adverse impacts.

As stated in the Systems Evaluation Report for West Cook County, "There is no zero-impact system. Components of all four systems have environmental concerns associated with them. A perfect system, with no environmental impact, does not exist. The decision not to decide, to wait for that non-existent perfect alternative, has its own set of environmental impacts."

The only solid waste management strategy with no environmental impact is waste reduction. By not creating waste in the first place, environmental impacts of treating that waste are eliminated. This concept, referred to as "pollution prevention" or "front of the pipe treatment" is gaining increasing acceptance. However, it is extremely unlikely that all waste will ever be completely eliminated.

An environmental assessment is presented below for each system component. More detailed environmental impact discussions are included in each technology assessment report.

A. Air Quality

1. Recycling

Separate curbside collection of recyclable from residences and businesses will result in air emissions from increased vehicular traffic. Conversely, the manufacture of products from recycled feed-stock generally produces less air pollution than using virgin raw materials. However, the County is home to only one paper-producing facility (Aurora Paperboard) and no metal or glass mills, so local benefits will not likely be significant.

2. Waste-to Energy Incineration

Emissions from the combustion of solid waste are dependent on the composition of the waste stream, operation of the incinerator, and types of air pollution control devices used. As described in the Incineration Report, the main types of air pollutants generated by waste combustion are "criteria pollutants" (sulfur and nitrogen dioxides, carbon monoxide, particulates, and lead), acidic gases, heavy metals and organic compounds. The emission of these materials are the subject of numerous Federal regulations including:

- National Ambient Air Quality Standards
- Preventions of Significant Deteriorations Standards
- New Source Performance Standards

The nature of air emissions from incinerators is such that the emissions will be dispersed, or distributed, over a large area beyond the immediate facility location.

3. Landfilling

Air quality concerns include particulates (dust) and gaseous emissions. Dust is controlled by wetting any powdery loads and roadway watering. Methane gas accumulations can be managed by flaring, or more commonly, by a gas collection and use system.

4. MSW Composting

Air quality impacts may result from emissions due to formation of gases, airborne bacteria and pathogens, and volatilization of compounds during processing.

5. Transfer Stations

Air emissions from vehicular traffic may increase or decrease depending on the distances involved and type of vehicles used.

B. Surface Water Quality

The primary concern is run-off from waste facility sites. Run-off concerns from recycling facilities, incinerators, composting facilities, and transfer stations would be similar to concerns for other industrial-type developments. Any outdoor curing or finishing piles at compost facilities would require special attention. Run-off considerations are greater for landfills, due to the larger land area involved. Water run-off is regulated through a variety of local and state requirements.

C. Ground Water Impacts

Ground water quality concerns center around landfilling and are not a significant concern for other waste facilities. However, a landfill component is included in all four defined systems. Landfill leachate impacts can be mitigated through proper siting, design, and operation of the facility. A leachate collection system reduces the possibility of leachate migration from the facility. IEPA approved liners (clay and/or synthetic) further restrict leachate migration. Groundwater monitoring is performed to verify the effectiveness of the leachate control system. Surface contours and the final cap serve to reduce the creation of leachate by limiting the amount of water which enters.

The landfill regulations adopted by the Pollution Control Board in August 1990 introduce a new method of setting groundwater protection standards which ties the

site characteristics, design, operation, and monitoring into an integrated system. Leachate containment mechanisms must be sufficient so that discharges from the facility will not cause an increase in the concentrations of leachate constituent compounds at a point 100 feet from the waste boundary or property line, whichever is less, within 100 years after closure of the unit.

D. Odor

Odor impacts for incinerators, recycling and compost facilities, and transfer stations are minimized by locating operations indoors. A potential area of concern would be outdoor curing piles at MSW composting facilities. Landfill-related odors are mitigated by daily cover and gas collection systems.

E. Noise

Noise emissions are minimized by indoor operations, adequate buffer space, and the use of earthen berms.

F. Vectors

The potential attraction of insects and rodents to any waste facility can be minimized through proper facility operations.

G. Land Surface Impacts

The amount of land required for landfilling is significantly larger than for other system components and varies in each defined system. Land use after a landfill is closed is generally limited to recreational applications.

The environmental impact of applying MSW compost is not yet well-understood. Potential concerns currently being investigated involve the presence of heavy metals and other undesirable materials in the finished compost.

III. ENERGY CONSIDERATIONS

Solid waste management strategies have evolved to maximize the resources which are recovered from the waste stream. There are two primary types of resource recovery: (1) material recycling and (2) the recovery of energy resources contained in the waste stream. Recycling, incineration, and landfilling strategies all include significant energy production or savings.

A. Recycling

Material recycling results in reduced energy consumption in manufacturing processes when recovered, rather than virgin, materials are utilized. The energy savings from existing and proposed recycling activities can be estimated by considering the amount of material recycled and the energy savings per ton for each material.

Based on the projected amount of recycling, the type of materials recycled, and the estimated energy savings, per ton, for each material an estimated 3,114,768 million BTU per year can be saved by the recycling programs proposed for Kane County. This estimate is intended for illustrative purposes only. Any actual energy savings would be realized only at the point of manufacture. These savings must be balanced against increased energy consumption as a result of increased collection and transportation activity.

B. Incineration

Waste-to-Energy incinerators recover energy in the form of steam, which can be used directly or converted into electricity. Typical energy recovery rates are 4,000 - 6,000 pounds of steam per ton of waste and 350-600 kilowatt-hours per ton. For the incineration component in System #1, this equates to 300-500 billion BTU's produced per year.

The System #1 incinerator could be expected to generate 90-155 million kilowatt-hours of electricity per year. Kane County has a relatively unique opportunity for usage of this electricity in that three municipalities own their own electric distribution systems and would be potential purchasers of the incinerator-produced electricity. The amount of electricity purchased in 1990 by the three municipalities is as follows:

Batavia:	146 million kwh
Geneva:	142 million kwh
St. Charles:	260 million kwh
Total:	**548 million kwh**

C. Landfills

The methane gas produced by decomposition at landfills typically has an energy content of approximately 500 BTU per cubic foot, versus 1,000 BTU per cubic foot for natural gas. This gas can be used in two ways: (1) it can be cleaned and concentrated into "pipeline quality" gas, and (2) it can be burned to generate electricity.

The amount of methane which may be produced by a landfill is difficult to predict and depends on such factors as size and age of the landfill, type of materials contained in the facility, and moisture levels. The Settler's Hills gas collection system produced approximately 20 million kwh of electricity for sales in 1990, roughly equivalent to 68 billion BTU of energy.

IV. COMPATIBILITY WITH RECYCLING

Recycling and waste reduction are the most preferred method of solid waste management under the State of Illinois hierarchy of waste management strategies. The proposed Recycling Program Plan for Kane County includes a recycling goal of 47.3 percent of the total waste steam. Given the relative importance of recycling, the effect of other system components on the potential for large-scale recycling must be considered.

A. Incineration

Combustion facilities commonly include front-end processing equipment to separate recyclable material from the mixed waste delivered to the plant. This mixed waste recycling has diverted 10-15% of the waste at a facility operated by XL Disposal in Crestwood, Illinois. However, the waste accepted by XL had not undergone intensive source-separation efforts. The potential for recycling of mixed waste after source separation has occurred is very uncertain. Another serious concern about separation of mixed waste is whether the level of contamination of recyclables will preclude their marketability.

The removal of recyclable materials from the combustion waste stream is believed to enhance combustion efficiency and reduce boiler maintenance. Removal

of metals and glass reduces the formation of slag and attendant operational problems.

The post-recycled waste stream has been found to have a higher energy content per ton than the pre-recycled waste stream. The removal of materials with no energy value (glass and metals) more than makes up for partial removal of material (paper and plastics) with a high energy content.

Combustion facilities are designed to accept a fixed amount of feedstock each day. A steady flow of waste is required to maintain adequate combustion efficiency and maximize revenues from energy generation. This situation essentially places a cap on the potential for recycling.

For example, consider a system with 50% recycling and 50% directed to an incinerator. If recycling program experience indicates that 60% recycling is feasibility, that extra 10% would be taken away from the incinerator, causing lower efficiency and energy revenue levels. The only way to maintain the 50% incineration design level would be to accept waste from out-of-county sources.

B. Landfilling

Landfills are not designed to accommodate a fixed amount of daily waste. Rather, they are designed to accept some volume of waste over a long period. If recycling greater amounts than the 47.3% goal became a feasibility, the reduction in daily receipts at the landfill would not materially affect facility operation. Recycling at higher than planned rates would conserve space in the landfill and thus extend the useful lifetime of the facility.

An argument has been made that a large amount of available landfill capacity serves as a disincentive to increased recycling, since there would be no motivation to divert material if plenty of space is available. The proposed recycling plan for Kane County includes a statement that recycling levels of greater than the targeted 47.3% should be considered if methods to reach a higher level are found to be feasible. A strong County position in support of recycling and regular monitoring of progress in achieving stated goals will be necessary to assure that the full potential of recycling is met.

C. MSW Compost

Composting facilities have a similar impact on recycling as incinerators. Front-end separation is commonly found at composting plants. Composting facilities also depend on a steady flow of waste which, again, essentially places a cap on the amount of recycling which can be accomplished.

D. Transfer Stations

These facilities also provide an opportunity for mixed-waste sortation. Since they are only an intermediate point, variations in the amount of recycling would have no significant impact on their operation.

V. TECHNICAL RELIABILITY

The ability of a solid waste management process to be technically available and reliable is critical. Municipal solid waste collection and disposal is a daily responsibility of municipalities and private hauling companies. A facility that cannot be expected to operate reliably over a long period is unacceptable. Technical viability is a function of the physical reliability of the technology and the ability of the process to meet all environmental criteria. An overall sense of technical reliability can be derived from past operational experience.

An estimated 160 waste-to-energy incinerators of various sizes are currently operating in the United States, and 150 more are being designed or constructed. Early generations of incinerators experienced mechanical problems related to improper design and a lack of familiarity with waste streams. As the amount of experience with incinerators has increased, so has their reliability.

Landfills are the predominant method of solid waste management in Illinois and the United States. The lack of mechanical systems means that facility shut-downs are almost unheard of.

The reliability of MSW composting facilities is difficult to assess due to the limited amount of operational experience. Although, the mechanical processes used here are fairly straight-forward, many compost facilities have experienced severe problems which have led to their closure. Common problems have been odors and

inadequate quality of the finished compost. Unfortunately, several facilities have not had access to additional funding required to correct these problems, and have subsequently closed. Transfer stations, as an intermediate point in a system, do not typically involve sophisticated equipment and are generally considered to be very reliable.

VI. MARKET RELIABILITY

A. Recyclable Material Markets

Markets for the wide variety of recyclable materials have been a cause of considerable concern for program operators across the country. For most materials, market demand has been sufficient to accommodate the amount of supply. Market prices, however, continue to exhibit signs of instability, much to the consternation of collection program managers.

The various material industries have demonstrated an ability, and sometimes even a willingness, to respond to the public demand for increased recycling by adding capacity. However, the process of developing manufacturing capacity and processing infrastrature to add more materials to the recycling list can take several years.

If the recent trends of (1) industry adequately responding with additional capacity, (2) haulers and independent companies providing processing infra-structure, and (3) increased consumer purchase of recycled-content products continue, market capacity for recyclable materials should remain satisfactory.

B. Energy Markets

The potential municipal use of electricity generated from landfill gas or incineration is strong. Commonwealth Edison is required to buy-back such electricity for distribution through its grid, although the economics of this arrangement are not as advantageous as sales to direct users. The potential demand for usage of steam from incinerators is believed to be extremely limited.

C. Compost Markets

The primary markets which have been identified for compost produced from municipal solid waste are landscape uses, application on agricultural land and use as

landfill cover material. The quality of compost is a significant concern due to the presence of undesirable material such as plastics and, potentially, heavy metals and other hazardous materials. Compost quality standards are being developed by several states; unfortunately Illinois is not one of them. Potential compost users typically demand a steady supply of material which consistently meets quality standards. The ability of facility operators to meet such standards has not yet been fully documented.

The Feasibility Study of MSW composting found that about 65,000 tons of compost would be produced each year. However, local market demand for this material was estimated at only 40,000 tons per year.

VII. FLEXIIBLITY

Solid waste management programs and facilities must be able to accommodate changes in the amount and composition of the waste stream. Flexibility to accommodate future technological advances should also be considered. This concern should be considered on a system-wide basis since a system may include some facilities which are flexible and other which are not.

Changes in the amount of waste may occur, for example, if waste reduction efforts are more successful than anticipated, or if the County experiences unexpected levels of population growth. The composition of the waste stream changes continually, as new products are introduced and packaging materials are changed. Also, the recent attention given to solid waste management problems has led to increased efforts to develop alternative management techniques. The possibility of unexpected advances in technology should also be considered in a careful planning effort.

A. Recycling

The recycling programs proposed would be able to respond to increases in the amount of waste by expansion, e.g. providing curbside service to new subdivisions or paper collection in new office buildings. A less than expected amount of waste would not have a significant effect on recycling programs. The recycling industry has also demonstrated that it can respond to changes in the waste stream composition,

although it may take several years to develop the necessary collection, processing, and manufacturing infrastructure.

B. Incineration

As stated earlier, combustion facilities require a steady supply of waste for the economics to work. They cannot respond to variations in the size of the waste stream. Changes in waste composition may affect the energy content of the fuel and, therefore, boiler efficiency and energy production. Waste could not be diverted from an incinerator to a new technology without incurring severe financial impacts.

C. Landfills

Variations in the size of the waste stream would affect the lifetime of a landfill (more waste-shorter life; less waste-longer life) but should not significantly impact day-to-day operations. Changes in waste composition could affect gas production rates and the amount of leachate generated. Landfills could readily accommodate technological advances. A new, improved waste management facility in the future would divert material from a landfill, increasing the landfill's life.

D. MSW Composting

Much like incinerators, these facilities are designed to handle a fixed amount of waste and cannot respond to significant changes in the size of the waste stream. Changes in waste composition may affect process efficiency and the quality of the compost product. They also would not be able to respond to any technologically-advanced systems which may be developed in the future.

E. Transfer Stations

Although transfer stations are also designed to handle a fixed amount of waste, they are not as capital intensive as incinerators or composters and could be expanded at relatively small cost. Changes in waste stream composition would not materially affect transfer station operation.

APPENDIX M

IMPLEMENTATION ISSUES AND STRATEGIES

Prepared by:

Kane County Development Department

February 1992

A. County Responsibility

This option would reflect a continuation of the existing acceptance of solid waste responsibility by the County. This is a fairly traditional and widely-accepted arrangement. State law provides Counties with the authority to issue bonds and enter into contracts for solid waste purposes, control the flow of waste within its jurisdiction, implement county-wide recycling programs, and to conduct other necessary activities.

B. Municipal Joint Action Agency

State statute allows counties to enter into an intergovernmental agreement between "two or more municipalities, counties, or a combination thereof". The statute refers to this combination of governmental authorities as a "Municipal Joint Action Agency" and confers on the Agency all the powers of a municipality.

The governing body of the Agency is a Board of Directors. Directors are selected by vote of the members eligible to vote under the terms of the intergovernmental agreement. The number, terms of office, and qualifications of the Board is determined by the provisions of the Agreement. The Board establishes bylaws and rules and regulations, determines general policy, makes all appropriations, and acts by a vote of the majority of its members or by such greater majority as may be provided in the Agreement.

The Agency is specifically allowed to enter into contracts and sell bonds, to sue or be sued, to hire employees, and to acquire real or personal property. The Agency can also, through the terms of the Agreement, control the flow of waste generated within its jurisdiction.

C. Solid Waste Authority

This approach is successfully used by counties in other states. It is not specifically allowed under current Illinois statues and would require new enabling legislation.

As practiced in other states, an Authority Board of Directors is appointed by the County Board. The enabling legislation would specifically grant the same powers as allowed for a Municipal Joint Action Agency to the Authority.

Regardless of the organizational structure selected, the implementing agency should appoint an ongoing citizens advisory committee. This formal mechanism for continual public involvement would allow for effective communication with the public, help establish credibility for future initiatives, and provide additional input and perspectives to assist in the resolution of increasingly complex and controversial issues.

III. DESCRIPTION OF FACILITIES AND PROGRAMS

The size, expected cost, and other characteristics of proposed facilities and programs are addressed elsewhere in the planning process. The key issue here is the identification of financing methods for the implementation of plan components. Several financing methods are available, including:

- County solid waste surcharge funds;
- Grants/Loans from State agencies;
- Revenue bonds; and
- Private financing.

In all cases, the ultimate financing mechanism is user fees. Users of the solid waste system pay for the services provided through their refuse bill. This bill includes state and county surcharges, the cost of collection, and the cost of using disposal facilities (tipping fee).

A typical arrangement uses county surcharge funds and state grants to finance overall planning activities, implementation of waste reduction and recycling activities, and general administrative costs.

There is no standard method of financing land acquisition and construction costs for disposal facilities. However, an expedient approach available to Kane County would be to use accrued solid waste enterprise funds for land acquisition and pre-development engineering costs. Costs for the construction of facilities could be financed either through county-issued revenue bonds (to be repaid with tipping fee receipts), or through private financing arranged through the facility developer. The private financing would also be "repaid" with tipping fee receipts. The primary benefit

of private financing is the shifting of risk, at some cost, from the County to the developer.

VI. SITE SELECTION PROCESS

The selection of sites for solid waste facilities involves several technical steps, including:

- Development of site selection criteria, both exclusive and inclusive. Waste facility sites are regulated by a combination of federal and state regulations. The County may wish to adopt other siting restrictions which exceed federal and state standards. Buffer space requirements and other land use criteria would also be established.
- An initial screening process to identify candidate locations and exclude inappropriate locations.
- Detailed site investigations, including hydrogeological studies using soil borings and preliminary groundwater monitoring.
- Final selection of sites.

Several of these steps will require the services of an engineering consultant. A facility engineering feasibility study must be conducted early in the site selection process to determine the size and other design parameters related to the site. This study will be particularly important for potential landfill sites, since actual landfill capacity is dependent on site specific topographic and hydrogeological conditions.

The other critical step in a successful site selection process is providing for substantive public participation in all phases of the process. The County should strongly consider appointing a citizen's siting advisory committee to oversee the siting process. Committee membership would include representation from governmental bodies, members of the business community and representatives of civic and environmental groups and would ensure that all geographic areas of the County were represented.

Another siting-related issue is the mitigation of perceived risks to adjacent

property owners. Two principal perceived risks of solid waste facilities are their effect on property values and groundwater quality. To address these concerns, an increasingly common approach is to adopt mitigation and compensation procedures.

For example, a typical mitigation measure is to guarantee the property values of homes in a defined area or to guarantee the purchase of the property. This agreement includes provisions to ensure that the decline in property values is unique to a specific area, rather than caused by general economic conditions. Situations where agreement on property values cannot be reached are handled by an arbitration process. In addition, a study of how siting of waste facilities has affected property values in other areas should be conducted.

Similarly, concerns about the faciility's impact on groundwater quality can be addressed by establishing a thorough groundwater monitoring program and, as has been done in some areas, guaranteeing the provision of adequate water supplies to adjacent homeowners if contamination does occur.

V. TIME SCHEDULE FOR PLAN IMPLEMENTATION

A schedule for the implementation of proposed waste reduction and recycling programs which calls for full implementation and achievement of the 47 percent recycling goal by 1998 has been established. A time schedule for the development of other waste management facilities must consider when additional management capacity is needed or desired and the length of time required to develop a facility.

According to Illinois EPA estimates, Settler's Hill landfill will reach capacity in early 2002 and Woodland landfill will reach capacity by the year 2000. Efforts are currently in progress to develop a horizontal expansion of Settler's Hill which would add an estimated 5 years of capacity. Siting approval and permitting processes must be successfully completed before the expanded capacity can be included in planning considerations.

The site selection and acquisition process may require 2-3 years for completion. Specific tasks in this process include appointment of advisory committee, development of site selection criteria, initial screening, detailed site investigations,

final selection and acquisition.

The time required for facility development is dependent on the type of facility but in all cases will include these steps:

- Selection of Contractor
- IEPA Development Permit
- Arrangement of Financing
- Construction
- Acceptance Testing
- IEPA Operating Permit

The development of combustion facilities has been estimated to require 60 to 73 months. MSW composting facilities will require 43 to 58 months to develop. Landfill facilities require an estimated 29 to 37 months to develop. Detailed timetables for these facilities are attached in Tables 1-3.

The lead time required for facility development can be considered in conjunction with estimates of when new capacity is required to determine the latest time that the development process should begin, as shown in Table 4. It may, however, be beneficial to proceed with site selection and acquisition at the earliest possible date, in order to prevent conflicts with the future development of adjacent property and to avoid paying higher future prices for the required property.

Table 1

Combustion Facility Development Timetable

	MONTHS	
	MINIMUM	MAXIMUM
Phase I - Facility Development		
Ownership Option, Request for Proposal Development; RFP Response Time; Select Proposal; Energy Contract Negotiation; Design/Permit Application Preparation	21	25
Phase II - Siting and Permitting		
SB 172 Hearing	5	6
Financing*	–	–
Development Permit Submission	1	1
IEPA Development Permit Review	2	3
Phase III - Construction and Testing		
Construction	21	24
Start-up/Testing	5	6
IEPA Operation Permit	1	2
Total without appeal	56	67
Additional Time if a SB 172 Appeal Occurs	4	6
Total with appeal	60	73

Financing is usually secured after the SB 172 hearing and concurrently during the IEPA development permit review.

Source: Champaign County Solid Waste Management Plan.

Table 2

Landfill Facility Development Timetable

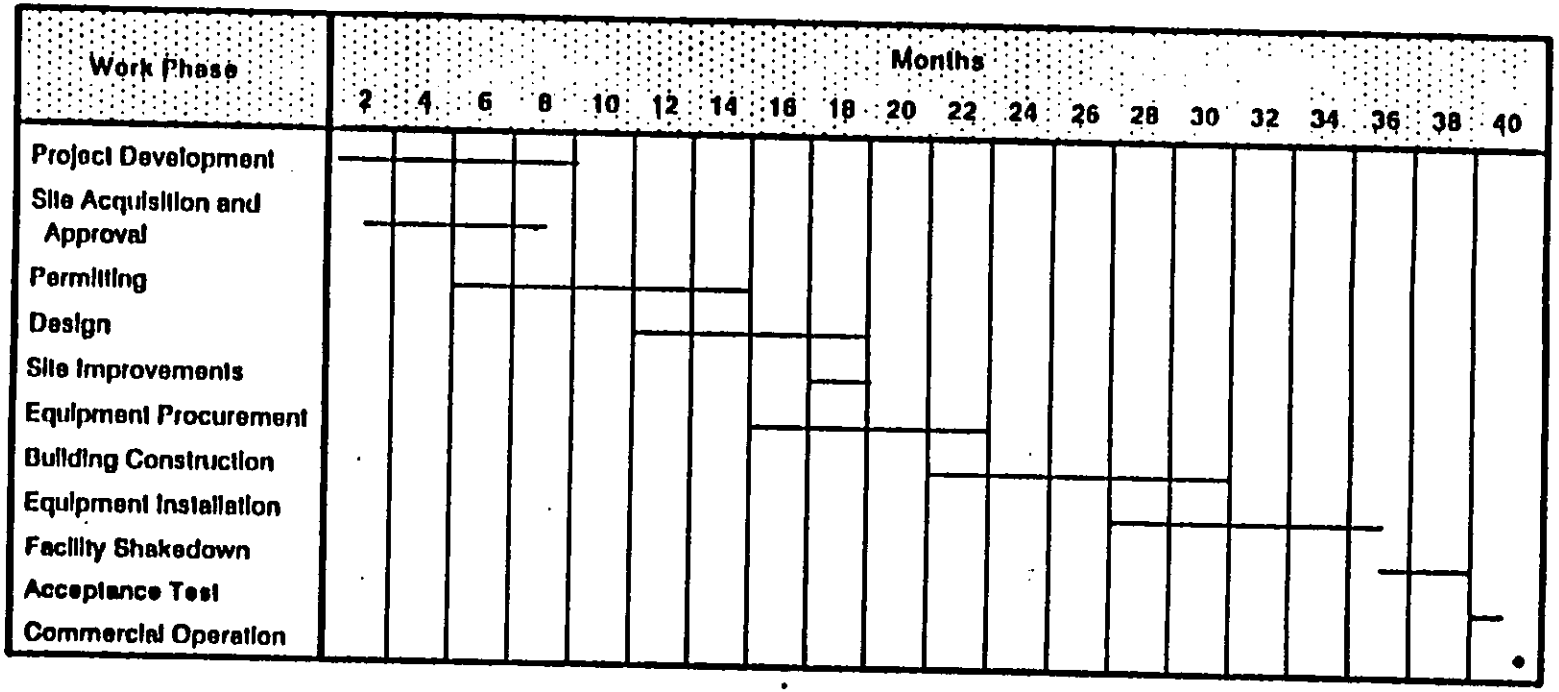
	MONTHS	
	MINIMUM	MAXIMUM
Phase I - Facility Development		
Criteria Review, Ownership Option, GIS Screening; Identify Sites; Select Sites; Preliminary Site Investigation; Select Candidate Site; and Detailed Site Investigation	21	27
Phase II - Siting and Permits		
Permit Application	2	3
SB 172 Hearing	5	6
Financing*	–	–
Development Permit Submission	1	1
IEPA Development Permit Review	5	6
Phase III - Construction		
Construction	10	12
IEPA Operation Permit	2	3
Total without appeal	**46**	**58**
Additional time if a SB 172 Appeal Occurs	4	6
Total with appeal	**50**	**64**

* Financing is secured after the SB 172 hearing and concurrently with the IEPA development permit review.

Source: Champaign County Solid Waste Management Plan.

Table 3

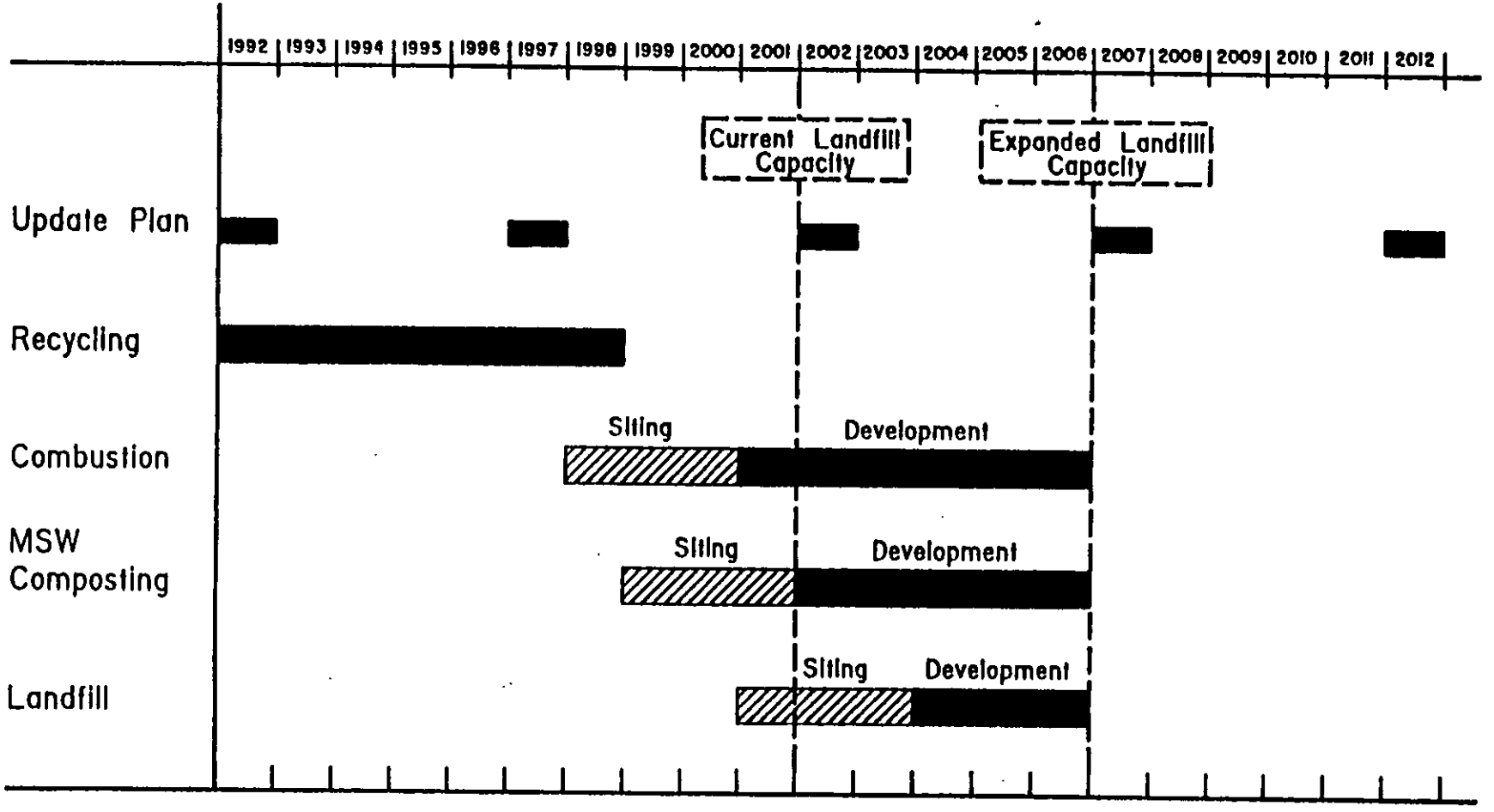
Implementation Schedule For New Composting Facility



Source: CalRecovery, Inc., Feasibility Study for MSW Composting in Kane County, Illinois.

Table 4

TIME SCHEDULE PARAMETERS FOR PLANNING AND PROGRAM/FACILITY DEVELOPMENT



K A N E C O U N T Y

Solid Waste Management Plan

Volume III

September 1992

Responses

To Comments Received During
Public Review Period

Printed on Recycled Paper

INTRODUCTION

The proposed Kane County Solid Waste Management Plan was prepared based on recommendations made by the Solid Waste Plan Advisory Committee. The two volume proposed Plan was released for public review and comment by the Development Committee of the Kane County Board on June 3, 1992.

The statutory 90 day public review period extended from June 3, 1992 to September 2, 1992. During this period, four public hearings were conducted and written comments were also accepted by the Kane County Development Department. All comments received during the 90 day review period are presented in Volume IV of the plan package.

Following the 90 day review and comment period, the Illinois Solid Waste Planning and Recycling Act requires that "The plan subsequently submitted to the governing body of the county for adoption shall be accompanied by a document containing written responses to substantive comments made during the comment period."

This document, titled "Volume III, Responses to Comments Received During Public Review Period" contains the responses as required by State law. These responses were prepared by Kane County Development Department staff and reviewed by the County Development Committee on November 3, 1992.

The questions and comments presented in this document have been paraphrased from the original comments and grouped to avoid redundancy. Each comment is attributed to the person who made the comment. The numbers shown at the end of each comment (W-1, B-6, D-2, etc.) refer to the comment number in Volume IV. For example, (W-4) refers to the fourth comment listed under the written comment section of Volume IV. Likewise, (B-2) refers to the second comment made at public hearing "B" (Waubonsee Community College), which may also be located in Volume IV.

CHAPTER 1 - INTRODUCTION

COMMENT: Governments and institutions need to share the responsibility for recycling along with the residential, commercial, and industrial sectors listed in paragraph 6 of the Statement of Goals and Objectives. (D-1)

RESPONSE: In the organization of the plan, governments and institutions are included in the commercial sector for the purpose of waste classification (see Vol. II, page A-7). In addition, Recommendation 4.11 (Vol. 1, p. 22) states that "Particular emphasis should be placed on establishing programs in public institutions such as schools, government offices, hospitals, and parks."

CHAPTER 2 - SOLID WASTE NEEDS ASSESSMENT

COMMENT: The waste generation calculations are based on a statement that 55 % of the waste received at Settler's Hill landfill originates in Kane County. This figure is not justified, and is likely too high since it is based on only 20 days of data collection in 1989. If this figure was lower, the estimates of the amount of waste produced in Kane County would be lower and, if out-of-county waste was limited at Settler's Hill, the landfill's current capacity would last much longer. (W-17,B-1,D-3,

RESPONSE: All data collected from the landfill during the past several years indicates that at least 55% of the waste delivered to Settler's Hill landfill is from Kane County. Results of five separate gate surveys and the first three months of operation under the new contract, when greater amounts of data has become available, show that the in-county rate has varied from 54.8% to 64.7%:

Year	Period	# of Days	In-County Rate
1989	June-July	20	55.5%
1990	July-August	20	57.5%
1991	March	5	54.8%
1991	August	6	57.5%
1991	December	1	62.3%
1992	June-August	3 months	64.7%

COMMENT: The waste generation rate of 8.4 pounds per person per day (pcd) is extremely high compared to other counties. Rather than being almost identical to Lake County's rate of 8.5 pcd, Kane County is demographically closer to Will County and it's rate of 6.8 pcd. (W-17, D-6, D-17).

RESPONSE: The waste generation rate reported in the plan was derived from locally-specific data, including landfill gate surveys and surveys of waste haulers, recycling companies, and municipalities. The Illinois Department of Energy and Natural Resources, in an August 1991 report titled "Summary and Analysis of Solid Waste Generation Data from Illinois County Solid Waste Management Plans," reviewed data from 29 different plans and found a range in generation rates of 2.8 pcd to 11.7 pcd, with an average value of 7.7 pcd. Generation rates from northeastern Illinois plans, as reported by ENR, are:

County:	Generation Rate:
DuPage	8.5 pcd
Kane	**8.4 pcd**
Lake	8.0 pcd
McHenry	7.8 pcd
North Cook	9.5 pcd
South Cook	6.0 pcd
West Cook	10.4 pcd
Will	6.5 pcd
Average:	**8.1 pcd**

The comment that Kane's data should be similar to Will County's, since both counties have a similar percentage of land in farmland, appears to be without merit. There is no apparent relationship between the percent of farmland and waste generation. In addition, several other counties that are primarily farmland have reported generation rates as high or higher than Kane County, including Grundy (8.6), Kankakee (8.4), and Ogle (11.3). Given the wide range of data reported by different counties, the closeness of Kane's data to the state and area-wide averages appears to indicate that Kane's waste generation data is as accurate, and perhaps more accurate, as the data reported by most other counties.

COMMENT: Does Table 2.2 (Vol. 1, p.11) take into waste reduction or recycling? (W-21)

RESPONSE: This table presents estimates of projected solid waste generation from 1989-2010. Both the generation rate and the total tons per year presented in the Table refer to total waste generation, including recycling. As shown in Table 11 of Appendix A (Vol. II, p. A-24), of the total 490,820 tons generated in 1989, 438,215 tons were landfilled, 7,977 tons were managed on-site, and 44,628 tons were recycled. The effects of waste reduction activities are extremely difficult to quantify on a County-wide basis and are not included.

CHAPTER 3 - WASTE REDUCTION

COMMENT: A suggested waste reduction goal of 10% should be established. Waste reduction can be measured, as was done in Lisle, although not as precisely as recycling. (C-1)

RESPONSE: While the total amount of residential waste disposed and recycled can be fairly accurately determined in a given community, and a reduction in the sum of those two amounts from one year to the next may be attributed to waste reduction efforts, data is not available to make similar calculations for waste from unincorporated residential, commercial, industrial, or construction sectors. Therefore, waste reduction efforts are extremely difficult to estimate on a county-wide basis. Rather than establish a numerical goal that could not be measured, the plan includes a series of comprehensive programs to promote waste reduction behavior in all sectors.

COMMENT: The plan should include provisions regarding source reduction. (C-13)

RESPONSE: The terms "waste reduction", "source reduction", and "volume reduction at the source" are all commonly used to describe efforts to reduce the amount of solid waste which is generated and requires management in the form of recycling, composting, incineration, landfilling or other approaches. This plan refers to these efforts as

"waste reduction" and addresses this area in Volume I, Chapter 3 and Appendix B.

CHAPTER 4 - RECYCLING

COMMENT: The County should promote the repair and re-use of durable items, such as furniture, that are discarded. (W-2)

RESPONSE: Recommendation 4.7 (Vol. I, p. 21) states that "the collection of used clothing and other household items by charitable organizations can be coordinated with curbside pick-ups to significantly increase the re-use of these materials." In addition, there are several used furniture stores in the County which will be promoted in future recycling directories. Also, an informal network of "curbside entrepreneurs", who pick up repairable or re-usable items from the curb before the garbage trucks arrive on collection day, is active in many communities.

COMMENT: Can contraction/demolition material be pulverized and used in the construction of new roads? (W-3)

RESPONSE: There are several existing concrete crushing operations in the County, operated in conjunction with cement plants. Several municipal street departments take the concrete debris from road and sidewalk replacement projects to these facilities. In addition, both landfills in the County accept concrete debris, which is crushed and used for on-site roadway construction.

COMMENT: Curbside recycling programs should accept corrugated paper, chipboard, and other materials not currently collected. (W-3)

RESPONSE: Recommendation 4.7 (Vol. I, p.21) calls for the County to "expand existing recycling programs by accepting additional materials such as plastics and other types of paper besides newspaper.

Early curbside programs collected only newspaper, glass, and aluminum cans. More recent programs are collecting tin cans and #1 and #2 plastic containers. Corrugated and chipboard are currently being collected

in several towns, including Aurora and Geneva. The trend in the region is toward programs with more comprehensive recycling "menus", and the plan calls for encouraging the continuation of that trend.

COMMENT: Recycling programs should be established for apartments; implementation of the County's multi-family programs should be moved up from 1995-1996 to immediately. (W-3, C-3, D-1)

RESPONSE: The timetable for establishment of multi-family programs (Recommendation 4.3, Vol.1, p.27) calls for supporting pilot programs through 1994, collecting data on the effectiveness of different approaches and, beginning in 1995, expanding the pilot programs to a county-wide level. As initial programs are established in 1993, data on how well they work will be compiled, and information on successful approaches provided to municipalities, building owners, and waste haulers. Multi-family projects would be a likely focus of the recycling grant program which is included in the proposed Fiscal Year 1993 budget for the County's Development Department.

COMMENT: The County should consider more stringent recycling mandates; real economic penalties are needed to encourage more recycling; the County should implement mandatory recycling with discounts for participants. (W-7, W-17, A-2, B-4, C-13, C-15)

RESPONSE: A primary philosophy of the plan is that initial recycling efforts should be conducted on a voluntary basis, with the provision for positive economic incentives (such as volume-based billing systems for refuse). Voluntary programs can be extremely effective if they are designed to maximize convenience to the generator and are accompanied by comprehensive on-going educational campaigns. A good example of this is the St. Charles residential curbside program which achieves a 90%+ participation rate on a voluntary basis. In addition, the argument has been made that voluntary programs evolve at a pace that allows markets to react in a timely manner to the increased amount of material that is collected, where mandatory programs may exceed market capacity, at least in the short-term.

The plan, as originally proposed, called for some regulatory approaches by municipalities to increase recycling in the commercial sector, by tying recycling efforts to requirements to obtain scavenger or liquor licenses. Proposed revisions to the plan (see Volume I, Chapter 4, Section 4.3 "Compliance Strategies") call for several additional approaches, including requirements that haulers provide recycling services in unincorporated areas; consideration of County licensing of all waste haulers with recycling a license requirement, and consideration of differential tipping fees at the County-owned landfill, where loads which originate from areas without exhaustive recycling programs or loads containing an excessive amount of recyclable material would be charged a significantly higher tipping fee.

COMMENT: A higher recycling goal should be established; the goal should be as close to 100% as possible since 90% of the waste stream is recyclable (B-4, C-7, C-15)

RESPONSE: A primary objective of the plan is "To recycle as much of the waste generated in the County as is practically and economically feasible" (see Volume I, p. 3, Table 1.1). A common assumption is that since 38% of the waste stream is paper, 8.8% glass, 9.4% metal, 8.3% plastic, and 17% yard waste (see Volume II, p. A-31), all of that material can and should be recycled. However, at this time, it is not practical to recycle, for example, all of the paper in the waste stream. The plan's 47% goal is based on reasonable assumptions about the effectiveness of current and foreseeable programs. The status of recycling efforts will be re-assessed at each five-year plan update, and higher goals would be established if available information indicates such a potential.

COMMENT: The proposed 75% recycling goal for construction/demolition material is too high; most other counties have a goal of 15-20% for this material. (C-1)

RESPONSE: This waste stream is particularly important in Kane County, given the high level of construction activity which is present. An analysis of construction and demolition waste composition by weight which was conducted in several New York communities by William F. Cosulich in 1991 found that 50% of the material was concrete, bricks, cinder blocks and asphalt paving materials. 25% was wood, including pallets,

landclearing debris, scrap lumber and siding materials, and treated wood. The final 25% included plywood, particle board, metals, tar-based materials, plaster and gypsum drywall, plastics and old corrugated containers.

As discussed in an earlier comment and response, a significant amount of concrete and asphalt paving is already being recycled, although specific data is not yet available. In addition, it appears that there are enough other recyclable materials in this waste stream to be able to approach the stated 75% goal.

COMMENT: County-wide leaf composting facilities are needed. (C-3)

RESPONSE: The plan (see Volume I, pp. 24-25) recommends that landscape waste composting facilities with adequate capacity for Kane County's landscape wastes be developed.

COMMENT: The plan calls for counting all landscape waste that is diverted from landfills toward the overall recycling goal. However, only that material which is collected and processed at a central composting facility can be counted toward the recycling goal. The material which is handled by homeowners on their own property (leaving grass clippings on the lawn or backyard composting) is considered by the Illinois EPA is considered to be a form of waste reduction, not recycling. (W-7, C-1)

RESPONSE: On-site management of landscape wastes is an important approach to diverting this material from landfills. Rather than attempting to estimate the amount of material that is retained on-site by homeowners separately from the amount of material that is collected for centralized processing, for the purpose of simplicity this plan includes on-site management in the overall recycling goal. The County will resolve this inconsistency in accounting procedures during the plan implementation period.

COMMENT: The plan calls for the development of composting facilities which are publicly-owned and privately-operated. Privately-owned and operated facilities should also be encouraged. (D-1)

RESPONSE: In fact, the County has responded to two separate proposals for private composting facilities in the past year. Proposed revisions to the plan add that proposals for privately-owned facilities will be governed through the County's existing zoning process, since these facilities require a special use zoning permit.

COMMENT: Workshops should be conducted for industries in the county to encourage them to use recycled material in the manufacture of new products, thereby creating additional markets for material which is collected in local recycling programs. (D-1)

RESPONSE: This concept is discussed in the Market Section of the full recycling program plan (see Volume II, p. C-20), which states "the County should work with local manufacturers to encourage their use of recycled materials in their operations. Local usage of these materials would help stabilize material markets and serve as a potential economic development opportunity." Workshops would be one approach of many to encourage to use of recycled material for industrial feedstock.

COMMENT: The County should buy park benches made from recycled plastic and other similar products to stimulate markets. (C-13)

RESPONSE: Recommendation 4.24 (Volume I, p. 25) calls for the County to adopt procurement policies which require the purchase of recycled-content products, including preferential pricing strategies, as part of an overall market development strategy. Since the plastic market is of particular concern, park benches, parking stops, and other recycled plastic products would be a primary focus of this procurement policy.

CHAPTER 5 - MATERIALS REQUIRING SPECIAL HANDLING

COMMENT: Household hazardous waste programs should be established immediately and operated on an on-going basis. Programs should not be delayed while waiting for possible state grants, but should be funded through the County's enterprise fund. (W-18,C-3, D-1, D-7)

RESPONSE: The one-day household hazardous waste collection days that have been conducted in northeastern Illinois typically incur costs of $100,000 to $150,000 for each event. In addition, participation rates have hovered around 2% - 4% of eligible households. While this approach is effective in raising public awareness of this important area, the cost-effectiveness is questionable.

Several recent developments may assist in the formulation of effective and affordable permanent collection programs. First, the City of Naperville will begin the state's first permanent, on-going collection program during fall, 1992. The information gained from this program will be invaluable in designing future efforts. Second, Kane County is attempting to develop a county-wide latex paint exchange program through local paint retailers. Since latex paint comprises 40% of the material handled on the current collection days, the diversion of this material may make the collection of other household hazardous wastes more affordable.

A proposed revision to the proposed plan recognizes these recent developments and calls for the County to develop permanent, County-funded household hazardous waste collection centers.

COMMENT: Reduction in the toxicity of the waste stream and wastes which are landfilled were not addressed by any specific recommendations. (D-1)

RESPONSE: Recommendations 5.1, 5.2, 5.3, 5.4, and 5.5 (see Volume I, Chapter 5) all address reduction in the use of hazardous household products and the diversion of these materials from landfills (and other future facilities) to more environmentally-appropriate management techniques.

COMMENT: The County should send a letter to all retailers in the County, urging them to accept back hazardous chemicals from their customers, as is already being done with paint and used motor oil. (D-1)

RESPONSE: The variety of products available in the marketplace which contain hazardous or potentially-hazardous materials is exhaustive. The logistics of setting up a return to point-of-purchase for all such materials would be extremely difficult. The inconvenience to the consumer of such an approach would place a significant

limit on participation.

The plan, in Recommendation 5.3 (Volume I, p. 30), recommends supporting state and federal legislative initiativesto reduce the generation of household hazardous waste as a workable solution to this situation.

COMMENT: No provision is made in the plan for dealing with special wastes. (W-18)

RESPONSE: Special wastes are addressed on pp. 31-32 of Volume I and in Appendix E of Volume II.

COMMENT: Special wastes should be banned from landfills. (D-7)

RESPONSE: Non-hazardous special wastes, such as industrial process waste and waste from pollution control measures, are permitted for acceptance at both landfills in Kane County and many other landfills in the state by the Illinois EPA. These materials must undergo a thorough testing process before an individual waste stream permit for the material is issued. Current state regulations balance the incremental cost of handling this material separately with the environmental impact of their placement in permitted landfills. The County closely monitors the acceptance of this material at Settler's Hill landfill and will continue to consider the potential related environmental impacts and the development of alternative management techniques.

COMMENT: The landfilling of tires should be immediately banned; 1994 is too long to wait to develop programs which divert tires from landfills. (W-18, D-1, D-7)

RESPONSE: While tires do present operational problems when placed in landfills (they tend to float to the surface) and alternative uses exist, such as energy production and the manufacture of various products, a very small quantity of tires is received at Settler's Hill landfill. Current estimates are that only 30 - 40 cubic yards of tires are received on an annual basis. Assuming 6 tires per cubic yard, only 180 to 240 tires

are placed in the landfill over a one year period, an insignificant amount when compared to the estimated generation of 320,000 used tires per year in Kane County. Private sector programs currently in existence are believed to already divert more than 99% of all used tires in Kane County from landfill disposal.

COMMENT: A government-run repair service for appliances should be developed so appliances can be repaired and re-used rather than discarded. (W-4)

RESPONSE: Although the state ban on landfilling of appliances unless certain toxic components are first removed does not take effect until 1994, most large appliances are already being diverted from landfills. In most local municipalities, appliances are collected separately either by the waste hauler or an appliance service company. At the present time, most of these appliances are repaired or cannibalized for parts, and sold in export markets.

The design of many small appliances precludes any repair. The County will monitor and support any state or federal legislation which requires that durable goods, including appliances, be designed for repairability or recyclability.

CHAPTER 6 - ALTERNATIVE TECHNOLOGIES

COMMENT: The potential for the use of refuse-derived fuel (RDF) was not examined in the waste-to-energy section and should be considered . (W-18, D-7)

RESPONSE: Refuse-derived fuel technologies were assessed in a report prepared for the County by Roy F. Weston, Inc. titled "Investigation of Emerging and Innovative Solid Waste Technologies." The discussion of RDF technologies may be found in Volume II, Appendix I, pp. 3-1 to 3-7.

COMMENT: The costs of alternative technologies presented in the plan are overstated. The stated cost of $94.6 million for an incinerator is much too high, and ignores the fact that many companies would build one at no cost to the county. (B-1)

RESPONSE: The plan estimates the capital cost of an 830 ton per day incinerator to be $94.6 million. This estimate is based on a 1990 survey of waste-to energy incinerators by the National Solid Waste Management Association (see Volume II, p. L-4). Cost estimates for municipal solid waste (MSW) composting facilities were prepared as part of the "Feasibility Study For MSW Composting in Kane County, IL" conducted by CalRecovery, Inc. (see Volume II, Appendix J).

Many vendors will provide financing for the construction of solid waste facilities without any capital investment required of the County. However, these private investments would need to be recovered through tipping fees at the facility. The truest measure of the economic impact of various technologies is, therefore, the tipping fee. The economic evaluation of different approaches contained in the plan presents cost information in terms of capital costs, annual costs, and costs per ton (tipping fee) in order to provide a well-balanced comparison of different approaches.

COMMENT: The County should compost the organic fraction of the waste stream. (C-1)

RESPONSE: Composting of only the organic fraction (food wastes, yard wastes, and some paper) of the waste stream was not specifically studied during the planning process. However, an exhaustive evaluation of MSW composting was conducted, since this more broadly-based composting was believed to have the potential to manage the largest portion of the waste stream. Proposed revisions to the plan include a recommendation that the County conduct a feasibility study for composting the organic fraction of the waste stream (see Volume I, p. 35).

COMMENT: Pilot projects to test new technologies should be established by the County. (D-1)

RESPONSE: The development of pilot projects is not recommended by the plan. At least one member of the advisory committee (see comment W-13) stressed that the testing of new technologies is most appropriately conducted by federal or state governments or the private sector. However, as the County continues to monitor the development of non-landfill technologies, full consideration will be given to the establishment of pilot projects which would provide a significant benefit to the County.

CHAPTER 7 - LANDFILLING

COMMENT: Future landfills should not accept any waste which is imported from other Counties. (W-5, D-1)

RESPONSE: The plan, as originally proposed, attempted to remain open to future opportunities for any potential joint ventures between Kane County and other counties which would be beneficial to Kane County. Proposed revisions to the plan (see Volume I, pages 43 and 49) would restrict any future landfills to only Kane County waste.

COMMENT: Landfill costs are drastically understated; the costs presented in Appendix G, pp. G-33 - G-39) are based on several wrong assumptions, including land costs of $1500 per acre, requirement of only a three foot liner, a five year post-closure period, and missing insurance costs. (W-18, B-1, D-7, D-10)

RESPONSE: The landfill costs and underlying assumptions questioned by several comments are, as stated on page G-33 of Volume II, "a detailed analysis of estimated costs for a hypothetical facility" which "demonstrates the variety of considerations and assumptions involved in determining costs". This information was not intended to provide an accurate analysis of actual conditions in Kane County. For example, the economic evaluation of alternative solid waste systems found in Appendix L (see page L-5) states that "In this study," (the study referenced on page G-33), "land was assumed to cost $1,500 per acre - an unreasonable level for the Kane County area".

A second set of landfill cost information is also presented in Appendix G. This information summarizes landfill costs that have been presented in five separate reports (see Volume II, page G-41). The summary of landfill costs shown in Table 5.3 on page G-41 shows an average capital cost of $12,500 per daily design ton (TPD) and a total cost per ton (tipping fee) of $20.64. This information was considered in the economic evaluation of landfills presented in Appendix L (page L-5). Here, an explanation is provided of how the $20.64 tipping fee is unreasonably low, in light of the new Illinois landfill regulations, and how the tipping fee estimate of $30.00 per ton which is used in the systems evaluation was determined.

COMMENT: Costs for maintaining a closed landfill during a 30 year post-closure period are not adequately considered. (D-17)

RESPONSE: The $30.00 per ton tipping fee figure used in the landfill cost evaluation is comparable to the current tipping fee at Settler's Hill landfill. The current Settler's Hill tipping fee includes an amount of $5.21 per ton which is ear-marked for closure and post-closure costs. At the current minimum contractual waste volume of 468,750 tons per year, more than $2.4 million is accrued annually for post-closure costs. Over the 17 year projected lifetime of the present facility, this would amount to about $41.5 million accrued, not including interest. The current estimate of closure and post-closure costs for a 15 year period, as filed with the Illinois EPA is $1,650,275. An independent analysis of post-closure costs for Settler's Hill, including the effects of the recent regulations over a 30 year period, conducted by Eldredge Engineering Associates, estimated those costs to total $5,849,100. The amount set aside for post-closure at a $30.00 tipping fee level significantly exceeds the anticipated costs for closure and post-closure activities.

COMMENT: The calculation of average landfill costs presented in Volume II on page G-41 is misleading, and should have included the costs of the Minnesota example. Including the Minnesota data results in landfill capital costs of $21,554 per ton, not the $12,500 per ton presented in the plan. (D-4)

RESPONSE: The Minnesota capital cost data is in reference to a landfill designed to receive 90 tons per day, significantly smaller than the landfill sizes considered in the four alternative systems for Kane County presented in Appendix K. Therefore, the Minnesota data was excluded from the analysis in order to provide cost estimates which, based on available information, most accurately reflect required sizes for future landfills in Kane County.

This comment continues by stating that, if the higher capital cost of $21,554 is used, the tipping fee would be $22.86 per ton, rather than the average tipping fee of $20.64 shown on page G-41. However, this higher tipping fee is much lower than the tipping fee of $30.00 per ton which, as discussed earlier, was used in the economic evaluations contained in the plan.

COMMENT: What was the basis for selecting a landfill size of 2,000 acres? (W-15)

RESPONSE: A proposal for a future landfill site of approximately 2,000 acres, including 1,000 acres of buffer space, was presented in Kane County before the development of this plan began. The 2,000 acre proposed size was not considered or incorporated in any way during the preparation of this plan. Proposed revisions to the plan include estimates of size, in acres, of the landfills included in each of the four comprehensive solid waste management systems defined in Appendix K. These estimated sizes range from 61 to 315 acres.

COMMENT: If the 11 acres recently purchased for expansion of Settler's Hill landfill will add 5 years to its lifetime, then only 44 acres would be needed to provide 20 years of capacity. (A-2)

RESPONSE: The actual expansion would encompass slightly more than 20 acres, including some land which was already owned by the County but could not be utilized for waste deposition without the purchase of the additional land. In addition, the three-dimensional geometry of the expansion is very different that the geometry for a new facility, since the expansion will essentially pile material on the side of an already-defined mass. A newly-designed landfill, taking into account side boundary setbacks and other considerations would require much more land to accommodate the same amount of waste. Also, the 11 acres recently purchased represent the last remaining parcels which have expansion potential at the existing site.

COMMENT: Construction and demolition wastes should be placed in either a separate landfill or at least a separate cell in the same landfill, rather than mixing it with putrescible wastes. (D-1)

RESPONSE: Separating relatively inert construction and demolition wastes from "regular" waste would require the same, if not slightly more land area to accommodate the total amount of waste. A separate arrangement could conceivably result in slightly lower total costs, since the construction/demolition facility could be constructed to less exacting, and therefore less expensive, standards. A determination of the viability of this approach would be made by the engineering consultant retained during the site selection process

(see Step 2 od the recommended siting process, Volume I, page 56).

COMMENT: Monies should be set aside for a clean-up fund for landfills. (D-1)

RESPONSE: At the current County-owned landfill, the contractual agreement specifies that post-closure activities, including "clean-ups", are the responsibility of the operator, and financial assurances have been provided in accordance with state law for funding of these activities. As discussed earlier, the estimated tipping fee for a future landfill includes provisions for payment into a post-closure fund.

COMMENT: If the in-place density at the current landfill was increased from 800 lbs. per cubic yard to 1700 lbs./CY, and alternative daily cover methods were used to gain 17% more current capacity, the life of Settler's Hill could be stretched to 35-60 years.(D-2).

If alternative daily cover was used 50% of the time, and the in-place compaction value was increased 10%, to 1760 lbs./CY, the capacity of Settler's Hill landfill could be stretched to at least the 20 year planning period. (D-4).

RESPONSE: Alternative daily cover (ADC), in the form of a removable fabric tarp, has been used at the current landfill for the past two years. The use of ADC is carefully regulated by the conditions of the Illinois EPA operating permit for the site. Currently, ADC is used about 43% of the time. Increased use of this space-saving technique is limited by several factors including weather conditions, site access requirements (truck traffic patterns), and filling location. If waste placement is occurring on an outer side slope of the site, ADC cannot be used since the waste in that location is immediately covered with intermediate cover to establish an outer berm necessary to continue upward construction.

With regard to compaction methods, the landfill operator currently estimates a compaction ration of 2.16 gate cubic yards to one in-place cubic yard. The density of gate yards received at Settler's Hill has ranged from 565 pounds per cubic yard to 800 pounds per yard during the past two years. Multiplying this

density by the 2.16 compaction ratio results in in-place densities of 1220 - 1728 pounds per cubic yard, so that existing compaction may already be at the level recommended by the comments. Future technologies which have been proposed to increase landfill compaction include new styles of wheels on the trash compactors used, dynamic compaction which involves dropping heavy weights from significant heights, and surcharging the waste mass by placing large volumes of soil or other overburden material on top of the waste to achieve slow compaction over long periods of time.

CHAPTER 8 - SYSTEM DESCRIPTION, EVALUATION, AND FINANCING

COMMENT: New technologies, including incineration, should be used to manage the County's solid waste, not landfills. (W-1, W-3, W-14)

RESPONSE: New technologies, particularly MSW composting and waste-to-energy incineration, were given full and careful consideration during the planning process (see Appendices F, I, J, and K). Concerns expressed by advisory committee members relative to alternative technologies included potential environmental impacts (particularly with incineration), availability of markets for compost and reliability of MSW composting technology, costs, and the need for continued landfilling of material which is non-combustible or non-compostible, or process residue such as ash. The plan recommends that the County continue to monitor the development of these and other technologies to determine if current shortcomings may be reasonably resolved.

COMMENT: The plan does not state the size of the future landfill, as required by state law. The only numbers presented are in terms of tons per day (TPD), which is not a useful term and is not recognized by experts in the solid waste field. (B-1)

RESPONSE: Tons per day is a common, if not universal, term used to measure and compare the size of solid waste facilities including transfer stations, recycling processing facilities, landfills, and incinerators. As discussed earlier, proposed revisions to the plan include estimates of land requirements, in acres, for the landfills in each of the four alternative systems

which were studied.

COMMENT: There should be no immediate landfill siting; alternatives should be examined over the next five years and if landfills are still determined to be the best approach, the siting decision can be made at that time. (W-11, D-1)

RESPONSE: Proposed revisions to the plan defer the commencement of site selection activities for a future landfill until the first five year plan update.

COMMENT: The County should proceed to purchase land for a future landfill site, but it should be smaller. (W-5)

RESPONSE: Refer to the two previous comments and responses for discussions of both timing and size considerations.

COMMENT: The plan calls for a landfill which will take 885 TPD, but Settler's Hill and the DuPage landfills currently take about 1300 TPD which is the size of a modern landfill. Therefore, imported waste will be needed to make up the difference. (B-2)

RESPONSE: There is no industry standard for the minimum size of a "modern" landfill. Publicly-owned facilities may accept as much or as little waste as is deemed appropriate by the governing body of the public entity. There are, however, economic implications of relative landfill sizes, with unit costs ($/ton) somewhat related to the size of the operation. See the following comment and response for additional discussion of this point.

COMMENT: The units costs for landfills of different sizes are not considered; the costs for landfills in all four systems are shown to be $30.00 per ton; the tipping fee for smaller landfills will be significantly more than that. (W-11)

RESPONSE: A constant $30.00 per ton figure was used for the differently sized landfills in the four systems which were studied. However, as noted in the comment, tipping fees could be expected to be higher for smaller

facilities. Of the four systems studied, the one relying primarily on landfilling included the largest landfill (at 885 TPD), and is the landfill for which the $30.00 figure is most accurate. The other three systems included other management technologies and smaller landfills. In these cases, the actual total system tipping fee which could be expected would be higher than the tipping fees of $64.57 - $84.33 per ton presented on page L-7 of Volume II.

COMMENT: Costs to County residents should not be increased. (W-5)

RESPONSE: The cost of providing comprehensive solid waste management services in the County is expected to increase to a certain degree even if no major changes are made in the way that waste is handled. The impact of new regulations and increased recycling efforts will increase the cost of baseline programs. The potential addition of non-traditional technologies (such as incineration or composting) in the future would result in a greater increase in future costs. However, additional costs must be balanced with environmental and other benefits which may accrue as a result of the utilization of alternative approaches.

COMMENT: How are revenue bonds to be repaid? If land is purchased with bond proceeds, the landfill must be opened immediately to pay off the bonds. (W-20, B-1)

RESPONSE: Revenue bonds are, by definition, repaid by revenue generated by the facility for which the bonds were issued. While the scenario mentioned in this comment is possible, a more likely scenario would be that the land for future facilities would be purchased using the cash balance of the County's Enterprise Fund. The balance for this fund, as of September 1, 1992, was approximately $7.5 million. At land costs of $10,000 per acre, this balance would be sufficient to purchase about 750 acres of land. For industrial land, which may be suitable for transfer stations, an incinerator, or other alternative technology, at land costs of $50,000 - $100,000 per acre, the existing fund balance would be sufficient to purchase 75-150 acres, which would be in excess of the land requirements for these facilities.

CHAPTER 9 - SITING AND PERMITTING

COMMENT: The plan does not disclose the site location for the future landfill. (C-16)

RESPONSE: The Illinois Solid Waste Planning and Recycling Act requires that County plans include "the identity of potential sites within the county where each proposed waste processing, disposal and recycling program will be located or an explanation of how the sites will be chosen." The Kane County plan identifies an extensive site selection process, but since that process has not been initiated, the plan responds to the State law by explaining how sites will be chosen.

COMMENT: The future landfill should be site next to tollways, which could serve as buffer space; publicly-owned land should be considered for future sites, including abandoned mines. Property should not be taken off the tax rolls. (W-6, B-3)

RESPONSE: The plan recommends that the criteria used during the site selection process be developed by the public siting advisory committee. The criteria will include both inclusive (favorable) and exclusive (unfavorable) considerations in determining preferred characteristics of a facility site. The criteria proposed in this comment will be referred to any future siting advisory committee for consideration.

COMMENT: Under the Senate Bill 172 Local Siting Approval procedure, the County will not be able to demonstrate the need for the facility, since 16 years of other capacity are available. (D-6)

RESPONSE: The plan does not recommend immediate initiation of the Senate Bill 172 local siting approval procedure. Siting approval would not be required until 2-3 years before the facility would be scheduled to open. At that time, with only 2-3 years of remaining capacity at existing landfills, a demonstration of need for a new facility could be produced.

COMMENT: Red-lining should be used instead of immediate siting. Purchase options should be used instead of condemnation and acquisition; potential property should be tested for hydro-geologic suitability before it is acquired.

(D-1)

RESPONSE: "Red-lining" is a concept most commonly associated with real estate transactions, where a certain neighborhood has a "red line" drawn around it and financial institution will not provide real estate loans for properties within that area. This approach differs from the County's use of zoning power to regulate land uses. In any case, a site selection process would be required to determine which area to "red-line" if it were possible. Actual decisions on acquisition strategies would be the responsibility of the County Board and would likely be made during the site selection process.

COMMENT: How would the County provide alternative sources of safe water to neighbors of a future landfill if the ground water was contaminated? Public water supplies do not exist in most areas of the County. (B-1)

RESPONSE: Groundwater mitigation programs are an increasingly common component of solid waste facility siting processes. Several methods have been identified to deliver non-contaminated water to affected property owners, including the drilling of deeper wells and the installation of large water storage tanks on individual affected properties and delivering water supplies in tanker trucks.

COMMENT: During the site selection process, a consultant who is mutually acceptable to the County and affected property owners should be retained. (D-1)

RESPONSE: The plan recommends that an independent, qualified engineering consultant be retained to assist the County and advisory committee (which will have broad geographical representation) in all phases of the site selection process. Recommendation 9.6 (Volume I, P. 49) states that a system should be created which would allow affected property owners to monitor and make suggestions as to facility development and operation. The recommendation further states that local citizens should be able to review operational reports, provide input on the type of development in buffer areas, and review environmental monitoring reports.

COMMENT: Why is the site selection process begun before the public siting advisory committee is appointed? (W-21)

RESPONSE: The proposed site selection process, as described in Volume I, pages 48 - 49, includes identifying facility needs and the proposed service area of each facility and informing and educating the public and elected officials about the siting process and the need for the facility. Also during the first step of the site selection process, the plan recommends that a public siting advisory committee be appointed.

CHAPTER 10 - PLAN IMPLEMENTATION

COMMENT: The plan update advisory committee should have the same members as the siting advisory committee; committee representation should include the County Health Department, the Soil and Water Conservation District, an environmental engineer, and governmental officials from affected areas. (D-1)

RESPONSE: The advisory committee expressed concern about naming specific representatives to future committees and recommended that general categories of representation be listed. It was the intent of the advisory committee to have the same broad categories of representation on both the site selection and plan update advisory committees. Accordingly, proposed revisions to the plan recommends that the plan update advisory committee membership "should represent all geographic areas of the County and should include representation from governmental bodies, the business community, citizen's groups, and civic, environmental and agricultural organizations.

K A N E C O U N T Y

Solid Waste Management Plan

Volume IV

September 1992

Comments

Received During June 3, - September 2, 1992
Public Review Period

Printed on Recycled Paper

KANE COUNTY

SOLID WASTE MANAGEMENT PLAN

Volume IV

COMMENTS

Received During the Public Review Period
June 3 - September 2, 1992

Prepared by the
Kane County Development Department
Geneva, Illinois

September, 1992

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Section I

WRITTEN COMMENTS

Received during the June 2 - September 2, 1992 Public Review and Comment Period

Regarding the

PROPOSED KANE COUNTY SOLID WASTE MANAGEMENT PLAN

Note: Comments contained in these written remarks are referred to in Volume III. Response to Comments by numbering the comments of each writer W-1, W-2, etc., in the same order as they appear in the index to this section.

Written comments are presented in the order in which they were received.

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David B. Groves
1311 Tyler Lane
Elgin, Illinois 60123
708-931-4684

RECEIVED
JUL 13 1992
Ans'd.....

July 10, 1992

Gary -

Relative to your waste newsletter -

Incineration is the way to go —

And it can be done —

Where I grew up, they Burned garbage — ashes + metal went to land fill — 60 + years ago

Dave Groves

July 12, 1992

Mr. Gary Mielke, Planner
Kane Cty. Solid Waste
719 Batavia Ave.
Geneva, IL 60134

Dear Mr. Mielke,

Your request for comments or suggestions led me to put my "2 cents worth" into a note to you.

It has been noted here at Park Shore Apts, Geneva Rd, St. Charles, that often people who either move or no longer wish to keep certain items (often furniture) simply dump these into the dumpster. At one time we found a perfect 2 wheeled bike (only 2 flat tires) in the dumpster. I told a couple with grandchildren who salvaged it. Such items, I feel, should be taken to a 2nd hand store or given to the poor.

If all apartment buildings in Kane Cty. were asked to do so - wouldn't this help to keep "solid" waste down?

Also, all young mothers using disposable diapers should be made to dispose these aside from waste dumps. If forced to do so I'm sure will get back to more sensible (if less desirable) methods of caring for our waste.

Americans must learn to not be such a "throw-away" country or will drown in our own filth one of these days.

Sincerely,

Mildred Buettner

1000 S. Geneva Rd (16B)
St. Charles, Il. 60174

July 12, 1992

RECEIVED
JUL 14 1992
Ans'd

RE: Solid Waste Newsletter

(1). I am in favor of incineration. The landfills, which would still be needed, would last much longer.

(2) Construction debris (road, cement, etc) can this be ground & re-used as a road surface?)

(3) New Construction - why are such large square-footed homes required? Too much waste from builders & who can afford such a huge mortgage?

(4) When can curbside recycling of cardboard, cereal boxes, etc be done. Even if only one day a month!

→

(5) Can we keep adding new items periodically to the recycle pick-up curbside. (Elgin now added the ....appliance pick-up service - great!)

(6) Are apartment owners who use dumpster service - required to provide a recycle bin for tenants? If not, why not?

These are just my comments, I do not require an answer to my questions, unless you feel a need to.

Thanks for reading this.

Carol Schraeder
451 Oak Street
Elgin, Il 60123

July 14, 1992

Solid Waste Division of Kane county
Development Department
719 Batavia Avenue
Geneva, Illinois 60134

My proposal is to have discarded household appliances picked up and brought to an unused government building, of which there must be several available.

Most discarded appliances can be restored to good working order with a minimum of parts and labor. Some do not even need repairs as they are discarded simply because people get tired of the color or other aesthetic reason.

Unemployed people could be trained to make the repairs. The appliances could then be sold (or given to genuinely needy people. The revenue could be used to pay the repair people and other incidental expenses. Landfill space would be preserved; people would be given an opportunity to earn a wage and may even be inspired to start their own business; natural resources would be used to full potential. It seems there would be many other benefits to such a program.

Of course, large appliance manufacturers may feel a pinch and oppose this. It becomes a matter of priorities. Are we serious about making the best use of our resources, recycling to the highest degree possible?

Sincerely,

Peter D. Hahn
P. O. Box 306
Hampshire, il. 60140

2S914 Harter Road
Elburn, IL 60119

July 14, 1992

Solid Waste Division
Kane County Development Department
719 Batavia Avenue
Geneva, IL 60134

Dear Sirs:

I received the July issue of SOLID WASTE PLANNING NEWS and read it through-out. I am aware that the subject of waste disposal is an extremely sensitive subject and must agree that I do not really wish to have such a facility in my backyard either.

It seems to me that the Advisory Committee is concentrating too much on landfill sites. It would seem to be prudent to purchase land at this time for a future siting but certainly not in the large amount of acreage as under the previous plans. It would then be possible to allow the land to remain in use for farming and do no preparation for accepting solid waste until absolutely necessary. This would enable land to be purchased at its present cost per acre before further development for housing and business drives the price up. Property owners adjacent to the siting should be reimbursed for possible devaluation of their property.

Under no circumstances should other counties be allowed to use Kane County's landfill. We are not to become a dumping ground for other counties! Who made the decision to accept out-of-county waste at the present facilities? Is there a law which says we must accept waste from other counties?

Meanwhile, before the present solid waste facilities become filled to capacity, exploring additional and new ways of recycling should continue. If one is tried and is not successful, try another. I recycle at present and it has reduced the amount of waste considerably. I am sure there are other items that should be included that are not at this time - cardboard and paper other than newsprint, for instance. Also, composting and combustion alternatives will surely become more practical and efficient before the present facilities are filled and these should be seriously considered and could perhaps be sited as part of the new landfill so all waste would be trucked to the same site. Be sure that everything is done by the bidding process so that costs are held to a minimum and we do not just "hand" the contracts to our present waste management company.

Whatever system is finally decided upon, it must be one that will not increase the cost of waste disposal to any degree. Already, we in the country are the recipients of bags and boxes of trash dumped along the highways. People simply will not be able or willing to pay the increased costs and will find other ways of disposing. This will create additional costs by the state, county, and township highway people to pick up and dispose of illegally dumped trash.

Sincerely,

Vera A. Long

RECEIVED
JUL 20 1992
Ans'd.....

To: SOLID WASTE DIVISION

I SUPPORT AN IMMEDIATE SITING OF A NEW LANDFILL.

RECYCLING, incineration, composting and other methods will obviously reduce waste; but there will always be waste and loss of it unless our society gets oriented in a totally non-materialistic manner; I don't think this will happen any time soon. I would site the landfill somewhere along the tollway for the following reasons: 1) the tollway will provide a wide buffer zone on one side at least; garbage haulers could use the tollway for quick access to the land fill 3) there is not much residential development along the tollway in Kane County.

As to the actual site - I don't know. Perhaps the quarry in North Aurora; perhaps Western Kane County. Good luck with your choice -

As to Settlers Hill - I live about 1-1½ miles away, but I think it's well-run and should stay open until it's full.

David Nelson - 9 - DAVID NELSON
1005 Britta Lane

northeastern illinois planning commission
400 west madison street · chicago · illinois 60606 · (312) 454-0400 · FAX (312) 454-

July 20, 1992

RECEIVED
JUL 22 1992
Ans'd...........

Mr. Gary Mielke, Director
Solid Waste Division
Kane County Development Department
719 Batavia Avenue
Geneva, Illinois 60134

Dear Gary:

The Commission, acting through its Planning Committee, has reviewed the draft Solid Waste Management Plan prepared by the County. A copy of the review statement adopted by the Committee is enclosed.

The Committee found the draft plan to be responsive to regional solid waste management needs and consistent with adopted regional policies and with the state's hierarchy of disposal methods. The Committee encourages Kane County to adopt the draft plan and to implement it as completely and expeditiously as possible.

In its review, the Committee expressed some concern about the proposed recycling program's adequacy to meet the ambitious goals of the plan. The Committee urges the County to monitor implementation of recycling initiatives closely and to be prepared to consider more stringent approaches if progress toward its goals does not meet the required pace. The County is also encouraged to seek ways of coordinating its continuing evaluation of alternative technologies with other planning agencies in order to avoid unnecessary duplication of effort.

If you have questions about the review statement, please address them to Jim Ford. Thank you for the opportunity to comment on the draft plan.

Sincerely,

Deborah L. Washington

Deborah Washington
Director of Project Review

cc: Hon. Patricia Sjurseth
Hon. William Ottilie

RECEIVED
JUL 22 1992
Ans'd.....

NIPC PROJECT NO. 92-A-002

Northeastern Illinois Planning Commission
Project Review Statement
July 16, 1992

Applicant: Kane County

Contact: Gary Mielke, (708) 232-3481

Request: Draft Solid Waste Management Plan

Review Summary

Kane County has released for public comment a Solid Waste Management Plan for its area. The plan has been prepared under the terms of the Solid Waste Planning and Recycling Act (P.A. 85-1198). Upon the completion of public review and comment, it is the County's intent to submit the plan to the Illinois Environmental Protection Agency for review under the provisions of the Planning and Recycling Act. Implementation of the plan will be the responsibility of the County, municipalities, and private and not-for-profit waste collection, recycling, and disposal operators.

The Plan recommends implementation of an integrated solid waste management system intended to meet the waste disposal requirements of the Association's service area through the year 2010. The plan comprises programs intended to (1) reduce waste volumes at the source by an unspecified amount, (2) recycle 47 percent of the waste stream; (3) dispose of the remainder of the waste stream by landfilling at facilities within the county, including expanded capacity at Settlers Hill, (4) site future landfill capacity within the county and under the County's control, and (5) evaluate the feasibility and impacts of alternative methods of disposal for possible future implementation.

The Commission finds that the draft plan is responsive to regional solid waste management needs and consistent with adopted regional policies. The plan is also consistent with the state's hierarchy of disposal methods. The Commission urges Kane County to (1) adopt the draft plan and proceed to implement it as completely and expeditiously as possible, (2) monitor implementation of recycling initiatives closely and be prepared to consider more stringent approaches if progress toward its goals does not meet the required pace, and (3) seek ways of coordinating its continuing evaluation of alternative technologies with other planning agencies in order to avoid unnecessary duplication of effort.

A summary of the plan and the Commission's detailed comments on it are attached.

Current and Projected Waste Generation

The County's consultants estimate that 491 thousand tons of solid waste, or 8.4 pounds per capita per day, were generated in the county in 1989. Of this amount, approximately 402 thousand tons were municipal solid waste (MSW) subject to planning under the Planning and Recycling Act and 89 thousand tons were manufacturing and process waste. The MSW comprised 180 thousand tons of residential waste, 138,000 tons of commercial and institutional waste, 22 thousand tons of industrial MSW, and 62,000 of construction and demolition waste. Approximately 9 percent of this quantity was diverted from landfills for recycling in 1989. This amount included landscape waste. It is estimated that recycling had increased to 20% of the waste stream by 1991.

Of the waste not subject to recycling in 1989, 92 percent was disposed of in two landfills in the county; Settler's Hill and Woodland. The remainder of the waste stream was exported to two landfills in DuPage County and one in DeKalb County. The estimated remaining lives of Settler's Hill and Woodland, at present rates of disposal, are 11 and 10 years respectively. However, as much as half of the waste received at the two sites is imported from outside the county. Any reduction in waste imports would extend the effective life of the facilities as far as waste generated within the county is concerned. The County has implemented a two-tiered pricing structure at Settler's Hill, which may act as a disincentive to importation of waste as long as alternative facilities are available. It has also acquired 11 acres adjacent to Settler's Hill which could be used for expansion.

Recommended Waste Management System

The Plan recommends implementation of an integrated solid waste management system intended to reduce the planning area's dependence on landfilling and to comply with the hierarchy of waste management methods contained in the Solid Waste Management Act (Public Act 84-1319). Each recommended component was based on technical, administrative, and financial assessment of alternative disposal methods. The recommended system includes the following major elements:

1. Promotion of programs intended to achieve reduction of waste volumes at the source

Recommended actions to encourage reduction of waste at the source include educational and promotional programs directed at school children and consumers; provision of waste audits and model waste reduction programs for commercial and institutional generators; increased procurement of recycled or recyclable materials by public agencies; encouragement of volume-based billing for residential waste service; and advocacy of labelling and packaging requirements directed at products with an inordinate impact on the waste stream. The plan does not specify a volume or percentage target for waste reduction.

2. Establishment of programs intended to recycle 47 percent of the waste stream, including 50 percent of MSW, by 1998

The recycling program would include components addressed to/ residential, commercial/industrial, landscape, and construction/ demolition waste. Programs intended to divert 33 percent of residential, commercial, and industrial waste would include extension of curbside collection to all single-family residences in the county; development and replication of pilot programs for multi-family collection; continuation of existing buy-back and drop-off programs; acceptance of additional materials in existing programs; implementation of volume-based collection fees; and extensive public education programs. Consideration may be given to making recycling efforts a condition of business licenses.

A pilot program for recycling of construction/ demolition waste will be established and the results disseminated. The goal is to achieve 75 percent recycling by 1998. Private development of centralized landscape waste composting facilities and recyclable material processing facilities will be encouraged. The plan does not anticipate the development of County-owned processing facilities.

Programs for the disposal of household hazardous waste, special waste, tires, white goods, and automobile batteries will be established in cooperation with IEPA and the private sector.

3. Assure the availability of future landfill capacity for waste generated in the county requiring land disposal

If the County attains its recycling goal and makes progress with respect to source reduction, nearly 50 percent of the waste stream will still require final disposal. Some land disposal capacity for residual materials would also be required if incineration or MSW composting were implemented. As noted above, most of the waste generated in the county is now disposed of at two sites: Settler's Hill, which is owned by the County and operated by Waste Management under contract, and Woodland, which is owned and operated by Waste Management. The combined remaining life of the two sites is about 10 years at current rates of use. The plan does not assume that waste imports will be substantially reduced.

The County has acquired 11 acres adjacent to Settler's Hill. The plan recommends that siting and permitting for an expansion of the facility be initiated immediately. This would add about 5 years' capacity.

The plan also recommends that the County appoint a public siting advisory committee to begin seeking a future landfill site. The site selection process would include screening out unacceptable sites on the basis of environmental and other criteria; identifying potential sites based on site-specific criteria such as land use and traffic; and selection of a potential site. Provisions for citizen involvement, impact mitigation, and host community benefits would also be developed. The plan recommends that this future site be restricted to waste generated within the county or imported from counties which receive an equivalent amount of Kane County waste.

4. Monitoring and evaluation of alternative methods of disposal as part of the first plan update process

Alternative waste management technologies will be monitored and promising approaches will be evaluated during the first five-year plan update. Evaluation criteria will include technical feasibility, siting requirements, environmental impacts, health risks, economic feasibility, and other factors. The alternatives would include MSW composting and waste-to-energy incineration.

Implementation

Overall responsibility for implementation of the plan is vested in the County under the Planning and Recycling Act. The County will administer landfill contracts and the site selection process, provide technical assistance to local governments, coordinate waste reduction and recycling programs, develop and coordinate public education programs, and carry on continuing planning. The plan recommends that the County explore approaches to intergovernmental cooperation with municipalities, which presently have responsibility for residential collection and recycling programs. The County will maintain public advisory committees on site selection and continuing planning.

Comments and Recommendations

The Commission finds that the draft plan is responsive to regional solid waste management needs and consistent with adopted regional policies. The plan is also consistent with the state's hierarchy of disposal methods.

The plan establishes an ambitious recycling goal of nearly 50 percent by the end of the decade. Attainment of this goal would extend the available capacity of existing landfills as well as return useable materials to the economy. The Commission has several questions, however, about the measures offered as means of attaining that goal.

The first concerns the adequacy of the measures recommended to achieve the next increment of recycling. The plan depends largely on voluntary recycling programs, supported by public education, technical assistance, and market development. The principle incentive is the recommended adoption of fee-based collection. This system, which charges the residential customer on the basis of how much waste is put out for collection, is intended to encourage waste reduction and recycling by making the cost of disposal immediately apparent. When fee-based collection and curbside recycling are implemented at the same time, recycling participation is high. When an effective curbside program is already in place, however, the fee-based system may do little more than encourage homeowners to pack more waste into a given volume for disposal.

The plan does suggest the possibility of attaching a recycling requirement to business licenses. Some other jurisdictions have proposed such measures as requiring the provision of curbside service to all customers as a condition of renewing a waste hauling license or collection franchises. Uniform reporting systems have also been recommended in several counties. The Commission recommends that the County monitor implementation of recycling initiatives closely and that it be prepared to consider more stringent approaches if progress toward its goals does not meet the required pace.

The second concern is essentially a matter of accounting. The County's recycling program includes the diversion of 100 percent of landscape waste from landfills. Landscape waste represents approximately 13 percent of the waste stream. In 1990, an estimated 40 percent of this material was collected and disposed of by composting, land application, or landfilling, while 60 percent was managed on-site. The draft plan recommends continuing encouragement of on-site management with provision of adequate composting capacity for the waste put out for collection. Both components of the landscape waste stream would be counted toward the recycling goal.

However, under current IEPA interpretation of the Planning and Recycling Act, "recycling" occurs when material is "returned to the economic mainstream in the form of raw materials or products" or when waste material "replaces other raw materials for fertilizer, soil conditioner, or mulch." Some of the landscape waste which is managed on-site undoubtedly meets this standard, but this quantity is difficult to account. It might be preferable in light of the IEPA interpretation (and consistent with plans in the other counties) to include landscape waste managed on-site as part of the waste reduction goal. The effect would be to lower the County's achievable recycling target from 47 to 39 percent - still a creditable accomplishment - while providing an 8 percent waste reduction attainment.

Like several other plans, the Kane County plan calls for continuing monitoring and analysis of alternative disposal technologies. These will be considered at the time of the first five-year update. The Commission urges the County to seek ways of coordinating this evaluation process with other planning agencies in order to avoid unnecessary duplication of efforts.

VALLEY INDUSTRIAL ASSOCIATION

2111 Plum Street
Aurora, Illinois 60506
892-4228

RECEIVED
JUL 31 1992
Ans'd.....

TO: Kane County Development Department

FROM: Jacqueline Henning

RE: Public Review of Proposed Kane County Solid Waste Management Plan

DATE: July 29, 1992

Jeline E. Henning
President

My name is Jacqueline Henning. I am President of the Valley Industrial Association and I served as co-chair of the Kane County Solid Waste Advisory Committee with Mayor Fred Norris of St. Charles. The twenty members of this committee represented city and county governments, industry, disposal and recycling companies and members of the community including EDKO.

Over the course of the last two years, our committee met with the capable support of Gary Mielke and Phil Bus to undertake an extensive analysis of the amounts and types of waste Kane County generates now and to make twenty year future estimates. We assessed the capacity of existing disposal facilities. We studied a variety of technologies, programs and facilities to manage refuse over the next 20 years. We generated extensive information regarding the environmental, energy and economic impacts of those programs, facilities and technologies.

From the outset of our study, the committee adopted a set of goals and objectives which guided our inquiry and shaped the plan that is today under public review. It is clear from these goals and objectives that the committee was dedicated to protecting the environment and sustaining a healthy economy in Kane County which makes our quality of life here possible. This plan as presented will ensure that the waste disposal needs of the majority of county residents will be met in the future.

When the mayors of Kane County's river towns which, along with the eastern townships, represent 89% of the county's population call for "the immediate acquisition of a new landfill site for solid waste disposal - a landfill to be used exclusively by Kane County" they are reiterating the findings of the Kane County Solid Waste Advisory Committee that are spelled out in this Solid Waste Management Plan. There is absolutely no doubt that at some point in the future a new landfill in Kane County will be necessary. The time for acquisition and siting is now.

The Kane County Development Committee must demonstrate leadership and vision now in order to fulfill its obligation to represent the best interests of the majority of county residents and their descendants who will inevitably have to face this issue under much more difficult and costly circumstances in the future if you fail to act now.

I urge you to adopt and to implement the Solid Waste Management Plan as submitted by the Citizen Advisory Committee so that when it comes to providing for solid waste disposal, future generations of Kane County residents can enjoy the results of your good judgment and vision.

Thank You.

Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

RECEIVED

AUG 10 1992

Ans'd.....

(217) 785-8604

August 6, 1992

Mr. Gary Mielke, Solid Waste Planner
Kane County Development Department
County Government Center
719 Batavia Avenue
Geneva, IL 60134

Re: SWM Grant/Planning/Kane County/Output

Dear Gary:

I have completed my review of Kane County's Public Review Draft Solid Waste Management Plan, received June 8, 1992.

My comments are presented to comply with the Solid Waste Planning and Recycling Act's requirement for the Agency's review of draft plans within 90 days of plan submittal.

General Comments

Kane County's plan is logically organized and well written. It is concise yet thorough.

Substantive Comments

1. p. 7. To lend clarity to the waste generation discussion, the definition of municipal waste used in this report should be added. Because this report includes data from 1989, it apparently uses the legal definition that was then in place. At that time, municipal waste included "...other material resulting from operation of residential, municipal, commercial, or institutional establishments and from community activities." At that time, we considered municipal sludge to be the result of municipal or community activities.

Recent revisions to the Environmental Protection Act now define municipal waste as garbage, general household, institutional and commercial waste, industrial lunchroom or office waste, landscape waste, and construction and demolition debris. Municipal sludge is not now included in this definition.

Because only 1500 tons of municipal sludge is involved, you may wish to revise the definition and data to reflect the current situation.

It appears that 1989 data was used for everything in this section,

except municipal sludge, for which 1991 data was provided. To be consistent, data from one year should be utilized.

2. p. 15, Section 3.2.2. It is unclear what is meant by "inordinate impact on the waste stream." It would be helpful to include a discussion of how this will be evaluated and what the criteria will be.

3. p. 18. You may wish to include the current definition of recycling in this document. It is: "Recycling, reclamation or reuse, means a method, technique or process designed to remove any contaminant from waste so as to render the waste reusable, or any process by which materials that would otherwise be disposed of or discarded are collected, separated or processed and returned to the economic mainstream in the form of raw materials or products."

4. p. 21. Recommendation 4.7. This recommendation includes the collection of used clothing and other household items by charitable organizations for coordination with curbside recycling. Although the county may wish to include this activity in its recycling rate calculations, the Agency does not consider surplus or donated clothing given to charitable organizations to be municipal waste. Because the law focuses on the recycling of municipal waste, donated clothing would not be included in the calculations. To be recycled, materials which would otherwise be disposed of or discarded, are collected, separated or processed and returned to the economic mainstream in the form of raw materials or products.

5. p. 24. Landscape Waste Management Programs. Reference is made here to exempted materials which were landfilled, which included woody material, such as tree trunks and stumps, with a diameter of more than 3 1/2 inches. In accordance with the Bureau of Land's Permit Section's interpretation, some vegetative wastes are exempt from the law's provisions. These include any landscape wastes, which due to their size, hardness or configuration pose a processing hardship for all reasonably close composting facilities. The general rule of thumb is a tree limb with a diameter greater than 12 inches. Because exempted wastes are determined by Permits on a case-by-case basis, you may wish to contact Ed Bakowski at (217) 524-3281.

6. p. 26. Implementation Strategies. Section 6 of the Solid Waste Planning and Recycling Act requires county recycling plans to have provisions for compliance, including incentives and penalties. This chapter includes recommendations for programs which would exceed the state recycling goals, but it is not clear what steps the county will take if these programs do not achieve these goals. A discussion of the county's incentives and penalties should be added to this chapter.

7. p. 27. The list of activities scheduled for 1990-1991 includes "4.6 &" but does not list any activity.

8. p. 30. The definition of special wastes in the Environmental Protection Act includes any industrial process waste, pollution control waste or hazardous waste. In addition, potentially infection medical waste (PIMW) is special waste.

The discussion in the draft plan omits hazardous waste from the category of special waste. Not all special waste is hazardous, but all hazardous waste is special waste. The plan should be revised to reflect this correction.

This section might flow better if the first and second paragraphs were reversed.

9. p. 31. Recent revisions to Section 22.28 of the Environmental Protection Act have changed the requirement to remove white good components before landfilling to 1994.

10. p. 47. Section 9.2.1 discusses mixed waste sorting facilities. It would be helpful to briefly discuss how these facilities operate. If they receive and sort mixed waste, they are a transfer station, and need to undergo siting and permitting. If they accept pre-sorted recyclable materials, they would not need to undergo siting and permitting.

I look forward to receiving a copy of the county's final plan which addresses these comments. After these revisions have been satisfactorily addressed, I will send a letter stating as such, along with the remaining activities necessary to close out the state grant.

If you have any questions or comments, contact me at the above number.

Sincerely,

Linda Hinsman

Linda Hinsman, Manager
Planning and Grants Unit
Solid Waste Management Section
Division of Land Pollution Control
Bureau of Land

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AUGUST 11,1992

W-10

was present at the Elgin hearing for the Kane County solid waste plan. am not an expert on this topic. I am a citizen who is trying to become owledgable and sensitive to the issues that effect our environment and ves. I am a citizen who wants to know what I can do in my own home and rkplace that will be environmentally friendly. I would like to respond what I heard August 6 at the hearing in Elgin by making two pleas.

rst of all, I ask the people of influence, those having positions of adership in our city governments, to please listen to the people you present. Listen to the heart of humanity rather than the temptations of onomic greed. Two people in the Elgin hearing stand out as examples of e population that you represent. The young man of fifteen who has udied the issues surrounding the environment and gave some good ggestions, and the older gentleman who has patents and submitted a plan r solid waste reduction to the board. These people represent our ucated present and future population. Is is not a shame that we have me people in our own backyard who are inventors and problem solvers that st go to England to be heard? Let us use the resources we have here in ne County. We, the People, are educated. We, the People have ideas. , the People, have voices. We, the People, are asking you to listen to and heed our advice. We, the People, want Kane County to be a place ere people want to come and enjoy the environment; the trees, water, r. People come here to get away from the city fumes and crowds. Let us ild on that concept. How can we preserve this beautiful land and keep is reputation? Do the people want it all developed? Maybe t.....maybe that is not in our best interests..... Rather than be llowers in development, why don't we be leaders in preservation and storation. Why don't we take the risk of putting our people first ther than our pocketbook? There is a book out, Do What You Love and the ney Will Follow. Let us take care of the environment that we love and hers visit to enjoy. We will be the envy of our neighbors.

My plea is in regard to source reduction.

condly, I ask the citizens of Kane County to examine their lifestyles. comment was made at the Elgin hearing that concerned me. Someone said at we in the United States have acquired a certain style of living. amples were given and comparisons to those in another part of the world. conclusion, the speaker said she was accustomed to her lifestyle and ked if any of us would like to give that up. Granted, we have an easy, nvenient way of life for the most part. But is that good? We all have examine our lifestyle. And, maybe it is in the best interest of the mmunity to adjust and alter our lifestyles. To be environmentally aware d sensitive will not be convenient. We have to face that and be willing change. We cannot be so arrogant to think that we here in Kane County the United States always know the best way of doing things. We can arn from our world neighbors. Let's face it.

t me use an example. When someone is caught in the act of theft, that rson is brought to trial and consequences occur. Society doesn't not ndone thievery. Society then tries to impose consequences on the thief at would hopefully cause the theif to alter their way of acquiring ods. The thief, in the act of robbery, believes that that act is stified for whatever reason. But the community sends a clear message at this is not acceptable. There is another way to acquire that which needed. Now think of our environment. Ask ourselves, are we thieves,

ing each other of clean air and land, possibly of lives? This type of t is more subtle. We think we need some of the things we have grown a stomed to having. Is there another way? What do we really value? Incentives and consequences must be imposed that reflect environmental values of society that we cause people to alter their lifestyles.

In summary, that is what I would like all of us to think about. What do we value? Is it life? Or, is is just our life? Do we view ourselves as part of a larger community; part of a neighborhood, city, county, country and the world? If we do view ourselves as part of a larger whole, how can we best work together to respect the life we have, the air we breathe, the ground on which we walk? Both the leaders of our communities and the general public must abandon their defenses and truly listen to each other and negotiate. It seems all want our community be economically stable as well as environmentally safe. With a common goal, cannot we work together? With popular representation, expert advice across the disciplines and government representation I believe it is possible.

Submitted by
Maryanne Sobiech

Maryanne Sobiech
656 Alice Place
Elgin Il 60123

Maryanne Sobiech
656 Alice Place
Elgin Il 60123

August 13, 1992

Solid Waste Division
Kane County Development Department
719 Batavia Avenue
Geneva Il 60134

Dear Kane County Board,

Enclosed are my remarks that I had intended to share at the August 11 hearing. Due to the hour and commitments at home I had to leave the meeting at 10:30 p.m. and my name had not yet been called. They are brief, yet reflective of the general public. I request that the Solid Waste Proposal as submitted to this date be returned for fine tuning. That is, do not accept it as it stands. After being at two of the meetings, and hearing experts advice, it is obvious that this plan is unacceptable.

As an aside, the hearings that I attended were not in keeping with time alottments as in the hearing guidelines. Neither the experts were kept to 15 minutes, nor the general public to five minutes. It also seemed that the attorney handling the hearings had some bias. When the general public (some) gave their opinions and feelings, especially if it called into question the proposal, he interrupted the speaker. In all instances the speaker was responding to and giving advice regarding the proposal and suggestions for the public.

Thank you.

Sincerely,

Maryanne Sobiech

Maryanne Sobiech

KANEVILLE TOWNSHIP
ervisor
ynship Clerk
hway Commissioner
Board of Trustees
Tax Assessor

2S101 Harter Rd.
Kaneville, IL 60144

August 12, 1992

Kane County Development Department
Solid Waste Division
719 Batavia Avenue
Geneva, IL 60134

Re: County Solid Waste Management Plan

Gentlemen:

The Kaneville Township Board has reviewed the County Solid Waste Management Plan and some of our members attended the public hearing held at Waubonsee Community College on August 4th.

Kaneville Township opposes the acquisition of private land for a landfill and believes a landfill should be the last resort for handling Kane County's solid waste. Alternatives available in new technology should be examined over the next 5 years. If a landfill is still determined to be the best method, a decision can be made at that time.

Further, when the Solid Waste Advisory Committee was selected, Kaneville Township requested that a representative of the Western Townships be included. We believe that the interests of the citizens residing west of the Fox Valley area have not been represented.

Kaneville Township opposes the Solid Waste Plan as presently proposed.

Sincerely,

David Werdin

David Werdin

DW/ch

VIRGIL TOWNSHIP
North Summer Street
Maple Park, Illinois 60151

RECEIVED
AUG 19 1992
Ans'd.....

RESPONSE TO KANE COUNTY SOLID WASTE MANAGEMENT PLAN

After two years of listening to the Solid Waste Department of Kane County, the Kane County Board and the people that have so strongly opposed the Proposed Kane County Solid Waste Plan (and especially the call for the immediate siting of a landfill), it is the unanimous opinion of the Board of Trustees of the Township of Virgil, in the County of Kane, that numerous items have been left out of plan.

Just think of where we are; it had taken this country over 200 years to move forward at a very fast pace. This was accomplised by placing trust in the working technology of people. We as people are put on this earth to make a better place for all mankind. We have been given the world to care for, grow in and leave in better condition for generations to come. Sometime in the early 60's, as we became a wasteful socity, we also became conscious of the fact that we had to protect our environment. So what did we do - but put our waste in the earth and compact it so tight that the bacteria that decomposed it could not live. Thirty or more years later we've discovered that a compacted covered landfill becomes dangerous by leaking gas and dangerous poisons into our air, ground and water. It is no ones fault - it's the evolution of time - so let's quit blaming people for being human. Let's take a lesson and not make the same mistake over again.

We strongly feel that with trust in our fellow man and faith in modern technology and our educational systems, a system will be developed to dispose of waste that cannot be recycled or reused without landfilling or incinerators.

VIRGIL TOWNSHIP
North Summer Street
Maple Park, Illinois 60151

We feel the whole plan should be scraped and a new one developed. In the remaining life of Settlers Hill, there is time to develop a plan that makes use of anything left over after recycling and reusing.

Throw out the plan presented and start over with these five basic thoughts as you begin to put together another plan:

1) Youth - let the youth have a say about what their children and grandchildren will inherit,

2) Trust - trust in one another instead of constantly having a NEGATIVE OUTLOOK AND ATTITUDE,

3) Humanity - Remember that we are all human and make mistakes; accept the mistakes, use them as a lesson for the future and move on with a good positive outlook,

4) Education - Billions of dollars are spent educating our youth. Let's begin to put some trust in that education by using it for future endeavors. Lets not use the same old methods over and over until we have destroyed both the earth and the human race.

5) Ambition - Let's not always take the easy way to do things, but work harder to search out the new and improved methods to make a better place for the future of our children and grandchildren.

In conclusion, we do not feel the proposed Solid Waste Plan is acceptable. We urge the County Board to scrap this plan and begin to develop one that actually addresses the needs, concerns and well being of the residents of Kane County with an eye to both the mistakes of the past and technologies of the future.

1521 Eagle Brook Dr.
Geneva, IL 60134
August 22, 1992

Kane County Development Department
719 Batavia Avenue
Geneva IL 60134

I had intended to present the following as verbal testmony at your public hearings on the soild waste management plan but business related travel precluded me from doing that.

Although I participated in the advisory committee, I feel a need to submit these written comments in support of the proposed plan to help explain why the committee recommended what it did. Recent reports in the local papers would appear to indicate that most of the people being quoted haven't read the report.

I am concerned that the Kane County Chronicle has consistently provided EDKO with a forum to present misleading information. It is unfortunate that EDKO has resorted to personal attacks on your staff members instead of dealing with the real issues on a factual basis. The so called "experts" recruited by EDKO show an incredible lack of understanding of waste management issues and technology (if the Chronicle and Republican have reported accurately on the testimony).

My academic training includes a PhD in Environmental Science and Engineering, with a specialty in biological waste treatment. For the past four years I have worked on solid waste technology and public policy issues on a full time basis. I've given a number of papers, primarily on recycling issues and technology, and I've worked with a number of states to promote development of integrated solid waste management policies and programs that meet their unique needs. I was a business and industry representative on the task force established by the Illinois Department of Energy and Natural Resources which attempted to develop improved solid waste reduction and waste management facility siting legislation for our state. In 1991, I was a judge for the national recycling awards presented by the U.S. EPA. I've included these personal data to help demonstrate why I am confident that you will find that I am generally regarded at the national level as one of the more knowlegable people on solid waste management technology and the related public policy issues.

My consistent message has been that no one waste management system is best. Every community doesn't need a landfill, an incinerator, and a composting facility; and many communities can't justify recycling. The combination of waste management methods that is appropriate for one community, is often not the best approach for others. While most people would agree that we should attempt to minimize landfilling and maximize recycling, we must recognize that economics have to be considered. Even if public opinion polls report that the general public wants to use

so called "environmentally friendly" approaches, there is a limit to their willingness to pay whatever it takes to achieve that ill defined objective.

From the time I volunteered to participate in the advisory committee which helped develop the proposed plan for Kane County I have frequently seen misleading information in the local papers about the issues involved in finding an appropriate solution for our future solid waste management needs. Many of the criticisms of the plan being put forth now by EDKO and their imported "experts" have demonstrated a lack of understanding of the plan, the content of the consultant's reports that provided a basis for the committee's recomendations, and on the technology of solid waste management. There are very few residents who will likely take the time to read the proposed plan, and even fewer with a background to critique EDKO's outrageous comments and challenges to the plan.

I think it is important that the County Board members who must act upon this proposed plan clearly understand the answers to several questions.

1. Why targeting higher recycling rates is not realistic?

The proposed plan calls for a recycling rate of 47 percent of all commercial, non-hazardous industrial, and residential waste. No community in the United States, with a waste stream make-up similar to Kane County, has proposed such an ambitious target. The City of Geneva has one of the most comprehensive recycling programs in the country, for residential waste. However, the Geneva program won't come close to achieving a 47 percent rate for all municipal solid waste. You may have heard some speaker at your hearings refer to a recycling rate of greater than 60%, by weight, in New Jersey. Those rates are factual, but they result from the extensive scrap metal recycling industry that is located in the state, not from addressing as large a fraction of the residential waste stream as Geneva now accepts. McHenry County, Illinois, says it will recycle 70% of its waste, but that figure includes composting which is almost universally excluded as a recycling technology by waste management experts (see additional comments under question #3 below). For Kane County to ever achieve the targeted recycling rate (47%), residents will likely be forced to provide a substantial subsidy because the value of most recycled materials is considerably less than the full cost incurred in recycling them.

No matter how much we decide to pay to subsize recycling, or if we choose to incinerate that portion of the waste stream which is combustible, there will still be a fraction of the waste which must be landfilled. Saying we don't need a landfill available is simply burying our heads in the sand.

3

2. Why "emerging technologies" are not the answer?

EDKO has been suggesting that the county plan to use "emerging technologies". The county hired a major, well qualified, and respected consulting firm, Roy F. Weston, to evaluate emerging and innovative technologies. Weston's report did not recommend any of the technologies as appropriate for consideration by the county at this time. I specifically asked the Weston representative who made the presentation to the advisory committee whether they had recommended use of any of these technologies to any client community and the answer was no.

For Kane County to try any of these technolgies, even as an experiment, is asking our residents to pay for research. The residents of almost every community which has tried mixed municipal waste composting, know what it is to be asked to pay for someone else to learn their "innovative" idea doesn't work. Research is expensive to conduct, particulary small scale demonstration projects. I would argue that it is the role of the federal or state government, or the business entity which proposes the new technology, to fund such research, not the residents of Kane County.

3. Why mixed mixed municipal waste composting is inappropriate?

We have local experience with yard waste composting. That state mandated requirement was supposed to be easy to meet. However, it has caused numerous problems (see recent articles in both local papers) as the operators found out that composting is a complex biochemical reaction that doesn't just happen without good and expensive operating techniques. The controls necessary for composting such a diverse mixture as municipal solid waste are more complex than most municipalities can afford. These concerns were clearly expressed by Cal Recovery, the consultant hired by the county to do an extensive review of mixed municipal waste composting.

Cal Recovery did not recommend that mixed waste composting be part of the plan. They pointed out that every mixed municipal waste composting facility that has been built to date has had operating problems, several have been closed at great cost to the residents of the communities, and uses for the product, other than as landfill cover, are limited. In other words, if we handle some of our waste by composting, we'll need a landfill to dispose of the "product". Mixed waste composting is thus an expensive waste volume reduction process, not a method for recycling or disposal.

At some time in the future, after other communities, or the federal government have paid for the experimental work, we may determine that composting can be one of the processes used at our

municipal waste management facility. The proposed plan allows us the flexibility to do this in the future.

4. Why is it necessary that a site for a waste management facility be identified as soon as poosible?

The proposed county plan recognizes that at some time in the future, some "emerging technology" may be appropriate for use in this county. The recommendation of the advisory committee was to maximize recycling, to attempt to identify an appropriate site for a waste management facility that can accomodate whatever combination of technologies we eventually use, and to continue to evaluate "emerging technologies".

By choosing a site for the waste management complex now, the county can provide for an orderly transition for the people who would be dislocated. The people who live in the area now, need not move until development of the site occurs, but no new people will locate there only to be subsequently evicted. We can plan for an appropriate set back or buffer zone, and the infrastructure such as major roads can be planned and built. People can chose to live on these routes, or adjacent to the waste management facility, but they will know in advance that there will be traffic, noise, etc.

Avoiding the issue of siting a waste management facility is not in the best interest of the residents of Kane County. If local opposition, even from a handfull of people, is going to block use of landfilling in this county, we might as well acknowledge in our plan that we need to resort to what I like to call "east coast technology"; i.e. shipping trainloads of solid waste to downstate Illinois or to another host state." You should recognize that the people who appear to be advising EDKO are the same people who forced McHenry county to plan to handle 70% of its waste and export the rest.

5. Why should we consider expansion of Settler's Hill at this time?

The primary reason is that there are many ways that activist organizations can block the siting and construction of a new landfill, so we have no assurances that we can ever construct another one. Activists blocked the success of a statewide task force that worked for over a year to develop legislation that would enable municipalities to site solid waste management facilities. They have consisitently enterred into local debates to fight the approval of landfill sites. Some of them will acknowledge that their objective is to force the cost of landfilling high enough, based on supply and demand factors, so that recycling that is not now cost justified will be attractive based on the comparison to the new, very high landfilling costs.

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I believe it is in our best interests to let other municipalities deal with these issues first, while restricting the ability to use Settlers Hill for those communities and counties which have refused to site a waste management facility in their our county.

6. What will our waste management system look like 25 years from now?

There is no "emerging" or "innovative" technology that any waste management expert who does not have a vested interest in someone paying for testing/development of his or her idea, could honestly recommend that Kane County build into its plan today. We don't know yet what the costs will be to achieve anything like our proposed 47% recycling rate. I believe we are being naive in expecting that people will be willing to pay those costs.

Our analysis says that landfilling will take the largest land area, but cost less than any other alternative for managing those wastes which we can't recycle, or chose not to pay to have recycled. If we block out an area of land of a size large enough to accomodate our current forecast of what is needed for a landfill, we will have time to analyse the trade off between cost and land requirements for alternative technologies that have been demonstrated between now and the time the site needs to be developed.

Expanding Settlers Hill now, provides more time for alternatives to landfilling to be developed and it gives us more opportunity to determine both how much waste we will have left to dispose of after economical recycling and what the alternative methods for managing it will cost.

7. The following comments are rebuttals to some of the "expert" witnesses imported by EDKO.

a) One chemist testified that landfills will result in toxic materials getting into our water supplies. Anyone who has been involved in the solid waste management debate knows that there are many landfills which have been designed and/or operated in an improper manner. These landfills are clearly an environmental liability. Current landfill design and operation criteria established by the U.S. EPA, with input from environmental and industry groups, precludes construction of new facilitiies that could create the problems identified by the "expert". In addition, landfills which don't meet the new standards are being closed all over the country. The county could not consider, nor would any reasonable person even suggest they would consider, a landfill that created the problems described by EDKO's "expert".

b) One "expert" said he had talked to other "experts" who don't know how to convert solid waste volumes in tons to landfill area.

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There are published data, used by such organizations as the U.S. EPA and major consulting firms which allow for conversion of waste weights to volume or visa versa. Your own staff could have included those calculations in the proposed plan, but I have no doubt that EDKO would challenge the calculations. Unfortunately, the County will probably have to pay fees to a consultant to do calculations on landfill size that your own staff could do.

c) Two "experts" from the University of Illinois challenged our waste generation figures. They reportedly think that per capita waste generation figures have something to do with how much farmland is in a county. Farmland, or city land, doesn't generate solid waste, people do; so the percentage of farmland has nothing to do with <u>per capita</u> waste generation. The reason waste generation figures are presented in per capita terms is to allow planners to forecast growth in waste volumes as population increases. The Kane county plan cites waste generation rates per capita for surrounding counties and our figures are clearly consistent with the demographics of our county. <u>Real</u> waste management experts put much more weight on data obtained from actual waste surveys, which Kane county used to verify its estimates, than they do on national average.

d) Ms. Stover, EDKO's representative on the advisory committee, apparently testified that she had proposed 10 ideas to the committee that were not adopted. Ms. Stover's ideas were considered by the committee; some were rejected, while others are appropriate for consideration during the implementation phase. I have the following comments on why her 10 ideas, as reported in a local paper, were not written into the plan:

* No immediate landfill siting - See answers to question 4 above.

* Begin piloting new technologies such as mixed municipal waste composting - See answer to question 3 above.

* Building a separate construction and demolition debris facility - This idea makes sense but it can be implemented by simply allocating an area in the proposed solid waste management facility; i.e. it is an issue of implementation that can be dealt with once the County Board approves the conceptual plan. By isolating construction and demolition debris within our county site, we may be able to help achieve the recycling rate target for these materials that is already part of the plan.

* No importation of waste - The plan says we could consider accepting waste from other jurisdictions that accept an equivalent amount of waste from our county. The advisory

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committee made this suggestion so we could evaluate if it was more cost effective to have some neighboring county handle our hazardous wastes in exchange for us accepting some of their non-hazardous waste. A blanket prohibition on importing or exporting waste is ill advised.

* If a landfill must be sited, hire a consultant who is mutually acceptable to the county and to nearby property owners - Ms. Stover orginally proposed that the county pay for a second consultant to review the recommendations of the consultant the county chooses. Many of the "experts" who testified for EDKO at your hearings would be the type of "consultants" EDKO will propose. We don't need that kind of advice. Selecting "nearby property owners" to help pick the consultant presupposes that a site is already selected; if that is the case, why do we need a consultant? If EDKO has the funds to hire a second firm, and that firm refutes the findings of the county's consultant (which would likely be the case based on the biased starting point), we may need to seek the assistance of the state Department of Energy and Natural Resources to referee.

* Create a household waste collection site - There are substantial financial obligations that go along with being a handler or disposer of hazardous waste. The county should avoid those obligations if at all possible. We should handle household hazardous wastes separtely from other municipal solid waste. However, it would be much better for the county to contract with a private firm to provide the collection and disposal service.

* Holding county-sponsored waste symposiums for similar industries to develop and use recycled materials - I suspect all committee members would support this concept. It is a tactic that can be used in the implementation phase to help us move in the direction of a 47+ percent recycling rate. The current conceptual plan needs to be approved by the County Board before we work on implementation details.

* Add environmental and health experts to the site-selection and waste plan update committees - I would hope that this type of expertise will be available to the committees, but they may need to be paid consultants because we will probably find it difficult to find local volunteers with these skills to serve on the committees. I don't recall that any of the groups which Ms. Stover suggested be given guaranteed seats on the committees were likely to bring environmental or health expertise to the table.

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* Adding representatives from affected area governments to the committees - Every community in our county is affected by the plan or lack thereof. The first committee which needs to be formed is one to establish site selection criteria. There are always both technical and political concerns in the site selection process. Clearly local government officials will bring the political viewpoint. There needs to be a mix of people on the advisory committee established to develop site selection criteria, just as we had on the advisory committee. If we can agree on the criteria, then all we have to worry about is pressure groups like EDKO trying to change the criteria. No one group should have veto power over the process.

From everything I've seen and heard from EDKO, I've concluded that the group is not interested in debating the merits of the proposed plan. EDKO doesn't want a landfill in the western part of our county. They are being advised by the same people who sabotaged the Illinois Department of Energy and Natural Resources task forces. These outside "experts" are raising issues that are not pertinent to the review and approval of the proposed plan, and much of their testimony was not factual.

The real issue is whether the County Board has the political will to stand up to EDKO and approve a plan to manage our wastes in the county. If not, we need a plan that says we will export waste to another county or state.

I urge the County Board to adopt the proposed plan as written.

Jim McLellan

Jim McLellan

COMMENTS ON THE KANE COUNTY SOLID WASTE MANAGEMENT PLAN

Please enter into the Public Record

Aug 24 1992

Throw out the plan and start a new one. More emphasis should be on alternatives and forget about siting landfills. Lets' enter a new era for using modern technologies.

Kane County should become a leader in new technologies, a role County citizens could be proud of.

It seems we are stuck living in the dark ages when all they knew was landfilling waste. We can pay now for new technologies or pay later to fix leaky landfills and contamination of water supplies.

Signature James A. Diehl Mildred F. Diehl

Name

Address JAMES A. DIEHL
46 W 500 WELTER ROAD
MAPLE PARK, IL 60151-6453

Burlington Ill
Aug. 27-92

Solid Waste Comm. Kane County

After hearing and attending a meeting at Central High School on Solid waste Plan. As a land owner living in Burlington Twp - Kane County I am very upset with this plan. After reading that it there are many questions.

2000 acres needed, where did this number come from?

Set Hill / Pod 5 / yds dumped per yr.

How much revenue generated for Kane and how much for Waste Management?

remaining capacity 21+ million yds - 11+ yrs. life left.

Woodland 121 acres to be used 15 yrs left.

Looks like ½ of 20 yr. plan we have an answer for our land fill need.

From the Plan to Develope 150 acres it would cost 10 to 11 million. It looks like we are going to take a lot of out of county waste to spend that kind of money.

After reading the plan and the hearing at the school I think it needs reworking & review. 60 days is not enough time. when we have 10 yrs + life Capacity left.

Lets think about some of the many acres that are unused out at the Fermi Lab.

a 45 yr. Kane county farmer and Tax payer

James Merlo
12N032 Waughon Rd
Hampshire, Il
60140

Solid Waste Division
Kane County Development Department
719 Batavia Ave.
Geneva, IL 60134

August 24, 1992

I am writing this letter to comment on the Kane County Solid Waste Plan. Please revise the plan so the acquisition of land for a new landfill is not put on the fast track. Instead, I would encourage our county to spend the five years before this plan has to be revised to gain better information concerning the amount of waste Kane County residents generate. As a result, we will have better data on which to base costly decisions. Within the said five years, the energy spent on the acquisition of a landfill may be used to get waste reduction and recycling programs into full swing. How serious is this county on recycling and reusing when a choice of last resort (a landfill) is a leading priority?

Please review the material provided at the public hearings in earnest and strive to make this plan a realistic proposal so that each board member may look their constituencies in the face and be able to say "this plan doesn't attempt to mislead the people of Kane County; it is the best plan in the long run for all of its citizens."

As a life long citizen of Kane County and a young adult, I am concerned with the public policies which will affect our county in the long run. Please do not endangered the future economic potentials of this county by placing a regional landfill into this county. Be willing to help this county lead, not follow, other counties into the next century.

Mark Stilp

August 25, 1992

David and Linda Arndt
8N341 Thomas Rd
Maple Park
IL 60151
708.365.2613

Kane County Board
Kane County Development Dept
719 Batavia AVe
Geneva IL 60134

Dear Ladies and Gentlemen,

We have lived in Kane County for fifteen months, the previous fifteen years in Chicago, and before that the state of Michigan. We moved here because, after investigating and inspecting numerous other counties and states, we concluded Kane offered the most. It seemed to be one of the most progressive of the areas we visited, run by people who were thinking about the future, who were aware of past failures in surrounding counties and would guard against repeating those dilemmas. In part we moved here because Kane's Development Department states in its publication Kane County Illinois-Historic Preservation Plan, page 1 "Kane County must preserve its unincorporated historic sites and rural landscapes..." Our love of Kane County and its people have grown steadily; our work and lives are now centered here. Recent events, however, regarding the Solid Waste Management Plan have shaken our faith in Kane County's leaders.

- *Secret planning and backroom negotiations*
- *Cozy relationships with Waste Management Co.*
- *Poor and inadequate research for the Plan*
- *Insistence on siting a landfill in western Kane Co*

We obtained both copies of the Plan, and read them from cover to cover. While neither of us are expert in the field of waste management it is clear that many who were consulted or worked on the Plan weren't either. Having attended the hearings, and read all the materials we could gather, we are now convinced that this Plan is a rather feeble ex post facto attempt to justify what was earlier attempted quietly behind the scenes. Once the public found out about the rush to site a landfill, seemingly in contravention of state law, it seems the Board then ordered this Plan. Accordingly, the Plan looks to be a minimal attempt to comply with state law and a poor attempt to support the Board's desires which will surely spoil the beauty of Kane County.

Even though David has done photographic assignments of landfills and their operations for Waste Management Corp. we aren't experts in this area and won't attempt to debate technical areas, but will instead approach the Plan as business people and residents of Kane.

In looking at the makeup of the Advisory Committee, which allegedly prepared the Plan, it is glaringly obvious that the committee was stacked against the people and area of the county which produces the least amount of waste yet would be most affected by the County's planned landfill. This would possibly have been overlooked had it not been for the County Board's meeting of April 1990 and their attempt to rush through a motion and plan establishing a mega-dump. The subsequent formation of the Advisory Committee and their

Plan looks suspiciously like an attempt to solidify these previous plans.

Does this Plan only provide justification for the Board's a priori back-room schemes?

Although not a part of this Plan, as written, numerous questions arise concerning the Board's planning and insistence on siting in western Kane County.

- *When the vast bulk of the waste stream, generated in Kane, is produced by people and industry along the Fox River, why are the selected landfill sites in the lowest populated areas of the county and not closer to the source of the waste stream:*
  A landfill will destroy the land values, environment and solitude of those who purposely moved there instead of in the communities along the river. Few would agree to accept Chicago or New York City waste in their communities so why should populated Kane expect to "export" its waste to the western townships?
- *Why not let those who produce the waste shoulder the burden of dealing with it instead of shoving it off on others?*

In this day and age when public scrutiny of government decisions and operations is at an all time high, for the Kane County Board to operate in a high-handed, clandestine manner begs the questions,

- *Why?*
- *What is there to be gained?*
- *And by whom?*

The Advisory Committee consisted of: 45% government officials, whose views may not properly reflect those of average citizens and certainly not of those who will be directly affected by a landfill; 25% business representatives whose views probably won't be those of average Kane Co. citizens; only 15% were said to be citizen spokespersons and embarrassingly and tellingly, for this report, 15% represented solid waste companies which may stand to benefit directly from a Plan such as this. In short, 85% of the Advisory Committee had possible agendas and motivations that may not reflect those of the citizenry of Kane Co. Meanwhile, experts in the various fields of waste management seem to have been ignored. Why weren't chemists, bioscientists, environmental and agricultural experts and others, many of whom we heard at the hearings, not part of this Plan? To virtually ignore Kane Co citizens and to heavily favor government and business is a slap in the face of each taxpayer and resident.

- *Was the county, in this Plan, just looking for a rubber stamp approval of their landfill schemes?*
- *How can the inhabitants of our county trust that committees, or the County Board, will seek or respect their views and wishes in the future?*

The County Board has seemingly had a run of poor decision making in regards to its waste management planning. We wonder who negotiated the contract with Waste Management Corp. which guarantees annual minimums? Waste Management has a history of negotiating winning contracts for themselves- if Kane needs a tougher and more clever negotiator than the one who made this bargain, I hereby apply. But then, the county won't benefit with $2 million donations to its ball field as we have heard happened. The Kane County Board's remarks about accepting only Kane produced waste ring hollow, especially when one looks at this contract with Waste Management

Corp. or the Plan.

- *Why is Kane accepting waste from other counties and then acting as if there were an emergency forcing them to establish another landfill?*
- *What makes the Board think the public trust in them is growing, or that they are trusted at all when they accept "gifts" from highly political and well connected corporations?*
- *Why does the Plan mention accepting non-Kane produced waste as an option, while saying the county shouldn't do so?*

The Plan itself is, at first glance, a look at the current situation and projected future in Kane County regarding waste management. After a brief perusal, even to a lay person, it is easily evident that the Plan suffers from a severe lack of financial, scientific, social and legal expertise. Technologies, many used successfully in other countries, are given minimal inspection, then too easily rejected. Virtually every technology mentioned is dismissed by suggesting it be "monitored" over the next five years or is rejected as too expensive or experimental. It is clear that the Plan lacks commitment to anything but landfilling. Financial research is practically ignored as is that of the social and legal impacts of the problems being addressed.

- *Given the brief period analyzing the waste stream in Kane was any consideration given to the fact that it was an insufficient period in which to generate comprehensive data?*
- *Did the Advisory Committee question why their report states Kane residents produce, per person, twice the amount of waste as the national average? If they did, why wasn't it addressed in the Plan?*
- *If Illinois statutes specify landfills as the least desireable method of dealing with waste why is the Advisory Committee promoting it over other techniques which are rated higher by those statutes?*
- *Why weren't comprehensive longterm financial, scientific and social costs of landfills (over their entire lifespan including post-closure) stated clearly, or at all, in the report?*

The proposals for waste reduction and recycling are commendable but rely too heavily on the good will of people and business. When we moved to Kane we did so thinking that this was a county which was willing to face hard issues and come up with creative solutions. Nowhere in this Plan is that done; to the contrary, placing the major emphasis on a landfill not only turns a blind eye to Illinois statutes but is the easy way out, for now. This Plan reminds one of Congress vis a vis the public, where Americans of every political persuasion are upset because Congress refuses to face tough issues and deal with them with thoughts of the future, and not just the next election.

- *Since the County Board feels they must rush a decision on a landfill why doesn't the Plan recommend REAL economic incentives (penalties) that would force businesses and residents to reduce consumption and ensure their full and immediate participation in recycling?*
- *Nike shoe company has announced they will, within one year, begin recycling their shoes. Since so much is changing so fast regarding recycling why not aim for higher goals than the stated ones and include methods by which reaching these targets will be guaranteed?*

Monitoring things or just hoping won't make it happen. This Plan is not a plan

for action; without clearly stated goals and prescribed methods by which to meet those goals this plan is no more than a wish list.

The great majority of experts at the hearings and in the field of waste management agree, as does the state of Illinois, that landfills are the least desireable method of dealing with waste. It is not necessary for us to repeat here the problems of landfills and their costs to society, they were well documented by the expert testimony during the hearings. Why then is Kane County's Plan and its Board placing such emphasis on a landfill? Is it just shortsightedness, perhaps an interesting exercise in promoting lawsuits, legal battles and ill will, or are there other motivations?

The lack of expert participation and testimony in the Plan became abundantly clear during the hearings, confirming our thoughts. The financial information that was orally presented, because the Plan lacked it, and the information regarding various technologies, especially landfill problems and their costs, which were also not in the Plan, lead one to conclude (as if one needs more convincing) that this Plan must be considered, at best, a first attempt, although severely lacking in substance.

Given that:

(1) by its own admission Kane County has eleven to sixteen years remaining space in its existing landfills and,

(2) we could greatly extend that time if we were to renegotiate the ridiculous "minimums" contract with Waste Management Corp plus,

(3) the rapid development of technologies like incineration with energy recover, composting and recycling

make it clear we are not in an immediate crisis situation. The testimony showed, as does the Plan suggest, that alternate technologies offer great promise. For Kane County to say it will only monitor these methods for the future is extremely short-sighted. Why shouldn't Kane County, after consultation with acknowledged experts, establish method(s) which would be looked upon by others as precedent setting, helping establish systems for the future, nationwide. Likewise, for Kane County to continue pressing solely or principally for a landfill is to endanger, through lawsuits and legal maneuvering, the monies we should be investing in technologies that are more environmentally and socially acceptable.

Future, additional planning should include, at a minimum, the recommendations presented by Roxanne Stover, Solid Waste Advisory Committee member:

- Eliminate all references to "regional" planning or waste disposal and instead only refer to Kane Co, as Kane is the only region we are concerned about. Cook, DuPage, Will, McHenry, and Lake must learn to take care of their own generated waste.
- No immediate landfill siting.
- Begin pilot programs in Kane Co for new technology, such as municipal composting of solid and food waste.
- Build a separate construction and demolition debris facility.
- No importation of waste into Kane Co.
- If a landfill must be sited (after further, extensive research and implementation of many other technologies) hiring a consultant that is mutually acceptable to the county and nearby property owners.
- Create a household hazardous waste collection site, funded by the county's enterprise fund.
- Plan to buy certain parcels before actually acquiring them, or buy

options on the land instead of acquiring it outright.
- Hold county-sponsored waste symposiums for similar industries to develop and use recycled materials.
- Add environmental and health experts to site-selection and waste plan update committees (for all technologies, methods and sites).
- Add representatives from affected area governments to all waste related committees.

Contrary to what politicians think, taxpayers and citizens are seldom against government spending IF it is for good cause and not wasted. A waste management plan founded upon weak or non-existent information will only cause the continued disillusionment of taxpayers, but thoughtful, well founded, plans will surely inspire.

This issue, and the way the County Board handles it, should and will be a turning point for the county. Will we continue to take the easy way out with no regard for future generations or will Kane County seize the initiative and place itself among the leaders of our nation?

It is up to the County Board.

Sincerely,

Linda and David Arndt

Comments on the Kane County Solid Waste Management
Plan, May 1992, Public Review Draft

My name is David Gossman. I have a B.S. and M.S. from Michigan State University in Interdisciplinary Physical Science. I have spent the last 12 years in industrial waste recycling and am currently President of Gossman Consulting, Inc. I live at 45W962 Plank Road, Hampshire, IL. My comments are those of an individual with no affiliation whatsoever.

As I examined the plan, on the surface, I got a good impression, but in reality the plan is badly flawed. What should be the last resort - a landfill, is the first resort. The plan is technically and factually flawed. In order to focus on just one aspect of the plan, I examined Appendix G in some detail, focussing on the cost estimates. Landfill costs are drastically understated.

- Land acquisition costs show $1,500 an acre. This might be possible - at the point of a gun.
- Post closure costs are given for only five years, but the law requires thirty years.
- Leachate disposal costs are given at 6 cents a gallon. That might pay for the transportation of the waste, but not the disposal.
- New regulations will substantially increase all the costs given. Leachate may be a hazardous waste under proposed EPA regulations, and thus it will be much more expensive to dispose of.
- Groundwater monitoring is estimated at only one to two tests a year for the first 5 years of closure, but in reality, much more extensive testing will be required. (Section 811.319 of the Illinois Solid and Special Waste Management Regulations requires quarterly testing for 15 years).
- There is no provision for estimating the cost of preventing surface runoff from the landfill, or treating surface runoff that might be collected.
- Siting and permitting costs assume an uncontested process, which is absurd.
- A financial assurance fund was not provided as required.

- No synthetic liner or cap is called for in the landfill cost estimate, only a clay liner and cap. Landfills are no longer constructed in this manner. Illinois regulations require a five foot thick clay liner, not the three foot specified in the plan. It is doubtful that a permit would be approved without the use of a synthetic liner.

A $20.00 per ton tipping fee cost is given in the appendix, but a $30 fee is given in the plan. This option needs a complete revision and reconsideration. I suspect the other options may be as severely flawed in their analysis. (Pages F-30 through F-37 were missing: they apparently contain the cost estimate for thermal treatment).

A major omission in the plan is the lack of coordination with the other waste management units in the county. Nor are there are any projections on how recycling and waste reduction will impact the existing landfill lifetimes. The plan violates the solid waste hierarchy established by state law and federal regulations. There is no provision in the plan for monitoring changes in regulations.

There is no provision in the plan for dealing with special waste and contaminated soils. Organically contaminated soils should be thermally treated and should be banned immediately from landfills. Tires should also be immediately banned from landfills. Tires are too valuable a resource to be disposed of in landfills.

For chemical and hazardous waste: why not set up household hazardous waste collection programs now? Why wait for the IEPA to fund with a grant some program in the unknown future?!

Refuse derived fuel (RDF) plants should be examined as an alternative to a landfill. Cement plants can use RDF as a fuel. Power plants may also use RDF. A single cement plant could burn 50-100 tons/day of RDF, power plants even more.

Instead of siting a new facility over the next 5 years, and monitoring alternatives, why not spend the next five years developing alternatives and monitoring the need for a new landfill?!

Campton Township Solid Waste Disposal Dist.
5N790 Route 47
Maple Park, Illinois 60151
August 25, 1992

Mr. Warren Kammerer Jr.
Kane County Board Chairman
719 Batavia Avenue
Geneva, Illinois 60134

Dear Mr. Kammerer,

The members of Campton Township Solid Waste Disposal District are currently reviewing the two-volume proposal, "Kane County Solid Waste Management Plan," in addition to the Solid Waste Planning News dated February 1992 and July 1992. Some of our members attended the public hearings, specifically August 4 at Waubonsee Community College and August 11 at Burlington Central High School.

We applaud your position on programs aimed at decreasing the amount of solid waste through recycling and alternative technologies. Adding new programs should be ongoing, and new technologies should be reviewed and implemented as they become available.

However, the "Kane County Solid Waste Management Plan" does contain some serious drawbacks. We believe that first and foremost there is no immediate need to site an additional landfill; that there should be no importation of solid waste at any existing or potential landfill; that the issue of toxicity should be addressed in the plan; that landfills are the least desirable method of disposal, especially with new and alternative technologies.

If the Kane County Board sees fit to adopt the "Kane County Solid Waste Management Plan" to site a landfill, we strongly encourage adding environmental and health experts to the Site-Selection and Waste-Plan Update Committees. We would further encourage the hiring of a consultant that would be mutually acceptable by County and nearby property owners.

Solid Waste is a tremendous problem, and the solutions are difficult. We, as well as all Kane County Citizens, need to continue to improve our efforts to recycle and dispose of solid waste properly. The Kane County Board's decision will effect the lifestyles of not only this generation but also generations to come. We urge you not to adopt the "Kane County Solid Waste Management Plan" as it stands. Please do not site an additional landfill. Look to a plan that proposes an environmentally sound approach to managing our solid waste.

Respectfully yours,

Colleen Newman
President

Joe Vokoun
Secretary

Tindy Cunningham
Treasurer

Ed Boone
Trustee

Fredrick D Robinson
Fred Robinson
Trustee

OFFICE OF THE MAYOR
CITY OF AURORA

DAVID L. PIERCE
MAYOR

RECEIVED
SEP 1 1992

September 1, 1992

Members of the Kane County Board
719 Batavia Avenue
Geneva, Illinois 60134

Ladies & Gentlemen:

I urge the Kane County Board to act within the legally established time frame and give favorable consideration and approvable to the Solid Waste Plan.

The Advisory Committee worked many long months to study the many numerous facets of solid waste. In doing so, a number of options were considered and many diverse opinions were taken into account. I believe the final plan being considered addresses the waste needs of our residents.

The plan calls for a strong recycling program to reduce the amount of solid waste sent to our landfills. While encouraging steps to prolong the life of the current Settler's Hill Landfill, it recognizes the importance of beginning immediately to determine a site for a future landfill when Settler's Hill must be closed. I believe assurances that the opening of any new landfill facility would only occur in conjunction with the closing of the current Settler's Hill facility would alleviate any concerns which our citizens might have as to excess landfill capacity.

Kane County has always taken a leadership role in planning to assure that the necessary facilities would be available to citizens as the County grows. I encourage you to be farsighted enough to plan for future landfill facilities.

We can only look to the controversy which is now being faced with the siting for the third major airport or the routing for the Fox Valley Freeway, to see what problems can occur when adequate long range planning does not take place. I encourage you not to make the mistake of procrastinating in the determination of a future landfill site so that geologically acceptable sites are lost to development.

Past leaders of Kane County were farsighted enough to plan for the future to assure us that we had adequate facilities available to meet the needs of a growing county. We owe it to future generations to do the same so that our lack of planning doesn't create problems for them.

Once again, I urge your favorable considerations of this plan.

Sincerely,

David L. Pierce
Mayor

nlw

CHARLES W. BAUMANN
949 S. BATAVIA AVE.
GENEVA, IL. 60134

RECEIVED
SEP 2 1992

-21

Kane County Development Department
719 S. Batavia Ave
Geneva IL 60134

8/31/92

Dear Sirs:

I would like to have the following questions and comments included as part of the public response to the Solid Waste Management Plan. Why in all of the two volumes is there never any definition of the term "waste"? In particular as it relates to recommendations 6.2 & 7.3 (pages 33,40 Vol. 1). Most reports for public consumption have had the terms defined to avoid misinterpretation by the reader. How are the revenue bonds referred to on page X in Vol.1 to be repaid? On the same page I think it is a bad idea to run the solid waste program as an enterprise fund. There has been far to much tapping of the current fund for non solid waste/environmental purposes ie. stadium loans. What is the rationale for waiting five years before reevaluation of Alternative Technologies? Why is the site selection process of a new landfill(pages x, 48 Vol.1) begun before the public siting committee is even appointed? It would appear that the County is attempting to ramrod a new site without the committee's input. Why is the County ignoring the first four steps of the State Policy in the Illinois Solid Waste Management Act (page 1 Vol.1),in favor of siting a new landfill within the next five years? Does Table 2.2 on page 11 Vol.1 take into account either reductions in packaging or increased recycling? On page 13 Vol.1 why is waste reduction so difficult to quantify? If you are picking up less trash in an area are you not experiencing "waste reduction"?

n page 31 of Vol.1 a comment on recommendation 5.6. Why should the unty wait until a problem with waste tires occurs? Set up the program now. The same comment applies to white goods In section 6.2 page 33 Vol.1,there is the following "...monitor the development of these and other emerging technologies over the next five years." Is that five years from 1990, when most of Vol.2 was compiled? Or are we to wait what is in reality seven years before the County gets around to "revaluating" alternative technology? I would suggest that the county consider starting a pilot program or two using the most promising alternatives. Try to apply for grants from either the state or federal government to fund the projects. Some private industry which has developed a state of the art process, might just be looking for a test site to perfect their technique. For a relatively small outlay of public money,the company ld set up the project in exchange for the knowledge gained by a full scale pilot facility. On page 35 the following statement appears in a discussion on mass burn incineration..." proper sizing of the facility,large enough to handle the waste but not so large as to discourage recycling...". The county wants to make sure that if an incinerator is constructed it is not too large. However we still have this goofy clause in the Settler's Hill contract about minimum annual tonnages. Very strange! As far as the technology assessment mentioned on pages 35-36 Vol.1, should we not also subject any new landfill to the same tests? In Vol.2 page A-10 the following statement appears in reference to landfill lifetimes"...The I.E.P.A. has begun to clarify their procedures...". Given the fact that this section is almost two ears old, has the I.E.P.A. come up with the new methodology?

Also given that the gate surveys cover only 15 and 20 days respectively at the two landfills, is this enough data to extrapolate yearly tonnage, waste source and type figures? Would not a better gauge be at least a one or more year study? Are there later studies of the type Franklin Assoc.(Vol.2 page A-30) did in 1986 which might show the effects of recycling? In reference to Vol.2 section 6 the following questions are posed: On page 6-2 this statement appears, "Landfilling has been considered the most convenient and econimical method..." Is the cost of post closure cleanup, which can run into the hundreds of millions of dollars, factored in? On page 6-11 it is noted that clay is "the most appropriate type of soil ... because of its low permeabilty" I note it is low rather than no permeation . On the same page the phrase "design period" is used but not defined. How long is the design period,twenty years? Fifty? Five hundred? On page 6-13 leachate monitoring is addressed. Why is the leachate tested only quarterly? In addition on page 6-21, should not the monitering wells also be tested more frequently? Also at what point is the monitoring changed from quarterly to annually? On page 6-23 it is stated that "A well run site can be an asset to the community and can be operated in a manner compatible with other uses." Only if you mean that the odors,reduced home values(around the site), and all the land off of the tax rolls are assets. On page 6-25 two of the end uses mentioned were ski slopes and toboggan runs. Like Mount Hoy? The heat from the rotting garbage melted all the snow! The report states the landfill is a suitable site for a ball field. If this is the case how come the Waste Management Wastrals("Cougars") are playing on taxfree land next to rather than on the landfill?

On page G-27 the posting of a performance bond is for closure and post closure are discussed. What is the size of the bond to be post for Settler's Hill? Who posts it? An additional comment: As far as landfills go, wasn't Dupage County's Mount Hoy suppose to be "state of the art". One only need read the papers to see how that "state of the art" facility is measuring up as far as post closure. On page G-29 the report mentions siting of the landfill in relation to lakes or ponds. In this regard how far away from Settler's Hill is the pond at the events center? Also on the same page there is a statement on groundwater impacts. Quoting, "It is anticipated leachate from a new landfill, utilizing state of the art technology, will be lower in dissolved chemicals..." How can the author anticipate what modern landfill leachate will contain? On page G-31 the term V.O.C. is not spelled out. Is there a more current table of landfill leachate characteristics than Table 4.1 from the early 1970's? In reference to fire protection on page G-31. How many times in the past five years has the fire department responded to "hot loads" at Settler's Hill?. On page G-35 why is the assumption made for only thirty years post closure care? The following comments related to Table 5.1. Are twenty soil borings adequate? Is $1500/acre realistic? Are either the number of monitoring or methane wells adequate? The post closure monitoring figure is grossy inadequate! On page I-5 the statement is made on the potential differences in the waste stream of Europe and the U.S. How about some specifics? The report condemns RDF and MSW on these differences and fails to site the specific rationale. On page I-8 a comment on the section on Innovative Technologies.

Why are we restricted to looking only at operating facilities in the U.S.? This study is deficient if it fails to look at either Europe or the Far East to draw its conclusions on the potential of these processes to provide a solution to the problem of waste disposal. Finally to repeat a question raised in my comments during the hearing held at Burlington Central school. What are the technical qualifications of the consultants hired by Kane County to do this study and it's appendices? These should be included for the public record.

Sincerely:

Charles W Baumann

Charles W. Baumann

Section II A

PROCEEDINGS OF PUBLIC HEARING

For The

PROPOSED KANE COUNTY SOLID WASTE MANAGEMENT PLAN

Conducted at:

Kane County Government Center

Geneva, Illinois

July 29, 1992

Note: Comments from this Public Hearing are referred to in Volume III. Response to Comments by numbering the comments of each speaker A-1, A-2, etc., in the same order as they appear in the index to these proceedings.

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M-22704

KANE COUNTY PUBLIC HEARING

In The Matter Of:

KANE COUNTY SOLID WASTE PLAN

REPORT OF PROCEEDINGS had and testimony taken at the public hearing of the above-entitled matter before Shannon M. Frey, C.S.R., R.P.R., a Notary Public in and or the County of DuPage, State of Illinois, taken on July 29, 1992, at 1:30 P.M., at the Kane County Government Center, Geneva, Illinois.

PRESENT:

MR. ROBERT M. FOOTE, Hearing Officer;

MR. J. PATRICK JAEGER, Assistant State's Attorney; and

MR. WARREN KAMMERER.

- - -

MR. FOOTE: I would like to call this to order.

Warren Kammerer has a statement he would like to make before we officially begin the public hearing.

MR. KAMMERER: Good afternoon. I want to welcome you to take part in the first solid waste planning meeting.

As you know, on July the 2nd, we released this draft for a public review.

The draft was prepared by staff and by the committee that was appointed by Frank, including members of the community from all different areas of government, to create a plan and to submit it to the development committee and then ultimately to the county board.

Because of the sheer volume of this report, we thought it was necessary to go one step beyond.

We are hired by staff to give one public review, but we have insisted that we have four public reviews; one today, and there will be three evening meetings, which I am sure many of you are aware of.

As you know, this is one of the most difficult issues that Kane County and the nation is facing right now, and that is the handling of our solid waste.

You have been informed of our solid waste problems.

A lot of the community started recycling, and the communities have responded dramatically, which is to indicate that the people have real concern about what happens to their waste, what happens to the environment, what happens in their community.

Currently, Kane County is doing recycling.

The majority of our landfill waste goes to two landfills, one at Settler's Hill, and the other one at Woodland Hills.

Some of it goes to out-of-county areas, but with our expanded proposal, we will have about 16 years of capacity remaining for our solid waste in the landfill.

I am certain that the period is here.

What these are designed for is public input, and we will get a lot of good ideas, and with this input, we will go back to review these, as is required by staff.

We need to review the public comments and incorporate or answer the suggestions that come out of

these meetings or the plan.

Now, I want to take the opportunity to commend the committee that worked on it, and I see some of them -- at least one of them that is here present today that worked two years hard and long on it and put a great deal of time and effort into it, and in the discussion and the draft plan, and it shows.

I want to officially open the meeting for public comment.

I want to introduce Bob Foote, who is a licensed attorney, and he is our hearing examiner for public hearings, and thank you again for coming.

MR. FOOTE: Thank you. We have four hours today.

As Warren Kammerer said, my name is Bob Foote.

My job is to make sure that everybody gets to have a chance to talk in an orderly way.

There have been rules set up for the hearing by the development committee, and we will try to follow those rules as closely as we can.

As Warren said, these hearings -- and I just want to for the record, under Illinois Revised Statutes, Chapter 85, paragraph 5955, we will have a reporter for all the hearings and a transcript made of al

the testimony.

In addition, if anybody has -- who is going to talk has anything in writing that they want to submit in addition to their written testimony, we will accept that as an exhibit to your testimony, and it will be attached to the final transcript and report which will go back to the development committee and eventually to the county board.

The rules basically are set up so that, first, people who I determine are experts testify or get to give testimony at the hearings.

Next public officials get a chance to talk, elected public officials, and, also, the general public.

Since there are four hearings, I really think that we will have time over 16 hours to let everybody have a chance to talk who wants to say something.

The rules require if you want to talk that you need to sign up to talk.

We have signed up today so far eight people to talk.

If anybody else wants to talk, the rules allow you to sign up for the next two hours.

So anybody that wants to sign up from now until about 3:30 may do so.

We will take a break at that time, mostly for the reporter, and after that break, if there is anybody else that has filled out one of these forms, they will also be allowed to talk.

In running the hearing, I am going to keep track of the time, again, try to follow the rules in terms of the time.

When the time is up, I will simply tell the reporter to stop taking testimony.

So that anything that is said after I tell her to stop taking testimony is not going to be part of the transcript that is considered first by the development committee and then by the county board.

Another rule that we want to make sure is followed is that you can only speak at one meeting.

We don't want to have repetition as we go around the county to the different locations.

So once you talk -- we will keep a record of who talks.

We prefer that you be ready and are able to give your opinions and whatever facts you have to be considered when you talk the first time.

I would like to then officially open the public testimony.

We have one person who, having reviewed his curriculum vitae, I have identified and who is asked to talk as an expert.

Forgive me if I give pronunciations wrong here.

Louis Marchi, I believe is the gentleman's name, and Mr. Marchi, you have the microphone.

I would ask the experts to first identify themselves; second, give a little background for the record; and third, if you could, Mr. Marchi, first give us your opinions because we want to make sure, because of the time, we get those in.

First give us your opinions. Then follow those up with the facts and the bases behind those opinions, if you could.

Thank you. You may proceed.

MR. MARCHI Yes, thank you.

My name is Louis E. Marchi, spelled L-o-u-i-s, middle initial E. Last name is M-a-r-c-h-i, pronounced Marchi.

I am a chemist. I have been studying chemistry since 1930. I guess that makes it 32 years.

For the last 20 years I have studied the chemistry of garbage dumps.

I find about 30 things wrong with garbage dumps, which, of course, is one of the mainstays of your particular plan.

I will give my summary first, since you requested that.

I think you are going in the wrong direction when you are considering a garbage dump.

Three things need to be pointed out at this time.

One is that all garbage dumps leak. I will expand on that later.

Secondly, they leak poisons, first of all, into the groundwater, and next, they emit dangerous gases.

Because of these situations, I would like to present in small detail here why garbage dumps are not the way to go.

I will briefly state and give a -- I have a handout here as to what I think you should be doing.

I said there were 30 things wrong with a garbage dump.

I am only going to discuss one of them today.

You will see that, first of all, when it rains and you have an open pit to put garbage in, you have to realize that the rain is acid rain.

The pH of the rain in this area as determined by Argonne National Labs -- and I have been down there twice to check on this -- the pH is around 4.0.

For those of you who understand pH, this is quite an acid rain, and acids will dissolve and react with clays.

This is a very important point that most engineers totally disregard because most of them don't know chemistry, and so I am looking at the chemical end of this.

So first of all, the clay is attacked by the acid in acid rain.

As most garbage dumps are designed, they generally have a 20-year life, and so you will be getting 20 years of acid rain into that pit attacking the clay, which would be one of the reasons why the dump leaks.

As the acid rain goes through the garbage, it dissolves out many different compounds.

Also, as you cover the garbage, you then create an anaerobic area, and the anaerobic bacteria now attack the garbage and change what beneficial compounds are in there into dangerous compounds.

All products, all the compounds coming from anaerobic bacteria, are dangerous, toxic, poisonous, whatever term you wish to use, all of them.

It has been determined that there are between 100 and 200 different compounds.

Most of them were not originally put into the dump. They come from the anaerobic bacteria.

Some of these compounds attack the clay. Other compounds that are in there that people normally throw away will attack the plastic liner.

In a study that was made -- and I have it here. In a study that was made by -- for the United States E.P.A. called the Puverance of Subsurface Migration of Hazardous Chemical Substances at Selected Industrial Wasteland Disposal Sites, they determined -- and I will give you a summary of all this forewords -- all garbage dumps leak.

This was known in 1981. It was made public at that time, although the report is dated in 1977.

Incidentally, about eight years ago,

Dr. Kirk Brown from Texas A & M made a study, and he determined that the leachate from garbage dumps had the same toxicity as leachate from hazardous waste dumps.

We separate them and we say over here are hazardous waste dumps and over here you have municipal garbage dumps, but when you analyze the leachate, they have the same toxicity.

That is a point you must not forget.

Of course it is the anaerobic bacteria that cause the production of about half of these toxic materials.

There are also -- from garbage dumps, you get a long list of gases. I have such a list here.

I will read a few of them. These are from landfill gas.

You have acetamidine, arsenic, benzene, carbon tetrachloride, chlorobenzene, chloroform, copper, dioxin, ethylene bromate, ethylene dichloride, formaldehyde, hydrogen chloride, hydrogen fluoride, hydrogen sulfide, manganese, methylene chloroform -- methylene, that is, chloride, nickel, perchloroethylene, polycyclics, aromatic hydrocarbons, also known as PAH's, styrene, toluene, trichlorobenzene, vinyl chloride and so on.

I won't go through the rest of them.

These are gases that come out of garbage dumps.

About eight or 10 years ago a chemist studied the acids coming out of a garbage dump in San Jose, California, and he found many gases; the ones listed here, of course, but most importantly, he found vinyl chloride which is on the list.

He found it coming out of there at the rate of 35 parts per billion.

Now, this dump had a life of 20 years and had been closed at that time for 35 years, and he found 35 parts per billion of vinyl chloride.

Now, you have to compare this with the fact that OSHA sets a limit of one part per billion for people working in plants that handle vinyl chloride, and this was at 35 parts per billion, coming out of here, out of the dump.

Just recently, by the way, in south Chicago Heights they also found vinyl chloride in one of the dumps there.

So these are dangerous materials, along with carbon dioxide, which causes the greenhouse effect, and methane that was also coming out. That is also one o.

the principal gases coming out.

This also causes the greenhouse effect.

So if you establish a garbage dump, you are going to be adding to the damage that is being done by the greenhouse effect.

Now, the question to ask is how long will the garbage dumps leak.

We cannot give you a definitive answer.

All we can say is the following, which I am quoting from a book called Groundwater by Dr. Allen Freeze and Dr. John Cherry.

They say in here, "In some cases leachate production may continue for many decades, even 100's of years.

"It has been observed, for example, that some garbage dumps from the days of the Roman Empire are still producing leachate.

So the answer to the question of how long will garbage dumps leak has to be left in a nebulous area to say it is 2,000 years plus, and we don't know how many years beyond 2,000 years.

Every garbage dump that I have studied from the articles and papers and meetings that I have gone to, they all leak, and the best one -- by best, I mean the

one that took the longest to leak, was 32 years.

Most of them will leak in the first year.

Some will take two, some five, some eight, but they will vary up and down the scale, and the longest one is 32 years.

Now, in the life of a dump that is going to be there -- I would say it is going to be there 10,000 years, 32 years is nothing compared to 10,000 years.

So basically all garbage dumps are going to leak in a very short time.

There is a solution to all of this, and I have a copy here which I would like to submit as part of my testimony.

It is quite a -- it is an eight-page document.

It is called "What Should We Do With Our Garbage," subtitled "The Total Recycling Plan," and I presented this at a public hearing to the McHenry County solid waste plan on June 12th, 1991, a little over a year ago.

If I may approach.

MR. FOOTE: You may. Mr. Marchi, for the record,

have marked your resume as Exhibit 1 and we will make this Exhibit 2, all right.

(Exhibits Nos. 1 and 2 were marked for identification as of 7/29/92.)

MR. MARCHI: Okay. The plan that I have just handed over to the hearing officer simply states that in about 10 to 12 years -- 10 to 12 years we can get to a point where we will be able to recycle either 100 percent or very close to 100 percent.

I have outlined it. I have put it into six steps, which I won't go through because it is in the document and I don't have that much time left, but I would recommend to the committee that is working on this, if they will look at that and hopefully find something that they like, I would be very happy.

My recommendation to you is let's get rid of garbage dumps.

There is a way to do it. No one has done it yet, but it can be done.

I would be glad to answer any questions that anyone would want to put to me.

MR. FOOTE: Thank you, sir.

Also, in response to what Mr. Marchi

just said, the purpose of these hearings is to allow people to talk, not to have questions back and forth.

So Mr. Marchi, certainly if he is willing, can answer questions outside for anybody who wants to ask and answer, but for purposes of the hearing, I want to limit it to people coming up and giving their testimony at the stand without questions and answers.

Next, A.W. Hatch, please.

For the reporter, when you come up, could you give your full name and your address so we can get that down on the record, sir.

MR. HATCH: A.W. Hatch. You have that there. 45W101 Ramm Road, Maple Park, Illinois, 60151.

Thank you, Doctor. Now I know why my garage door -- outside the garage door the cement is all pitted.

Inside the garage door, the cement looks just as good as it did 30 years ago.

So that is that acid rain chewing up my concrete; the calcium, I suppose.

Well, I have written this down and it says, "Saving Kane County and Illinois Land."

I do want to say congratulations on the landfill tons per day reduction of 60 percent by the year

2001.

This is real progress, but that is the last time I am going to say landfill.

A rose by any other name is a rose, and a dump by any other name is a dump.

By the way, I have put one of these in each county board member's -- up at their office, so each one will have a copy, and I have a few more if you want.

On Page 3 of this mailer of the solid waste, it is explained that an additional 11 acres added to Settler's Hill will extend its life by five years.

That being the case, we need 44 acres.

If my arithmetic isn't right and you don't understand it, please raise your hand.

44 acres will take care of 20 years, but all waste is going down nearly, according to this, to reach 50 percent at least by the year 2000, so even 44 acres is not really needed.

Why do we need more land then? Up to -- what was those astronomical figures they used to say, the western fourth of the county, 2,000 acres.

There are those who say we need it for recreational purposes; golf, tennis, polo fields as shown on the plat map.

Now, if that is wrong, tell me again.

Arnold Palmar was at Stonebridge last week in Aurora, as we all know.

Did he play the Settler Hill dump? Oh, no, he played at a private club, which he should.

Many of the millionaires play the Royal Fox in St. Charles, Aurora, Elgin, but how many are going to play on the county dump golf course.

Along with millions of others, I was fortunate enough to serve overseas in the invasion forces of World War II, and don't think I am trying to be cocky here, there are hundreds of thousands of those boys that never came home.

They called me back for the Korean War, but since I can't afford to play at any of the above private clubs, now you want me to play in the county dump.

Please, no golf course. Save the land for a hungry world.

You only have to turn on your TV at night and see what is going on in some other land to know that we need food more than we do -- and I love to play golf. Anybody ask me to play golf tomorrow, I will probably suggest today.

The latest issue of the Illinois Golf

Magazine stated, "Kane is the only county in Illinois to offer golf on a dump site."

Anyone proud of that distinction?

If we need more recreation, we the people are paying $288 million in property taxes in the county, besides that influence of two-and-a-quarter million dollars that Waste Management gave us from their war chest.

We need mandatory recycling from all facets of our society.

Manufacturers might accept trade-ins for a resale or recycling at the time of sale.

Automotive industry has done this ever since Henry Ford rolled off the first Model T.

Would you think of just dumping your car in the dump and just go buy a new car? No.

We are in the habit of doing that, so we trade it in and we barter for every nickel we can get.

We are going to have to do the same thing when we trade in a dishwasher or a TV or whatever else it may be.

Oh, yes, it will add to the cost of the product, but nothing worthwhile comes free.

After all, free -- the county

saddled us and our children for the next 20 years with a $49 million bond debt, so money shouldn't be a big problem.

If it cannot be recycled, then it has got to be incinerated.

Denmark, Japan and others do it. If they can, so can we.

Anything to cut down destruction of food-producing land acreage. When it is gone, it is gone.

10,000 years, he said. I won't be here in 10 probably. Thank goodness.

This last Monday night PBS, Public Broadcast Channel 20, showed what some U.S. cities besides Japan and Denmark are doing to save the planet.

So PBS has a series going if you are interested to watch it.

It is called "Race to Save the Planet."

A transcript of that program is $12 for Monday night, so one has been reserved and paid for, which I will deliver to Mr. Mielke within two weeks.

Would the county please communicate with the Illinois Manufacturers Association, and I have given the address.

I encourage you members to recycle.

am talking about trading in the TV set for a new TV set.

MR. FOOTE: Excuse me, Mr. Hatch, your five minutes is about up. If you could just make a closing remark.

MR. HATCH: Also, I will say I will obtain the address of the National Manufacturers Association, also, and make that available. Thank you.

MR. FOOTE: Do you want to make your report part of the record?

MR. HATCH: Sure.

MR. FOOTE: We will mark Mr. Hatch's report as Exhibit 3.

(Exhibit No. 3 was marked for identification as of 7/29/92.)

MR. FOOTE: Thank you, sir.

MR. HATCH: I meant to introduce by saying members and so forth and media, but I goofed.

MR. FOOTE: Thank you, sir.

Next signed up -- these are in the order that they signed up -- Ellen Nottke, please.

Ellen, if you could state your name and address for the reporter. Thank you.

MS. NOTTKE: That man was a tough act to follow.

My name is Ellen Nottke. I live at 38

West 462 Deerpath Road in Batavia Township.

I am chairman of Batavia Township Neighborhood Association.

Our neighborhood group recognizes the necessity for a plan for future waste disposal, but we are concerned over the emphasis placed on a landfill meeting Kane County's immediate waste management needs.

Our focus cannot be on today's needs when discussing landfills.

We can only speculate on the life expectancy of waste containment and won't see its ultimate effects on the environment for many years.

However, our concern should be for those inheriting decisions made here, as well as for our own solutions.

If we are willing to accept waste from out-of-county sources, there is no way we can ensure the safety of its contents for future generations.

Landfill costs are never ending.

The cost of maintaining and monitoring landfills will be passed on to our children, grand-children and great-grandchildren and so on.

However, alternatives seem to have a one-time cost and never ending benefits.

BTNA would like to see pursuit of alternatives so that Kane County officials today can leave a legacy of concern for responsibility that future generations can be proud of.

MR. FOOTE: Thank you. Do you have anything you want to submit in writing?

MS. NOTTKE: (Indicating.)

MR. FOOTE: Mr. Nottke, we will mark that as Exhibit 4 and include it in the report.

(Exhibit No. 4 was marked for identification as of 7/29/92.)

MR. FOOTE: Thank you.

Next, Pat -- I always get the pronunciation wrong --

MS. SJURSETH: Sjurseth.

MR. FOOTE: -- Sjurseth. Thank you, Pat.

MS. SJURSETH: Pat Sjurseth, 12N040 Randall Road, Elgin.

I am here as the Northeastern Illinois Planning Commission commissioner to report on the project review statement that our NIPC staff prepared from Gary Mielke's submission of the solid waste management plan.

The plan recommended implementing of

the integrated solid waste management system intending to meet the waste disposal requirements of the association service area through the years 2010.

The recommended waste management system was to implement an integrated solid waste management system intended to reduce the planning areas dependency on landfills, and to promote the program intended to achieve the reduction of the waste volume and its source, establish a program intended to recycle 47 percent of the waste stream, including 50 percent of the MSW by 1998, to assure availability of future landfill capacity for the waste that is generated in the county required by land disposal.

In order to monitor and evaluate the current methods of disposing, as part of the first plan update process, alternate waste management technologies will be monitored and promising approaches will be evaluated during the first five years of the plan updates.

The alternates would include MSW composting and waste-to-energy incineration.

The plan recommends that the county explore an approach to intergovernmental cooperation with the municipalities which presently have the responsibilities for the residential collection and

recycling programs.

The comments and recommendations made by our NIPC staff were that the commission finds that the draft is responsive to the regional solid waste management needs and is consistent with adoption of the regional policies.

They felt that the plan established an ambitious recycling goal of 50 percent by the end of the decade.

Attainment of this goal would extend the available capacity of the existing landfill, as well as return reused materials to the economy.

The commission has several questions, however, about the measures offered as the means of obtaining that particular goal.

Their first concern was the adequacy of measuring the recommended achievements in the next implementing of the recycling, and that the plan depended largely on a volunteer recycling program supported by public education, technical assistance and marketing development, and adopting of fee-based collection.

The plan does suggest the possibility of obtaining recycling by requiring business licenses.

Kane County's plan calls for continuing

monitoring and analysis of the alternate goals and technologies, and the commission had urged that the county coordinate this evaluation process with the planning agency to avoid unnecessary duplication of ethics.

Thank you.

MR. FOOTE: Thank you.

Do you have anything in writing you want to submit as part of your testimony?

MS. SJURSETH: Not right now.

MR. FOOTE: Next, Ed Kelly, please.

MR. KELLY: I didn't realize we weren't going to be able to testify in more than one hearing, so I would rather wait until the other hearing.

MR. FOOTE: That's fine.

Next then, Richard Sharp, please.

MR. SHARP: My name is Richard Sharp, 2031 Allen Drive, Geneva.

I am going to be commenting on the small manual, solid waste management plan, which I studied, and I do play golf at the dump.

In your summary on the first page you state that recently-purchased 11 acres at Settler's Hills would be used to expand the landfill.

I doubt if any of you are aware that

this area is within blocks of Geneva neighborhoods where people live.

This area would be very unsuitable to the people in that neighborhood.

The tractors roll very early in the morning and the backup beepers that they have on them would wake everyone at about 5:00 A.M.

How would you like that for five to seven years of your life.

Your summary says you would choose a site as soon as possible.

I hope that is true and you do it before you move to use the 11 acres in the Geneva neighborhood.

The sooner you select a site, then the less tax money will be spent on it and fewer people will be affected.

Five years is too long to wait to find the needed land.

On page 14, you write about establishing another county department for waste reduction.

As a taxpayer, I object to more government.

On page 35, you wonder what size the new facility would need to be.

With recycling figured in, you should plan on 100 years.

Now, that doesn't necessarily mean you have to use all that land, but you should plan that long ago to reach the goal of having no landfill.

In the meantime, the land can still be farmed.

On Page 40 and 41, you acknowledge that land filling is a significant part of solid waste management.

So do it as soon as possible and safe a whole Geneva neighborhood by not using the 11 acres.

I agree that a siting committee be appointed.

I agree that we only accept Kane County garbage at a new landfill.

On Page 54 you state local governments play a very important part in landfills.

I want to encourage the city council of Geneva to object to the 11 acres, and Geneva Township, also.

Also, I would encourage the county

board member from Geneva to vehemently oppose this 11-acre addition to Settler's Hills.

We in Geneva have done our share in land filling sites, and it is time to move to a site that does not have as much population. Thank you.

MR. FOOTE: Thank you, sir.

Do you have anything you wish to submit in writing?

MR. SHARP: (Indicating.)

MR. FOOTE: We will accept Mr. Sharp's written statement as Exhibit 5.

(Exhibit No. 5 was marked for identification as of 7/29/92.)

MR. FOOTE: Next, Leana Ronsen, please.

MS. RONSEN: My name is Leana Ronsen, and I live at 7N463 Route 31.

This is an area for the ICGS bridge, which is a road that goes from 47 to Stearns Road. That would be one of the sites for the landfill. It is a 2,000-acre site.

I do represent the B. Smart Red Gate Group.

To save our planet, we have to start in

our own back yards and our Fox River in Kane County.

There has always been money in garbage, a lot of money, but Kane County's quality of life is at stake right now.

Why did you move to Kane County. Why did I live here forever with the quality of life, the environment.

The waste disposal is important, very important, but recycling is even more important.

I have seen a lot of recycling, but I have seen those plastic bottles dumped over at Woodland dump.

So part of this recycling isn't really being done.

I would like to see the quality of life saved in St. Charles, Hampton and Plato Center Townships.

Our future of our children are at stake -- not mine, but my kids.

They were born here. Yours were born here.

They are going to graduate from high school, and their kids.

Once you move into this area, you really don't want to move out.

Now, please look at the whole plan and don't ruin the hopes, aspirations and dreams of all of us who live here or who just moved here.

The South Elgin fen, which is in the ICGS corridor, is alkaline. Artesian serves it, and all the poisons that are poured into it and all the poison acid that pours into it kind of gets washed away with the artesian springs that are going on.

The quality of endangered -- if you take a check -- a check list, and that is that little book that the conservatory gives you, one of these little books, and you take a check list along the places where they want to put these 2,000-acre dumps, you will find that the majority of them will be in here.

They may not have been identified by University of Illinois, but us who walk the back yards and swim the river -- I don't swim it, but I will walk in it, canoe, you will find out that most of this stuff is right here in Kane County.

We have fens, we have forests, we have a river, we have flat land.

We have got every type of base that you would ever want to see. We have it, but we won't have it with the way things are going.

All I ask is that you stop, look and save our county because this isn't a backyard issue.

This is our issue. This is the Fox Valley issue, and just remember how many people live downstream from that river.

I mean, if Elgin goes ahead and puts in their sewer lines that they want to take all the way to Route 47, through Plato Center, and through all these other places and dump it into a little place behind those chemical factories on Route 31 that are on the River, I just don't see it happening.

I was part of the Fox in the '60s when we went to clean up the river and I want to see it stay that way.

Thank you very much, and I really want to see everybody help save our area and not get these New York garbage trains be traveling down railroad tracks.

There are three things I would like to see; some real recycling, really truly recycling.

Number two, a realistic acquisition of less land, something that is realistic. 44 acres, that sounds good.

Thirdly, the very last point is, I don't want to see this area with acid rain to the point

where it will destroy everyone.

In the '60s we had leukemia, and I lost at least six people in my graduating class of '69.

You don't see that in my son's graduating class of '89, and you don't see that in my son's graduating class of '94. Thank you.

MR. FOOTE: Thank you, Leana.

Did you have anything you wanted to submit in writing?

MS. RONSEN: No.

MR. FOOTE: The last person we have signed up for today is Jean Sauber, please. Jean.

If anybody else wants to sign up, now is the time.

When Jean is done, we will close the meeting for today.

MS. SAUBER: Good afternoon. My name is Jean Sauber. I live at 202 Concord Drive in DeKalb, Illinois, however, my roots and my livelihood are in Kane County.

Our family business is in western Kane County, and I am here today because I am angry.

I believe that intelligent, thinking people could not have read that report as I did and think that it was based on fact, statistics or research or sound

analysis.

I have an M.B.A. from N.I.U., and if I had done a report such as that even in my graduate studies, I would not have passed.

The need for immediately selecting a site has not become evident in reading that report.

There is nothing in that report that says we need to immediately go out and select a site.

We have 10 years even with our current facilities.

I believe that the county board members are intelligent, educated people.

I hope that you will do the right thing.

I urge you to remove the landfill language from this waste plan.

I urge you to take the time to explore alternatives over the next 10 to 16 years.

Technology changes by the minute. I am confident that we will have a better, safer alternative.

The land will be there if needed, and it may cost a little more, but that land that has been indicated in the previous site selection process or the talk of the 1,000 to 2,000 acres has been in many of our

families for years.

It will be there in 10 years, believe me.

I ask the board to please review this carefully, to please look at this again, to please get some experts in engineering, environmentalists, et cetera, to do a more thorough job and to look at the alternatives.

We have already reduced waste in Kane County by 20 percent with just the minimum recycling that is available here.

In DeKalb County, I don't know the statistics, but I know that it is much greater.

I can tell you from my own experience, I have three children and our waste has been reduced by at least 70 percent.

I can cite you another example of which I can provide the statistics for.

We have a family business. We have just been certified as a model community.

Over the last year we have reduced our waste by 47 percent. We are recycling everything that we can.

We are buying in bulk, and I think that there are a lot of other companies in Kane County and

individuals who are willing to do the same things we have.

In addition to reducing, recycling and reusing, we have saved money.

Our land -- excuse me. Our waste costs have been reduced by several thousand dollars.

There is a way if we have the will.

Let's take the time to plan. Let's use things that do not destroy people's lives, their homes, their livelihood and let's go from there.

Thank you.

MR. FOOTE: Thank you.

John Schmitt, please.

MR. SCHMITT: My name is John Schmitt, S-c-h-m-i-t-t, from Peck Road in Geneva, Illinois.

First, let me say, I have not had an opportunity to review the report in great detail.

I did look over it briefly and I found three areas lacking.

Number one, the size of the landfill is based on generating so many tons of garbage X numbers of years out, but the presumption then is that so many people will be generating so much garbage per person.

However, if growth in this county is left without some control by the county governments or

city governments, that estimate is without foundation.

Therefore, we must address how we are going to go to make sure any landfill is actually going to be big enough for our needs.

The second thing that I found lacking in the report was also the problem of -- excuse me, the strategy of using recycling materials.

Now, tonight when I put my waste -- I will divide it into five or six different groupings.

The problem is, a number of those there is no demand for several of those groupings.

We are generating, as I understand it from watching public television, a good deal more waste newspapers than we ever could possibly use in this country. They are being exported to Europe.

That is true of a number of other categories, and I think the report needs to recognize that there is not sufficient demand to take all of these reclyclable materials in the near future, and perhaps it is hopeful thinking that there will be demand in the future.

The next thing that the report was lacking is how do we control who can put what in our landfill.

Recently the Supreme Court found unconstitutional a Michigan statute which prevented -- or excuse me, allowed various counties to control who may put what in a landfill.

This is such a serious problem that the Senate has already passed a bill attempting to overcome the voting of the Supreme Court.

Again, I think the report has to address who can put what into our landfill in light of this Supreme Court decision and assuming that the Congress of the United States does not pass a law giving us control over limiting who can put material in the landfill.

Thank you.

MR. FOOTE: Thank you, and we have one more speaker.

Again, if anybody else wants to speak, please let us know now. After the speaker we will close the hearing for today.

Paul Descoteaux, please.

MR. DESCOTEAUX: As you could tell from my dress, I did not plan on addressing this group.

Those of you that may know me will know that I am impulsive, and that is the reason why I am here speaking today.

Somebody said -- I am not sure who -- when emotion comes into a conversation, reasoning goes right out the window, and I have seen a lot of evidence of that today.

Those who are die-hard environmentalists all of a sudden for recycling, some of it is like a newfound religion.

Let's be honest. What some people are saying is they don't want a dump in their backyard.

There is a gentleman that clarified the term it is a dump.

I happen to have an element of Geneva, a so-called landfill, Settler's Hill, in my ward.

Those neighbors that have been disturbed are in my ward.

Therefore, you might say, well, I want the dump to leave Geneva and find a new site west. That is not what I want.

What I want to do is -- we have a dump in Geneva. It is not going to go away. Nobody can pick it up and move it out of town.

It is there, and I think it should be optimized for the common well of all of the citizens of Kane, from a living landfill to the garbage or refuse that

is generated in Kane County.

There was a previous speaker that said that our law maker's court voted against that, but that can be changed, too.

I would say I am for a landfill.

Those that say the landfill can be avoided, we can go to incineration -- I have heard comments from our esteemed Ph.D. -- which I disagree with probably about 90 percent of what was said, because here again, he brought fair into the equation rather than rational thinking and planning for the common good of all of our citizens here.

So I urge everyone, put a girdle on their emotion. Start opening up your mind to progressive and rational solutions to our refuse problems.

We have refuse. We can solve some of it by recycling.

The City of Geneva, and I would encourage all of the municipalities in Kane County to encourage recycling, but someone mentioned there truly is no market for it.

So we are really talking about economic problems, too, economic consideration.

It is great to be pure of heart that we

are going to do everything nice and clean and to the best of everyone's concern, but we also must bring in rational thinking about economics.

Economics rule our lives.

I know it is crass to say that, but it is a reality of our life. Economics is there and we must face it.

When people start talking about experts and they have a Ph.D., start talking about one part per billion, they are going to scare you.

I could drink almost anything that is one part per billion. It wouldn't hurt me whatsoever.

So think a little bit, because most of us don't know what a bill is.

It is too big a number for us to -- only bureaucrats in Washington spend billions of dollars, in fact trillions.

All I urge everyone is to think clearly, take your time, don't get overly excited.

The landfill is not the end of the world.

Most of the things that we will put back in the landfill came from the earth.

We talk about plastic bottles being

somehow onorous.

I spent 30 years in the chemical industry, and believe me, the world is not as dangerous as some would make you believe.

MR. FOOTE: Mr. Descoteaux, could we have your address just for the record?

MR. DESCOTEAUX: Oh, I'm sorry. 101 Howard Street, Geneva, 60134.

MR. FOOTE: We are still within the time period.

Is there anyone else who wants to speak at today's hearing?

The lady back there by the desk, does she want to talk today?

(No response.)

MR. FOOTE: Thank you. With that, we will close the public hearing for today.

The hearing will reopen August 4th at 7:00 P.M. at Waubansee Community College in Sugar Grove. Thank you.

* * * * *

STATE OF ILLINOIS)
) SS.
COUNTY OF DU PAGE)

I, Shannon M. Frey, C.S.R., R.P.R., a Notary Public in and for the County of DuPage, State of Illinois, do hereby certify that I reported in shorthand the proceedings had in the above-entitled matter; that the testimony given by the said witnesses was reduced to writing by means of shorthand; and that the foregiong is a true and correct transcript of my shorthand notes so taken as aforesaid.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my notarial seal this 2nd day of September, 1992.

Shannon Frey
Notary Public

" OFFICIAL SEAL "
SHANNON M. FREY
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 9/12/95

Exhibit 1 7/29/92

March 1, 1992

LOUIS E. MARCHI RESUME

7319 West Trey Road, McHenry, Il. 60050-7472 815-385-6047

I, Louis E. Marchi, Ph.D., am presently retired. I received my B.Sc. from Northwestern University in 1938 and my Master's and Doctor's degrees in chemistry from the Ohio State University in 1940 and 1942 respectively.

During my working career I have held the following positions:

Instructor at Georgia Institute of Technology
Instructor at Indiana University
Assistant Professor at University of Pittsburgh
Associate Chemist for the Manhattan Project working on the radioactive trigger for the atomic bomb during World War II
Senior Scientist at Armour Research Foundation
Director of Inorganic Research for Morton Salt Company
Director of Waving Research for the Toni Company (a division of the Gillette Company)

I have been elected to the following honorary organizations: Phi Beta Kappa, Sigma Xi, Alpha Chi Sigma, Phi Lambda Upsilon, and Gamma Theta Upsilon. In 1988, I received the National Society of the Daughters of the American Revolution Conservation Award.

For about 45 years, I have been interested in environmental problems, such as sustainable agriculture, the effects of pesticides on man and his environment, waste disposal methods, preservation of endangered species - plants and animals, groundwater contamination, acid rain, soil conservation and erosion, recycling and recycling education. In 1986, I took a graduate-level course in Environmental Science at the University of Illinois. Dr. L. Banks of the Elgin Community College and I designed a course on teaching chemistry to non-chemists.

I continue to endow scholarships at McHenry County College to study methods of increasing root size of farm crops as a means of soil improvement and erosion control. I contribute to an annual program in environmental education being taught in McHenry County schools.

TEACHING EXPERIENCE SINCE RETIREMENT

JUDSON COLLEGE (Elgin, Il.)
1987, 1988, and 1989: "co-taught", as visiting lecturer in Biology, course "Ecology and Environmental Problems." My responsibility: Environmental Problems.

NORTHEASTERN ILLINOIS UNIVERSITY (Chicago, Il.)
Since 1988: Graduate level course for the Geography and Environmental Science Department entitled Solid Waste Issues.
1989: Hazardous Substances. (graduate level)
1991: Hazardous Substances (graduate level)

MCHENRY COUNTY COLLEGE (Crystal Lake, Il.)
1988: Solid-waste Issues course for the interested lay person.
1989: A one-day seminar on Radon
1990: "The Race to Save the Planet"

COLUMBIA COLLEGE, (Columbia, Mo)
1991: The Natural Environment and Business Decisions

Exhibit "2" 7/29/92

WHAT SHOULD WE DO WITH OUR GARBAGE? THE TOTAL RECYCLING PLAN
(Presented by L.E. Marchi at the Public Hearing of the preliminary draft of the McHenry county Solid Waste Plan, June 12, 1991)

Garbage, garbage, garbage, what should we do with our garbage?

In the recent past, three choices (and their various combinations) have been proposed: bury it, burn-bury it, or recycle it. Regardless of which options are selected their solutions will turn out to be complex. This complexity was recognized by H.L. Mencken in 1917 when he said:

"There is always an easy solution to every human problem - neat, plausible ... and wrong."

That was his unique way of saying: there are no easy solutions. Pity, there are no quick fixes or simple answers to our environmental problems.

Yet when you read the document presented by the Health Services Committee and by the Waste Advisory Committee for our consideration tonight we find essentially no discussion of any possible problems with any of the three choices. Remember, Murphy's law which states:

If anything can go wrong, it will.

Over the last 17 years, I have read dozens of books and hundreds of articles on these subjects, i've visited eight garbage dumps, two garbage burners, more local recycling centers than I can count. From all this background, I conclude that garbage dumps and garbage burners do not work. They do not do what they are supposed to do in an environmentally safe way.

All garbage dumps produce leachate. Several years ago Dr. Kirk and his associates concluded, after analyzing 58 leachate samples, some from municipal dumps and some from hazardous waste dumps, that the leachate from municipal dumps had the <u>same</u> toxicity as leachate from hazardous waste dumps. Furthermore, the U.S. Environmental Protection Agency has stated many times since their first

announcement in 1981 that all garbage dumps leak. Clearly, the underlying aquifer will become contaminated. Here again the U.S. EPA has affirmed that once an aquifer is contaminated, there is no way to clean it up.

Lastly, most of the gases coming out of garbage dumps are detrimental in several different ways:

Carbon dioxide (CO_2) is recognized as the main gas that contributes to the global warming through the greenhouse effect.

Methane (CH_4) is increasing four times faster than CO_2. In addition CH_4, molecule for molecule, is 50 times more efficient in causing global warming. This combination of properties could make, after 35-40 years, CH_4 the global warming gas; CO_2 would still be there, but now in second place.

Nitrous oxide (N_2O), chlorofluorocarbons and hydrochlorofluorocarbons contribute to both global warming and to stratospheric ozone depletion. The protective layer .of ozone would be damaged for the next 150-200 years by these gases.

Time does not permit a discussion of the problems caused by burning of municipal garbage. Here, too, some of the problems are global in nature. Our garbage dumps and garbage burners as disposal methods are a disaster.

Since it appears that neither of these two options can safely solve our problems from an environmental standpoint, we'll have to find a way to avoid the building of both systems. If we are to avoid garbage dumping and garbage burning, the only possible solution is total recycling. Today, there is a nation-wide groundswell to reduce, reuse and recycle.

To achieve total recycling, six steps must be taken. Each step will have a definite objective, yet each step has a flexibility and some possible

variations within the framework of the objective. In addition, all six steps are interrelated so that for the total recycling plan to work, all six steps must proceed at the same time. The elimination of one or more of them will cause the plan to fail. Because of this, the order in which they are presented is not to be considered as a measure of importance; they are all equally important.

The six steps are:

1. The schedule, year by year, of the recycling percentages goal.
2. The need to establish a Total Recycling Research Institute.
3. The educational and motivational plans needed to achieve the eventual total recycling goal.
4. The "Let's Make a Deal" plan to trade processing their recyclable materials for dump space for our non-recyclables, the deal to be limited to no more than 10-12 years.
5. The encouragement of industries to use recyclable materials.
6. The various ways to finance the overall project.

Step 1: The Goals

The total recycling goal is to be achieved in 10 to 12 years. One scheme could be as follows:

a. For each of the first 3 years, an additional 20% of materials will be recycled. Therefore, by the end of the third year, 60% would be recycled.

b. For each of the second 3 years, an additional 10% of materials will be recycled. hence, by the end of the first 6 years of the plan, 90% would be recycled. This percentage was achieved by Dr. Barry Commoner in an experiment in East Hampton, Long Island, N.Y. He had 100 families separating their garbage for 10 weeks, based on a set of instructions he provided them. Admittedly, they were dedicated, educated, and motivated people. Ninety percent of the garbage

can now be recycled, composted, or put to some beneficial use.

c. The last 10% of the garbage could be recycled in 4 or 5 years; namely, 2 to 2 1/2 %/year. These materials are not recycled now because no effort has been made to utilize them. Obviously, the work of the Total Recycling Research Institute is needed. It should be pointed out here that this last 10% of the garbage contains about 90% of all the toxins in the household. It is these materials that cause the leachate from municipal garbage dumps to have the same toxicity as the leachate from hazardous waste dumps.

Step 2: The Total Recycling Research Institute (TRRI)

TRRI is the experimental and scientific information source for the total recycling 6-step plan. This group of 50 or so people would work to furnish information on how to:

a. Recycle those items we now do not know how to recycle. For example, batteries of all types are useful; when they are "spent," they then become a source of groundwater contamination in dumps or a source of air contamination from garbage burners. When properly recycled, no such air or groundwater contamination should occur. Much energy, water, and toxic metals will be conserved. Another example would be used motor oil. Unfortunately, it is still legal for homeowners to put motor oil in garbage dumps. One gallon of oil will render one million gallons of water undrinkable because of taste and smell. It is estimated that McHenry County produces at least 50,000 gallons of used motor oil per year.

b. Find beneficial uses for those items that are now a glut on the market. For example, at this time newspapers are a glut. We already know that newspaper can be converted to a material for home insulation. Also, shredded newspapers can be used for animal bedding. Very recent research has shown that newspaper

can be incorporated, by up to 10%, into the production of the familiar brown paper shopping bag. We need more such beneficial uses.

c. Replace all household hazardous and toxic wastes commonly used in homes by safe alternatives. There now exist many books and pamphlets on this subject. Research is needed to determine which are the best alternatives. It should be pointed out that many of these household hazardous materials should not be handled by women of childbearing age because they could damage the fetus and possibly cause birth defects.

d. Investigate the unsanitary problem posed by disposable diapers in garbage dumps.

e. Solve the dozens of problems which have not been here discussed and those that will arise in the future.

Step 3: Educational and Motivation plans:

Clearly, citizens need to be educated about the dangers of garbage dumps and garbage burners which pollute the groundwater and air,irreversibly. Total recycling would eliminate these problems.

In addition, reasons for separating recyclables must be outlined. Citizens would be given a set of instructions detailing just how to recognize the materials for source separation. Obviously, this point is critical for getting total cooperation.

Any and all kinds of educational and motivational materials should be developed. These could include (but are not limited to): videotapes, movies, slide shows, film strips, pamphlets, comic books, posters, bumper stickers, brochures, and courses of study for classroom use.

For some time, I have recommended that the County spend $1 per person for recycling education. With our population growing rapidly and nearing 200,000,

that money could produce the best possible education and motivation effort. For the last four years the educational effort under the supervision of the Regional Superintendent of schools has achieved a high level of excellence with very modest funds. Try to imagine what a budget from $1 per person would do!

Step 4: Let's Make a Deal

Wherever possible, the plan would prevent the building of new garbage dumps, while relying (decreasingly) on existing dumps. The plan might work as follows:

a. Contact all dump owners in counties bordering McHenry County

b. Explain to them the full Total Recycling concept

c. Suggest that they might adopt the same recycling schedule, year by year. as explained in Step 1.

d. Explain that we would take their source-separated materials and recycle them here at a McHenry county Recycling Center. In return, they would take our non-recyclable materials to their dumps on a decreasing percentage schedule, as follows:

Year	Percentage Recycled by them and by us	Percentage Non-Recyclable for their dump
1	20%	80%
2	40%	60%
3	60%	40%
4	70%	30%
5	80%	20%
6	90%	10%
7	92%	8%
8	94%	6%
9	96%	4%
10	98%	2%
11	100%	0%

With their help by the 11th year, neither they nor we would need the use of their garbage dumps.

Step 5: Encouragement of Industries

Economic benefits of several types could be offered to industries (old or new) to utilize at least 25% by weight of source-separated materials we would be collecting from our county and from cooperating counties. The steady and assured supply of materials with our low transportation costs should be considered attractive.

Step 6: Financing the Total Recycling Plan

Funds of at least $5 million per year could come from at least three sources:

a. A proposal sent to the federal, state, county, and municipal governments, explaining that the whole country would benefit immeasurably as this plan is developed.

b. Various foundations could be approached, pointing out the enormous dividends that would accrue from the development of such a plan.

c. The hundreds of trade associations could be asked to donate about $50,000 per year (more or less depending on the size of the organization) to the research effort. In some cases they could assign one or more of their scientists to work out how to recycle their particular product. Furthermore, each organization could be asked to re-design their products for easy recycling. One car and one appliance maker has already started to work out such plans.

McHenry County College has offered to administer the money received. They have even offered land to be used for this purpose.

SUMMARY AND CONCLUSIONS

You and I can make a difference. We must begin to implement this plan. Time is of the essence. Therefore, I propose the formation of the McHenry County Total Recycling Advisory Committee (MCTRAC) under the auspices of McHenry County College. This Committee would decide what steps are needed to implement this plan.

Sign your name on the available 3 x 5 cards to volunteer for this Committee. We need people from every conceivable field of endeavor. Your background is not as important as your willingness to do something that's necessary to put "the show on the road."

The handout I have for you is a 2-page summary of a 6-page article entitled "Global Chemical Pollution," published in the May, 1991 issue of Environmental Science and Technology. This puts the garbage disposal problem in its proper perspective. To quote from it: "The only reasonable solution to global pollution is not increased regulation of isolated point sources, but rather an increased emphasis on waste reduction and materials recycling."

Let me close with the following quotation by Chief Seattle made almost 150 years ago:

"This we know: All things are connected.

Whatever befalls the earth

befalls the sons of the Earth.

Man did not weave the web of life.

He is merely a strand in it.

Whatever he does to the web

He does to himself."

-30-

EXHIBIT NO. 3
7-21-92.

SAVING KANE COUNTY AND ILLINOIS LAND

Congratulations on the landfill tons per day reduction of 60% by the year 2001 (Page 3). This is real progress. That's the last time I'm going to say "landfill" - a rose by any other name is a rose, and a dump by any other name is a dump.

On Page 3 of the Solid Waste Mailer it is explained that an additional 11 acres added to Settler's Hill will extend its life by five years. That being the case, 220 acres would last 100 years but the plan stated on Page 1 is to provide an environmentally-sound and cost effective approach to managing our solid waste for at least 20 years. So, that means we need 44 acres, but all waste is to go down yearly to the year 2000 and reach at least a 50% reduction. So, even less than 44 acres would be needed - why do we need more? There are those who say we need it for recreation purposes; golf, tennis, polo fields, etc., as shown on your plat map.

Arnold Palmer was at Stonebridge last week. Did he play on Settler's Hill dump - no, he played at a private country club which he should. Many of the multimillionaires play at Royal Fox, St. Charles Country Club, Aurora Country Club, Elgin Country Club but how many are going to play on a county dump golf course.

Along with millions of others I was fortunate enough to serve with the overseas invasion forces in World War II, returning overseas again during the Korean War, and since I can't afford any of the above private clubs, now you want me to play golf on the county dump. Please, no golf course. Save the land for a hungry world.

The latest issue of Illinois Golf Magazine stated "Kane is the only county in Illinois to offer golf on a dump site." Any one proud of that distinction? If we need more recreation areas, we the people are paying $288,000,000 in property taxes for 1992 beside influence two-and-a-quarter million from Waste Management's war chest.

EXHIBIT No 4
7-29-92

July 29, 1992

Re: Statement at Public Hearing on Waste Management

My name is Ellen Nottke. I am chairman of the Batavia Township Neighborhood Association.

Our neighborhood group recognizes the necessity for a plan for future waste disposal, but we are concerned over the emphasis placed on a landfill meeting Kane County's immediate waste management needs.

Our focus can not be on today's needs when discussing landfills. We can only speculate on the life expectancy of waste containment and won't see its ultimate effects on the environment for many years; however, our concern should be for those inheriting decisions made here as well as our own solutions. If we are willing to accept waste from out-of-county sources, there is no way we can insure the safety of its contents for future generations.

Landfill costs are never ending. The cost of maintaining and monitoring landfills will be passed-on to our children, grand-children, great-grand-children and so on; however, alternatives seem to have a one-time cost and never-ending benefits.

BTNA would like to see active pursuit of alternatives ~~mentioned here,~~ of concern for responsibility so Kane County officials today can leave a legacy that future generations can be proud of.

EXHIBIT NO 5
7-29-92

Dick's Fix-It

Richard Sharp

Minor Home Repairs
232-0411

Public Hear
7-29-92
County Building

Kane County Solid Waste Managment Plan
Volume 1

In your summary on the first page you state that the recently purchased 11 Acres ~~purchased~~ at Settlers Hills would be used to expand the Land Fill.

I doubt if any of you are aware that this area is within blocks of Geneva nieghborhoods where people live. This area would be very unsuitable for the people in that niehborhood. The tractors roll very early in the morning and the back up beepers would wake eveyone at 5. A.M. How would you like that for 5 to 7 years,

Your summary says you would choose a site ...

EXHIBIT NO. 5 F 2
7-27-92

Dick's Fix-It

Minor Home Repairs
232-0411

IS TRUE and you do IT. before you move To use The 11 acres in a Geneva neighborhood. The sooner you select a site The less Tax money will be SPENT on IT and The fewer people will be affected. 5 years is To long To wait To FIND The needed land.

On Page 14 you write about establishing another County department for waste reduction. as a Tax payer I object To more government.

on Page 35 you wonder what size The new Facility would need To be? with recycling figured in you should plan on a 100 year landFill.

On Page 40 + 41 you acknowledge That Landfilling IS a SIGNIFCANT part of solid waste management so do IT as soon as possible and save a whole Geneva neighborhood by not using The 11 acres

EXHIBIT NO. 5 page 1
7-29-92

Dick's Fix-It

Minor Home Repairs
232-0411

I agree That a siting Committee be appointed, I agree That we only accept Kane County Garbage at The new Landfill

on Page 54 you state That Local Governments play a very important part in Landfills. I want To encourage The City Council of Geneva To object To The use of The eleven acres and Geneva Township To object. Also I would encourage The County Board member From Geneva To vehemently oppose This eleven acre addition To Settlers Hills. We in Geneva have done our share in Landfilling sites and it is Time To move To a site That does not have as much population.

Richard Sharp
2031 Allen Dr.
Gen. 232-2452

Section II B

PROCEEDINGS OF PUBLIC HEARING

For The

PROPOSED KANE COUNTY SOLID WASTE MANAGEMENT PLAN

Conducted at:

Waubonsee Community College

Sugar Grove, Illinois

August 4, 1992

Note: Comments from this Public Hearing are referred to in Volume III. Response to Comments by numbering the comments of each speaker B-1, B-2, etc., in the same order as they appear in the index to these proceedings.

S30061

STATE OF ILLINOIS)
) SS.
COUNTY OF KANE)

BEFORE THE KANE COUNTY BOARD
DEVELOPMENT COMMITTEE AND
SOLID WASTE PLAN ADVISORY COMMITTEE

In Re the Matter of:)
)
KANE COUNTY SOLID WASTE)
MANAGEMENT PLAN)

REPORT OF PROCEEDINGS had at the hearing of the above-entitled matter, before Hearing Officer Robert M. Foote, taken at Waubonsee Community College, Route 47 at Harter Road, Sugar Grove, Illinois, on the 4th day of August, A.D. 1992, at the hour of 7:10 o'clock p.m.

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(Marquardt)

HEARING OFFICER FOOTE: On the record. Good evening.

If we could filter in now and take seats.

If there's anyone else that wants to speak, I need the sign-up sheets now. If there is anybody else that wants to speak, could you bring those up now.

Under the rules that were set by the Development Committee, you can give me the sheet for another two hours, if our hearing tonight lasts that long.

For those of you who don't know, my name is Bob Foote. I was appointed by the County Board and Warren Kammerer, I think, specifically to just run these hearings.

They are not contested hearings. The purpose of these hearings -- and this is continued from July 29th -- is to take public comment in response to the proposed solid waste plan.

The statute sets out a process whereby the public gets to respond to the plan, and at the first meeting I indicated that it's not

really a question-and-answer type of hearing. People can listen to public comment by others.

It's certainly appropriate, because a record is being made of everything that's said -- it's certainly appropriate, as part of the comments, to ask questions of the Development Committee in the statements.

What happens to this transcript is that I will put the entire transcript together, along with anything we receive in written form from the public, and get it all to the Development Committee as soon as possible so that they can respond to it, and then it's brought before the County Board.

So far we only have two people signed up. I think there may be a third. I talked to a gentleman before who said he might want to speak. May I have your sheet, please?

We were allotted 16 hours total for this. Last time I stuck to the times that were provided in the general outline, and we had a lot of time left over. I don't think time will be a problem again tonight, so I will be very lenient in how much time I'll

give people to speak.

If I think they're getting off the subject or it's not pertinent, I'll ask that they close within a few minutes. But other than that, I think we've got enough time for everybody here who wants to talk to get their talk in.

The order that we're supposed to follow is, first, expert witnesses; second, elected officials; and, third, interested community members.

So far I do not have any elected officials. I have one person who has signed up as an expert. I will recognize Tom Osran as an expert. Apparently he is an attorney licensed to practice law in the State of Illinois.

I think he wants to speak with respect to legal issues, as I read this, as they relate to the solid waste plan; and in that respect, he, in my opinion, is an expert. Why don't we start with him.

Mr. Osran.

MR. OSRAN: I brought with me some

waste plans because I thought there were a lot of people in the county that haven't seen one.

HEARING OFFICER FOOTE: Excuse me for one second.

Could you identify for the Reporter your full name and your address, please, first.

MR. OSRAN: My name is Thomas Osran, O-s-r-a-n. I live at 423B West Briar Place in Chicago.

To start with, I would show this as Kane County's plan, all maybe 400 pages of it.

(Indicating.)

This is DuPage's plan.

(Indicating.)

This is Lake County's plan, which appears -- a great portion of the assumptions in our plan, in the Kane County plan, it appears have been taken almost verbatim from this plan.

(Indicating.)

And here is the Will County plan.

(Indicating.)

Now, my point isn't that more is better; that you have to have a big, thick plan in

order to have a good solid waste plan. But these other plans indicate that a lot of thought and time and energy went into these plans. A lot of engineering, a lot of numbers and a lot of math and a lot of science and a lot of analysis are in those plans.

There is no science, no math, no analysis in the Kane County solid waste plan.

One of the most crucial sections of the Kane County waste plan is the first section, on waste generation, and the reason that that section is so critical is because you need to formulate a waste stream in Kane County to determine how quickly you will fill up your landfills.

Gary Mielke, who did most of the work here, established a waste stream for garbage going into Kane County at 55 percent. There is no justification for that figure in the plan, none. The only thing Gary bases it on are a couple weeks of surveys done at two landfills more than two and three years ago, in '89 and '90.

The actual numbers, the data from those

surveys, is not in the plan. There's no actual hard numbers. The only thing that's in the plan is a percentage.

Basically -- and I'm really unhappy to say this -- basically the Kane County waste plan is a sham. It is nothing more than window dressing around a new landfill.

The plan also violates the law that requires plans, the Illinois Solid Waste Planning and Recycling Act. While there's a lot of things that are wrong, that are just flat-out lies or inaccuracies or dishonesties, the whole thing -- the whole plan boils down to what I call a trilogy of lies.

See, Kane County has a problem. It has abundant landfill capacity. Yet the plan calls for the immediate acquisition of a new landfill site. Yet the plan also clearly states that are 16 years left at County landfills.

So how does the plan do that? How do they justify immediately acquiring a new site when the plan itself says there's no need for it?

There is no justification for it.

The closest thing I could find for a justification for it is in the executive summary on Page X, where it says the county should initiate the site selection process for future facilities as soon as possible following the adoption of the plan to -- and I'm quoting -- "to protect the interests of all people who will be affected by the future sites."

Let me make that clear. The County is going to protect us by taking our farms and turning them into a landfill. You know, Gary, don't do us the favor. Please, don't protect us. Leave us alone.

I'm sorry. Back to the trilogy of lies. The first thing that Gary had to do was, since we have so much excess and abundant capacity so much so that we're taking excess garbage from other counties, he had to come up with a way to fill up the landfills as soon as possible.

He did that by saying 55 percent of the garbage being generated in Kane County -- I'm

sorry -- 55 percent of the garbage going to Kane County landfills is being generated within the county.

We will be presenting engineers that will dispute that figure. They will demolish that figure. They will show that figure has no support.

The second lie is that alternatives are vastly more expensive than landfills.

And the third lie is that a landfill is a very cheap garbage disposal option.

Now, under both those you'll see under the alternatives that Gary Mielke has drastically overstated the cost of alternatives. I discovered 7.7 million dollars in contingency costs for a compost facility and practically no contingency cost -- or very little, 10 or 20 percent, for contingency costs on a landfill.

You'll find insurance costs for an incinerator but no insurance costs for a landfill. I guess a landfill doesn't need insurance.

The main problem, as I've said, with the

plan is that it calls for the immediate acquisition of a landfill even though the current landfills will last 16 years. Basically this stems from the fact that the County is using Gary Mielke to write this plan.

Gary Mielke is not an engineer. Gary Mielke is not qualified to write this plan. I'm sorry to point this out, Gary, but just because I like to fly kites, it doesn't qualify me to fly the space shuttle.

Other counties are using professional solid waste engineers, and we will be presenting more solid waste engineering and science during these hearings than is in the entire plan. Of course, that's not hard, because there is very little science and engineering in the plan.

Since there's no language in the plan that justifies the need for a new landfill immediately, that language should be taken out of the plan. There is no reason that a landfill siting committee needs to meet by July and begin immediately selecting a new

site for a landfill when that landfill is not needed for 16 years.

And that provision violates the Illinois Solid Waste Planning and Recycling Act. That law requires that waste plans follow another law, the Illinois Solid Waste Management Act. Those two laws sound very similar, but they're different.

The Illinois Solid Waste Management Act was passed because the State Legislature was worried about landfills filling up, so they passed a law that said everybody has to realize that the state policy is against landfills, and the state policy is that we should first reduce the volume of garbage at the source.

Second -- that means reduce, encourage people to reduce their garbage. Gary gives lip service to this in his plan.

The second is that we should recycle and reuse our products.

The third is combustion with energy recovery. That's incineration.

And the fourth is combustion for volume

reduction. That's incineration with no energy recovery or no generator.

The fifth and least desirable alternative is disposal in landfill facilities.

Now, Gary says the plan follows this hierarchy, but I'll be darned if I can see how, because the plan says, "Let's get a new landfill now. We'll look at alternatives later." The law says you have to look at alternatives now and do a landfill later.

But, you know, it's kind of funny. If you look at the history of what happened to this county, it's really no surprise. Remember, Kane County didn't even start a solid waste plan until they were sued by an EDKO-backed lawsuit that said that their new 2,000-acre landfill they were planning was, in effect, an illegal solid waste plan.

They signed a consent decree that said basically they had to go back to the drawing board and do a solid waste plan -- I almost said "landfill plan"; that's what it is -- they had to do a solid waste plan before they

could do anything toward siting their landfill.

So Phil Elfstrom and Frank Miller went back to the drawing board and hired Gary Mielke. They said, "Gary, give us a plan that gives us a landfill," and that's exactly what he did.

Tonight I found the minutes from an April 12, 1990, meeting. That's where Phil Elfstrom decided to share with the rest of the County Board his 2,000-acre landfill plan. That was an executive session meeting. It was an illegal secret meeting.

Later the county was found guilty of violating -- I'm sorry. They signed a consent decree where they admitted violating the Illinois open meetings law. We sued them under that. They were found in violation -- I'm sorry. They admitted violating.

Here Elfstrom is talking about his new landfill, and he says -- here he talks about siting a new landfill. Then he says, "A solid waste plan will be needed to go along with the siting of a new facility." In other words,

"Let's get the landfill now, and we'll do a plan that fits it." That's exactly what this plan is. It's just window dressing around a new landfill.

As I said, that violates the law because it doesn't follow the hierarchy. It also violates the law in a much more basic way.

The law requires that waste plans contain at a minimum a description of the proposed facilities and also the costs of those facilities and what's called the "life-cycle costs."

Now, I'm not an economist, but apparently life-cycle costs is looking at the cost of something over the entire life of it, bringing it -- figuring out those dollar costs out to the future, then bringing those dollars back to the present to show this is what a landfill will cost.

And that would include everything: building it, buying the land and filling it up with garbage, ultimately then closing it, post-closure maintaining it for 30 years. Gary only maintains it for five years in his

plan.

But going back to this description of facilities and programs that are proposed for the management of waste and a description of the facilities, this plan clearly calls for a new landfill.

Does it talk about the size of this landfill? No. In one part of the plan, it says 321 tons per day. In another part of the plan, it says 544 tons per day. In yet a third part of the plan, it says 800-and-something, 855 or whatever it is, tons per day. And in another part of the appendix, I found where it says 300 to 1,000 tons per day.

Well, when I read this, I didn't understand this, because I thought I had a lot of experience in solid waste and I never heard of a landfill described in terms of tons per day, so I asked some solid waste engineers.

They said, "It's utter nonsense. Nobody in this profession describes landfills or any facility in terms of tons per day. The only way to describe a landfill is the same way farmers describe it: acres."

This starting a plan with a landfill and then writing a plan to fit it -- I call it a waste plan in reverse, because basically that's what the County has done here.

They've started with a landfill -- that was their conclusion -- and they've worked backwards. They're worked their plan backwards to get there.

Now I'd like to talk about how Mielke -- the three really big lies that Mielke uses to attempt to justify this.

Like I said, Kane County has an abundance of garbage disposal. They've got two landfills that won't fill up for 16 years. So how does the County get away with saying, "We've got to get this new site now because, gosh, we might need it in 16 years"?

One thing Gary does is he comes up with this number of 55 percent of garbage currently going to landfills being generated inside the County, and he bases this on these surveys that were done by I think Aurora University.

Basically he had some college students go out and ask the garbage truck drivers "Hey,

where did you come from?" These truck drivers could have -- who knows what they could have been doing? Waste Management could have told them, "Go to DeKalb this month." Nobody knows.

But Mielke doesn't bother troubling us with the numbers from those surveys. Instead he gives us a rough 55 percent. He says he knows that figure is accurate because it matches the operator's numbers, Waste Management's numbers, to within 3.8 percent.

Well, you know, Gary, I'd like to check your math. What were the numbers? What were the survey numbers? What was the methodology? What are the numbers that match the operator's numbers? What are any of those numbers? We don't know. They're not in there.

Gary points out -- and a lot of the lies that Gary does in here he admits they're lies or he says they may be inaccurate because of this or that.

For example, on that survey he points out that you have to seasonally-adjust numbers because when you study garbage in the summer,

you're not getting an accurate picture of a year-round event. Garbage in the winter is different from garbage in the summer. He says it has to be seasonally adjusted.

Then he says he did that seasonal adjustment; that's the seasonal adjustment.

Gary, the number is not in there. Engineers go nuts over this kind of thing, they go ballistic, because they know you have to have the math.

You know, when I was in high school algebra, I learned if you didn't show your work for a problem, you didn't get any credit. Gary doesn't show his work here, and he shouldn't get any credit.

So that's one of my questions: What was the seasonal correction? What were any of those numbers?

The reason Mielke didn't put any of his analysis in there is because I don't think there is any analysis. I think he just picked a number out of the thin air. I think he worked backwards. He started with the solution, a landfill, and he worked backwards

to cook the numbers, to cook the books, stack the deck and go backwards on the equation to come up with numbers that would look good going where he wanted them to go, and that's what Phil Elfstrom hired him to do.

I hate to sound cynical, folks, but remember this is a county that started with a landfill, and we stopped them with the landfill, and they had to go get the plan before they could get the landfill.

So it's no surprise they want a landfill. What a shock. They wanted a landfill two years ago.

The other line Mielke uses is that alternatives are vastly more expensive than a new landfill. Now, while I don't support an incinerator, Mielke's plan states that an incinerator would cost 94.6 million. That's on Page 35. Not only is this figure ridiculously high; it ignores the fact that many incinerator companies would build an incinerator for nothing.

The Robbins incinerator, for example -- not that I think it's a wonderful project; I

don't -- that's being built with no local tax dollars. There are companies out there that will come into Kane County and build you a facility in exchange for a promise to give you garbage. Municipalities sign up and promise the garbage, promise them the flow, and they will build the facility.

Everybody knows this. There's no reason that the County has to go out and spend the money to build this incinerator that's going to cost 100 million dollars.

And I don't believe, even under the landfill -- Gary talks about landfill costs in a very nebulous way, but even where he does talk about them, he mentions that the operator may fund those. In other words, an operator is going to come and build this landfill.

Kane County is not building Settlers Hill. They've never had a bulldozer operator go out there and turn one shovelful of garbage.

The third lie is that landfills are very, very cheap. Mielke says 4 to 7 million dollars. This lie is based on several

underlying lies. One of them, if you go to G37 -- again, you know, talking about going back to the law, the facility size has to be in the plan. Also, the costs of the facility have to be in the plan.

In Section G Gary talks about two different costs for landfills. One he admits is this hypothetical landfill. You'll find that on G37. I don't know where this landfill is, because it can't be in Kane County because it says the land cost is $1,500 an acre.

If anybody wants to sell me their land for $1,500 an acre in Kane County, please meet me after this meeting here. We'll sign the contracts by this weekend. I don't know where it is, but it sure isn't Kane.

Another thing he does is call for a three-foot liner. Obviously, it's going to be built out of state, because Illinois landfill regulations require a thicker liner than that.

There's no insurance on this landfill. If you look on G38, he does some sort of thing with the post-closure period. He talks about a five-year period at $750,000 a year. Well,

Illinois law requires a 30-year post-closure. So let's multiply that out. I come up with 22.5 million over 30 years.

In reality, when you think about this, the County is going to own this landfill. What happens after 30 years? Are we going to close the door and walk away and let it pollute the heck out of everything?

It's going to be like radioactive waste sites. You're going to have to monitor these things forever. So, really, if you think about 22.5 million over 30 years, it could be hundreds of millions over 100 years.

I also would argue with these figures because they're vastly low. I just read in the paper, the Beacon or the Elgin Courier, about the Tri-County landfill, another environmental disaster brought to you by your friends at Waste Management. They're going to spend 12.6 million to do the initial remediation on that one and just basically build trenches and try to catch some of the stuff that's going out sideways.

I'm not an engineer and I don't

understand it all, but they're not going in and putting a liner in or doing anything that's really going to solve that problem. All they're doing is trying to make the best of a bad situation.

Speaking of making the best of a bad situation, I kind of had a chuckle over this one in the plan.

On M5, all the way in the back, one of the last few pages of the thick part, Mielke talks about the new landfill polluting everybody's water, which is a great concern out in western Kane County. He says, "Don't worry about it. You can take care. It can be addressed by establishing a thorough groundwater monitoring program and has been done in some areas, guaranteeing the provision of adequate water supplies to adjacent homeowners if contamination does occur."

Well, I can sleep better tonight knowing that. I'm sure Mike Sauber in the audience, with his 15.6-foot wells, can sleep better after that.

How is the County going to get that

water all the way out to Virgil or wherever the landfill is going to go? They're going to have to build a pipeline and a water plant because the County doesn't own a water plant. Maybe they'll give you Hinckley & Schmitt credits. I don't know.

There's another provision under -- the landfill vastly understates the cost and one that I take -- as an attorney, take personal umbrage with; and that is that G35, the permitting and siting costs estimated for legal and engineering fees, assumes that the siting and permitting process, including local site review, will not be contested.

This is the assumption for the hypothetical landfill. Reading this, you know that this is a hypothetical landfill because any real landfill has a heck of a lot of costs for permitting and siting and is contested.

And I can assure you that the new landfill, wherever it goes, is going to be contested vociferously and loudly and continuously.

And this is -- part of my background is

I worked up in Lake County for the State's Attorney's Office, where we were fighting Waste Management during these siting hearings. Waste Management would spend maybe a couple million dollars on their plan for the landfill.

Then we would spend -- the County -- we'd have like a quarter-million-dollar bond back then or half a million, and we'd spend several hundred thousand dollars to hire engineers and to really attack Waste Management's plans, because Waste Management doesn't propose a good landfill.

They come in and they proposed it -- like, for example, in Lake County they proposed a real cheap landfill the first time. When the County voted that down, they came back with a better landfill with a double liner and all that stuff. So I can guarantee that there will be engineering and siting costs related to a contested hearing.

Again, that's just another low-ball assumption by Gary. He wants to understate the costs of the landfill because he wants to

make that look like the most desirable option.

Are you getting it down, Gary?

There's also other landfill costs in this Section G. Those costs are not for a hypothetical landfill. Those are for five other landfills that were built somewhere else.

My question is and my point is that this is why this plan violates the law. It doesn't give you the costs for the actual landfill that we're talking about. It gives you the costs for this hypothetical landfill. It gives you the costs for these five other landfills, one of which was in Massachusetts, one was in Minnesota, Lake County, Will County. Here he's got one that just says "Illinois."

Where is the real landfill that we're going to get, Gary? It's not in here, and because of that, this plan violates the law.

Another real dishonesty is that Gary says that the new landfill isn't going to be needed for 16 years but we've got to get it now, but we'll pay for it with revenue bonds

from the landfill.

Well, it seems to me if the County was ready to spend 30 million the last time for the 2,000-acre mega dump, they're going to have to open that landfill right away to pay off those bonds. So I don't believe the County when they say, "We'll get the land now. We're just doing that because we want to do something nice for these farmers whose farms we're going to be condemning. Take it now so they won't be so mad 16 years from now."

The real problem is by getting this landfill site now, you've committed the County for 20 or 30 years to a landfill, which is an obsolete technology. Gary says, "We'll look at alternatives in five years." You're not going to do that. If you have your landfill site already, why are you going to look at alternatives?

You can't look at alternatives, because alternatives would take garbage away from that waste stream that you need to generate to pay off the bonds in the new landfill.

So if you get this new site now, you are

foreclosing the possibility of any alternative to a landfill for the County for the next 30 to 50 years, perhaps, and that, to me, is the biggest dishonesty in this plan. It is ruining the County's chances to even explore alternatives, alternatives that may cost the County taxpayers nothing.

I've talked to more -- at EDKO we've had more vendors come in and talk to us about how they could put together an incinerator, this or that, a composter, a recycling facility, and they would do it for no cost, no tax dollars, no revenue bonds -- well, perhaps revenue bonds that they're going to repay, but where they'll pay; it will be on their nickel.

Instead, Gary wants the taxpayers to shell out all this money for land that supposedly won't be needed for 16 years. My point is: What if we find alternatives in the next 16 years and we don't need a landfill?

That's wonderful. We've spent all this money on land, and what are we going to do; turn it into Elfstrom's polo grounds? You would have saved all that money if you didn't

get the site and then find out that it's not needed.

What acquiring a site now really does is it continues the County's practice of importing lots and lots of garbage from other places. Currently Kane County is what I call a "garbage prostitute." They take as much garbage from other places as they can, and they do it for money, even though the money is not really happening. This is what really poor communities do, like Robbins, where they need this.

And why is Kane County doing this with the wonderful lifestyle we have out here? People didn't move out here to become a big garbage dump. People came out here to have a nice environment, have a few acres and a barn, grow some crops, maybe.

If the language, though, that calls for this new site goes through, the County's practice of importing vast amounts of out-of-County and out-of-state garbage will continue and, in fact, Gary Mielke has guaranteed that. The County Board passed a provision that said

the new landfill should only take Kane County garbage. Gary's plan says no; we should take garbage in equal proportions from other jurisdictions that dump equal or greater amounts of our garbage.

Well, now, that's a completely unenforceable, ridiculous provision. As a lawyer, I could tell you that that language is completely unenforceable. I don't know how in the world you'd even go about formulating a way to count how much garbage is going in.

"Well, DuPage sent us 10 trucks this week and we only sent them four trucks and they owe us six trucks." How is that going to work? The answer is it won't work and can't work, and that's what Gary wants.

There's another possibility. If you look at the plan, it points out that other area landfills by the year 2000 will all be closed. Cook, Will, DuPage, McHenry -- I don't think they have one -- Lake. They're all going to be closed.

Here Kane County is. They have garbage capacity to the year 2008, and here Gary is

planning the next landfill. These other counties are licking their chops. NIPC and SWANK -- they are licking their chops, waiting for Kane County to put the landfill in, because they know if Kane puts in a landfill, that's a landfill they don't have to put in.

Something might happen in DuPage. Theirs might close this fall, this year, because of the lawsuit regarding the forest preserve districts not being allowed to operate landfills. A lot of DuPage's garbage comes here already. If they close, we'll have even more of it.

Another scenario is the Illinois General Assembly is going to look at the garbage wars, and they'll say everybody in the state has to take a percentage of Cook County and Chicago's garbage. They're generating way more garbage than they can deal with. What happens if the Illinois General Assembly passes a law saying you have to take this garbage?

Another thing that is happening is out-of-state waste is being imported into Illinois, Ohio, Indiana, Iowa.

Phil Elfstrom vowed no out-of-state waste, but the Supreme Court keeps saying out-of-state waste is an article of commerce and you can't keep it out.

One thing else -- one nice alternative approach that Gary Mielke has completely ignored is the possibility of funding from the state, state money -- instead of our money, state money -- to do a pilot project for composting or other types of alternatives.

Gary won't even pick up the phone, won't even return this guy's calls over at the DENR, won't even talk to this guy about Kane getting a grant to do something, to do composting.

Why is that? Because Gary doesn't want the County to do composting. Gary wants this County to continue to do landfilling, because that's what they do. This County is committed to landfilling.

I used to call Kane County "the County that Waste Management bought," and that's unfair because I see a board member here tonight who is an excellent board member, who is one of the best and fighting for good

government. And I hate to tag that board member, because there's some very good board members on that board.

I want to point that out, that I don't blame the board for this. I know the board didn't sit up with Gary late at night writing this thing, but I do blame Gary Mielke and I do blame Phil Boss because they're pulling the strings and they've written this thing.

The board's job is going to be to edit this plan, rewrite it, to make Gary do an honest job of the plan. We're going to help them. We're going to give them engineering, math, some of the science.

We're also going to ask them to go back to Gary and get him to put some of the numbers that should be in this plan into the plan, because they're not there now and a lot of our engineers -- they scratch their heads because this plan is so devoid of any numbers, of any solid analysis, that it's incredible.

One engineer we've talked to really truly, honestly believes that some very crucial sections are flat-out copied from Lake

County.

HEARING OFFICER FOOTE: Mr. Osran, could you close up your talk now?

MR. OSRAN: Sure.

HEARING OFFICER FOOTE: Thank you.

MR. OSRAN: I want to ask the County to look at this plan and take out the lies, take out just the flat-out dishonesties.

Since the new landfill is not justified by the plan and, in fact, the plan states it's not needed for 16 years, I'm asking the County Board to take that language out. There's absolutely no reason that there should be any call for a new landfill site immediately, as this plan does. There should be no reason for that language in the plan.

As I've said, the plan states we'll look at alternatives in five years. That's not true. If the County gets a new landfill site and they start doing it in July, they're not going to look at alternatives, because they're going to be committed to a new landfill.

You know what else? They could save themselves some legal fees on this, because a

plan that violates the law is not a good plan, and, you know, it's just not what the County wants to do.

Thank you very much.

(Applause.)

HEARING OFFICER FOOTE: If you have anything in writing, we'll receive anything you have in writing as an exhibit.

MR. OSRAN: (Indicating.)

HEARING OFFICER FOOTE: Thank you. Mr. Osran's statement will be marked as Exhibit 1 from the August 4th hearing.

(The document was thereupon marked Exhibit No. 1 for identification as of August 4, 1992.)

HEARING OFFICER FOOTE: Forgive me on these pronunciations if I get somebody's name wrong. Michael Yagen; is that correct?

MR. YAGEN: Yes.

HEARING OFFICER FOOTE: Could you please come up and state your name and address for the record.

MR. YAGEN: My name is Michael

Yagen. I live at 49W901 Winters Road, Maple Park, Illinois.

I'm a farmer. Along with my brother, we operate a 500-acre family farm located in western Virgil Township and we rent some more land in DeKalb County. I'm also treasurer of the Virgil Township Solid Waste Disposal District.

The 160 acres of what we call our home farm was purchased by our great grandfather, J. F. Winters, in 1871; and 80 acres of this original tract is located north of Winters Road and is part of what was in the County's original plan called Green Site 1.

Well, this information was suspected for a long time but was confirmed in April, 1992, thanks to a lawsuit that was filed by some citizens in western Kane County and by our rural townships.

Since the rumors first began in 1990, I've become involved in solid waste disposal. I've learned more about garbage -- I guess "solid waste" is the name for it -- than I had ever hoped to know. I believe my past 27

years as a farmer make me more a person of the land, and it is the land itself that I want to talk to you about today.

For myself and our farming operation, we are a business. If we are forced to sell to the County, so be it. We'll move on and operate elsewhere. But the land itself will not be so fortunate.

Much of the farmland in western Kane County is amongst the richest in the United States and, therefore, most certainly the world. It is an undisputed fact that U.S. farmers are the most efficient producers of food and fiber in the world.

But as good as our cultural practices are, it is the topsoil that makes it all possible. It is truly a blessing from God.

Farmland in western Kane County ranges from deep silt loams to lighter clay loams. All these soil types have a very high USDA production capability. Our average yearly yields are in the upper 10 percent of Illinois and probably nationally.

These topsoils may be less than 12

inches deep or in spots run to better than six feet, and each inch is irreplaceable. Farming itself can be destructive to the soil, and almost all farmers in Kane County use conservation methods to stave off both wind erosion, water erosion and other things.

Why? Because if you lose an inch of topsoil, it won't be replaced in your lifetime, if ever.

This process of conservation is ongoing and can protect the land for generations, as many of our better farms in Kane County can testify.

But then comes this plan, this plan that cavalierly calls for the siting of a new landfill. The siting is to occur as one of the first actions under the plan, at least as soon as waste reduction and before some sections will even start recycling.

At least waste reduction and recycling are environmentally friendly. A landfill, no matter how well run, simply is the total reduction of farmland as a productive unit.

Once the ground is open and replaced

with a giant hill of garbage, it's permanently destroyed. You've lost a natural resource, and we cannot replace it. We cannot make topsoil. And just like Joyce Kilmer's tree in the poem, only God makes topsoil. He makes productive farms, and he makes for productive economy.

The State of Illinois recognizes this. In its hierarchy listed in the beginning of the plan, landfilling is the least desirable solution, only to be considered for the final products of waste disposal. This plan calls those methods in the hierarchy untested and unreliable.

We meet here today in the last decade of the 20th Century. At the start of this century, man had never flown. By the '60s we put a man on the moon. In truth, science and technology are still perfecting methods of waste-handling.

But in this country science moves quickly. From physics we learn that all matter is changed to its various forms by addition or subtraction of energy. Much of

what we put in landfills is rich in energy but indigestible in form.

But if we incinerate these products and recapture the energy for other uses, we can in reality make something useful from waste. This is what I believe the state had in mind in its hierarchy.

Kane County is in a very good position. It has 11 years without the 11-acre expansion at Settlers and 16 years with that expansion. We should spend this time to reform this plan and to make it much more energy efficient.

There's some other things in the plan, aside from the land, that I'd like to get into now, and Tom touched on them briefly. There are a few numbers in this plan that lead us down the road to a stray thing. One of them is this 885 tons per day that the County is supposed to be producing by the year 2010.

Our current landfill -- two landfills we have are Woodland and Settlers. Settlers is the one that we rent to Waste Management. This had a new contract written this past year, and in this contract we guaranteed that

we would put 468,700 tons of refuse a day in this hill. Well, during that negotiation, that same figure was quoted for both Mallard Lake and Greene Valley in DuPage County.

Now, that comes to about 1,300 tons per day of garbage going into those landfills. Now, something should dawn on us at that point. That's about what you put per day in a modern landfill.

If Kane County is only going to produce 885 tons, we are never going to be able to keep other counties out. If we have a landfill that's capable of taking 1,300 tons per day, what are we going to do with it?

A farmer doesn't buy a combine and only use 60 percent of its capacity. If you have something, you'd better use it or you're just wasting everybody's time and money by having it.

Another thing that I find interesting in the plan that doesn't necessarily have to do with land is the fact that we get these quoted at $30 a ton for landfilling and $90 a ton for incineration. But I've lifted enough hay

bales and they weigh about 40 pounds, and most garbage bags don't even contain that. But let's say they do. That makes 50 bags of garbage to make a ton. That comes down to about 60 cents a bag.

Something tells me, with what we're getting charged to haul garbage, somebody else is getting an awful lot of money out of that if it's going to cost us $30 a ton to put garbage in a landfill.

The same is true with $90. That would only raise it to $1.80 a bag. I think that's still pretty cheap.

I don't think that we should just make a decision on this whole plan based on the cost. I think we should get to be environmentally correct on it, and I think that adding the extra $1.20 a bag is not that bad of a deal.

In closing I'd like to say that landfilling not only wastes the resources that is the energy trapped in the waste, but it also destroys the resource which is the land. This County Board can, if it wants, ignore science, waste the resource that is knowledge

and politically is very capable of destroying the resource which is farmland. Or it can use its powers to step into the 21st Century with a progressive plan.

Wasting a God-given resource is normally a monument to the time when we were ignorant. But if this board chooses to build another garbage mound, it will be producing its own epitaph.

500 years ago an English playwright, William Shakespeare, wrote a eulogy for a political leader who lived many years before, Julius Caesar. It said that the evil that men do lives after them, and the good is often interred with their bones.

Well, the problem here is that evil pile of garbage is going to live long after all of us, and all of our good intentions are going to be buried underneath it.

Now, I have one other thing I'd like to ask a question to the board about, that it be included in this. This past two years ago, this County accepted a gift from Waste Management of 2.3 million dollars to build a

ball field.

It seems awfully funny to the people in my neighborhood that a County Board would accept a gift like this and then, within a matter of months, come out and try to condemn our land.

Thank you.

(Applause.)

HEARING OFFICER FOOTE: Next, David Werdin. Good evening, sir. If you could step up there and give your name and address, please.

MR. WERDIN: My name is David Werdin. I live at 2 South 540 Dauberman Road, and the address is Elburn, Illinois, although it's just outside of Kaneville.

When I came in tonight, they asked if I wanted to speak, and I said, "It depends on what I hear." As you see, I don't have a prepared text.

I have been a neighbor to the south and have read for the past two years all of the grief and agony that's been going on concerning the landfill. I'm not here to

condemn or to applaud this issue.

However, having lived through several other large attempted projects in the western part of Kane County, I am a little bit familiar with the process that has been going on as far as the landfill. They are always lengthy, they are always very wordy, and they don't get to the point very quick.

I point to the proposition that we were going to have a planned unit development for 30-some-thousand people at one time. I think it was in the '70s that this was going on.

Also, we were going to have a collider, which was going to come out and do all kinds of wonderful things. This is another issue that's a little more located centrally to the people in Virgil.

I asked the County a long time ago on just a one-on-one basis, "Why do you ignore completely public lands?"

The State of Illinois, the federal government and, yes, even the County owns a lot of land that's off the tax rolls, has been off the tax rolls for years and years and

years. Some of it's not even used anymore for the purpose it was intended.

I point to the Illinois training school for boys, which is still in existence, but the land is no longer used in the same manner that it was when I was a boy and grew up next to it; that is, it was worked by the people that lived there, the boys. They did everything: the farming, the canning, taking care of livestock, gardening, metalwork, everything.

That over the years has changed. Here you have this large block of land that contributes nothing to the taxes, sits there and is rented out to farmers.

Why don't you look at this property? Why don't you site something there? You already own it. You wouldn't have to buy it. What about the Fermilab?

And in the greater sense for the state, what about the existence of Army camps, Air Force bases, supply depots, all kinds of property that is sitting there dead, not used.

No, it's more fun to go out and condemn land, cause all this upset, cause all this

hard feelings, cause all of this unrest in the community, and I think it's totally unnecessary.

My purpose tonight is to try to shed a new light. Garbage is going to be here no matter how much we get mad at Mr. Mielke or Mr. Elfstrom or anyone else. I think our problem-solving has been in the wrong direction too long. It seems like it's politically popular to create a large, big, new something or other, and that's what this strikes me as being. So I'm asking to go back.

I think the siting of these things is 90 percent of the problem. I submit that there are places that it could be sited, and I'm holding out again on the public lands throughout the State of Illinois. There's also abandoned coal mines, surface mines that's just sitting there, derelict property. You can haul in your sealers. You can do all this. It would makes a nice contribution to the economy to get work to do that.

But don't take community land that's

already producing taxes, that's already providing homes, that's already at its best use. Take something that's not being used, and then maybe the state can get tipping money and we won't be so in the red.

I thank you.

(Applause.)

HEARING OFFICER FOOTE: This is the last person who signed up.

Is there anyone else who wants to speak tonight after this person? If no one else wants to speak, we'll close the meeting.

If there is anybody else, please fill out one of these sheets in the next few minutes and get it up here to me.

Barbara Marquardt.

Please, again, if you could, for the Reporter, give your name and address when you get up to the speaker's stand. Thank you.

MS. MARQUARDT: My name is Barbara Marquardt. I live at 1130K Yew Court in Elgin, and I'm speaking for a state committee of the Sierra Club, the Illinois Sierra Club, the Conservation Easements Committee.

I, too, am against landfills, and I'm very worried at the suggestion that they be placed on public lands. However, my prepared statement is primarily about recycling goals, which, although they are inadequate, are significantly better than is being achieved. So if I sound a little positive, it's because I'm glad to see something is being done in this area.

So I begin positively even though I am certainly -- I repeat -- against any kind of a landfill.

Kane's solid waste plan is a good one in many ways. Its goals are admirable -- I mean the recycling goals -- and, if achieved, would represent a great improvement over current practices. Its percentage goals are over state requirements and are high compared to current percentages.

But in making such comparisons, we need to keep in mind that the waste plan's goals and percentages are quite moderate. It's just the comparison that makes them seem high.

Our current wasteful practices are quite

immoderate, and that's the basis of this comparison.

10 years ago Denmark was recycling 60 percent of its waste. Our highest target is 47.3 percent. That 47.3 percent takes into account practical considerations and may even seem overambitious to some. We're nowhere near that now, remember.

But consider 90 percent of all waste, according to EPA figures, is made up of paper, food and yard waste, glass, metals and plastic, all recyclable if we try.

Our ultimate goal should be as close to 100 percent as we can get, even though we know that's unrealistic. Just as we want doctors to try to cure 100 percent of their patients and teachers to try to educate 100 percent of their pupils, we should try to reuse 100 percent of our waste.

It is in trying that we fall short. We are for convenience and against compulsion. But the things we have to do to reduce and recycle waste are inconvenient and will probably not be done without compulsion.

We need to create incentives and make doing the right thing as easy as we can, but after that we need stiff penalties and tough enforcement when the right thing is not done.

We need to go to the trouble to create programs to recycle materials that are less easy to recycle: magazines, for instance, and all of the various plastics.

It is taking a Clean Air Act to get people to do what they will not do voluntarily to get clean air. It will take the same kind of compulsion to reduce solid waste significantly.

We say we do not like to force people to do things and forbid them to do other things, and yet we do that all the time. Imagine the chaos if our traffic laws were voluntary.

The fact that people do break the laws doesn't negate their value. People will probably try to beat any system which requires them to reduce and recycle waste or pay, just as people exceed speed limits or cheat on taxes. But overall compliance will be greater than with a voluntary system.

Commercial and industrial waste and waste associated with construction can be regulated more easily than household waste. It should become very expensive for businesses to throw things away now that there is no "away."

When it becomes less expensive to recycle, businesses will find the means to do so. In the meantime, the costs some of them will choose to pay can be used to subsidize County-wide residential recycling programs.

The cost of bringing recycling to multi-family housing is going to be very high. Trying low-cost voluntary methods like adding big recycling dumpsters and educating residents simply will not work and will be a waste of money and cause of discouragement.

You need only visit Elgin's McLean Avenue drop-off recycling dumpsters to see that unsorted recyclable materials are mixed with inappropriate ones even by people with the incentive to transport their garbage.

Tenants of rental housing, of which I am one, are accustomed to living with ugly and

unsanitary, all-purpose, 24-hour dumpsters in their parking lots. It is not at all unusual, however, to see people foraging in these dumpsters to collect cans for recycling.

As long as these dumpsters remain and people can throw anything in them anonymously or take anything out of them anonymously like the cans in the middle of the night or at any time if they wish, there will be no way to make people comply with recycling regulations, just as there is no way now to tell who is throwing trash near dumpsters instead of in them or even along roadsides.

I believe that it will be necessary to change trash collection systems radically, to hire people part-time even at minimum wage to monitor locked recycling areas open only at certain hours, perhaps early morning and evening, or perhaps trash should be picked up at doorways on certain days with no pickup for those who have not sorted their trash.

After all the reduction and recycling of waste that we know how to do is being done, there will still be something left.

Converting waste to energy is one option the County should keep investigating. Sending waste to a landfill should be a very last resort.

Kane County land is valuable in so many senses of that word. It is expensive. It is treasured for its beauty. It is a non-renewable agricultural resource formed slowly over thousands of years since glaciation. It is home to Kane's citizens and wildlife.

To use this land as a dump for garbage that should be recycled or produced in much smaller quantities is a waste of land, resources and money that we should all avoid. The costs of reducing and recycling waste are great in terms of effort and dollars but cannot approach the cost to the future of using up and inevitably polluting our countryside.

Kane's solid waste plan accepts as inevitable considerable future use of landfills and is planning for them. Let us see less resignation and more determination to

make alternatives work.

(Applause.)

HEARING OFFICER FOOTE: Thank you. Barbara Marquardt's statement will be taken as Exhibit 2 to tonight's hearings.

(The document was thereupon marked Exhibit No. 2 for identification as of August 4, 1992.)

HEARING OFFICER FOOTE: Is there anybody else that would like to speak tonight?

MR. VAN DYKE: Could I make a couple comments? I didn't fill out one of those sheets.

HEARING OFFICER FOOTE: If you promise to fill one out after you're done. Please state your name and your address.

MR. VAN DYKE: My name is Larry Van Dyke. I live at 42W612 Still Meadows, Elburn.

I just want to make a couple of comments on the individuals that spoke tonight.

Tom, as far as purchasing the land, going out and purchasing the land for a

landfill, I think economically it makes more sense to purchase it now rather than wait 10 years as far as if you do not use the land 10 years down the road, if you find some alternative technology, you're certainly not going to lose any money by selling the land again. Land does not depreciate in value.

If anything, you're going to make quite a bit of profit on it.

As far as destroying the groundwater supplies, there are other alternative methods, guarantees of Waste Management or some other such landfill operation. If they decide to choose to guarantee the safeness of the water, you don't have to bring a pipeline out to the residents. There are means of water purification within the home which can remove virtually any organic contaminant, any type of contaminant in the water if that should occur. There are --

UNIDENTIFIED SPEAKER: That's not true.

HEARING OFFICER FOOTE: I would ask that there be no comments from the people

in attendance. This is not a debate; it's a public hearing. So if you want to speak, you certainly can have an opportunity to speak. But otherwise please let the speaker go ahead and finish his comments.

MR. VAN DYKE: Composting -- there are grants available for composting. Right now we've had -- we have one pilot compost site virtually on our borders with DuPage County, and Waste Management also had a composting site that they decided to close because of problems with odors and whatever else.

I don't think that we have to try our own experiment just because somebody is willing to give us a few dollars to start up a composting operation.

With grants, it's been my experience that they fund you quite well the first year. The second year you might get some of that funding, a majority of that funding. And as time goes on, you get less and less funding. So that maybe by the end of five years, you'll have compost and no funding for it. It's just

not needed. Another composting site is not needed even if people give us money to do it.

Mike, I appreciate your concerns for saving the farmland. I think there's nothing I'd like better than to see this land remain the way it is right now, unchanged. I love to see the farmers work their land and keep it that way.

But 22 years ago I moved into DuPage County, and I stood on the corner of Army Trail and Glen Ellyn Road and I turned to the east and I could see civilization, let's say. I could see Addison. I could see Chicago. I turned to the west, and there were beautiful farm fields. I thought, "This is great."

You go and stand on the corner of Army Trail and Glen Ellyn Road now, and what you see is housing developments, shopping centers, thousands and thousands of people; no longer any farms.

My point is it's going to happen to Kane County. I would love to see the farmland stay here, but that's not going to be the case. If I were a farmer, given the option of selling

my land now or waiting 10 or 15 years, then selling it later, possibly to a housing development, I would choose the housing development. And that's going to be the way to go.

As I stand here tonight, I say: What would I rather have? I would rather see a landfill that has been converted into public lands, public use, than I would rather see a housing development. I don't want to see the houses. Ideally I'd like to keep it farmland, but I don't think that's being realistic.

Dave, I like your comments about using public lands for landfills. The only consideration you have to make when you use that is: What is the geographic lay of the land? What do we have underneath the soil? Is it suitable for the landfill? But I like that idea. I think it's a good idea.

Those are my only comments.

HEARING OFFICER FOOTE: Thank you, sir. Again, if you could fill out one of these so we have a record of everyone that spoke.

Is there anyone else who wants to talk tonight at this hearing?

(No response.)

HEARING OFFICER FOOTE: Thank you for your attendance. The next hearing, then, will commence Thursday, this coming Thursday, August 6th, at the Elgin Community College, again at 7:00 o'clock. And for tonight, then, the hearing is closed. Thank you.

(Which were all of the proceedings had in the above-entitled matter at the time and place aforesaid.)

STATE OF ILLINOIS)
) SS.
COUNTY OF KANE)

I, Nancy J. Hopp, Certified Shorthand Reporter No. 84-2005, Registered Professional Reporter, a Notary Public in and for the County of Kane, State of Illinois, do hereby certify that I reported in shorthand the proceedings had in the above-entitled matter and that the foregoing is a true, correct and complete transcript of my shorthand notes so taken as aforesaid.

IN TESTIMONY WHEREOF I have hereunto set my hand and affixed my notarial seal this 14th day of August, A.D. 1992.

Nancy J. Hopp
Notary Public

My Commission Expires
June 18, 1993.

"OFFICIAL SEAL"
NANCY J. HOPP
Notary Public, State of Illinois
My Commission Expires 6/18/93

EDKO'S THOMAS N. OSRAN'S SPEECH ON KANE WASTE PLAN:

The Kane County Solid Waste Plan is a dishonest sham. The Plan is nothing more than window dressing around a new landfill. It is the skimpiest, thinnest plan I've seen of any solid waste plans I've seen. The Plan also violates the law, the Illinois Solid Waste Planning and Recycling Act, in several ways.

While the entire Plan is a web of dishonesties and lies, the Plan can be boiled down to what I call "A Trilogy of Lies." You see, Kane County, unlike every other area county, has an abundance of remaining landfill capacity. So, in order to write a plan to give Phil Elfstrom a new garbage dump, Mielke had to create three basic lies. First, that Kane County residents are creating 55 percent of the garbage going into Kane dumps; second, that alternatives to landfills are vastly more expensive than landfills; and third, that landfills are a very cheap garbage disposal option. I will explore these lies later.

The biggest problem with the Plan is that it calls for the immediate acquisition of a new landfill when the plan clearly states that the County's current landfill will last 16 more years. Why? The plan doesn't say. That's another dishonesty. In fact, the plan itself totally fails to justify the immediate need for a new landfill. That's another dishonesty. Further, the plan calls for very little action, mostly study, on alternatives to landfills like recycling, reduction and composting, but calls for the immediate siting of a new landfill. (p.56) More dishonesty.

To make sense of these dishonesties, you have to realize first of all that the plan's author, Kane County bureaucrat Gary Mielke, wrote the plan. Mielke's qualification for this task is a bachelor's degree in Earth Science. Mielke, I'm sorry to say, is basically not competent to write a valid solid waste plan. Most Counties in the State use professional solid waste engineers draft their solid waste plans. DeKalb County, with one-third the population, is hiring a professional engineer to draft their solid waste plan. You know, just because I like to fly kites, that doesn't qualify me to

fly the space shuttle.

Now, this may seem like a small point -- using an imcompetent to write a plan -- but it's not. Throughout the plan, it's obvious to anyone with a professional background in Solid Waste that Gary Mielke has cooked the books, stacked the deck, in favor of immediately acquiring a new landfill. The Plan's immediate demand for a new landfill site of an unspecified size is done in a dishonest manner that no engineer would do. Mielke's plan has absolutely no scientific analysis supporting the call for a new landfill. Engineers don't do this because they understand that calling for a landfill without establishing the need for it is ridiculous. Engineers have their professional reputations at stake when they write a solid waste Plan. Gary Mielke can say anything he wants in the plan because he has no professional experience or credibility in this area. But somebody has to point out that the Emperor has no clothes: Gary Mielke is not competent to write a solid waste plan. And the plan that he has written is not a legal, valid plan.

Without supporting the need for the new proposed landfill, the language calling for a new landfill must be removed from the plan.

In short, the plan is a dishonest sham, but if you recall the history of the County's solid waste efforts, it's about as honest as we at EDKO expected. Remember, the County did not even begin working on the Solid WAste Plan until a court order forced the County to take no new steps toward siting the MEGA-DUMP until a Solid WAste Plan was written and submitted to the IEPA.

Here, a bit of history will help explain why the Kane Solid Waste Plan is such a dishonest sham. In April, 1990, with garbage czar Phil Elfstrom presiding, the Kane County Board illegally met in secret to discuss spending $30 million on a 2,000-acre MEGA landfill. Five landfill sites in Western Kane were discussed. Educated Disposal for Kane County later sued the County for violating the Illinois Open Meetings Act and the County agreed that the meeting was an illegal violation of the Open Meetings Act. The sites were

leaked to the press, and Educated Disposal for Kane County rapidly formed to ght the proposed MEGA-DUMP.

EDKO's was able to block the dump in a lawsuit by western Kane county townships and villages as plaintiffs. The suit charged that the County's proposed MEGA-DUMP was violating the Illinois Solid Waste Planning and Recycling Act because the MEGA-DUMP constituted an illegal solid waste plan. Before a judge could agree with our suit, the County capitulated, signing a consent order requiring that the County draft a solid waste plan before any action could be taken toward a new landfill.

So Phil Elfstrom and Frank Miller went back to the drawing board, and in 1990, hired Gary Mielke to write a plan that would get them their beloved new landfill. In short, to get the landfill, the County had to do a Waste Plan. So is it any surprise to us the new plan calls for a totally unneeded landfill? No. Gary Mielke was hired by Phil Elfstrom for one purpose only: to him his huge new landfill, whether its needed or not. And Mielke's done a good job for Phil, writing a sham plan for Kane Co. that calls for a new landfill of unspecified size without any justification.

Thus, two years ago, the County put the cart before the horse: they tried to get a huge new unnecessary landfill before writing a plan that would justify the need for it. And now, two years later, the car remains before the horse -- the proposed solid waste plan calls for a new landfill despite the fact that it is totally unnecessary (and the plan even says that it won't be needed until 2008). This is called a waste plan in reverse: the plan's starting point was a new landfill, despite the total lack of need for it. It's also totally dishonest. This plan was written around the landfill. It was written to fit a solution.

By the way, this waste plan in reverse also violates the law governing id waste plans. The Solid Waste Planning and Recycling Act requires that waste plans comply with Illinois law establishing a solid waste hierarchy.

The heirarchy states that landfills are the least desireable method of garbage disposal, recycling and waste reduction are the best. Waste plans are supposed to recognize this heirarchy and follow it.

THE TRILOGY OF LIES AT THE BASE OF THE PLAN

In order to justify a large new garbage dump, when its not justified under the Plan, Mielke had to create a Trilogy of Lies. You see, Kane, unlike all other suburban counties, has an abundance of landfill capacity: 16 years. First, that Kane County residents are creating 55 percent of the garbage going into Kane dumps; second, that alternatives to landfills are vastly more expensive than landfills; and third, that landfills are a very cheap garbage disposal option.

1. Mielke's first lie, that 55 percent of the garbage currently going into Kane dumps is from Kane County, is easily demolished since there is no scientific or mathmatical analysis in the Plan that supports such a high percentage of Kane waste generation. Mielke supposedly bases the 55 percent on an 1989 and 1990 survey for a few weeks done at Settler's Hill and Woodlands landfills. How were these supposed "surveys" done? What was the methodology? What numbers did they generate? How were those numbers extrapolated into the "conclusion" that 55 percent is Kane garbage? Nobody knows because Mielke doesn't include any data, facts or mathmatical calculations in the plan. Math was always my worst subject, but I remember from my high school and college algebra class that you had to show your work to get any credit for an answer. Since Mielke doesn't show his work, he shouldn't get any credit for his 55 percent answer.

Mielke admits in the Plan that these numbers are flawed, pointing out that summer surveys do not accurately reflect a year-round waste stream. (A-11-12) But, he says, the numbers were "seasonally corrected" to adjust for this. BUT HE FAILS TO SAY HOW the figures were corrected. What number was the seasonal correction? Mielke says the figure is accurate to within 3.8

ercent based on comparison to WMI's numbers but AGAIN HE FAILS TO PROVIDE E ACTUAL NUMBERS.

The reason Mielke didn't put the analysis in to support his 55 percent conclusion is because there isn't any analysis to support it. He picked a number out of thin air that would suit his purposes and he went with it. This is something I'm specifically asking Mielke to respond to in his reply: where is the analysis and documentation supporting this 55 percent figure. I submit it does not exist.

2. The second lie is that alternatives are vastly more expensive than a new landfill. While I do not support an incinerator, Mielke's Plan states that an incinerator would cost $94.6 million. (p. 35) Not only is this figure ridiculously high, it ignores the fact that many incinerator companies (like in Robbins) would build an incinerator for Kane County at ZERO cost to the County. That's right: many companies would be more than willing to build a ne County incinerator on their nickel, in exchange for a guaranteed waste stream from municipalities. The Robbins incinerator is being built with no local tax dollars but completely financed by the company proposing it. I'm not saying this because I'm in favor of an incinerator, I'm just pointing out the lies in the Plan. (There's also $7.7 million in "contingency" costs written into the composting system, and a few thousand written into the landfill costs.)

3. The third lie is that a new landfill would only cost $4-$7 million. This is based on several lies:

1. Land in Western Kane County costs only $1,500 an acre. (G-37)
2. That a 3-foot clay liner and sand and clay cap will be sufficient for the landfill. (G-35 & 37) That's wrong under Illinois law that went into affect a year and a half ago. (Mielke calls it "proposed" regulations.)
3. There will be no opposition during the proposed landfill siting hearings and thus legal and engineering costs will be low. (G-35) (No opposition? Where's Mielke proposing this landfill? On the Moon? The truth is re will be fierce, vociferous, continous and tenacious opposition to the ing and permiting of any new garbage dump in Kane County.

The Trilogy of Lies provides a backdrop for what Mielke wanted to accomplish: by closing Kane landfills sooner than in reality, overstating the costs of alternatives and understating the cost of a new landfill, Mielke attempts to justify the call for a new landfill. This Trilogy forms the basis of Mielke's attempted justification for a new landfill.

A further dishonesty in the plan is the internal inconsistency of it. For example, the plan states that alternative technology that may eliminate the need for a new landfill should be "monitored" and examined for the plan's five year update in 1997. But the plan calls for the immediate acquisition of a new landfill. Once the County acquires a new landfill, the economics of that acquisition, the huge cost, will require that the facility begin accepting waste in order to pay off the bonds. This will require a steady stream of garbage that effectively forecloses any possibility of alternative technology for Kane County such as an incinerator, recycling plant, an RDF facility, or a mixed waste composting facility.

Mielke's plan says the bonds will be paid for with revenue generated from landfill, but the plan says the new landfill will not be needed for 16 years. If the County buys the land now but doesn't build a landfill immediately, how will the bonds be paid off? The answer is, by opening the new landfill immediately, and accepting thousands of tons of out of County and out of state waste in order to generate the revenue to pay off the bonds. Also under the Plan, the new landfill will continue to take out of County garbage.

Mielke has said that the reason for immediately acquiring the site is to save the land from development. That's another lie. The County controls development in the area where a landfill would go. The County can stop any development it doesn't want by refusing to issue building and development permits.

Mielke has also justified the immediate acquisition by claiming that it

will save money to acquire the land now. This is another lie: the bonds will st the taxpayers a fortune in interest costs if the land is acquired and a landfill is not immediately built to pay off the bonds.

Acquiring the land now to save money is another big lie. Imagine how much money the taxpayers will save if after the 16 years left at Settler's Hill, we discover alternative technologies that eliminate the need for a new landfill? If that happens we save the taxpayers $20 or $30 million. Instead, Mielke is proposing a new landfill for the express purpose of killing any possibility of an alternative to a landfill. This is dishonest, plain and simple. Any person with an ounce of intelligence can see through the tissue of lies Mielke has weaved together in drafting this so-called waste plan.

What calling for a new landfill now really does is force the County to continue its past practice of accepting out of county waste for the purpose of making money. Kane County is currently a garbage prostitute, accepting lf out of county waste at the county-owned landfill. This is bound to continue if the language calling for the immediate siting of a new landfill is retained in the plan.

I would like to point out: I don't blame the current County Board, or the development committee, for the plan's flaws, the flat out lies. The County Board didn't hire Gary Mielke, Phil Elfstrom did. They are stuck with him just like we are. I do ask the development committee to correct the lies in the plan and remove the language calling for a new landfill since those provisions violate the law and a new landfill is not justified or needed. The County Board must edit the plan, change it, and take out the illegal, undesirable language in it calling for a new landfill. By doing that, they may save the County future legal fees in litigation over the Plan.

As I've said, the plan violates the Illinois Solid Waste Planning and ycling Act in several ways.

The SWP & R Act requires all sw plans contain, among other things, the

following:

1. "A description of factilities and programs that are proposed for the management of muny waste generated within the county's boundaries during the next 20 years, including, but not limited to their size, expected cost, and financing method."

2. Evaluation of environmental, energy, life cycle cost and economic advantages and disadvantages of the proposed waste management facilties and programs. Chapter 8.

3. Identity of proposed sites or method to select. Chapt. 9.

Are these elements in the Plan? The answer is No.

In support, Mielke says, see chapters: 3, 4, 5, 6, 7 & 8.

Chapter 3: Waste reduction programs that set no goals for reduction but merely call for educational efforts. No facility is proposed in chapter 3 for w reduction. But Mielke, empire builder that he is, calls for a "waste reduction staff" of 1 & 1/2 staff.

Chapter 4: Recycling programs include providing "technical assistance" to 8 communities without curbside programs, encourage existing programs, increase education, etc. No concrete program of any substance is requested. For ex, re construction waste: "conduct a survey" and "closely monitor" developments. On p. 24, "county should not consider devepmt of central processing plants but encourage private sector efforts in this area." No facility is proposed but Mielke asks for 2 & 1/2 staff increase for recylcing.

Chapter 5: Hazardous waste programs: pursue funding for pilot programs, monitor legislation, encourage and educate citizens, etc. No facilities are proposed in this chapter nor is any new staff requested.

Chapter 6: Alternative technologies: no new facilities are proposed only more study and monitoring of technology. Ironically, the plan not only does not call for a new facility, but states that "any future facility should be

controlled by the County." This is ironic given that the plan explicitly les out a new alternative technology facility. How can a new facility be controlled by the County when it doesn't want to do it? The real reason for the provision appears to be to rule out the possibility of a private operator opening up such a facility at no cost to the taxpayers. You would think the County would welcome that possibility. But Mielke's plan continues the County's committment to owning costly landfill facilities where Waste Management gets the huge profits and the taxpayers get stuck with the bills. Mielke also creates a curious "checklist of questions" to apply to alternative technologies. One question is what are the siting requirements and whether sites exist? Why isn't that question asked of landfills?

Chapter 7: Landfilling. County says 11 acres will last the County five years, but that involves the current Settler's Hill contract which requires 50 percent importation of out of county waste. That means 11 acres would last e County alone 10 years. This means the new landfill, if at all, to take care of the remaining 4 years left in the plan, should be 5 acres.

As far as compliance with the Illinois Solid Waste Planning and Recycling Act, the plan does not describe the proposed facility by size and cost. The Plan only says that with 47 percent recycling and an incinerator, "321 TPD" of landfill capacity would be required, with "full" recycling and a MSW composting facility 544 TPD of landfill capacity would be needed. When? The plan doesn't say. On Page G-33, yet another size is given: 300 to 1,000 "Tons Per Day." P. L-6 885 TPD

What is this "tons per day?" Solid Waste professional engineers tell me that describing a facility by "tons per day" is meaningless nonsense. No solid waste engineer would describe a landfill in this manner. When engineers describe landfill size they use the same word as farmers: acres. The only lid way to describe a landfill is by acreage. Remember, the author of the plan, Gary Mielke, has only a bachelor's degree in earth science.

Conservation Easements Committee, Illinois Sierra Club
Contact:: Barbara Marquardt, 1130-K Yew Ct., Elgin, IL 60120 708-741-6638

DATE: August 4, 1992

TO: Kane County Board Development Committee
Kane County Solid Waste Advisory Committee

FROM: Barbara Marquardt, Chair

Kane's Solid Waste Plan is a good one in many ways. Its goals are admirable and, if achieved, would represent a great improvement over current practices. Its percentage goals are over state requirements and are high compared to current percentages. But in making such comparisons we need to keep in mind that the Waste Plan's goals and percentages are quite moderate and our current wasteful practices quite immoderate. Ten years ago Denmark was recycling 60% of its waste; our highest target is 47.3%. That 47.3% takes into account practical considerations, and may even seem over-ambitious to some. But consider: 90% of all waste, according to EPA figures, is made up of paper, food and yard waste, glass, metals, and plastic, all recyclable, if we try. Our ultimate goal should be as close to 100% as we can get, even though we know that's unrealistic; just as we want doctors to try to cure 100% of their patients, and teachers to educate 100% of their pupils, we should try to re-use 100% of our waste.

It is in trying that we fall short; we are for convenience and against compulsion, but the things we have to do to reduce and recycle waste are inconvenient and will probably not be done without compulsion. We need to create incentives and make doing the right thing as easy as we can, but after that we need stiff penalties and tough enforcement when the right thing is not done. We need to go to the trouble to create programs to recycle materials that are less easy to recycle, magazines, for instance, and all the various plastics. It is taking a Clean Air Act to get people to do what they will not do voluntarily, and it will take the same kind of compulsion to reduce solid waste significantly.

We say we do not like to force people to do things and forbid them to do other things, and yet we do that all the time. Imagine the chaos if our traffic laws were voluntary. The fact that people do break the laws doesn't negate their value; people will probably try to beat any system which requires them to reduce and recycle waste or pay, just as people exceed speed limits or cheat on taxes, but overall compliance will be greater than with a voluntary system.

Commercial and industrial waste, and waste associated with construction, can be regulated more easily than household waste. It should become very expensive for businesses to throw things "away," now that we know that there is no "away." When it becomes less expensive to recycle, businesses will find the means to do so. In the meantime, the costs some of them will choose to pay can be used to subsidize countywide residential recycling programs.

The cost of bringing recycling to multi-family housing is going to be very high. Trying low-cost voluntary methods, like adding big recycling dumpsters, and educating residents, simply will not work and will be a waste of money and cause of discouragement. You need only visit Elgin's McClean Avenue drop-off recycling dumpsters to see that unsorted and unrecyclable materials are mixed with appropriate ones, even by people with the incentive to transport their garbage. Tenants of rental housing, of which I am one, are accustomed to living with ugly and unsanitary all purpose 24-hour dumpsters in their parking lots; it is not at all unusual, however, to see people foraging in these dumpsters to collect cans for recycling. As long as these dumpsters remain and people can throw anything into them anonymously, in the middle of the night, if they wish, there will be no way to make people comply with recycling regulations, just as there is no way now to tell who is throwing trash near dumpsters, instead of in them, or even along roadsides. I believe that it will be necessary to change trash collection systems radically, to hire people--part time, at minimum wage--to monitor locked recycling areas open only at certain hours, perhaps early morning and evening. Or perhaps trash should be picked up at doorways on certain days, with no pickup for those who have not sorted their trash.

After all the reduction and recycling of waste that we know how to do is being done, there will still be something left. Converting waste to energy is one option the County should keep investigating; sending waste to a landfill should be a very last resort. Kane County land is valuable in so many senses of that word: it is expensive; it is treasured for its beauty; it is a non-renewable agricultural resource formed slowly over thousands of years since glaciation; it is home to Kane's citizens and wildlife. To use this land as a dump for garbage that should be recycled, or produced in much smaller quantities, is a waste of land, resources, and money that we should all work to avoid. The costs of reducing and recycling waste are great in terms of effort and dollars, but cannot approach the cost to the future of using up, and inevitably polluting, our countryside. Kane's Solid Waste Plan accepts as inevitable considerable future use of landfills and is planning for them; let us see less resignation and more determination to make alternatives work.

Section II C

PROCEEDINGS OF PUBLIC HEARING

For The

PROPOSED KANE COUNTY SOLID WASTE MANAGEMENT PLAN

Conducted at:

Elgin community College

Elgin, Illinois

August 6, 1992

Note: Comments from this Public Hearing are referred to in Volume III. Response to Comments by numbering the comments of each speaker C-1, C-2, etc., in the same order as they appear in the index to these proceedings.

S30072.1

STATE OF ILLINOIS)
) SS.
COUNTY OF KANE)

BEFORE THE KANE COUNTY BOARD DEVELOPMENT COMMITTEE
AND
SOLID WASTE PLAN ADVISORY COMMITTEE

In Re the Matter of:)
)
KANE COUNTY SOLID WASTE)
MANAGEMENT PLAN)

REPORT OF PROCEEDINGS had and testimony taken at the hearing of the above-entitled matter before the Kane County Board Development Committee and Solid Waste Plan Advisory Committee, at Elgin Community College, 1700 Spartan Drive, Elgin, Illinois, on the 6th day of August, A. D. 1992, at the hour of 7:00 o'clock P.M.

PRESENT:

MR. ROBERT M. FOOTE, Hearing Officer.

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HEARING OFFICER FOOTE: Good evening. If I can have your attention for a minute, please, my name is Bob Foote.

I have been appointed by the County Board to be the Hearing Officer for these public hearings. There are four hearings. This is the third of four. These are the public hearings with respect to the Solid Waste Plan. The Development Committee set up four different hearings of four hours.

We certainly have enough time tonight for all the speakers who have signed in so far. I want to make sure everyone gets an opportunity to talk. At the four hearings you only get to speak one time, so if you have spoken before, you don't get to talk again.

This is not a debate forum. It is not like some public meeting where you go back and forth. The idea is for people to put their views out before the public. They are taken down by our Court Reporter, Linda, here tonight. They will be put together in a transcript and sent to the Development Committee, whose job is to respond to the

public comment.

So as part of the plan, the legislature invites the public to comment and to ask questions of people who put the plan together. They then respond to that plan in submitting the final version of the plan to the County Board.

So my job is to make sure that we get a nice, clean record, that people get a chance to talk and that the public and both the Development Committee and the County Board get a complete transcript of what happens.

Anybody who would like to submit to us anything in writing, I will accept anything in writing as part of the record.

Under the rules set up by the Development Committee, people can sign in to talk until 9:00 o'clock. So far, we haven't had a meeting that's lasted two hours, so if anybody wants to speak, please sign in on one of these forms.

The order of speakers is first we take people who have some expert knowledge about this and, after that, more general views from

the public. The only person tonight who signed up as an expert, reading through this, teaches environmental law, and I will recognize her as an expert, Joanna Hoelscher.

Joanna, when you come up here, could you please, as all witnesses, first state your name and your address so we have that for the Reporter and the records.

MS. HOELSCHER: My name is Joanna Hoelscher. I actually live in Elmhurst at 240 Highview. I am here this evening representing Citizens for a Better Environment. The address there is 407 South Dearborn, Suite 1775, Chicago, 60605.

Citizens for a Better Environment is a not-for-profit environmental advocacy group with more than 13,000 members in the northeastern Illinois area. CBE was one of the chief architects of the Recycling Act, and we followed with great interest the development of the solid waste plans mandated under that law. We have also served on the solid waste advisory committees established by the Lake, Will and Cook Counties, the South

Suburban Mayors and Managers Association, and the City of Chicago, and we have reviewed and commented on almost every solid waste plan that has been developed in the northeastern Illinois area. It is from that background and perspective that CBE makes the following comments on the proposed Kane County Solid Waste Management Plan:

As we read the proposed plan, it contains three basic elements: One, aggressive source reduction; two, recycling 47 percent of the County's waste by 1998 and, three, landfilling the rest. We find problems with all three.

First, while the plan indicates that the County is serious about source reduction, it contains no waste reduction goal, ostensibly because "waste reduction efforts are difficult to measure," quote, unquote. CBE acknowledges that it may be -- I'm sorry. CBE acknowledges that it may be impossible to quantify waste reduction as precisely as recycling or landfilling; however, it can be measured.

For example, one of the proposed plan's waste reduction recommendations is to

encourage a volume-based approach to solid waste services. The Village of Lisle measured the results of its volume-based garbage rates by simply comparing the amount of garbage picked up the year prior to implementation with the amount of garbage recovered the year after. The missing elements, which range from a low of 6 percent to a high of 46 percent, depending on the month, was attributed to source reduction.

Thus we believe that if the County is as serious about waste reduction as it says in the proposed plan, a goal will be established, and we are sure that as the County examines trends over time, it will be able to determine if implementing its plan recommendations is achieving that goal.

As Appendix B of the plan indicates, most estimates of waste reduction's potential range from 1 to 10 percent. Since reduction at the source is at the top of the alternatives, we would suggest a goal of at least 10 percent.

Second, while a 47 percent recycling goal is certainly attainable by 1988, the proposed

plan does not lay out a strategy for achieving it. In fact, our analyses of the, quote, "division potential for recommended recycling programs," which is in Table 4.1, Page 19, indicates that the proposed recycling scenario contains several major flaws.

First, the 47 percent recycling goal includes credits for recycling 100 percent of the County's yardwaste; yet the authors of this plan should have known that the Illinois Environmental Protection Agency only allows recycling credits for yardwaste that is collected and used as compost or land applied. Since the County's own data suggests that at least 60 percent of all landscape waste generated within the County was managed on site in 1990 to '91, we can conservatively assume that at least that amount will continue to be source reduced and not available for recycling credit in the future.

Subtracting an equivalent tonnage from the County's estimated recycling goal reduces that goal by 8.1 percent. Should the County's proposed public education program be

successful and additional yardwaste is managed on site, the recycling credit for this category would be lowered still further.

We believe the County's goal of recycling 75 percent of its construction and demolition debris is also unrealistically high. Most of the solid waste plans we've reviewed include at most a 15 to 20 percent recycling goal for C and D waste, and since the proposed plan contains nothing to indicate that Kane County will take any extraordinary measures to ensure achievement of this exceedingly ambitious goal, we believe that a reduction from 75 percent to no more than 20 percent is appropriate. Again, subtracting the equivalent tonnage reduces the County's overall recycling goal by another 7 percent.

The result is a 32.2 percent recycling goal which, while it still meets the State's 25 percent minimum requirement, is significantly lower than the 47.3 percent recycling rate the County would have us believe it will achieve. Further, reaching even this 32.2 percent level will require that

all of the other recycling recommendations in the proposed plan are fully implemented.

Yet there is very little in the plan to assure us that the County is, in fact, committed to making any of its plans on source reduction or recycling a reality. While the plan indicates that the County will provide such things as encouragement, assistance, public education and other forms of general support, there is neither "carrot" or "stick" to actually ensure that local communities and businesses will cooperate with the County and do their part.

And since the County appears to have rejected the idea of a Municipal Joint Action Agency, which is the option most planning areas have chosen, the County has limited authority to actually carry out the recommendations in the proposed plan. The County could, of course, commit to implementing some of its recommendations by simply stating in the plan that it will fund them, for instance, by providing the proposed waste audits at low or no cost, or it could

provide financial incentives that would encourage participation in the County's recommended programs, such as differential waste disposal fees for communities and businesses that recycle. However, the plan contains no such commitments. In fact, it contains very little concrete financial information at all.

The County does indicate that user fees, revenue bonds and federal grants will be used to fund, quote, "all future facilities and programs," unquote, while County surcharge funds will be targeted to, quote again, "overall planning activities, waste reduction recycling programs and general administrative costs," unquote. However, few specific dollar amounts are attached to either the various programmatic elements or administrative costs of the plan, and there is no indication of the potential dollars available from the sources of revenue that are cited.

Interestingly, the plan refers to something called "accrued solid waste enterprise funds" that could be used for land

acquisition and predevelopment engineering costs, but it does not indicate the source or the amount of this accrued money. We assume that it comes from either the County's share of the profits from the Settler's Hill landfill or the County surcharge. In any case, there should be a full public accounting of how much money has been accrued to date and how much is anticipated in the future.

There should also be some explanation of why these accrued solid waste enterprise funds seem to be reserved exclusively for the development of new landfill capacity, rather than source reduction or recycling programs, particularly when there is no evidence presented in the proposed plan to justify the contention that additional capacity needs to be sought now, which brings us to Point No. 3:

It seems clear from the information in the plan that Kane County has a minimum of 11 years of in-County landfill disposal capacity virtually guaranteed, even if it does nothing to restrict the out-of-County waste that is currently using up nearly half of its existing

disposal capacity each year. Thus we disagree completely with the plan's recommendation that the County, quote, "immediately obtain siting and permitting approval for the expansion of Settler's Hill Landfill," unquote, as well as additional land disposal within the County. Not only is landfilling the option of last resort under Illinois waste management hierarchy, but expanding so significantly now could preclude consideration of more benign technologies later.

If the County is seriously concerned about ensuring sufficient disposal, we believe it should be negotiating with the operator of its landfill now to restrict out-of-County waste, as DuPage County has done. We fail to see any reason why this or any other measures aimed at extending the life of the County's existing landfill capacity should wait until future land disposal facilities are developed, as the plan suggests.

In addition to restricting out-of-County waste, the County could also help preserve its existing capacity and use its ownership of the

landfill to show that it's serious about implementing some of the plan's recommendations by encouraging recycling through the differential fee structures that were referenced earlier by prohibiting recyclables from being landfilled or even restricting access to the landfills to communities and businesses who do not carry out their responsibilities under the plan.

So not only is there no demonstrated need, but we believe a more thorough analysis of alternative technologies will show that composting the organic fraction of the waste stream, coupled with aggressive, implementable source reduction and recycling programs, could eliminate the necessity of considering additional landfill disposal capacity until well into the next century.

Instead of establishing a siting committee to help find additional landfill capacity, we believe that the County would be better severed by immediately establishing a committee to evaluate nonburn, nonbury technologies.

While the County did engage a consultant to evaluate municipal solid waste composting, the resulting report focused almost exclusively on mixed municipal waste composting, which we believe is unduly expensive and inefficient. It also produces a compost of questionable quality.

The alternative which CBE believes is the most promising involves composting the nontoxic organic fraction of the waste stream, in other words, yardwaste, food waste and soiled paper, commonly referred to as green waste. Together these wastes comprise about 50 percent of the waste stream; and, again, combined with an aggressive and implementable source reduction and recycling program, they should be able to handle 85 percent of the waste stream.

In Fairfield and Greenwich, Connecticut, a recent demonstration project aimed at testing so-called wet/dry collection systems, which are an essential component of green waste composting, resulted in 40 percent of the residential waste being collected for

recycling and 30 percent for composting. These results are particularly significant because they do not include leaf and yardwaste, which normally comprises another 15 to 25 percent of the waste stream.

Similar green waste projects are underway in a number of other communities across this country. Experience in Europe indicates that green waste composting is clearly preferable to mixed municipal waste composting because the resulting compost has significantly lower concentrations of heavy metals which can over time contaminate groundwater because the soil's ability to safely bind heavy metals from compost eventually deteriorates.

In conclusion, we appreciate the opportunity to comment on the proposed plan and hope that staff will take our suggestions and our criticisms into account in revising the plan before it's submitted to the County Board and ultimately the IEPA for approval.

We are submitting for the written record a number of additional comments on source reduction and recycling elements of the plan.

Thank you.

(Applause.)

HEARING OFFICER FOOTE: Thank you, and we will accept your written statement as Exhibit 1, Joanna, for tonight's hearing.

(The document was thereupon marked Exhibit No. 1 for identification as of August 6, 1992.)

HEARING OFFICER FOOTE: Next is George VanDeVoorde.

MR. VAN DE VOORDE: Good evening. My name is George VanDeVoorde, Mayor of the City of Elgin, and I am here to speak tonight on behalf of myself and the entire Elgin City Council.

I am going rise and speak in support of this draft of the Solid Waste Advisory Committee. I just have a very few points to make.

It seems apparent that the Advisory Committee has worked for well over two years in reviewing and revising material generated by the County staff and nationally recognized

expert consultants in the field of solid waste.

The composition of the Advisory Committee in the planning process provided the opportunity for various points to be considered on the solid waste issues. The process was fair and representative. We were somewhat impressed by those people that served on the committee.

We concur with the plan's finding that the County take all necessary steps to assure future landfill capacity as available for solid waste management generated in the County which requires disposal, only that part that requires disposal.

We concur with the plan's recommendation that the County should initiate a selection -- site selection process for future facilities as soon as possible following the adoption of the plan. A site selection process for a solid waste facility should begin immediately, and the acquisition procedures for the site should be in accordance with the Advisory Committee's final recommendations.

We would also encourage the Kane County Board to take an aggressive approach in working with the IEPA units of local government to provide for a systematic approach for disposal of household hazardous waste. We further urge the County to site and develop facilities capable of handling yardwaste and the composting of leaves.

Finally, we would like to thank the subcommittees of the Kane County Board, particularly Mr. Bus and Mr. Mielke, for providing us with a well-thought-out development and management plan for solid waste.

Thank you.

HEARING OFFICER FOOTE: Next Steve Rauschenberger.

MR. RAUSCHENBERGER: I would like to pass the opportunity and speak at Burlington.

HEARING OFFICER FOOTE: That's fine.

Gary Miller.

MR. MILLER: I am Gary Miller. I

am the assistant director of public works for the City of Elgin. I am here not to repeat what Mayor VanDeVoorde stated, but as a representative of the Council, also, following a meeting on July 22nd when the draft plan was discussed at a work session meeting.

I was asked to reiterate some of the comments, but also to emphasize the process since I had been involved with the City of Elgin through the public works department implementing garbage collection plans, yardwaste collection, curb-side recycling, leaf -- Citywide leaf collection program, household hazardous waste involvement.

The process that is being followed now is similar to what the City undertook back in '88 and '89 when the Mayor and Council appointed a 21-member advisory committee on solid waste alternatives task force. That group met for over eight months every two weeks.

We did site visits. We had representatives come in and speak. We considered incineration, refuse, dry fuel. We went to Madison, Wisconsin. We went to

Waukesha, Wisconsin, to an incinerator, the point being that the same process was implemented by the City of Elgin. A series of recommendations were put forth to the Mayor and Council. They were approved.

And in the last three or four years, we have slowly but surely implemented a plan and followed those recommendations, so the process works. We are in support of the process and the results of this draft program.

Relative to the household hazardous waste, I want to take it a step further and suggest that we not be limiting ourselves to simply a once a year or a couple times a year program for household hazardous waste. We believe that that's the first step.

Elgin submitted an application to the Illinois EPA to conduct a household hazardous waste collection day in Elgin. We have yet to be selected. We hope to be selected next year; but we think the long-range plan should include an ongoing program, not only for the City of Elgin but the County, to provide an opportunity to residents to dispose of that

material on an ongoing basis. We think that will happen, but we would encourage the County to include that as part of the plan.

Relative to yardwaste and composting, the City of Elgin got into the leaf-burning issue many years ago, and for the last seven or eight years, our public works department has conducted a Citywide leaf collection program. We are committed to that; but because of problems with the location, to handle both the volume of leaves that we would pick up in a given year, we went with a backup plan, for lack of any other nearby facilities, and developed our own compost facility for leaves only, about a seven-acre site. But we would encourage the County to look at composting relative to leaves on a Countywide basis to avoid the duplication of those types of facilities.

Multi-family recycling is an issue to help meet some of the goals that have been presented in the draft plan. We would like to see some leadership and funding from Kane County to help implement some of those

programs to get everyone involved.

Elgin -- the last I checked, we are about the seventh largest curb-side recycling program in the State. Now we have changed -- more and more programs coming on line, and it may have changed. We think in order to meet those goals, we have to get into the apartment complexes with planned unit developments, and we would like to see some County involvement along those lines.

One other aspect of the plan that would hopefully be addressed on the County level is to try to come up with plans or programs and funding that hopefully can be standardized or generalized so that the different communities can follow along and thus avoid some of the confusion that the residents and the general population experiences. They read articles or they see publications relative to what the City of Elgin is doing with the recycling program, for example, or how we deal with yardwaste or grass. People in perhaps South Elgin or East or West Dundee or Algonquin that might read the paper tend to get confused as

to what they are supposed to do with their programs or municipalities, so we are looking for perhaps leadership and guidance and some consistency to make it easier for people to follow throughout the County.

Basically, the Council has indicated that the plan is sound and that it provides a reasonable approach for the future, but we would hope those other items could be incorporated into that plan.

(Applause.)

HEARING OFFICER FOOTE: Ed Kelly.

MR. KELLY: Thank you, Mr. Foote. My name is Ed Kelly. I am executive vice-president of the Elgin Area Chamber of Commerce, a position I've held for 15 years.

I was also a member of the 20-member Kane County Solid Waste Plan Advisory Committee, which met in the morning at 7:30 for two years, twice a month, sometimes more often. We submitted to the Kane County Board for their consideration a solid waste management plan for the next 20 years. This plan was developed, as I said, over a period of two

years.

These 20 individuals I think bent over backwards during this two-year period to be fair, to allow all points of view to be heard, and gave careful consideration and examination, I believe, to every concern. Every alternative technology suggested was carefully evaluated.

I want to point out that the 58-page document that was referred to the other night is not the plan. It's only the summary of the plan. There is a Volume II, which is about this thick, a three-ring binder, this thick with all sort of reports of consultants and mathematical computations and all sorts of information.

(Indicating.)

There was also a careful report published on waste management reduction, solid waste technology plans.

Now, the point I am trying to make is: For those who are going to comment in opposition to the plan, I think you have got to read all the material. Frankly, everything

I have heard at another hearing I was at. When I read in the paper -- I don't think most people opposing the plan have had the opportunity, put it that way, to read everything before one forms an opinion.

Let me quote from the executive summary of the solid waste management plan, Volume I:

> "During the planning process, numerous strategies and technologies for waste management were studied. Environmental and economic impacts of each potential approach were assessed. The plan recommends a comprehensive solid waste management system consisting of extensive waste reduction and recycling programs, further monitoring and evaluation of alternative technologies and additional future landfill capacity."

I think this committee was very open-minded. We recognized that things can change in the future, new technologies must come along. We must constantly update this

plan and remain open-minded at all times.

I want to point out that additional landfill capacity was listed last in the hierarchy, not first. Extensive waste reduction and recycling programs are listed first.

We understand the hierarchy. We understand the importance of doing everything we can to have independence on any future landfill programs.

I would like to also point out -- I don't think there is any expert in the country that can refute what I am going to say -- that there isn't any guarantee at this time that current recycling goals can be met at as a high level as has been alluded to earlier, or that any affordable, effective and dependable technology will ever be offered that will negate the need for additional landfill capacity. I am not saying it won't happen, but at this time I don't think that statement can be made. So in my opinion, there is always going to be a need, based on what we know now, for some kind of additional landfill

capacity.

With the exp. sive growth that's occurring in Kane County and the growth that is certain to com. over the next 20 years, we must begin the pr ess now of finding a suitable new site not building a landfill now, finding a si . This growth is not happening just on e urban fringes; it is occurring in a ho scotch fashion all over Kane County. Sel contained mini villages of 500 to 1,000 acre sing the land-application method of sanitar ewer disposal have been approved. Others ve made application for approval. More w surely follow.

If we let too ch time go by, it will be impossible to find suitable site because development patter in western Kane County, for example, can m e it impossible to find one. I urge the e County Board to begin immediately the lo and arduous task of defining criteria picking new landfill sites and the iden ication of a suitable location or locati to meet our needs for the next 20 to 50 rs. We must begin

planning for new additional landfill capacity in Kane County so by the time we need it, it is available; and if we don't need it, we don't use it. That is called leadership.

Thank you.

HEARING OFFICER FOOTE: Thank you, Mr. Kelly. Your statement will be marked and accepted as Exhibit 2 to the hearing.

(The document was thereupon marked Exhibit No. 2 for identification as of August 6, 1992.)

HEARING OFFICER FOOTE: Next Mike Lullie. If you could state your name and address, please, when you start for the Reporter. Thank you.

MR. LULLIE: Yes. My name is Mike Lullie. I live at 8N081 Eckingham Lane, which is in Plato, Elgin mailing address.

I would just like to stay, to start with, I am really appalled at what I just heard from the three people from Elgin. I can't believe that Elgin -- these people would tell me that -- if I wanted to build a house in Elgin, I

would have to go in downtown Elgin and get a permit. That permit would want to know all the specifications and what I had to have for my home. I would have to have size dimensions. I would have to have inspectors, the whole ball of wax.

Yet these three gentleman just told me we can build a landfill; we should get a landfill, build it and don't ask how big, what size. Should we make it 1,000 acres, dig a hole of 1,000 acres or should it only be one acre?

They would not allow me to do that in Elgin. I would have to have permits. I got to have all the specifications. My God, I got to have inspections. I need all of that.

I know why Elgin wants that landfill for 20 years. The Mayor and the City Council is looking for a place to dump garbage for 20 years. I can understand that. They are going to have garbage for the next 20 years; there is no doubt about it. But they do not at this time need a 20-year landfill. They need four more years. That's all they need. Then they

will have met the State requirement for 20 years.

They already -- they have a level. That's provided the acreage at -- Settler's Hill is approved for the landfill. Then they would have 16. They would only need four more years.

Now, who would go out, build a landfill or acquire property for 20 years of landfill; and then two years from now, five years from now, we have technology that we no longer need it. You better believe if they get a landfill for 20 years, somebody is going to fill that landfill, and it's going to be Waste Management. They are going to fill it. Whether it is Elgin's garbage, Kane County's garbage, New York's garbage. Somebody's garbage is going in that hole because there is too much money involved not to. There is too much money involved not to.

I think Mr. Kelly has very highly underrated the genius and the brilliance of the American people to say he does not believe that anybody will come up with a way to get

rid of garbage.

I believe they will. We are the greatest country in the world. We have always led. I think somebody -- there is somebody right now maybe just being born or that will come up with a way to get rid of garbage. We have gotten to the moon, we have done many, many things that they said could never, ever, ever be done. We have done it.

I don't think we need 20 years' worth of dump and then find out that, boy, we shouldn't have done that.

Our children may clean up Settler's Hill.

They tell me how clean it is. It is being monitored. That's like flying in a jet plane with a net under you. Why do you need the net? It is safe. Why does Settler's Hill need monitoring? It is safe. That's what they are telling us. It's safe.

Tri-County was safe they thought once. $12 million of taxpayers money to clean it up.

You and are I going to pay for that. Our children and grandchildren may pay to clean up Settler's Hill; maybe they won't.

Mr. Kelly said "maybe." I will say maybe they won't, but maybe they will, and the law of average says they will because most of the landfills in the country have at one time or another had problems with leakage and pollution. Once our water table is polluted, once it is polluted, we are never, never going to clean it. You are never going clean it.

I don't think we should take the chance for 20 years' worth of landfill. That's a long, long time. That's a very long time.

In closing, I would like to say I would hope for one time -- well, one other thing: The forest preserve seems to have plenty of money to spend. They are always buying property. Things were never cheaper. Buy now while they are cheap. Maybe we better look into technology other than putting garbage in the ground. The ground has told us many times, "I don't want it. Get it out."

In closing, I would like to say I hope our County Board is smart enough to leave and do something different than just continue to bury garbage because it has not worked. It

hasn't worked.

You know, there are three kinds of men in the world -- and women, I might say; we are in that age -- there are those that watch what happen, those that ask what happened and those that make something happen, and I hope the County Board is smart enough to make something happen other than burying garbage.

Thank you.

(Applause.).

HEARING OFFICER FOOTE: Loretta Hatch.

Please give your full name and address.

MS. HATCH: My name is Loretta Hatch, 45W103 Ramm Road, Maple Park, 60151.

It's been implied that the response of the people who oppose the County's plan to site a landfill has been too emotional. The fact is this is an emotional issue. The County has developed a plan that not only will destroy prime farmland, but also poison the water and air that sustains us.

It also has been said that landfills are safe. That simply is not true. All landfills

leak toxins, and all emit poisonous gas, both of which contribute to increased risks of birth defects and cancers in children and adults.

Many of us have been lifelong residents of Kane County. Some have moved away and then returned because of the beauty and serenity of this area. Many more are moving here to find that beauty, only to find that the County is proposing a solid waste plan that will destroy what took millions of years to create. All that for what some may say are economic reasons.

Economic for who? Who will pay to clean up the water and air? Who will pay for declining property values? What will happen to the great move westward and all the tax dollars that will be lost by destroying the attraction to western Kane? For who wants to move to the dumping capitol of the Midwest?

We must wake up and realize that by adding 11 acres to Settler's Hill, its life will be extended by five to seven years. That, added to the 11 years left at the

current site, gives our County plan -- gives our County a plan nearing the 20 years that State law requires. Just imagine how long our current landfill would last if we limited it to Kane County garbage alone. 60 percent longer, as that is the amount of garbage we now except from other counties.

Does our County really think we need more landfill space or to plan for decades past the 20 years that Illinois State law requires? Or is it that this plan has been developed to benefit a multi-billion-dollar company that claims to manage waste?

Our County must take it slow. Plan for the 20 years as State law requires. Follow the State Solid Waste Management Act recommending that landfills be the last resort, not the first choice for solid waste disposal. Stay open to the options that rapidly developing technology will offer.

It is the legal responsibility of the Kane County Board to develop a solid waste plan for 20 years. It is their moral and ethical responsibility to develop a plan that

will preserve the environment for all its citizens, present and future; for without a safe and healthy environment, nothing else matters.

(Applause.)

HEARING OFFICER FOOTE: We will receive Loretta Hatch's written statement as Exhibit 3.

(The document was thereupon marked as Exhibit No. 3 for identification as of August 6, 1992.)

HEARING OFFICER FOOTE: Michael McGuigan.

MR. MC GUIGAN: Close.

My name is Michael McGuigan, address 4N515 Pin Oaks Lane in Maple Park.

I do not have any prepared remarks, but I do want to speak to a couple different things.

One of the first things I would like to see is the Article No. 9 of the contract between Waste Management and the County renegotiated. I think the County Board has done a disservice to the citizens of Kane

County in that particular article. It shows that there must be a certain minimum amount of waste deposited in the waste fill or we are going to be charged for the difference.

I think even if Kane County residents achieve significant reductions in their waste, this particular clause is going to be a great disincentive for waste reduction. I think that this needs to be addressed fairly soon so we can get on with some of the other areas of waste reduction that I think are very important.

One of the areas that concerns me quite a bit, I think, is the fact that we are importing over half of the solid waste into Kane County from other areas. I wonder why. Why are we accepting solid waste from other areas? If we were to limit the two landfills we have now to strictly Kane County waste, the length of time available in our landfills would be significantly extended.

I find it a little hard to accept sending, let's say, yardwaste over to DuPage County and then having them send us toxic

waste in return. To me that's just not a fair trade. I don't like that at all.

Under Section 4.3 of the implementation strategies in the plan, there are a number of different adjectives describing what should be done in the implementation stage. If you will bear with me for just a moment, most of them are prefaced by "support, establish, encourage, survey, develop, encourage, promote, evaluate, encourage, develop." Nice words. They don't really mean a whole heck of a lot.

In my opinion, there is too much encouraging and not enough mandating by the County Board. I would certainly like to see the County Board take a leadership role and tell people that this is what they have got to do. You have got to start to recycle. There are things you have not to do. Don't just talk about it.

We do need some leadership.

The plan talks about a 47 percent recycling rate by 1998. Why is it 47 percent? Why isn't it higher? I would think with the

technologies that we have and are going to develop, 47 percent is going to be actually a fairly low number.

Over in Europe -- somebody mentioned Europe a little earlier. The European community has a goal of 90 percent rates of recovery in ten years for packaging and for paper products. If they can do it, why can't we do it over here? 47 percent is a good goal, but I think it is far too low.

We talked earlier a little bit about landscape waste recycling. If I understand things correctly, we do send a fair amount of this over to DuPage County. I would like to see a landscaped waste facility near Kane County. I think we should be able to do our own work instead of sending it out and having to bring in something from some other County.

Thank you.

(Applause.)

HEARING OFFICER FOOTE: Thank you. Marti Jernberg.

MS. JERNBERG: My name is Marti Jernberg, 1163 Fairwood Drive in Elgin.

I don't have any prepared remarks. I want to comment on a few things I heard here tonight.

The plan that has been developed in Kane County is a 20-year plan, as mentioned before, and it states there is 11 years left of the landfill. This is an optimistic goal. The Illinois Environmental Protection Agency estimates the whole State of Illinois will run out of landfill space sometime between 1996 and 1999. That is not 11 years, so we have -- we have that to look at. We have to realize that the State is going run out of landfill space, and Kane County is going to run out of landfill space.

There are things that can be done, yes. We can improve the recycling. We can take care of yardwaste and some of these other things to make the landfill space last as long as possible; but with the development in Kane County as it is, it's far better to choose the land now and set it aside and save this as a potential site.

We are not saying develop it now, but buy

the land, set it aside, say that this is a potential site, so that people moving into that area are aware of it, and they know that land is set aside for it and they are ready to deal with it. Far better to do that than to wait for ten years and then decide we need a landfill space and then try and purchase the land and have the kinds of problems that they have around O'Hare every time they try to expand O'Hare with the people there complaining because of the noise and all of that kind of thing.

Some other things: All of the estimates. All of the experts say that no matter what technology is used at the current time, everything ends up in something being landfill, whether it is recycling, whether it is incineration. No matter what it is, a certain amount still is left to be landfilled.

Yes, it is on the bottom of the hierarchy. That means merely that we look at those other things first. We do as much as we can in the other levels and then turn to landfilling, and we probably will not get away

from that in our lifetimes, in spite of new technology. And, yes, it is a wonderful thing and we probably will find all kinds of new things happening, but we will not get away from it completely.

My final comment has to do with the statement that I just heard about the European goal of 90 percent reduction. The reason that it can be done there and it can't be done here deals in our lifestyles. If you look at the European communities, the products, things like that, they don't have the kinds of packaging we do. They don't have the kinds of stores we have. People carry their own bags to the grocery store most of the time. They don't expect to be handed a bag when they leave, and they also shop in small amounts at one time.

We cannot compare goals there and goals here. It just -- if we are planning on changing our lifestyle back to where we shop three and four times a week, which I don't think I could handle too easily -- so it's great they are looking at that and, yes, they

have some things that they can do that we cannot do.

But we have to be realistic about what we have. We have to look at our own lives and realize that if we are going to live in the 20th Century and put out -- have all the wonderful conveniences we are used to, we are going to have to pay the price. One of those prices dealt with how we are disposing of the waste we create. We have to look at it realistically and realize we are creating the waste. It is not them that is creating the waste; we are all creating the waste.

Each one of us in Illinois creates about five pounds of garbage every single day, and it has to be dealt with in some way. Yes, we can recycle some of it, we can compost some of it; but in the end we are going to be left with needing landfill space always -- or at least probably within our lifetimes -- and so we have to look at that realistically as well and see that now is a good time to look for the land.

Maybe it won't be needed in 10 years or

20 years, but at least the land is set aside, and people know that that's what it is going to be used for. It seems to me that's a far wiser thing to do than to wait until we are absolutely running out of landfill space and then try and site it when we have housing developments all around the County and not the space to put it where it wouldn't severely impact homeowners.

Thank you.

(Applause.)

HEARING OFFICER FOOTE: Marry Byrne.

MS. BYRNE: My name is Mary Byrne, 2145 Sycamore, Hanover Park, 60103.

I am president of Citizens Against the Balefill, and I feel that my seven-year battle against the proposed Bartlett balefill and the Solid Waste Agency of northern Cook County enables me to address the problems with the County's Solid Waste Plan.

But first let me commend the County for making some good solid recommendations for waste reduction and for doing it in just 58

pages, quite unlike SWANCC's multi-thousands of pages.

The recycling, re-use, waste reduction -- all good and all necessary to solid waste management. However, nowhere did I see anything about source reduction, and that's where it all begins. Emphasis needs to be made on addressing source reduction in order to carry out a true waste reduction program. While the recommendations are good, the plan itself lacks substance and technical data.

The plan speaks of achieving a 47 percent recycling goal, yet the predominant factor throughout the whole plan is the need for a huge landfill site. Now, if you need a huge landfill site, you will need a lot of garbage for that landfill. If you are seriously trying to remove every usable, recyclable and salvageable item from the waste stream, it is obviously going to cut down on what is left and totally unusable. Therefore, it is illogical to think in terms of megadump when it should compute to needing less space. With waste-to-energy and solid waste composting

being new and viable technologies, archaic landfilling should be the choice of last resort.

Every day somewhere in the world new technologies are being developed. Today's Daily Herald tells how Germany is turning plastics back into oil. Recycled tires have been turned into irrigation hoses and used successfully. These are but a few examples.

Why does the County limit itself to 47 percent recycling, and why do they continue to lean on the crutch of another landfill?

The County is putting the cart before the horse in pushing to secure a site, a push citizens can determine as landgrabbing of their fertile pastures. You are never going to achieve maximum recycling and waste reduction with the attitude that you will always need a landfill.

And I must take exception to a remark quoted in the Courier-News by Geneva Alderman Paul DesCouteaux. He is quoted as saying, "The landfill is not the end of the world. Most of the things we put in the landfill come

from the earth."

I am not a scientist, but common sense tells me the components going into landfills are not the same components we have extracted from the earth. And God help us all and protect us from this mentality because if we continue to pollute the earth and our groundwater with another garbage dump, it will hasten the end of our world.

While the citizens of Kane County are fortunate that the County must follow the SB72 process, quite unlike Cook County, which is exempt, they should not be lulled into passiveness thinking the Illinois Environmental Protection Agency will protect them from all the evils of landfilling. The IEPA is nothing more than a garbage-permitting agency and does so knowing it will pass the buck to another agency when the dump starts leaking and contaminating groundwater.

Historically, all landfills leak; it's just a matter of time.

It's time for the County to kick out the crutches they have all been leaning on and

stand on their collective two feet and become a leader in new technologies.

Do form your committees. Do involve the residents, the ones to be most impacted by a garbage dump. Do listen to them; you may learn. And do the let the buck stop here.

Thank you.

(Applause.)

HEARING OFFICER FOOTE: Mary, for us and for the Reporter, can you give us your written copy of your statement?

MS. BYRNE: Sure.

HEARING OFFICER FOOTE: We will mark your written statement as Exhibit 4.

(The document was thereupon marked Exhibit No. 4 for identification as of August 6, 1992.)

HEARING OFFICER FOOTE: Philip Heitz.

MR. HEITZ: I didn't bring a written statement. I have in my hand here a copy of a newspaper article I thought was rather interesting.

My name is Philip C. Heitz. My address is 7N416, Route 31.

The reason I brought this newspaper was because of the fact that it had a very interesting article here on Monday, August 3rd, in the Chicago Tribune. This is the northwest section on groundwater and how it may cause a flood problem, and I thought it was rather interesting because, in fact, guess where that groundwater comes from?

They are also talking about basements being flooded in the area of Kane County from the rising water levels, the water table, and the reason the water table in the ground is rising is because we are not using as much groundwater as we once used.

But it states right here in this article that according to groundwater hydrology that water coming from west of Kane County flows towards Kane County, and that water level is rising to the point that it is actually going to be flooding into people's basements.

I think that it becomes rather obvious that you are going to dig a hole in the ground

in an area where the water table is so high it will flood basements, and you are going to put garbage in there, and that garbage is going to leach into the groundwater system, and it will definitely spread from the west to the east, no matter where you put it. To the west of it, it will head up Kane County, and it has got to go through us first.

I think to put a dump in the ground is an ill-advised idea by today's technology standards. We used to bury our garbage 200 years ago. I think by today's standards we can come up with a better view.

The only reason I came to speak tonight is because of the fact I would like to make sure that all other considerations are taken as to options to avoid putting in a landfill as a method of disposal of our trash.

Thank you.

(Applause.)

HEARING OFFICER FOOTE: John Basic.

VOICE: He will be right back.

HEARING OFFICER FOOTE: Ted Thull.

MR. THULL: My name is Ted Thull,

T-H-U-L-L, 41W897 McDonald Road, right next to one of the megadump plan sites.

So I am -- I'm kind of following this a little bit, but I never knew about all this planning that some of these illustrious gentlemen referred to in their Elgin meetings. They have been obviously doing a great job of planning how to get rid of their garbage next to me, and I am a NIMBY; I don't like it.

I thought we were going to really have a meeting here tonight that was going to explain whatever that new thing is. Instead, it is comments from all of us that really don't know a whole lot about what is going on.

So anyway, I just wrote down a couple comments now, and I want to know: Getting back to those meetings that they were talking about that they had in Elgin around the other places, were any of my neighbors invited? Were any of my neighbors there, any of the people that probably have to deal with the actual siting of these garbage dumps?

I am not aware of anybody that has been to them or know anything about it. It's only

-- they are only patting themselves on the back for how good those meetings were. People like myself who have to stare at and smell it probably wouldn't agree with you, no matter how well-intentioned they are.

Your intentions are to get rid of your garbage in my back yard, and that's what I said before that. I would like the opportunity to also say that I would endorse also the thought that we not have anybody else's garbage coming into Kane County. Let's use Kane County for Kane County people and forget about the extra dump tipping fees that we get from out-of-County dumpers.

Talking about the water that someone just spoke about, I can almost see the garbage floating out of the garbage dump now headed for Elgin. That sounds good, but I don't know if that would really happen.

The main thing is that I have -- my water comes from a well, like anybody else that lives out in the boonies, and we were once the super boonies, and then we were the boonies, and now we are getting a lot of people around

us. For years I had no neighbors except Tuffys. Then Tuffy moved, and that was the end of it. I have houses around me now.

But Hartman still has that pig farm across the street, and I would rather have pig smell than garbage smell.

VOICE: There you go.

MR. THULL: I am sure they are still looking at it and saying, "This is a great place to put a garbage dump," for their garbage. Certainly my garbage has to go somewhere, too, but you know what? The little bit of garbage that we have left after recycling I can take care of on my own property. I don't really need to ship it anywhere.

I just read a small article as I sat down here, and it talked about one of these plans had to do with guarantees for us that would have to look at the garbage dump that we wouldn't lose our property values.

As soon as this marvelous thing comes in here, I want out. What could I buy to replace my home after the depressed value from the

garbage dump sitting there? I probably couldn't buy a whole lot; at least not live in the way I am currently living, which I think is pretty nice.

And that's going to be done. That's going to be gone with these things coming out by us.

And I want to know where is the guarantee that they said in that article that they were going to reimburse us? I would really like to see that in writing someplace with everybody getting a written signature of everybody and anybody that's involved in charge of placing these dumps.

One other thing that we have to consider is the amount of truck traffic that's going to hit our country roads. It is going to destroy our country roads and increase the taxes that keep those country roads up. They are going to have to rebuild a lot of those roads after use. They are going to have to rebuild and make other roads wider to accommodate the traffic. It is going to be incredible, the amount of truck traffic we are going do see

out there.

Again, the people in the City that are going to ship all their garbage out to us, they are not going to have to worry about it. We are going to have to worry about it. Again, I am opposed to bringing in all the garbage out by me.

And last of all, I would say to those of you who are proponents of getting a proposed site now and having it all ready in the hopes we wouldn't use it, which is very phony -- you know as soon as they get it, they will start using it.

I would say to all you proponents of this that my home, which is a very nice home, and the land that it is on is very nice property. I invite you to purchase my property right now at the current going rate, and if that's the case, if you will do that, please put your garbage dump there then.

(Applause.)

HEARING OFFICER FOOTE: John Basic. I have two more people that have signed up to talk after that, so if there are any

more, if I could have the forms now. Thank you.

MR. BASIC: My name is John Basic. I live at 41W202 Whitney Road, west of St. Charles.

I am a citizen of Kane County. I have been here, starting next year, 30 years. I raised a family out here. I am a graduate of IIT back in 1947. I am an engineer.

I got involved in the County program about June 3, 1990, when I saw the newspapers discussing the various solid waste plans and costs which I thought were astronomical, so I started to write a report on my own, gave it to the County, the full County Board, and I also sent it to the new chairman. I never even heard "thank you" or "I received it" or anything.

This was a plan that said if you use the basic solid waste spoiler technology, you can spend $1 a month per capita to get rid of your waste, a very reasonable figure, I thought.

Now, I believe the plan takes everything into consideration. I honestly believe in

source reduction, recycling, composting, energy recovery and landfill. I believe there is a place for all of it in some places, some areas, some types of packaging, some types of living conditions. You are going to get different variables, and no one thing works everywhere. You are going to get a crowded urban area. You are going to get a nice country area. You have different conditions of what you can do, how you can store your waste and how you can recycle, how you can compost.

I spent 22 years in the solid waste program. I spent ten years with the ASME research committee on municipal and industrial waste. I feel I know a little bit about the field.

I hold patents in 35 countries in the world. I have over 800 patent regulations on clean combustion.

On April 2nd of this year in England, there is a plant that's going to burn 1 million tires every month in five of our systems. It is going to be the cleanest power

plant in the world, cleanest one in England and in the world. They are going to generate 26 million watts every hour with it.

To give you some idea of the cleanliness of this combustion technology, you take a diesel truck -- modern, not the smoky -- drive one hour down the road with, let's say, the solid waste, one hour, 55 miles an hour on a nice highway. You burn 11 gallons of gasoline or diesel. That weighs probably 90 pounds. He will make as much carbon monoxide as we will make burning 9 tons every hour for 18 hours straight. That's the difference in the combustion technology between that diesel engine burning only 90 pounds.

So I feel, mainly as a citizen, taxpaying citizen, I offered my services in any way this committee and the board would like to use it.

Not an answer. I was disappointed. And that's why I spoke here now.

(Applause.)

HEARING OFFICER FOOTE: Joe Zakosek, please.

Joe, could you spell your last name for

us?

MR. ZAKOSEK: Z-A-K-O-S-E-K.

HEARING OFFICER FOOTE: Your address?

MR. ZAKOSEK: 52770 Old State Road.

And for Mr. Kelly's information, I did read the Solid Waste Management Plan. It says so right there.

I am 15 years old and a sophomore in high school. My view on the Solid Waste Plan is of the future. My generation and I will be stuck with the decision made and will have nothing to do with process.

The first step taken in solving Kane County's waste problem should be recycling this plan. As with any solution, a combination of things is better than any one solution. That's why I think the plan should include the five following things:

No. 1, source reduction. People and businesses should be educated to purchase the products with the least packaging. This benefits the purchaser in two ways: No. 1, the consumer pays less without the unneeded

packaging; secondly, it will cost less to dispose of less material. Sarber Manufacturing saved 47 percent on waste disposal costs.

HEARING OFFICER FOOTE: Let me interrupt for one second. We want to make sure we get all this down for the County Board, so take your time and speak a little bit louder for the Reporter. Okay?

MR. ZAKOSEK: No, 2, recycling. Recycling should be made mandatory with benefits for the recycler. The person who successfully complies with the program should have a substantial discount on his monthly garbage bill. This is a better system than the pay-by-the-pound method because many people will try to reduce the volume of garbage by putting it in an industrial dumpster or by burning newspapers, et cetera, which is not the way we want to achieve our waste output reductions.

Also, people who give old clothes, shoes appliances and other reusable items to organizations like the Salvation Army and get

receipts should also get further reductions in the monthly garbage bill.

The Council should also buy recycled park benches, et cetera, thus giving a market for recyclables in the area.

My third point is composting. Composting should be utilized because it is an easy way of getting rid of yardwaste and food scraps and other organic degradables. This way takes the least energy of anything and is highly usable.

I have many times walked by and drove by the DeKalb Disposal Composting site and noticed no odor. This proves that if done correctly, composting has no adverse effects on the surrounding communities such as the horrible stench. This form is worth any start-up costs.

No. 4, incineration and energy recovery. An incinerator with scrubbers should be built adjacent to the two existing operating landfill sites. With recycling and added scrubbers, air pollution should be minimal because harmful uncombustibles have been

removed. The incinerator should be built to handle present garbage rates. As recycling, source reduction and composting starts to reduce the garbage loads, one can shut down for an overhaul and also mine the old existing portions of Settler's Hill & Woodland's Landfills, thus reducing their volume and adding much needed life.

These facilities will also help out -- help cut operating costs at the landfill sites by cutting electricity costs by powering the needs of the site.

No. 5, landfill. A new landfill is not needed if the above outline is followed. If the available acreage at Settler's Hill is used and is maybe even expanded a little bit more, the new facility is not needed. The same should be followed at Woodland's Landfill. The plan says a new landfill is not needed until 2,008, so why do we need a new landfill now? Let's wait and use alternatives and see what we need in 16 years.

The above is just a brief outline, which includes many things working together, each

taking care of its own type of waste. As mentioned above, old landfills can be mined to recover resources -- I read it in a Popular Science; I am not sure what date or anything. Many things do not decompose well in landfills such as paper, food wastes, plastics. They are kept from sun, water and air, all things which are needed for decomposition.

As any person who took any type of chemistry class knows, matter cannot be destroyed; it can be changed, recycled and sometimes depressed. Garbage is a matter, too. It won't disappear if we bury it; it will be there for many generations to come.

Who knows? After the human race perishes, an alien race could come to Earth and see the great earthen temples built to the Garbage Gods.

Thank you

(Applause.)

HEARING OFFICER FOOTE: Lori Brown.

VOICE: She will be right back.

HEARING OFFICER FOOTE: Owen Trimble.

MR. TRIMBLE: My name is Owen Trimble, 8N660 Crawford Road, Plato Center, about a mile from the dump. I am a NIMBY.

Is there any age requirement for the planning committee? I would like to see that guy maybe be on that committee, because he is our future.

Nobody wants landfills, even the existing landfills. People of Geneva do not want to see it extended 11 years. Nobody wants landfills, but everybody creates an irresponsible amount of garbage, burying our natural resources and forgetting about the future impact. We had what I call the public viewpoint of garbage.

Many of us are ostriches. We bury our heads in our own responsibility, and what we need is to get away from that concept.

It is our responsibility to be educated, to educate the people to promote various other products, recycling, composting, incineration, and so on. Promote individual responsibility, community responsibility, and there won't be any need for these megadumps.

Landfills have been around since the caveman. It is the 20th Century, not the dark ages.

Groundwater quality has been mentioned before. Water ground -- groundwater does flow from west to east. Any interested people -- I believe the panel that developed a committee should maybe contact Layne Western. They are a well drilling company, I believe, based in Aurora, do various testing, core samples at the various dumps and other unsafe or potentially hazardous waste areas. It might be interesting to see what our present safe dumps are doing to our groundwater.

Here I'm -- let's see. Here is where I am getting very negative, and personally I feel that this concept plan is a Rube Gulberg. For those who may be interested, Rube Gulberg in the early part of this century created a cartoon strip using complicated machines to accomplish the simplest of tasks. As a cartoon, the outrageous, intermediate, unnecessary machinery and theoretical cost is hilarious, which was part of the humor.

Nobody could believe the complicated machinery that could ever create -- that could ever be created to confound the user into achieving the simple task.

Every one of us is responsible for our own garbage, but out of site, out of mind. It is somebody else's problem.

Tonight it is our problem. If a megadump is promoted, I think we will be a regional, territorial, national dump.

Good night.

(Applause.)

HEARING OFFICER FOOTE: Lori Brown.

MS. BROWN: I'm sorry I was gone when you called my name. I had to check on my little girl who isn't feeling well.

My name is Lori Brown, Jackson Street in Gilberts. I am also a student in environmental studies at Northeastern Illinois University.

I am here to speak about the proposed landfill, but I do not want to take a not-in-my-back-yard approach.

There are many reasons why I believe we

should not have a landfill in Kane County, and a lot of them deal with a problem we face on a national, global level. Landfills produce methane gas, warming the atmosphere. One molecule of methane gas can contribute as much as 25 molecules of carbon dioxide.

Also in 1991 world population grew, yet we have the best agricultural land in the world, and we should be proud of that. I believe that we can find a much better purpose for agricultural land than using it to store garbage.

The third reason that I have here is that all landfills leak. It doesn't matter. The best ones say they are lined with plastic on the bottom. Although plastic does not biodegrade, it becomes brittle and cracks. All landfills leak; is only a matter of when.

I also read something about that incineration was being considered as an alternate method. We have to realize with incineration that it takes the chemicals in the products we use and concentrates them. The ash has to be disposed of in a landfill in

a powder form.

When rain water leaches down through the landfill, it picks up all sorts of things, including lead from newspapers, chemicals that we use in our houses, and all these things eventually enter our groundwater when the plastic liner cracks. When ash is in a powder form, the rainwater leaches these chemicals quicker from them.

I realize that Kane County's desire is to set up a fund to help compensate adjacent land owners for property damage in particular groundwater contamination. But my question is: So then how much money are they going to have to put aside to really do that right? I don't believe that they can put aside enough money to compensate people for property damage like that. We don't even know how to clean up contaminated groundwater, if it can even be done. That's money they would have to put in for something like that.

It also says that the County intends to write it as a business enterprise. You will never make enough money short term to outweigh

the economic liabilities that you will incur in the future. 50 years after this landfill closes and toxic chemicals start leaking from it, is there any money left in that fund? I want to know: Then who will pay for that? And I believe it will be my children. They may pay for it with their taxes or with their health.

If we site another landfill in Kane County, the only thing we are doing is pouring the agony of switching over to new waste disposal methods. I believe there are several things that Kane County can do to improve our waste reduction programs.

There was a study done in Jersey to find out how much people could recycle if they wanted to or if they had to, and I was pretty shocked to find out that the amount they achieved was 84 percent recycling rates.

Also a township in New Jersey has a 57 percent recycling rate. Massachusetts recycles 41 percent of their garbage.

And it's rather surprising to me that Kane County only has 47.3 recycling percentage

in the year 2000 after we will have much more technology. I believe that recycling should be mandatory in Kane County.

I realize that there aren't a lot of programs right now. Some places have curb-side recycling, but a lot don't. For rural residents, for people that don't have them yet, I believe they can be made to bring their garbage to township collection stations. If they have the means to get the garbage, they have it the means to bring it back where it can be disposed of properly.

Also by the year 2000, 7 percent of our waste stream is expected to be food waste. These can be composted by the home in people's back yards.

Seattle has a corps of volunteers that go around and help people set up home composting operations, and I believe that would be a good idea for Kane County to get involved in.

Also, going back to the mandatory recycling, we should also have fines for noncompliance and enforce them. It doesn't do any good to have a plan and not enforce it. I

believe that with a waste reduction program with mandatory recycling and with the future technology that is expected to come about that we can reduce a need for any new landfill in Kane County, including the proposed addition to Settler's Hill landfill in Geneva.

Thank you.

HEARING OFFICER FOOTE: Cheryl Osran.

MS. OSRAN: My name is Cheryl Osran, O-S-R-A-N, Cheryl with a C. My address is 423 Briar Place, Chicago.

If you wonder why I am here from Chicago, it is because I grew up here. My parents are here.

I am an EDKO board member, active for the last couple years.

My parents own a farm out there in what we call Dumpville in the western part of the County, and it is a real beautiful part of the County.

I am glad to see there are a lot of public servants here, there are a lot of board members here, and I know the board members get

really tired. They get about as much criticism as we do, and I am glad to see them here.

I understand what it means to be a public servant. My husband is one, my father is one, my grandfather was a public servant. And I think it is a tough job, and I think you are in for a lot of criticism; but I think really, giving you the benefit of the doubt, even though I disagree with some County Board members, I think they are doing the right thing and try to do the right thing.

But I think we have a problem here in that they always don't get the right information to base their decisions on. I know when you are the member of a school board or a county board or any other kind of a public board that what you need is good, accurate information. Public bodies routinely ask for advice, and they need advice. They couldn't possibly be experts in every subject. They need advice from lawyers, from accountants, from engineers, real estate appraisers and every other kind of expert.

Regardless of what comes up, they need advice. They also depend on their County staffers.

I think one thing that we can talk about is that when it comes to budgets and financial analysis, budgets are routinely submitted for audits. Everybody understands that. The numbers have to work. They have to go to CPAs, independent, outside auditors, and those numbers have to add up because the County needs -- the County and every other public body needs good numbers and reliable information. That's only sensible. Every business does that. Every government does that.

In the same way I think this Solid Waste Plan should be submitted for an audit. We at EDKO are not experts. We are a little more educated.

About 60 days ago, we got this plan, and we have all read the plan. Some of you haven't read the plan, but we have heard it backwards and forwards. We handed it over to two teams of experts. I am going to let those experts speak for themselves.

We turned it over to two sets of engineers. One set is people from the University of Illinois. One is a professor of solid waste engineering, who is also an expert in statistics and impact analysis. The others are two graduate students, also registered professional engineers, and we also turned it over to another consulting firm, a very outstanding firm in Kane County, and they have more than 50 experts from every discipline on their staff. They will be presenting probably at Central High School, I believe, their findings.

The engineers -- what we learned was -- I will let them talk for themselves, but I will give you a summary of what we found out so far; that these engineers -- that this plan -- I am digressing here.

This plan should be audited by about four different disciplines: Engineers, CPAs, lawyers and environmental experts.

Finally, it should be looked over to see if it makes any sense for the County to do its plan. The County -- that's who we had them

look over.

Our professional expert, certified public accountant, did look it over to see if it made sense financially, also by private attorneys.

The County depended on Gary Mielke, who is their solid waste coordinator. There are a couple problems with Gary Mielke. For one thing, he is not a professional engineer but a bureaucrat. He has a BS in earth science, but the County had to base their decisions on something. That's why I don't believe the County Board or the Solid Waste Advisory Committee -- I feel they got incorrect information from Gary Mielke.

The other problem with Gary Mielke is that he was hired by Phil Elfstrom. He was hired by Phil Elfstrom to write a plan to justify this new landfill.

I am going to submit this exhibit. It is from an April 12, 1990, County Board meeting in executive session, in violation of the Open Meetings Act. It says in here that this is -- quoting Phil here, it says, "A Solid Waste Plan will be needed to go along with the

siting of a new facility."

A landfill planner needs to be hired to put the board decision into a plan. That's what he had to do. They already decided to have this big landfill of undetermined size, but they had to find a planner to write a plan to fit around this new landfill, so that's what we have now, no surprise.

Another one that they needed was that the landfill legally has to comply with the Solid Waste Management Recycling Act, and the purpose of that act was to reduce our need for landfills, and to do that, we are supposed to comply with the solid waste hierarchy, and the solid waste hierarchy says we are supposed to do everything else first and reduce our amount of garbage going into a landfill.

This plan is clearly in violation of that act because it says, "Let's get a landfill first and do everything else later." It is a landfill -- it is a waste plan in reverse.

Also, according to State law, it's supposed to name the size and the site of the landfill. The exact size and site of any

proposed facility is supposed to be included in the plan. Instead, Mr. Mielke says that the site and size will be determined in the future. He talks in vague generalities about tons per day. That's the only size we hear about, tons per day.

When we told the engineers about it, they laughed. They laughed. They thought it was so funny they laughed and laughed. When they stopped laughing, they said, "This number is meaningless. Landfills have to be described in acres and exact depth and height."

So I think it is kind of ludicrous because everybody says, "Let's get this land now because we are going to have this landfill, but we don't have figures to decide how many acres we should get or when or where."

It is like trying to buy a car. Let's pretend -- we talk about tons per day, all these millions, and most of us can't relate to millions. We don't deal in millions.

Let's say you are trying to buy a car, and Mielke is the car salesman. He says, "I

want to sell you a car."

You go, "Okay. Is it a big or little car?"

"I don't know. I can't tell you."

"What model is it?"

"I don't know."

"What about the mileage it gets?

"Real good mileage, good miles per day."

I am like, "Miles per day? Per day? What about miles per gallon?"

"Miles per day, it gets great mileage."

"What about payments?"

"Payments are so much a month."

"How many months?"

"We don't know yet."

"What about how long is this car going to last?"

"Well, I don't know yet. That depends, but you should buy it because the cost of this car is going up every day, so you should buy this car."

So here we have this hypothetical car we are supposed to buy. How many of us if we are going to make a purchase would buy a car if we

don't know anything about the car?

That's what they are asking the County to do here. They don't want to name the size, the site. Why not? Name the site. They did all this work last year. Why don't they name the site?

In McHenry -- I made some phone calls. McHenry has a site. Everybody knows what the site is. You can walk in the County building any time, and there it is. It is 53 acres. Only for McHenry County, will take 560 tons a day, lasting 20 years, and it is going to cost $30 million.

Compare the statistics on this site: double clay liner, plastic liners, two leachate collision systems. Everything is right there. Everybody knows what is going on in McHenry County.

Here, according to Mielke's plan, he says in our landfill, our hypothetical landfill, we don't know where it is or how big it is going to be. Is going to cost $4 to $11 million. The land is only going to cost $1,500 an acre. Right there you know it is hypothetical

because where is he going to get land for $1,500 an acre in Kane County?

He said there is no cost for opposition to the landfill. I can't understand that.

He said we are going to have a three- to five-foot clay liner with the clay available on the site, but we don't know where the site is. Where is this site?

He said we don't need any insurance, but what landfill doesn't need insurance?

He talks in his plan about everything except the landfill that is going to be in Kane County. He talks about landfills in Massachusetts, Minnesota, Illinois. I don't know which one is in Illinois. Where is the one we are going to get? Where is it and where are the numbers for that landfill?

Okay. Financially here is another one from CPAs we talked to. They are going to give their reports. They said that it is very interesting because we have heard this over and over and over again. We should buy this land now because we might need it in the future. It is only going to get more

expensive.

I wonder if he will accuse us of not reading the plan. Do they know how they are going to pay for this? What does the plan say? The plan says that it's going to be paid for by revenue bonds. Where are you going to get revenue? Does anybody here who said we should buy the land now -- did anybody read that? Where we are going to get the revenue to pay for this is by opening it and taking any dipping fees, opening it up not in 16 years, but immediately.

Here is another point that everybody makes: No matter what we do, we are going to still need a landfill. We have already got two, and by the year 2000, we are going to have two more landfills in every other County in northern Illinois. Why should we build a third one, so other counties can shift their garbage here and plight our County?

We are currently importing almost 60 percent of the garbage. That's a travesty. This out-of-County garbage is something that is of concern. Everywhere we go, people are

upset when they found out.

A couple years ago, the County Board passed a resolution and Phil Elfstrom said the new landfill is Kane County garbage. That's wonderful, except it all didn't work out. Back then we took that information to an engineering expert at the Illinois Institute of Technology. He's a professional witness who thinks dumps are wonderful; the bigger, the better. We had all configurations. An attorney in our group met with him, and he said, "I want you to figure out, Mr. Landfill Expert, how long this landfill would last if it was only for Kane County garbage."

He took a long time and did all his calculations and finally got back to us, and he said -- guess how long this landfill would last if only for Kane County, considering everything, population projections, everything? 1,500 years.

So I am glad our County Board is thinking ahead, because who knows in 1,500 years what we would be doing with our garbage. I was really glad to know that.

So anyway, they passed this resolution limiting it to Kane County garbage. Now comes along this plan, which I read backwards and forwards, and so have the rest of us, and it leaves the door wide open to taking out-of-County garbage.

On Page 40 of this plan, it says, "We will take garbage from any County that takes in an equal amount of our garbage." That's nonsense. Legally, it is a joke. It's totally unenforceable.

I heard a gentleman talk about it. He said that we send DuPage yardwaste, perfectly harmless yardwaste. If people want to bring that to my property, my parents' property, we will be glad to take it any time.

What do they send us? They send us special hazardous waste, chemical polymers from Amoco Oil Company. Nobody knows how that is going to affect the groundwater. That's what goes to Settler's Hill.

I notice there is somebody from Amoco on the Solid Waste Advisory Committee, and he thinks it is wonderful we are getting a new

landfill. No wonder.

Also from a couple years ago, they sort of sneaked this in. We went from all these promises, that we are going to be Kane County's regional solution to a regional problem. That's what it says in this plan here.

Here the County Board passed this resolution limiting a proposed new dump, but Mielke's plan calls for a regional dump.

I have knocked on doors all over Kane County and never found anybody that is happy about this. They are all outraged. They think we should limit outside dumping here.

McHenry County needs only 53 acres for 20 years, and they have no dump now. They export everything. All we have to do is have a plan; we don't have to have a landfill. Nowhere does State law say you have to have a landfill. You just have to have a plan. Your plan could be to export your garbage to the moon. All it says that is you have to have a plan.

Another gentleman here mentioned about

the landfills by the year 2000. All the current landfills that are cited today and operating in northern Illinois will be full; but here in Kane County, according to the statistics we have now, including taking 60 percent imported waste, both of our dumps are good until the year 2008.

So why are we planning a third dump, so all these other counties can dump here? Is that what we want to do? Is that the future we want for Kane County?

The goal of the Solid Waste Management Act is to preserve landfill space because landfills are so dangerous. I have heard a lot of people say this, "All landfills leak." Where does that comes from? The U.S. EPA. They all leak. They eventually all leak. That's why nobody wants to live near them. Who would want to live near a landfill?

What I would like to know is: When did we decide to go into the garbage business for money, because business involves two issues: revenue and risk. Why did we decide to go into the garbage business for money? Do you

know who goes in the garbage business for money? The poorest communities in the United States. They sacrifice the health and welfare of their citizens to put in an incinerator.

Why can't we do better than that in Kane County? Can't we think of a better revenue generator than pollution?

You've got to think about the quality of life here. People talk about Kane County's developing. Who is going to want to move here if we are known for being the biggest landfill in northern Illinois or one of the biggest landfills in the United States?

But we don't know because in this plan it doesn't say. It doesn't say it's 50 acres, 500 acres. It doesn't say it's a thousand acres, and we are supposed to buy this thing that no one will describe. We are supposed to commit ourselves on something we have no information on. We have no information on the cost, on the location. Why not?

I really think this plan makes our County into what I call "garbage prostitutes." It's going to use up all our natural resources,

taking garbage from our County.

And what is going to be left in the future? The garbage companies will go down the road and find other people to be toxic chumps because we will be all used up, and who is going to want to move here?

And it will affect everybody in Kane County; financially, our water supply. It's going to affect the quality of life. It is going to affect traffic on our roads. Everybody, one way or another, is going to pay for this.

One thing that is a very big concern to me is polluted water, and I -- somebody gave this to me today about the landfill near South Elgin, how their people are worried about their water being polluted. And that's something really serious to worry about.

I think we better remember who polluted that landfill and made it the mess it is today.

People at Waste Management and people down at the Kane County seem to like to be involved in this incestuous relationship with

the worst polluter in the United States.

Waste Management will not clean up Tri-County. They refused. The taxpayers have to do it.

Why does the County, then, want to go into business with them?

Settler's Hill. People on Settler's Hill hate it. All you will hear about is a model landfill. People around there hate it; knock on their doors. Nobody wants to live near a landfill.

If it's so wonderful, why isn't everybody clamoring to live there? If it is so great, why don't we all move and put it on a golf course. It's not a wonderful place.

Tri-County is one of the most polluted areas in the United States. The U.S. EPA has what's called the super funds list. It is a list of the 1,200 most polluted sites in the whole United States. Right here in South Elgin, Tri-County is 347. 347.

Do you know what that is? It is 100 numbers higher than Times Beach, Missouri. That is nothing to be proud of.

One of our experts told us, who is going to be talking at Central High School, to invite everybody, especially County Board members, to come out.

I was interested to hear what this gentleman said that talked about the groundwater running west -- east because we had a hydrologist mention that to us a couple weeks ago.

A lot of people that we meet immediately put you on the defensive. I am confused. It is the solid waste calling us NIMBYs. We have an answer. What about the people that want a landfill? Do you know where they want it? Anywhere not near them. That's where they want it because -- I would like to know if anybody here wants to give up their home to have a landfill move in and wreck their neighborhood. Stand up right now. Does anybody want to do that? Is there any volunteers here to do that? I don't see them. I have never had anybody do that.

Also the County must be concerned about the adverse effects of this landfill. On Page

50 it says under mitigation and host community benefits: "Groundwater quality control program guarantees the provision of adequate water supplies to adjacent homeowners if contamination occurs."

How will they guarantee? Do we have to get a class action and sue the County? How much is the property worth if we have polluted water? Are they going to put a pipeline out to Virgil? Are we going to get coupons to buy bottled water? How are they going to do that? It's not spelled out anywhere. Why should we go for that?

Finally, we always hear this business of all these alternatives. "They won't work. They won't work. They won't work." What a bunch of nay-sayers.

I would like to know how many people drove here in a car more than 20 years old tonight. Did anybody? How about your TV? How about your camera, your computers? Are any of them 20 years old? Would you go to a doctor that uses technology from 20 to 30 years ago?

Of course not. It's ridiculous. We are a leader of the free world. You wouldn't dream of using old technology, but landfills are old technology that don't even work. All we hear about is, "We can't try anything new. We have to keep on polluting because we don't know what else to do."

There is nothing great about landfills. Landfills don't work. Landfills pollute. We have plenty of evidence. We have mountains of it.

So I am going summarize here; our experts will go over all the details.

I am not an expert, but Mielke's plan flunked this audit. It didn't meet the requirements of the law, it didn't meet standards of engineering. Financially it doesn't work because the landfill would have to be paid for by tax revenue or by revenue bonds. That means it would have to open up immediately and generate revenue and take in vast amounts of out-of-County garbage.

And public policy? What about public policy? Is that our policy, to import vast

amounts of garbage for money?

You know, as I said earlier, a public servant is a tough job; I understand that. But you have to depend on somebody to give you accurate figures, so I don't blame you. I don't blame you Board members. I don't blame members of the Solid Waste Advisory Committee. What do you know except what is given in your staff meetings? You don't know.

I think what is really important here is somebody has to stand up. I blame this fiasco on Mr. Mielke because he is just another bureaucrat.

If you look at Page X in the front of this part of the plan here, you will see that he wants to -- he came out with this plan that doesn't meet the standards of any professional audit, and the County has right now a $900,000 budget deficit.

Mr. Mielke, typical of most bureaucrats, wants to hire three more bureaucrats and a secretary. By the time he hires all these people and sends everything out to consultants, he is not going to be doing

anything. You know, he is going to be costing the County a lot of money, and what does he put out? He puts out reports that don't pass. We could have saved a lot of money by getting rid of him and sending it to a professional engineering firm on a contract basis. It was just a stupid way doing it.

We have to remember his goal was to site a landfill. That's why he was hired by Phil Elfstrom. He was hand picked by Phil Elfstrom. That's what we got.

HEARING OFFICER FOOTE: Could you close for us, please?

MR. OSRAN: Finally, I would like to say that he flunks not only these other tests, but the test of common sense. If landfills are so great, how come no one wants to live near one? I never met anybody that wants to live near one. The people that do live near them complain about everything, the water quality, the noise, the smell. They can't stand it. All the neighbors are complaining.

If you want to knock on doors in

Tri-County or Settler's Hill, listen to all the complaints. If landfills are so great, such a great deal, why isn't Waste Management going out and buying their own properties and taking all the risk themselves? No one is stopping them. Go out on the open market, and buy property right now. Why are they waiting for Kane County to condemn the land for them?

You know why. Liability. That's why. Because Waste Management wants to get most of the profit and leave the liability. They want to leave the liability to the taxpayers. It is something that becomes very expensive. Liability, especially water pollution, lasts forever and ever.

Thank you.

(Applause.)

HEARING OFFICER FOOTE: Thank you. We will mark your written statement as Exhibit 5.

(The document was thereupon marked Exhibit No. 5 for identification as of August 6, 1992.)

HEARING OFFICER FOOTE: Is there anyone else that wants to speak tonight? Last chance.

(No response.)

HEARING OFFICER FOOTE: The hearing is closed then for tonight and is continued until August 11th at Burlington Central High School at 7:00 P. M.

Thank you for coming.

(Which were all the proceedings had and testimony taken in the above-entitled matter at the time and place aforesaid.)

STATE OF ILLINOIS)
) SS.
COUNTY OF DE KALB)

I, Linda D. Hansen, Certified Shorthand Reporter No. 84-3027, Registered Professional Reporter, a Notary Public in and for the County of DeKalb, State of Illinois, do hereby certify that the foregoing is a true, correct and complete transcript of my shorthand notes so taken as aforesaid.

IN TESTIMONY WHEREOF I have hereunto set my hand and affixed my notarial seal this 14th day of August, A. D. 1992.

Notary Public

My Commission Expires
January 6, 1994.

OFFICIAL SEAL
LINDA D. HANSEN
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXP. JAN. 6, 1994

Exhibit "I" 8/6/92
Hearing at Elgin Comm College

Citizens for a Better Environment

Comments
on the
Kane County Solid Waste Management Plan

Presented by
Joanna Hoelscher, State Director
Citizens for a Better Environment

August 6, 1992

Citizens for a Better Environment is a not-for-profit environmental research and advocacy group with more than 13,000 members in the northeastern Illinois area. CBE was one of the chief architects of the Illinois Solid Waste Planning and Recycling Act, and we have followed with great interest the development of the solid waste plans mandated under that law. We have also served on the solid waste advisory committees established by Lake, Will and Cook Counties, the South Suburban Mayors and Managers Association, and the City of Chicago; and we have reviewed and commented on almost every solid waste plan that has been developed in the northeastern Illinois area.

It is from that background and perspective that CBE makes the following comments on the proposed Kane County Solid Waste Management Plan.

GENERAL OBSERVATIONS

As we read the proposed plan, it contains three basic elements: 1) "aggressive" source reduction"; 2) recycling 47% of the County's waste by 1998 and 3) landfilling the rest. We find problems with all three.

First, while the plan indicates that the County is serious about source reduction, it contains no waste reduction goal, ostensibly because "waste reduction efforts are difficult to measure." CBE acknowledges that it may be impossible to quantify waste reduction as precisely as recycling or landfilling; however, it can be measured. For example, one of the proposed plan's waste reduction recommendations is to "encourage a volume based approach to solid waste services . . ." (3.10, p. 15). The Village of Lisle measured the results of its volume-based garbage rates by simply comparing the amount of garbage picked up the year prior to implementation with the amount of garbage, yard waste and recyclables recovered the year after. The "missing element" - ranging from a low of 6% to a high of 46%, depending on the month - was attributed to source reduction.

Thus, we believe that if the County is as serious about waste reduction as it says in the proposed plan, a goal will be established; and, we are sure that, as the County examines trends over time, it will be able to determine if implementing its plan recommendations is achieving that goal. As Appendix B of the plan indicates, most estimates of waste reduction's potential

to ten percent. Since reduction at the source is at the top of Illinois' hierarchy of waste management alternatives, we would suggest a goal of at least ten percent.

Second, while a 47% recycling goal is certainly attainable by 1998, the proposed plan does not lay out a strategy for achieving it. In fact, our analyses of the "diversion potential for recommended recycling programs" (Table 4.1, page 19) indicates that the proposed recycling scenario contains several major flaws.

First, the 47% goal includes credit for recycling 100% of the County's yardwaste. Yet, the authors of this plan should have known that the Illinois Environmental Protection Agency only allows recyling credit for yardwaste that is collected and used as compost or land applied. (See April, 1992, memo from Linda Hinsman, Manager of the Planning and Grants Unit of the IEPA's Solid Waste Management Section to all Environmental Coordinators in the state.)

Since the County's own data suggests that at least 60% of all landscape waste generated within the County was managed on-site in 1990-91, we can conservatively assume that at least that amount will continue to be source-reduced and not available for recycling credit in the future. Subtracting an equivalent tonnage (39,387) from the County's estimated recyling goal reduces that goal by 8.1%. Should the County's proposed public education program be successful (4.20, page 24) and additional yardwaste is managed on-site, the recycling credit for this category would be lowered still further.

We believe the County's goal of recycling 75% of its construction and demolition debris is also unrealistically high. Most of the solid waste plans we've reviewed include, at most, a 15-20% recycling goal for C&D waste; and since the proposed plan contains nothing to indicate that Kane County will take any extraordinary measures to ensure achievement of this exceedingly ambitious goal, we believe that a reduction from 75% to no more than 20% is appropriate. Again, subtracting the equivalent tonnage (34,111) reduces the County's overall recycling goal by another 7%.

The result is a 32.2% recycling goal which, while it still meets the state's 25% minimum requirement, is significantly lower than the 47.3% recycling rate the County would have us believe it will achieve. Further, reaching even this 32.2% level will require that all of the other recycling recommendations in the proposed plan are fully implemented. Yet there is very little in the plan to assure us that the County is, in fact, committed to making any of the plan's source reduction or recycling recommendations a reality.

While the plan indicates that the County will provide encouragement assistance, public education and other forms of general support, there is neither "carrot" or "stick" to actually ensure that local communities and businesses will cooperate with the County and do their part. And since the County appears to have rejected the idea of a Municipal Joint Action Agency, which is the option most planning areas have chosen, the County has limited authority to carry out the recommendations in the proposed plan.

The County could, of course, commit to implementing some of its recommendations by simply stating in the plan that it will fund them (for instance, providing

proposed waste audits at low or no cost); or it could provide financial incentives that would encourage participation in the County's recommended programs (such as differential waste disposal fees for communities and businesses who recycle). However, the plan contains no such commitments. In fact, it contains very little concrete financial information at all.

The County does indicate that user fees, revenue bonds and federal grants will be used to fund "all future facilities and programs", while county surcharge funds will be targeted to "overall planning activities, waste reduction and recycling programs, and general administrative costs". However, few specific dollar amounts are attached to the either the various programmatic elements or administrative costs of the plan, and there is no indication of the potential dollars available from the sources of revenue that are cited.

Interestingly, the plan refers to something called "accrued solid waste enterprise funds that could be used for land acquisition and pre-development engineering costs", but it does not indicate the source or the amount of this accrued money. We assume that it comes from either the County's share of the profits from the Settler's Hill landfill or the County surcharge. In any case, there should be a full public accounting of how much money has been "accrued" to date and how much is anticipated in the future.

There should also be some explanation of why these "accrued solid waste enterprise funds" seem to be reserved exclusively for the development of new landfill capacity, rather than source reduction or recycling programs - particularly when there is no evidence presented in the proposed plan to justify the contention that additional capacity needs to be sought now. . . which brings us to point number three.

It seems clear from the information in the plan that Kane County has a minimum of eleven years of in-county landfill disposal capacity virtually guaranteed - even if it does nothing to restrict the out-of-county waste that is currently using up nearly half of its existing disposal capacity each year. Thus, we disagree completely with the plan's recommendation that the County "immediately obtain siting and permitting approval for the expansion of Settler's Hill Landfill", as well as additional land disposal capacity within the County. Not only is landfilling the option of last resort under Illinois' waste management hierarchy, but expanding Kane County's landfill capacity so significantly now could preclude consideration of more benign technologies later.

If the County is seriously concerned about ensuring sufficient disposal capacity for its own residents, we believe it should be negotiating with the operator of its landfill right now to restrict out-of-county waste, as DuPage County has done. We fail to see any reason why this or any other measures aimed at extending the life of the County's existing landfill capacity should wait until "future" land disposal facilities are developed, as the proposed plan suggests.

In addition to restricting out-of-county waste, the County could also help preserve its existing capacity and use its ownership of the landfill to show that it's serious about implementing some of the plan's recommendations by encouraging recycling through the differential fee structures that were referenced earlier, by prohibiting recyclables from being landfilled, or even restricting access to

communities and businesses who do not carry out their responsibilities under the plan.

So, not only is there no demonstrated need, but we believe a more thorough analysis of alternative technologies will show that composting the organic fraction of the waste stream, coupled with aggressive, implementable source reduction and recycling programs, could eliminate the necessity of considering additional landfill disposal capacity until well into the next century.

So, instead of establishing a "siting committee" to help find additional landfill capacity, we believe that the County would be better served by immediately establishing a committee to evaluate non-burn, non-bury technologies. While the County did engaged a consultant to evaluate municipal solid waste composting, the resulting report focussed almost exclusively on mixed municipal waste composting, which we believe is unduly expensive and inefficient. It also produces a compost of questionable quality.

The alternative which CBE believes is the most promising involves composting the non-toxic organic fraction of the waste stream, i.e. yardwaste, food waste, and soiled paper - commonly referred to as "green" waste. Together, these wastes comprise about 50% of the waste stream, and , again, combined with an aggressive, and implementable source reduction and recycling program, they should be able to handle as much as 85% of the waste stream. In Fairfield and Greenwich, Connecticut, a recent demonstration project aimed at testing so-called wet\dry collection systems (which are an essential component of green waste composting) resulted in 40% of residential waste being collected for recycling and 30% for composting. These results are particularly significant, because they do not include leaf and yard waste - which normally comprise some 15 to 25% of the waste stream.

Similar "green waste" projects are underway in a number of other communities across this country. Experience in Europe indicates that "green waste" composting is clearly preferable to mixed municipal waste composting because the resulting compost has significantly lower concentrations of heavy metals which can, over time, contaminate groundwater because the soil's ability to safely bind heavy metals from compost eventually deteriorates.

In conclusion, we appreciate the opportunity to comment on the proposed plan and hope that staff will take our suggestions and our criticisms into account in revising the plan before it is submitted to the County Board and ultimately the IEPA for approval.

More specific comments on the source reduction and recycling elements of the plan are attached for the record.

WASTE REDUCTION/RECYCLING

Volume-based garbage rates. CBE is a leading proponent of volume based garbage rates, so we agree with the recommendation that they be encouraged (3.4, p. 14) There is probably no other single measure that can promote waste reduction - and recycling - quite as effectively as charging residents for the amount of waste they generate. In fact, CBE authored a volume-based rate bill, SB 1768, which was passed by the General Assembly this spring and is awaiting the Governor's signature. It requires any municipality of more than 5,000 in a county of more than 100,000 consider the "feasibility of implementing quantity based user fees that promote waste reduction and recycling" and that they be implemented "at the earliest convenience unless the municipality determines that those fees would pose an administrative, safety, or economic hardship upon its waste collection system or residents."

The bill specifically identifies - and CBE endorses - two-part pricing structures that charge a base user fee to cover fixed costs and a minimum level of service, then an additional per container fee for service beyond the minimum level. Such structures are fairer to waste haulers and all the evidence indicates that they result in source reduction and recycling levels that are comparable to so-called "bag and tag" programs.

Model Waste Reduction/Recycling Programs. CBE also endorses the recommendation that the County conduct waste audits and establish model waste reduction programs in representative businesses and institutions (3.5 & 3.6, p.14). We also suggest that the audits include both waste reduction and recycling, as the plan suggests. (4.9, p.2).However, the County needs to either make the commitment to hire staff and conduct the audits itself (3.5, p.14) or limit the use of its landfill to only those businesses who both conduct and implement all feasible alternatives identified through a waste audit. Without more direct involvement by local communities in solid waste plan implementation, we question the County's ability to convince municipalities to make waste reduction or recycling a condition for receiving business or liquor licenses (4.10, p. 21). If the County chooses to provide the audits, it might consider trying to leverage its dollars by working with the local community colleges to develop a waste audit curriculum and internship program that could augment the work of County staff.

Before asking other businesses to become "models", however, we believe the County needs to set an example and become one, itself. In fact, we would suggest that the County commit itself to the immediate establishment of an in-house committee to investigate methods of reducing and recycling wastes generated at all County facilities. At a minimum, the County should be recycling its newspaper, kraft and mixed office paper; its glass, steel/bi-metal, aluminum and plastic containers; and its motor oil.

Waste-reduction alternatives the committee could examine might include such things as 2 sided-copying; binding paper printed only on one side into scratch pads; reusing envelopes and file folders; reducing mailing and distribution lists; increasing the use of documents on fiche; central rather than multiple files, "corporate" coffee mugs and water glasses for staff instead of paper cups,

etc. The Committee could also work to maximize both recycling and the use of reusable, and/or recyclable products by County personnel. Not only would these measures have an effect in and of themselves, but they would help develop a waste reduction/recycling mindset in County employees which is likely spill over into their lives outside work. The County could also use the information derived from this effort to develop a model Waste Audit Handbook that could be used by other local units of government. Those who don't should be denied use of the County's landfill.

We would also suggest that the County consider funding one or more "Model Community" efforts as part of implementing this goal. Developed several years ago by the Central States Education Center in Champaign-Urbana, Model Community is one of the most creative and effective waste reduction programs we've encountered; yet it is relatively low-cost. It involves all segments of the community by encouraging the development of "model" supermarkets, schools, libraries, churches, banks, car dealers, florist shops, etc. Will County funded such a program in Wilmington, and the Junior Women's Club, which served as the local organizer, estimates that in 1990 - its first year of operation - at least five percent of that community's waste stream was diverted through waste prevention, with another five percent recycled just through drop-off centers.

Source-Separated Recycling. We applaud the proposed plan's recognition that a source-separated approach to recycling in the residential sector is preferred (4.1, P. 20). Increasingly, the proponents of one-size fits all programs like Chicago's blue-bag co-collection program or X-L's mixed waste processing system are attempting to undermine more conventional - and more successful - recycling programs by using misleading and inaccurate information. Unfortunately, some public officials still respond favorably to the idea that they can continue to perpetuate the "out of sight, out of mind" mentality these programs promote. Thus, we hope the County will do more than just "encourage" source separation but, instead, will aggressively work to ensure that no such programs are adopted in Kane County - even if it means denying access the County landfill to any community which adopts such a program.

Processing Facilities. At the same time, we believe the County may have to take a more active role in ensuring that the infrastructure is in place to process the broad spectrum of materials that will have to be recycled if the County is to meet its goals. In the case of residential recycling, private operators sometimes limit their processing capacity - and consequently the materials they are willing to pick up at the curb - to only those recyclables which bring in the most money. Additionally, it is doubtful that even our suggested 70% C&D waste recycling goal will be met without some public investment in processing. The County only need look next door to DuPage County to see the positive impact a publicly owned processing facility can have on expanding recycling. DuPage is the first County in the state to have recycling in every municipality, as well as more than half its townships. It has already achieved a 40% residential recycling rate and a 17.5% overall recycling rate.

Procurement. CBE endorses the County's recommendation that a procurement policy be adopted and believes that it should move expeditiously to adopt an ordinance which would give a preference to products made of recycled materials. Other units of government which use the County landfill should also be required to

adopt procurement policies. For your information, the Will County Solid Waste plan suggest a procurement policy that not only favors products produced with recycled feedstock but that gives consideration to disposal costs in awarding bids. Bidders with products whose life expectancy is less than ten years would be required to estimate disposal costs or salvage values of their products as part of their bid submittals.

Exh. 2 8/6/92 Hearing @ Elgin Community College

TESTIMONY BY EDWARD KELLY

KANE COUNTY SOLID WASTE PLAN HEARING

THURSDAY, AUGUST 6TH - ELGIN COMMUNITY COLLEGE

GOOD EVENING. I AM ED KELLY, EXECUTIVE VICE PRESIDENT OF THE ELGIN AREA CHAMBER OF COMMERCE. I HAVE HELD THIS POSITION FOR 15 YEARS. I WAS ALSO A MEMBER OF THE 20 MEMBER KANE COUNTY SOLID WASTE PLAN ADVISORY COMMITTEE, WHICH SUBMITTED TO THE KANE COUNTY BOARD FOR THEIR CONSIDERATION A SOLID WASTE MANAGEMENT PLAN FOR THE NEXT 20 YEARS. THIS PLAN WAS DEVELOPED OVER A PERIOD OF TWO YEARS.

THESE 20 INDIVIDUALS BENT OVER BACKWARDS DURING THIS TWO YEAR STUDY PERIOD TO ALLOW ALL POINTS OF VIEW TO BE HEARD, AND GAVE CAREFUL EXAMINATION TO EVERY CONCERN. EVERY ALTERNATIVE TECHNOLOGY SUGGESTED WAS CAREFULLY EVALUATED.

LET ME QUOTE FROM THE EXECUTIVE SUMMARY OF THE SOLID WASTE MANAGEMENT PLAN, VOLUME I.

> "DURING THE PLANNING PROCESS, NUMEROUS STRATEGIES AND TECHNOLOGIES FOR WASTE MANAGEMENT WERE STUDIED. ENVIRONMENTAL AND ECONOMIC IMPACTS OF EACH POTENTIAL APPROACH WERE ASSESSSED. THE PLAN RECOMMENDS A COMPREHENSIVE SOLID WASTE MANAGEMENT SYSTEM CONSISTING OF EXTENSIVE WASTE REDUCTION AND RECYCLING PROGRAMS, FURTHER MONITORING AND EVALUATION OF ALTERNATIVE TECHNOLOGIES, AND ADDITIONAL FUTURE LANDFILL CAPACITY."

NOTICE THAT ADDITIONAL FUTURE LANDFILL CAPACITY IS LISTED LAST, AND EXTENSIVE WASTE REDUCTION AND RECYCLING PROGRAMS ARE LISTED FIRST.

THERE IS NO GUARANTEE AT THIS TIME THAT CURRENT RECYCLING GOALS CAN BE MET, OR THAT ANY AFFORDABLE, EFFECTIVE AND DEPENDABLE TECHNOLOGY WILL EVER BE OFFERED THAT WILL NEGATE THE NEED FOR ADDITIONAL LAND FILL CAPACITY. IN MY OPINION, THERE WILL ALWAYS BE A NEED FOR AN ADDITIONAL LANDFILL.

WITH THE EXPLOSIVE GROWTH ALREADY OCCURING IN KANE COUNTY AND THE GROWTH THAT IS CERTAIN TO COME OVER THE NEXT 20 YEARS, WE MUST BEGIN THE PROCESS NOW OF FINDING A SUITABLE NEW SITE. THE GROWTH IS NOT JUST HAPPENING ON THE URBAN FRINGES. IT IS OCCURING IN A HOP-SCOTCH FASHION ALL OVER KANE COUNTY. SELF CONTAINED MINI-VILLAGES OF 500 TO 1,000 ACRES USING THE LAND-APPLICATION METHOD OF SANITARY SEWER DISPOSAL HAVE BEEN APPROVED, OTHERS HAVE MADE APPLICATION FOR APPROVAL, MORE WILL FOLLOW.

IF WE LET TO MUCH TIME GO BY, IT WILL BE IMPOSSIBLE TO FIND A SUITABLE SITE BECAUSE DEVELOPMENT PATTERNS IN WESTERN KANE COUNTY COULD MAKE IT IMPOSSIBLE TO FIND ONE. I URGE THE KANE COUNTY BOARD TO BEGIN IMMEDIATELY THE LONG AND ARDUOUS TASK OF DEFINING CRITERIA FOR PICKING NEW LANDFILL SITES AND THE IDENTIFICAITON OF SUITABLE LOCATIONS TO MEET OUR NEEDS FOR THE NEXT 20 - 50 YEARS.

WE MUST BEGIN PLANNING NOW FOR ADDITIONAL LANDFILL CAPACITY IN KANE COUNTY, SO IF BY THE TIME WE NEED IT, IT IS AVAILABLE, AND IF WE DON'T NEED IT, WE DON'T USE IT.

LORETTA HATCH
45W103 Ramm Rd.
Maple Park, Il. 60151

It has been implied that the response of the people who oppose the County's plan to site a landfill has been too emotional. This is an emotional issue. The County has developed a plan that not only will destroy prime farmland, but also poison the water and air that sustains us. It also has been said that landfills are safe. That simply is not true. All landfills leak toxins and all emit poisonous gas. Both of which contribute to increased risks of birth defects and cancers in children and adults.

Many of us have been lifelong residents of Kane County. Some have moved away and then returned because of the beauty and serenity of this area. Many more are moving here to find that beauty, only to find that the County is proposing a solid waste plan that will destroy what took millions of years to create.

All that for what some say are economic reasons. Economic for who? Who will pay to clean up the water and air ? Who will pay for declining property values? What will happen to the great move westward and all the tax dollars that will be lost by destroying the attraction to Western Kane? For who wants to move to the dumping capitol of the Midwest?

We must wake up and realize that by adding 11 acres to Settlers Hill it's life will be extended by 5-7 years. That added to the 11 years left at the current site gives our county a plan nearing the 20 years that state law requires. Just imagine how long our current landfill would last if we limited it to Kane County garbage alone. 60% longer as that is the amount of garbage we now accept from other counties.

Does our county really think that we need more landfill space or to plan for decades past the 20 years that Ill. state law requires? Or, is it that this plan has been developed to benefit a multi-billion dollar company that claims to manage waste?

Our county must take it slow. Plan for the 20 years as state law requires. Follow the State's Solid Waste Management Act recommending that landfills be the last resort, not the first choice for solid waste disposal. Stay open to the options that rapidly developing technologies will offer.

It is the legal responsibility of the Kane County Board to develop a solid waste plan for 20 years. It is their moral and ethical responsibility to develop a plan that will preserve the environment for <u>all</u> it's citizens, present and future. For without a safe and healthy environment nothing else matters..!

Exhibit 4

Prepared statement for Kane County Solid Waste Management Plan public hearings.

August 6, 1992

Members of the Board:

My name is Mary Byrne, President of Citizens Against the Balefill. I come before you to speak on behalf of many Kane Co. residents. I feel my battle against the proposed Bartlett balefill and the Solid Waste Agency of Northern Cook County enables me to address the problems with your solid waste plan.

But first, let me commend ~~you~~ THE COUNTY for making some good, solid recommendations for waste reduction, and for doing it in just 58 pages, quite unlike SWANCC's multi-thousands of pages. Recycling, re-use, waste reduction - all good, and all necessary to solid waste management. However, no where did I see anything about source reduction, and that's where it all begins. Emphasis needs to be made on addressing source reduction in order to carry out a true waste reduction program. While the recommendations are good, the plan itself lacks substance and technical data.

The plan speaks of achieving 47% recycling goal, yet the predominant factor throughout the whole plan is the "need" for a huge landfill site. Now, if you "need" a huge landfill site, you will need a lot of garbage for that landfill. If you're seriously trying to remove every ble, recyclable and salvagable item from the waste stream, it iously is going to cut down on what's left and totally unusable. Therefore, it is illogical to think in terms of megadump, when it should compute to needing less space. And with waste- to-energy and solid waste composting being new and viable technologies, archaic landfilling should be the choice of last resort. Every day, somewhere in the world, new technologies are being developed. Today's Daily Herald tells how Germany is turning plastics back into oil. Recycled tires have been turned into irrigation hoses and used successfully. These are but a few examples. Why do you limit yourselves to 47% recycling? Why do you continue to lean on the crutch of yet another landfill?

~~You are~~ COUNTY IS putting the cart before the horse in pushing to secure a site, a push ~~we~~ THE citizens can only interpret as landgrabbing of their fertile pastures. You are never going to achieve maximum recycling and waste reduction with the attitude that you will always need a landfill. And I must take exception to a remark quoted in the Courier-News by Geneva Alderman Paul DesCouteaux. He is quoted as saying "the landfill is not the end of the world. Most of the things we put in the landfill come from the earth." I am not a scientist, but common sense tells me the components going into landfills are not the same components we have extracted from the earth. And God help us all and protect us from this mentality, because if we continue to pollute the earth and our groundwater with yet another leaking garbage dump, it will hasten the end of our world.

e the citizens of Kane Co. are fortunate that the county must low the SB172 process, quite unlike Cook Co. which is exempt, they ould not be lulled into passiveness, thinking the Illinois Environment Protection Agency will protect them from all the evils of landfilling. The IEPA is nothing more than a garbage permitting agency,

and does so, knowing it will pass the buck to another agency when the dump starts leaking and contaminating groundwaters. Historically, all landfills leak; it's just a matter of time.

It is time for ~~you~~ THE COUNTY to kick out the crutches you've all been leaning on, and stand on your collective two feet, and become leaders in new technologies. Do form your committees. Do involve the residents, the ones to be most impacted by a garbage dump. Do listen to them - you may learn. And do let the buck stop here.

Thank you.

Mary Byrne

Mary Byrne, President
CITIZENS AGAINST THE BALEFILL
2145 Sycamore Avenue
Hanover Park, Il 60103
(708)837-1258

I. PUBLIC SERVANT

My name is Cheryl Doughty-Osran. I'm an EDKO board member. My parents own a farm in the western part of the county.

My husband is a public servant. My father was a public servant and my grandfather was a public servant. Working for the public is a tough job. You're in for a lot of criticism no matter what you do. And I think most public servants want to do the right thing.

II. INFORMATION

Whether you're a member of a school board or the county board or any other board, you need good, accurate information to make good decisions. Public officials routinely ask for advice from lawyers, accountants, engineers, real estate appraisers, and other experts. They also depend on county staffers.

III. AUDITS

Everyone understands that county budgets and financial reports must be valid -- that is the numbers have to make sense. Budgets are routinely submitted to independent outside auditors. Its a standard business practice used by both the private and public bodies. Taxpayers deserve to know how their hard-earned dollars are being spent. And those tax dollar decisions have to be made on the basis of real facts, real numbers, and valid data, not vague generalities and hypothetical scenarios.

Budgets must routinely withstand audits. Likewise, this solid waste plan should be audited:

1) ENGINEERS:
It should be audited by licensed professional engineers with expertise in solid waste. Its only sensible.
Engineers, just like CPAs, have to produce numbers that work. They have to justify their conclusions with real facts, real numbers, and valid data.

2) CPAs:
It should be audited by certified public accountants.
If the county wants to site a landfill or anything else, lets see the numbers. Lets find out if it works financially before we make a decision.

3) LAWYERS:
The plan should be analyzed to see if it complies with state law

4) ENVIRONMENTAL EXPERTS:
To analyze the environmental impact, geology, hydrology, topography for any proposed facility.

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IV. ANALYSIS

Public officials routinely ask for professional advice and so do we. By "we", I mean EDKO. When we obtained copies of the Kane County solid waste plan about 60 days ago, we asked experts to analyze it for us, to audit the numbers and the conclusions.

V. EDKO experts

Our experts include:

1) Three professional engineers from University of Illinois
One is a professor with a doctorate in engineering, a nationally recognized solid waste expert, he's also an expert in statistics and what's called impact analysis. The other two engineers are his graduate students including a financial analyst. They will make a presentation next Tuesday.

2) Engineering and Environmental experts from a Kane County engineering firm with a staff of more than 50 experts in:
   a) engineering: civil, environmental, chemical, safety
   b) chemistry, biology, ecology
   c) economics, environmental law
   d) geology, groundwater hydrology
   e) a former U.S. attorney and expert in federal, state regulations and legislation
   f) environmental audits

3) Certified public accountants
4) private attorneys

EDKO needed help from these experts to make informed decisions, to base our comments and recommendations on real numbers, real facts, valid data.

VI. COUNTY ADVISOR: GARY MIELKE.

The county depended on Gary Mielke, the solid waste coordinator who is the author of Kane County's solid waste plan. Mielke is not an engineer, CPA, attorney nor an expert in any solid waste field. Mielke has a B.A. in Earth Science. He's a government bureaucrat.

But, the county has to base their decisions on valid information, so it only makes sense to submit this waste plan to an independent outside audit by experts in the field.

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VII. FLUNKED THE TEST

I'll let our experts speak for themselves, but what we learned is that the Kane County solid waste plan flunked the audit.

1) LAW: It doesn't comply with state law which was designed to reduce our dependence on landfills.

ALTERNATIVES FIRST, LANDFILLS LAST
The Illinois SWM Act says that we have to do everything else (reduce and recycle, waste alternatives) first, and use landfills only as a last resort.

This plan says we should site a landfill first and wait on everything else

MINUTES OF: April 12, 1990
"solid waste plan will be needed to go along with the siting of a new facility"
"landfill planner needs to be hired to put the Board's decision into a plan"

SIZE & SITE
The exact size and site of any proposed facility --landfill is supposed to be included in the plan. Instead, Mielke says the site and size will be determined "in the future" by a siting committee.

Mielke talks in vague generalities about "tons per day" Engineers, when they stopped laughing, said describing a landfill in "tons per day" is meaningless. Landfills must be described in acres, in exact depth and height.

CAR SALESMAN:
Big or little car?
Model?
Mileage? Miles per day instead of miles per gallon.
Cost? Don't know the cost because we don't know the model the size, or the mileage
Payments? Payments are so much a month -- great deal
How many months? Don't know yet
How about maintenance, repairs, life?

So, here we have a car salesman selling us this hypothetical car. But we don't know the size, the model the mileage and most of all we don't know the cost.

If we had all the facts, we might decide its cheaper to take the train. Let me ask you, would you buy this car?

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McHenry: 53 acres
only for McHenry County
will take 560 tons/day
last 20 years
site is on file
cost $30 million
includes: 2 liners, 30 feet of clay, 2 leachate collection systems

double clay & plastic liners
(plastic)

Mielke's hypothetical landfill:
p. 45 will cost only $4-$11 million,
land will cost only $1500/acre
there won't be any costs for opposition
3-5 ft. clay liner with the clay available on site, (but he doesn't know the site)
no insurance

He talks about landfills in Mass., Minnesota, Illinois, but nowhere does he tell us what we're going to get.

FINANCIAL: Mielke says we should buy the land for this hypothetical landfill now because a) control development b) land will get more expensive (in 16 years)

I'll let our financial experts, the CPAs and statistics people and the other number crunchers give you all the details.

1) the county controls all development through their zoning department, so there will always be plenty of land available.
2) the cost factor: Mielke says in here that the l'fill will be paid off by revenue bonds. In order to generate any revenue, we wd. have to open the landfill immediately and take huge amounts of out-of-county garbage to pay off the bonds.

Still need a landfill → We already have 2

OUT OF COUNTY GARBAGE:

(MORE LEGAL): Resolution limiting new dump to Kane County.

Two years ago, when the county proposed the big dump -- the 1,000 acre dump, they promised it would be limited to only Kane County garbage.

1500 YEARS

So, one of our lawyers interviewed an engineering professor at Illinois Institute of Technology. Loved landfills. He's a professional witnesses who thinks dumps are wonderful -- the bigger, the better. So, our attorney

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gave him the exact configuration of this 1,000 acre dump. And this dump-loving engineer spent a lot of time working out all the calculations and the population projections for Kane County. 1500 years. ELF & CLAY

KCB passed resolution limiting to Kane County, but now here comes Mielke with a plan that leaves the door wide open to take out of county garbage.

Page 40 It says that we will take garbage from any county that takes an equal amount of our garbage. That's a bunch of nonsense. Legally its a joke. Its totally unenforceable.

KANE sends DUPAGE: yard waste for them to compost.
DuPAGE send KANE: special hazardous waste to S.H.
That's chemical polymers from Amoco. Nobody knows how that's going to effect the groundwater around Settler's Hill when it eventually leaches out the bottom.
SWAC McClellan works for Amoco

REGIONAL: This plan says "regional" solutions to a "regional" problem. Here, the county board passed a resolution limiting the proposed new dump to Kane garbage, but Mielke's plan calls for a regional dump?

GARBAGE PROSTITUTE: By the year 2000, all the current landfills in N.E. Illinois will be full. But here in Kane County, we have capacity until the year 2008.

We'll become the dumping ground for all of northeastern Illinois. NIPC -- garbage will be sent out west. We'll be garbage prostitutes. Instead of protecting our natural resources, we'll be destroying them.

When did we decide to go into the garbage business for money? Just like prostitution, we'll be trading our health, safety and welfare for a few dollars.

QUALITY OF LIFE: Only America's poorest communities will take garbage for money. Robbins, Illinois. Why would we want to do that here? People move to Kane County because of its high quality of life. Its a wonderful place to raise a family -- I was raised here and other people are moving here for the same reason. They didn't move here to live next to a regional garbage dump.

POLLUTED WATER: TRI-COUNTY pollutes Elgin water no. 347 on the SUPERFUND list

One of our experts told us that a landfill in western Kane County which has a very high water table would immediately pollute the groundwater and that this groundwater runs

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eastward towards the Fox Valley.

USEPA says all landfills leak

P . 50: under mitigation and host community benefits: "groundwater quality control program guarantees the provision of adequate water supplies to adjacent homeowners if contamination occurs."

Pipeline to Virgil? Bottled water?
That sure makes me sleep better at night!

ALTERNATIVES/NEW TECHNOLOGY
Cars, cameras, VCRs, computers,

MIELKE's fault:

MIELKE's plan flunked the audit:

1) LAW
2) ENGINEERING
3) FINANCIAL
4) PUBLIC POLICY: importation

As I said earlier, public servants -- in this case the county board and the advisory committee depended on Mielke to give them the information to make a decision. They need real facts, real numbers, valid numbers, not vague generalities and hypothetical scenarios.

So I blame this on Mielke. He's just another featherbedding empire-building bureaucrat. (see page x in the front).

The county has a $900,000 budget deficit, yet he wants to expand to an entire department. He wants three more bureaucrats and a secretary. By the time he hires all these people and sends everything out to consultants, he won't be doing anything.

Mielke's was hired by Elf to site a landfill. His goal is to site a landfill immediately.

COMMON SENSE:

But this flunks the law of common sense.

If Landfills are so great, why doesn't anyone want to live near them? Waste Management has already brought us Tri-County in South Elgin, Settlers Hill in Geneva. All the neighbors are complaining.

And if landfills are so great, why is Waste Management waiting around for the county to buy land and build them this new landfill?

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Why don't they build their own and get 100 percent of the profit?

LIABILITY

Because Waste Management wants to make most of the profit while the taxpayers get most of the liability.

Perpetual care

If liability was figured into the costs of a landfill, it suddenly becomes very expensive. Because liability, especially water pollution lasts forever and ever.

Just like a pimp, Waste Management wants to use Kane County to reap huge profits and leave the long-term liability to the taxpayers.

We'll be toxic chumps, garbage prostitutes for all of northern Illinois.

Two hundred years ago, this country was founded by a group of people just like us -- ordinary citizens -- farmers, business owners, and entrepeneurs with a lot of new ideas. People who weren't afraid to leave the old country and build a new life here.

Back then, the idea of democracy was considered laughable. But these ordinary citizens just like us built the greatest nation in the world. They had a lot of courage.

And so do we. In the best traditions of American democracy, we will fight for the future of Kane County.

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Kane County Waste Bureaucrat Gary Mielke's ~~27~~ deliberate lies in the Kane County Solid Waste "Mangement" Plan

LIE: 1. That the Kane County Solid Waste "Mangement" Plan is, in fact, a solid waste plan.

TRUTH: The Plan is a thin, shabby sham plan that is totally devoid of the solid waste science and analysis that is required by Illinois law. The Plan is so poor that it indicates Mielke's contempt for the intelligence of the Kane County Board, taxpayers and citizens. It appears to be a blatant ripoff off the Lake County Solid Waste Plan.

LIE: 2. The County must immediately begin selecting a site for a new landfill in western Kane County.

TRUTH: There is no rush; the plan points out that current landfills have 16 years of life left. The plan contains no anaylsis supporting the immediate need for new landfill. In fact, the plan states a new landfill for Kane won't be needed until the year 2008. By that time, waste alternatives to landfills will be far more available that today. There's no hurry. But if a new landfill site is acquired, there will be no landfill alternatives in Kane County's future.

LIE: 3. The Plan complies with the Illinois law: the Solid Waste Planning and Recycling Act.

TRUTH: The Plan does not comply with the law in several basic ways. It does not contain a description of the facilities proposed and the cost and economic impact of the facility. The S.W.P. & R Act also requires compliance with the Illinois Solid Waste Act's solid waste heirarchy. Since the Plan does not comply with the hierarchy, it also violates the S.W.P. & R. Act.

LIE: 4. The Plan complies with the Illinois Solid Waste Management Act.

TRUTH: The Plan reversed the mandatory solid waste heirarchy contained in this law. That law states that landfills are the least desirable garbage option and should be used only as a last resort after alternatives have been used. The Kane Plan leaps to a landfill as the first option, thus violating the Act.

LIE: 5. The County will just select and acquire the site now, but not use it for 16 years.

TRUTH: If the County acquires the land, it will need to open the landfill as soon as possible just to pay off the bonds used to buy the land.

LIE: 6. The County needs to select the site to "save" the land from development.

TRUTH: The County controls development in unincorporated areas of Kane County through the development department. The County's "fear" that all potential sites will be

developed by the time a new dump is needed is ludicrous given the fact that their own development department controls growth in Kane County. If the County wants to "save" a potential landfill site, it can easily be done without selecting and acquiring the site now.

LIE: 7. By acquiring the land for the new landfill now, the County will save money because of the rising land values.

TRUTH: The cost of paying interest on bonds for 16 years for a dump that's not needed during that period will far exceed any potential increase in land values. Also, if alternatives become available during the next 16 years that eliminate the need for a new dump, then no land need be acquired and the money spent on land would be saved.

LIE: 8. The proposed landfill is the cheapest option for disposing of waste.

TRUTH: Mielke deliberately lies about the cost, drastically understating costs (as demonstrated below). The true costs of a landfill include post-closure, and potential cleanup of leachate contamination, which can run into the 10's or 100's of millions.

LIE: 9. The proposed landfill will only cost $4-$7 million:

<u>LANDFILL LIES in plan:</u>

LIE: 10. Land acquisition will cost only $1,500.00 an acre. (p. G-37)

TRUTH: Land in western Kane County costs at least $5,000. to $10,000. an acre, not $1,500.

LIE: 11. A 3-foot single clay liner will be sufficient for the landfill. (G-35 & 37)

TRUTH: New Illinois and federal regulations require much more extensive landfill liners than simple clay liners. Illinois laws that will apply to the proposed new landfill will require very costly and extensive liners and leachate collection systems. Mielke's plan calls these regulations, passed a year and a half ago, "proposed regulations."

LIE: 12. That clay for the 3-foot liner will be available "on-site." (G-34)

TRUTH: How can anyone know what will exist "on-site" when the sites are not even part of the plan? Again, this is done to deliberately understate the cost since it is cheaper to assume that clay will be available on site, than it is to actually truck in and buy clay.

LIE: 13. There will be no opposition during the proposed landfill's siting (SB-172) and permiting hearings and thus legal and engineering costs will be low. (p. G-35)

TRUTH: There will be fierce, vociferous, continuous and

tenacious opposition to the siting and permiting of any new garbage dump in Kane County. It will involve extensive engineering and legal challenges to any proposed dump.

LIE: 14. That a cell cap of "simple clay and sand" will be sufficient for the landfill. (G-35)

TRUTH See Truth No. 11.

LIE: 15. Gary Mielke is competent and qualified to write a County solid waste plan.

TRUTH: Virtually every other County is using professional solid waste engineers to draft their plans. Engineers have professional reputations at stake when they draft solid waste plans. Mielke can say anything he wants with no scientific support since he has no reputation at stake.

LIE: 16. Kane County's new garbage dump will end the County's current practice of being the garbage dump for all of Northern Ilinois. (plan p. 40)

TRUTH: The new dump will accept large amounts of garbage from out of County and possibly from out of state. Under the Plan, out of County garbage will continue to stream to existing and proposed dumps. Also, the State may change the law to require all counties to accept garbage from other counties.

LIE 17. The new dump will only accept solid waste from outside the County from a county that accepts an equal or greater amount of Kane garbage. (No such place exists on the planet Earth.) How will this unintelligible provision be enforced? Is it no surprise Mielke doesn't say.

TRUTH: Such a regulation will be impossible to enforce, which appears to be exactly what Gary Mielke and Waste Managemen want. Garbage from one county looks exactly like garbage from another. It is virtually impossible to discover where garbage is coming from. Also, there appear to be no counties which accept more waste from Kane County than they ship to Kane County since Kane is the dumping ground for several other counties. This practice is going to continue if the new dump site is acquired. Most suburban landfills will be closing by the year 2000.

LIE: 18. The County can bar out of County and out of State garbage from the new garbage dump.

TRUTH: The County may not be able to bar out of State or out of County garbage at the proposed garbage dump.

LIE 19. That alternatives will be looked at in five years despite the fact that the new landfill site will have been

selected and acquired.

TRUTH: If the County selects a new landfill site, the County will be forced to use that site as a landfill merely to pay off the bonds. That reality will foreclose the possibility of alternatives to landfills. Any alternative technology would require a waste stream that will be diverted to the proposed landfill.

LIE: 20. The S.W. Advisory Committee reviewed the plan as required by law.

LIE: 21. The S.W. Advisory Committee approved or even read the final draft of the plan.

LIE: 22. The S.W. Advisory Committee mandated that site seletion immediately begin.

LIE: 23. The S.W. Advisory Committee decided that the new landfill should take out of county waste.

TRUTH: The Kane County Solid Waste Advsiory Committee never even read the final Plan. Over two years, it was given various sections of appendices, but the Committee was never shown the entire Solid Waste Plan. A mere two weeks before the final plan was drafted, the Committee was abruptly dismissed, never seeing the plan they were supposed to "review" and propose changes. What was Mielke trying to hide? Since the plan has been released, Mielke has blamed the Advisory Committee for some of the most controversial aspects of the Plan that they never even saw. Again, this constitutes another deliberate deception or lie about the Solid Waste Plan. The Advisory Committee never even saw the final draft plan that is currently being reviewed during the hearings. Someone should ask Mielke: Why was the plan deliberately kept from the Committee?

LIE: 24. The Plan contains a description of the facilities proposed for the management of garbage in Kane County.

TRUTH: The Plan does not specify the size of the proposed landfill in terms of acres. Instead, the Plan describes the landfill in terms of "Tons per Day" ranging from 321 "TPD" to 544 "TPD" to 1,000 "TPD." Solid waste professionals indicate that "Tons per Day" is meaningless nonsense that no professional would ever use to describe a landfill. When describing landfill size, solid waste professionals use the same term as farmers: acres.

LIE: 25. The Plan minimizes the environmental and economic impact on air, water and land quality in Kane County.

TRUTH: It does not.

LIE: 26. That 55 percent of the garbage currently being disposed of in Kane landfills is generated within Kane County. (P. 9 of Plan, and A-11-12)

TRUTH: This figure is utter nonsense, wholly plucked from thin air. Mielke supposedly bases this figure on gate surveys done for a few weeks two years ago at Kane landfills.

But, curiously, no data from those surveys is presented in the Kane plan or the appendix. No facts, figures or raw data from those surveys, or the analysis used to evaluate those figures are given. For example, Mielke says the figures were "seasonally adjusted." How? As in the entire plan, the actual facts, figures, and mathmatical calculations are absent. Even in high school math courses, one must show their work or no credit is given for answers. No credit should be given Mielke for his 55 percent figure of Kane waste generation until he shows his math.

LIE: 27: That a two-year old gate survey conducted by asking garbage truck drivers where they came from, conducted only during the summer, can reveal an accurate picture of how much out of county garbage is coming into Kane landfills.

TRUTH: It cannot. For example, what "seasonal" correction was used? Is more or less garbage generated during the summer? Mielke doesn't say. Mielke also says the gate survey figures "agreed with" the operator's reports to the County. What figures are shown in those reports? Again, the actual data is missing. Absent the hard data, all of Mielke's conclusions must be rejected as baseless.

LIE: 28: Post closure costs for a landfill will only last 5 years. (G-38) $750,000 Annual post closure.

TRUTH The County will be required to fund the post closure costs for at least the 30 years required by Ill. law. Mielke's Plan figures the post-closure costs for only 5 years. Thus the $750,000 should be: 750,000 x 10 (7.5 mill) x 3 = $ 22.5 million.

LIE: 29: Only Composting systems and Incinerators need insurance, landfills do not.

TRUTH All facilities need insurance. Mielke's plan contains figures for insurance costs for incinerators and composting systems, but no insurance costs are included in the landfill costs. This is yet another way Mielke attempts to overstate the costs of alternatives, and understate the costs of a landfill.

LIE: 30 That if the new landfill pollutes the wells of surrounding property owners, the County should "guarantee the provision of adequate water supplies." (M-5)

TRUTH The County is going to do nothing when the new landfill leaks and contaminates area wells. The County has no way of providing water in western Kane County since the County does not own a single water plant in the County.

April 12, 1990

Executive Session Re: Land Acquisition

EX. 46

The Kane County Board met as the Committee of the Whole, went into executive session commencing at approx. 9:35 a.m. on Thursday, April 12, 1990 in the Board Room, Bldg. A, Kane County Government Center, Geneva, IL.

Members present: Chairman Miller, Bermes, Cameron, Clusen, Damisch, DeStefano, Doederlein, Douglas, Elfstrom, Fleming, Hess, Kammerer, Kerasiotis, Ledebuhr, Patterson, Richards, Schoengart, Sharp, Shoemaker, Shoop, Taylor, Tooley, Vauchope, Wolff, Yurs. Also present: Development Dept. Dir. Bus, Development Dept. staff Seiben & environmental consultant Young, Ass't. State's Attnys. Jaeger and Sullivan, and County Board staff Ruppert and Keasler (recording the meeting).

Entered into executive session for the purpose of discussing land acquisition, on a motion by Elfstrom, seconded by Clusen. Motion carried unanimously.

Chairman Miller relinquished chairmanship to Landfill Liaison, Mr. Elfstrom. Elfstrom introduced Richard Young, environmental consultant and former Environmental Division Director for the County. Young commented on background of County landfills, pointing out uniqueness of Settler's Hill, where one can play golf on top of a landfill, and where methane gas is utilized for electricity.

Elfstrom explained the process that will be needed to determine a site for a new landfill: Determination of landfill site; hiring of County-wide solid waste planner. Elfstrom explained that siting a new landfill is more difficult that expanding an xisting landfill. Stated that the existing landfill is being run extremely well. Need s to try to duplicate that at some other location in the County. Regardless of recycling, composting, etc., a landfill will be needed at the end of the process. The biggest deterrent to siting a landfill is the people who live in the area; therefore, siting needs to be done while a minimum number of people are living in the area; will become more difficult with time. A solid waste plan will be needed to go along with the siting of a new facility.

Elfstrom stated that a site needs to be chosen so that everybody in the County knows this is where the solid waste will be deposited. Also, recycling coordinator/landfill planner needs to be hired to put the Board's decision into a plan. Elfstrom encouraged advertising for such position immediately.

Elfstrom displayed a Proposed Landfill Concept drawing and explained the aspects of the proposed concept. Area shown in Concept was 1000 acres of landfill and 1000 acres of Forest Preserve; any actual landfill activity would be kept 1/4 to 1/3 mile minimum distance from population. Elfstrom suggested that existing farmhouses around the perimeter of the site could remain, or County could offer to purchase them rather than obtaining them by condemnation. Elfstrom suggested various uses for the buffer area around the landfill.

Elfstrom stated that condemnation will be necessary to obtain 1000 to 2000 acres. On a 2000 acre site, approx. 15-16 farmsteads can be expected to be found. Property will not need to be assembled for 4-5 years, which leaves room for negotiations in purchase of land. Obtaining property will also result in taking 2000 acres off tax rolls.

New landfill is projected for only Kane County garbage, unless the Board decides differently at some time in the future. Elfstrom stated that Waste Management is not a consideration in this matter; there is nothing in what is being done that will in any way tie the operation to any specific contract operator.

Discussion and ansver period followed. Elfstrom said you may have to vacate some existing rural unpaved roads. Said that you will want to come back and see maps, see who owns property, size of farms, specifics, legals, knov end use. Said that staff could do this for all 5 sites, but if staff could rank the sites, why not zero in on two or three sites for specifics. If site is 15-30 miles from population, you might vant to look at a transfer station. Bus said long range - transfer & recycling station; the average pick-up truck vouldn't go to any of the landfill sites. Elfstrom said the rating could be presented the middle of May or first of June or even into June. Bus said it would take at least 30 days to do a good analysis of total 5 using a matrix and computer approach to settle on two or three. Elfstrom said these are the only sites that meet the important criteria. (Shoop left meeting)

Elfstrom asked: Is there anybody that thinks ve need two landfills (no reply); Is everybody thinking that as a start, we should look for 1,000 acres with 1,000 acre buffer (affirmative response); Is anybody thinking we shouldn't try to get a buffer (no reply). Elfstrom: go back and rank 5 sites and ve will do a detailed analysis for 3 sites sometime in May or early June/July, consider and adopt.

Doederlein suggested that staff prioritize the sites and provide details on 2 or 3 highest rated areas. Elfstrom suggested that the staff then make definitive site analysis on three top choices: including property owners, use, legal descriptions, any information not available from the general study. Schoengart asked if Board members had any additional criteria they would like applied to the sites (no response). Wauchope suggested 2 or 3 Board members be involved in the study to assess political impact (Shoop and Kerasiotis left meeting). Kammerer: Doesn't object size-wise, but we should have an opportunity to make a change. Elfstrom: You will. Kammerer suggested considering the cost of improving nearby County roads. Miller suggested that the site's proximity to State highways be considered in relation to needs for future road improvements; would like State assistance to cover high costs of infrastructure. Fleming: we have a 10 yr. lead time on the operation to allow for planning (of roads). Shoemaker suggested press be informed of the landfill siting criteria. Elfstrom responded Yes, that "bus can explain it, don't you try it." Sharp expressed concern re: DeKalb Co.'s proximity to site. Doederlein responded that you could use only a portion of the acreage, and not necessarily the part closest to DeKalb County. Damisch suggested consulting with townships and school districts in priority areas--they're short of money. Schoengart responded that the Board should take those needs into consideration, but not to involve other taxing bodies during this investigatory period.

Elfstrom revieved what had been agreed by consensus: one landfill site rather than two; site of approx. 1000 acres plus 1000 acre buffer; desire for buffer area; staff to rank the sites "1 through 5" and do detailed analysis on three sites; report back to Board at the end of May or early June for Board's consideration and approval.

Returned to regular session. on a motion by Elfstrom, seconded by Ledebuhr. Motion carried unanimously. Board Chairman Miller asked for the Committee to adjourn to Wed., May 2, 1990 at 9:30 a.m. for a special Board Meeting so the architects could provide information on the proposed nev Kane County Judicial Center and Phase I of the Courthouse building program. So moved by Patterson, seconded by Wolff, and carried unanimously.

Meeting adjourned at approximately 11:50 a.m.

Bobette Keasler and Mary Ruppert,
Clerks Pro Tem

APPROVED:
Frank R. Miller,

Section II D

PROCEEDINGS OF PUBLIC HEARING

For The

PROPOSED KANE COUNTY SOLID WASTE MANAGEMENT PLAN

Conducted at:

Central High School

Burlington, Illinois

August 11, 1992

Note: Comments from this Public Hearing are referred to in Volume III. Response to Comments by numbering the comments of each speaker D-1, D-2, etc., in the same order as they appear in the index to these proceedings.

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M-22761

KANE COUNTY PUBLIC HEARING

In The Matter Of:

KANE COUNTY SOLID WASTE PLAN

REPORT OF PROCEEDINGS had and testimony taken at the public hearing of the above-entitled matter before Barbara E. Smith, C.S.R., R.P.R., a Notary Public in and or the County of DuPage, State of Illinois, taken on August 11, 1992, at 7:00 P.M., at Burlington High School, Burlington, Illinois.

PRESENT:

MR. ROBERT M. FOOTE, Hearing Officer.

I N D E X

Name of Witness	Pages	Exhibit
Roxanne Stoner	7 - 27	No. 1
Lee Barrett	27 - 37	No. 2
Michael Cailas	38 - 49	No. 3
Ken Goldberger	50 - 64	No. 4
Robert Meissner, Sr.	64 - 70	No. 5
John Thompson	70 - 80	No. 6
David Gossman	80 - 88	-
Jerry Zakosek	88 - 100	No. 7
Michael Sauber	100 - 102	-
Steve Rauschenberger	102 - 108	-
Wayne Breda	108 - 124	No. 8
John Dove	124 - 126	-
Timothy Thompson	126 - 131	-
Al Ingram	131 - 136	-
Pat Burke	136 - 137	No. 9
Lane Burnidge	137 - 140	[Model]
Michael Zakosek	140 - 142	No. 10
Craig Frank	142 - 146	No. 11
Pierre Hatch	146 - 153	No. 12
Christi Gee	153 - 163	No. 13
Charles Sauber	163 - 165	No. 14
Charles Baumann	166 - 168	-

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No. 1 (Stoner)	172 - 180
No. 2 (Barrett)	181 - 196
No. 3 (Cailas)	197 - 200
No. 4 (Goldberger)	201 - 208
No. 5 (Meissner, Sr.)	209 - 211
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No.10 (Zakosek)	250 - 281
No.11 (Frank)	282 - 324
No.12 (Hatch)	325 - 326
No.13 (Gee)	327 - 336
No.14 (Sauber)	337

MR. FOOTE: Good evening. I don't have a gavel. Gary Mielke got my gavel, and we only have one microphone.

There are a lot of people who want to talk tonight. So far at the hearings, we have not had any problem with time.

Can people in the back hear me okay?

VOICES: Speak up.

MR. FOOTE: Speak up louder? Okay.

So far we haven't had any problem with time.

Tonight, we have more speakers; and if anybody wants to talk -- I'm trying to gauge how much time we have, based on what has been turned in.

If anybody else wants to talk tonight, please turn in your sheets right away. Don't hold them back tonight and decide later on you want to talk, because we may not have time.

We have got just about four hours to get this in. There are a lot of experts that want to talk tonight.

As some of you know, my name is Bob Foote. I'm an attorney from Aurora. I was appointed by the County Board just to take this testimony.

My job is not to take sides in this.

My job is simply to make sure that we get a good record to give to the County Board and to give to the Development Committee.

Because we are a little more pressed for time, I want to make sure that everybody understands what the public hearing is about.

The public hearing is to make comments about the solid waste plan.

And I would ask people tonight, because we may be more limited in time: Limit whatever you have to say -- and you are free to say anything you want; but please limit it to a response to the solid waste plan that has been put forward to the public by the Development Committee.

The legislature has set up these hearings as part of the statute that creates the necessity for the County to come up with a solid waste plan.

Whatever is said here tonight, our reporter, Barb, is going to take down; and that transcript, along with anything in writing that you want to submit to me, is going to go to the County Board.

Now, I notice that there are exhibits and projectors and things.

And I try cases for a living. I know

may not be able to hear me if I ask someone to please direct their talk to the solid waste plan or if I tell them they only have a couple of minutes left. You may not be able to hear what I say because there is only one microphone. But it will be part of the transcript. Barb will be able to hear me fine.

People who come up: Please, it is going to be hard to tell whether everybody can hear you. It is supposed to be a public hearing, where everyone can hear you.

So if the people in the back cannot hear the speakers, raise your hand. I will be watching. That's all you have to do, and I will ask them to raise their voice or put the microphone closer or whatever they need to do so that you in the back can hear.

Let me try it once.

How's that back there?

VOICES: No.

MR. FOOTE: How's that back there?

(Laughter.)

MR. FOOTE: There's a little switch here, whoever is going to speak. I will leave it off.

Before we start, are there any other people who want to sign up?

how important it is sometimes to make it so that the audience or the jury or whoever can see things.

Please remember when you are speaking, though, that whatever you show up on here may or may not be something that will be part of this transcript; and if you have exhibits and you are going to give them to me afterwards, please make sure that they are marked so that the transcript makes sense.

So that when you are talking about soils or something on the projector here, that you call it Exhibit A or Exhibit 1 or whatever, so that it makes sens when I get it, in reading the transcript; so that you can actually read the transcript and figure out which exhibit you were talking about.

With respect to this exhibit here, I would ask: Whoever is going to use this, since it is not something that we can make part of the record, whosever this is, I would ask them to describe whatever it is going to show before it is turned on or whatever happens to this exhibit, so that there is something in the record.

That's my job: To make sure that the record is clear and clean.

You may not be able to hear me as well as the people from the microphone. At certain points, you

The first expert sign-up sheet is -- forgive me on these names -- Roxanne Stoner, I believe, from Maple Park. I will recognize her as an expert on the sheet. She has taught and attended special classes on solid waste.

And I would ask each of the people who want to speak that when they get up to the microphone, state your name first and then your address. That's all, again, so that we get it nice and clean on the record.

You may proceed.

MS. STONER: Okay. As he said, my name is Roxanne Stoner.

I don't know if I'm truly an expert, but I did sit on the Solid Waste Plan Advisory Committee for two years. I'm also a member of Educated Disposal for Kane County. So I have been in on the inside through the whole thing. I think I have come a long way with this plan.

First of all, I would like to state that, for the record, there has been some discussion about what is the plan and what is the appendices, and what's what in this.

First of all, this is Volume 1. There are two volumes.

Volume 1 is the meat of the plan. In Volume 1 are all the formal recommendations that the County will follow in the next 20 years for our solid waste plan.

Volume 2, the thicker volume -- and I'm not going to take it out -- is the appendices or all of our studies.

So what I'm going to direct my comments to is Volume 1.

On on my committee, there were 18 of us. I would like to just briefly tell you that, of the 18, there were nine representatives from government bodies, most of them along the river towns; five representatives from business; three representives from waste haulers; and three representatives from community groups.

I would like to make a comment at this time: That it was a very heavily weighted committee toward business and industry and waste haulers.

I was definitely a minority on that group. I was one of the three community groups.

We actually had no experts on our pane in the environmental field. There were no engineers and no experts with Ph.D.'s helping in the environmental or

health field.

The other thing I would like to address is that -- before I get into the meat of this plan -- there were two philosophy changes that I'm really kind of upset about in the plan.

One is that we are going to import trash into Kane County now.

In the beginning of the process, it was our philosophy on the Kane County Solid Waste Advisory Committee and the philosophy of the Kane County Board, through a resolution that they passed, that we would use facilities in Kane County for Kane County trash only.

They changed the wording in there so that we will be importing trash now.

The other addition was that we look at this on a regional approach. This is also a change of philosophy.

When we think of region, I would like to think of Kane County -- that's what we set out to do -- and yet language was added, again, into the report looking at a regional approach.

I just want to briefly tell you that in Region 2 in Illinois, the I.E.P.A. Region 2, there are nine counties. Of those nine counties, only 4.5 percent

of the population is here in Kane County.

The other 95.6 percent or 94.6 percent live in all the other collar counties.

In their plans, they have large exportation and no imports.

Where do you think they are going to export that trash if we open our gates? That language needs to be changed in the plan.

The other thing I would like to hit on is that, as a member of this committee, there was a diversity of people; and I got to know those people and I have a great respect for their minds and they served their people well. They served business well, the waste industry well, and government well.

But I would like to reiterate that that committee was very heavily weighted, and it was a difficult task that I had to try and pull everyone into the environmental scope of this.

There were a great many ideas that were exchanged at my committee. We did a lot of things through consensus and discussion.

This plan was written by the Development Committee, and we were an advisory committee only.

Quite often when I had things brought up -- it happened about a dozen times -- it did not make it into the plan, and I was a bit upset about that.

Some of these items in fact met with some concern and some support from other committee members.

Very quickly -- because I don't have many minutes here -- I'm going to tell you about 10 areas that I would have liked to have seen in the plan and that, as I said, that was on approval from some other committee members.

First of all, no immediate landfill siting.

I will go into explanations of these later.

Secondly, new technology pilot projects to be implemented in Kane County.

Separate construction and demolition debris facilities.

No importation of waste.

A consultant mutually acceptable to the County and the affected property owners to be with us in the siting process. That language was dropped out of there.

Household hazardous waste collections to be funded by the Enterprise Fund if we cannot get the State to do it.

Red-lining property instead of immediate siting, and options on the land in lieu of condemnation or acquisition.

County government sponsorship of waste symposiums for like-kind industries to develop recycling markets.

Addition of pertinent environmental and health experts on all committees.

And the addition of representation from affected area governments. No one from the affected areas from the original sites had a government official sitting on my committee. I think that's terrible.

Now, to get into the meat of the program -- this might be a little bit boring for you, but I tried to be as concise as I could, and I went through the plan and made very direct changes in language or additions or deletions.

I told you about the two goals that we had for the importation and for the regional approach. I would like to see those changed.

In the Recommended Statement of

Goals -- and I'm reading from that. For those of you who have copies of this, I will tell you the section that I'm reading from.

The recommendation is that we limit recycling and importation to what is legally, practically, and politically feasible. These are redundant statements that do not belong in here. Politics has no place in garbage decisions.

Our state's attorney has already told us that we can legally restrict out-of-county waste in a County-owned facility.

And the words economically practical, I would recommend that they define those within the plan, because they have too broad a connotation.

In Paragraph 6, where they listed the different entities within the county that are going to be joining this program and jumping on the recycling bandwagon and doing everything that the rest of us are doing, they left off the words "institution" and "governmental offices."

Governmental offices, in particular, must be added because government has got to take a leadership role in this.

We have got to look at their

procurement practices and their recycling practices and do what the rest of us are expected to do right there in their office.

In the Executive Summary, once again I would like to say that I would like to see a consultant -- and this was a recommendation made by my whole committee -- that would be mutually acceptable to the homeowners and to the County to come in and sort of mitigate and help the homeowners know what is going on in the siting process.

I would also like to at this time talk about Page 10, where there is an Enterprise Fund set up for any garbage funds that come into this county.

There was language added at the end that, you know, I'm not real clear on; and I would like to recommend that they drop this language or tighten its boundaries.

"Any refuse attained from garbage can be used in waste-related projects" -- and this was the addition at the end -- "for environmental programs."

I think that has too broad a scope. I want that language dropped or tightened up.

In the Waste Reduction Section, the State laws state that, when we talk about reduction, we

talk about reducing volume and toxicity.

In this plan, toxicity was not addressed at all in any form of recommendations.

I have three additional recommendations in there: One being that we apply to the State agencies for help in household hazardous waste and other special waste collections; but in the event that we do not get that, that we go to the Enterprise Fund and dip into the fund and fund those programs through that.

The second recommendation is that the County should fund, through the Enterprise Fund, all educational efforts in that respect for reducing toxicity.

And third, the County should attend to the Special Waste projects alone. No other county should be allowed to bring in their special wastes into Kane County.

Right now Settler's Hill, we are taking in approximately 10 percent of its total tonnage in contaminated soils from other counties.

We must be force our neighboring counties to plan for their own special waste disposal, or we may be looking at problems on down the line that they don't have to address.

In the Recycling Section: I'm quite

proud of the Recycling Section, and I think the committee worked hard.

Gary Mielke comes to us from D.E.N.R., and his expertise is in the recycling field. We have a very high recycling goal, and I think it's going to be met very easily, but it's going to take a lot of work.

In the appendices is a lot of good information on how we can do that; but in the meat of Volume 1, I would like to see a few specific changes.

One recommendation is that we move up the multi-family recycling from 1995-'96 to immediately.

Multi-family recycling -- in other words, a unit that has two homes or four homes -- they can already join on the blue box program; and I would encourage the County to encourage waste haulers and renters and landlords to immediately participate in the curbside recycling program by sharing the cost of these large bins that need to be put outside the building.

In the Construction and Demolition Debris, we have a high recycling goal, and we are not addressing it very soon. I would like to see more meat into that.

My recommendation there is that we apply to the D.E.N.R. for grants and help in a

construction and demolition debris recycling program immediately.

Just recently, the D.E.N.R. has gone on record as stating that they are really going to avidly seek different markets and work with communities in making out programs for C and D debris.

The other recommendation I have in -- and this was brought up in my committee several times and also didn't make it into the plan -- is that we take construction and demolition debris and recycle it as much as we can or dispose of it in a separate cell. It's basically inert and should not be mixed with our waste.

We need to move forward into the future where we look at every portion of our waste and take whatever we can; and construction and demolition debris has markets right now.

The Landscape Waste Section, the recommendation is for public ownership and private operation.

I would like to change that a little bit by giving Recommendation 4.22 more latitude by saying that it can be public ownership and private operation or private and private, private ownership and private operation.

Private enterprise needs to come into Kane County and help us out of some of our problems. Government cannot take all the responsibility on its back; and some of the smaller portions of our waste program, we need to let private enterprise in.

Through operating permits, we can really restrict and guide these people in the private enterprise.

Boy, I could use a drink of water.

In Market Development, there is not a lot of teeth in the market development area of the solid waste plan.

So I would like to make a recommendation here. This was a idea also talked about on my committee and did not become part of the plan. It's spoken of here in the appendices, but we need a recommendation that is stronger.

The County should immediately draft a letter to all retail businesses in Kane County encouraging them to take an active role in accepting back hazardous chemicals and items that are hard to dispose of.

You see this happening in the paint industry now. It can also be done in yard, chemicals, cleaning agents, etching chemicals, and small appliances.

The County needs to take a leadership role now and mail that letter out so that we can get these retailers writing to their members and saying, "Take this material back."

The other recommendation that I have is that the County should take an active role in workshops at the County Building where they incorporate all of the people from like-kind industry in and get them talking about using recycling and reusing that material.

For instance, we have over 60 plastics plants in Kane County. Gather them together in a forum where they can share information and create the markets that we need to take this recycled material and turn it into park benches or road signs or whatever.

That was discussed on my committee, and it has not been made in the formal recommendations; and I think that that approach alone would open wide up the markets in Kane County.

Also, in Recommendation 5.6 it was disturbing to me that "alternative approaches" -- I reading from the plan now -- "Alternative approaches to landfilling contaminated soils have to be limited to the extent allowed by contractual constraints."

I will try to give a brief summary of

what this means.

Our contract at Settler's Hill says that we have to have a waste minimum tonnage in there per year.

Contractual constraints have no place in our solid waste plan here in Kane County. We need to move forward on what is environmentally safe; and it means that if we fall short on our waste tonnage at Settler's Hill, we have a two-tier pricing system that might be able to make up the difference on that. And we need to work on that.

Or what they also need to think of is: The on-down-the-line costs of taking into it toxic material just to make our waste minimum tonnage.

Tires, I'm going to hit on briefly because it was hit on briefly here.

Tires have to come out of our landfills in 1994, and yet the only recommendation in the plan is that we monitor their disposal for the next two years.

Tires are a nightmare in a landfill. They float to the top and they tend to violate the cap, and they are just a landfill nightmare.

The time is now. The markets are there for the County to get together with the rubber companies,

with the tire companies, with the road companies, and find where we can reuse that material now. 1994 is too long to wait.

In the Alternative Technologies Section -- this was kind of my baby at EDKO; alternative technologies is near and dear to my heart -- we had a couple of very good studies done for our Kane County Solid Waste Advisory Committee; and according to the Cal Recovery Group, one of these groups, they -- their answer to my question, "Is the good mousetrap out there now?"

"Yes." The components are there now for alternative technologies to be incorporated into Kane County.

In this plan, they are going to look and monitor them, and that's about as far as they are going to go.

My suggestion, along with some of the other committee members -- Jim McLennon, for instance, sticks in my mind. He had written a letter.

We do need to watch these, but I'm thinking the excellent way to do that is to take a test pilot case here in Kane County for some of these technologies.

In the 15 years we have left, it would

be an excellent time to fine-tune these and understand what can and can't be incorporated into Kane County in 15 years.

The other counties around us don't have that latitude.

So my formal recommendation is: Implement test pilot projects throughout the county in alternative technologies that process waste above ground. Examples are solid waste composting, food waste composting, small incinerators, and R.D.F. technologies.

I would like to also just add to that that there were no long-term cost studies in any of this plan on landfilling. It looks very -- it looks very appealing in here from a business aspect. It looks very appealing from the tipping fee.

There are no costs in here of what it will cost to collect leachate, dispose of it, monitor it, fix the cap and maintain the cap over the lifetime because, folks, 15 or 20 years of monitoring is not enough. We will have that landfill with us forever.

Tri-County Landfill, 20 years ago they tried to tell them they needed to put a berm on that and clean it up. 1992, they still have not done it.

System Financing: There is too much

latitude in the environmental program's phrasing again.

My recommendation is to tighten up that and zero in on waste-related environmental programs.

An explanation of that is that the language, if it is left that way, has a potential for loose interpretation and misuse of funds on down the line when subsequent county boards come on board.

There is also no mention in the plan about the County taking responsibility for eventual cleanup costs. I will touch on that briefly.

Within our Enterprise Fund system, this would be an excellent time to set aside a percentage every year of money that is gained in this county from the revenue generated through garbage disposal or waste processing. Set it aside in the event that in the year 2030 there is an environmental program -- or problem, excuse me.

Right now, we are relying on the waste hauling companies, on the state government, and on the federal government.

State and federal government have no funds to clean this up anymore, and that is crystal clear.

And when it comes to the waste haulers or the potentially responsible parties, they are crippled

in court for 25 years.

It is time to understand that, if this is our landfill, we need to set the funds aside for the eventual cleanups or the eventual problems that we have.

My recommendation is just that then. The formal recommendation is that they set aside a fund every year, figure out what that percentage is; and it cannot be touched for anything else.

In the Site Selection process, they talk about committee organization on Page 53. This was a little disturbing because there's two committees that are going to be in charge of siting and implementing. One is the Site Committee, and one is the Solid Waste Plan Advisory Update Committee.

In the Site Committee, there are four groups -- the citizens groups, civic organizations, environmental organizations, and agricultural organizations -- that were dropped off for some reason of the Plan Update Committee.

My recommendation is that we add those four back into it so that both committees have the same structure and weight to them.

But I have an additional recommendation on here that says we need to add the health department, we

need to add the soil and water conservation district, an environmental engineer, and affected area governmental officials.

When you have a committee that is too far weighted into the waste hauling business and government, we do not have the environmental aspect covered.

I'm in no way standing here and telling you that those people that were on my committee were wrong or that they had hidden agendas.

What I'm telling you is: We must have a balanced committee so that you attack the problem from every aspect.

We looked at economics and systems far more than we did at what the environmental aspect of it was going to be.

In closing, I would just like to say this. I have come a long way in two years learning, and the thing I have learned the most is that I have a lot more to learn.

But try and remember that we will have 420,000 people in Kane County in the next 15, 20 years. We must be concerned about saving their future environment more than we are concerned about anything else.

If political and business people outweigh environmental experts, the plan will not be the best for the most; and that is government's responsibility.

I would also like to add to that: My recommendations in here in no way cripple this plan. I'm certain that they enhance the plan. My objective here is -- and has always been -- to protect the property rights, the citizens' rights, and the environment.

And I hope that the County Board will look at these and understand that I have put a lot of time into wording these correctly so that none of them are inflammatory, none of them are crazy plans that would only work in the year 2030.

These technologies are available today. It's time to move into the future and realize that some of what we have done in the past to the environment must stop.

I would also like to ask them to please consider appointing me to the implementation committees, both of them.

And I would like to have this entered into the public record. This is called my Minority Report. I was encouraged by several people to do this.

As a minority on that committee, I feel I have the right; and it is also my recommendations for the plan. So it is a dual piece of paper here.

Thank you very much for listening.

(Applause.)

MS. STONER: One more thing before I forget.

I have an envelope up here. I'm going to leave some pens.

If you would like to sign your name and address on there, I will see that you get a copy of my Minority Report so that if I have talked 20 miles an hour here and you didn't get everything, at home, the organization I belong to will make sure that you get a copy of my Minority Report.

MR. FOOTE: Thank you, Roxanne.

Lee Barrett, please.

MR. BARRETT: My name is Lee Barrett. I'm an engineer in Elgin. My address is 368 Bluff City Boulevard.

I have been asked to look at the report, and I'm working on the response at the moment; but I thought that what I have done to this point does seem to make a couple things fall out that are interesting, interesting enough to be able to -- I have to go over

here.

I will take you to the report in its present state, if I can figure out how to turn this thing on.

MR. FOOTE: Right in the back here.

MR. BARRETT: Can everybody kind of make that out? Can you read that?

(No response.)

MR. BARRETT: That's not important. That's the cover.

The first thing that we looked at was the origin and content and the weight and the volume of the waste that is generated within the County, just within the County, and where we think that's going. And we took one year, its total tonnage; and it was 807 million pounds.

We converted it into pounds because we got into an interesting situation with the densities and some of the problems that we have in the landfill itself.

And then we looked at, as the County did -- we looked at the spread of population, which is the source of most of the garbage; and we see that it comes in two different areas. One is in the northeastern part and the southeastern part of the county.

And those population centers are projected to increase, and that's based on, well, on everybody's prediction, whether it's NIPC or just anybody on the street.

We looked at the waste stream itself and how it is constructed, and we used -- this is out of the Franklin report; and what we did was, we used this number later on to determine what the actual tonnage was.

But down in the right side in 1990, if you look, most of those numbers relate to items that can be recycled. They shouldn't even be in the waste stream, and it kind of gives us an idea how disposable we are as a society. It represents over 87 percent of the mass of the garbage that we generate, is stuff that we just throw away that really should be coming back at us.

And then the impact on the -- we are looking right now at the impact on the waste stream and how it affects the landfill.

And if you take -- on the bottom, you get some idea what the mass of different materials are that are in here: compacted yards of glass, paper; and those are generated from other studies. So we used that.

I'm just kind of going through, giving you an idea of the kind of work we have done to get to

where we are.

The report isn't finished and I will do this and get it in before the end of the month for Mr. Mielke.

But if you take these numbers and you expand them, on the right hand you will see the amount of tonnage that we get.

On the bottom is the fallout of those numbers of the material that you can recycle, and it represents 617,000 tons, just in Kane County. And as I say before, it represents -- the greater portion is 87.7 percent of the waste stream.

So when we are talking about recycling, you can see how very important that really is.

Then it seemed to generate the question of what is the volume as a ratio of the existing fill.

And where we went with this is: It turns out that there is so much capacity; there is a square yard. And in that square yard we put so much garbage. And every day we put earth over it and we press it down and we work that down, and in that square yard is 800 pounds of waste there. That's all that's in it, 800 pounds.

So that -- at the bottom here, I have

got densities of 1,700 pounds per yard -- seemed to be attainable; but something between 1,200 and 2,400 seems to be a range that is reachable.

So if we can achieve a 1,700-pound compression or density per yard, we will increase the capacity of the remaining fill. That potential is by almost twice.

And then we use -- for numbers again, we went to the County report to see what we had for capacity; and we checked with the I.E.P.A. And they confirmed that they are working with the same numbers.

And if you look at Woodland -- and we wrote Woodland off because we said that's -- right now, we don't have any ordinances or anything to affect that quantity or how heavily it is used.

But if you look at Settler's, we do have some control there, that's ours to work with; and we have got about 20,000,000 yards left in there. Plus the additional -- if we get the additional 11 acres that we are talking about, it would be another five years. So the projected 11 would go to 16.

And that led us to look at some other things.

If we take the 11 years and we add the

five and get 16 and you take away the earth covering that we put on there on a daily basis and use a removable membrane, we can pick up another 17 percent capacity.

So that, with the improved densities, would really stretch it; and we have done some graphs.

It should stretch the capacity of that landfill to, depending upon which line you want to listen to, anywhere from 35 to possibly 60 years. And that's without even going back and taking out the recyclables that we probably should be getting out.

And this is a summary on the Maximization of Available Landfill, where we really address that.

So I'm going to -- on the third paragraph from the top, we address that with just a simple comment that it looks like if we can get the densities of 1,719 a yard and a layering of waste removed at a ratio of four or five to one, we can almost double the capacity; but we have some work to do on that to find out if that's true.

We do know that the membrane is right; and we are looking to see if the densities can be achieved, what densities can be achieved.

So that would put us well over and

without that 20-year period.

These are some charts that we have generated, and I don't know if we can get it all up here. It is pretty good.

There are all kinds of numbers up here; but if you look at the compacted yards right at the center, under Table 2.2, where it has the little (a) next to it, that's the yards that we applied and that is taken at -- that's a 1,700-pound compaction; and that's how badly we affect the landfill.

And you can see what the numbers do if the quantities remain, assuming we started at about 30,000,000 capacity.

Well, we are at 20 and we are assuming another 10 for the additional add to Settler's; and I don't know what that capacity is. It's somewhere between 6,000,000 and 12,000,000 yards, and I don't have that number, either. So that's hard.

But you can see that it still runs out very well. At 2010, you've still got capacity left.

In the column on the right, under (b), it is using the density of 1,200 pounds; and if we get that much, instead of the 800 that we are running at right now, you can see that we have still got almost 12,000,000

yards remaining on Settler's in this modified setting.

So we thought that was a very interesting event that occurred during this study. And like I say, we are not finished yet, and I hope these numbers are fairly close.

They are running against -- some of the other engineers that are working, some of the other engineering firms, they appear to be fairly realistic.

And then this is -- this is my guess chart. This is assuming that we do that and we take -- on the left, you see the two curves, the I.E.P.A. Calc and earth cover. That's using the present calcs to the year 2000 or just below that; and that's when Settler's is intending to expire.

And then where the earth cover and then the adding the imports and going to heavy densities, you can see we move out over -- well, to the year 2010 and beyond.

And if we get to 1,700 density, you can see the curve winds up way off the chart.

So the length -- so the life of the landfill is very extensive if we can get heavier densities and if we remove this earth cover that we are using and use another method. And it's an acceptable method. I

don't think anybody has a problem with it.

The reason that we say that there are 11 years left has to do with the E.P.A. and how they do this calculation.

You can do a calculation like this, where you determine what the volume is left and a little more knowledge about the material that you put in and what the densities are for compaction; or you can do one, which is what they seem to have been doing -- and there is nothing illegal about it; it is just the way you report it, and it's probably as good a guess as any -- but they look at the amount of material -- or they look at the volume they had last year, what they lost; and then they say, well, we used so much cubic yards of air space.

And that's what we used and we have so much left and divide one by the other, and we say, okay, it's 10 years or it's 11 years in this case.

And that's -- I think it's a little bit overly simplistic approach; and if we did it in the method for which we are suggesting, that it would be a little more realistic.

So I think -- and then I've got some other curves here that are pretty good.

The other thing that I have run into

and I didn't bring one; but whenever you do an analysis for, oh, wood burning or slurry feeds or any system, some states mandate -- and we could mandate in this case that you do a life cycle cost analysis, and that's a very long, time-consuming thing to do; but each solution has that life cycle then on it; and what that does is, it takes the entire allocation period of 20 years, it looks at the first cost, it looks at the operation and maintenance costs, it looks at the replacement costs, it takes all the money that you spent in the project over 20 years and turns it back to some point in time.

In this case, I'm using present value. That P.V. on the left stands for Present Value.

And into that, you add inflation rates, you add investment -- if you invested the money as opposed to if you had spent it, what your return is going to be on it; and very often what we find with this is that the most expensive first cost is usually the best or the cheapest over the long run.

And landfill is not -- has not been historically the cheapest -- or has not been the most expensive first cost; and I think that's what makes it attractive.

But I think if we looked at it and do a

good life cycle against gasification or wood burning or debris, maybe use -- you know, maybe use the dump itself as a site for only a repose for material while we separate it and then recycle it. We may be able to get a little more out of it.

So the sense of the whole thing, that I got, is that recycling appears to be probably -- has the greatest first impact, but that there is capacity in the dump that we may be able to gain to extend the life of the facility from 16 or 17 years anywhere up to 40 or 50; and that's something that we should take a very hard look at. And I will be working on that myself, and I would suggest the County do the same.

Thank you.

(Applause.)

MR. FOOTE: I want to repeat my suggestion to the witnesses: If you are going to have an exhibit and you want the Development Committee to be able to read your testimony and know what you were referring to, my suggestion is that if you have got something -- remember what we are doing. We are getting a record to the Development Committee.

If you put something up here like this, my suggestion is either mark it, so that you can say "I

have labeled this Exhibit 1" or "Looking at this Kane County map, we see" -- that way, the record will mesh together with what you say.

Certainly everybody -- this is a public hearing, and the idea is to let people talk about this; but I want the record to be as clear as possible.

So I would ask, if anybody else has exhibits, that they refer to them and use them in that way, please.

Next, Michael Cailas.

MR. CAILAS: Hello. My name is Michael Cailas, and I'm an assistant professor at the University of Illinois at Chicago at the School of Public Health.

Tonight I will be talking about the -- all the numbers that appear in the plan of Kane County. Okay? And they are quite interesting, because based upon those numbers, those simple numbers, okay, that sometimes we just overlook, okay, long-term decisions are going to be made that will influence the growth and sometimes even the prosperity of the county.

Somebody might ask, "What's the problem with those numbers?"

One of the problems is that in the plan itself those numbers are not well-justified.

And it is extremely important, in order to make long-term predictions like the 20-year plan that came for public hearing, to have very reliable and very well-justified numbers.

Just to be more specific, I will show you how those numbers -- how this probably magic 8.4 number generation made in Kane County was estimated.

First of all, you start with the basic gate cubic yards up here, okay. As mentioned in the report, okay, those yards have been obtained by landfill operators.

I think you will find the conversion factor, okay -- and this is an overall conversion factor which I'm using for comparative purposes.

This conversion factor is used in order to account for differences in densities that exists. Okay? Some waste is loose; some is compacted.

And this conversion factor that you see up there is a overall one. Okay? It is not specific. So for each component of the solid waste, we have a different one; and this is an average overall factor.

Okay. Later on, you will see that there are problems with that number as well.

Now, if you apply that conversion

factor, you derive the tons. Okay? 730,566 tons. Okay? And the -- each number, and the volume in the plan is quoted as well.

Now, one of the most interesting numbers, okay, that have not been justified at all, and not only that, but, as we will see, it was even mentioned that it is problematic, is the percent of Kane County contribution.

What .55 means is that 55 percent of the waste that goes into landfills, okay, comes from Kane County, which means 45 percent is imported. Okay?

Now, there is a problem here because, as we will see later on, this number was estimated from gate service that were done for 20 days during two summers. And I will be talking about it a bit more, in a bit more detail.

Now, if you add the amount of exports to other counties, the on-site solid waste, and the recycling amount, you derive the total generated waste.

That, you divide by pounds per ton, by the population, the '89 population, and finally by the days in one year; and you derive this maximum number of 8.4.

What this tells you is that each person

What you can see here is the percent of compacted and loose waste that goes into the landfills. Okay? Again, Kane and Lake have almost similar percentages of loose and compacted waste, whereas all the other ones, at least the neighboring ones, have different. Okay?

Now, that kind of occurrence is quite rare to happen, because the other amount is -- a large part of it is imported; and you cannot control. Okay? There is no way that you can say that two counties will have all those characteristics similar.

Now, something else that we found out in the report is that Kane County and Lake County have extremely similar, almost identical, solid waste generation rates.

As you can see here at bottom, Kane County has an 8.4 generation rate, as I said before and I showed you how it was arrived at, whereas Lake County has an 8.5. And that's, you might say, almost identical if you take into account the variability in those numbers.

Now, if you consider all these similarities that I mentioned -- first of all, the conversion factor, which is almost similar, then the percentage; and then this, this final, you might say,

in Kane County generates per day 8.4 pounds of waste.

Now, this is a very useful number because, as you will see, by bringing it to that scale, in the scale of pounds per capita per day, you can compare it with other counties. Okay?

So we will make some comparisons with other counties, neighboring counties actually, and see if this number makes sense.

Something else that I mentioned before is the conversion factor, the overall conversion factor. I need to repeat that.

What I have got here is a figure, okay, showing other conversion factors used by other counties in their plans.

As you can see, Kane County and Lake have almost similar conversion factors. Okay? They are the top ones. Okay?

Now, neighboring counties, even West Cook has a lower one. I.E.P.A. is using a 3.3 conversion factor, whereas Kane and Lake County have a 3.9, around a 3.9 conversion factor.

Now, there is one more similarity that we found in the plan, and it's even more striking in a way because it's extremely rare to occur.

similarity, which is the solid waste generation rate -- you might assume and quite justifiably, that the two counties are identical. Okay? And maybe then you can justify those numbers.

But it will be quite difficult, even if that is proven. Okay? But let's assume.

What we have done is, we did a comparison, okay, based on the 1990 census that came out recently, okay, between those counties. Okay? Between Kane, Lake, and we added Will. And this is part of a broader study that I'm doing at the university in comparing studies all over Illinois in terms of generation rates.

And we are trying to correlate demographic characteristics like population, household density, with solid waste characteristics. Okay?

So we just took those three counties; and what we found out is that Lake and Kane County are far away from being similar.

The most obvious difference is in terms of farmland as percent of total area.

As you can see, okay, the farmland in Kane County is 68 percent of the total area, whereas in Lake County it is only 27.6.

Of course, if you go to Will County, Will County is 60 percent, 61 percent almost, farmland as a percent of the total.

Now, if you go through the table, you will see that there are a lot of dissimilarities between Kane and Lake County, whereas there are a lot of similarities between Kane and Will County. Okay?

And in this table, you can see also the generation rate of Will County, which is 6.8, near the average, the recent average of Illinois, which is around 7.

What this means is that, for some reason, the numbers that I had indicated before in the first table that I presented, have to be looked upon more closely, okay, and why -- I will show you here in a graphical way. Okay?

If we assume a different import rate in the Kane County landfills -- instead of 55 percent, which is the one on the left, if we assume a 45 percent, which is just a 10-percent difference -- and that can easily happen, okay -- then what we come up with is a 7.1-pounds-per-capita-per-day generation rate for Kane County, which is fairly close to the one of Will County, plus it is very close to the average. Okay?

And this is just based on a different percentage of imports. And since that percent has not been well-justified at this time, there is no reason to assume that this one is better than the other one. Okay?

So that's a serious drawback of the plan, that this basic, very basic number has not been justified at all.

Usually what you do in cases like that, if there is no way of estimating properly, is to take an interval. Okay? An interval means a 10 or maybe more, depending on how well you feel about that number, interval plus or minus percent; and use that to derive a long-term plan, because, remember, based on that 8.4 generation rate, you are going to estimate a lot of things.

For example, in the year 2001, you are going to estimate the tons per year; and as you can see, if you use the 8.4, you are going to derive a totally different number than if you use a 7.1.

And you can see those numbers at the bottom here, this one and this one; and of course, if you divide it by the numbers of days, you are going to find a different tonnage-per-day figure as well.

Now, why is this so important? Because at the time, okay, you are somehow trying to estimate the

land, the surface land, that a landfill will use.

So definitely you need very, very good estimates of that kind of quantities in order to be able to design that landfill. Okay?

So with almost 100,000 tons per year difference, okay, it's almost impossible to design in a reasonable, reliable fashion a landfill, let alone do a cost/benefit analysis that should have been done in the plan. Okay? And one of the other speakers will be talking about that.

Now, what I will be talking about -- the first speaker mentioned what goes into Settler's Hill, okay, the landfill that is owned by the County. Okay?

You can see in the 55 percent, 45 percent lines -- and I will be talking about them in a while -- that if only the amount of Kane County waste was going into Settler's Hill, then that landfill, by itself, would have been sufficient to support in terms of capacity the county, far beyond the year 2010, which is the requirement, okay, the 20-year planning period. And you can see that.

Even if you assume a 55 percent local rate of imports into the landfills -- okay; you can see that -- the line near 6, okay, indicates the total

capacity; and those lines down there are the cumulative tons that go into the landfill year by year. Okay?

So you can see that the Settler's Hill Landfill, by itself, has the capacity to sustain the county far beyond the year 2010.

Now, why are we thinking about a new landfill?

The reason here is that Kane County, as I said before, is importing a considerably significant amount of waste. Okay? And according to the new contract, okay, almost half a million tons per year have to be dumped into the landfill, at least that landfill. Okay?

Now, what you have here is this line. If you take into account that amount that has to be going into the landfill because of the contract, you have this line here; and as you can see, your existing capacity won't last that much. Okay? It will deplete at some time around 2002 and 2003.

If you add 11 more acres, which are in the plan, okay, then again you won't be able to reach far beyond the year 2010. You will have depletion around 2008. Okay?

So that's something that's very

significant because, under normal practices, when things like that are planned, what you are trying to do is to maximize the gains because, of course, the county has to get a very good revenue; but you have to take into account as well the needs of the county in terms of landfill space. And obviously that has not been done.

Now, my recommendation -- and later on, one of our graduate students from the university will be talking in more details about similar cautions.

My recommendation is that those numbers -- and especially the percentage of imports -- have been very -- have to be very closely assessed, okay, because it is very likely, okay, that they are overestimated.

So it is extremely important if the County is planning to come up with a long-term plan to have very good, accurate estimates. If not of the total amount that goes in, at least of the amount that is imported in the county.

And, of course, if that's done, then everything is changing as you saw before. Instead of an 8.4, you will have a totally different generation rate. Okay?

And later on, as you will see, there

are ways of expanding the life of the existing landfill, Settler's Hill Landfill, okay, by very simple practices, like the practice that was mentioned before, like an alternative cover, plus an increased compaction efficiency.

And if you follow that kind of practices, then the life of the landfill can be expanded beyond the year 2010, which takes care of the planning period. That's one of the requirements. Okay?

I'm finished.

(Applause.)

MR. FOOTE: Yes. My job is to make sure the record is clear; and I'm now going to insist that if the witnesses come up here and make any exhibit part of their speech, they identify it.

Remember, that the Development Committee is going to get a transcript; and if you want them to respond to this, you have to identify it so that they know what to respond to.

So, for example, in this case, if the witness was going to use this, I would ask them to either mark it as 1 or Banana or however they want to mark it, when they put it on here or just name it, "I'm now referring to the Cumulative Waste at Settler's Hill

Landfill Chart."

Otherwise, it's not in the record and the Development Committee will have no idea, when they go through this, what to respond to.

So from now on, any witnesses that have these overheads, you must identify the overhead before you put it on the projector.

And I will accept -- I have been marking these exhibits -- Mr. Cailas's summary as Exhibit 3.

Next, Ken Goldberger.

And I would remind the witnesses also: Please identify your full name and address when you start speaking.

And one other suggestion, and that is: I think it would be helpful, so people can follow this, if you give some idea of your area of expertise as part of your talk and follow that -- I think the best way to do it, is to let everybody know what your conclusions are; and then you can explain your conclusions. I think that's probably the most organized way to do this.

So Ken.

MR. GOLDBERGER: Hi. My name is Ken Goldberger. I live at 1458 Lake Avenue in Wilmette. I'm a graduate

student at the University of Illinois, Chicago, and I'm working on solid waste management and I'm helping Dr. Cailas with his research project.

I'm going to kind of pick up where he left off actually with the same graph.

This once again --

MR. FOOTE: Will you identify it?

MR. GOLDBERGER: Do you want me to write on it?

MR. FOOTE: Just identify.

MR. GOLDBERGER: Okay. Graph 1.

As you can see, this is the same graph with the estimations of the Kane County waste for the 45 percent and 55 percent Kane County waste landfills with the capacity and the extended capacity.

To kind of put this into perspective, if Kane County put all of -- well, right now, Kane County puts their waste in Settler's Hill and Woodland Landfill.

If Kane County were to put all their waste generated into Settler's Landfill, you would be at the 8.4 generation factor on the 55 percent line.

That would, you know, easily -- Settler's Landfill would easily meet the capacity needed for Kane County through the planning period 2010.

The problem comes in -- not really a

problem -- with the imports. There is a contractual obligation of the 468,750 tons.

Actually, this year, or the last report year to the E.P.A., it was about a half-million tons. So the slope of that line actually would be a little bit longer.

What I want to talk about now is the cost of the landfill.

Chart 1.

MR. FOOTE: Can you identify it somehow, based on what it says on there?

MR. GOLDBERGER: Summary of Reported Landfill Cost.

MR. FOOTE: Thank you.

MR. GOLDBERGER: Okay. This is two charts really.

The first chart on top is the actual chart that appeared in the Kane County Solid Waste Plan.

What they did to estimate costs is -- you can see the source is Illinois Lake County, two facilities in Lake County; Massachusetts; Minnesota; and Will County.

The parameters applied are acres, life in years, tons per day in design tons, total capital cost, and total capital cost per design ton, total capital cost per acre, and total cost per ton.

Now, the total capital cost is -- this is your predevelopment and your first cell of the landfill; and total cost per ton is taking into account the yearly operation and maintenance and the debt service on bonds if the bonds are issued to finance the landfill.

You see, they have taken an average total cost per design ton of $12,503 and used that to estimate costs of different sized landfills, as size stated in design ton.

So if you would just multiply your design tons -- like in the case of Illinois, the design ton is 1,000. You just multiply 1,000 by 12,503 and arrive at your capital costs.

The bottom chart is a little bit better.

I made some changes really to that chart. The biggest one would be concerning the Minnesota facility.

I found that the average cost per ton for the Minnesota -- the total capital cost per design ton in total capital cost per acre for the Minnesota facility had been excluded. On the footnote in the original chart, it stated that because it is inconsistent it was excluded.

Now, if you look at it, it does seem

kind of inconsistent to have $5,000, 11, 9, 8, 28, and 76. It seems pretty large.

Actually it is not. It is completely consistent.

What you are doing to estimate your total cost per design ton is merely dividing your total capital cost by the design ton; and given economies of scale, the higher your total cost per ton -- I'm sorry, the design ton, the lower your total cost per design ton.

Lots of design tons.

So it really just represents an economy of scale. Your total capital cost is fairly well in line with all the other capital costs. It is just that, since it's a low design ton, the cost is higher.

So being consistent, I have included this data.

I have also included a 300-ton-per-day site under the Illinois category.

The Kane County plan, in its assumptions, stated that there was a 300-ton-per-day and 1,000-ton-per-day design facility.

The plan quoted the I.D.N.R.'s report, Municipal Solid Waste Management Options Landfill Volume, where they did include the 300-ton-per-day facility. That

adds -- excuse me.

The capital cost for that is about 3.4 million. So the 11,500 actually brings the average cost down a little bit. And there is an addition of the total cost per ton of $36, compared to the $19.33 total cost per ton for the 1,000-ton-per-day facility.

Given these new figures -- actually there are a couple more.

The Will County numbers used in the original chart were a 1990 draft that stated that the total cost per ton -- they have used a low estimate and a high estimate. The low estimate was $17.10 and a high estimate was $24.53.

In the final copy of '91, it was dropped a little bit to $15.56 and $23.58 for the low estimate and high estimate respectively. It's an average of $19.57, which has been included.

The Minnesota facility was referenced in a version of Wasteland, which is a computer modeling tool that is used to design different -- plug in just different assumptions, you get different costs and parameters.

They listed the total cost per ton as $30.14. It'a a little bit higher than what was reported

in the original. So I included that.

The Lake County -- the author of the Kane County plan omitted a 10-percent equipment replacement fund. I have included that and factored that in. And it raises the total cost per ton marginally; maybe 50, 60 cents. And that's about the additions that I have made.

So the new total capital cost per ton is $21,554. It is a 72-percent increase in cost based on the original plan, just by the inclusion of the Minnesota facility, which shouldn't have been excluded in the first place.

Other things to note: In the table, there are some other inconsistencies.

The Illinois facility -- the cost estimated only included a post-closure period of five years. New regulations require that to be 30 years. It's very costly, and it will add greatly to the cost of that facility.

The report requires, as the State regulations, a five-foot clay liner; and new regulations also require the same for the final cover. The cost estimate only calls for a three-foot liner. So that will add to the cost of the landfill.

The Massachusetts facility makes no provisions for leachate treatment. That will add to the cost of the facility as well.

And the Minnesota facility only has a post-closure period of 20 years. The extra 10 years will also add.

So this is -- the $21,554 is still an underestimation, given the data provided.

To show you how this affects things, this chart is a revised version taken from --

MR. FOOTE: Please identify it.

MR. GOLDBERGER: Estimated Capital Costs For Landfills.

(Continuing.) -- taken from the Kane County plan.

The different landfill ton per day are estimates of sizes for the different waste management systems.

For instance, System 1 calls for a combination of landfill and combustion and recycling.

System 2 calls for a combination of landfill and recycling.

3, landfill and composting and recycling.

And 4, landfill, composting, combustion, and recycling.

These are the four systems provided in the reports to meet the solid waste management needs of the county.

You can see that the original capital costs that the 321-ton facility costs about 4,000,000, goes up to about 7,000,000 with the corrected capital costs; and the 885-ton-per-day facility that is recommended for Kane County goes from a cost of 11,000,000, up to 19,000,000. It's an increase of about $8 million. Very considerable and definitely something to think about.

Well, they cost a lot of money; but there are ways to meet your solid waste plans without spending so much money.

The next chart is Combined Effects of Daily Cover and Increased Compaction.

Let me tell you a little bit about this first.

The daily cover -- alternative daily covers, as mentioned before, is a means of increasing the volume of your landfill.

Regulations state that at the end of

each day six inches of soil cover be placed over the work itself. That means the exposed waste should be covered every day. That's to prevent against odor; littering; blowing paper; vectors, which are birds, flies, all the good things that tend to congregate around a landfill.

Alterative sources of daily cover, I will mention a few. There is a fabric panel. The panel would be pulled in place over the waste at night; and then at the start of the working day, it will be pulled off. Obviously that takes up no volume. So you have saved that volume.

You can use a foam spray to spray over it. That would take up a little volume.

You can also use compost from a composting facility.

Whatever the method you choose, you are going to reduce the amount of volume needed for daily cover.

Currently, Settler's Hill, in their 1992 worksheets that are supplied for the report entitled Available Disposable Capacity For Solid Waste in Illinois, reported that they estimate 20 percent daily cover for the remaining volume of the landfill.

What that means is: Given the

remaining cubic yards of space, 20 percent of that is going to go for daily cover. So obviously if you can reduce that, you are going to add space in there or life to your landfill.

Compaction is another method of increasing the life or space in your landfill. Solid waste -- I mean, the waste that comes to the landfill, it is already compacted. It is compacted in the trucks or however it gets compacted.

Earlier, Dr. Calias mentioned a conversion factor of 3.9 gate cubic yards per ton. That translates into 513 pounds per cubic yard.

As we said, that might be a little bit high. So we have used a different conversion factor, a more justified one of 3.54. That yields a gate density of 565 pounds per cubic yard.

Settler's Hill also reported that their compaction factor is 2.83. What that means is that 2.83 gate cubic yards can fit into one in-place cubic yard; in-place, meaning the cubic yard as it sits in the landfill.

Multiply the 565 pounds per cubic yard by the 2.83. You get in-place compaction density of about 1,600 pounds per cubic yard.

By higher compaction efficiencies -- that can be achieved by a multitude of methods; bigger tractors, different wheels -- you can also increase the space.

This graph, table actually, shows now the percent daily cover, 20 percent, 10 percent, 5 percent on the way down; the compaction factor for each of the cover percentages from 2.6 to 3.2; and the corresponding density, with that compaction factor, assuming 565 pounds per cubic yard of gate density.

Right now, with -- you can see the 20 percent daily cover, a compaction factor of 2.8, which is very close to the 2.83, yields your gate cubic yards for disposal or the remaining life for 12.64 years, which the report of the I.E.P.A. is about 12.5 years, same thing, and the depletion year is 2005.

By a moderate decrease in daily cover, say by 50 percent to 10 percent, and an increase in compaction by 10 percent, making about 1,760 pounds per cubic yard, which would be compaction factor of about 3.1, you are looking at an increase to 15.74 years, so really about three years, and the completion year would be 2008.

Obviously this increases the life of the landfill, but it doesn't get you through the planning

period.

This graph, cumulative waste at Settler's Landfill, graphically represents this. You have seen that one before.

Here we listed the depletion year of 2010.

MR. FOOTE: Please identify it.

MR. GOLDBERGER: The Depletion Year for Settler's Hill Landfill as a Function of Daily Cover and Compaction.

You have different lines representing the slope of different percentages of daily cover; and you can see with a five percent daily cover and a high compaction factor, probably above 1,800 pounds per cubic yard, you can extend the life of the landfill beyond the planning period of 2010.

This next table entitled Combined Effects of Daily Cover and Increased Compaction on the Remaining Capacity at Settler's Hill Landfill With 11 Acres Added, this is adding the proposed 11 acres. That would add five years to the life. And it's the same table with the acres added.

You can see that on the depletion year you can reach 2010 by basically doing nothing. I mean, that's daily cover of 20 percent, which they state, and a

compaction factor of 2.8 which is stated in the report. Right there, you are all the way through the planning period.

By taking, as we said before, the 10-percent daily cover and the compaction factor of about 3.1, your remaining life is 22.31 years, and it goes to 2014, four years past the end of the planning period.

And I will graphically represent this with Depletion Year With 11 Acres Added.

You can see, with a 10-percent cover and an increased compaction factor, you are well above the planning period year.

So why do we need the landfill?

My recommendation would be to use increased compaction and an alternative daily cover to extend the life of the landfill.

Given the five years of added life, you are already through the planning period. So you can just increase the life of your landfill. And 2014 is 22 years away. It's quite a long time.

I don't know why you require a landfill now. It doesn't seem feasible. It's a lot of money, as I have shown; more than was originally estimated.

As we have also shown, there is a high

degree of variability in the generation rates and a lot of the numbers in the report.

Within the time that the landfill eventually depletes itself, the time could be spent in justifying the numbers and coming up with numbers that are more accurate and verifiable.

That's about all I have to say. Thank you.

(Applause.)

MR. FOOTE: Mr. Goldberger's report will be marked as Exhibit 4.

Robert Meissner.

MR. MEISSNER: Can you hear me?

I'm not going to take nearly as long as my fellow engineers.

(Applause.)

MR. MEISSNER: I have tried to organize this --

MR. FOOTE: Sir, your name and address, please.

MR. MEISSNER: My name is Robert C. Meissner, Sr. I live at 201 South Vine Street in Hinsdale, Illinois.

I'm here to make engineering, scientific, and economic comments on the Gary Mielke Soli Waste Management Plan.

I'm a little older than most of these

other fellows, and so I think that I don't have as much time to wait around and plan on having this done and that done.

In any case, after reading the plan, all of its appendices, the history of Mr. Elfstrom's handling of Kane's waste problems, there is no doubt that these two men, plus several others, have created a shameful fiasco --

(Applause.)

MR. MEISSNER: -- which must be corrected through a number of lawsuits; not just civil, but possibly criminal.

(Applause.)

MR. FOOTE: Sir --

MR. MEISSNER: Yes?

MR. FOOTE: Sir. Please. The purpose of these hearings is to respond to the plan.

MR. MEISSNER: I am doing that.

MR. FOOTE: Please do that.

MR. MEISSNER: Okay.

The other way to respond is with real engineering analysis, design, and planning to point out the proper and economic way out of the morass.

Now, who am I and why am I here?

I was born in Illinois. I graduated from Lyons Township High School.

I got one of three scholarships to a school called the Massachusetts Institute of Technology. I attended and graduated from M.I.T. in Cambridge and was sent by the United States Navy to Harvard University for graduate study in electronics and communications.

After an extended tour of combat duty in the western Pacific, I returned to the Chicago area to make my home and take further graduate study at I.I.T. and to commence a professional consulting engineering practice, which is still going strong after 41 years.

Now, this practice, professional consulting work, has been in bulk materials sampling, processing, and then the design and construction of mineral and chemical process plants and facilities.

These activities have included dozens of plants and facilities for Materials Service Corporation, U.S. Steel Corporation, Inland Steel, Aluminum Corporation of America, and a number of cement manufacturing companies, and all of the major chemical companies that you can name in the United States.

Now, in every instance, consulting work of this nature included a detailed examination of markets,

the raw materials, the product transportations, the environmental considerations, the construction costs, the transportation costs, the cost of and returns on money, and on and on.

It included examination of alternate ways of performing the process of the original plan.

Then, and only then, are recommendations made to a client or an owner as to what should be done.

That isn't the way it's worked in Kane County.

In Kane County, there are different rules; or, as I should say, there are no rules. Just grab the money and the hell with the citizen voter.

Mr. Elfstrom announced his intention to acquire land and build an enormous new landfill, even though Illinois state law says that a landfill is the least desirable, most unwanted way of handling waste.

Now, the problem presumably is that there is no time.

These gentlemen up here have been very nice about the fact that there might be 15 years, there might be 20 years.

The facts of the matter are that if we

apply the technologies that are applied everywhere else in the United States, not just here, there is somewhere between 40 and 100 years in existing time in the existing facilities.

In any case, these gentlemen have, with Kane County, with the smallest population in northeast Illinois, smaller than six other counties in northern Illinois, smaller than 30 other counties in northern Indiana and Michigan and Wisconsin, and smaller than hundreds of U.S. population centers and yes, yet, it is to these gentlemen the proposed home of the third largest landfill in the entire United States.

Such a landfill belongs in Cook County or in eastern Long Island or in Los Angeles but not in Kane County.

Kane County citizens don't need it; Kane County industry doesn't need it. Kane County business doesn't need it.

Waste Management wants it; and their former and present employees who are entrenched in the present Kane County government have rigged it for them.

Now, I have confirmed that EDKO's common sense answers and conclusions that Kane County has been hoodwinked and has been lied to.

Together, however, we can reverse this process; but two important things are needed, and this is what is planned.

The first is the employment of aggressive legal counsel working locally, right here, who will sue the small group of crooks --

MR. FOOTE: Sir --

MR. MEISSNER: Yes?

MR. FOOTE: Please. You need to respond to the plan. This is not a rally, and you certainly are welcome to hold a rally after this.

The purpose --

MR. MEISSNER: Okay.

(Applause.)

MR. FOOTE: The purpose is so that we can get to the Development Committee a transcript of how people feel about the plan. So please limit your comments to that, sir.

MR. MEISSNER: Well, I hope I'm getting over the idea that I think that it's a terrible plan.

The second is the employment of several consulting firms that are totally professional and honest whose assignment is to examine now the alternatives, the solutions available to the county, and there are many of

them.

Further, there will be plenty of time for this work to be done and will cost the county a tiny fraction, maybe one percent, of the spending jag proposed of $30 million to buy some land that isn't necessary.

These consultants would analyze the sorting of waste, the grinding of some of the waste streams, incineration and electric power generation, gasification of the waste stream, and generation of moneys for the county, not for Waste Management.

Currently it's interesting: 94 percent of the income paid for waste treatment and disposal goes to Waste Management Corporation.

The remainder goes to Kane County, but Kane County has to carry the load for accounting, legal services, and insurance; and their net income is zero.

I think that we can do a better job; and that's what I, as a consultant, would propose that we together do. Thank you.

(Applause.)

MR. FOOTE: I will mark Mr. Meissner's written comments as Exhibit 5.

And Mr. Goldberger, I still need a copy of the exhibits of yours?

MR. GOLDBERGER: (Indicating.)

MR. FOOTE: Next, John Thompson, please.

MR. THOMPSON: Well, good evening, everyone. I'm John Thompson, and I'm the executive director of the Central States Education Center, which is nonprofit, and we are based in Champaign. Our address is 809 South Fifth Street, Champaign, 61820.

I guess -- a little bit of background about myself.

I'm a chemical engineer by training. I received my bachelor's degree from the University of Illinois in chemical engineering in 1982.

Since 1984, I have been the executive director of Central States Education Center which works almost exclusively on solid waste, hazardous waste, and low-level nuclear waste issues in Illinois and Indiana.

Over the course of -- since about 1984 to the present, I have testified as an expert witness in maybe approximately 40 landfill hearings, testifying in the areas of need and testifying in the areas of safety and design.

I have analyzed about a dozen solid waste plants in Illinois and Indiana, and I have developed solid waste management programs in several Illinois

counties and cities, totaling eight.

And I guess -- I have reviewed both volumes of the solid waste plan that is proposed for Kane County, and I have submitted a seven-page report with all the numbers punched in there, and I don't intend to go through that number by number here tonight.

But I do want to share with you some of the thinking that I had in reviewing this document and that there were two things that stood out in my mind as very odd about this plan when I went through it.

The first is the waste generation numbers. This pounds per person per day, the per capacity waste generation rate, was extremely high in Kane County relative to solid waste plans not only here in Illinois but in Indiana and elsewhere across the nation.

The significance of that is that, if you assume a high generation rate per person, you end up overestimating the amount of garbage that you generate in the county; and when that happens, you introduce several errors into the plan.

The size of the proposed treatment and disposal facilities is exaggerated and the costs of those facilities is too large. So that that first oddity about this plan is very significant.

And then the second thing that struck me as very peculiar about this plan was -- the plan states that there is 11 years', approximately, capacity at Woodland, 11 years approximately at Settler's Hill, and by purchasing another 11 acres and expanding Settler's Hill, you can extend the capacity of that landfill another five years.

So roughly 16 years of capacity in this county; and yet one of the primary, principal recommendations of this plan is to put a new landfill on the fast track for the county. That's odd.

You see, 16 years is an extremely long period of capacity relative to the rest of the state, an extremely long period of capacity; and to put the landfill, finding a new landfill, as such a high priority, given that huge capacity, is very strange.

And so in looking at this document, I would like to just kind of bring up some of the findings that I had with respect to those two points.

First of all, the per capita waste generation rate assumed by the plan is 8.4 pounds per person per day; and that's based on a gate survey, someone going out in 1989, looking at Settler's Hill for 20 days, looking at Woodland for 15 days, and trying to figure out

how much garbage went through in that period that came from Kane County. Based on that gate survey, about 55 percent of the waste came from Kane County.

That value of 55 percent was then used as the annual basis and that was used to calculate how much waste on a yearly basis we generate or you generate here in Kane County.

There's a problem with that.

When you take three weeks of data and try and project it over the course of a year, you introduce a lot of uncertainty into the calculation; and if that 55 percent assumption is wrong, it introduces a tremendous amount of error into the final result.

For example, if the actual amount of waste entering that landfill from Kane County is 40 percent, not 55 percent, you end up with generating about 6.5 pounds per person per day; 45 percent, you get 7.1 pounds per person per day.

The significance of that can't be overstated, because if you factor that all the way through the plan -- and let's say you use a more reasonable value of, say, 7.1 pounds per person per day over the entire life of the 20 years of the plan, you end up projecting about 2.2 million tons of garbage less than what the plan

projects.

Now, I realize that I'm getting into a lot of numbers; but let me put that 2.2 million tons in some perspective.

This plan recommends a landfill, a new landfill, of 2.8 million tons.

That uncertainty, that potential error that is introduced by using the wrong per capacity of waste generation rate, is equivalent to 50 to 70 percent of that new landfill. All right? That is a tremendous amount of uncertainty, if you think about it.

You assume a certain generation rate; and if that generation rate is made to be more reasonable, you overestimate the amount of waste to be generated in the county by the equivalent of about 70 percent of the capacity of the proposed new landfill. All right?

So it's a significant factor.

Now, I realize that we don't always have the best data when we are developing these kinds of documents; and I'm not suggesting that you have to have perfect data in order to develop a plan.

But what is relevant in discussions of public policy is what do you do when you are not certain about how much garbage you have. What should you do as a

planner? What should you do as a county?

And I think that what you do is to try and take the least-cost solution. Try and take the solution that is not irreversible.

And what I mean by that is that if we know that we have about 16 years of landfill capacity in the county and we know that by law we have to revise this plan in five years, the prudent thing to do from a public policy standpoint is to put the new landfill on hold, at least for five years, until you revise the plan as you are required to in 1997.

Because of the significance of the waste generation factor, it may be that you may not need a new landfill in the entire solid waste planning period of 20 years. That's how great the uncertainty is in those numbers.

And it makes no sense. It makes no sense to spend millions and millions of dollars and all kinds of County staff effort and your efforts in trying to develop a facility that may or may not be necessary.

What makes sense, given the uncertainty, is to revise the plan and say, "No, we are not going to move ahead with the new landfill and put it on the fast track. We are going to put it on hold. We

are not going to do anything."

And over the first five years of the solid waste plan, what makes sense is to put the county's limited resources and staff time into waste reduction and recycling. Because if you really put the effort into that, you can change the composition of the facilities and then you end up meeting it over the entire course of the 20-year period.

There are some very practical reasons for doing that beyond just economic ones.

If you try and fast-track a new landfill in this county, you will have to go through Senate Bill 172 proceedings. That's the law and process describing getting local approval.

I won't go into all the details of that; but there is one aspect of that that's relevant to our discussion tonight; and that's the first criterion of S.B. 172.

If you want to build a new landfill in the State of Illinois, you have to show that that landfill is necessary to accommodate the waste needs of the area it is intended to serve.

The Illinois Pollution Control Board has probably had maybe a dozen cases on this every single

year for the past -- since 1981.

In most of those cases, they have defined need for a new landfill as having it -- in an area where you need to show that there is less than 10 years of capacity in your existing facilities before you can build a new one or before they interpret that as need, as the need criterion being met.

If you have 16 years of capacity right now and you try in the next year or two to say, "We need a new landfill," you are not going to be able to meet the first criterion; or at least that's my judgment, having testified in about 40 of these things. And that's been supported in numerous appeals all the way up to the Illinois Supreme Court.

And what happens is that not only do you end up not being able to show need for this facility, but you end up having to spend an enormous amount of staff time at the County level trying to site, trying to develop consulting reports, trying to show that this landfill is a good site; and it becomes a full-time job.

And the practical effect of that is that no time is spent at the County level on recycling an on source reduction and on the kinds of things that we know we need to be doing, because it is such a consuming,

intensive experience, trying to pick a new site, trying to acquire, trying to characterize it, and trying to win approval for it.

The question really, from a public policy standpoint, is how do you want to spend the next five years? Do you want to spend it in a landfill battle over a project that is going to be many, many millions of dollars over the next couple of years that may or may not be necessary over the course of the 20 years?

Or do you want to spend that kind of resources and energy into trying to reduce the size of the waste stream? And then after five years of recycling and waste prevention and doing those sorts of things, evaluate whether you need to develop a new landfill during the 20-year planning period.

My recommendation is that you take the latter approach, that you put your effort into the source reduction and recycling now for the next five years and cross the landfill bridge five years from now when the plan has to be updated according to State law.

At that point, you will at least have some solid, accurate verifiable numbers.

You will also know the effect of your waste reduction and recycling efforts; and if there is a

landfill that needs to be built -- and based on what I have heard tonight on using the alternative ways to cover, it certainly suggests that you won't -- at least you will have some kind of factual basis for winning support for that.

So I have other comments that are contained in my seven-page report; but I think that, with the high points of what I have covered, I needn't spend more time on them.

Thank you.

(Applause.)

MR. FOOTE: I marked Mr. Thompson's report as Exhibit 6 for tonight's hearing.

Next, David Gossman.

MR. GOSSMAN: My name is David Gossman. My address is 45 W 962 Plank Road. I'm a resident of Burlington Township here in Kane County.

Some of you may know me as a school board member of District 301. For a point of clarification, I'm not representing the district. I'm here representing myself.

I have a Bachelor of Science, a Master's of Science in interdisciplinary physical science. I have spent the last 12 years in the industrial waste

recycling and reuse industry.

I am generally considered to be an internationally recognized expert in certain areas in industrial waste recycling and reuse. I have clients all over the U.S., as well as Europe and South America.

In reading the plan, on the surface you get a good impression, with strong recycling and reuse objectives. Yet a more detailed look reveals that the ball was dropped by falling back on landfills. What should be the last resort is the first resort in this plan.

I spent three to four hours reading the plan, both volumes; and I have the following comments and observations. They are in no particular order.

The plan is technically and factually flawed. You have heard a lot of that already this evening; but just to focus on one area, I looked at Appendix G in Volume 2, which is the section on landfills, and it talks about costs and things like that, trying to come up with some sort of estimate for operating a landfill.

I would like to run down some of the things that I observed in that section.

The land acquisition cost of $1,500 an

acre. Maybe at the point of a gun.

(Laughter.)

MR. GOSSMAN: There is a provision in the assumptions that indicates a 30-year post-closure care; but then as you go to Table 5.2, it only has five years in the cost estimate. That's an internal conflict in the document itself.

There is a leachate disposal cost of six cents a gallon. You might be able to transport the leachate for six cents a gallon, but you are not going to get it disposed of for that cost.

The checking of the monitoring wells, which are the wells that are drilled around the landfill to see if there is any leaking from the landfill, is only done four times a year. That's probably going to be inadequate under most permits today.

There is no provision in the cost estimates for new regulations. There are new regulations likely within the next one to two time frames on landfills from the federal government that are going to drastically change these costs.

The groundwater monitoring program during the five-year post-closure period is apparently decreased to only one or two tests per year, based on the

cost estimates that are put in there.

The leachate data that is presented in this same appendix that is used to support the contention that the leachate is not a hazardous waste would in fact be hazardous under proposed E.P.A. rules on hazardous waste that are due to be implemented next spring, or at least could be hazardous.

There appears to be no provision for treatment of surface runoff water despite the fact that the plan indicates that there is a need for it. But there is no provision in the cost estimates.

Table 5.2 should indicate at the top that the figures are thousand dollar figures. It does not.

The cost for assuming that -- that the cost assumption for siting and permitting assumes that that permitting process will be an uncontested process. Okay?

And finally there are no synthetic liners or synthetic caps. It is all done with clay.

Now, I did note that Appendix G has a $20 tipping fee cost, but then the plan uses a $30 tipping fee cost.

Now, if the County developed a separate

set of cost estimates and came up with that $30 fee, that should be presented as part of this plan, or at least the rationale for why $20 is in the appendix and $30 is what they put in the plan.

I don't think that that difference will still account for the differences in costs that are likely in this scenario.

One thing that I considered to be a major omission is that there is no mention of coordination with, or even existence of, the other waste management units that exist within the county; and it would certainly be appropriate for them to consider that option in a plan like this.

There is no discussion of how recycling and reduction plans might extend the lifetime of existing landfills. Beautiful recycling and reduction programs, but then no projections on how it's going to extend the life of existing landfills.

In at least the copy of Volume 2 that I had, which was the volume that was made available here at the school district for public viewing, Pages F-30 through F-37 were missing. They simply weren't there.

Those pages contained the cost estimates on combustion. So there is no way I have any

way of evaluating how good a job they did there. Some of their cost estimates in that area appear to me to be high; but without the details, I can't verify it.

It seems to me that the plan also violates the hierarchy in the Illinois Solid Waste Management Act by not pursuing combustion with energy recovery prior to landfilling, in conflict with the second sentence of the plan. The second sentence of the plan says it is in conformance, and then there is nothing to support that contention. In fact, everything seems to indicate just the opposite.

There is nothing in the plan that monitors, that provides for monitoring of state and federal changes in regulations. This plan is supposed to be for 20 years. There are going to be changes in the regulations, and part of the plan should be monitoring the changes in the regulations and meeting those changes.

The County indicates that they aren't going to do anything in particular with special wastes.

Now, most special wastes are gasoline- and oil-contaminated soils. They may not be hazardous, but they do contain organic compounds; and those organic compounds can affect water quality and can significantly reduce the effectiveness of both synthetic and clay

liners.

That should be banned immediately. From the existing landfills, those materials should be banned immediately. There are alternative technologies for treating those materials, including incineration and thermal desorption. Those facilities are out there and available to do that, and that's where those materials should go.

Tires should also be banned immediately from the landfills. You have heard it before. Many states, many areas of the country put a $1 tax on a tire when you buy it, and that $1 then goes to provide for the proper recycling of the tire when it becomes a waste tire.

Tires are too valuable either as a fuel or as a material resource to be disposed of in landfills.

And then why wait for the Illinois E.P.A. funding grant in order to keep household hazardous wastes out of the landfills? We have the Chem Waste Management regional office within the county; we have Safety Clean world headquarters within the county. Why doesn't the County work with one of those companies or another company to set up a regional program for picking up those types of waste materials and handling them properly, instead of putting them in the ground.

The waste energy section of this report I found to be deficient.

It does not examine the potential for working with potential users of refuse-derived fuel, the manufacture of refuse-derived fuel from our waste materials. Make it into a usable product.

In northern Illinois, there are three cement plants. Each one of those cement plants, if it used only 25 percent refuse-derived fuel, could be using 60 tons a day of that type of fuel. That technology exists. It is proven. It is used in Europe and it is used in other places in the United States. Why isn't it done? Why isn't it even considered?

Utilities also have been mentioned, and I agree. They could easily be handling a lot of this material as a fuel. Our waste streams typically contain significant B.T.U. content.

This plan doesn't -- this plan follows the herd. It doesn't lead, and it should. Instead of spending the next five years developing a landfill and monitoring other technologies, we should be developing other technologies and monitoring the potential need for another landfill.

(Applause.)

MR. GOSSMAN: Federal regulations are in place for municipal waste combusters. If you are going to design a municipal waste combuster, the regs are there; you know the standards you have to meet. You can do it. The technology exists.

That's not true for landfills. Those regulations are still in the process of being developed and will likely become more and more stringent over time. That's going to be a multiplying factor on the cost of a landfill over the life of that landfill.

I don't believe that we should let existing costs be the guiding factor. We need to start paying attention to the long-term costs as well.

Thank you.

(Applause.)

MR. FOOTE: Jerry Zakosek, please.

MR. ZAKOSEK: Thank you. Are we on?

I have got kind of a raspy voice tonight.

We have been here awhile. If everybody would like to stand up for a second, I will gladly give up my time so we can get stretch for a minute.

MR. FOOTE: Sir, let me run this, please. I want to get done.

MR. ZAKOSEK: While you are standing, I will get into my speech.

I'm Jerry Zakosek, and I'm a graduate of Northern Illinois University with a degree in accounting.

I'm a licensed C.P.A. and currently work as a vice-president of finance in the private sector, a non-waste-related industry.

I'm a member of a number of professional accounting and financial associations. My experience includes seven years in Big Eight public accounting and 15 years in industry.

I offer this information as evidence in my ability to competently speak of financial and economic issues, including the cost of capital investments, which is one of the things that I have responsibility for.

I have some prepared comments, but I think I can probably cut them short to give everyone a chance.

In looking at the plan, though, one thing that strikes me: If I look at the couple pages that are in just the summary piece, that purport to be the economic and financial considerations, let me tell you two days ago one we bought a new fax for the office because we

do national business and we need some things sent overnight.

We did more than is in these whole two pages here for a fax that costs $3,000, but I guess we do things a little bit differently at times.

One of the things I think we have all heard about is that people think that a 1,000-acre landfill is dead, and I would hope it is.

The concern I have, though, is the plan really doesn't indicate a size; and right now, you know, I have heard 800 acres is a possibility, I have heard 30 acres, I have heard 50. I don't know. Right now, it is hard to tell what that is.

I think to a great degree that a landfill is an invitation to do things that you really couldn't do otherwise once you get inside it. I think it is like a cancer cell. It may start small, but it kind of grows big. And I think that's what we face.

I also think that some of the concerns that we have relate to how the land will be acquired, and I know that there is a section in here that discusses what we are -- we are going to have some siting committees.

I would point out, though, that the siting of the landfill originally was going to be by

ing a center section of land and putting these little
ns up all over that said, "This is a future landfill
e." And then the property next to it probably wouldn't
be bought at the same price as that core section would be,
because who really wants to live there if you know what is
coming down the road.

So let me bring out one other -- a
couple other points, getting into the economics.

Early on, we all heard about the 1,000
acres and the cost involved.

I have got a little exhibit which --
well, actually, it is not a exhibit. I would probably
entitle the exhibit Apple, for want of a term. This
really does not need to be responded to by the County, but
it's just an indication of general economics.

And that is -- we said that it would be
a $20,000,000 investment; and this investment, according
to the County Board minutes, indicated that revenue is
available and this size of the plan, because the plan
talks about having the landfill sited without tax burdens
and so on; it should not be taken out of the normal
revenue streams of accounting.

But if you look at the original plan,
it was a $20 million cost. If I take -- and it was not

going to be used for 15 years.

If I take interest -- the interest I have calculated, by the way, is eight percent, which I think is still a reasonable number over the longer term. We have a lot of low-interest rates now that I think are kind of an aberration in the economy. When things turn around, we will be back to -- I don't know -- eight percent. I don't think people would argue with that.

So for long term, I think eight percent is an appropriate number.

Interest annually on $20 million at eight percent is $1,600,000. And that was to come from unknown sources.

If I look at the cost of that original proposal, I have the $20 million price; I have 16 -- $1.6 million for 15 years, or $24 million additional. I have $44 million before I was ever to use the landfill.

Now, I don't know where the County gets $44 million; but the only conclusion I ever came to was that the landfill wasn't going to be opened immediately.

It also, as you know, doesn't -- it's only going to take -- buying in this local area. It won' take it from all over, and I think that is definitely something that should improve, if you look at the numbers.

Excuse me for the delay.

A lot of people I think misunderstand the cost of waste disposal. If everybody presumes that what goes on the curb is really what the County gets for picking up garbage, it's not true.

Your waste carrier picks up your curbside waste, as it's called, and takes it to the landfill and -- gets there, and when the truck is filled and deposits -- it's called a tipping fee. The tipping fee is typically one of out of every three dollars that you spend on disposal.

So remember that there are very many components in the profitability of waste disposal. Part of that relates to curbside pickup and two-thirds of that stays right now with your waste hauler. The $1 tipping fee is only a small piece of it.

So when you hear that fees are going to go up tremendously, remember that there is a big component of that that you never hear about.

There is a conclusion in this report that the most economical means of disposal is landfilling. Well, here is an article in the Wall Street Journal which is Exhibit 1 to what I will leave. It is December 3, 1991.

And I will -- I can't read the whole thing here. There will be copies if you would like to see one. I will read down into the -- what was in the Journal's second page.

It said, "Dumps are profitable both because of a shortage of disposal sites and because of their unique economics. Although every site is different and costs vary, Waste Management says permit and construction costs generally run between $100,000 and $500,000 an acre." That was not the cost that we have seen in here.

"But because a dump is built in small sections, with revenue coming in as each section is filled, much of the investment occurs after the money has started rolling in.

"In addition, operating expenses are a minor fraction of fixed costs; So profits rise rapidly as disposal volume increases."

The former president of Browning-Ferris says, "A dump can earn gross profits of 15 percent on 1,000 tons a day but 60 percent on 4,000 tons a day."

I think in some of those comments you get an understanding of why we have to have -- we need such a large facility.

Another real concern -- and I think other people alluded to this, so I won't spend a lot of your time on it -- is the fact that I think the biggest thing that bothers me from an analysis standpoint is that the initial cost of the landfill is looked at. We are looking at nothing in post-closure. Okay? And that's basically ignored.

I have taken the current contract we have with Waste Management, and I have -- you can call it Exhibit 2.

In Exhibit 2, I have taken the $5.21 per ton that is paid on every ton tipped and given to Waste Management, what is called post-closure cost.

If I take those amounts and I put them in a trust fund -- that's not what's happening unfortunately; but if I put them in a trust fund, over the first 20 years of the landfill, Settler's Hill, I would have $79,107,395. That's using the eight percent rate. Again, a livable number.

If I go to post-closure in the year 2013, that same fund, if it was funded, would be worth $117,875,000. 2028, it's $389 million.

So when someone tells me that post-closure is not a big concern, you know, who are they

kidding?

I would like to address one more issue, and that is: We keep hearing that we should buy the land now. The County needs the land immediately because, you know, something is going to happen. The aliens are going to come down tonight and take the land away because it won't be here tomorrow. Everything west of 47 will be gone in the morning.

(Laughter.)

MR. ZAKOSEK: The County -- you know, the thing to consider, though, is -- look at it. The County controls the development of unincorporated areas. I can't do anything without their permission. They can protect space for farms. They can protect space for waste disposal. So they have all the controls. What do we have?

Land prices do go up, but they also go down. Talk to farmers.

You can assume -- you can assume some escalation, but I don't think you can presume that there is dramatic escalation and that right now we should be buying land because we are worried that someday somebody is going to want to develop it. Maybe. But not in my life time.

And then we have got the cost if we do

buy land.

Now, recently out here somebody bought 20 acres -- and I hope their assessor isn't here -- but the land was sold for $10,000 an acre. I don't think there's too many people that think that that's a ridiculous amount. Not at all. I think probably it would be market price, not the $1,500.

I took that price and actually used $11,000, which is the correct amount for this purchase, and I said if the County buys 500 acres -- and that's not out of the realm that we are talking about -- that original cost will be $5,500,000.

I took the annual cost of upkeep of mowing and keeping it good until you wanted to use it at $60,000. I think that's reasonable.

The interest at eight percent would be $440,000 a year.

So the annual cost would be $500,000.

Now, let's presume that I hold that land for 15 years, when I think I'm going to need it for compliance.

So therefore I have the original land cost, remember, of $5 million. I have 15 years at a half million a year of these costs of interest and upkeep; and

it gives me another $7,500,000.

If I add those two together, I have got a total cost for that 500 acres of $12,500,000.

If I divide that by the 500 acres, it comes down that the investment I will have here is $25,000 an acre. You know, and that's really what it will cost to buy land and hold it.

And that's the thing that you keep hearing, is you have got to buy because it goes up. Well, you can't buy something and stop all the costs on it. You have got to have continual costs on anything you purchase.

So this land will escalate, but that will keep right with it.

I think it is silly to hold it, so you have to have it now because all the land is going to be gone.

Again, there is another handout that anyone can check.

The last point I have is logic, and that's what accounting really is, for people who are not familiar with it.

Every time we make a decision we -- if we are going to put a facility someplace and do something different, you kind of wonder, well, what do I see that

somebody else doesn't see? Sometimes you get a good answer. If you have a technology that they don't have, get a patent.

I can't see a reason why Kane County is doing something that nobody else wants to do around here. Other areas that are in this geographic area that have land suitable for building are not rushing out for landfills.

Poorer areas of this state, downstate where they need jobs, they are doing it; and I can understand that. But I really can't understand why we want to rush and to put a landfill in there. There's a good number of other counties -- do we really want to do it here?

The last point I want to make, and I probably will get in trouble again by going into it.

We generate more waste than other counties. I would find a reason for that generation. Think of what you see every morning. Do we see cars coming into Kane County for work? No.

We see virtually -- many of our residents driving to employment in DuPage and other counties. What does that tell you?

It tells me I should be able to compare

what DuPage and Kane do and find out that DuPage is higher. Why? Because when you are at work that day, do you bring all the waste you generate where you are sitting around? No.

Five days a week for at least eight or 10 hours a day, you are living in another county. You should generate less in Kane County, since we commute.

Tell me why we have a higher generation rate. I can't understand that. I think it's a very big fallacy. It defies the test of logic for any needs or designing a program.

With that, I thank you.

(Applause.)

MR. FOOTE: There are 15 more people who want to speak. So I'm not going to take a break. You can -- feel free to move around while people are talking, though. With the microphone, the reporter can hear it.

And remember, again, the purpose is to make sure that the reporter gets it down for the transcript.

Next, Michael Sauber, please.

MR. SAUBER: Good evening. My name is Michael Sauber. I live at 6 N 370 Sauber Road in Virgil.

I am currently the president of the

Village of Virgil. I'm here to, I guess, put the protest of this County plan on record, that the Village of Virgil is against the plan for pretty much the reasons shown here tonight.

We feel that there is at least some discrepancies that should be addressed before this plan could be adopted.

I have just a couple comments. I'm kind of new at public speaking. I'm new at being in the political realm. It's a very small political realm, I must say, but I just have a couple comments.

One main comment I view with this plan is the morality of the plan.

I'm not here to say that I'm a good moral person or whatever; but I am here to say that if you look at this plan and you look at what it calls for in the end, which is a landfill, I think we have to question the morals of this.

As public servants, I think we are here to serve the people and listen to the people and not dictate to the people. I'm not sure that that has been done; and I'm not sure that, if we adopt this plan, that would be part of what the County Board would be doing.

I think they need to take a look at

this plan, reach into their back pockets, and not pull out money but pull out some moral support for the people.

A landfill isn't what you do to the next 10 generations; and that will be proven over the next several hundred years, and that is what landfills are doing.

I think we need to look at alternatives. They are out there. We are very intelligent people. Challenge the people in this country. They are being challenged every day under different circumstances.

I think it has been proven here tonight -- not necessarily proven, but there is enough doubt as to these figures and how they can be extended.

I think that we can ask the County Board or the County Board should ask the planners to look again and not accept this county plan as it is presented to them.

Thank you.

(Applause.)

MR. FOOTE: Steve Rauschenberger.

MR. RAUSCHENBERGER: I will say for everybody that my name is Steve Rauschenberger. I'm a candidate for the State Senate seat in the 33rd District, which encompasses

the City of Elgin, South Elgin, Dundee, and most of western Kane County, as well as a portion of Cook and also DeKalb County.

I will speak very briefly on this. I certainly am not an expert. We have a myriad of people who understand the numbers about landfills a good deal better than I do.

What is clear to me is that a good deal in the landfill plan is not very clear.

What is clear to me is that we have a citizens committee that, in good faith, made a real effort to give us some input and some ideas and to move the whole planning process forward.

What is also clear is that we have a very dedicated group of citizens who have looked very, very hard at this plan and studied the numbers and come up with some inconsistencies in this planning process.

What is also clear to me is that, as a group of citizens in Kane County and in the United States and the State of Illinois, we all need to be a good deal more responsible about the waste stream.

A lot of talk you have heard today about compaction and about bearing and about clay liners and other people's responsibilities and let DuPage County

take care of its own trash; but essentially we are the problem here, and we need to all recognize that, and that's probably the single biggest positive in the whole planning process, is that we are the ones that are creating the garbage.

Somehow we are going to have to deal with getting toothpaste out of tubes instead of pumps and we are going to have to deal with bulk purchases of products we use in our households, and we are going to have to deal with the fact that we are going to need to consume recycled products.

I could tell you stories about what it's like being in the home furnishings industry and have mounds and mounds of cardboard that you cleaned the staples from and find out that there is absolutely no economic market for the cardboard.

Now, we have to deal with that as a society. So hopefully we don't let this end here. This represents a wonderful beginning.

But what's very, very clear to me is that we do not need to rush this judgment; that there have been enough inconsistencies pointed out in the plan, that I would like to urge our County Board in Kane County to go very slow with this; to appoint a committee to take a look

at what a lot of people have pointed out that are inconsistencies in the plan, the inconsistencies in the numbers of the plan, inconsistencies in the planning process.

And we need to take this as a first step positive for how we are going to deal with solid waste in the future.

With the capacities we have in the existing landfills, we do not need to rush this fall to site -- to pass this plan or to begin the acquisition process for siting the landfill. I think that's very, very clear; and I think that's the best part of the whole outcome of these hearings, is that we do have a better idea of what our needs are and what our responsibilities are going to be.

We also need -- I think it's very clear we need time to restore the trust of the people of western Kane County in the County Board.

There have been some real problems in the past, and I think part of the political process is a healing process, and the County Board needs to go extra slow because they need to address some of those trust concerns that they themselves or past boards have been responsible for. And I think that's very important.

We need time to obtain the concurrence and the consent of the governed, the people who have to live with this landfill in the west and -- have to fill this landfill from the east and have to cope with disposal in the future, have got to be given time to build a consensus.

So basically that's about all I have got to say. No experts -- a couple of questions I do want to raise, though, is -- one real concern I had when the hearings were announced was -- if you think to the Senate hearings in Washington, you always see the confrontation of the testimony and the witnesses by the decision-makers.

And I think that that's a flaw in the hearing process here. It's going to be very difficult for County Board members to spend and give a good deal of attention to mounds of written testimony. I hope they are going to make a real study.

I would like to suggest in the future that if they want to make these kinds of decisions and accept the responsibility, that they confront the people testifying and they ask questions of them.

It's a shame that they are not going t have the opportunity to either debunk the people giving the testimony or to find out where they may have been

misled or to be misinformed about what they know.

So I would like to urge them in the future to look at testimony where they are facing the people.

If we can give the time to come to these hearings and be here, I think we need to ask our County Board to find an evening or two to come and listen to the testimony, because if it's given in good faith, it needs to be accepted in good faith, not in bound things that can inadvertently end up on a shelf in a busy public official's point of view.

At any rate, I want to thank everybody. I think you are doing a wonderful job, and I want to go on record as a State Senate candidate with no expertise whatsoever except I'm a consumer and also a user of products and also a generator of waste, and we need to go very slow and I would like to see the County restudy this plan and improve it and see if we can't improve it, come up with one of the better plans in northeastern Illinois.

(Applause.)

MR. FOOTE: Just so the record is clear again, these hearings and the way they are run was not set up by the County Board. It was set up by the Illinois legislature, that these be a period of public comment and

to not be a debate, a public debate.

The legislature could have done it either way, and the legislature directed the County to have these types of hearings.

So if there is a complaint about the manner in which these hearings are done, I suggest if Mr. Rauschenberger is successful --

MR. RAUSCHENBERGER: I stand corrected.

MR. FOOTE: -- in his bid, that you address those to him in the Illinois legislature.

Wayne Breda, please.

MR. BREDA: This is a heated experience this evening, and I'm very emotional, and I'm taking my presentation from two points of view, my only personal experience as a tax payer in Kane County with Kane County government as it now exists, as well as my professional experience as an environmental scientist.

My name is Wayne J. Breda, and I reside at 206 Country Club Place in Geneva. I'm a taxpayer of Kane County. My educational background is that of a medical doctor and an engineer.

I am currently president of American Environmental Sciences and Technology, AESTI, located at 2600 Keslinger Road in Geneva.

AESTI is an environmental engineering consulting firm comprised of engineers and scientists. We are a registered professional engineering corporation.

We are comprised of resident engineers and scientists in five locations in the Midwest, as well as long-term contracted professional engineers and scientists engaged in the science and technology and engineering as applied to the environment in university settings across the United States of America.

My past environmental experience has been as the executive vice-president and head of the environmental division of the ALEX Corporation, Analytical Laboratories for Environmental Excellence, Burr Ridge, Illinois.

My significant past contributions and past environmental experience has been in control system analysis and design, air quality, N.P.D.E.S. permitting, federal and state regulations regarding environmental emissions on an $800 million coal gasification plant, COGA-1, to be built over the coal mines in Macoupin County, Illinois.

The design of the plant has passed all of the U.S. E.P.A. and I.E.P.A. regulations and meets and exceeds new source standards for air quality and water

quality well into the next century after the year 2000.

I was subpoenaed to give expert testimony and witness to the largest toxic tort case ever held in the United States for the plaintiffs in United States Court in Massachusetts in Boston: Anderson, et al. vs. W.R. Grace, Beatrice Foods, John J. Riley Company, and X.Y.Z. Companies which includes 43 cases of childhood leukemia from contaminated groundwater into public drinking wells.

We as a firm have studied the hydrology of the upper and lower aquifer of the 31st Landfill site in Westcheser, Illinois, to determine whether the leachate containing vinyl chloride, a carcinogen leaching from that fill, would affect the surrounding groundwater and residential drinking wells and to determine how that outflow would affect public health.

This project led to unique research and development in looking at leachate flow in groundwater.

This landfill was adjacent to Hickory Lane in Westchester, Illinois, where their shallow residential drinking wells had to be abandoned due to the health risk and a special act of the Illinois legislature created to provide municipal drinking water to the area.

We have recently been involved in the

Champaign-Urbana I.S.W.D.A. landfill plan for the purpose of studying the impacts of the plan upon the property valuation in the area.

Our firm was engaged by the Village of North Aurora as their consultants regarding the annexation of the Conco Western Quarry into the Village of North Aurora and to evaluate a proposed plan by that firm to develop underground mining at the site.

The village requested that we also develop an alternative plan to the mining.

Our firm arrived at a conclusion that since Kane County was suffering from an acute shortage of landfill space, according to Elfstrom, Bus, and Mielke, and that a stone quarry is far better hydrologically both from a containment point of view and creating additional environmental impact, that it may be an answer to the County needs.

The site was located directly adjacent to the north side of the tollway, off of the toll booth, and directly east of Illinois 25.

We had calculated the needs of the County and found that this 93.7-acre site was ideal from both a logistics and an environmental health point of view and would create a minimum of impact upon any type of

groundwater or upper aquifer as compared to a solidly clay-lined membrane-type landfill or balefill in a perched condition, as is proposed for the western part of Kane County.

The North Aurora Village Board accepted our recommendations.

We had brought in Dr. Allen Wherman of the Illinois State Water Survey to testify as to the tightness and containment of the quarry. His testimony was very positive and he stated himself that he would not be afraid to live adjacent to or to drink surrounding groundwater at this particular site in Kane County.

During the final meeting of the North Aurora Board, Mr. Phil Bus of the Kane County Development Board was present. He had not been present at any other time.

After Dr. Wherman's testimony, Mr. Bus stood up and stated that this site was more dangerous to public health and water contamination than the Bartlett Balefill which resides in wetlands and has been acted upon in a negative way by the United States Congress.

Obviously Mr. Bus was sent to the meeting for a decided purpose; and that was to create doubt, cause the quarry plan to fail, as Elfstrom, Bus,

and Mielke had too much at stake to allow this to interfere with their grand landfill plan for Kane County.

It is appalling to me that Mr. Bus, a geographer, would have the gall to make these public statements; but one must remember that this is very typical of a bureaucrat who is attempting to manipulate and persuade the public to go along with their thinking.

I feel compelled to have stated the above so that the public would know exactly how they have attempted to thwart competitive development in the area of landfill development.

It is imperative that the taxpayers and citizens of Kane County demand that the Board withhold action on voting for this landfill proposed by Elfstrom, Bus, and Mielke, and passing one of the most substandard landfill plans ever presented for review to any environmental body.

Should the plan be forced through Kane County government, it should be passed on to I.E.P.A., federal authorities, including the U.S. Attorney's office, and the U.S. E.P.A. Region 5 as well as headquarters in Washington, D.C.; and they should be informed as to the type of unsubstantiated analysis that has taken place in this plan and presented to the public.

The outcry of the public was, "Wait. Put it on hold and investigate both the authors, the proponents, and the writers of this plan."

I am herewith presenting this document, along with my examination of the landfill component of the Kane County Solid Waste Management Plan which I shall now read and present to the hearing officer as evidence of incomplete and improper documentation of a document atttempting to be ramrodded through the County government into the hands of the Illinois Environmental Protection Agency and then into the hands of the U.S. Environmental Protection Agency, Region 5.

One only has to see the Chicago Tribune dated Thursday, August 6, 1992, titled Landfill Near South Elgin Poses a Major Health Risk, E.P.A. Says. I have enclosed a photocopy of this article.

The dump should have been cleaned up in 1972 but has been fought off by various court actions and holding actions.

One only needs to imagine the deal that Elfstrom has created by his contract negotiations with Kane and Waste Management.

The County was given Settler's Hill for a pittance. The County stated that it was gaining a

tremendous revenue source and that the landfill would be under Kane County control entirely.

The only control and profitability that the County has assumed is a zero-funded remediation and emergency contingency plan that will be borne by the taxpayers of Kane County.

Their children will inherit the task of possibly paying tens of millions of dollars in superfund remediation while Waste Management looks on with a smile and says, "Well, we sure got out of this mess easy."

(Applause.)

MR. BREDA: Now, my report, my professional sense in regards to the plan: An Examination of the Landfill Component of the Kane County Solid Waste Management Plan.

Kane County is in the process of adopting a comprehensive solid waste management plan for the county. The recommendations for the plan are contained in a two-volume draft report entitled Kane County Solid Waste Management Plan dated May, 1992.

The report details the thought process and cost consideration which went into developing the various solid waste management options. All of the management options suggest that additional landfill capacity will be necessary.

This paper will examine the assumptions which were used to develop the costs for development and operation of the landfill component of the Kane County plan. These assumptions are contained in Kane County Solid Waste Plan Volume 2, Appendices G and L to the report.

The costs projected in the Kane County report will be examined for their accuracy as related to regulatory compliance, both federal U.S. E.P.A. and state I.E.P.A., and will be compared to known costs associated with development and operation of landfills.

The source of information for the cost analysis is a model developed for the Michigan State and Waste Industries Association for presentation before the Michigan Special House Democratic Task Force on Solid Waste Disposal.

This source was chosen by us as it was developed by and for landfill operators -- like Waste Management, B.F.I. -- as an industry standard and not taken as theoretical fact, in quotes, by Bus and Mielke Standards of Landfill Development and Operations.

Regulatory Compliance: The report accurately indicated that the landfill must comply with Illinois regulations which are contained in Docket R88-7

and U.S. E.P.A. Subtitle D regulations, Page G-3.

One major important regulation which is absent from the report's discussion is on the proposed requirement under the federal Clean Air Act, called C.A.A., to manage non-methane organic compounds, N.M.O.C.'s, at landfills which have a total design capacity equal to or greater than 111,000 tons. The proposed Kane County landfill will have a design capacity greater than 111,000 tons.

The costs associated with federal and state regulatory compliance and any discrepancy noted in this report will be discussed in later sections of this paper.

Predevelopment Costs: The two most important issues to be considered here are the cost of land purchase and the amount of acreage dedicated to buffer areas.

Simply, the larger and more costly the buffer area is, the greater the allocation amount must be per ton or cubic yard to amortize the land purchase.

A third issue, which is missing and deserving of mention, is the actual site and the overall size of the facility.

One proposal, which may or may not be

abandoned, would have sited a 1,000-acre landfill with a 1,000-acre buffer. This will result in a requirement to pay off two acres of land for one acre of landfill area.

Additionally, the landfill would have an operational life of close to 100 years, including out-of-state and regional solid waste, e.g., Cook, Lake, McHenry, and Kane.

This time period is based upon the report stating that 100 acres of landfill space is necessary to provide disposal capacity for 10 years at current Settler's Hill and Woodland intake.

Since general obligation bonds are not written for 100 years, the land purchase cost would have to be spread out over the first few years of the landfill and not the design life of the landfill.

This will severely front-end-load the the project with exhorbitant costs and result in a large percentage of the tipping costs initially devoted to paying off the costs of the land acquisition, which in turn results in higher tipping fees.

Cell Development Costs: The report indicates that a five-foot liner is necessary to comply with Illinois Regs, Page G-11. The cost estimate is for a three-foot liner, Page G-37.

Thus the numbers for excavation and recompaction should be adjusted to reflect the additional costs of plus 66 percent to those figures that they presented.

Additionally, there are no costs allocated in the report to initially excavate the landfill itself. The excavation costs in the Kane Solid Waste Plan relate only to the construction of the liner after the landfill has been excavated.

It should also be noted that U.S. E.P.A. Subtitle D requires a composite liner consisting of both clay and a flexible membrane liner, F.M.L.

All new landfills and expansions to existing landfill facilities must comply with these U.S. E.P.A. requirements; and variances are unobtainable, especially with the soil types, hydrology, and shallow well locations at the three site selections in western Kane County.

Cell Closure Per Each Cell: The Kane County Solid Waste Plan does not include a methane collection system for control of N.M.O.C.'s which will be required under the C.A.A.

Thus a line item cost for installation of a system should be included but isn't.

Also, U.S. E.P.A. Subtitle D requires that the final landfill cover must be constructed at least as impermeable as the liner, five feet or greater. The final cover of the landfill must also contain an F.M.L., adding further costs to landfill construction over the years.

Equipment: According to the M.W.I.A. cost model which we used, the following heavy equipment is necessary to operate an 800- to 1,000-ton-per-day landfill.

A Cat 826 compactor, three of them; a total of $1,080,000.

A Cat D8 dozer, two; a total of $900,000.

A Cat 627 scraper, three required; $1,110,000.

A Cat 12 grader, one required; a total of $200,000.

A water truck to keep dust down, one; a cost of $90,000.

A tractor/mower, one; $20,000.

Pickup truck, two, $30,000.

A backhoe, one-and-a-half cubic yards, $250,000.

Service truck, one, $60,000.

Total equipment cost, just for machinery sitting there on the landfill, is $3,740,000.

Adding 10 percent for spare parts, the total equipment costs should be $4,114,000, as opposed to the $1,170,000 allocated in the Kane County Solid Waste Report.

Annual Operating Costs: The M.W.I.A. model indicates that the following personnel are necessary to operate an 800- to a 1,000-ton-per-day facility:

One division manager; one operations manager; one office manager; six operations people; laborers, two; mechanic, one; scale person, one; two clerks. A total of 15 people.

It should be noted that the labor costs for the heavy equipment operators in the report, based on a 40-hour week, are $20.42 per hour per operator. Union scale wages for operators are approximately $30 an hour, including benefits.

Post-Closure: The report indicates that post-closure care will be required for 30 years, Pages G-25 and G-35. However, the associated cost tables in the Kane County Solid Waste Plan indicate a five-year post-closure period, Pages G-38, G-39.

The post-closure costs in the report do not reflect in any gas management during post-closure that will be required under the United States Environmental Protection Agency's Clean Air Act.

The M.W.I.A. cost model projects the total costs of a 30-year post-closure period at $5,526,000. This figure also does not include sufficient funds to comply with the Clean Air Act. Thus, the annual accrual costs for post-closure care identified on Page G-39 should be at a minimum doubled.

Landfill Tons Per Day: The last cost issue to be addressed in this paper is the effect daily volume of waste receipt has on unit pricing at landfills.

The report proposes four systems for management of wastes, Appendix L. A summary of costs for each system is contained on Page L-7. Each system assumes a landfill cost of $30 a ton.

Many costs associated with landfills are fixed costs. These costs must be spent each year regardless of the volume of waste received.

Attached to this paper is a cost per ton chart developed utilizing the M.W.I.A. model for landfills receiving 50, 500, and 1,000 tons per day.

The important point to be derived from

this chart is that the landfill disposal costs associated with Management Systems 1 and 4 in the Kane County Solid Waste Plan will be substantially higher, as they have diverted only 321 and 342 tons per day to landfill.

The final issues on cost per ton is the method in which these costs were developed by the Kane County Solid Waste Plan Report and the M.W.I.A. model.

The Kane County Solid Waste Plan Report developed a cost per ton to build and operate the landfill of $19.33. Page G-39, and added an estimated cost to comply with the new Illinois regulations plus governmental and ownership royalties to arrive at a $30-a-ton figure.

The M.W.I.A. model utilized cost information developed from actual landfill construction and operation to arrive at an exact cost-per-ton figure. And that's what the Kane County plan did not do.

The model, however, does not include costs which were included in the Kane County Solid Waste Plan Report such as interest, insurance, bonding, taxes, contingencies, remediation, and government and ownership royalties.

Therefore, the costs per ton presented in the attached table would be much higher, possibly doubling or tripling the costs in the Kane County Solid

Waste Plan.

And here is the chart on the Impact of Daily Volume on Cost.

Spread over here are landfill -- the highest one is 50 tons per day, 500, and 1,000, with revenues at 0 to $150 per ton.

Projected at a 50-ton-per-day landfill for Kane County, less other all figures, just in the operation, would be $130 a ton which would be charged at the landfill.

A 500-acre landfill would be $32.93 per ton; and 1,000 would be $28.95 per ton. With those figures, who can afford to put their trash in the barrel?

Thank you.

(Applause.)

MR. FOOTE: John Dove.

MR. DOVE: Most of my thinking has been pretty well covered by other people.

There's two things, though, that I would like to bring up that haven't quite received that much attention today. And that is recycling.

Now, the Kane County papers in the last few days have had several articles about companies having difficulty finding, for instance, cardboard and other

plastic materials.

Now, as we all know, the curb cycling only accepts certain types of plastics.

I would like to know why the Board, the Kane County Board, has not dealt with these people and others and their own methods of recycling other items than what is on curbside.

The Kane County Board seems to have only one thought in mind, and that's a dump; but a dump, as has been spoken here many times, has one drawback. Sooner or later, it will leak. The two -- there is two over on Route 25, and they are saying in South Elgin that -- the paper again reported as leaking. And who is to say when the other will?

Tomorrow, there will be hundreds of garbage trucks going out to pick up trash. It hasn't been talked too much about what they will pick up.

I happen to look at items that are in my own trash bin that I would like to see recycled but in many cases isn't.

Quite a few of us put oil in our own cars, but I can't find anybody that accepts the cans as recycled.

How may of us kill our weeds? All of

these cans will be going into our trash cans and going into the dump as they will be rusting, rotting; and this material, it won't bother us. We won't be around then. But our children and our grandchildren will be.

They mentioned out here 30 years, 40 years before these dumps start leaking. By that time, the Fox Valley will be relying very heavily upon water from the Fox River for its supply, if they continue in the way they are now.

Will this material that we are putting into the dumps now -- will this continue on and be in the river 30 years, 40 years from now?

I would like to see the County Board get involved in recycling rather than trying to find ways of setting up a dump.

I don't know why the Kane County Board can only see the dump, but I do think that our grandchildren are more important than the money that they can make off of the dumps and the landfills that they envision.

Thank you.

(Applause.)

MR. FOOTE: Timothy Thompson, please.

MR. THOMPSON: My name is Timothy Thompson, and I

live at 50 W 066 Route 38, Maple Park, Illinois.

I have got a few things to say, just -- I have not seen the plan; but I did see Settler's Hill grow from start to finish and take my parents' house. So I watched one landfill grow and the last thing I want to do is see another one.

Settler's Hill right now has boundaries. It has got roads around it; it has got barriers. It can't go any further than the other 11 acres they are buying. It has to stop.

If they buy another landfill with no boundaries, they will go for acres upon acres upon acres, nonstop. It will be massive, huge.

The main topic I have heard tonight about the whole plan is that we are buying the one thing that should never be used. There's other options out there, you know. They don't need to use landfills.

They say that other alternatives are too expensive.

To see everything go into the landfills is just not -- the costs really should not be figured into into it.

The other alternatives can pay for themselves.

Like one gentleman just said, they need to set a place for people can take stuff -- there is hazardous waste going in, and there is no place you can do it, other than putting it in the garbage can. They don't know what to do with it. There is nothing they can do with it.

And the hazardous wastes are going in right now in the landfill. They have no control over that.

They can't take the soils from the old filling station where the gasoline tank burst, and yet they might be able to if the other guy goes around the block five times and pulls in and says, you know -- either that or they load it up on a different truck. But they have no control over that. None whatsoever.

And the one thing I would like to ask is: Why is it only a 20-year plan?

I will be here hopefully far longer than 20 years and my six-month-old baby boy will be here longer than that; and we have got to -- we need to look a lot farther than 20 years, you know, a lot farther.

They need to -- the one lady brought up pilot programs, pilot projects. That should be number one priority right now. Number one. Not trying to buy land.

One gentleman said that it will still be here -- the farmland they want to buy now will still be there in 20 years. They don't need to buy it now.

All we keep hearing is it may exist -- all I'm trying to say is this landfill can go on another 20 years. Well, hopefully it can; but I have seen that landfill -- I used to walk those fields all the time over there, and I seen that landfill come closer and closer and closer. Some of those tractors use to wake me up in the morning as they went by, you know. I would look out the bedroom window and see the tractor going by, you know.

And finally, sooner or later, they had to buy our house and now they put a ball park in there, Elfstrom Stadium.

All the money they are spending right now to try to get the new landfill passed should be spent by -- the landfill money should be spent -- include the pilot projects, to figure out a way, a solution to the project not -- if they can't find a final solution, then they are just twiddling their thumbs and just wasting everyone's money and time. And we don't need to do any of that.

What they should do and do immediately is set up a public recycling center where people can take

stuff and not have too -- they don't do it. The average waste, the oil cans and stuff, they need -- they got to set up a place where people can take their stuff and then not charge people extra if they want to recycle.

My sister told me that she gets charged $5 or $2.50 a week -- or a month extra to recycle. She is trying to raise four kids by herself. She doesn't need to spend $2.50. She loves to recycle. Does it all the time. She is always picking stuff up and taking it over to the recycling center; but if they are going to charge her extra, she says she can't do it.

Well, that doesn't sound like a solution. That sounds like a burden to some people. If they don't want to recycle, charge them triple or double. Make them recycle.

You just can't be buying land and putting landfills up all over the place, especially out in the middle of farmland and prairie, because I see right now another landfill going up in my back yard and see it coming closer and closer and closer again until the house I got right now is bought out; but I'm going to try to fight it.

But I said I would be brief. I have kept it a lot briefer than anyone else. So that's the

end. That's all I got to say.

Thank you.

(Applause.)

MR. FOOTE: Al Ingram.

MR. INGRAM: Thank you. If my wife were here, she would remind me to look at the people and speak up.

My name is Al Ingram. I live at 302 Long Avenue in North Aurora. I am the village president of North Aurora, but I'm not here in any official capacity. I am speaking for myself as a taxpayer, as a father, and a grandfather, who expects to have my progeny living in Kane County long after I'm buried here.

However, I cannot divorce myself from my experience as village president, and some of the remarks that I make will be -- will touch upon that experience.

Dr. Breda was up here earlier from AESTI. I was not aware that he was going to speak tonight. I have not talked to or communicated with Dr. Breda since he finished his survey on behalf of the Village of North Aurora and received his less than generous payment.

I want to say with regard to his remarks, which touched upon the proposed balefill in the

Village of North Aurora, that factually he recited a correct and accurate statement of what took place.

I disassociate myself from any personal remarks he may have made or implied towards Mr. Elfstrom, Mr. Bus, or especially Gary Mielke.

However, in what he said, he was essentially correct.

We did have a proposal from a developer to be annexed to the Village of North Aurora some 93 acres of what was the Conco gravel pit. Their original proposal was for deep tunnel mining.

At my request and with the concurrence of the village board, AESTI, who had been hired as the expert, added a study of potential other uses of the quarry, in addition to the deep tunnel mining; and it was determined that a balefill might be economically much more satisfactory.

There is money in garbage, folks; and don't you forget it. That's what this is all about.

We had our studies, and we felt that preliminarily it was a go that we could satisfy the necessary requirements and eventually get sited.

Dr. Breda mentioned Phil Bus's appearance before the village board. It is true; he did

appear. He did give testimony. He did torpedo the project, in my judgment.

Prior to his appearance, I thought we had the votes on the village board to preliminarily approve it. After his appearance, I felt we didn't have the votes.

I'm not a technical expert. I don't intend to say anything about the plan, other than based upon what I have heard; and what I heard tonight, I think there are two inescapable conclusions: One, the plan is flawed; and two, the plan itself does not -- I repeat, does not -- demonstrate the need for a new landfill.

In any case, a landfill should never be the first resort. It should be the last resort.

I'm not anti-landfill per se. I have already mentioned that I attempted to have a balefill placed in the Village of North Aurora.

Last night at the village board meeting, we finalized a new or extension of our contract with Fox Valley Disposal, a subsidiary of Waste Management.

So I know how much it costs us or our villagers to have our garbage taken away from them, and I know a place has to be provided to take care of it.

Mr. Elfstrom's name was mentioned earlier in the evening. Actually, he is the reason I ran for office. Without him, I never would have been a candidate for public office.

In 1987, when I read in the Beacon News that a ball park, believed to be dead, was magically going to be resurrected, but by a gift of a contribution by Waste Management, I got interested. I went up to the County Board. My wife said I got obsessed.

Eventually she told me, if I wanted to be interested in politics, to come home and run for the mayor's office, which I did; but I don't think that anyone can consider the siting of a landfill without considering the long-term personal and secret relationship between Mr. Elfstrom and Waste Management or its various entities.

Nobody gives you 1.2 million, 2.1 million without expecting something in return, even if in fact that is your money that it came from in the first place.

In my judgment, the other shoe fell when the County Board attempted secretly to site this landfill.

Don't forget that. Except for some dedicated individuals who got together and screamed and

paid some money for legal fees, the matter would have been passed secretly or at least the deal struck secretly and passed, as was the past history of the County Board. And you would now have your landfill sited.

You have these public hearings only because the County Board was forced to admit that it violated the Open Meetings Act.

MR. FOOTE: Sir. Sir, please. We need to talk about the proposal from Mr. Mielke. That's the purpose of this.

MR. INGRAM: I understand the purpose of this meeting.

What I'm saying is: You can't consider the proposal without considering this background.

But I will conclude very quickly.

If and when the County does site the landfill, and the attempt to be made, I urge the County Board members to bring the matter up to the normal committee. Not on the floor and bypassing the committee.

I urge that they adopt an anti-bribery and anti-pollution clause on any operator of the landfill.

Any such clause, however weak its provisions, would probably eliminate Waste Management.

And I urge that the identity of any and

all beneficial owners of any land trusts for any proposed site to be acquired by the County, that these owners be disclosed.

There was a movie not too long ago called A Field of Dreams, where some fellow built a ball park in the middle of Iowa and he was told that if he built the field, that the people would come.

If you dig a hole and site a landfill, the garbage will come, and not exclusively from Kane County.

Thank you.

(Applause.)

MR. FOOTE: Pat Burke, please.

MS. BURKE: My name is Pat Burke. I live at 709 Willow Street in Maple Mark. I'm a board member on the Village of Virgil Township Solid Waste Disposal District, and my comments are going to be very brief.

I just want to urge -- I just hope and implore that the County Board looks over what has been said tonight and examines it closely and does not approve the plan as it currently stands.

And the only thing I have to say is: have some letters that were written by Virgil Township residents in response to the plan, and I would like to

submit them for public record. That's all.

(Applause.)

MR. FOOTE: Lane Burnidge.

MR. Burnidge: Are we on?

I'm Lane Burnidge. I reside at Route 1, Hampshire, which is Rutland Township, Kane County. I'm a lifetime resident of this county.

This is my model dump as per the state regulations, up until the most recent changes.

This dump has been around for two years. As you can see, you can still read Lipton Tea, and you can still see the corn silk from the last -- two years ago, the corn silk from sweet corn.

It does have a clay cap. At that time, the regulations required 2.3 feet. It's supposesdly now 5.

They did require 10 feet at the base back then.

Below that are sand and gravel aquifers. These are shallow wells, point wells, home owner wells.

Below that are farm and suburban wells, limestone mostly; and the below that is the newer aquifer, which is city wells and this -- probably most likely this

school building.

I also need to say thank you to EDKO. More than 10 years ago, the Regional Transportation Authority chose my folks' farmstead as their preferred site for a rail coach yard in Plato Township.

I remember how scared and exhausted my mom got for organizing neighbors and speaking out, even going to family members of folks buried in the cemetery.

Thank you, young busters. Without you, there would be no public hearings tonight.

Too many of you would have Chicago's garbage.

(Applause.)

MR. BURNIDGE: You would have had Chicago's garbage right where your homesteads were.

We're wimpy. I'm wimpy.

Without EDKO I would be still be taking my garbage down to South Elgin.

We are unethical. I'm unethical. I know garbage dumps pollute. I know Woodland pollutes. I know what it will cost me.

I know Waste Management gave the Old Elgin Dump and the Tri-County Dump over to the Federal Super Fund, and I will be paying for it.

I'm lazy. I want the easy way out.

Our County Board and staff were lazy. They want the Waste Management way out. Why?

It's money. Plain and simple. The green stuff, the real green stuff.

The Bible says the love of money is the root of all evil. Did you ever try to shave while you are holding onto money? It's not possible.

Or how about eating? You always spill. And then you don't dare take the garbage out for fear of throwing away your money.

County Board, did you take juice money from Waste Management?

Citizens, is that a bribe?

What about Elfstrom Field? Is that good business?

Give it back. We want honest government in Kane County. We want open meetings. Now. Quit taxing us to death.

Taxpayers, we are apathetic. Our representatives thought it was okay to buy the special interest groups.

Find your public servants. They might be hiding. Make them serve you. Hold them accountable.

Take your trash to recycling. Take back your dump. Take back your schools. Take back your county. And take back your country.

(Applause.)

MR. FOOTE: Michael Zakosek.

MR. ZAKOSEK: My name is Michael Zakosek. I live at 50 W 770 Old State Road in Maple Park in Virgil Townshop.

I graduated from Sycamore High School.

I'm currently enrolled at the University of Illinois at Urbana-Champaign, in the civil engineering department, majoring in environmental engineering. How ironic.

When I applied to the school before the dawn of EDKO and megadumps, I was accepted into the aeronautical and astronautical department. I thought designing airplanes would be a pretty exciting way to make a living; but then little things like the collapse of communism shriveled up the job market.

Also, by the summer of 1990, I was becoming rather interested in the environmental problems faced by us.

Watching the politics of garbage at work only heightened that interest.

I decided to major in environmental engineering. My job will be to prevent and clean up pollution, especially those related to the solid waste problem.

Sadly enough, there is a great market for my major. There are not enough environmental engineers to go around, because we have so badly destroyed our environment.

I am one of the next generation this problem is being left to. The cost will be borne by my peers. The only people to profit will be those who clean up the mess, like me. Everyone else will lose.

Our county, both in the past and in the proposed plan, is heavily reliant on landfills. We cannot throw our hands up and say, "Well, we will always need landfills. So why fight them? I don't see an immediate solution, so let's get that new dump."

I don't see an immediate cure for cancer, either, but we are continuing to search for a cure.

Just as chemotherapy exists to prolong the life of cancer victims, there are alternatives to landfills.

No one system is yet perfect, yet they

are definitely good enough to prolong the lives of our landfills. The less we put in dumps, the longer they last, and the longer we have to make them extinct. It is as simple as that.

Things such as clean incineration and municipal solid waste composting do work. But our plan gives only a cursory glance at these alternative technologies.

The County should contact the leading firms in these alternative fields and ask them what they can do with our Kane County waste stream.

Instead, our plan only suggests looking at these fields again in five years. That is absolutely inadequate. I didn't write my speech on a manual typewriter when I had my computer available.

Also, we need more accurate figures on which to base our analysis. Our plan says every Kane County resident generates 8.4 pounds of garbage a day. It seems to be a sticking point with everyone.

Most other areas quote figures from five to six pounds per day. By the year 2010, this discrepancy accounts for more than 270,000 tons per year, or a 40-percent difference between the two answers.

Also, the plan never adequately deals

with post-closure costs.

Post-closure monitoring goes on forever and ever. The landfill will always need tender loving care.

We are currently paying Waste Management a set amount per ton that they promise will be used on the post-closure and monitoring of Settler's Hill.

Maybe the County should set up an independent fund to handle these moneys for the future facility.

It's not that I don't trust Waste Management, but I think it's better to be safe than sorry.

Besides, when someone is working on cleaning these two facilities up, I want to make sure there is some money left to pay his or her salary.

Finally, let's remember that our Citizens Solid Waste Committee did not write this plan. They only examined recommendations made by the development department, the same department that has already done extensive planning on a new landfill. It is comparable to saying I wrote my senior thesis by way of a multiple choice test. It doesn't fly.

Let's be constructive in our review of this plan and offer suggestions of the right way to take

care of our waste, by non-landfill means. We can use these 50-odd pages as an outline, but we need to write an environmentally responsible plan to protect our future.

Hopefully someday my job description will not involve cleanup of past waste disposal sites, but it looks as if Waste Management and the County are doing their best to keep me employed.

I hope they remember that they do not own the Earth and neither do I; we are just taking care of it until the next generation comes along.

Thank you.

(Applause.)

MR. FOOTE: Craig Frank.

MR. FRANK: My name is Craig Frank. My address if 5 N 190 Hanson Road in Lily Lake.

I serve as plan commission chairman for the Village of Lily Lake.

Lily Lake incorporated in November of 1990 and has just completed its comprehensive land use plan.

This plan was developed under contract with a professional land planning firm. It has been reviewed by the Kane County planning department, and it is consistent with the land use as allowed by the County's

comprehensive plan and the Northeastern Illinois Regional Plan Commission.

In our land use plan, there is a section called Quality of Life. It is brief, so I would like to read it to you.

"The Village of Lily Lake strongly wishes to maintain a quality of life that has been traditional for this semi-rural community. To preserve this character, the following will not be allowed:

"Operations that degrade or deplete or have the potential to degrade or deplete the surface or groundwater resources;

"Operations (excluding farming) that produce or have the potential to produce offensive smells or degrade the air quality;

"Operations that generate excessive truck traffic, especially during the evening or nighttime hours; and

"Operations (excluding farming) that generate excessive or constant noise, especially during the evening or nighttime hours. This includes, but is not limited to, production machinery operations, construction equipment, and excavating equipment."

Now, if the solid waste plan calls for

a landfill and if the landfill is to be sited near Lily Lake, then the operations that would occur in and around the vicinity of the landfill would be in violation of our land use plan.

I would like this plan to serve as an example to what other areas can do.

The Village of Virgil, which has incorporated but has not completed a land use plan, and Plato Township, which is not yet incorporated, I encourage you to move forward quickly.

I also ask the County to respect their resolution that no landfill be sited within one-and-a-half miles of the village.

My point is: If the County realizes that it may be difficult or impossible to site new landfills in Kane County, then alternative disposal methods will receive greater emphasis.

I have a copy of our plan draft that you may have for the record.

Thank you.

(Applause.)

MR. FOOTE: Thank you.

Pierre Hatch.

MR. HATCH: Good evening. I'm Pierre Hatch. I

live at 44 W 210 Empire Road, and it's in the Village of Lily Lake.

I participated as the village board president for Lily Lake when we incorporated in December of 1990 and the interim term, and I was voted in thereafter in March of '91.

A few comments I have on the plan.

As I read over, one thing -- well, not excluding the plan, but is the solid waste planning news? If there is a positive thing to say, I think openness to the public is very important. I hope this continues, and I hope they continue to inform us of what they are doing.

In reading Volume 1 of the Solid Waste Management Plan, just as a lay person -- to give you an example, I -- you know, I'm not educated in this; but in looking at it and in reading it through, I came to where I have concerns and I have some questions that I have written and some comments that I hope the County will answer to them.

Looking at what they call their Executive Summary and -- again, if any villagers or those that are even outside of the village; anyone who is interested in reading this, we have this copy, and it's for public review. And you may do that. You may contact

me at home or contact our village.

But in reading through this, I looked in the first part, and it is called the Executive Summary, Kane County Solid Waste Management Plan.

Page -- Roman numeral 9, Paragraph 4, the last sentence, what it says.

They are talking about alternative technologies, and they are saying that they were extensively studied. It says in the sentence, "In recognition of the rapid pace at which these and other technologies are beginning to develop, the County will continue to monitor their development and reevaluate the viability of alternative technologies during the first five-year plan update period."

My question is: If approved technologies develop and are viable alternatives to the antiquated landfill process and are then -- and are then used in our county, would the County put less emphasis on a reliance of landfill, should these alternatives develop; and if they do develop -- and some are already in existence -- would the County also maintain a greater volume -- would the County also maintain no greater volume of importation of solid waste.

Continuing on, in this Executive

Summary, also -- this is on Page 9, Paragraph 5, the last sentence: What they are discussing here is a future facility should be controlled by the County, located within the county, and accept only solid waste generated within the county or from a jurisdiction which accepts an equal or greater quantity of Kane County waste for processing or disposal.

My question was: Although the future facility would be controlled by the County, would the County operate the facility itself or contract the facility operations with a private firm?

If a private firm, will the process begin with a selection through publicly open bidding? I would hope that they would recognize that and follow that process.

Continuing on, they have a section here that is called Chapter 1, the Introduction; and this is just to give you a feel for some of the things as a lay person that I picked up in a short reading of this.

In Chapter 1, they have a list, and it is about -- it contains information acquired in the State of Illinois, and there's 13 associated reports referred to on these items, to see Volume 2, which is the larger thick document.

And within this, there were some items called Technology Assessment, Incinerators, Landfills, and Transfer Stations; and then they had a section that said Investigation of Emerging and Innovative Solid Waste Technologies; and another section said Feasibility Study For Municipal Solid Waste Composting.

My comment is: We need a technology assessment for those listed and not listed in the area of Emerging and Innovative Solid Waste Technologies, including that entitled in the list Municipal Solid Waste Composting.

I think that's pertinent to understand further what the assessment of those technologies are to come up with some alternatives.

Further in this Chapter 1, they have what is called Solid Waste Plan Provisions. It's on Page 2, and it is what is called Item 4.

It says, "An evaluation of the environmental energy life cycle cost and economic advantages and disadvantages of the proposed waste management facilities and programs" -- and you refer to Chapter 8 further in this book to get a little more detail.

My comment is: We need technology

assessment for those listed and not listed in the area of emerging and innovative solid waste technologies, including that entitled Municipal Solid Waste Composting -- I'm sorry. That was from what I just stated.

What I meant to -- my question was: Does the life cycle cost of any solid waste technologies that they have reviewed include the cleanup cost of hazardous waste, should the site be listed on the Super Fund cleanup list?

Continuing on further and a little bit more on this page, they describe -- it is Item No. 6 in here. It's a statement of the goals and objectives on this plan.

And what they explain in here, this is the listing of the statements and goals; and on Item No. 2, it says -- one of these statements of goals and objectives that I have a question on, it says, "To minimize the extent and politically feasible the amount of solid waste imported into the county for disposal."

I mean, this is one of the primary objectives.

My question is: I would like to understand or have the County explain the topic of, quote,

political feasibility in regards to this sentence on the solid waste importation into the county for disposal. What does politics have to do with waste disposal?

VOICE: Everything.

(Applause.)

MR. HATCH: One last -- this is the last item. Chapter 1, Table 1, Statements of Goals and Objectives again, and this is Item 4.

It states, "The primary objectives of this plan," this section of the report, "is to recycle as much of the waste generated in the county as is practically and economically feasible."

My statement is this: I think the statement should replace the words "as much of... is generated."

I think we should say that we should recycle "all of" in regards to our goals and recycling waste.

The people at County now want to recycle as much of the waste as they can; and as much as they generate, they want to dispose of this properly and in a practical and economic way. This is a given.

Some of us have better habits developed at this than others. That's understood, but it can be

seen out in the public.

But I believe the sentiment throughout the county already currently exists for all people in the county, because it is a concept and it's the correct practice to do to ensure a clean world for the future. It is also, I feel, an example of discipline for us to recycle.

As a result of your discipline, you are all in a sense, respecting each other more and also the environment more.

That's all I have for this evening. I thank you for your time.

(Applause.)

MR. FOOTE: Thank you.

Christi Gee.

MS. GEE: Good evening. My name is Christi Gee, and I reside at 5 N 909 Fabris Road, Maple Park.

Tonight I'm speaking to you not only as a resident of Kane County but also as the president of Virgil Township Solid Waste Disposal District and as chairperson of EDKO.

I, as well as the other members of the solid waste district and EDKO, have carefully read and considered the Kane County Solid Waste Management Plan.

After thorough review, we have found many flaws and inconsistencies which have been explained and documented by the experts here tonight.

I feel, though, that it is also important to point out that the most fundamental flaw in Kane's solid waste plan is that the entire plan and planning process was based on the idea that a landfill must be the primary method of waste disposal for this county.

Well, according to state law, the Solid Waste Planning and Recycling Act, counties the size of Kane are required to write a 20-year plan.

That's 20 years only, with updates every five years, so that we will not lock ourselves into outmoded technology.

But Phil Elfstrom, then Board chairman, and Frank Miller were not planning on following the law. They were planning on siting a landfill and making that their plan.

In fact, in Resolution 90-37, which was approved on February 13 of 1990, they stated that attempt.

In fact, this resolution was originall entitled Adopting a Solid Waste Plan; but the title was later changed to Adopting a Solid Waste Disposal

preference.

And I would just like to take a moment to read you what that says. "Be it resolved by the Kane County Board that a landfill will be the primary method of waste disposal for Kane County, and it is the wish of the County Board that all the county's solid waste planning documents incorporate this decision."

I think we should take a moment to think about this resolution.

If the Kane County solid waste plan was truly written in a fair and objective manner, why then was this resolution never rescinded?

The planning process was clearly landfill-biased. This plan was clearly written to call for a landfill.

I also refer you to the minutes of the Kane County Board meeting of April 12, 1990. These minutes, along with other documents which included landfill site maps, aerial photographs, photographs of your farms and homes, were recently released as a result of an appellate court decision which ruled this meeting a violation of the Open Meetings Act.

Again, I will read to you. "Elfstrom explained the process that will be needed to determine a

site for a new landfill; determination of the landfill site; and hiring of a County-wide solid waste planner."

"Elfstrom explained that siting a new landfill is more difficult than expanding an existing landfill."

"The biggest deterrent to siting a landfill is the people who live in the area."

"A solid waste plan will be needed to go along with the siting of a new facility."

"A recycling coordinator and landfill planner needs to be hired to put the board's decision into a plan."

Well, Phil Elfstrom hasn't gotten his landfill yet, but our solid waste coordinator, Gary Mielke, has written a landfill plan.

Fortunately for all of us, these early discussions were leaked to the press and the County was sued by nine townships, several villages and citizens to follow Illinois State law.

In a court decision -- like I said, a consent decree was arrived at, the County had to stop further siting procedures until at least a solid waste plan was written. And that's the plan we are reviewing tonight.

As a result of the court decree, a solid waste coordinator was hired, Mr. Mielke, and a 20-member solid waste advisory committee was formed to give input into the plan.

But as you already learned from Resolution 90-37, they were to do their planning with a landfill in mind as the ultimate goal.

I now refer to Resolution 90-144, dated June 12, 1990. This resolution requested specific studies be done concerning solid waste planning.

In this resolution, our board resolves to form a solid waste committee, and you have heard one of those committee, Roxanne Stoner, speak here tonight.

But also they said this. "Be it resolved that the Board recognizes its responsibility to be fully informed as to the available options of volume in waste reduction, source recycling, composting, and waste-to-energy systems as they relate to siting and space requirements of landfilling."

Once again, there is this blatant reference to landfill.

Our county will look at options only as they concern landfilling.

As has been shown through the reading

of our County's resolutions and board minutes, a landfill was decided upon two years ago.

The plan incorporates this decision and is written simply to satisfy the requirements of the lawsuit and nothing more.

There has never been an attempted exploration of alternatives in waste disposal.

Experts who have spoken here tonight have all carefully studied the Kane County plan and found it deficient in facts and figures since substantially the conclusions drawn by Gary Mielke do support the need for a new landfill.

The Virgil Township's Solid Waste Disposal District and EDKO concurred that the recommendation to immediately site a new landfill is wrong. There is no immediacy.

Currently there is 11 years' landfill capacity left at Settler's Hill.

The solid waste plan calls for siting an additional 11 acres which, according to the plan, would extend landfill capacity by five years.

And we have to keep in mind that this is at the current rate of over 50-percent importation of out-of-county garbage.

Imagine the capacity we could get if the clause in our old contract at Settler's Hill had been enforced, which would have limited out-of-county waste to 25 percent.

Kane needs to pay more heed to the environment and less to political expediency. We need to stop being a garbage-friendly County.

The current contract with Waste Management at Settler's Hill guarantees them a minimum amount of waste disposal annually. If not, we will pay Waste Management the difference.

This is a complete disincentive to recycling and the waste reduction efforts on behalf of citizens of this county. For whatever we save, that just means that more waste must be imported.

In fact, Kane imports over 50 percent of our disposed waste.

Siting a new landfill will only make this county a more inviting target for outside waste.

Over the past two years of our planning period, our Kane County Board has over and over again publicly stated that a new landfill would be only for Kane County waste.

In fact, they passed a resolution to

that effect, Resolution 90-115.

Suddenly, however, in the final draft of the plan, it states that the County will accept waste from any jurisdiction which accepts an equal or greater quantity of Kane waste.

EDKO and the Virgil Township Solid Waste Disposal District calls for this language to be deleted.

We are completely -- we are very concerned that the waste Kane may import may be much more hazardous than any waste exported.

The citizens of Kane County should not sacrifice forever our natural resource, our land, as well as spend our tax dollars to fund a landfill for other counties' waste disposal needs.

By the end of this decade, most landfills, except those in Kane, will be closed.

The Kane Solid Waste Plan refers to regional planning, and I quote: It says, "It is a regional approach to what is clearly a regional problem."

Kane is our region; not northeastern Illinois.

We need to change the language of the plan to delete reference to regional planning.

We must also delete that clause which states we will take out-of-county waste.

EDKO and the Virgil Township Solid Waste Disposal District believe that waste prevention, waste reduction, recycling and reuse are necessary and important components of any solid waste plan.

However, the implementation of the Kane County plan is backwards. Waste reduction and recycling efforts will be evaluated or monitored and put off until later. These should be done immediately.

It says that alternative technologies may be looked at in the five-year update. These must be looked at.

The plan also states that we need to site a new landfill now. And this is wrong.

We believe that the County must look to science and new technology for solid waste disposal methods.

To immediately commit our county to a new landfill is absurd when we are about the only county in northern Illinois with the luxury of 16 years of remaining landfill capacity. That's 16 years to search for alternative disposal systems.

In studying the appendix to this plan,

you will see that Gary Mielke claims to have reviewed alternatives and found a landfill to be the least expensive.

However, as our experts have pointed out, there are many flaws to these calculations and costs have been radically underestimated.

Just look at the Tri-County Landfill in South Elgin. 12.6 million will be needed just to begin remediation.

What will we need later, 30 to 50 years from now, to remediate Settler's Hill?

Gary Mielke has written Phil Elfstrom's landfill plan for him; but it's not too late. Solid waste planning should be an open process. All citizens of Kane County have a right to input into this plan. We should let our voices be heard.

I don't know if you remember, but there is an open resolution on our County Board's floor requesting land for landfill purposes. That is Resolution No. 90-116.

Don't be lulled into a sense of security. We must call for changes to this plan now.

EDKO and the Virgil Township Solid Waste Disposal District call on the County to show their

good faith effort by immediately rescinding Resolution 90-37 which states that landfills should be County's primary method of waste disposal.

We also call on them to amend Resolution 90-114 and delete reference to landfills as well.

We call on all County Board members to thoroughly review all comments and the expert testimony and incorporate these changes that must be made in the plan before it is sent to the Illinois E.P.A. and before it is approved.

Let's plan for Kane waste only and seriously look at alternatives. Landfill was the plan two years ago. Landfill is still the plan. In a county with 16 years' landfill capacity left, it is time we all said no.

Thank you.

(Applause.)

MR. FOOTE: Mary Ann Zobiac? Is Mary Ann still here?

Charles Sauber.

MR. SAUBER: Hi, everybody. My name is Charles Sauber. I live on Sauber Road, Virgil, Illinois; and I'm going to read this to you because I get a little too

emotional if I just don't.

So I have lived the first 72 years of my life in Kane County, except for a couple of years in the infantry in World War II, most of it in Virgil.

My father, Paul Sauber, was a County Board member, a supervisor, for many years. I don't think he ever did anything to be ashamed of.

My wife and I have raised 15 children. We have 42 grandchildren, three great-grandchildren.

I'm an inventor with more than two dozen patents and founded a company that develops and markets these products. We have 62 people working with us in a company called Sauber Manufacturing.

I'm telling you this to let you know, as they say, where I'm coming from.

Inventors believe in the future, in change, and most of all in hunting truth.

About this landfill -- piling refuse up -- is strictly the way of the past.

Japan, for example, cubes and compacts their refuse and turns it into energy and composts the rest of it for plant food.

It is my belief that the future is not in the pile of debris that goes around, fouls the air,

polluting the water, and covering productive farmland.

Time is really on our side if we do not commit to these methods of the past.

If a barn were to burn in 10 or 15 years, would we send the fire truck out there now? The song, Fools Rush In Where Angels Fear to Tread, highlights this folly.

The County Board members of the recent past can be remembered for a $30 million bond issue for the forest preserve that circumvents the law, a $30 million plus courthouse, a $5 million ball park, and a ton of offices in many County-owned and rented locations.

Every citizen of this country is carrying a half a man when he tries to make a living; and they are called bureaucrats. And we need some of them, no doubt; but we sure as hell don't need as many as we have in Kane County.

Will they please stop this farce and let new and hopefully brighter minds look to the way of the future for solutions instead of repeating the failures of the past.

Thank you.

(Applause.)

MR. FOOTE: Charles -- I think it is Baumann.

MR. BAUMANN: Mr. Sauber, Sr., is kind of a tough act to follow; but we will see what we can do.

Good evening, ladies and gentlemen. My name is Charles Baumann. I live at 949 South Batavia Avenue in Geneva.

Surprisingly enough, I appear before you this evening as a private citizen.

I support Recommendation 7.1 on the expansion of Settler's Hill, contrary to former County Board Representative Sharp's comments.

I'm absolutely opposed to acquisition of any property for a future landfill until at least the first five-year plan updates are complete.

Finally, I would urge the appointment of Roxanne Stoner to both the site selection and plan advisory committees.

There are a number of questions which need to be answered on the Solid Waste Management Plan. I have not been allocated enough time to even touch on most of them. They will be submitted in writing at a later date, as will the statements. Several are of paramount importance.

First and foremost, in my mind, is: Who are the consultants that the County hired to do this

study?

Nowhere in either volume are their technical qualifications mentioned.

I find it ironic that one of the, quote-unquote, consultants lives in Batavia.

Second, why is the plan in two parts?

Volume 1 in my view is almost useless without the supporting data in Volume 2. And yet the County is freely distributing the first, while charging for the second.

Another question is on the language of Recommendation 7.3 appearing on Page 40, Volume 1. I will quote it.

"The future facility should be controlled by the County, located within the county, and" it says, "only that solid waste which is generated within the county or from a jurisdiction which accepts an equal or greater quantity of Kane County waste processing disposal."

The term waste is never defined. We could be exporting all of our compostibles and recyclables and in return getting high volumes of more toxic materials.

By the study's own admission, Page E-2,

Volume 2, Settler's Hill, in order to meet an artificially high minimum annual tonnage figure is turning to special wastes such as gasoline-contaminated soil.

This material could be treated rather than buried and thus increase the landfill's life.

If the County is really interested in the problem of waste disposal, here are a couple of suggestions.

First, renegotiate the current contract of Settler's Hill, getting rid of that ridiculous minimum-per-year-tonnage clause. It provides a disincentive to recycling and encourages acceptance of out-of-county waste.

Second, seriously consider the approach that the City of St. Charles has taken using a combination of paper bag and an aggressive recycling campaign. They have a 95-percent compliance rate. Basically if you bag it up, it gets paid for.

Finally, look to the pilot projects, using one or more of the modern technologies, to create a true solution to waste disposal.

Kane County must stop being a follower of the old school and become our leaders of the future.

Thank you.

(Applause.)

MR. FOOTE: Ken Czerwinski? Does anybody know Ken? Did he leave?

And Mary Ann Zobiac? One more time?

If there is nobody else that wants to speak, that will close these hearings.

I want to thank everyone who talked. I know it is hard sometimes, when you are not used to public speaking, to get up here and do this.

This is exactly what I think the legislature had in mind, broad kinds of comments like this, when they set this statute up.

So thank you for coming; and I will do my job and make sure the transcript gets to the Development Committee now.

(Applause.)

(Brief interruption.)

MR. FOOTE: This will be a short addendum.

We are back on the record for one minute, because one of the witnesses wanted to make available his exhibit of a landfill to the County Board.

What is your name?

MR. BURNIDGE: Lane Burnidge.

MR. FOOTE: This is Lane Burnidge's model dump;

and his form is already part of the record.

And the model dump will be available for view on notice to Lane at his house which is --

MR. BURNIDGE: Big Timber Road, Hampshire, 60441.

MR. FOOTE: Thank you, sir.

That's it then, Barb. Thanks.

* * * * *

STATE OF ILLINOIS)
) SS.
COUNTY OF DU PAGE)

I, Barbara E. Smith, C.S.R. No. 1525, R.P.R., a Notary Public in and for the County of DuPage, State of Illinois, do hereby certify that I reported in shorthand the proceedings had in the above-entitled matter; and that the foregoing is a true and correct transcript of my shorthand notes so taken as aforesaid.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my notarial seal this 4th day of September, 1992.

Notary Public

"OFFICIAL SEAL"
BARBARA E. SMITH, Notary Public
Du Page County, State of Illinois
Commission Expires 10/25/95

Minority Report

by
Roxanne L. Stover

As a member of the Kane County Solid Waste Plan Advisory Committee, I would like to submit this report.

The Committee worked very hard at formulating the Kane County 20-year waste plan. Some of the plan is very good.

As a member of E.D.K.O. and the only citizen on the committee living west of Hwy. 47, I was definitely the minority.

It is my opinion that the SWPAC was heavily weighted with business, government and waste representatives. This made my job very difficult.

Gary Meilke and the Development department drafted all of the documents for the Solid Waste Plan. They took suggestions and advice from the committee. There are several projects and directions I fought very hard for that never became part of the plan. On the other hand there were several committee members whose suggestions became part of the plan on their first mention.

Some of the ideas I brought to the table several times that were never adopted are:

1. No immediate landfill siting.
2. New technology pilot projects.
3. Separate Construction and Demolition Debris facility.
4. No importation of waste.
5. Consultant (mutually acceptable by County & property owners during siting).
6. Household hazardous waste collections funded by the Enterprise Fund.
7. Red lining property instead of immediate siting -- and options on land in lieu of acquisition.
8. County Government Sponsorship of waste symposiums for like-kind industries to develop recycling markets.
9. Addition of pertinent environmental and health experts to all committees.
10. Addition of representatives from affected area governments.

Some of these items are given lip service in the plan but not listed as recommendations.

The Solid Waste Plan Advisory Committee conducted business by holding lengthy discussions on every subject. We did very little voting. The support staff was free to pick and choose the ideas and conclusions they wanted to become part of the plan.

My position on the Committee in no way means this waste plan is everything it should be. The major portion of my ideas is ***not*** part of this plan. I tried very hard to access the studies that came to our committee and propose only projects that made sense and were achievable with 1991 and 1992 technology. It is my opinion that this plan is too heavily facility weighted toward landfills. The changes I have suggested in the following pages can change that.

Listed below are several recommendations I have for changes in the Kane County Solid Waste Plan.

It was the philosophy of the Kane County Solid Waste Advisory Committee and the Kane County Board two years ago to site facilities in Kane County for Kane County Waste only. There are several areas in the Plan where these philosophies have been changed. There is language about importing waste from jurisdictions that accept equal or greater amounts of Kane's waste. There is also language throughout about looking at "Regional" Solutions. This language should be dropped.

In Region II (IEPA) in Illinois, Kane County represents 4.5% of the total population and yet in a few short years we will have a vast majority of the landfill space left for the 7.3 million people. If we allow "import" language or "regional" language, we risk state and federal laws changing to force us to take our neighbors waste. All of the other counties in Region II have "no imports" as part of their plan. They do have export as a large part of their plans. Where will the be exporting to?

If imports and regional approach's language are left in the plan, we risk subsequent County Boards using our waste facilities as revenue generators for this county. This is unacceptable!

Recommended Statement of Goals

In the Statement of Goals there are several areas that should be changed. When addressing importation of waste and recycling, the limits are set with language like "legally" "practically" and "politically" feasible. There are no clear definition for these clauses and have too broad connotations.

Recommendation: Drop this language or define it.

> *explanation: (1) politics has no place in waste decisions.*
>
> *(2) our state's attorney has rendered a legal opinion that states we are "legally" able to restrict waste and control all waste decisions in a county owned landfill. Therefore legal boundaries in this section are redundant.*
>
> *The words "Economically" and "practically" need definitions. These words can mean just about anything. These guidelines are much too broad.*

In paragraph #6 of this section there is no mention of governmental offices and institutions.

Recommendation: add the words institutions & governmental offices.

Executive Summary

Pg. X. It was a recommendation of the KCSWAC to make available a consultant "mutually acceptable to the County Board and affected property owners" during the siting process. This became part of our document headed Recommendations of the Solid Waste Advisory Committee.

Recommendation: Add this language to paragraph #3.

Page. *X*. There is language about the Enterprise Fund being used for "solid waste or environmental programs." This is not what the philosophy of the KCSWAC was in the beginning of our plan process. In the beginning of the plan process any and all money gained from waste projects in Kane County were to be spent in waste projects alone. The "environmental programs" language is an eleventh hour language addition. This clause has too broad a definition with potential for abuse.

Recommendation: Drop words "environmental programs" or tighten its boundaries.

Waste Reduction Section (pg.13 & 14)

The State Laws place reduction of toxicity at the top of its hierarchy. This is not addressed well in this plan. Although the plan makes several comments about moving in that direction, there are no strong recommendations to do so. I suggest additional recommendations be added to this section.

Recommendation: 3.5 If after applying to our State Agencies for hazardous waste collections we are denied, we can fund these projects through the Enterprise Fund. We can incorporate our schools into this at an educational level also.

Recommendation: 3.5 The County should fund, through the Enterprise Fund, educational efforts for removal of all toxic materials that have recycling or reuse capabilities.

Recommendation: 3.6 The County should attend to Kane County's Special Waste projects alone. No other county should be able to dispose of special wastes in our landfill.

> *explanation: We must force our neighboring counties to plan for their own special waste disposal.*

Recycling Section (pg. 18-28)

pg. 20. Multi-family recycling is not targeted aggressively until 1995-1996. The equipment and know-how is available now to offer recycling to multi-family units now in 1992.

Recommendation: The County should encourage waste haulers, renters and landlords immediately to participate in the curbside recycling programs.

> *explanation: In smaller multi-family units (2-4 units) the small bins can be used. In the larger multi-family buildings the waste haulers and owners should be encouraged to share costs and responsibilities for centralized large recycling receptacles.*

pg. 20. Construction and Demolition Debris can and should be separated from the waste stream now.

The Department of Energy and Natural Resources is interested in helping to plan and fund pilot projects in this area now (1992).

I have two recommended additions to the recommendations in this area.

Recommendation: Apply to the DENR for grants and help in a C&D debris recycling program immediately.

Recommendation: Dispose of C&D debris that is not recycled in a separate cell or facility. We can divert this inert waste and avoid mixing this with our mixed waste stream.

explanation: This will lengthen the life of our existing and future landfills.

Landscape Waste 4.2.3 (pg. 24 & 25)

The plan calls for a "public ownership/private operation" approach to landscape composting. This is one area where private enterprise can be responsible for a portion of our waste stream. The county can retain a great deal of control through operating permits. We need this facility now!

Recommendation: Give recommendation #4.22 more latitude by changing the language to "public/private" or "private/private" ownership and operation.

Market Development Strategies 4.2.4 (pg. 25)

The Kane County Solid Waste Advisory Committee talked extensively about encouraging retailers to take back difficult-to-dispose-of waste for reuse or recycling. This is not addressed in the form of a recommendation. I suggest a formal recommendation.

Recommendation: 4.28 The County should immediately draft a letter to all retail businesses in Kane County encouraging them to take an active role in accepting hazardous chemicals and difficult-to-dispose-of items that have been sold in their businesses. Examples of these items are: paints; unused yard and garden chemicals; cleaning and etching chemicals; and small appliances. The letter should encourage retailers to contact all of their vendors and suppliers for possible returns of materials.

The advisory committee also discussed the County's involvement in sponsoring workshops for business and industry with common product use/production to gather and participate in information and ideas for recycling and reusing certain items in the waste stream. A good example is the plastics industry. There are over 60 plastics' companies in Kane County.

Recommendation: 4.29 The County shall take an active role in organizing workshops for industry to meet and share ideas for market development for materials recycling and reuse.

Special Wastes (pg. 30 & 31)

In recommendation 5.6, the plan calls for alternative approaches to landfilling contaminated soils; however the phrase "to the extent allowed by contractual constraints" should be removed. Our existing contract at Settler's Hill has yearly waste minimums. This cannot hinder our efforts to remove any and all "special wastes" from our waste stream. The economic impact of cleanups has the potential of costing far more economically and environmentally than not meeting waste minimums in our contract.

Recommendation: Remove the words "to the extent allowed by contractual constraints with the landfills."

> *explanation: There are no figures in Vol II showing what economic and environmental impacts can be expected from "special waste" monitoring, leachate disposal costs and possible future remediation will cost.*

Tires 5.2.3

Tires must be removed from our landfills (by State Law) by 1994. We must move forward expeditiously with alternative methods for their reuse. Recommendation 5.7 should be changed to read:

Recommendation 5.7 The County should move forward immediately to encourage market development for tire reuse and recycling.

> *explanation: There are currently several companies involved in tire reuse. The County can move forward now to facilitate an industry workshop to spur market development for tires. Tires tend to float to the top of a closed landfill and cause all kinds of problems. Why wait until 1994 to address their removal if markets exist now? In Minnesota there is a stretch of highway where shredded tires are being used as road aggregate.*

Alternative Technologies Chapter 6 (pg. 33-37)

In the time schedule for implementation of alternative technologies, the plan allows Kane County to drag its feet. According to the Cal Recovery Group, who conducted a study for Kane County, there are alternatives available today with markets available for end use products. The Solid Waste Advisory Committee discussed several times the possibility of pilot projects in Kane County in some of these areas, yet this language is left out of Volume I.

The DENR has expressed an interest in assistance in this area also.

If we implement pilot projects in alternative technologies now, it will allow Kane County to fine tune these methods for our future, before we open another landfill.

Experts agree that when you mix and bury waste you lose some of your control over chemical changes, and pollution. Processing waste above ground alleviates this. Ground water pollution is difficult to isolate and impossible to clean up. Technologies today to turn waste into reusable fuels , compost, and gases are available. In fifteen years these processes will have changed and improved.

In section 6.4.1 the plan states that due to "contractual arrangements" "alternative waste technology in the near term would neither save landfill space nor save costs." While it is true we have waste minimums at Settler's Hill we must be careful not to let this cripple our efforts to move forward. Our two-tiered pricing system can be structured to adjust cost short-falls at Settler's Hill. What this clause misses completely is the environmental costs. This must be our primary concern for the long term future of Kane County. The short term economics of landfilling are reported on in this report; however long term costs were not studied or reported. If these costs, 1) long term monitoring 2) leachate collection & disposal costs 3) maintenance of the cap and problems that arise on the cap 4) possible remediation of problem areas) were calculated per ton/forever we would see a much higher cost for landfilling than what has been reported in this plan. Short term costs were the only figures gathered for this plan.

Recommendation: Implement test pilot projects throughout the County in the alternative technologies that process waste above ground. Examples: solid waste composting; food waste composting; small incinerators; RDF technology.

Comprehensive Waste System Description 8.2 (pg. 43)

In the landfill portion of the system description, the plan states we will "take all necessary steps to assure that future landfill capacity is available for all solid waste generated in Kane County that requires land disposal."

This statement is redundant. There is no reliable method for pinpointing how much and how we will dispose of waste in our new facilities. To take too much land now is unnecessary. This places an undue burden on taxpayers and property owners.

Some County officials claim we must take land now while 1) it's available 2) it's cheaper 3) before our growing county limits areas where a landfill can be sited. I would like to refute these points.

1. According to NIPC in the year 2010 there will be approximately 50% open space left in Kane County.

2. According to Gary Meilke, our Solid Waste Planner, the land cost of the landfill is almost a non-factor in his words it is a "negligible cost."

3. Our County Development Department has the ability to red-line an area for future landfill use. This would eliminate problems later. Remember that our County Development Department *controls* development.

Recommendation: Suitable areas for landfilling should be red-lined by the County. Options on land should be used in lieu of acquisition and/or condemnation. Testing for landfill suitability should be done before acquisition.

System Financing (pg. 46)

There is language in this section that addresses what the county can spend waste revenues on. It calls for spending revenues on "waste related projects and

environmental programs." There is too much latitude in the phrase "environmental programs."

Recommendation: Tighten up the "environmental programs" clause to include only waste-related environmental programs.

> *explanation: If this language is left as is, there is a potential for a loose interpretation and mis-use of these funds in unrelated projects.*

There is also no mention in the plan about the County taking responsibility for eventual clean-up costs. It is time to take responsibility for setting funds aside for possible environmental problems in the future. This should not be left to waste companies, State Government or Federal Government. Cleanup projects can be crippled in court for 20 years or more. Tri County Landfill is a prime example.

Recommendation: The County should set aside money from the Enterprise Fund every year into an account to be used only for landfill related environmental problems.

> *explanation: The landfill will be our responsibility forever. We must not depend on any other company or agency to pay for clean-up or remediation.*

Site Selection (pg. 49)

The plan does not outline ***when*** in the siting process testing and investigation of specific sites should be done. I suggest an additional recommendation.

Recommendation: 9.7 Site specific testing should be done before acquisition to minimize property owner problems and tax payer's unnecessary spending.

Committee Organization 10.2.3 (pg.53)

There are two committees involved in plan implementation and yet the personnel listed differs.

The Siting Committee includes:

Citizens Group
Civic Organizations
Environmental Organizations
Agricultural Organizations

The Solid Waste Plan Update Committee does not include these four groups.

Recommendation: Add: Citizens Group
Civic Organizations
Environmental Organizations
Agricultural Organizations

Recommendation: Add: 1) The Health Department representative
2) Soil and Water Conservation District
3) Environmental Engineer
4) Affected Government officials

to both committees.

> *explanation: I asked several times for representation from these groups and was ignored. Why?*

The Solid Waste Plan and Advisory Committee was heavily weighted with government officials, waste hauler representatives and business people. Addition of environmental *experts* can only serve to enhance our future waste plans. We must be most concerned about serving the future environmental concerns of 420,000 people. If political and/or business people out weigh environmental experts our plan will ***not*** be "the best for the most" (*government's responsibility*).

In closing, I would like to point out that my recommendations ***do not*** in any way cripple the waste plans for our future. My recommendations are designed to protect private property rights, citizens and taxpayers' rights and most importantly, our environmental health throughout the county.

Please consider appointing me to your Implementation Committees.

This is my minority report and my recommendations for changes in the Kane County Solid Waste Plan. Please enter into the public record.

KANE COUNTY
SOLID WASTE MANAGEMENT PLAN
1992

PUBLIC REVIEW COMMENTS

Lee Barrett
34W049 Fox River Drive
East Dundee, Il
60118

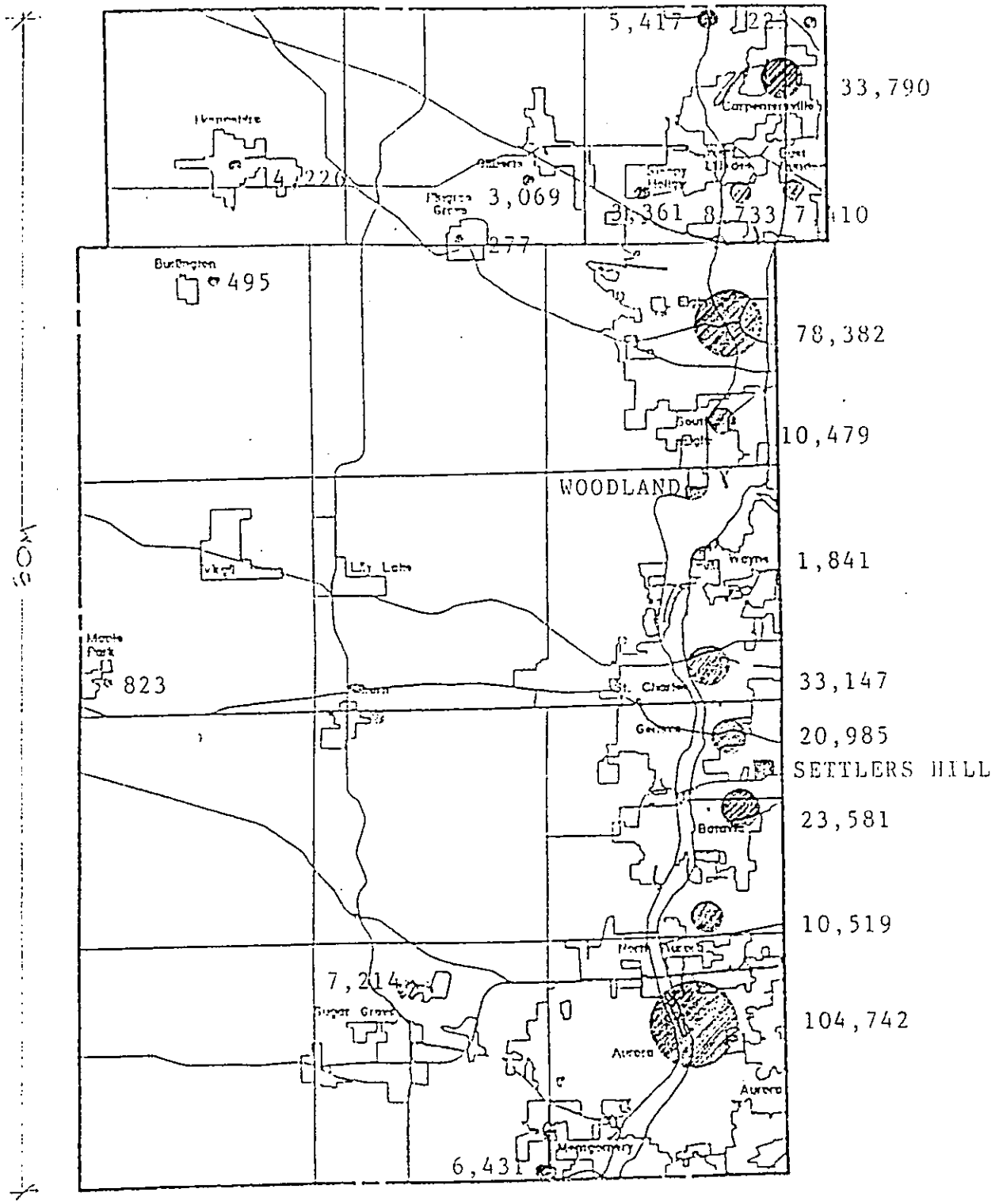
ORIGIN, CONTENT AND WEIGHT/VOLUME OF WASTE GENERATED WITHIN KANE COUNTY

SOURCES OF WASTE (1989)

	Settler's Hill		Woodland	Total
Total				
Gate Yards	2,100,765		759,333	2,860,098
Compacted Yards	1,604,088		577,853	2,181,940
Tons	534,963		195,603	703,566
Kane County Component				
	534,963		195,603	
Percent	x 0.555		x 0.546	
Kane contribution	296,904 T	+	106,799 T =	403,703 T

807,406,000 lbs

KANE COUNTY



Population Distribution-2010

TABLE

Materials Discarded Into the Municipal Waste Stream, 1960 to 2000

(in percent of total discards, by weight)

Materials	1960	1980	1984	1990	2000
Paper and Paperboard	32.1	33.6	37.1	38.3	41.0
Glass	8.4	11.3	9.7	8.8	7.6
Metals:					
Ferrous	13.0	8.9	8.3	7.8	7.1
Aluminum	0.4	1.1	1.1	1.4	1.7
Other Non-Ferrous	0.3	0.3	0.2	0.2	0.2
Plastics	0.5	6.0	7.2	8.3	9.8
Rubber and Leather	2.2	3.3	2.5	2.5	2.4
Textiles	2.6	2.3	2.1	2.2	2.1
Wood	3.9	3.9	3.8	3.7	3.8
Food Wastes	14.6	9.2	8.1	7.7	6.8
Yard Wastes	20.3	18.2	17.9	17.0	15.3
Miscellaneous	1.7	1.9	1.9	2.0	2.1
Total:	100.0	100.0	100.0	100.0	100.0

Source: Franklin Associates, Ltd.

KANE COUNTY WASTESTREAM IMPACT ON EXISTING LANDFILL:

(Vol I para 2.3 table 2-1, p 9)

	Kane %	Total	Kane Tonnage
Settlers Hill	57.3	534,963 T	306,534 T
Woodland	41.4	195,603 T	80,980 T
Total		730,566 T	387,514 T
Exported (DuPage)			35,725 T
Exported (DeKalb)			600 T
Total		421,439 T	

WEIGHT AND VOLUME OF SOLID WASTE

Loose yard	=	208.43 lbs
Loose yard per ton	=	9.60
Compacted yard	=	667 lbs
Compacted yard per ton	=	3.0
Gate yard	=	511.5
Gate yard per ton	=	3.91

RECYCLING

In order to address the impacts of recycling the waste stream has to be profiled. Currently data specific to Kane County is not available. We have opted to use the Franklin Associates report which is in Vol 4 Table 14 appendix A-31 of the Kane County report. The report summary table is attached for reference.

Using the 1989 figure of 703,566 tons as a base we can illustrate the impact of recycling on the waste stream.

Material removed from waste stream	% by weight	
Removing Paper and paperboard	38.3	269,465 tons
Glass	8.8	61,465 tons
Metals:		
Ferrous	7.8	54,878 tons
Aluminum	1.4	9,850 tons
Other	0.2	1,407 tons
Plastics	8.3	58,396 tons
Textiles	2.2	15,478 tons
Wood	3.7	26,032 tons
Yard wastes	17.0	119,606 tons
Total	87.7%	617,027 tons

WASTE VOLUME AS A RATIO OF EXISTING FILL (1989-90)
(IEPA 1990 Tbl 15.1/2-p34 & 71)

Tons landfilled	867,000
Cu yards landfilled	1,733,996

Mean lbs/cu yd 977#/cy

Waste density derivation:

Earth cover @ 5:1 or 25% of the total volume

1989 33,714,583 cy
1990 (-)30,824,736 cy
2,889,847 cy of landfill used

25% (2,889,847 cy) = 722,462 cy
(-)722,462 cy represents the daily cover
2,167,385 cy is the solid waste component
@ 1,734,000,000#/2,167,385 = lbs/cy

Each cy of landfill contains 800 lbs of waste.

This indicates the compaction is low and the ratio of waste to earth fill is causing an earlier than desired closure at this site.

Waste densities of 1700 lbs/cy are attainable and reduction of the daily earth cover will allow better utilization of the landfill capacity.

Altering landfill operations and standards within contemporary parameters will better than double the life of the existing landfill.

(From IEPA/LPC/90-173 & IEPA/LPC/91-59)

COUNTY NAME: KANE	REGION: 2			
	1988	1989	1990	1991
ESTIMATED POPULATION:	0308,122	311,488	314,889	330,250
TOTAL WASTE GENERATED (CU YDS):	1,030,928	1,155,880	1,291,097	1,386,224
TOTAL WASTE DISPOSED (CU YDS):	3,498,504	3,181,276	2,720,593	2,889,593
TOTAL REMAINING CAPACITY (CU YDS):	22,997,020	38,930,851	33,714,583	30,824,736
SETTLER'S HILL				
REMAINING CAPACITY (CU YDS):	14,908,000	19,973,351	21,338,258	19,564,252
WASTE DISPOSED (CU YDS):	2,550,495	2,357,721	1,900,151	1,773,996
YEARS REMAINING (CALCULATED)	6	10	11	11
YEARS REMAINING (REPORTED)	12	10	11	11
WOODLAND				
REMAINING CAPACITY (CU YDS):	8,089,020	18,957,500	12,376,325	11,260,484
WASTE DISPOSED (CU YDS):	948,009	823,555	820,442	1,115,841
YEARS REMAINING(CALCULATED):	9	23	15	10
YEAR REMAINING (REPORTED):	13	2	15	10

Years remaining (calculated) = Remaining capacity/total waste disposed (reporting year)
Years remaining (reported) = Year reported by owner/operator of landfill.

Solid Waste Landfill Capacity Worksheet
Part 1

Site Name:
Site Number:

I. Capacity As of

April 1, 1990 — cubic yards
(1)

II. Quantity of Solid Waste Received During 4/1/90 - 3/31/91

4/1/90 - 6/30/90	a.	cubic yards
7/1/90 - 9/30/90	b.	cubic yards
10/1/90 - 12/31/90	c.	cubic yards
1/1/91 - 3/31/91	d. _____	cubic yards

III. Total Quantity of Solid Waste Received (4/1/90 - 3/31/91) _____ cubic yards
(2)

IV. Capacity As of April 1, 1991 _____ cubic yards
(3)

[(1) _____ - (2) _____ = (3) _____]

V. Number of Years Remaining _____ years

VI. We agree with the above calculation of capacity remaining as of April 1, 1991 and do not wish to make any adjustments.

Signed _____
Site Owner

VII. If you do not agree with the above calculation please complete Part 2.

Solid Waste Landfill Capacity Worksheet
Part 2

I. Determine the remaining volume of the landfill (air space) allowed in the development permit assigned to your site. _____ (1)

a. Permit number _____.

b. Permit date _____.

c. Method used for determining the remaining volume (check one): survey _____; aerial photograph _____; records of volumes received in previous years _____: other (describe) _____.

II. Determine how much of this volume is available for waste disposal.

a. Amount of permitted volume needed for daily and intermediate cover _____(2)

b. Amount of permitted volume needed for final cover _____(3)

c. Remaining volume available for waste disposal: (1)_____ - (2)_____ - (3)_____ = _____ (4)
(in place cubic yards)

III. Determinine how much "as-received" waste (gate yards) can be placed in the available capacity.

a. Average compaction of waste as received _____.

b. Average compaction ratio of waste as it is placed into the fill area _____(5). How many gate yards can you fit into an in-place yard _____?

c. Volume of waste as received that can be disposed in the remaining permitted capacity: (4) _____ x (5) _____ = _____
(6) cubic yards.

IV. Determine how much time is expected to take to fill this remaining capacity.

a. Determine how much waste was received at the landfill during the previous 12 months, April 1, 1990 - March 31, 1991 (use the information) _____(7).

b. Determine the number of years life remaining at the current disposal rate (6) _____ divided by (7)_____ = _____ (8) years.

c. If there are any adjustments to this life expectancy, describe _____
_____

V. If an alternate method has been used, please describe._____
_____

Signed_____
Site Owner

JH:ds:0098M/38

MAXIMIZATION OF AVAILABLE LANDFILL:

This report approaches the problem of waste stream management from the perspectives of maximization of tonnage per cubic yard within the landfill, and reduction of solid waste assigned to landfills.

The volume of the landfill is fixed. For Kane County the current available volume is 33,714,583 cubic yards. The addition of 11 acres at Settlers Hill will increase that capacity by approximately 14,450,000 cubic yards, or 5 years as a function of the 1990-91 capacity consumption.

Maximizing the density of the fill reduces the volume of fill. Currently densities of 1,719 lbs/cubic yard are achieved and layered of waste:earth is applied at 4-5:1.

Gate yard mass is calculated at 537 lbs/cubic yard based on the 1989 total gate yards reported at 3,181,276 at a tonnage of 438,215 (876,430,000 lbs). It should be noted that operators report the gate densities at approximately 500 lbs/yard.

Landfill density, after compaction, is reported at a mean of 1,200 lbs/yard after site compaction. The fill ratio:gate yardage is in the range of 1:2.4 to 1:4.36 depending upon the figure selected.

Reduction of daily layering of earth by interim application of a membrane that is retracted during working periods could increase the landfill capacity by as much as 17%.

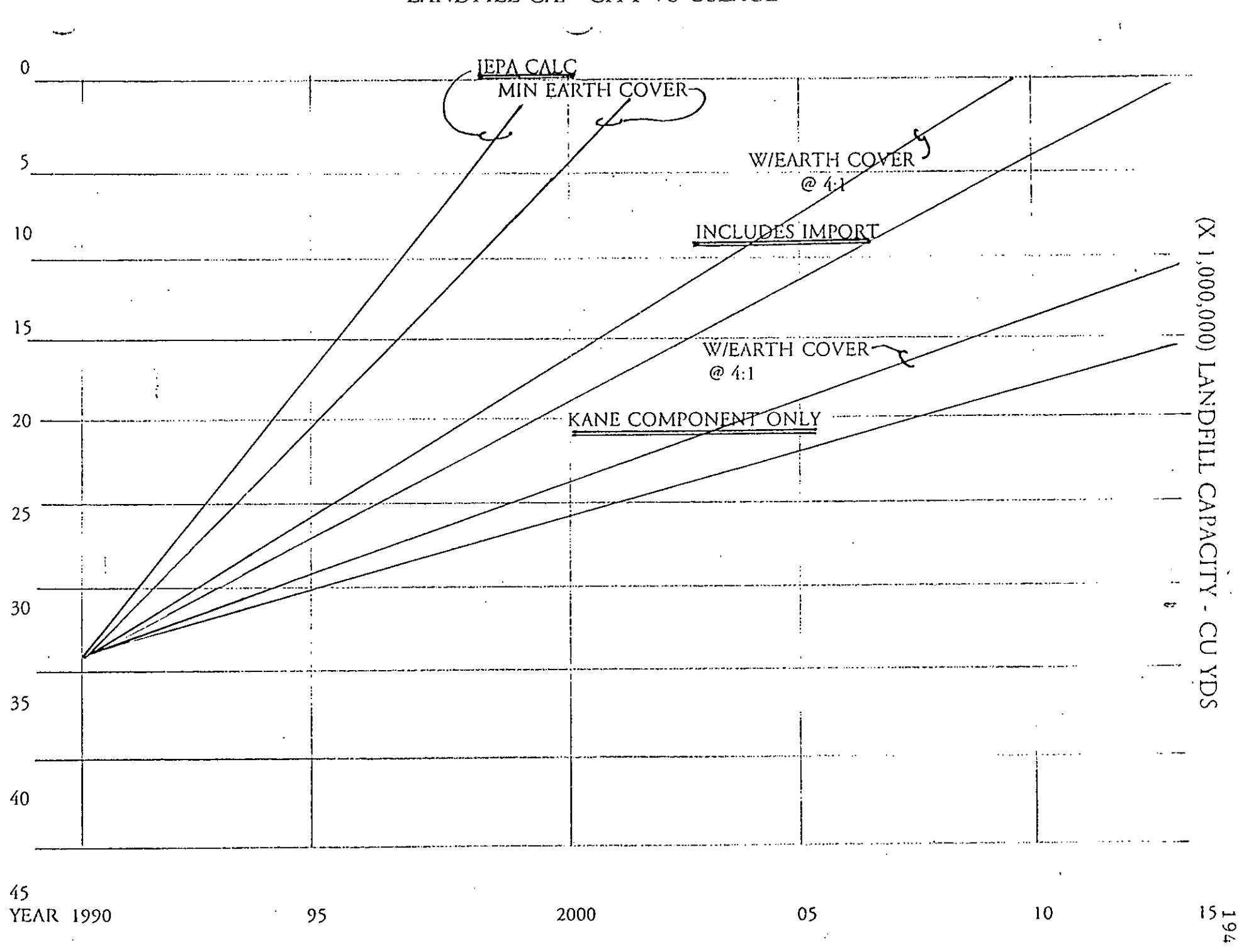
The figures to transfer to the final equation to determine capacity will be the actual compacted yardage (not gate yards) and the additional volume available by utilizing membrane rather than earth during non-work periods (the 17%).

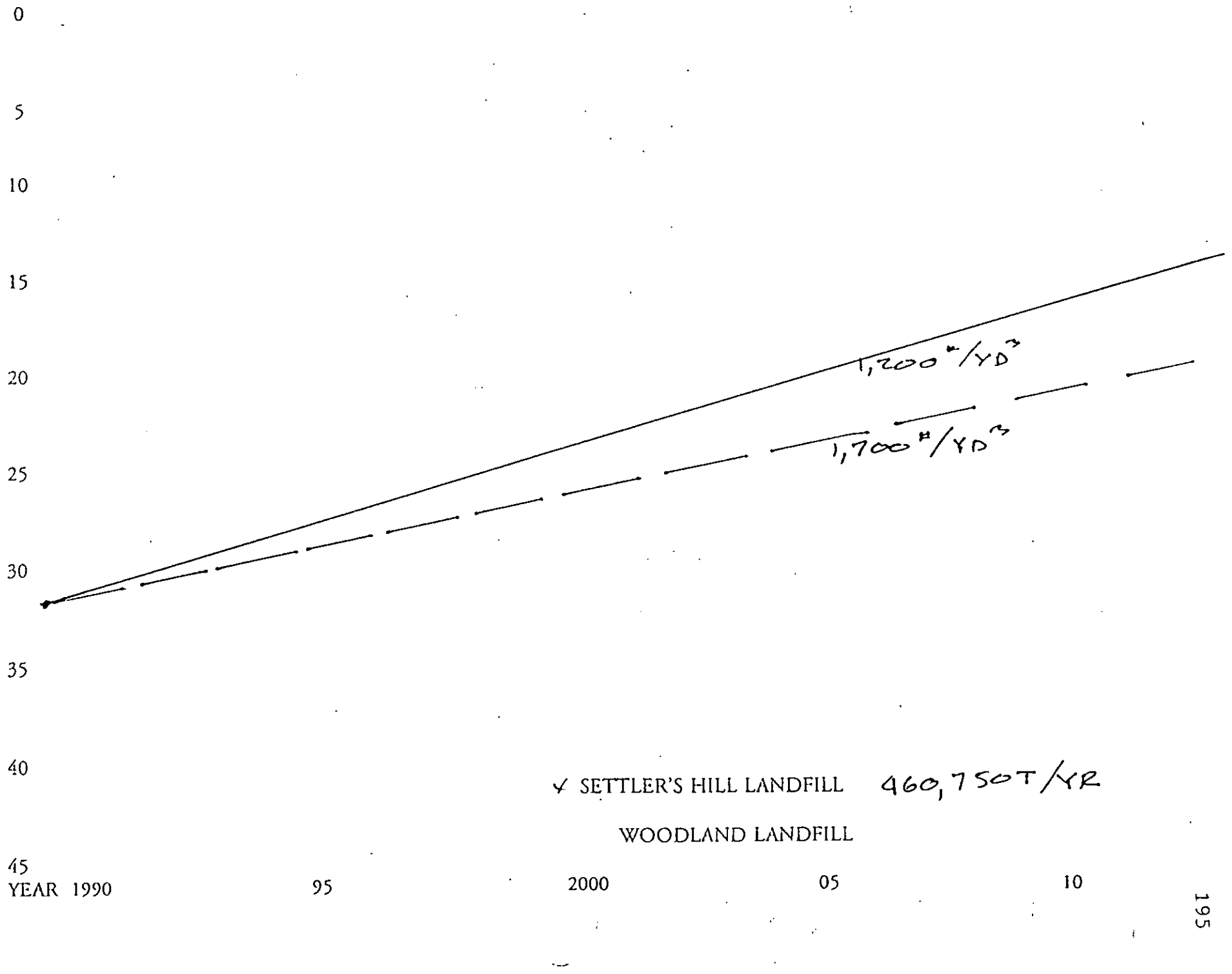
Table 2.2
PROJECTED SOLID WASTE GENERATION, 1989-2010

Year	Population	Generation Rate	Total Tons /year	Gate Yards	Compacted Yards (a)	Landfill Remaining	Compacted Yards (b)	Landfill Remaining
1989	320,000	6.9	403,703	1,493,701	468,703	29,981,297	670,147	29,779,853
1990	325,429	6.92	410,984	1,520,641	476,721	29,504,576	682,233	29,097,020
1991	330,857	6.95	419,650	1,552,705	486,794	29,017,782	696,619	28,401,000
1992	336,286	6.97	427,764	1,584,727	496,206	28,521,576	710,088	27,690,913
1993	341,714	6.99	435,916	1,612,889	505,663	28,015,913	723,620	26,967,293
1994	347,143	7.01	444,108	1,643,200	515,165	27,500,748	737,219	26,230,074
1995	352,571	7.03	452,339	1,673,654	525,030	26,975,718	750,883	25,479,191
1996	358,000	7.05	460,612	1,704,264	538,916	26,436,802	764,616	24,714,575
1997	363,428	7.07	468,922	1,735,011	548,639	25,888,163	778,411	23,936,164
1998	368,857	7.09	477,273	1,765,910	558,409	25,329,754	792,273	23,143,891
1999	374,285	7.11	485,663	1,796,953	568,226	24,761,528	806,201	22,337,690
2000	379,714	7.13	494,093	1,828,144	578,008	24,183,528	820,194	21,517,496
2001	385,142	7.13	501,156	1,854,277	586,353	23,597,167	831,919	20,685,577

2002	390,571	7.13	508,261	1,880,418	594,619	23,002,548	843,713	19,841,864
2003	395,999	7.13	514,763	1,904,623	602,268	22,400,280	854,507	18,987,357
2004	401,428	7.13	522,348	1,932,688	611,147	21,789,133	867,098	18,120,259
2005	406,856	7.13	529,411	1,958,821	614,117	21,175,016	878,822	17,241,437
2006	412,285	7.13	536,476	1,984,961	622,312	20,552,704	890,550	16,350,887
2007	417,713	7.13	543,539	2,011,094	630,505	19,922,179	902,275	15,448,612
2008	423,142	7.13	550,603	2,037,231	638,699	19,283,500	914,001	14,534,611
2009	428,571	7.13	557,667	2,063,368	646,894	18,636,606	925,727	13,608,884
2010	434,000	7.13	564,732	2,089,508	655,089	17,981,517	937,455	12,633,429

Generated rate directed to landfills increased 0.0034 per year through the year 2000.
Population increase per NIPC projected population figures.
Coefficient for gate yards derived by 2000/537 lb/cubic yards = 3.7
Coefficient mass per cubic yard derived by 2000/1719 lb/cubic yard = 1.16 cu yds = 1 ton (a)
Coefficient mass per cubic yard derived by 2000/1200 lb/cubic yard = 1.66 cu yds = 1 ton (b)
Using the average waste stream increase of 0.34% per year increase through the year 2000 Table 2.2 of the SOLID WASTE MANAGEMENT PLAN has been adjusted as follows to indicate the impact of the waste stream on the existing landfills in Kane County:
Landfill component in lbs/capita/day = 807,406,000/320,000 = 2,523/365 = 6.9 lbs/day
Present Settler's Hill capacity = 19,000,000 cu yds + 11,000,000 added = 30,450,000 cu yds. Woodland not included.


LANDFILL CAPACITY VS USEAGE
0
5
10
15
20
25
30
35
40
45
IEPA CALC
MIN EARTH COVER
W/EARTH COVER
@ 4:1
INCLUDES IMPORT
W/EARTH COVER
@ 4:1
KANE COMPONENT ONLY
YEAR 1990
95
2000
05
10
15
(X 1,000,000) LANDFILL CAPACITY - CU YDS


0
5
10
15
20
25
30
35
40
45
YEAR 1990
95
2000
05
10
1,200 #/YD³
1,700 #/YD³
✓ SETTLER'S HILL LANDFILL 460,750T/YR
WOODLAND LANDFILL

LIFE CYCLE COST ANALYSIS

Life cycle reveals the total cost at a common point in time for economic analysis.

The model includes many factors relating to the project, over time, and returns all expenditures and economic impacts to a base year. Generally present value is preferred for perspective.

The elements to be used include first cost, maintenance cost, fuel escalation, cost of capital, replacement of major assemblies and structures during the study period, etc.

The project that generates the lowest present value is usually considered the most attractive in that it it is the smallest economic burden.

The equation for present value which represents the total owning and operating costs is as follows:

$$PV = FC + OC \times \frac{a(a-1)}{a-1} + MC \times \frac{(1+i)^n - 1}{i(1+i)^n} + RC \times \frac{1}{(1+i)^m}$$

Where:

PV = Present value
FC = First cost
OC = Operating cost
MC = Maintenance cost
RC = Replacement cost
a = 1 + e/1 + i
n = Study period (20 years)
i = Discount rate
e = Escalation rate
m = Replacement years

Summary of comments on the Kane County Solid Waste Management Plan

by

Michael D. Cailas[1], Kenneth E. Goldberger[2] and John R. Bing-Canar[3]

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Introduction and general comments

The Kane County Solid Waste Management Plan should contain sufficient data and a detailed analysis in order to facilitate public understanding of the way in which the County proposes to manage its solid waste for the planning period of 20 years, beginning in 1990. Unfortunately, such requirements have not been met, especially in the most essential components of the plan which are the Assessment of Solid Waste Needs (Appendix A), the Technology Assessment: Landfills (Appendix G) and Evaluation of Defined Solid Waste Management Systems (Appendix L) sections. Furthermore, the Kane County plan contains a number of computational and methodological errors which renders its effectiveness and reliability questionable.

Specific comments

The following comments address issues related to the basic quantities and rates which are used throughout the report:

Total volume of solid waste disposed in landfills (2,860,098 Cubic yards, pgs A-10 and A-11). This volume has been derived "according to reports made to the county by landfill operators" (Vol. II, pg. A-10). Erroneously it is regarded as a reference number since it is used to evaluate the gate survey results as evidenced by the statement in the plan: "The amount of solid waste accepted at both facilities during the gate surveys was extrapolated to a 12 month period, seasonally corrected, and agreed with the operation's (probably landfill operators) reports to the county within 3.8 percent, indicating a certain degree of accuracy of the gate survey results " (Vol. II, pg. A-11). No effort has been made to substantiate the accuracy or to assess the variability of either the operators numbers reported to the county or the gate survey results.

Percent of Kane county solid wastes received in local landfills (55%, Vol. II, pg. A-12, Table 7). This quantity has been estimated from two 20 day gate surveys conducted during the summers of 1989 and 1990. Estimating sources of waste by using such limited data does not accurately assess the variation in generated waste, which depends on a large number of factors including the season and the weather conditions. Furthermore, no actual survey data and analysis are given in the Plan. The inaccuracy of

the surveys is acknowledged in the plan where it states: "Gate surveys conducted during other, non-summer, periods would be useful in quantifying these monthly variations in import amounts" (Vol. II, A-12; see also Table 5, Pg. A-11, for year to year variability). Additionally, the survey data was seasonally corrected, but the factors used to make this correction were not provided. The actual survey data and a reliability analysis should be included in the plan in order to substantiate the 55% figure. This type of rigorous scientific approach is needed because the percentage amount of imports is critical for the estimation of the generation rate. As seen in Figure 1, a 10% difference in imports will result in a significantly different generation rate (i.e. 7.1 pounds per capita per day compared to 8.4). If this generation rate is used, the future plans are substantially altered. A valid generation estimate is the foundation for a reliable solid waste management plan.

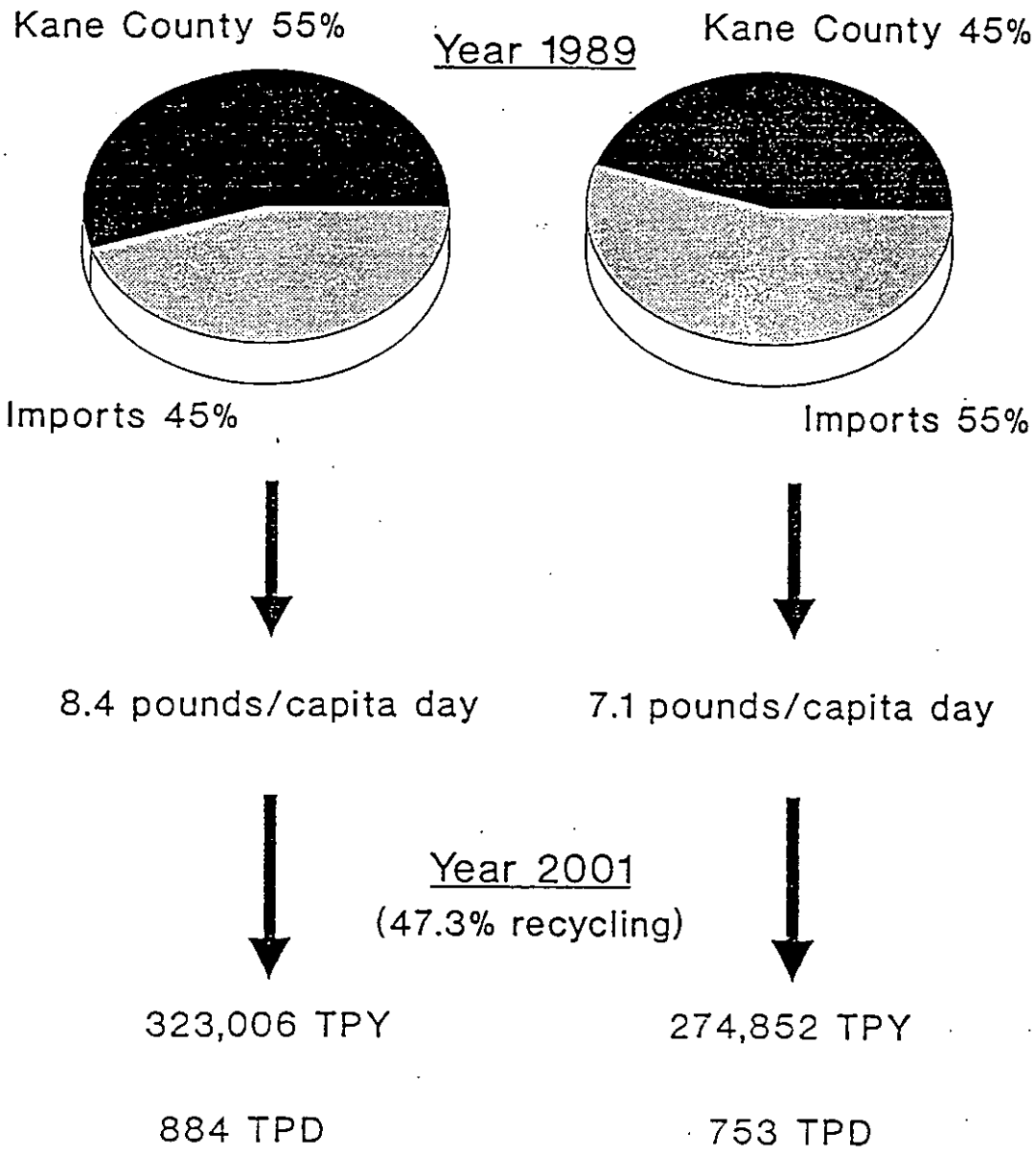


Figure 1 Influence of Imports on long term planning in Kane County

Overall conversion factor (3.915 gate cubic yards per ton, derived by dividing the aforementioned 2,860,098 gate cubic yards by the tonnage amount, 730,566, reported in Table 7, pg. A-12). This conversion factor appears high for Kane County. The conversion factor used by IEPA is 3.33 gate cubic yards per ton. The Kane conversion factor, the percent of compacted and loose waste, and the per capita solid waste generation all appear questionably similar to Lake County figures. Such "similarities" are extremely rare and highly unlikely given the vast differences in socio-economic characteristics between Lake and Kane county. Lake County is much more developed in terms of urban population centers with only a 27.6% percent farmland, compared to Kane's 68.2%. This can be seen in the following table which demonstrates that Kane is more socio-economically comparable to Will County. As noted, Kane and Lake counties report similar waste generation rates of 8.4 and 8.5 pounds per capita per day, respectively. It would seem more likely for Kane County to have a generation rate closer to the rate reported by Will County, which is 6.8 pounds per capita per day.

Table 1 Socio-economic characteristics and generation rates

Demographic variable	KANE	LAKE	WILL
Population	317,471	516,418	357,313
Area (square miles)	521.9	467.9	847
number of farms	824	446	1239
farmland as percent of total	68.2	27.6	60.7
Households (number)	106,914	173,887	117,209
Employment (% of population):			
executive, administrative & managerial	18	25	17
Technical, Admin. support & clerical	18.7	22.16	17.4
Household Income (% population):			
less than $20,000	20.3	16.3	19.6
more than $20,000 less than $100,000	73.8	70.3	75.9
more than $100,000	5.9	13.7	4.5
Household density (% population):			
1 or 2 persons/household	48.54	48.92	44.62
3 or 4 persons/household	36.13	37.97	39.26
more than 5 persons/household	15.33	13.11	16.12
Educational level (% population):			
bachelors degree	9.3	13.7	8.1
graduate or professional degree	4.5	7.1	3.6
Generation rate			
(pounds per capita per day)	8.4	8.5	6.8

Generation rate (8.4 pounds per capita per day). Because of all the above considerations and especially those raised for the percent of Kane County waste received in the local landfills it can be concluded that the generation rate estimate is likely to be biased.

Alternative methods of solid waste management

The solid waste management act clearly states: "It is the purpose of this act to reduce reliance on land disposal of solid waste, to encourage and promote alternative means of managing solid waste...". Furthermore, disposal in landfill facilities has the lowest preference ranking compared to all other

means of disposal. The Kane county plan appears not to embrace the intent of the goals set forth by the State of Illinois. This is demonstrated by the lack of diligence in assessing alternative solid waste management options especially involving landfills, transfer stations and incineration. A feasibility study has only been completed for Municipal Solid Waste Composting (Appendix J). All the other alternatives are basically literature reviews. Literature reviews are appropriate for informational purposes only and are not satisfactory for solid waste management decision making processes.

In the economic assessment of all possible alternative systems the only factor taken into account is cost (Appendix L). As known, landfilling is the cheapest method of solid waste management, but cost should not be the only consideration, as demonstrated by the hierarchy of the solid waste management options stated by the EPA. "Based on the results of the feasibility study, it is recommended that Kane County Consider of MSW composting" (Vol. II, Appendix G, pg. 7-1). However, this recommended alternative was presented as incompatible with Kane County solid waste management needs, seemingly on the basis of cost alone. Furthermore, increasingly stringent regulations related to landfill design and operation are likely to substantially increase the landfill cost in the future.

Another instance of lack of diligence is the examination of solid waste landfilling practices which should have been more thoroughly researched in the plan. Application of practices such as alternative daily cover and higher compaction efficiency would result in increased remaining life at Settler's Hill landfill. Furthermore, if the additional 11 acres of landfill expansion at Settler's Hill become operational and are combined with alternative daily cover and higher compaction efficiency, the remaining life at Settler's Hill can be extended far beyond the year 2010, the end of the planning period.

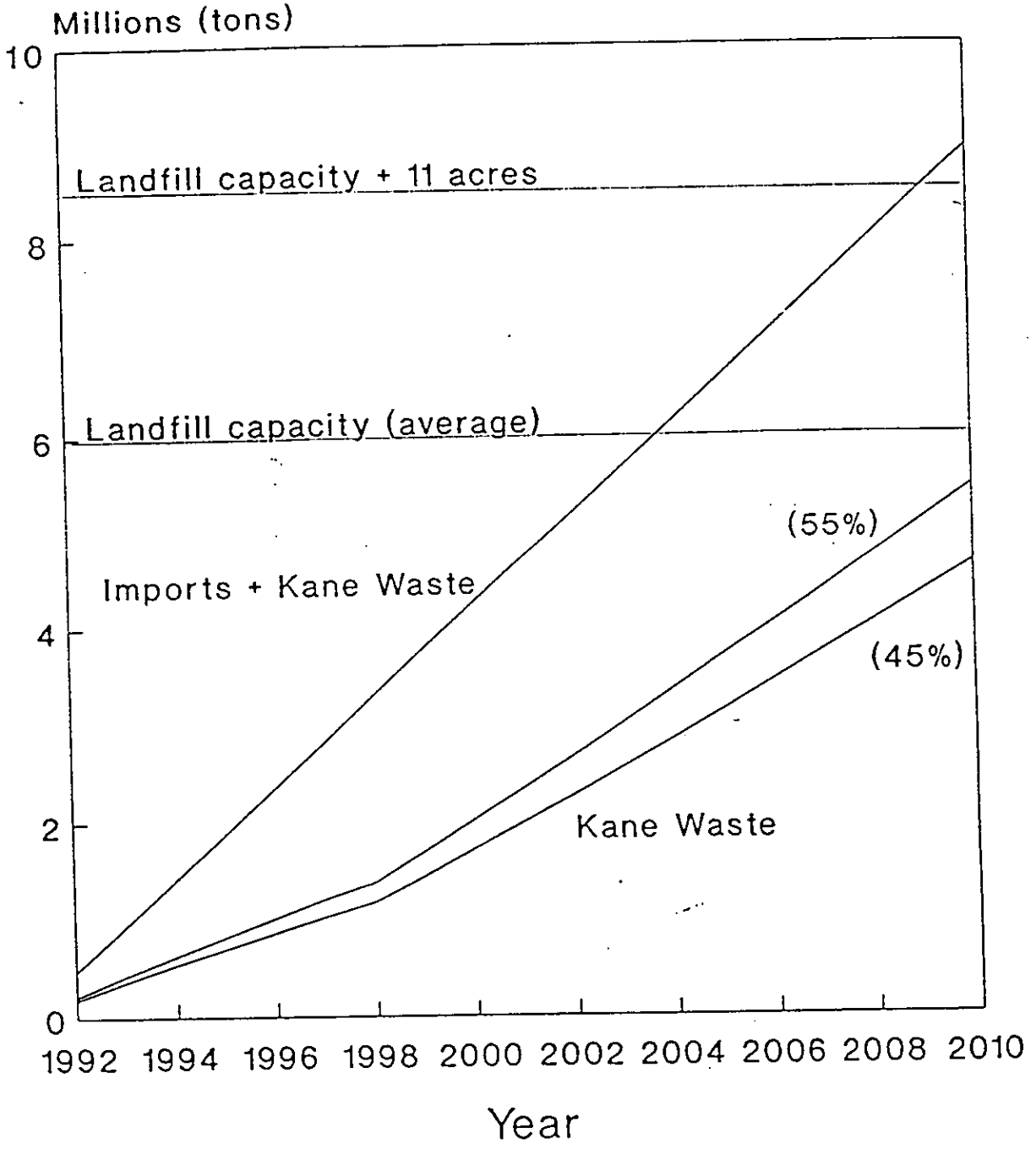
Proposed Landfill Costs

The provisions in the Plan regarding the proposed landfill costs are grossly misleading (Appendix G and L). The Illinois Solid Waste Planning and Recycling Act requires specific descriptions of the size, expected costs and financing methods of proposed facilities. The only detailed cost analysis and size information given is for a hypothetical landfill (Vol. II, pg.G-33). This hypothetical landfill is a generic estimate of potential costs and ignores cost increases due to new regulations.

Due to errors in the analysis of landfill costs (Table 5.3, pg. G-41), the average capital cost per ton per day is severely underestimated. Based on proper data analysis the total capital cost per ton per day is $21,554 instead of $12,503, as stated in the Kane County plan (Table 5.3, pg. G-41), a 72% underestimation. These inaccurate cost assumptions were used as the basis for projecting the proposed landfill costs for the four waste management system alternatives. The following table demonstrates the cost differences which will occur due to the erroneous costs assumptions in the analysis.

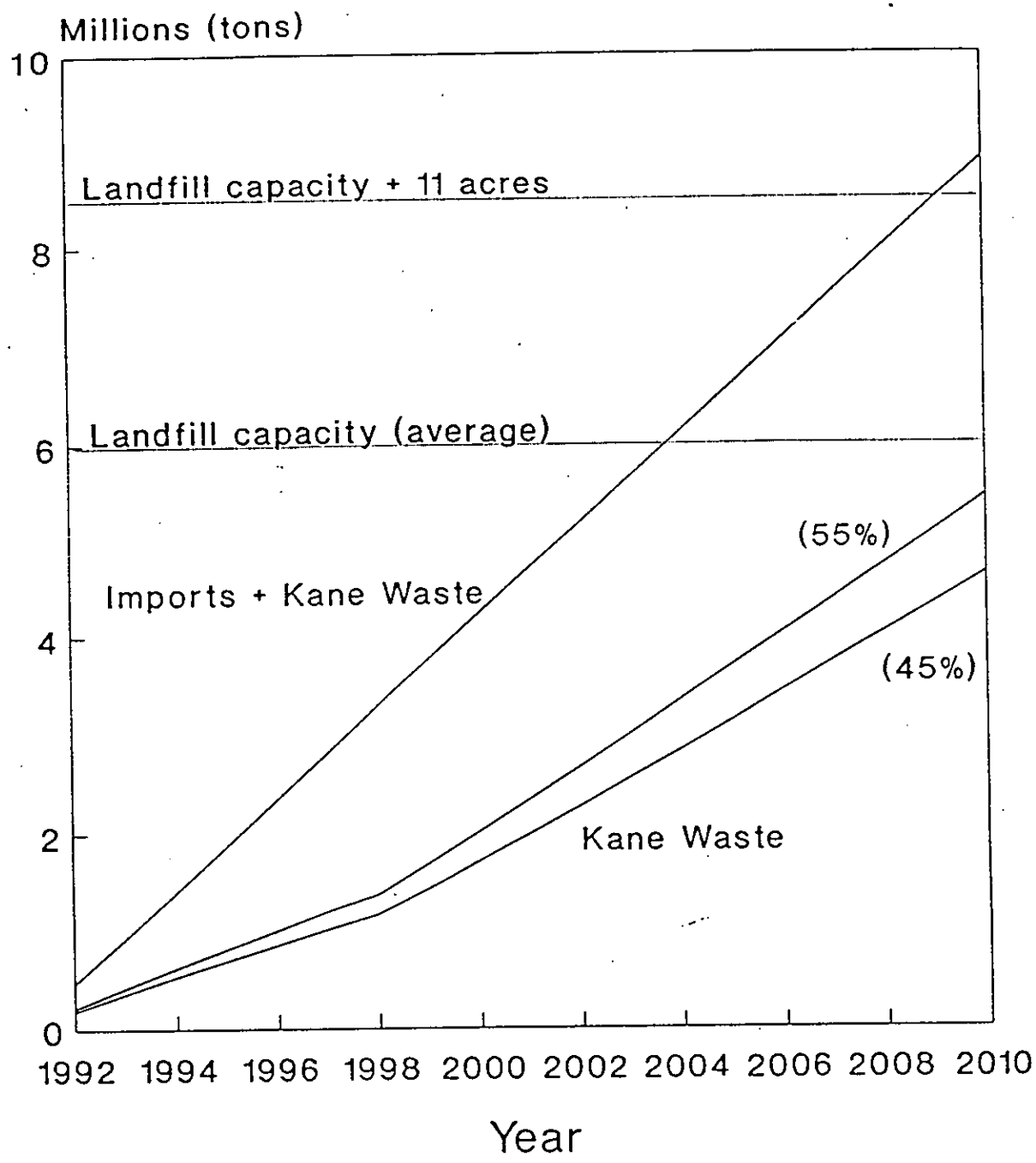
System	Landfill Size (TPD)	Original Capital Cost in Plan	Corrected Capital Cost	Cost Difference (underestimation)
#1	321	4,012,500	6,918,834	2,906,334
#2	885	11,062,500	19,075,290	8,012,790
#3	544	6,800,000	11,725,376	4,925,376
#4	342	4,275,000	7,371,468	3,096,468

Cumulative Waste in Settler's Hill Landfill (468,750 tons/year contract allowance)



NOTE: Woodland landfill capacity will be depleted in 1999

Cumulative Waste in Settler's Hill Landfill
(468,750 tons/year contract allowance)



NOTE: Woodland landfill capacity will be depleted in 1999

MMARY OF REPORTED LANDFILL COSTS (original)
dollars

urce	acres	life (yrs.)	TPD	Total Capital Cost	Total Capital Cost/Ton	Total Capital Cost/Acre	Total Cost Per Ton
nois	150	10	1000	$5,090,000	$5,090	$33,933	$19.33
ke County	–	20	1000	$9,484,000	$9,484	–	$18.77
	–	20	1000	$12,429,000	$8,286	–	$15.89
ssachusetts	88	33	330	$9,532,000	$28,885	$108,318	$18.91
nnesota	45	42	90	$6,840,000	($76,000)	($152,999)	$29.98
ll County	–	20	1300	$10,358,000 −19895000	$7,968 −15304	$51,790 −99475	$17.10 −24.53
ERAGE					$12,503	$73,379	$20.64

MMARY OF REPORTED LANDFILL COSTS (corrected)

urce	acres	life (yrs.)	TPD	Total Capital Cost	Total Capital Cost/Ton	Total Capital Cost/Acre	Total Cost Per Ton
nois	150	10	1000	$5,090,000	$5,090	$33,933	$19.33
	85	10	300	$3,450,000	$11,500	$40,588	$35.99
ke County	–	20	1000	$9,484,000	$9,484	–	$19.57
	–	20	1500	$12,429,000	$8,286	–	$16.48
ssachusetts	88	33	330	$9,532,000	$28,885	$108,318	$18.91
nnesota	45	42	90	$6,840,000	$76,000	$152,000	$30.14
ll County	200	20	1300	$10,358,000 −19895000	$11,636	$75,633	$19.57
ERAGE					$21,554	$73,379	$22.86

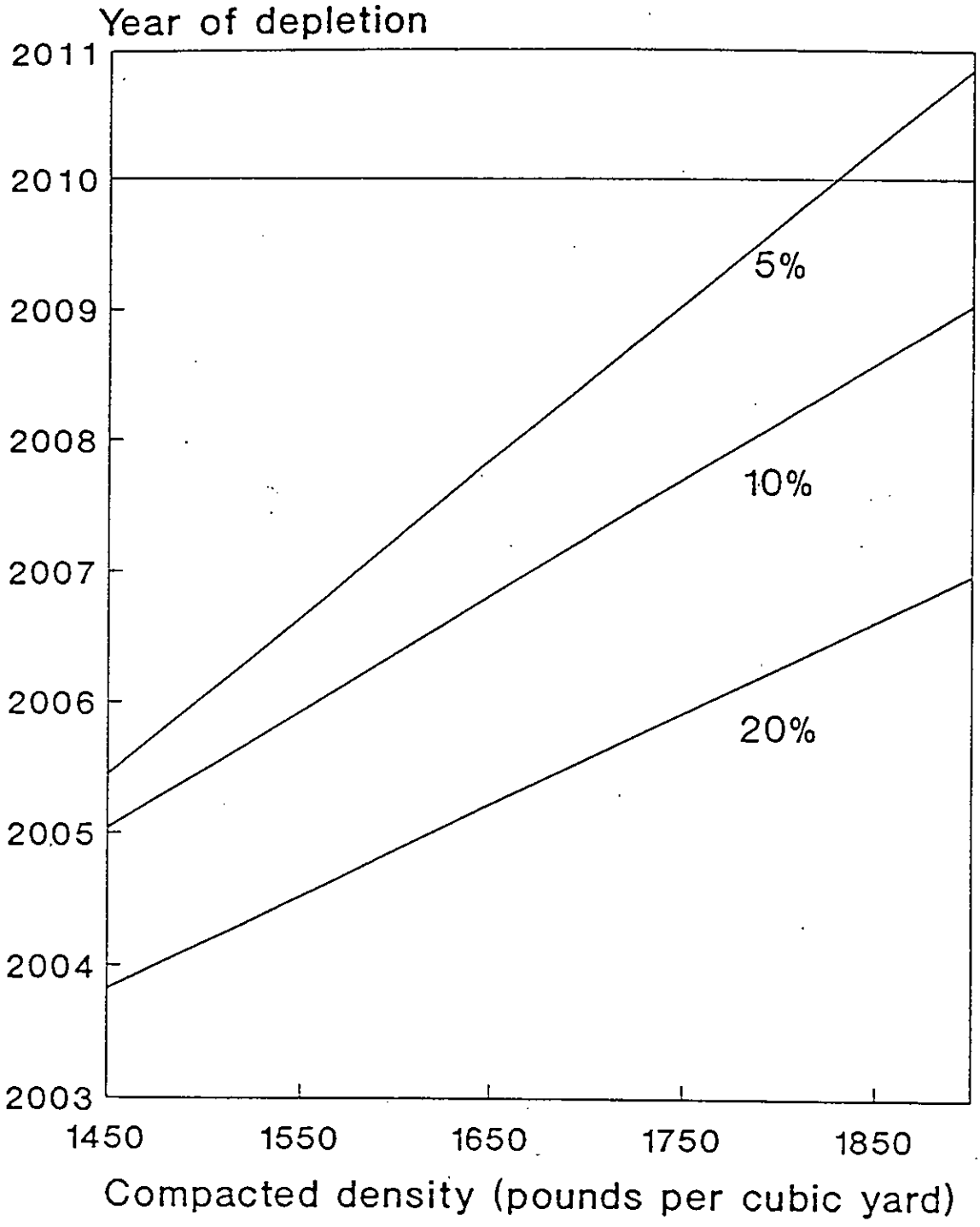
ESTIMATED CAPITAL COSTS FOR LANDFILLS
(KANE COUNTY REPORT, VOL. II, APPENDIX L, TABLE 1)

SYSTEM	LANDFILL SIZE (tpd)	ORIGINAL CAPITAL COST	CORRECTED CAPITAL COST	DIFFERENCE
#1	321	$4,012,500	$6,918,834	$2,906,334
#2	885	$11,062,500	$19,075,290	$8,012,790
#3	544	$6,800,000	$11,725,376	$4,925,376
#4	342	$4,275,000	$7,371,468	$3,096,468

COMBINED EFFECTS OF DAILY COVER AND INCREASED COMPACTION ON REMAINING CAPACITY AT SETTLER'S HILL LANDFILL

PERCENT DAILY COVER	COMPACTION FACTOR	DENSITY (lbs./cu. yd.)	GATE CU. YDS. FOR DISPOSAL	REMAINING LIFE (yrs.)	DEPLETION YEAR
20	2.60	1469	19477031	11.74	2004
20	2.70	1526	20226147	12.19	2004
20	2.80	1582	20975264	12.64	2005
20	2.90	1639	21724380	13.09	2005
20	3.00	1695	22473497	13.54	2006
20	3.10	1752	23222613	13.99	2006
20	3.20	1808	23971730	14.45	2006
10	2.60	1469	21911659	13.20	2005
10	2.70	1526	22754416	13.71	2006
10	2.80	1582	23597172	14.22	2006
10	2.90	1639	24439928	14.73	2007
10	3.00	1695	25282684	15.24	2007
10	3.10	1752	26125440	15.74	2008
10	3.20	1808	26968196	16.25	2008
5	2.60	1469	23128974	13.94	2006
5	2.70	1526	24018550	14.47	2006
5	2.80	1582	24908126	15.01	2007
5	2.90	1639	25797702	15.55	2008
5	3.00	1695	26687277	16.08	2008
5	3.10	1752	27576853	16.62	2009
5	3.20	1808	28466429	17.15	2009
5	3.30	1865	29356005	17.69	2010

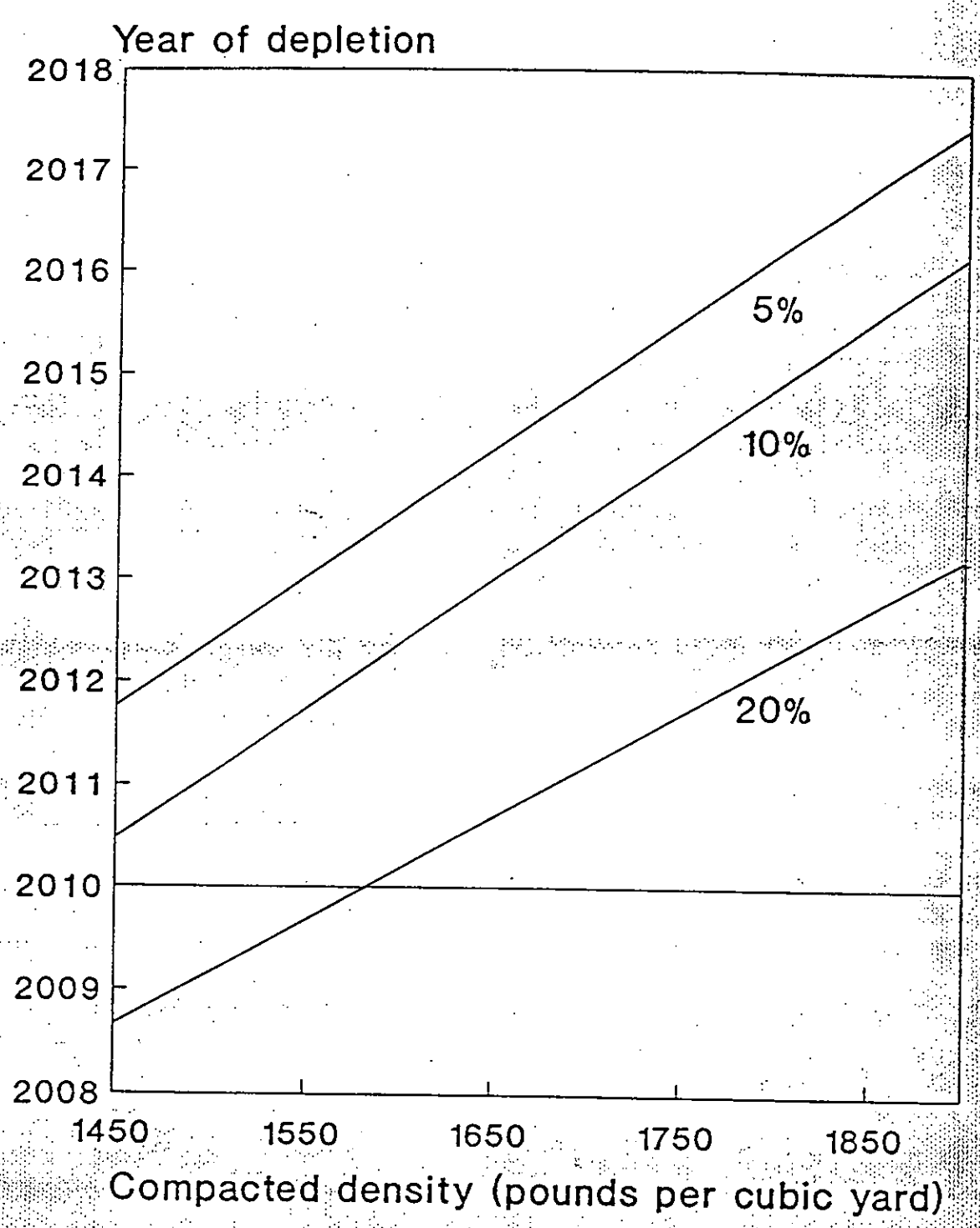
Depletion year for Settler's Hill landfill as a function of daily cover and compaction



COMBINED EFFECTS OF DAILY COVER AND INCREASED COMPACTION ON REMAINING CAPACITY AT SETTLER'S HILL LANDFILL WITH 11 ACRES ADDED

PERCENT DAILY COVER	COMPACTION FACTOR	DENSITY (lbs./cu. yd.)	GATE CU. YDS. FOR DISPOSAL	REMAINING LIFE (yrs.)	DEPLETION YEAR
20	2.60	1469	27598700	16.63	2009
20	2.70	1526	28660189	17.27	2009
20	2.80	1582	29721677	17.91	2010
20	2.90	1639	30783166	18.55	2011
20	3.00	1695	31844654	19.19	2011
20	3.10	1752	32906143	19.83	2012
20	3.20	1808	33967631	20.47	2012
10	2.60	1469	31048538	18.71	2011
10	2.70	1526	32242713	19.43	2011
10	2.80	1582	33436887	20.15	2012
10	2.90	1639	34631062	20.87	2013
10	3.00	1695	35825236	21.59	2014
10	3.10	1752	37019411	22.31	2014
10	3.20	1808	38213585	23.03	2015
5	2.60	1469	32773457	19.75	2012
5	2.70	1526	34033974	20.51	2013
5	2.80	1582	35294492	21.27	2013
5	2.90	1639	36555010	22.03	2014
5	3.00	1695	37815527	22.79	2015
5	3.10	1752	39076045	23.55	2016
5	3.20	1808	40336562	24.31	2016

Depletion year for Settler's Hill landfill with 11 acres added as a function of daily cover and compaction



Notes for RCM talk 08-11-1992

1. Name: Robert C. Meissner, Sr.

2. I am here to make some engineering, scientific and economic comments on the Gary Mielke "Solid Waste Management Plan".

   After reading "The Plan", its appendices, the history of Mr. Elstrom's handling of Kane's waste problems there is no doubt but these two men plus several others have created a shameful FIASCO, which must be corrected--through a number of law suites--not just civil but criminal; and with real engineering analysis, design, and planning to point out the proper and economic way out of the morass.

3. I was born in Illinois, was graduated from Lyons Township High School in La Grange, attended and was graduated from the Massachusetts Institute of Technology in Cambridge, was sent by the U.S. Navy to Harvard University for graduate study in electronics and communications. After an extended tour of combat duty in the Western Pacific, I returned to the Chicago Area to make my home, to take further graduate study at IIT, and to commence a Professional Consulting Engineering practice in 1949, which is still going strong 40 or 41 years later.

4. This professional consulting work has been in Bulk Materials Handling and Processing, and the design and construction of Mineral and Chemical Process Plants and Facilities. These activities have included dozens of plants and facilities for Material Service Corporation, United States Steel Corporation, Inland Steel, Aluminum Corporation of America, a number of cement manufacturing companies, and all of the major chemical manufacturing and mining companies here in the U.S. and elsewhere throughout the world.

   In almost every instance our consulting included a detailed examination of the markets, the raw materials and product transportation available, the construction costs, the operating costs, and cost "of" and "returns on" the monies needed for construction and operation. It included examination of alternate ways of performing the process and operational steps. THEN AND ONLY THEN are recommendations made to the client or owner as to what should be done and its cost.

5. In Kane County ----there are different rules---or I should say " THERE ARE NO RULES ". Just make a grab for the money and the hell with the citizen-voter!

Mr. Elfron announced his intention to acquire land and build an enormous new land fill even though Illinois State Law says that a land fill is the least desirable--the most unwanted way of handling waste.

6. Kane County has the smallest population in Northeast Illinois. It is smaller than 6 other counties in Northern Ill., and smaller than 30 other counties in Northern Indiana, Michigan and Wisconsin. Kane County is smaller than hundreds of other U.S. population centers, and yet it is

THE PROPOSED HOME OF THE THIRD LARGEST
LAND FILL IN THE ENTIRE UNITED STATES !!!!

Such a land fill belongs in Cook County, or in Eastern Long Island in New York, or LosAngeles but not in Kane County.

7. Kane county citizens don't need it!
Kane county industry doesn't need it!
Kane county business doesn't need it!

Waste Management wants it--and their former and present employees who are entrenched within the Kane County government--- have " rigged it " for them !

8. I have confirmed EDKO's common sense answers and conclusions that Kane County has been hoodwinked--cheated--and lied to, and that its people are being robbed and being sold into taxation slavery.

Together we can reverse the process--but two important things are needed.

The first is paid, aggressive legal counsel --working locally --right here - who will sue the small group of crooks, and use the courts to reverse the present headlong plunge into disaster--by stopping the PURCHASE OF ANY MORE LAND as it is absolutely unneeded.

The second is the employment of several consulting firms who are totally professional and honest whose assignment is to examine the alternate solutions available to the county, and there are many of them. Further, there is plenty of time for the work to be done, and it will cost the county only a tiny fraction--one percent--of the spending jag current proposed by Elfstrom and his gang.

9. These consultants would analyze:

   Sorting of waste--pneumatically, magnetically
   Grinding of some of the waste streams
   Incineration and electric power generation
   Gasification of many waste streams and generation of money for the county not just Waste Management.

10. Currently--94% of the income paid for waste treatment and disposal goes to Waste Management Corporation, but Kane County, which carries the load for accounting, legal services and all insurances services, ends up with a net income of zero.

Exhibit 6 to Burlington Hearing 9/11/92

Review of the Kane County Solid Waste Plan

Prepared by John W. Thompson
Executive Director
The Central States Education Center
809 S. Fifth Street
Champaign, Illinois 61820
(217) 344-2371

August 12, 1992

Summary

The Kane County Solid Waste Plan was submitted for public review in May 1992. This document reviews the data developed in the plan and evaluates the proposals it contains.

While the plan has some good goals, such as recycling 47.3% of the waste by the year 2000, generally the plan is weak in many important aspects.

The plan estimates that the per capita waste generation rate in Kane County is 8.40 lbs/person/day. The method used to derive this value contains a high level of uncertainty because it is based upon a three week gate survey.

The actual per capita waste generation rate is more likely to be closer to Will County, which is 5.8 lbs/person/day.

The per capita generation rate used in the plan significantly overestimates the amount of waste generated in Kane County. Without accurate waste figures, the plan cannot make informed recommendations for waste treatment and disposal facilities.

A new landfill is not required in the county for at least 16 years. Because of the uncertainty in the plan's waste figures, there may not be a need for a landfill at all in Kane County during the entire planning period.

The plan's goal to site a new landfill "as expeditiously as possible" needs to be revised. No new landfill activities should be started now. Instead the need for a landfill and size should be reviewed in 1997 as part of the plan's update process. This change would still give the county ten years to find a new site if needed. The change would allow the county to focus its energies on waste reduction efforts during the first five years of the plan and save millions of dollars.

the 55% value as representative of the entire year. One indication of the variability of this fraction can be seen in the following year's data. In 1990, the same gate survey found that the percentage of waste buried at the two landfills originating from Kane County was 51.5%.

If the fraction originating from Kane County in 1989 was even slightly less than 55%, the per capita waste generation rate changes dramatically as shown in Table 1.

Table 1

Percentage From Kane County	Kane County Waste Buried at Settler's Hill and Woodland	Per Capita Generation Rate (lbs/person/day
40%	380,556 tons	6.5
45%	417,084 tons	7.1
50%	453,613 tons	7.8
55%	401,890 tons	8.4

Table 3

Landfill	1989 Volume cubic yards	1990 Volume cubic yards	1991 Volume cubic yards
Settler's Hill	2,357,721	1,900,151	1,773,996
Woodland	823,555	820,442	1,115,841
Total	3,181,276	2,720,593	2,889,837

Some of this reduction in 1990 and 1991 is due to the ban of landscape from landfills and increased reduction and recycling measures. But the reduction may also reflect the overestimation of the Kane County per capita generation rate. The lower values may show that the estimated 8.4 lbs/person/day is too high. For comparison, Will County's Solid Waste Plan estimates a waste generation rate of 5.8 lbs/person/day.[2] Will County, like Kane County, is a collar county of Chicago. It has a similar distribution of urban and rural areas. Will County's lower per capita generation rate highlights the likelihood that the 8.4 lbs/person/day rate is too high.

Chapter 3 Waste Reduction

The waste reduction chapter outlines educational activities aimed at source reduction and recycling.

Generally, the recommendations contained in the chapter are useful and will serve the county well. Listed below are several suggestions that would improve the recommendations in the Chapter:

1. Page 13 states that "Since waste reduction efforts are difficult to measure, no numeric waste reduction goal was developed in the plan." Source reduction is harder to measure in some ways, but measurement is possible and important.

   The plan should set an explicit goal of measuring the results of the source reduction activities outlined in the plan. This should be accomplished during the first year of the program. Once enough measurements have been taken, the plan should be revised to establish a numeric source reduction goal.

2. The plan does not identify existing waste reduction activities in the County. EDKO has just begun work to establish the Model Community program in Kane County. Model Community incorporates many of the education features outlined in the chapter. The solid waste staff should explore ways to work with existing programs like Model Community in order to measure source reduction actions and get the most reduction possible in the county.

3. The education activities in the plan need to be more specific. Generally, the public has a high interest in being part of the process that determines how education plans are developed and implemented. One way to achieve more specificity and involve the public

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[2] Patrick Enginneering, (1991) The Will County Solid Waste Management Plan, Volume II, page 2.

If Kane County were to attempt "SB 172" siting in the next six years, the landfill would not meet the first criterion, "the facility is necessary to accommodate the waste needs of the area it is intended to serve." In many cases before the Illinois Pollution Control Board, need has been interpreted as less than 10 years of capacity remaining. Kane County would not meet this interpretation for at least 6 years and possibly longer.

Developing a new landfill is a very intensive experience when measured by staff time and money. Although the plan fails to identify yearly costs for each action recommended, consulting fees and site acquisition costs would range between two and three million dollars over the first five years. Not included in this estimate is county staff time and county resources needed to support siting activities. An often forgotten factor is that landfill siting often becomes the full-time occupation for the county staff. The result is waste reduction programs are not fully implemented or supported.

From an environmental safety perspective, it also makes sense to delay the development of the landfill. Over the past 20 years, landfill construction regulations have changed dramatically. They will probably change more in the coming years. The longer the time to development, the more likely the chance to learn from existing designs.

The plan needs to be revised. No activities to acquire a new landfill should take place in the next five years. Instead, the need for a landfill should be reviewed in 1997 as part of the update process. If Kane County needs a landfill, its size and location should be decided at that time. This change would still give the county about 10 years to site a new landfill if needed. It would also allow the county to accurately determine the required size. Trying to project today what size landfill is needed in 16 years is not possible. Trying to acquire such a landfill today will result in wasted time and money. By waiting five years,the county could avoid spending millions of dollars on a less urgent activity. It could focus instead on reduction and recycling activities and develop more accurate waste generation figures.

Chapter 8 System Description, Evaluation and Financing

The chapter states that the Illinois Solid Waste Planning and Recycling Act requires "an evaluation of the environmental, energy, life cycle cost, and economic advantages and disadvantages of the proposed waste management facilities and programs."

The Kane County Solid Waste plan fails to meet this requirement. Specifically:

1. The plan evaluates alternatives on a piece-meal basis, never combining the different programs into a series of plan options. Only one option is developed: education, some recycling and a landfill. The plan should have put forward a series of alternatives and developed costs for each of them. In addition to the recommended option, the plan should have considered these alternatives.

    - No action

    - Waster reduction, recycling, composting, and landfill

    -Waste reduction, recycling, transfer station and no landfill

2. No life cycle costs were developed for the recommended plan. A mixture of operating and construction costs were developed, but they were never pulled together in an economic and environmental analysis as required by Illinois statutes.

THE WALL STREET JOURNAL.

★★ Midwest Edition TUESDAY, DECEMBER 3, 1991 Naperville, Illinois

Economics of Trash

Some Big Waste Firms Pay Some Tiny Towns Little for Dump Sites

What Localities Get Depends On Their Bargaining Skill, And Fees Vary Widely

Landfills' Fat Profit Margins

By Jeff Bailey
Staff Reporter of The Wall Street Journal

Two years ago, Waste Management Inc. won the hearts of people in Mobile, Ariz.

When the tiny desert town approved construction of a 640-acre garbage dump, the big trash hauler showed its appreciation by donating a $17,500 school air-conditioning system, a two-trailer community center and $5,000 for camp scholarships. It also threw a big Christmas party.

"They go out of their way to help," says Jerry Begaiman, the administrator of Mobile's 25-student school district. "I'd love to have another half-dozen Waste Managements here."

Actually, one should have been plenty. For what Mr. Begaiman and other residents of Mobile never realized is that the town might have got millions of dollars from Waste Management.

Secret Arrangements

The nation's garbage industry, which is dominated by Waste Management and Browning-Ferris Industries Inc., frequently agrees to pay local communities handsome "host fees" in return for allowing dumps or, as the industry calls them, landfills. But these arrangements are usually kept secret. The secrecy helps the companies because some towns and counties are shrewder negotiators than others, and a few, such as Mobile, don't even know to ask about fees at all.

The resulting disparities are huge. In contrast to the modest gifts in Mobile, Riverside County, Calif., arranged more than $30 million in annual host fees from Western Waste Industries for a planned 1,020-acre dump expansion.

The industry acknowledges its desire to keep host fees quiet—not because it views them as questionable but because publicity could cost the companies a lot of money. "Your advantage, if you have any in the marketplace, is your ability to gauge the market and price yourself accordingly," a Browning-Ferris spokesman says. A Waste Management official says host fees are "not something we want to discuss."

Difficult Comparisons

The industry also says that its compensation arrangements with communities are often complex and that comparing the economics of one dump site to another can be difficult or unfair. The National Solid Waste Management Association doesn't collect data on host fees, a spokesman says, because "our members wouldn't appreciate it." And though the Environmental Protection Agency issues voluminous technical rules on dumps, it offers little financial guidance to local officials.

Yet because new federal and state environmental laws will force the closing of about half the nation's garbage dumps in the next few years, more communities than ever before are under pressure to build new ones. To the small, out-of-the-way towns typically targeted for haulers' sales pitches, a favorable fee deal could make the difference between continued poverty and relative affluence. But many either lack good information or can't afford the lawyers and consultants needed to help get a good deal.

"Waste dumpers look for powerless communities," says Luke Cole, a lawyer at the California Rural Legal Assistance Foundation who fights siting of dumps and incinerators. "They look for desperate areas and then take advantage." The companies deny doing that but concede that many dumps are being sited near small towns. They say it's because that's where

Scouring the Countryside

At any one time, both Waste Management, based in Oak Brook, Ill., and Browning-Ferris, of Houston, have dozens of salesmen out in the countryside trying to get communities to accept dumps. In some initial discussions, the subject of host fees doesn't even come up. When it does, companies usually begin with a low-ball offer of, say, $1 a ton, although they might be willing to pay five times that. Local officials inexperienced in landfill economics may see this as a windfall and not ask for more.

Large municipalities experienced in running their own big dumps do better. Robert Nelson, the Riverside County trash chief, says he often hears from companies seeking to build dumps in the desert east of Los Angeles. "They all want to stick to a dollar or so a ton" in host fees, he says. "We just say no."

With a 60-person engineering and administrative staff to analyze proposals, Mr. Nelson got $6 to $7 a ton from Western Waste for one proposed disposal site and more than $4 a ton on a new Browning-Ferris dump that would be the nation's biggest. Together, the two could bring the county more than $40 million a year.

The county justifies such hefty fees on the ground that they compensate it for putting up with a dump that takes trash from other areas. Scores of trucks arriving every day can clog traffic and bring dust, odor and vermin. And environmental damage due to hazardous materials improperly dumped or design flaws is possible.

Despite host fees, moreover, garbage dumps are so profitable that the companies can earn big returns. Although they

Please Turn to Page A3, Column 6

Economics of Trash: Some Tiny Towns Get Little for Dump Sites

Continued From First Page

don't disclose those profits, industry insiders and knowledgeable municipal officials say gross margins—before taxes and corporate overhead—typically run 50% or more of revenue at big dumps. Sanifill Inc., a Houston company that gets all its revenue from dumps, had profits, before taxes and overhead, of $24 million last year on revenue of just $39 million—a 61.5% margin.

At one dump, Chambers Development Co. pays Charles City County, Va., a poor farming area, a host fee running about $4.2 million a year. The Pittsburgh-based company reaps a gross margin of 40% to 50% at the dump.

Dumps are profitable both because of a shortage of disposal sites and because of their unique economics. Although every site is different and costs vary, Waste Management says permit and construction costs generally run between $100,000 and $500,000 an acre. But because a dump is built in small sections, with revenue coming in as each section is filled, much of the investment occurs after the money has started rolling in.

In addition, operating expenses are a minor fraction of fixed costs; so profits rise rapidly as disposal volume increases. Tom J. Fatjo Jr., a former chairman of Browning-Ferris, says a dump can earn gross profit of 15% at 1,000 tons of trash a day but 40% at 4,000 tons a day.

And if the operators can hold down the local community's share of the action, their profits soar. At Waste Management's Mobile, Ariz., dump, preparing the 480 acres that will actually hold garbage will cost a maximum of $240 million in today's dollars. But at current fees, those acres, with a capacity of 86 million tons, will bring in $2.28 billion over the dump's 50-year life. And because Mobile didn't negotiate any fees for itself, Waste Management will keep all the revenue.

The lack of a host fee, confides Jim Teter, a Waste Management vice president, "is unusual in this day and age."

But many other municipal officials are also at a disadvantage, finding it hard to get financial information on which to base decisions, says Steve Cramer, a Minneapolis councilman who heads the National League of Cities' task force on garbage issues. Garbage has joined crime, taxes and schools "on that list of issues that drive local officials nuts," he adds.

Waste Management's reaction to a Kentucky law that lets communities take a percentage of a dump's revenue, instead of a per-ton amount, shows how jealously the companies guard their financial data. "Our biggest beef isn't the amount" of money, says Don Drummond, Waste Management's dump manager in Estill County, Ky. "They want us to open our books."

Other communities have known enough to ask yet failed to drive a hard bargain. Gilliam County, Ore., a poor farming and ranching area 150 miles east of Portland, was already home to a Waste Management hazardous-waste dump. So, a simple garbage dump was hardly frightening.

In 1987, Waste Management approached Laura Pryor, the county administrator, and said it needed quick approval so it could bid on Portland's municipal hauling contract. She had heard that another community got 50 cents a ton, and she asked for more. Gilliam County got 75 cents to $1.25 a ton, and the company got a 40 million-ton dump, where it now buries Portland's and Seattle's trash for $25 a ton.

"I guess those big bucks would've been wonderful," Ms. Pryor says. "But you've got to be reasonable." Waste Management did agree to hire local residents, currently about 100 of them, and buys some supplies from local merchants. Those benefits have "stabilized our economy," Ms. Pryor says. Gilliam County also will get a second chance when the dump contract comes up for renewal in 1997.

Secrecy can backfire on a company. Browning-Ferris last year approached officials of Caswell County, N.C., with a proposal tailored to the poor tobacco-growing area's problems: The company would help pay the cost of closing the old dump, which is fouling groundwater; trash disposal would be free for the whole county; and the host fee of $1.25 to $2 a ton would produce about $1 million a year, enough to solve Caswell's budget problems and perhaps expand the overcrowded jail.

But Browning-Ferris insisted that county officials keep the proposal secret while the company quietly optioned land. That kept Gordon Satterfield, a tire dealer and chairman of the county commissioners, from shopping for a better deal.

When Caswell residents found out about the proposed dump, many felt betrayed. National environmental groups showed up to help organize the opposition. Mr. Satterfield, who had viewed the Browning-Ferris proposal as "a windfall," backed off.

Confused and afraid to make an unpopular decision, the commissioners put the proposal to a vote, and the dump was voted down last month by a 3-to-1 margin. The opposition was so strong that Browning-Ferris never sweetened its offer. "We're not fightwads," says Neil H. Clark Jr., vice president of Southwestern operations. "But no amount of money would've helped."

CALCULATION OF THE VALUE OF
POSTCLOSURE PAYMENTS IF
FUND ESTABLISHED

YEAR	POSTCLOSURE (1) FEE PAID TO WMI	INTEREST RATE	YEARS TO CLOSURE	VALUE OF PAYMENT AT JUNE 2008
1992	$1,221,094	8%	16	$4,373,219
1993	$2,442,188	8%	15	$8,076,123
1994	$2,442,188	8%	14	$7,457,182
1995	$2,442,188	8%	13	$6,885,674
1996	$2,442,188	8%	12	$6,357,966
1997	$2,442,188	8%	11	$5,870,700
1998	$2,442,188	8%	10	$5,420,778
1999	$2,442,188	8%	9	$5,005,338
2000	$2,442,188	8%	8	$4,621,736
2001	$2,442,188	8%	7	$4,267,533
2002	$2,442,188	8%	6	$3,940,475
2003	$2,442,188	8%	5	$3,638,483
2004	$2,442,188	8%	4	$3,359,635
2005	$2,442,188	8%	3	$3,102,158
2006	$2,442,188	8%	2	$2,864,413
2007	$2,442,188	8%	1	$2,644,888
2008	$1,221,094	8%	0	$1,221,094
TOTAL FUND BALANCE				$79,107,395

FUND VALUE AFTER CLOSURE

2013	$79,107,395	X	8%	5 YR.	=	$117,875,813
2018	$117,875,813	X	8%	5 YR.	=	$175,589,957
2023	$175,589,957	X	8%	5 YR.	=	$261,601,944
2028	$261,601,944	X	8%	5 YR.	=	$389,746,532

(1) Assumes no CPI increase
(2) Calculated at contract minimum tonnage 468,750 x $5.21 (contract payment) = $2,442,188 - first and final years were calculated at 1/2 because they are 6 month periods.

JFZ
8/11/92

Do we need the land now?

1. The county controls development in the unincorporated areas. They can protect open space for farms and waste disposal.

2. Land prices go up and down. You cannot assume an escalation of land prices. Yes, they will increase, but not dramatically.

3. What is the cost of land held for future use?

   Assume 500 acres -- current prices in the area are $10,000/acre. In 15 years the county could afford to pay $25,000/acre.

4. The cost of a landfill, according to sources at Waste Management (WSJ article 12/3/91), is $100,000-$500,000 an acre. Therefore, land cost is a small component of the total cost.

5. To grab land now would simply cost taxpayers and encourage little else in alternatives.

Exhibit III

JFZ
8/11/92

TOTAL COST OF LAND PURCHASED
IN 1992 AND HELD UNTIL "NEEDED"

500 acres at $11,000	$5.500.000
Annual cost mowing, etc.	$60,000
Interest cost $5,500,000 x 8%	440.000
Total Annual Cost	$500.000

WHO WOULD PAY THE $500,000 ANNUAL COST -- THE TAX PAYER!

ASSUME LAND IS HELD FOR 15 YEARS:

15 years x $500,000 - Annual Cost	$7,5000,000
plus Land Cost	5.000.000
Total Investment	$12.500.000

COUNTY INVESTMENT IN LAND AFTER 15 YEARS --

$12,5000,000 / 500 = $25.000 ACRE

Tax payers will pay $12,500,000 over the next 15 years.

Exhibit IV

INTRODUCTION

My name is Wayne J. Breda. I reside at 206 Country Club Place, Geneva. I am a taxpayer of Kane County. My educational background is that of a Medical Doctor and Engineer.

I am currently President of American Environmental Sciences and Technology, Inc. (AESTI) located at 26000 Keslinger Road, Geneva.

AESTI is an Environmental Engineering Consulting firm comprised of Engineers and Scientists. We are a Registered Professional Engineering Corporation. We are comprised of resident Engineers and Scientists in five locations in the midwest, as well as long term contracted professional engineers and scientists engaged in the science and technology and engineering as applied to the environment in university settings across the United States.

My past environmental experience has been as the executive vice president and head of the Environmental Division of ALEX Corp., Analytical Laboratories for Environmental Excellence, Burr Ridge, Illinois. My significant past environmental experience has been in Controll System Analysis and Design, Air Quality, N.P.D.E.S permitting, federal and state regulations re: environmental emissions on an 800 million dollar coal gasification plant - COGA-1 - to be built over the coal mines in Macoupin County, Illinois, the design of the plant has passed all of USEPA and IEPA regulations

and meets and exceeds new source standards for air, water quality, well into the next century after 2000.

I was subpoenaed to give expert testimony and witness to the largest toxic tort case ever held in the United States for the Plaintiffs in U.S.Court, JFK Federal Building, Boston, Mass., Anderson et.al v.s. W.R. Grace, Beatrice Foods, John J. Riley, Co. and XYZ Companies which includes 43 cases of childhood leukemia from contaminated ground water into public drinking wells.

We have studied the hydrology of the upper and lower aquifer at the 31st landfill site in Westchester to determine whether leachate containing vinyl chloride, a carcinogen leaching from that fill, would affect the surrounding groundwater and residential drinking wells and to determine how that outflow would affect public health. This project led to unique research and development in looking at leachate flow in groundwater.

This landfill was adjacent to Hickory Lane in Westchester where their shallow residential drinking wells had to be abandoned due to the health risk and a special act of the Illinois legislature created to provide municipal drinking water to the area.

We have recently been involved in the Champaign Urbana ISWDA landfill plan for the purpose of studying the impacts of the plan upon the property valuation in the area.

Our firm was engaged by the Village of North Aurora as their consultants regarding the annexation of the Conco Western Quarry and to evaluate a proposed plan by that firm to develop underground mining at the site. The village requested that we also develop an alternate plan to the mining. Our firm arrived at a conclusion that since Kane County was suffering from an acute shortage of landfill space, according to Elfstrom, Bus and Meilke, and that a ~~granite~~ STONE quarry is far better hydrologically both from a containment point of view and creating additional environmental impact that it may be an answer to the county's needs. The site was located directly adjacent to the north side of the tollway, off of the toll booth, and directly east of Illinois 25. We had calculated the needs of the county and found that this 93.7 acre site was ideal from both a logistics and environmental health point of view, and would create a minimum of impact upon any type of groundwater or upper aquifer as compared to a solidly clay lined membrane type landfill or balefill in a perched condition. The North Aurora Village Board accepted our recommendations. We had brought in Dr. Allen Wherman of the Illinois State Water Survey to testify as to the tightness and containment of the quarry. His testimony was very positive and stated that he, himself, would not be afraid to live adjacent to or drink surrounding groundwater at the site. During the final meeting of the North Aurora Board Mr. Phil Bus of the Kane County Development Board was present. After Dr. Wherman's testimony Mr. Bus stood up and stated that this site was more dangerous to public health and water contamination than the

Bartlett Balefill which resides in wetlands and has been acted upon in a negative way by the United States Congress. Obviously, Mr. Bus was sent to the meeting for a decided purpose, and that was to create doubt, cause the quarry plan to fail, as Elfstrom, Bus and Meilke had too much at stake to allow this to interfere with their grand landfill plan for Kane County. It is appalling to me that Mr. Bus, a geographer, would have the gall to make these public statements. But, one must remember that this is very typical of a bureaucrat who is attempting to manipulate and persuade the public to go along with their thinking.

I feel compelled to have stated the above so that the public would know exactly how they have attempted to thwart competitive development in the area of landfill development.

It is imperative that the taxpayers and citizens of Kane County demand that the Board withhold action on voting for this landfill proposed by Elfstrom, Bus and Meilke and passing one of the most sub standard landfill plans ever presented for review to any environmental body. Should the plan be forced through Kane County government ~~and~~ It Should have passed on to IEPA, Federal authorities, including the U.S. Attorney's office and the USEPA Region 5 ~~and~~ as well as the national headquarters, Washington, D.C., should be informed of the type of unsubstantiated analysis that has taken place in this plan and presented to the public. The outcry of the public is "No. Put it on hold and investigate both the authors, the proponents and the

writers of this plan".

I am herewith presenting this document along with my examination of the landfill component of the Kane County Solid Waste Management Plan which I shall now read and present to the hearing officer as evidence of incomplete and improper documentation of a document attempting to be ramrodded through County government into the hands of the Illinois Environmental Protection Agency and then into the hands of United States Environmental Protection Agency, Region 5.

One only has to see the Chicago Tribune dated Thursday, August 6, 1992, titled "Landfill near south Elgin poses a major health risk, EPA says". I have enclosed a photocopy of this article. This dump should have been cleaned up in 1972, but has been fought off by various court actions. One only needs to imagine the deal that Elfstrom has created by his contract negotiations with Kane and Waste Management. The County was given Settler's Hill for a pittance. The County stated that it was gaining tremendous revenue source and that the landfill would be under Kane County control entirely. The only control and profitability that the County has assumed is a zero funded remediation and emergency contingency plan that will be born by the taxpayers of Kane County. Their children will inherit the task of possibly paying tens of millions of dollars in Superfund remediation while Waste Management looks on with a smile and says, "Well, we sure got out of this mess easy".

AN EXAMINATION OF THE LANDFILL COMPONENT OF THE KANE COUNTY SOLID WASTE MANAGEMENT PLAN

Dr. Wayne J. Breda, President AESTI

INTRODUCTION

Kane County is in the process of adopting a comprehensive solid waste management plan for the County. The recommendations for the plan are contained in a two volume draft report entitled Kane County Solid Waste Management Plan, dated May, 1992. The Report details the thought process and cost consideration which went into developing the various solid waste management options. All of the management options suggest that additional landfill capacity will be necessary.

This paper will examine the assumptions which were used to develop the costs for development and operation of the landfill component of the Kane County Plan. These assumptions are contained in Kane County Solid Waste Plan Volume II, Appendices G and L to the Report. The costs projected in the Kane County Report will be examined for their accuracy as related to regulatory compliance, both Federal USEPA and State IEPA, and will be compared to known costs associated with development and operation of landfills. The source of information for the cost analysis is a model developed for the Michigan Waste Industries Association for presentation before the Michigan Special House Democratic Task Force on Solid Waste Disposal. This source was chosen as it was developed by and

for landfill operators and owners as an industry standard and not taken as "theoretical fact" by Bus and Mielke Standards of Landfill Development and Operations.

REGULATORY COMPLIANCE

The Report accurately indicated that the landfill must comply with Illinois Regulations which are contained in Docket R88-7 and USEPA Subtitle D Regulations (p.G-3). One major important regulation which is absent from the report discussion is the proposed requirement under the Federal Clean Air Act (CAA) to manage non-methane organic compounds (NMOC's) at landfills which have a total design capacity equal to or greater than 111,000 tons. The proposed Kane County landfill will have a design capacity greater than 111,000 tons.

The costs associated with Federal and State regulatory compliance and any discrepancy noted in the this Report will be discussed in later sections of this paper.

PRE DEVELOPMENT COSTS

The two most important issues to be considered here are the cost of land purchase and the amount of acreage dedicated to buffer areas. Simply, the larger and more costly the buffer area is, the greater the allocation amount must be per ton or c.y. to amortize the land purchase.

A third issue which is missing and deserving of mention is the actual site and the overall size of the facility. One proposal, which may or may not be abandoned, would have cited a 1,000 acre landfill with a 1,000 acre buffer. This will result in a requirement to pay off two acres of land for one acre of landfill area. Additionally, the landfill would have operational life for close to one hundred years and including out of state and regional solid waste, e.g. Cook, Lake, McHenry, Kane. This time period is based upon the Report stating that 100 acres of landfill space is necessary to provide disposal capacity for ten years at current Settler's Hill and Woodland intake. Since General Obligation Bonds are not written for one hundred years, the land purchase cost would have to be spread out over the first few years of the landfill and not the design life of the landfill. This will severely front end load the project with exhorbitant costs and result in a large percentage of the tipping costs initially devoted to paying off the costs of the land acquisition, which in turn results in higher tipping fees.

CELL DEVELOPMENT COSTS

The Report indicates that a five foot liner is necessary to comply with Illinois Regs. (p.G-11), the cost estimate is for a three foot liner (p.G-37). Thus the numbers for excavation and recompaction should be adjusted to reflect the additional costs of (+66%). Additionally, there are no costs allocated in the Report to initially excavate the landfill itself. The excavation costs in

the Kane Solid Waste Plan relate only to construction of the liner after the landfill has been excavated!

It should also be noted that USEPA Subtitle D requires a composite liner consisting of both clay and a flexible membrane liner (FML). All new landfills and expansions to existing landfill facilities must comply with these USEPA requirements and variances are unobtainable, expecially with the soil types, hydrology and shallow well locations at the three site selections.

CELL CLOSURE PER EACH CELL

The Kane County Solid Waste Plan costs do not include a methane collection system for control of NMOC's which will be required under the CAA. Thus a line item cost for installation of a system should be included, but isn't. Also, USEPA subtitle D requires that the final landfill cover must be constructed at least as impermeable as the liner - five feet or greater. The final cover of the landfill must also contain a FML adding further costs to landfill construction over the years.

EQUIPMENT

According to the MWIA Cost Model, the following heavy equipment is necessary to operate an 800 to 1,000 TPD landfill:

Type	Number	Unit Cost	Total
CAT 826 Compactor	3	360,000.00	1,080,000.00
CAT D8 Dozer	2	300,000.00	900,000.00

CAT 627 Scraper	3	370,000.00	1,110,000.00
CAT 12 Grader	1	200,000.00	200,000.00
Water Truck	1	90,000.00	90,000.00
Tractor/Mower	1	20,000.00	20,000.00
Pickup	2	15,000.00	30,000.00
Backhoe (1 1/2 cy)	1	250,000.00	250,000.00
Service Truck	1	60,000.00	60,000.00
	Equipment Cost Total		$3,740,000.00

Adding 10% for spare parts, the total equipment costs should be $4,114,000.00 as opposed to the $1,170,000.00 allocated in the Kane County Solid Waste Plan Report.

ANNUAL OPERATING COSTS

The MWIA Model indicates that the following personnel are necessary to operate a 800 - 1,000 TPD facility:

Division Manager	1
Operations Manager	1
Office manager	1
Operations	6
Laborers	2
Mechanic	1
Scale Person	1
Clerks	2
Total	15

It should be noted that the labor costs for the heavy equipment operators in the Report, based on a 40 hour week, are $20.42 per

hour per operator. Union scale wages for operators are approximately $30.00/hour including benefits.

POST CLOSURE

The Report indicates that Post-Closure care will be required for 30 years (pp.G-25, G-35). However, the associated cost tables in the Kane County Solid Waste Plan indicate a 5 year post-closure period (pp.G38, G-39). The post closure costs in the Report do not reflect in any gas management during post-closure that will be required under the USEPA CAA.

The MWIA cost model projects the total costs of a 30 year post-closure period at $5,526,000. This figure also does not include sufficient funds to comply with the CAA. Thus, the annual accrual costs for post-closure care identified on Page G39 should be at mnimum doubled.

LANDFILL TONS PER DAY

The last cost issue to be addressed in this paper is the effect daily volume of waste receipt has on unit pricing at landfill. The Report proposes four systems for management of wastes (Appendix L). A summary of costs for each system is contained on page L-7. Each system assumes a landfill cost of $30.00/ton.

Many costs associated with landfills are fixed costs. These costs

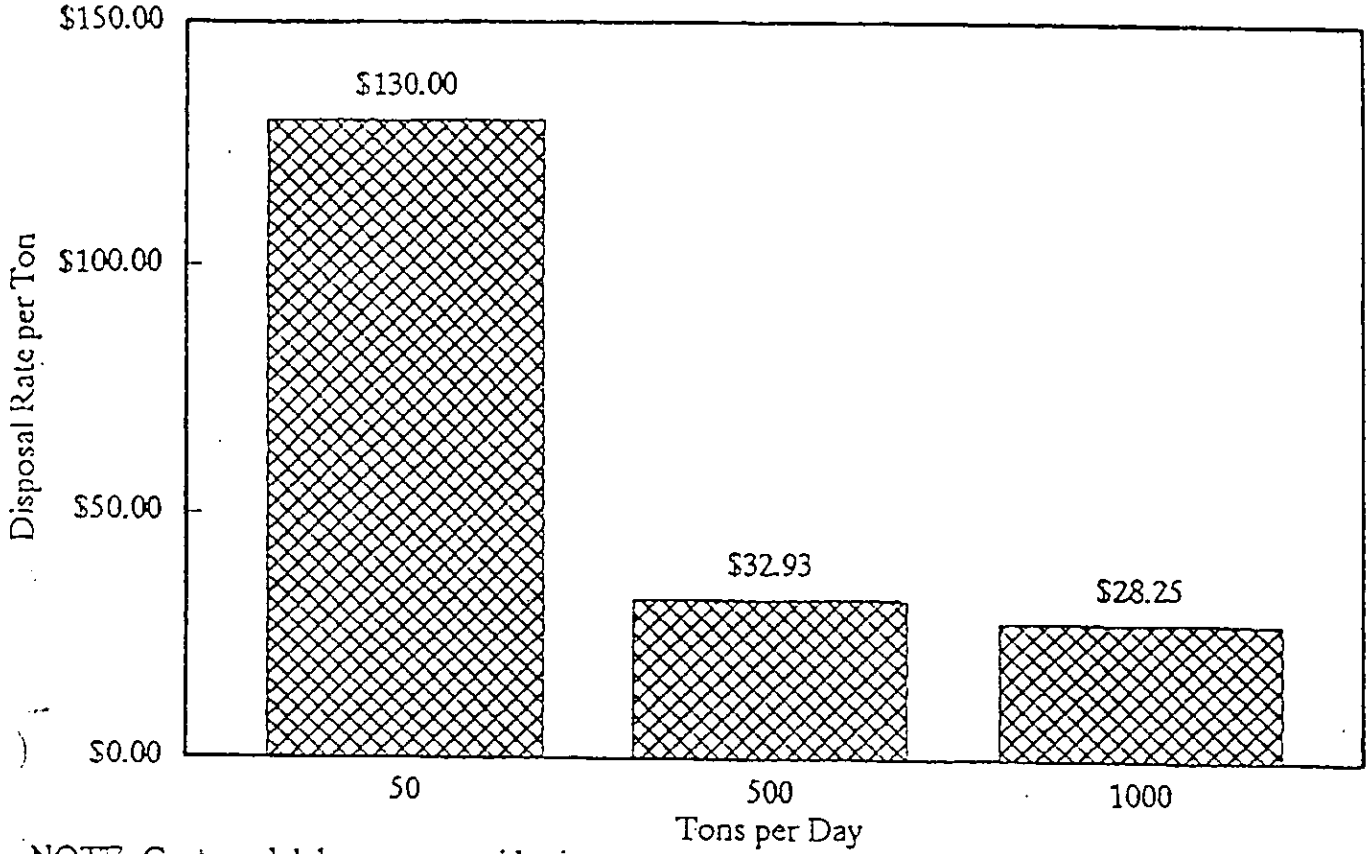
must be spent each year regardless of the volume of waste received. Attached to this paper is a cost per ton chart developed utilizing the MWIA model for landfills receiving 50, 500, and 1,000 TPD. The important point to be derived from this chart is that the landfill disposal costs associated with Management Systems 1 and 4 in the Kane County Solid Waste Plan will be substantially higher as they are diverting only 321 and 342 tons per day to landfill.

The final issues, on cost per ton, is the method in which these costs were developed by the Kane County Solid Waste Plan Report and the MWIA model. The Kane County Solid Waste Plan Report developed a cost per ton to build and operate the landfill of $19.33 (p.G-39), and added an estimated cost to comply with the new Illinois Regulations plus governmental and ownership royalties to arrive at a $30.00/ton figure.

The MWIA model utilized cost information developed from actual landfill construction and operation to arrive at an exact cost per ton figure. The Model, however, does not include costs which were included in the Kane County Solid Waste Plan Report, such as interest, insurance, bonding, taxes, contingencies, remediation, and government and ownership royalties. Therefore, the costs per ton presented in the attached table would be much higher, possibly doubling or tripling the costs in the Kane County Solid Waste Plan.

Impact of Daily Volume on Cost

MWIA Landfill Cost Model



NOTE: Cost model does not consider interest payments, insurance, bonding, taxes, contingencies, remediation, or governmental and operator royalties.

Thursday, June 4, 1992

KANE COUNTY CHRONICLE

Firm uses high-tech to solve environmental puzzles

By GG WEBER
Assistant Business editor

GENEVA — As society's concern for the environment grows, so too does the demand for environmental engineering services.

The need for this type of expertise has prompted American Environmental Sciences and Technology Inc. to expand its operation. The firm recently relocated its corporate personnel from LaGrange to offices at 2600 Keslinger Road, Geneva.

The firm maintains a laboratory in LaGrange, and has additional offices in Indianapolis, Ind.; Niles, Mich.; Alpina, Mich.; and Phelps, Wis. AESTI also is the parent company of AESTI International, a division of which is AESTI Italia S.A., which has offices in Genoa and Rome, Italy. AESTI International plans to establish another division in England.

The decision to move the parent company's administration to larger, more modern offices in Geneva was based on the company's growth during 1991, said Wayne J. Breda, medical doctor, electrical engineer and president of AESTI.

"As an established environmental engineering firm, AESTI has experienced a substantial increase in business and prospects," said Breda, who lives in Geneva.

"We're going to expand everything into Kane County. We want a presence here," he said.

Economic cycles do not affect the performance of environmental firms, Breda said. "The environmental business is recession-proof. As long as (environmental) laws are enacted, ... firms like ours will always be in business."

Breda, with William J. Bauer, founded AESTI in 1988, combining engineering services with innovation aimed at solving environmental problems.

"Our business is solutions to environmental problems," Breda said. "We assess air, ground water and land pollution and evaluate those areas and how they are either affecting or could affect the environment," he explained.

"We are developing new ways to integrate housing and industrial developments ... with their natural landscape without destroying the wetlands and other natural areas," Breda said. "It may cost a little more, but it's worthy of preserving the natural resources."

One of the company's goals, for instance, is to create natural aquatic lakes, not just detention ponds, in developments with a high water table, he explained.

Breda's background as an engineer and a medical doctor with a specialty of neurology help him to put scientific findings into human perspective.

"Not only can I look at a problem from an engineering point of view, but I can look at it from a medical point of view and determine how it is affecting the population," Breda said.

AESTI holds several patents on technology applied in the environmental arena. The firm has registered professional engineers in all engineering disciplines on staff. More than 50 percent of the scientific staff hold doctoral degrees, and 75 percent have master's degrees, as well. Breda also has many consultants who provide expertise in a wide range of areas.

"My philosophy is to look for the best engineers in the world," Breda said of the firm's associate experts, many of whom are university professors.

"We go to whatever extent it takes to get the best engineers," added George Brown, vice president of marketing and sales.

Breda is the former exective vice president of ALEX Corp. (Analytical Laboratory for Environmental Excellence Inc.), where he headed environmental engineering and operations.

Founding partner, Bauer, is the originator and designer of the Chicago Deep Tunnel system.

The firm's clients include government agencies, municipalities, manufacturers, petrochemical facilities, commercial real estate companies, developers, lending institutions, legal and engineering firms, "the whole schmeil," Breda said.

Its engineers also are called upon as expert witnesses in litigation over environmental contamination, he added.

As more and more of Kane County's agricultural land becomes turf for development, many natural resources too often are lost, Breda said.

"This is the grain belt of America. I'm not against development, as long as it's proper. But someday someone is going to have to put our land in reserve for crops," he said. "One of our biggest problems today is proper utilization of land."

To help preserve those resources, AESTI offers a variety of services designed to identify existing or potential contamination and return the land to, or keep it in, its natural state.

Environmental impact studies, for instance, determine whether a proposed development will harm its surroundings. They answer the questions, "what will be the impact on people, the community, the natural resources of the land," Breda explained.

Environmental audits or surveys identify existing hazards, if any, and methods of clean-up. Aerial photography of large geographic areas has proven effective in these studies, Breda said.

Wetland deliniations surveys the natural contents of an existing wetland, and wetland remediation involves returning the land to its original state.

Remedial investigative feasibility studies combine economic and scientific points of view, Breda said. They examine whether a cleanup plan — of a landfill or drinking water, for instance — would be economically feasible to complete.

AESTI has taken its environmental services to the remote corners of the world, undertaking assessment projects such as the Congo River in Africa, Son River in India, and a methanol and synthetic fuel plant in New Zealand.

More information is available at 232-7304.

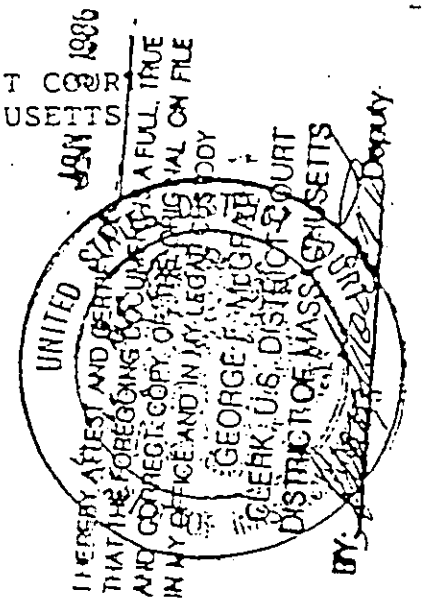
IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

ANNE ANDERSON, for herself, and as Parent and Next Friend of CHARLES ANDERSON, and as Administratrix of the Estate of JAMES ANDERSON; CHRISTINE ANDERSON; RICHARD AUFIERO, for himself, and as Parent and Next Friend of ERIC AUFIERO, and as Administrator of the Estate of JARROD AUFIERO; LAUREN AUFIERO; DIANE AUFIERO, for herself, and as Parent and Next Friend of JESSICA AUFIERO; ROBERT AUFIERO; KATHRYN GAMACHE, for herself, and as Parent and Next Friend of AMY GAMACHE; TODD L. GAMACHE; ROLAND GAMACHE; PATRICIA KANE for herself, and as Parent and Next Friend of MARGARET KANE, KATHLEEN KANE, TIMOTHY KANE, and KEVIN KANE, JR.; KEVIN KANE; DONNA L. ROBBINS, for herself, and as Parent and Next Friend of KEVIN ROBBINS, and as Administratrix of the Estate of CARL ROBBINS, III; MARY J. TOOMEY, for herself and as Next Friend of MARY EILEEN TOOMEY, and as Administratrix of the Estate of PATRICK TOOMEY; RICHARD J. TOOMEY; JOAN ZONA, for herself, and as Administratrix of the Estate of MICHAEL ZONA; RONALD ZONA; ANN ZONA; JOHN ZONA; and PAT ZONA,

Plaintiffs,

v.

CRYOVAC, Division of W.R. GRACE & CO.; W.R. GRACE & CO.; JOHN J. RILEY COMPANY, Division of BEATRICE FOODS CO.; BEATRICE FOODS CO.; and XYZ COMPANY(IES).



Civil Action No.

82-1672-S

86C0168

RECEIVED
JAN 9 1986
M. STUART CUNNINGHAM
CLERK, U.S. DISTRICT COURT

NOTICE TO TAKE DEPOSITION

TO: Dr. Wayne Breda
29 East Madison Street
Suite 508
Chicago, Illinois

Please take notice that pursuant to Rule 30 of the Federal Rules of Civil Procedure, plaintiffs will take the deposition on oral examination of Dr. Wayne Breda, 29 East Madison Street, Suite 508, Chicago, Illinois, commencing at 10:00 a.m. on January 17, 1986 at 29 East Madison Street, Suite 508, Chicago, Illinois, or at such other time and place as may be mutually agreed upon by the parties, before an officer authorized by law to administer oaths.

Pursuant to Rule 45 of the Federal Rules of Civil Procedure, a Subpoena shall be served upon John Camerlengo commanding him to appear.

This is the 8th day of January, 1986.

Terry F. Lenzner KAB
Terry F. Lenzner
David Geronemus
ROGOVIN, HUGE & LENZNER
A Professional Corporation
1730 Rhode Island Avenue, N.W.
Washington, D.C. 20036
(202) 466-6464

Jan Richard Schlichtmann
171 Milk Street
Boston, MA 02109
(617) 423-9777

Attorneys for Plaintiffs

CERTIFICATE OF SERVICE

I, Jan R. Schlichtmann, attorney for the Plaintiffs, hereby certify that I have sent a copy of the attached Plaintiffs' Notice of Deposition for Wayne Breda, M.D., by delivering the same in hand on January 8, 1986, to the following counsel:

Jerome Facher, Esq.
Hale & Dorr
60 State Street
Boston, MA 02109

William Cheeseman, Esquire
Foley, Hoag & Eliot
One Post Office Square
Boston, MA 02109

Dated: January 8/ 1986

Jan Richard Schlichtmann
Schlichtmann, Conway & Crowley
171 Milk Street
Boston, MA 02109

Signed in the presence of Kathleen Boyes, on this 8th day of January, 1986.

Kathleen O. Boyes
Notary Public
My commission expires:
5/30/86

Landfill operations converting old quarry into municipal asset

Carefully planned process a pollution-free system for solid waste disposal

BY SANDY HEROD

A popular PBS television series, "This Old House," encompasses themes that have much in common with quarries.

Some old quarries, like some old houses, with a facelift and conversion into attractive recreational areas, once again are making a contribution to their locales. Some old quarries, like some old houses, have been long neglected; but, unlike the houses, they do not deteriorate to the point where they can be disposed of by demolition.

Then there are some old quarries, their basic characteristic being a sizable hole in the ground, that have been recognized, not as eyesore nor as a prettied-up ce of real estate, but as a potenial boon to efforts to meet a basic need of our modern society—that of disposing of vast amounts of refuse in a pollution-free manner.

Cook County, Illinois, incorporating much of the metropolitan Chicago area, is but one section of the country in which sanitary landfill operations are used to handle large volumes of waste. It also is the area in which one of the most progressive landfill operators does business, an enterprise in which the firm has had nearly 50 years of experience.

John Sexton Sand and Gravel Co., at one time, was an aggregate producing firm that also engaged in construction contracting. In a unique turn of events, the late founder, John Sexton, found himself during the 1930s becoming increasingly involved in building demolition instead of construction to obtain valuable basement space for waste disposal—already beaning an essential function in e area. That function also proved to be a lucrative enterprise.

As the metropolitan area expanded, so did the need for sanitary landfill; Sexton's capability grew with the need. From the beginning, Sexton established high standards for his landfilling operations, taking pride in finishing off each completed site "until it looked like a billiard table."

Owing to those standards, the firm now operating as John Sexton Contractors Co., has become recognized worldwide as a leader in sanitary landfill. It has become sought by, rather than fought by, communities of greater Chicago.

Through the years, operations have developed in the northwest sector of metro-Chicago at Des Plaines where solid waste disposal capacity in 160 acres is estimated as equal to the cubic volume of some 20 John Hancock buildings; in the southern extremity at Blue Island in the 200-acre former clay pit excavation of a brick company; and in the western area near the Tri-State Tollway and 31st St.

It was in 1957 that operations were started at the 31st St. site; they were to become recognized as a prime example of modern sanitary landfill techniques. Involved was the encircling of the 275-acre tract with an earth berm more than 2 miles in length. Significantly, the surrounding area now is dotted with homes valued in six figures.

Phasing out of the 31st St. landfill became necessary last year; but, typically, Sexton had begun a search for an alternative location long before closure was imminent. This brought the firm to its first utilization of a former quarry site.

After a century of activity, the Hillside quarry, 4 miles northeast of the 31st St. location, had been closed owing to the combination of blasting complaints from neighbors and the depletion of economically recoverable rock.

However, with a volume of some 16 million cu. yd., it had obvious promise as a landfill site. In fact, previous owners of the 72-acre property had received waste disposal permits from the Illinois EPA, but only a nominal quantity of solid waste had been dumped, a key word as will be seen.

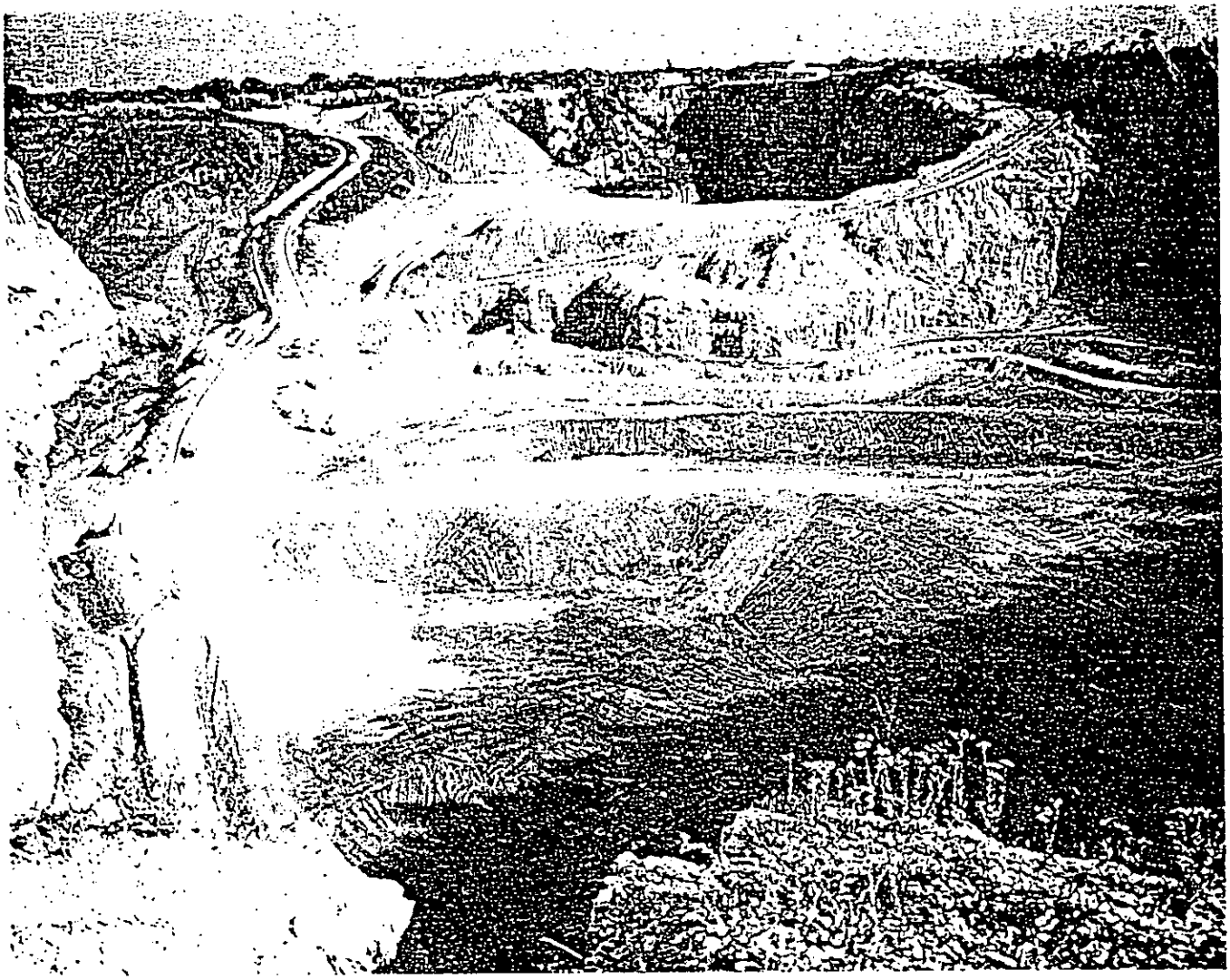
Several highly favorable factors were evident—a key location at the intersection of two major thoroughfares, a capacity supportive of many years of operation, and the feasibility of using an existing stone ramp in the quarry for access to the deepest level.

This latter point is in contrast to the usual procedure in quarry landfilling in which refuse is dumped from the top of the high wall with consequent tumbling and blowing on the way to the bottom. As potential newcomers to this type of landfill operation, but spurred by the firm's tradition as a progressive landfill operator, Sexton's management team had other ideas.

While steps were being taken to obtain control of the site, then owned by Commonwealth Edison, the public electric utility, a contract was given to Eldredge Engineering Associates, Oak Brook, Ill., to combine earlier permit considerations and Sexton's method of operations into a proposal of an effective quarry filling procedure to be presented to the Illinois Environmental Protection Agency.

A consortium was established by Sexton and Browning Farris Industries of Illinois to purchase the quarry in the name of the Congress Development Co. This is the first time Sexton has had a partner in a landfill operation; in this venture, they are the sole operator of the site.

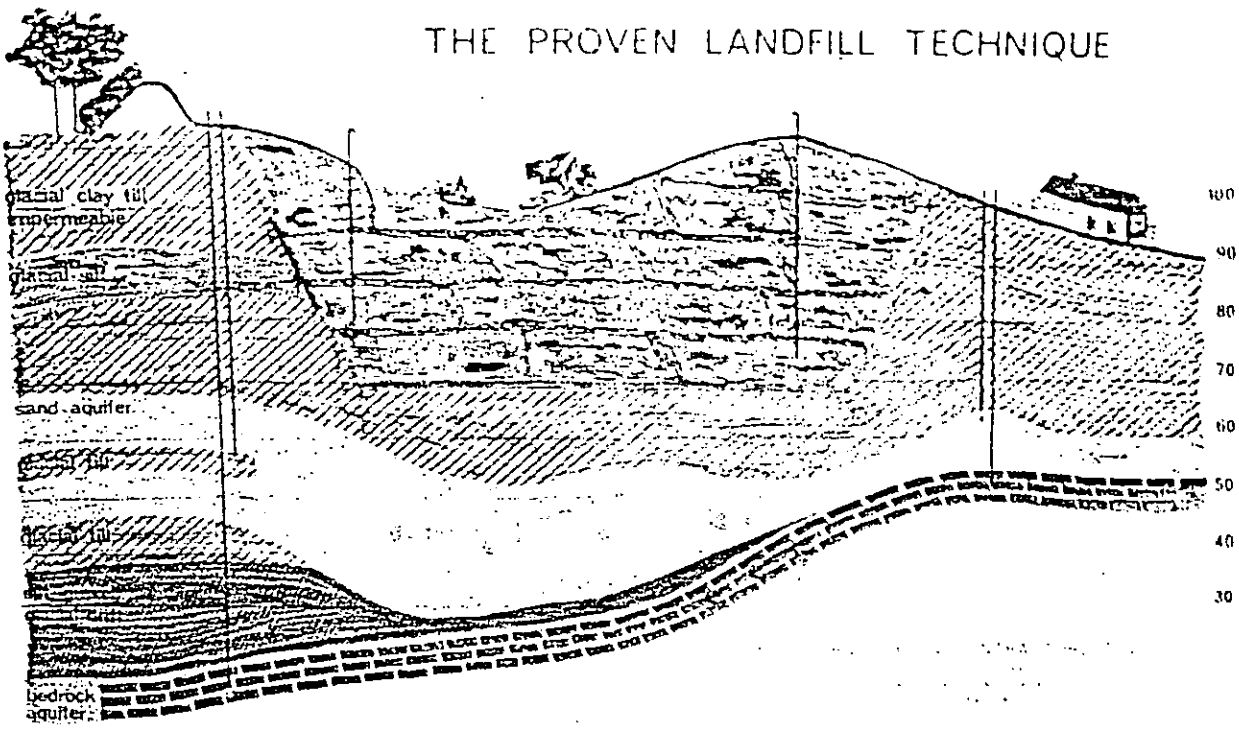
Some 30 months of study and careful planning passed before September 1980, the time quarry filling began. A major consideration was sealing the quarry floor



A view from northwest to southeast across the historic quarry site in the metropolitan Chicago area that provided a volume of some 16 million cu.yd. for pollution-free, solid waste disposal in sanitary landfill.

Dumping and compaction of solid waste on the quarry floor. At center – background is a section where impermeable shale is being applied as a sealer.

A stockpile of the shale used to seal the quarry walls. It is placed in thicknesses ranging from 15 ft. at the base to 5 ft. when fill nears the top.



Schematic of Sexton's landfill technique.

and walls to preclude seepage of fluids into the underlying and surrounding virgin limestone strata.

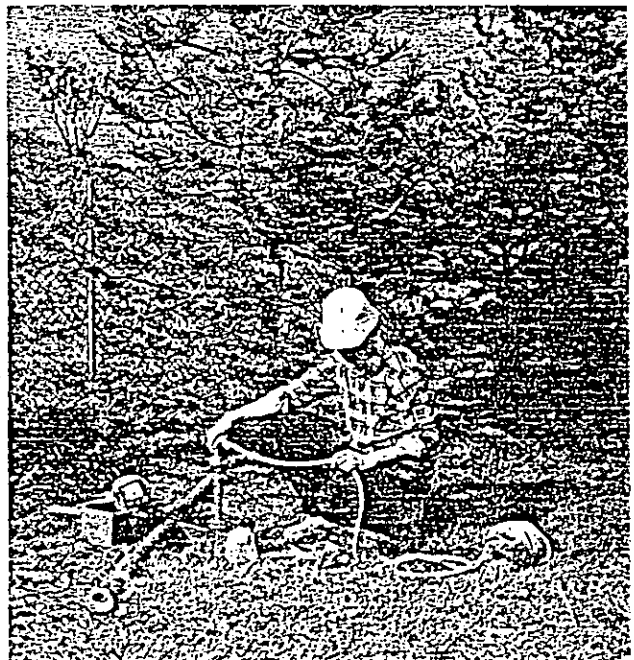
Sexton permits no disposal of fluid waste, but percolation of ground and rain water through the disposal site into underlying potential aquifers could not be allowed. The limestone strata, in which quarrying had been carried out, are the same that have provided water for other areas although constant pumping at this site, and from nearby quarries, has caused the formation, locally, to dry up as a water source.

A 200-ft. thick layer of dense, highly impermeable shale is found more than 300 ft. down from the ground surface. This layer provides an ample supply of the impermeable shale that, under the operating design concept, is being used to seal the quarry side walls. The walls are being sealed, from the bottom up, with a 15-ft. thickness at the bottom that will taper to 5 ft. as the filling nears the top. This lining procedure for a quarry landfill operation may be one of the first of its kind on such an extensive scale.

In addition to wall sealing, daily covering of waste received is necessary. Construction and demolition wastes, previously dumped into a 7-acre section of the quarry under earlier landfill permits, contain a substantial volume of earth material suitable for this cover. Other nearby earth excavations are expected to augment the supply of daily waste cover during the projected 10-year life of the site.

As carried out by Sexton, the landfill operation involves as much careful attention to physical and operating details as actual quarrying. To assure an orderly flow of waste vehicle traffic in and out of the quarry, an additional road was built to provide access to the quarry floor. Inbound and outbound ramps have 11% and 16% grades, respectively.

Both ramps are provided with specially designed "traps" as emergency stops for any runaway trucks. These are side lanes built



Monitoring wells provide for regular checks on the water around a Sexton landfill site.

of pea gravel to a depth of 2 ft.; they provide an effective retardant to the speed of a truck steered into them.

All roadways are built with a 6-in. layer of plant mix bituminous concrete on a 24-ft. wide limestone base, and, if necessary, can handle two-way traffic. In a commendable public relations consideration, a 400-ft.-long concrete "rumble strip" was placed on the out-bound roadway which could not be built long enough to allow trucks to fling mud from their tires, unaided, before returning to the public roads.

Also unusual are on-site traffic signs which reflect the bi-lingual makeup of waste truck driver personnel. The obvious safety problems associated with heavy loads on steep grades dictated the need for extra signs detailing proper driving procedures; these are posted in English and Spanish. During startup of the site, further precautions were taken by assigning a bilingual instructor to acquaint drivers with special safety requirements.

In preparation for the operation, the quarry had to be dewatered by pumping at the rate of 2,200 gpm for 16 weeks. Routine pumping of storm water and seepage now is handled by smaller pumps in staged sumps, and, as refuse filling progresses, sumps are eliminated.

In order to evaluate the effectiveness of the sealing procedure and the impact of the site on the local environment, the quarry fill ultimately will have three interior wells plus 10 peripheral wells between the seal and the limestone. All wells are monitored for hydraulic and chemical parameters; each is designed for conversion to a permanent pumping point should such a control procedure be required.

Installation of gas control wells also is planned; these may become necessary to the operation. Gases collected at another Sexton site have been used for the energy powering a 25kW generator. Although not large by commercial standards, this amount has provided current for summertime air conditioning of field offices and winter equipment head bolt heaters. Owing to the depth and volumetric capacity of the Hillside site, it ultimately may provide an abundant source of energy.

The quarry now receives more than 450 loads of solid waste refuse on an average day. That volume of traffic calls for some hard and fast rules, such as:

Only the driver may sign the trip ticket, for gate charge, at the site office.

No shifting of gears is allowed either ascending or descending within the site.

Only experienced and Sexton-selected truck servicing units are allowed to help disabled trucks on site.

Trucks using the site must have adequate tire tread to assure traction under prevailing weather conditions.

Handling and spreading the volume of material involves a sizable fleet of equipment. Included are four Caterpillar D8 tractors, one fitted with a ripper; three 627B Cat earth movers fitted with Rud Pro Trac tire chains; a Cat 966B wheel loader; a Rex Pulvi-Mixer for liner seal preparation and construction; a Rex 3-50A Pactor; a water tank truck; and an Elgin street sweeper.

Communication between the site superintendent and equipment operators is maintained with a base radio and vehicular units, plus hand-held transceivers on the same frequency. Radios always are available to equipment operators at the fill face.

While the Hillside site is a "natural" in terms of its high potential and advantages as a landfill operation, the firm's experience of nearly 50 years in landfilling was the key to establishing a smoothly implemented, well-organized project—one in which carefully planned preparation, engineering, and operation have been combined to convert an old quarry site from one of empty space with no potential economic benefit to the community to an asset being returned to long-term productive use.

As pointed out in a newsletter published by Cook County's Department of Environmental Control, the county "has had a would-be white elephant turned into a state-of-the-art, money saving, pollution limiting asset."

Until recently, the privately-owned and independently operated firm has offered only disposal service, either at one of its own facilities or as operators of construct/operate locations. However, its experience and expertise has been recognized as marketable in its own right; this led the board of directors of John Sexton Contractors to form a new organization, Alternative Technologies.

The ALTECH Division was established to provide specific consulting services in the field of waste disposal. Included in the broad spectrum of factors comprehended are plan development, need assessment for new facility planning, waste sampling studies, regulatory analyses and compliance planning, site selection, water quality surveys, contingency planning, and coordination of multidiscipline programs.

These, along with many other considerations, are based on the knowledge generated in-house, plus that of associated technical groups, in the environmentally responsible management of some 15 disposal facilities owned and/or operated by Sexton.

The progressive firm is headed by E. G. Sexton, board chairman and president; Carole S. Malinski, vice president; Arthur A. Daniels, executive vice president; and Alfred E. Gallo, vice president/general counsel.

John Shea Lehman, assistant vice president, is director of the firm's comprehensive community relations program; James Butler is superintendent of the Hillside site. ●

ou Page

With news from the Fox Valley

icago Tribune Thursday, August 6, 1992

Landfill near South Elgin poses a major health risk, EPA says

By Janice Bjorklund

The soil covering of the Tri-County Landfill near South Elgin is polluted and eroding away, exposing anyone who ventures onto the site to an increased risk of cancer, a spokesman for the U.S. Environmental Protection Agency told residents at a public hearing.

"I wouldn't suggest [anybody] go walking on the site," David Seely, remedial project manager at the U.S. EPA, said at the Tuesday hearing.

Though few people would have reason to walk the dump, the Illinois Prairie Path, where people jog and ride bicycles, makes up its western border.

About 30 people attended the hearing on the EPA's $12.6 million plan to clean up the leaky dump site, which South Elgin officials fear is not only polluting the air with carcinogenic toxins but also could poison the village's water supply.

The site lies directly east of South Elgin between the Prairie Path and Illinois Highway 25. It includes the Tri-County Landfill and the Elgin Landfill, both of which ceased operations in the 1970s, an EPA report says.

The landfills were covered in 1981, but the soil is wearing away, and a significant amount of gas, including explosive methane gas, is escaping. According to an EPA report, inhaling the "contaminated fugitive dust and volatile emissions" over one's lifetime could cause two additional cases of cancer in every 10,000 people.

To solve air pollution, the EPA is proposing extraction wells to capture the gas and burn off the contaminants. The site also would be capped with 2 feet of clay, 8 inches of topsoil and vegetation to seal in the polluted dust.

Of extreme concern to South Elgin is the possible pollution of the aquifers, or underground water supplies, said Village President Thomas Rolando. The growing village of 7,474 has a 113-foot-deep well about three-quarters of a mile from the dumps, he said.

Monitoring wells have shown significant pollution in the shallow aquifer under the dumps, said Elizabeth Uhl, senior project hydrologist for WW Engineering & Science, Grand Rapids, Mich., contractor for the EPA.

And though there is a layer of clay between the shallow aquifer and the medium aquifer where South Elgin gets its water, initial studies suggest the polluted water is flowing into the medium aquifer, she said.

The medium aquifer is considered by the state to be a Class I ground water supply because it's "naturally of drinking water quality," said Richard Lange, project manager for the Illinois EPA. Therefore, he said, it deserves the "highest level of protection."

But the shallow aquifer also is of concern to residents, particularly those who have private wells, said Sue Schudel, a 40-year South Elgin resident. She said that 10 houses on Middle Street, less than a mile from the site, have wells only 30 to 60 feet deep.

To handle polluted water, the U.S. EPA proposes that the water be collected around the perimeter of the site and pumped to a treatment plant of the Fox Valley Water Reclamation District, Seely said. Also, capping the site with clay will limit the amount of water entering the dump, which could dissolve more contaminants.

Several people, however, expressed concern over the project's estimated $12.6 million cost.

"We continue to throw money like more is better," said Larry Buechel. Because there is not a large amount of pollution moving off the landfills, Buechel said, "I don't think the expense is of any use."

Though the federal EPA says cleanup could begin in 1994, South Elgin's Rolando is skeptical.

"I don't have any confidence in either federal or state agencies," Rolando said. He added that a court in 1972 ordered the owners of the landfill to build a berm to contain contaminated water on the site, and "it still isn't done."

Please return by July 20, 1992 to: Virgil Township Solid Waste Disposal District
P.O. Box 52, Maple Park, IL 60151

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To be collectively submitted at a County Public Hearing on the Solid Waste Management Plan

COMMENTS ON THE KANE COUNTY SOLID WASTE MANAGEMENT PLAN

Please enter into the Public Record

We, the Berkes Family, are opposed to the plan of another landfill in Kane County for three reasons:

1) The present landfill site at Settler's Hill will have an extended capacity of another 5 years, bringing total capacity to 16 years. Therefore, we feel another landfill is not needed.

2) Technology in waste management is always producing new forms of recycling garbage + we support such research.

3) If the new landfill site becomes a reality, it will take away excellent farmland. We urge the management group of this plan to consider ~~[illegible]~~ that many homes will be taken for a needless dump site.

Our thoughts are behind EDKO in its determination to continue to explore other ways of garbage disposal.

Signature Andy Berkes Frank Berkes Darlene Berkes

Name

Address 636 Willow St.

Please return by July 20, 1992 to: Virgil Township Solid Waste Disposal District 244
P.O. Box 52, Maple Park, IL 60151
(e collectively submitted at a County Public Hearing on the Solid Waste Management Plan)

COMMENTS ON THE KANE COUNTY SOLID WASTE MANAGEMENT PLAN

Please enter into the Public Record

July 9, 1992

Dear Sirs:

My comment on the proposed Kane count solid waste plan is that the plan is taking the immediate, least expensive (cheap), easy way out. But to tell the truth, landfill is the most expensive way to get rid of our trash in the long run. Landfill brings many, many problems, pollutes our aquifers is a big problem, especially to us who have our own wells. It must take forever for the trash to disintegrate, they have dug into 50-year-old landfills and find newspapers that can still be read. We will just be bequeathing the next generations our garbage, sort of like the national debt.

We should pursue all other means of recycling our trash and start DOING IT NOW. Alternative technologies, incineration for example, may be more expensive for the moment, but cheaper in the long run.

Landfills may be necessary till we can get used to doing without them, but please keep them small and closely monitored. A large landfill will only attract more trash.

My last thought is: Don't forget who runs Kane County: It's not Waste Management, it's you.

Yours truly,

Signature Charles K. Bristol

Name Charles Bristol

Address 5N818 Meredith Rd.

Maple Park, Il 60151

COMMENTS ON THE KANE COUNTY SOLID WASTE MANAGEMENT PLAN
Please enter into the Public Record

1. The clause in the current Waste Management contract guaranteeing a minimum amount of waste per year must be immediately renegotiated! We are concerned with and committed to recycling waste. This clause is a total disincentive to those efforts. Even if Kane County reduces waste, we will be forced to import waste to fill the contractual void. Only idiots would have allowed this clause in a contract. The residents of Kane County were betrayed.

2. There are 9 counties in Illinois Region II. Only 4 1/2% of those residents live in Kane County, but we import over half of the waste put into our two landfills. WHY????

3. Why must Kane County import waste at all? Landfills here should be for only Kane County waste. That policy if implemented would extend the life of the landfills significantly. I do not want to be the dumping ground for other people's waste, especially hazardous waste. We've had enough of the open door for garbage policy!

4. Under sec. 4.3 Implementation Strategies of the Plan, there is far too much "encouraging" and not enough "mandating". We need stronger waste policies and appropriate penalties for non-compliance. Kane County needs to implement statutes mandating waste reduction to all sectors.

5. Why study tire disposal practices (sec. 5.3.1, pt. 5.7) when recycling technology exists today. Let's get on with it now.

6. The overall plan reflects a strong pro-landfill mentality, obviously fostered by the long and cordial relationship between Waste Management and Kane County.

7. I strongly feel alternative technologies must be aggressively pursued now. They need further and serious consideration. With 16 years left at Settler's Hills, what is the immediacy for siting another landfill now?

8. We should not be satisfied with only a 47% recycling rate by 1998. The goal should be higher and implemented over a shorter period of time.

9. We need to establish a landscape waste recycling facility in Kane County now, but obviously out of Waste Management control. Technology that really works is already available.

10. If another landfill must eventually be chosen, a qualified engineering consultant must first determine if the site is suitable. Take an option on the land, but do not buy it outright until proper surveys have been conducted. Don't put the cart before the horse. We want responsible government from our County officials.

Michael L. McGuigan
4N515 Pin Oaks Lane
Maple Park, IL 60151
July 14, 1992

April 12, 1990

Executive Session Re: Land Acquisition EX. 40

The Kane County Board met as the Committee of the Whole, went into executive sessi commencing at approx. 9:35 a.m. on Thursday, April 12, 1990 in the Board Room, Bldg. A, Kane County Government Center, Geneva, IL.

Members present: Chairman Miller, Bermes, Cameron, Clusen, Damisch, DeStefano, Doederlein, Douglas, Elfstrom, Fleming, Hess, Kammerer, Kerasiotis, Ledebuhr, Patterson, Richards, Schoengart, Sharp, Shoemaker, Shoop, Taylor, Tooley, Wauchope, Wolff, Yurs. Also present: Development Dept. Dir. Bus, Development Dept. staff Seiben & environmental consultant Young, Ass't. State's Attnys. Jaeger and Sullivan, and County Board staff Ruppert and Keasler (recording the meeting).

Entered into executive session for the purpose of discussing land acquisition, on a motion by Elfstrom, seconded by Clusen. Motion carried unanimously.

Chairman Miller relinquished chairmanship to Landfill Liaison, Mr. Elfstrom. Elfstrom introduced Richard Young, environmental consultant and former Environmental Division Director for the County. Young commented on background of County landfills, pointing out uniqueness of Settler's Hill, where one can play golf on top of a landfill, and where methane gas is utilized for electricity.

Elfstrom explained the process that will be needed to determine a site for a new landfill: Determination of landfill site; hiring of County-wide solid waste planner. Elfstrom explained that siting a new landfill is more difficult that expanding existing landfill. Stated that the existing landfill is being run extremely well. N is to try to duplicate that at some other location in the County. Regardless of recycling, composting, etc., a landfill will be needed at the end of the process. T biggest deterrent to siting a landfill is the people who live in the area; therefore siting needs to be done while a minimum number of people are living in the area; will become more difficult with time. A solid waste plan will be needed to go along with the siting of a new facility.

Elfstrom stated that a site needs to be chosen so that everybody in the County knows this is where the solid waste will be deposited. Also, recycling coordinator/landfill planner needs to be hired to put the Board's decision into a plan. Elfstrom encouraged advertising for such position immediately.

Elfstrom displayed a Proposed Landfill Concept drawing and explained the aspects of the proposed concept. Area shown in Concept was 1000 acres of landfill and 1000 acres of Forest Preserve; any actual landfill activity would be kept 1/4 to 1/3 mile minimum distance from population. Elfstrom suggested that existing farmhouses around the perimeter of the site could remain, or County could offer to purchase them rather than obtaining them by condemnation. Elfstrom suggested various uses for the buffer area around the landfill.

Elfstrom stated that condemnation will be necessary to obtain 1000 to 2000 acres. On a 2000 acre site, approx. 15-16 farmsteads can be expected to be found. Property will not need to be assembled for 4-5 years, which leaves room for negotiations in purchase of land. Obtaining property will also result in taking 2000 acres off tax rolls.

New landfill is projected for only Kane County garbage, unless the Board decides differently at some time in the future. Elfstrom stated that Waste Management is not consideration in this matter; there is nothing in what is being done that will in way tie the operation to any specific contract operator.

Elfstrom said that staff had looked for sites with less than 10 dwelling units per square mile; expects that 25-30 dwelling units will be involved in condemnation. Elfstrom requested that Board members consider the County as a whole; 12,000 people in each of their districts need a place to put their garbage in the future. Contract on new landfill would be different from previous one; presently taking in approx. $3.2 million per year. Expects that putting together 2000 acres would cost approx. $20 million. Revenue is available without a tax burden or taking anything out of existing landfill operation.

Elfstrom asked the Board to consider: (1) If they want one landfill or two; (2) how big; (3) should it have a buffer area; (4) how much buffer; (5) early uses of buffer; (6) conceptual plan for final use of buffer; (7) where to locate landfill.

Elfstrom explained that two landfills of 500 acres each with buffers would require more total acres than one 1000 acre landfill; also, a square space is more productive than oblong; two landfills would cost double to run. Elfstrom showed a sample of a sign which would be placed around landfill area when it is chosen, to inform citizens that this is a future landfill site. Regarding size, Elfstrom stated that a larger landfill would mean more park; longer period of use. Site chosen will partly determine size. Elfstrom stated that buffers have worked well in the past; size of buffer could be ermined later, as well as uses of the buffer area. Where to locate the landfill is hardest decision.

fstrom turned meeting over to Development Dir. Bus to explain the criteria used by staff to locate possible sites...displaying maps and overlays:

> GROUNDWATER PROTECTION: hydrological investigations, shallow groundwater resources, prairie aquigroups, Newark Aquifer, 270,000 gpd/ft transmissivity, 50 mgd long term yield; GEOLOGIC SUITABILITY: Tiskilwa Till member, relatively uniform composition, Deposit 200 to 300 ft.thick, 10 to minus 7 cm/sec hydraulic conductivity, geology for planning in Kane County; LAND USE AND POPULATION: existing land use and 325,000 pop.-1990 est., density less than 10 d.u./sq.mi., Year 2000 proposed land use, municipal 1 1/2 mi. planning areas, 2010 population forecast of 434,000; SURFACE ENVIRONMENTAL FEATURES: floodplains and wetlands, wooded areas and prairie, wildlife habitats, slope and topography; and TRANSPORTATION AND LOCATION: 15 mi. radius of population, state and federal highways, county and township roads, weight limits and traffic impact.

Final overlay identified five best sites meeting criteria of within 15 mi. radius of population, outside of 1 1/2 mi. municipality planning area, within Tiskilwa Till 50 ft. thick, not subject to urbanization, and having no more than 10 dwelling units per square mile. Bus identified the sites by surrounding highway names; acreage was from 1,000 to 4,000 acres.

Discussion and answer period followed. Elfstrom said you may have to vacate some existing rural unpaved roads. Said that you will want to come back and see maps, see who owns property, size of farms, specifics, legals, know end use. Said that staff could do this for all 5 sites, but if staff could rank the sites, why not zero in on two or three sites for specifics. If site is 15-30 miles from population, you might want to look at a transfer station. Bus said long range - transfer & recycling station; the average pick-up truck wouldn't go to any of the landfill sites. Elfstrom said the rating could be presented the middle of May or first of June or even into June. Bus said it would take at least 30 days to do a good analysis of total 5 using a matrix and computer approach to settle on two or three. Elfstrom said these are the only sites that meet the important criteria. (Shoop left meeting)

Elfstrom asked: Is there anybody that thinks we need two landfills (no reply); Is everybody thinking that as a start, we should look for 1,000 acres with 1,000 acre buffer (affirmative response); Is anybody thinking we shouldn't try to get a buffer (no reply). Elfstrom: go back and rank 5 sites and we will do a detailed analysis for 3 sites sometime in May or early June/July, consider and adopt.

Doederlein suggested that staff prioritize the sites and provide details on 2 or 3 highest rated areas. Elfstrom suggested that the staff then make definitive site analysis on three top choices: including property owners, use, legal descriptions, any information not available from the general study. Schoengart asked if Board members had any additional criteria they would like applied to the sites (no response). Wauchope suggested 2 or 3 Board members be involved in the study to assess political impact. (Shoop and Kerasiotis left meeting). Kammerer: Doesn't object size-wise, but we should have an opportunity to make a change. Elfstrom: You will. Kammerer suggested considering the cost of improving nearby County roads. Miller suggested that the site's proximity to State highways be considered in relation to needs for future road improvements; would like State assistance to cover high costs of infrastructure. Fleming: we have a 10 yr. lead time on the operation to allow for planning (of roads). Shoemaker suggested press be informed of the landfill siting criteria. Elfstrom responded Yes, that "bus can explain it, don't you try it." Sharp expressed concern re: DeKalb Co.'s proximity to site. Doederlein responded that you could use only a portion of the acreage, and not necessarily the part closest to DeKalb County. Damisch suggested consulting with townships and school districts in priority areas--they're short of money. Schoengart responded that the Board should take those needs into consideration, but not to involve other taxing bodies during this investigatory period.

Elfstrom reviewed what had been agreed by consensus: one landfill site rather than two; site of approx. 1000 acres plus 1000 acre buffer; desire for buffer area; staff to rank the sites "1 through 5" and do detailed analysis on three sites; report back to Board at the end of May or early June for Board's consideration and approval.

Returned to regular session. on a motion by Elfstrom, seconded by Ledebuhr. Motion carried unanimously. Board Chairman Miller asked for the Committee to adjourn to Wed., May 2, 1990 at 9:30 a.m. for a special Board Meeting so the architects could provide information on the proposed new Kane County Judicial Center and Phase I of the Courthouse building program. So moved by Patterson, seconded by Wolff, and carried unanimously.

Meeting adjourned at approximately 11:50 a.m.

Bobette Keasler and Mary Ruppert,
Clerks Pro Tem

APPROVED:
Frank R. Miller,
Chairman
Kane County Board

Exhibit "10"
9/11/92 Burlington Hearing

My name is Michael Zakosek. I live on S0W770 Old State Road, Maple Park, in Virgil Township. I am currently enrolled at the University of Illinois at Urbana-Champaign, in the Civil Engineering Department, majoring in Environmental Engineering.

When I applied to school before the dawn of EDKO and mega-dumps, I was accepted into the aeronautical and astronautical department. I thought designing airplanes would be a pretty exciting way to make a living, but then little things like the collapse of ~~the Warsaw Pact~~ Communism shriveled up the job market.

Also, by the summer of 1990, I was becoming rather interested in the environmental problems faced by us. Watching the politics of garbage at work only heightened my interest. I decided to major in Environmental Engineering. My job will be to prevent and clean up pollution, especially those related to the solid waste problem.

Sadly enough, there is a great market for my major. There are not enough Environmental Engineers to go around, because we have so badly destroyed our environment. I am one of the next generation ~~we~~ you are leaving this problem to. The cost will be borne by my peers. The only people to profit will be those who clean up the mess, like me. Everyone else loses.

Our county, both in the past and in the proposed plan, ~~are~~ is heavily reliant on landfills. We cannot throw our hands up and say,"Well, we will always need landfills, so why fight them? I don't see an immediate solution, so lets get that new dump." I don't see an immediate cure for cancer either, but we are continuing to search for a cure.

Just as chemotherapy exists to prolong the life of cancer victims, there are alternatives to landfills. No one system is perfect, yet they are definitely good enough to prolong the lives of our landfills. The less we put in dumps, the longer they last, and the longer we have to make them extinct.

Things such as clean incineration and municipal solid waste composting do work. But our plan gives only a cursory glance at these alternative technologies. The county should contact the leading firms in these alternative fields and ask them what they can do with our Kane County waste stream. Instead, our plan only suggests looking at these fields again in five years. That is inadequate. I didn't write my speech on a manual typewriter when I had my computer available.

Also, we need more accurate figures on which to base our analysis. Our plan says every Kane County resident generates 8.4 pounds of garbage a day. Most other areas quote figures from five to six pounds per day. By the year 2010, this discrepancy accounts for a 270,000 tons per year, or 40% difference.

Also, the plan never adequately deals with post closure cost. Post closure monitoring goes on for ever. The landfill will always need tender, loving care. We are currently paying Waste Management a set amount per ton that they promise will be used on the post-closure and monitoring of Settler's Hill. Maybe the county should set up an independent fund to handle these monies for the future facility. Its not that I don't trust Waste Management, but I think it is better to be safe than sorry. Besides, when someone is working on cleaning these two facilities up, I

want to make sure there is some money left to pay his/her salary.

Finally, lets remember that our Citizen's Solid Waste Committee didn't write this plan. They only examined recommendations made by the Development Department, the same department that has done extensive work on a new landfill. It is comparable to saying I wrote my senior thesis by way of a multiple choice test.

Lets be constructive in our review of this plan, and offer suggestions of the right way to take care of our waste, by non-landfill means. We can use these 50 odd pages as an outline, but we need to write an environmentally responsible plan to protect our future. Hopefully someday my job description will not involve clean up of past waste disposal sites, but it looks as if Waste Management and the County are doing their best to keep me employed. I hope they remember that they do not own the Earth, and neither do I; we are just taking care of it until the next generation comes along.

Michael Zakosek
50w770 Old State Road
Maple Park, Ill. 60151

Problems

With The

Plan

Problems With the Plan

Kane County has before it the plan for dealing with its waste for at least the next 20 years. The plan has been the subject of heated debate ever since its beginnings. Many concerns over the plan have been voiced. I have read the plan and noted some questions I have. I am not an expert, but have become rather educated in the issues of waste disposal over the past two and a half years.

The most blatant problem prevalent throughout the entire plan is a total lack of support for any numbers used in it. First of all, there are very rarely any sources sited as to where these figures were drawn from. In the very least, these sources should be credited so they can be thoroughly checked. At most, the writer is guilty of plagerism for attempting to pass off someone else's work as his own.

Also, these same numbers are used extensively to derive theoretical results for Kane County. Nowhere are the methods used to generate the new figures given. Some methods can be deduced after lengthy study, but others appear to be randomly generated.

From this point forward, I will list the page and my explanation of my problems with the plan.

page viii

According to the cited figures, per capita waste generation will be increasing. This is contradictory to any logic presentable. The country as a whole is becoming much more environmentally conscious. The garbage problem is front page news. On the

contrary, waste generation will decrease as a result of demand for a elimination of excessive packaging, etc.

page ix

The new county facility will "...accept only solid waste generated within the County, or from a jurisdiction which accepts an equal or greater quantity of Kane County waste for processing or disposal." It appears that this jumble of words is not only legally, but practically unenforceable. How will the countys keep the waste trade even? Also, does this mean that a load of Kane County grass clippings sent to Dupage County is equivalent to a load of Dupage County contaminated soil?

page x

This page suggests that the new facility cost included "host community benefits." This is a thinly veiled synonym for a bribe. Paying a community to a accept a facility that no one else will have seems ethically questionable.

Also, it states that no general funds shall be used to pay for the facility. How then will land for a new landfill be payed for? The new facility is promised not to open for 11-16 years, but the bonds will be due in ten.

page 2

Point #3 says the plan, by state law, must include,"A description of the facilities and programs that are proposed for the management of municipal waste generated within the planning area during the next 20 years, including their size, expected cost, and financing method." The plan does not include any

estimated costs or financing methods for any of the waste reduction or recycling programs it is proposing. It also does not specify size of the new landfill it touts.

page 7 - 9

These pages contain the estimated per capita generation rate of garbage in Kane County. The estimations are based nowhere on fact. Their methods cannot be checked because the methods used are not disclosed.

page 14

"Model waste reduction programs should be established by the County in representative businesses and institutions. By providing technical, and perhaps financial assistance, the County could develop pilot programs in a government building, school, hospital, several different types of retail establishments, private sector offices, etc. The results of these model programs would be used to encourage widespread implementation of waste reduction programs."

This sounds suspiciously like a program already being championed by EDKO, Model Community, from the Central States Education Center in Champaign. This program is currently in progress in the county. If the writer of the plan did not know this, maybe he should read the February 14, 1992 issue of the Aurora Beacon News. If he did know about this, then the passage in the plan is outright theft of an idea with no credit given.

page 30

Recommendation 5.6 is another passage that directly contra-

dicts itself. It says contaminated soil should be handled by alternatives to landfilling to the extent allowed by contractual constraints. Then it says the goal "...should be to maximize diversion from landfills...". These two statements are mutually exclusive.

page 33

The recommendation 6.1 suggests the county examine alternative methods of waste disposal over the next five years, but not to use them now. Nowhere in the plan or appendices have there been legitimate studies involving correct waste stream figures, economics, and environmental impacts of these non-landfill meth ods. The plan simply dismisses them and jumps to landfill.

Recommendation 6.2 is a repeat of page ix. It shows again that the clause is legally, and practically, unenforceable.

page 34

This page contains cost estimates for a municipal solid waste composting facility. It also suggests a site size for this facility. The costs sited appear to be estimated quite high. Also, there is no footnote siting where or how they were arrived at. Finally, no other facility in the plan includes a site size except for municipal solid waste composting.

page 35

Page 35 details the cost for an incinerator, which again seem rather high. Again, the sources for these prices is not noted.

page 40

The landfill requirements for an incinerator and a municipal solid waste composting facility are given. According to the plan, "Analyses conducted as part of the planning process found that additional future landfill capacity will be required regardless of other approaches which may be utilized." This statement is quite a leap of logic from the studies found in the appendices.

page 45

This page details the cost of landfilling. It quotes site size by tons per day and not acres. It also reports a new landfill will cost between $4 million and $7 million. Again, there is no support given to how these vague numbers were arrived at. They appear to be pulled from thin air.

page 49

Recommendation 9.5 suggests that the county "Recognize the rights and concerns of private property owners at all times during the site selection and acquisition process." This seems like a bold and broad statement. The plan should detail how the "rights and concerns" will be protected.

page 50

"A property value assurance program guarantees that a waste facility will not cause the decline of property values of homes within a defined area around the facility." As we review this plan, property values west of Route 47 have already been affected. Also, since the waste facility that is suggested is a land

fill which lasts forever, will the assurances of property value last forever?

Later, the plan states "...that the proposed facility will not cause pollution or violate any environmental laws or regulations." We all know landfills leak and pollute. There is no such thing as the perfectly tight landfill. It seems, then, that landfills would be excluded under this language.

page 52 - 57

These pages detail the implementation of the plan. These strategies seem rather idealistic and without much substance. Not all the ideas should be thrown out, but the strategy should be reworked to be more realistic about its ability to enforce the plan.

I have done my best to point out parts of the plan that I do not feel comfortable with. I have made suggestions for improvements on some of the points. I, as one person, cannot rewrite this plan by myself. This plan should be sent back to the author with all the suggestions and questions made by citizens, to be reworked, to develop a responsible method for disposing of our waste.

Table 2.2			
Projected Solid Waste Generation, 1989 - 2010			
Year	Population	Gen. Rate	Tot. Ton/ Year
Given	Given	Computed	Computed
1989	320000	5	292000
1990	325429	5.017	297963.6
1991	330857	5.034058	303963.5
1992	336286	5.051174	310001.6
1993	341714	5.068348	316076.4
1994	347143	5.08558	322189.8
1995	352571	5.102871	328340.2
1996	358000	5.120221	334529.6
1997	363428	5.137629	340756.4
1998	368857	5.155097	347022.6
1999	374285	5.172625	353326.5
2000	379714	5.190212	359670.3
2001	385142	5.190212	364811.8
2002	390571	5.190212	369954.2
2003	395999	5.190212	375095.6
2004	401428	5.190212	380238.1
2005	406856	5.190212	385379.5
2006	412285	5.190212	390522
2007	417713	5.190212	395663.4
2008	423142	5.190212	400805.9
2009	428571	5.190212	405948.3
2010	434000	5.190212	411090.7

Table 2.2							
Projected Solid Waste Generation, 1989 - 2010							
Year		Population		Gen. Rate		Tot. Ton/ Year	
Given		Given		Computed		Computed	
1989		320000		5.5		321200	
1990		325429		5.5187		327760	
1991		330857		5.537464		334359.8	
1992		336286		5.556291		341001.8	
1993		341714		5.575182		347684	
1994		347143		5.594138		354408.8	
1995		352571		5.613158		361174.2	
1996		358000		5.632243		367982.6	
1997		363428		5.651392		374832	
1998		368857		5.670607		381724.9	
1999		374285		5.689887		388659.2	
2000		379714		5.709233		395637.3	
2001		385142		5.709233		401292.9	
2002		390571		5.709233		406949.6	
2003		395999		5.709233		412605.2	
2004		401428		5.709233		418261.9	
2005		406856		5.709233		423917.5	
2006		412285		5.709233		429574.2	
2007		417713		5.709233		435229.8	
2008		423142		5.709233		440886.5	
2009		428571		5.709233		446543.1	
2010		434000		5.709233		452199.8	

Table 2.2			
Projected Solid Waste Generation, 1989 - 2010			
Year	Population	Gen. Rate	Tot. Ton/ Year
Given	Given	Computed	Computed
1989	320000	6	350400
1990	325429	6.0204	357556.3
1991	330857	6.040869	364756.2
1992	336286	6.061408	372001.9
1993	341714	6.082017	379291.6
1994	347143	6.102696	386627.7
1995	352571	6.123445	394008.2
1996	358000	6.144265	401435.5
1997	363428	6.165155	408907.7
1998	368857	6.186117	416427.1
1999	374285	6.20715	423991.8
2000	379714	6.228254	431604.3
2001	385142	6.228254	437774.1
2002	390571	6.228254	443945
2003	395999	6.228254	450114.8
2004	401428	6.228254	456285.7
2005	406856	6.228254	462455.5
2006	412285	6.228254	468626.4
2007	417713	6.228254	474796.1
2008	423142	6.228254	480967
2009	428571	6.228254	487137.9
2010	434000	6.228254	493308.9

Table 2.2			
Projected Solid Waste Generation, 1989 - 2010			
Year	Population	Gen. Rate	Tot. Ton/ Year
Given	Given	Computed	Computed
1989	320000	6.5	379600
1990	325429	6.5221	387352.7
1991	330857	6.544275	395152.5
1992	336286	6.566526	403002.1
1993	341714	6.588852	410899.3
1994	347143	6.611254	418846.7
1995	352571	6.633732	426842.2
1996	358000	6.656287	434888.5
1997	363428	6.678918	442983.3
1998	368857	6.701627	451129.4
1999	374285	6.724412	459324.5
2000	379714	6.747275	467571.4
2001	385142	6.747275	474255.3
2002	390571	6.747275	480940.4
2003	395999	6.747275	487624.3
2004	401428	6.747275	494309.5
2005	406856	6.747275	500993.4
2006	412285	6.747275	507678.6
2007	417713	6.747275	514362.5
2008	423142	6.747275	521047.6
2009	428571	6.747275	527732.8
2010	434000	6.747275	534417.9

Table 2.2							
Projected Solid Waste Generation, 1989 - 2010							
Year		Population		Gen. Rate		Tot. Ton/ Year	
Given		Given		Computed		Computed	
1989		320000		7		408800	
1990		325429		7.0238		417149	
1991		330857		7.047681		425548.9	
1992		336286		7.071643		434002.3	
1993		341714		7.095687		442506.9	
1994		347143		7.119812		451065.7	
1995		352571		7.144019		459676.3	
1996		358000		7.168309		468341.5	
1997		363428		7.192681		477059	
1998		368857		7.217136		485831.7	
1999		374285		7.241675		494657.2	
2000		379714		7.266296		503538.4	
2001		385142		7.266296		510736.5	
2002		390571		7.266296		517935.8	
2003		395999		7.266296		525133.9	
2004		401428		7.266296		532333.3	
2005		406856		7.266296		539531.4	
2006		412285		7.266296		546730.8	
2007		417713		7.266296		553928.8	
2008		423142		7.266296		561128.2	
2009		428571		7.266296		568327.6	
2010		434000		7.266296		575527	

Table 2.2								
Projected Solid Waste Generation, 1989 - 2010								
Year		Population		Gen. Rate		Tot. Ton/ Year		
Given		Given		Computed		Computed		
1989		320000		7.5		438000		
1990		325429		7.5255		446945.4		
1991		330857		7.551087		455945.2		
1992		336286		7.57676		465002.4		
1993		341714		7.602521		474114.6		
1994		347143		7.62837		483284.7		
1995		352571		7.654306		492510.3		
1996		358000		7.680331		501794.4		
1997		363428		7.706444		511134.6		
1998		368857		7.732646		520533.9		
1999		374285		7.758937		529989.8		
2000		379714		7.785317		539505.4		
2001		385142		7.785317		547217.6		
2002		390571		7.785317		554931.3		
2003		395999		7.785317		562643.5		
2004		401428		7.785317		570357.1		
2005		406856		7.785317		578069.3		
2006		412285		7.785317		585783		
2007		417713		7.785317		593495.2		
2008		423142		7.785317		601208.8		
2009		428571		7.785317		608922.4		
2010		434000		7.785317		616636.1		

Table 2.2

Projected Solid Waste Generation, 1989 - 2010

Year	Population	Gen. Rate	Tot. Ton/ Year
Given	Given	Computed	Computed
1989	320000	8	467200
1990	325429	8.0272	476741.8
1991	330857	8.054482	486341.6
1992	336286	8.081878	496002.6
1993	341714	8.109356	505722.2
1994	347143	8.136928	515503.7
1995	352571	8.164594	525344.3
1996	358000	8.192353	535247.4
1997	363428	8.220207	545210.3
1998	368857	8.248156	555236.2
1999	374285	8.2762	565322.5
2000	379714	8.304339	575472.4
2001	385142	8.304339	583698.8
2002	390571	8.304339	591926.7
2003	395999	8.304339	600153
2004	401428	8.304339	608380.9
2005	406856	8.304339	616607.3
2006	412285	8.304339	624835.2
2007	417713	8.304339	633061.5
2008	423142	8.304339	641289.4
2009	428571	8.304339	649517.3
2010	434000	8.304339	657745.1

Table 2.2								
Projected Solid Waste Generation, 1989 - 2010								
Year		Population		Gen. Rate		Tot. Ton/ Year		
Given		Given		Computed		Computed		
1989		320000		8.4		490560		
1990		325429		8.42856		500578.9		
1991		330857		8.457217		510658.6		
1992		336286		8.485972		520802.7		
1993		341714		8.514824		531008.3		
1994		347143		8.543774		541278.8		
1995		352571		8.572823		551611.5		
1996		358000		8.601971		562009.8		
1997		363428		8.631217		572470.8		
1998		368857		8.660564		582998		
1999		374285		8.69001		593588.6		
2000		379714		8.719556		604246.1		
2001		385142		8.719556		612883.7		
2002		390571		8.719556		621523		
2003		395999		8.719556		630160.7		
2004		401428		8.719556		638800		
2005		406856		8.719556		647437.6		
2006		412285		8.719556		656076.9		
2007		417713		8.719556		664714.6		
2008		423142		8.719556		673353.9		
2009		428571		8.719556		681993.1		
2010		434000		8.719556		690632.4		

Table 4			
1989 Solid Waste Amounts Received at Dumps			
	Settlers Hill	Woodland	Total
Gate Yards	2100765	759333	2860098
Compacted Yards	1604088	577852	2181940
Tons	534963	195603	730566
Gate Yd. to Tons	3.926935	3.882011	3.914907
Compacted to Tons	2.998503	2.954208	2.986643

Table 4			
1989 Solid Waste Amounts Received at Dumps			
	Settlers Hill	Woodland	Total
Gate Yards	2100765	759333	2860098
Compacted Yards	1604088	577852	2181940
Tons	534963	195603	730566
Gate Yd. to Tons	3.926935	3.882011	3.914907
Compacted to Tons	2.998503	2.954208	2.986643
+ 3.8% of Error	555291.6	203035.9	758327.5
- 3.8% of Error	514634.4	188170.1	702804.5

United States Environmental Protection Agency
Office of Public Affairs Region 5 77 W. Jackson Blvd. Chicago, Illinois 60604
Illinois • Indiana Michigan • Minnesota Ohio • Wisconsin

U. S. EPA PROPOSED PLAN FOR TRI-COUNTY LANDFILL SUPERFUND SITE

Elgin, Illinois
July 1992

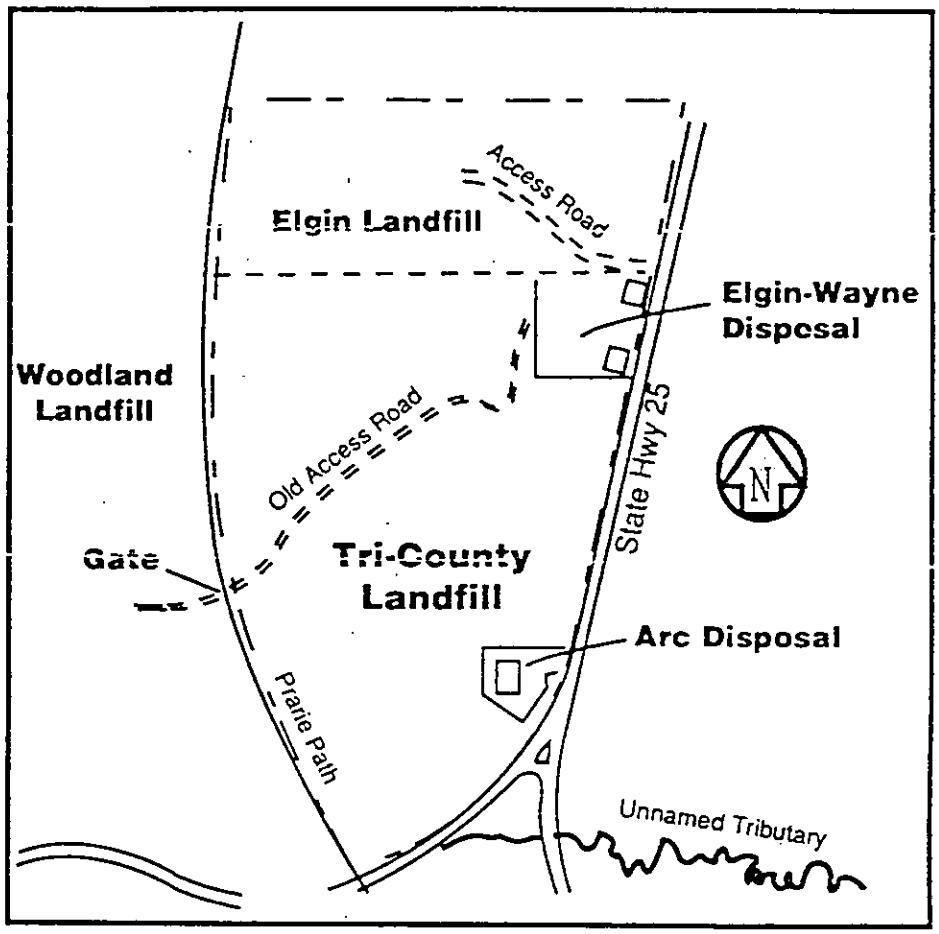
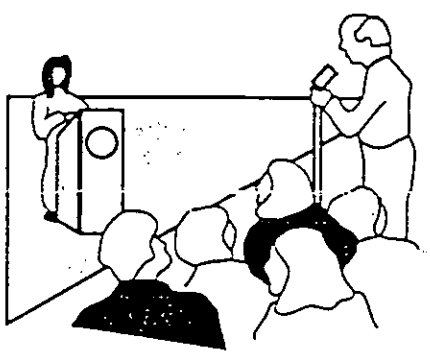


Figure 1 Site Map

Public Comment Period
July 24, 1992 - August 23, 1992

EPA invites the public to submit comments on remedial alternatives considered for the Tri-County Landfill Superfund Site and on the preferred alternative recommended by EPA. Comments will be taken orally or in writing at the public meeting (see below) and may be mailed (postmarked by August 23, 1992) to Gina Rosario, Community Relations Coordinator; see address on page 9.



Public Meeting

Date: August 4, 1992
Time: 7:00 pm
Place: South Elgin Village Hall
10 N. Water Street
South Elgin, IL 60177
(708)742-5780

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) is holding a 30-day public comment period on its proposed plan for cleanup at the Tri-County Landfill Superfund site, Elgin, Illinois. The public comment period starts on July 24, 1992 and ends on August 23, 1992. The proposed plan contains the alternatives for site cleanup, as well as the alternative which EPA has chosen as its preferred alternative. A public meeting will be held on August 4, 1992 at the South Elgin Village Hall to accept oral comments on the Remedial Investigation (RI), Risk Assessment (RA), Feasibility Study (FS), and preferred alternative. Written comments can be mailed to EPA during the comment period. This fact sheet is based on the proposed plan. The proposed plan document can be found in the site information repository in the Gail Borden Public Library, Elgin, Illinois.

SUMMARY OF SITE RISKS

Because the Tri-County Landfill and the Elgin Landfill have accepted a variety of wastes, numerous chemicals have been detected at the site. Following the RI, an analysis was conducted to estimate the potential health or environmental problems that could result if the site was not cleaned up. This analysis is referred to as the Baseline Risk Assessment (RA).

The RI investigation documented widespread contamination in most media. The RI did not identify any hotspots or distinct sources; however, the northwest portion of the site seems to be impacted mostly by organic contamination, while the southern portion located in the leachate ditch south of the landfill was significantly impacted by heavy metals in the leachate.

The Baseline RA evaluated many potential scenarios to evaluate actual or potential risks from the site. The Baseline RA documented unacceptable risks (exceeding risks which may cause one additional cancer case in 10,000 people exposed over a lifetime) for the following potential exposure pathways: 1) future ingestion of contaminated ground water, 2) future dermal exposure to ground water contaminants during showering, and 3) current and future inhalation of contaminated fugitive dust and volatile emissions from the landfill. The highest risks were associated with inhalation of contaminated fugitive dust and volatile emissions (approximately 2 additional cancer cases in 10 people exposed over a lifetime).

The RI and Baseline Risk Assessment conducted for the site established that there are unacceptable risks associated with the contaminated ground water, surface soils, and sediments as well as a problem of venting landfill gas. The source of the risks all originated from the landfill and its contents. The RI did not identify any areas considered to be a "hot spot" or distinct disposal areas of hazardous substances.

The response action to be taken would be designed to address all unacceptable risks associated with the site. It is intended to be the sole response action for the site. The response action would address: 1) the contaminated ground water currently migrating off-site; 2) the contaminated sediments located in the leachate ditch, 3) the contaminated surface soil which creates an inhalation risk; 4) treat or control the emissions of landfill gases, and 5) contain and/or cap the landfill contents.

FEASIBILITY STUDY/SUMMARY OF ALTERNATIVES

Based on the results of the RI, a list of alternatives was assembled. The alternatives include those which would provide no action (as statutorially required), waste containment, and/or waste treatment. Since the site had contaminated soil, ground water, sediments, landfill wastes, and landfill gases which needed to be addressed, alternatives were developed for each contaminated medium. This was done to simplify the evaluation between the different alternatives. However, since an alternative for one contaminated medium may affect the other contaminated media, selecting the final response action for the site would also have to be based on the best overall trade-offs among the different alternatives.

The following remedial alternatives were developed for the site, and are briefly described below.

ALTERNATIVE ONE: NO ACTION

Alternative One is the No Action Alternative and serves as a basis to which all other alternatives can be compared.

SOIL AND WASTE MATERIAL ALTERNATIVES

These alternatives address the containment of impacted soils and waste material on-site. Containment would be achieved by capping. Two types of capping systems are proposed: a clay cap, and a multilayer cap. These alternatives will also provide protection of ground water by limiting the infiltration of precipitation into the waste material and will prevent the uncontrolled emission of landfill gas from the site.

sediments are located on top of the landfill, any capping remedy would contain the contamination below the cap. contaminated sediments located in the leachate ditch south of the landfill do represent an unacceptable risk. Since capping remedy would not contain this contamination, these sediments have to be addressed. These sediments would excavated and consolidated on-site within the landfill prior to capping or disposed of at an appropriate off-site facility.

With any action taken at the site, the drummed drill cuttings generated during the RI activities will have to be addressed. These drums are currently stored on-site in a secured area. The drill cuttings would be handled the same as the contaminated sediments during the remedial action.

Alternative SS-1: Collection and Off-site treatment of surface water, and Consolidation and Containment of Sediments On-Site

Alternative SS-2: Collection and Off-Site Treatment of Surface Water and Consolidation and Containment of Sediments Off-Site

EVALUATION OF ALTERNATIVES

There are nine evaluation criteria used in selecting an alternative for clean up. They are:

1) Overall protection of human health and the environment
2) Compliance with applicable or relevant and appropriate requirements (addresses whether a remedy will meet Federal and State Environmental Laws)
3) Long-term effectiveness and permanence (of remedy)
4) Reduction of toxicity, mobility and volume (of waste)
5) Short-term effectiveness
6) Implementability
7) Cost
8) Support Agency (IEPA) Acceptance
9) Community acceptance

The assessment of support agency and community acceptance will be completed after the public comment period is completed. The Record of Decision (ROD) will document support agency acceptance and the Responsiveness Summary attached to the ROD will document the community's reaction to the proposed remedy.

A detailed discussion of the evaluation of the alternatives against the nine criteria has been provided in the Feasibility Study.

THE PREFERRED ALTERNATIVE

The U.S. EPA and IEPA have conducted an analysis of the potential remedies and have developed a cleanup plan for the site. The cleanup plan, or the preferred alternative, is a combination of remedies developed for the various contaminated media. The components of the preferred alternative are provided below.

Soil and Waste Material Preferred Alternative	SW-1 (Figure 2)
Ground Water and Leachate Preferred Alternative	GW-1 (Figure 3)
Landfill Gas and Ambient Air Alternative	LG-1 (Figure 4)
Surface Water and Sediments Alternative	SS-1

The alternative would consist of draining the standing surface water on the landfills and a small portion of the wetland area to the south of the landfills. The contaminated sediments in the wetland would be excavated until local background

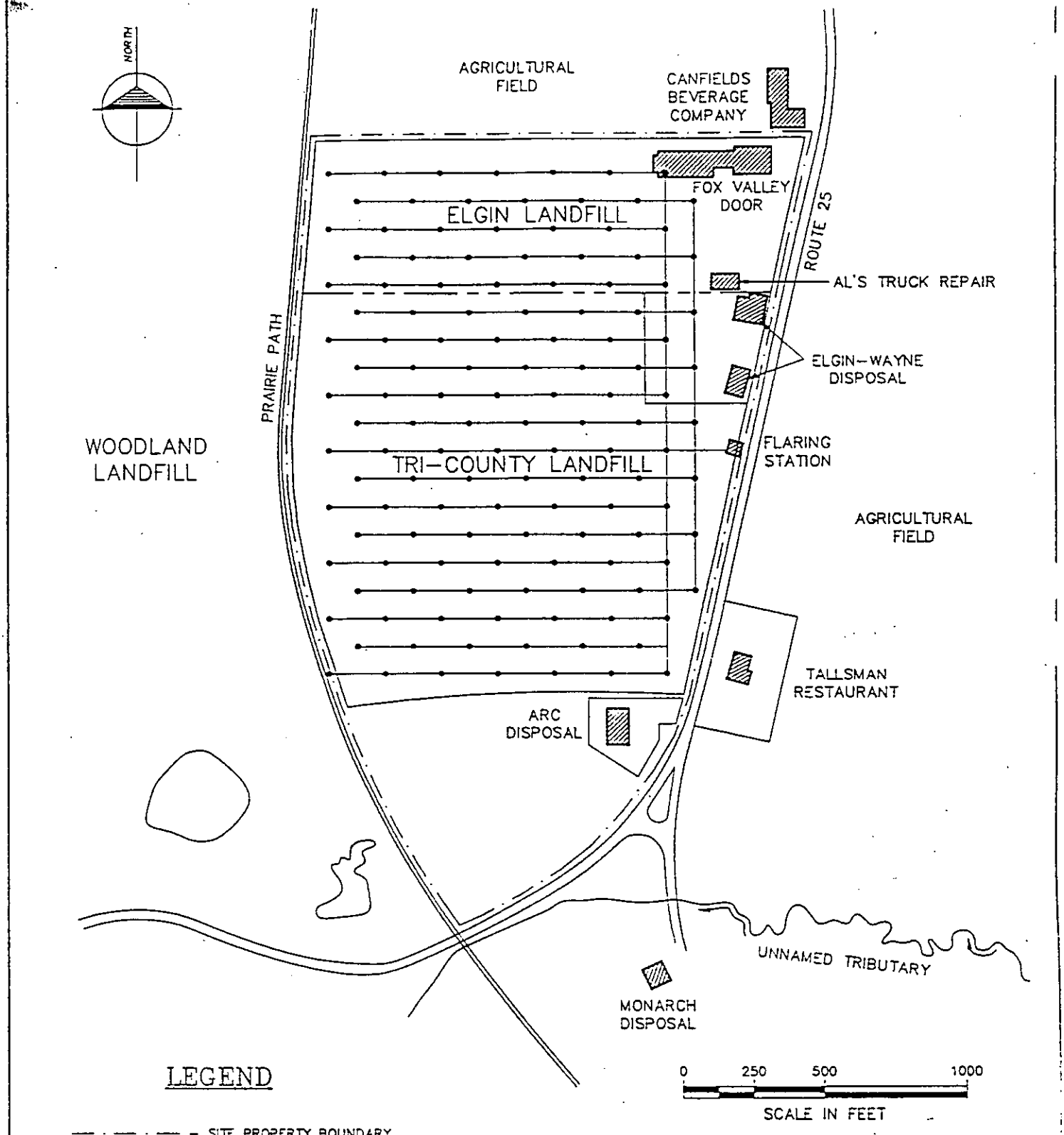


FIGURE 4

ACTIVE GAS COLLECTION SYSTEM LAYOUT

TRI-COUNTY AND ELGIN LANDFILLS
ELGIN, ILLINOIS

proposed plan should be consulted for more information on these alternatives. They, along with either site documents can found in the Administrative Record at the Gail Borden Public Library, in Elgin, Illinois.

Significant comments received during the public comment period will be responded to in the Responsiveness Summary section of the Record of Decision (ROD). The ROD is the document that presents U.S. EPA's final alternative selection for cleanup and IEPA's concurrence with that remedy. The public can send written comments to or obtain further information from:

Gina Rosario
Office of Public Affairs (P-19J)
U.S. Environmental Protection Agency
77 W. Jackson Blvd.
Chicago, IL 60604
(312) 353-3207
or toll free: 1-800-621-8431

Information can also be obtained from:

David Seely
Remedial Project Manager
Office of Superfund (HSRL-6J)
U.S. Environmental Protection Agency
77 W. Jackson Blvd.
Chicago, IL 60604
(312) 886-7058

Public Meeting on Feasibility Study and Proposed Plan

U.S. EPA and IEPA will hold a public meeting to present the findings of the FS and the Proposed Plan. Personnel from U.S. EPA and IEPA will be at the meeting to responsed to questions on the FS and the Proposed Plan and to formally receive public comment.

Date:	August 4, 1992
Time:	7:00 p.m.
Location:	South Elgin Village Hall 10 N. Water Street South Elgin, Illinois 60177 (708) 742-5780

DRAFT

COMPREHENSIVE LAND USE PLAN
Lily Lake, Illinois

July 1992

Prepared By:

Planning Resources Inc.
615 West Front Street
Wheaton, Illinois 60187
Telephone: 708/668-3788
FAX: 708/668-4125

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Figure 1 Comprehensive Land Use Plan

INTRODUCTION

Background

Lily Lake was officially incorporated in 1990. The impetus for incorporation gained momentum when it was announced that a regional landfill may be located near the unincorporated community of Lily Lake. This issue, in conjunction with the desire to provide growth management over an area in the direct path of development, led to the formation of the Village and the development of this Comprehensive Land Use Plan.

The original Village boundaries followed quarter section lines, and covered approximately two square miles. The Village's annexation policies (page 30) have encouraged selective annexation. As a result, the incorporated area continues to grow. Because incorporation occurred after the submittal of the 1990 census, no official census data exists for the Village. However, the Northeastern Illinois Planning Commission (NIPC) has provided 1991 demographic estimates for Lily Lake. NIPC estimates the 1991 Lily Lake population at 565 persons. The 1991 estimate for number of housing units is 170.

With the advent of growth in the Fox Valley area, and its expansion to the west, the Village of Lily Lake has the opportunity to help shape the pattern and distribution of growth in central Kane County. In creating its first land use plan, the Village has looked carefully at the many issues facing the small town. The proximity of Lily Lake to: the Fox Valley, the future County fairgrounds site, and two major state roadways, has forced the Village to look to the future.

Why Plan?

Most people realize that they have to plan to accomplish what they want. They accumulate money, grow in experience and develop skills according to plans which may take hours or months or years to accomplish. We know that planning can help us to get the most out of scarce resources, time and money. We plan our weekends, the purchase of a home, an education, career, family and retirement. Although many good things may happen to us by chance, many of our goals can only be realized through careful planning and wise decision-making over time.

Why do communities have comprehensive plans and what is included in such a plan? Communities, like individuals, have limited resources with which to meet their responsibilities and accomplish their objectives. The powers of the community to plan are set by the authority granted to them by state statutes (Chapter 24, Section 11-12-5). The main focus of the comprehensive plan is to identify how the land resources can best be used for the benefit and interest of both individual property owners and all of the citizens of the community.

Purpose of the Plan

A comprehensive plan is an attitude. It reflects what a community wants itself to be, while acknowledging existing conditions and impending changes.

This plan is an effort by elected and appointed public officials to control the destiny of the Village of Lily Lake at a time when strong growth pressures are at work in central Kane County. While acknowledging that change is likely, the people of Lily Lake want to control its growth, thus helping the Village retain its semi-rural, small-town character. This plan describes how they intend to do it.

The Comprehensive Plan identifies the desired type, intensity and quality of land uses within the Village's statutory planning limits. The broad purposes of the plan are to solve and avoid problems, meet future needs and create new opportunities to enhance community life and environmental quality. The proposals for future land use, coupled with the statement of goals and objectives, and planning and design guidelines, establish a framework for decision-making leading to an orderly and balanced pattern of land uses.

The planning and design guidelines (page 16) are intended to achieve a high quality of development consistent with the goals and objectives for each basic land use proposed in the plan. Developers of specific parcels should consider not only this broad policy document, but also the specific development regulations that apply.

How Does Planning Relate to Zoning?

Planning shows how land resources should be used in the long-term. The types or categories of land use, including agriculture and transportation, are general and broad in their definition. The plan shows an overall pattern of land use which a community believes will help to achieve their goals. The land use plan provides a framework which can be used to evaluate development proposals and phase public improvements. It can serve as a guide to set aside land to meet future needs for items such as transportation improvements, public open space and flood control.

Zoning is a tool established by state statute to control the type and intensity of land use within specific districts or zones (Chapter 24, Section 11-13-1). Most communities

are divided into districts and the zoning ordinance text identifies what kind of uses are "allowed" outright in each district. This is to avoid conflict between land uses which may not be compatible. Certain industrial, commercial and agricultural operations, for instance, may not be compatible with a single family residential subdivision. Other uses are allowed by what is called a "special use permit". Special uses are those which are generally compatible with the predominant uses allowed in the district that has the potential to create negative impacts. For instance, a drive-in commercial establishment may require individual consideration of access for cars and trucks to avoid creating safety problems on adjacent roadways or nearby residential development. The zoning ordinance, therefore, is much more specific and detailed than the comprehensive plan and it is the legal tool which determines how land can be used. Zoning also contains what are called "bulk regulations". Bulk regulations include such things as minimum yards and setbacks for different types of buildings, maximum building height and buffers between residential and non-residential development. Zoning ordinances also typically control off-street parking and loading, and the size and location of signs and provision for open spaces.

Subdivision regulations are also a tool for implementing a comprehensive plan. They are authorized for use by communities by state statute (Chapter 109). Subdivision regulations set up a system so that the community can review proposals for the subdivision of land for development. It sets standards for public facilities, services and improvements. These include stormwater management provisions such as retention ponds, erosion control plans, standards for street rights-of-way, pavement width and strength, the planting of street trees, and provision of public rights-of-way and easements.

GOALS AND OBJECTIVES

Introduction

Simply stated, a plan is an expression of what the Village wants to become over the long term. The comprehensive plan, if carefully created, should become a policy guide for decision making and action. As part of the comprehensive planning process, the development of goals and objectives is critical to establishing future land use policy in Lily Lake.

Goals are long-term qualitative statements of desirable conditions at ultimate development. They are ideal situations. Objectives are more specific steps which can be scheduled, budgeted and accomplished as a means of trying to achieve the long-term goals. Goals and objectives are policy statements as to what the Village wants to accomplish with their plan and other development tools and ordinances. They provide direction and a guide against which specific land use alternatives can be evaluated.

Goal 1 Citizens' Awareness

Instill in the citizens an active interest in the future of the Village and its community functions.

Objectives:

1. Develop and maintain a free flow of communication between the municipal government and the citizens regarding events, actions and problems which affect the Village and its environs;

2. Encourage the formation of civic improvement organizations that will actively strive for the betterment of the Village; and

3. Cooperate with and support local associations interested in the promotion of a better community.

Goal 2 Character and Image

Preserve and enhance the existing character of Lily Lake as a semi-rural Village.

Objectives:

1. Support the current zoning of Kane County where it supports sound planning principals and conforms with the Village's goals and objectives;

2. Maintain an environment free of pollution, unnatural smells, excessive noise and excessive traffic (this does not pertain to farming operations);

3. Promote farming as an important and meaningful land use;

4. Plan residential areas to be of an average lot density greater than 1¼ acres;

5. Maintain a separation of the residential (Canada Corners) and the business/commercial (Route 64 & 47 intersection) core areas;

6. Designate the Route 64 and 47 corridors within the business district as a special planning sub-area with design guidelines;

7. Establish planning and design guidelines to be applied through a site plan review ordinance;

8. Implement a tree planting, maintenance and replacement program for new and existing Village streets;

9. Create a focal point of activity around the Lake redevelopment area;

10. Require landscaping of new development to accentuate the rural character of Lily Lake and buffer views of parking, outdoor storage, loading areas, etc.;

11. Provide for restrained and orderly use and location of billboards and signs;

12. Permit single-family homes only on lots of 40 acres or more in agricultural preservation and estate residential areas; and

13. Create distinctive and attractive entryway corridors to the Village.

Goal 3 Natural Resources

Preserve and enhance existing natural resources and environmental systems.

Objectives:

1. Encourage preservation of existing topography, vegetation and other natural features through use of innovative site planning that respects the character of the landscape;

2. Prohibit urban development in floodplains and wetlands, while encouraging the use of flood prone land for public open space, recreation and wildlife habitat;

3. Protect surface and groundwater resources from depletion and contamination;

4. Enact a grading and stormwater control ordinance;

5. Establish a tree preservation and replacement ordinance;

6. Establish a structure for acquiring and maintaining park land;

7. Provide adequate recreation areas and open space at a scale to serve neighborhoods and the community; and

8. Create a Lake Redevelopment plan.

Goal 4 Residential Land Use

Maintain a high quality of residential housing and promote high development standards for new subdivisions.

Objectives:

1. Promote the growth of residential development in such a manner that this growth maintains the existing character of the Village, yet provides residents with an opportunity to choose from a diverse selection of single family residences;

2. Prevent residential sprawl from encroaching on prime agricultural soils that surround the Village, by limiting residential development to areas designated by the plan;

3. Annex land necessary to accommodate future growth of Lily Lake and control the quality of development;

4. Protect existing development from degradation caused by incompatible land uses;

5. Require standards of construction and maintenance that meet or exceed the minimum present housing and building codes;

6. Promote historical preservation, maintenance and enhancement of the existing housing stock; and

7. Promote residential densities which reflect the adequacy of the soils, topography, vegetation and surrounding land uses.

Goal 5 Economic Development

Enhance the quality of life by managing the expansion of industrial and commercial services.

Objectives:

1. Build on the existing industrial base and encourage clean, non-polluting industrial and commercial uses to locate in Lily Lake;

2. Discourage strip commercial development;

3. Encourage high standards of esthetics for retail development with emphasis on maximizing landscaping and buffering, minimizing signage, outside storage and curb cuts; and

4. Provide the appropriate balance of land for retail, office and industrial development.

Goal 6 Infrastructure

Provide the public facilities necessary to protect Lily Lake's quality of life, economic well-being and natural environment.

Objectives:

1. Encourage developers to design retention ponds to enhance the visual quality of development, recreational value and wildlife habitat as well as to meet stormwater management objectives;

2. Establish a comprehensive drainage plan and encourage consolidated retention ponds for adjacent developments;

3. Protect the integrity of the Facilities Planning Area boundaries from encroachment;

4. Develop a plan for a central water and wastewater treatment system to be implemented as future needs dictate; and

5. Promote the development of residential uses at densities which maintain the efficiency of providing infrastructure.

Goal 7 Transportation

Provide a safe, efficient transportation system that can be maintained in a cost effective manner.

Objectives:

1. Identify where new arterial roads are needed to serve projected growth, so that right-of-way can be reserved as development occurs;

2. Apply the functional street classification system to roads identified on the Plan and to new roads identified in the site plan review process;

3. Discourage non-local traffic through residential neighborhoods;

4. Promote a transportation network which provides roadway, pedestrian and efficient infrastructure linkages between neighborhoods;

5. Prepare design guidelines for primary roadways regarding factors such as landscaping, building and parking setbacks, signage and consolidated access points;

6. Require new developments to pay for necessary improvements to accommodate their traffic impacts;

7. Focus roadway improvements and maintenance as a priority of local government; and

8. Minimize curb cuts or driveways onto arterial roads and collector streets, and prohibit driveways that force cars to back out onto an arterial roadway.

Goal 8 Public Services

Provide adequate health care, education, social and public safety services.

Objectives:

1. Work with the local school district to provide adequate educational facilities with locations suitable to efficiently provide quality services;

2. Encourage the development of recreational areas to serve projected population, including the Lake Redevelopment;

3. Establish a community/government center;

4. Establish public works and public safety facilities when needed to meet demand; and

5. Work with police, fire and ambulance protection districts to provide adequate and efficient services to accommodate population growth.

PROPOSED LAND USE

The Lily Lake Comprehensive Land Use Plan (Figure 1) includes those areas within the Village's one and one-half mile planning jurisdiction area. The western portion of this planning area generally extends only one-half mile beyond the existing corporate limits due to a verbal intergovernmental boundary agreement with the Village of Virgil for purposes of annexation. The villages have agreed to consult with each other if one village wishes to annex property across the boundary line. It is not the intent of this agreement to waive the right of review for land uses within the mile and one-half planning jurisdiction or fully to the mid-point between the villages. The land area within the statutory planning limits for Lily Lake is approximately nine times the area of the existing corporate limits.

The land use categories illustrated on the Comprehensive Land Use Plan reflect a combination of existing conditions and the Village's policy direction. The accompanying table shows the number of acres and percent total of each land use proposed within the incorporated area and the planning boundaries of the Village. The following is a description of the intended land use within each category of the Comprehensive Land Use Plan.

The Village gratefully acknowledges the assistance of the Kane County Development Department in furnishing base maps of the Village.

Agriculture Preservation

A substantial portion of the area within the Village's planning jurisdiction has been designated for agricultural preservation. These lands include those areas with predominantly prime and state significant farmland. Preservation of these areas is important to the agricultural production of the region and the maintenance of Lily Lake's identity and character.

A minimum lot size of forty acres for a single family dwelling is required in the agricultural preservation areas. This policy is designed to discourage piecemeal, incremental subdivisions which displace the rich agricultural land, increase the cost of public services, and pose a long-term threat to the quality of the groundwater resources. The agricultural zone also reflects the Village's desire for a buffer between the suburban sprawl and their small town atmosphere. This policy would not apply to permanent or temporary farm-related housing constructed for the farmer, parents, children or laborers working on farms.

COMPARISON OF PROJECTED LAND USE ALLOCATION
Lily Lake, Illinois

P91130-00
7/6/92

LAND USE Classification	VILLAGE BOUNDARIES Acres	Percent	ULTIMATE PLANNING BOUNDARIES Acres	Percent	TOTAL PLANNING AREA Acres	Percent
Agricultural Preservation	447.5	44.3	4856.0	55.2	5303.5	54.2
Estate Residential	0	0	577.6	6.6	577.6	5.9
Rural Residential	34.3	3.4	219.1	2.5	253.4	2.6
Single Family Residential	402.4	39.9	2095.5	23.8	2497.9	25.5
Multi-Family Residential	6.9	0.7	5.9	0.1	12.8	0.1
onmental idor	68.0	6.7	499.5	5.7	567.5	5.8
Park/Recreation	0	0	92.0	1.0	92.0	0.9
Commercial	26.7	2.6	7.5	0.1	34.2	0.3
Light Industrial/ Office/Research	0	0	181.3	2.1	181.3	1.9
Governmental/ Institutional	23.8	2.4	254.5	2.9	278.3	2.8
TOTAL:	1009.6	100.0	8788.9	100.0	9795.5	100.0

Note: Figures include existing public rights-of-way
Source: Planning Resources Inc.

Estate Residential

One large area within Lily Lake's planning jurisdiction has been designated as estate residential. This area, north of the Village, is currently in agricultural use. This category has been established for areas experiencing growth pressures, or are fragmented by lots that prevent efficient farming practices. In order to retain the rural character in this outer area, a minimum lot size for single-family dwellings is set at forty acres. Individuals seeking to locate a non-farm residential dwelling on forty or more acres are encouraged to look in areas planned for estate residential use, to prevent the disruption of farming practices on prime agricultural land and to locate in proximity to existing residential areas.

Rural Residential

Within the predominantly residential eastern portions of the Lily Lake planning area, there are selected locations planned for rural residential development. Single family dwellings in these areas are required to have lot sizes ranging between 5 and 15 acres. The rural residential land use category represents portions of the Village that transition from agricultural preservation/estate residential to single family residential. This range in lot size provides a variety of large lot housing options to those persons seeking a more rural atmosphere. The rural residential category is intentionally limited to those regions in transition. The Village does not seek to encourage large areas with this residential density range. Rather, it encourages the evaluation of creative planning options to reduce the amount of agricultural and conservation land lost to residential sprawl. Any lots ranging in size between 15 and 40 acres would also fall into this category, but such lot sizes are not generally encouraged.

Single Family Residential

This designation is found extensively throughout the eastern portions of the planning area and incorporated Village. Within this area, residential development can occur on minimum lot sizes ranging between 1.25 to five (5) acres. In order to promote good planning practices, Lily Lake encourages subdivision development with an average lot density within this range. This will permit the Village to consider a variety of housing developments, densities and planning configurations based upon the merits of the specific proposal.

This range gives the developer flexibility for the purpose of encouraging creative planning and the creation of neighborhoods consistent with the Village's goals and objectives, and planning and design guidelines (page 16). The quality of proposed site plans will be considered as important as the adherence to traditional measures of land use density. However, because the Village has no immediate plans for developing a municipal wastewater treatment system, residential densities should be designed to accommodate the maintenance and longevity of septic systems, or the provision for

a quality unified wastewater treatment system. Cohesiveness with adjoining development, along with preservation and enhancement of natural resources, through quality design and landscaping, will be viewed as positive assets during the site plan review process.

It is recognized that pressures exist for residential development in the area north of Empire Road, near Swanberg Road. Although not encouraged at this time, following substantial residential infill development throughout the Village, single family residential development may be considered by the Village at this location.

Multi-Family Residential

Approximately six acres of multi-family residential land use is shown in the central part of the existing Village. The location of this planned use would place the higher residential densities in proximity to proposed open space, as well as existing and future commercial retail and service opportunities. A maximum density of eight units per gross acre is appropriate to duplexes, townhomes or two-story condominiums in this location.

The Village recognizes the importance of providing housing diversity for its residents. Selected areas of multi-family housing are encouraged for "empty nesters" and the elderly. The location of multi-family uses has been designated on the plan in order to provide efficient transportation linkages, open space amenities, and adjacent land uses that are compatible with medium density residential areas. It is not the intention of the Village to provide large tracts of land for multi-family development, rather to encourage a housing type which responds to the needs of the small town resident.

Open Space/Conservation Areas

Conservation lands are those areas that should not be subject to urban development. They include wetlands, floodplains, major areas of mature forest and unique natural areas as shown on the plan graphic. The open space designation also includes areas that the Village would like to see retained in open area, in order to promote the semi-rural character of Lily Lake and control urban sprawl. Preservation of natural features, that have intrinsic environmental values (flood control, maintenance of water quality, wildlife habitat, recreational and visual), are a key component of the overall plan. Areas designated as open space/conservation are generalized in extent. The implementation of the open space concept will be evaluated as site-specific proposals are presented to the Village.

Any park donations and open space requirements may be met by that portion of a property that is designated as a conservation area. This will be evaluated on a case by case basis to assure that the area set aside will provide needed recreational

opportunities and facilities suitable to the population being served. When these evaluations are made, the concept of shared stormwater detention will be encouraged.

The Village strongly recommends the preservation of stream corridors, not shown on the land use graphic. These smaller riparian areas represent important local stormwater control and wildlife habitat. The preservation of environmental corridors has the additional benefit of providing attractive open space and passive recreational areas. It is recommended that a zone of 25 feet on either side of the stream bank be preserved in its natural state if surrounding land is developed.

Also included in this land use category is public and semi-public open space and recreational areas. This includes forest preserves, parks, recreation trails and golf courses. It is anticipated that larger scale subdivisions will establish neighborhood parks that are not shown within the plan but that will be developed as a part of the subdivision process. It is intended that some of the conservation areas that have recreational and open space value will also be set aside as institutional open space through conservation easements, parkland donations or acquisition by public or semi-public groups, so that they remain permanently dedicated for preservation, enhancement and use.

Two areas are specifically planned for community parks and/or recreation areas. These include the Lily Lake wetlands, west of Route 47, and a parcel of approximately 33 acres, north of Route 64, at the eastern edge of town. Both of these areas offer unique park opportunities. The Lily Lake wetland would provide an attractive area in the heart of the Lily Lake's growth area. Restoration and enhancement of this resource would be a major asset to the Village. The second area planned for park use is located on the north side of Route 64, east of Anderson Road. The site is surrounded by floodplain, wetlands, the Great Western Trail and existing residential development. The proximity of this site to these amenities would provide an excellent eastern entrance into the Village. A portion of this site could also be used for a wastewater treatment facility at some future date, if sewer service is desired in Lily Lake.

The Great Western Trail is another important recreational and environmental resource of the Village. This regional trail, which was converted from an abandoned railroad easement, extends from St. Charles to Sycamore. The number of trail users has steadily increased over the past decade, and should continue to grow as new regional residential development, and a preference for an active lifestyle, continues. The Village encourages the connection of residential development, open space and recreational areas to the Great Western Trail, through trail extensions and pedestrian walkways. In particular, a trail extension would be desirable from the Great Western Trail, at Wooley Road, south to the future fairgrounds site.

Commercial

The plan envisions three concentrated locations for retail and service commercial establishments. The primary location acknowledges the importance of the Route 47 and 64 intersection. The quality and type of commercial development at this location is critical to the community image projected by Lily Lake. Therefore, it is important to promote attractive, high quality development at this intersection. Of equal importance is the maintenance of the southeast and northwest quadrants as non-developed parcels. The presence of wetlands and steep slopes at this intersection will aid in the preservation of the rural atmosphere.

The second commercial area encompasses the existing commercial uses within the historical town center of Lily Lake. Low intensity service uses, compatible with institutional or office uses, are proposed for this area. An adaptive reuse of the historic Lily Lake store may be appropriate if a use consistent with the neighboring residential area is proposed. Any non-residential or governmental use, proposed for this location, would be processed under the special use provisions of the Village.

The third commercial area is proposed for the area of the Route 47 and Welter Road intersection. This area is in close proximity to: the Route 47 and 64 intersection, the proposed Lily Lake park, future light industry, office or research area, and the future County fairgrounds. This location would facilitate the growth of a concentrated commercial center in which all of Lily Lake can be effectively served.

Strip commercial development should be prevented along the Route 47 corridor. Commercial activity at these proposed locations should attempt to combine road access to Route 47 or Welter Road though a cross-easement agreement with adjacent office or light industrial uses. This would minimize the number of curb cuts to these major roadways, thereby increasing safety for motorists and pedestrians.

Light Industrial/Office/Research

A substantial amount of land (181 acres) has been set aside for light industrial, office or research uses at the northeast corner of Route 47 and Beith Road. This large land area would provide an economic base to support municipal services as well as provide a variety of employment opportunities for local and areawide residents. The location of this area is designed to interact with the activity, use and possibly the facilities of the new Kane County fairgrounds. Uses such as light industry, agricultural research and other uses interactive with the fairgrounds are encouraged.

The Village also encourages office use within this area, particularly along Route 47 and adjacent to commercial development. Uses such as government bureaus and regional office parks are preferred. All uses along Route 47, between Beith Road and Route 64, should be encouraged through the plan review process and Illinois

Department of Transportation (IDOT) standards to limit the number of access points to Route 47.

The Village supports the development of a unified industrial, office, and/or research campus at this location. A quality campus setting would promote efficient traffic circulation, attractive buildings and high quality tenants. Piecemeal, haphazard, and unattractive development could be more easily eliminated through a unified campus development concept.

Governmental/Institutional

Selected locations of governmental and institutional land use are indicated on the Comprehensive Plan. These areas represent the existing locations of churches, cemeteries, government buildings and the elementary school. Future uses which would fall under this land use category would include: municipal buildings, fire/police stations, and a wastewater treatment plant.

County Fairgrounds

The future Kane County fairgrounds site will be located on 487 acres at the southwest corner of Route 47 and Beith Road. The Village anticipates a surge of growth related to the development of this commercial facility. The Comprehensive Plan encourages light industrial, office and research uses north of the fairgrounds which would interact with the activities of the fairgrounds. The scattering of commercial uses along Route 47 will be discouraged. The Village supports promoting concentrated commercial activity, traffic safety, and the maintenance of a semi-rural atmosphere as described in other sections of this plan.

Primary Road Network

A network of primary roadways has been designated on the Comprehensive Land Use Plan. This network includes State routes, major County roads, and key local roads which facilitate the efficient movement of vehicles, yet provide minimum conflict with local residents. Developers of future land uses along State and County routes must work with the appropriate agency to provide development which has a clear, focused and logical access along the primary road network.

Should large-scale single family residential growth continue to occur throughout the planning area, the Village would look to developers of these areas to help defray the cost of future road expansion. Two potential roadway expansions include: Read Road extended east to Swanberg Road, and Welter Road extended southeast. These extensions are conceptual, and reflect an attempt to look at providing safe and efficient road connections around the Village.

Special Entry Treatment

Entry treatments are proposed for key intersections along State Routes 47 and 64. These special entry treatments are promoted to provide attractive entry and focal points within Lily Lake. Entry treatments are to be accomplished by implementing the planning and design guidelines contained in this document, as well as regulating the type of land use, setbacks, signage and landscaping at these intersections.

PLANNING AND DESIGN GUIDELINES

Residential Development Guidelines

The purpose of the following guidelines is to assist the Village in the evaluation of specific site plans and development proposals. Although some of these policies may eventually be incorporated into the development ordinances of the Village, they present planning principles which will help the Village achieve the goals and objectives of the Comprehensive Plan and produce high quality development.

Furthermore, much of the ultimate planning area is within unincorporated Kane County. These policies will assist the Village in reviewing zoning and/or subdivision requests for properties developing within the County.

Residential development should be an integral part of the surrounding neighborhoods of which they are a part. Subdivisions should consider the compatibility of adjacent land uses, continuity of the local vehicular and pedestrian transportation systems, protection from traffic impacts and the planning and design guidelines contained in the following:

1.0 Small Subdivisions

Small subdivisions and in-fill residential development.

A. The development should be compatible and harmonious with the character of adjacent buildings and the streetscape.

B. Natural features, significant existing trees and vegetation, topographical character and drainage should be protected where possible and incorporated into the planning and design of the subdivision.

C. Private roads and driveways serving more than two dwelling units are discouraged unless a desirable subdivision can be implemented with a reduction in the number of curb cuts on public rights-of-way by the use of a private drive.

D. Small subdivisions should be linked to the surrounding street network in a safe and logical fashion. Major points of egress and ingress should

consider appropriate sight lines, relationship of alignment with other drives and intersections, and incorporate appropriate geometrics and traffic control measures to maintain safety, capacity, and operational efficiency.

E. Flag lots are discouraged.

F. Curb cuts onto arterial and major collector streets should be minimized.

G. Dwellings adjacent to arterials and major collector streets should be set back further from the right-of-way than those located on local streets or minor collectors.

H. Detention areas should be designed to accommodate localized stormwater run-off and encourage joint detention with adjacent landowners.

I. Small subdivisions should incorporate lotting and circulation systems which fit into the established pattern of rights-of-way and existing development. Wherever possible, smaller subdivisions should be considered in relation to all of the contiguous planned areas which are likely to develop in the future, in order to achieve an orderly and unified plan. Site plans should be carefully conceived so as not to create small islands of dissimilar land uses or lotting which could not efficiently be incorporated into the broader circulation and land use pattern of the surrounding area.

J. All new development should meet Village of Lily Lake ordinances and standards as amended.

K. All of the applicable guidelines for large scale subdivisions contained in 2.0 should be followed.

2.0 Major Single-family Subdivision

There are many large tracts of vacant or agricultural land within the planning jurisdiction which could be developed for major single-family subdivisions. These developments should follow the applicable guidelines for small subdivisions as well as the following which relate to larger scale developments.

A. The internal system of local streets should discourage through or short-cutting traffic.

B. Retention areas should consider water quality, visual, recreational and wildlife values and opportunities, as well as hydrologic criteria.

C. Where possible, an internal pedestrian/bikeway trail system should be incorporated into the design of major subdivisions to increase accessibility to: nearby schools; employment and shopping areas; public parks, the Great Western Trail and community open space.

D. Site planning should emphasize the effectiveness and visual quality of buffers between residential uses, major arterial roadways and adjacent non-residential development.

E. An anti-monotony code which reflects the specific housing product, density and site character, should be developed for each major subdivision.

F. Useable, accessible open space should be provided as a part of new residential developments. Recreation opportunities and facilities should be consistent with the needs of the residents of the development, the Village, School District and Park District. Land designated for public uses should be set aside in perpetuity and not be sold for development at a later date.

The impact of the development on the School District and potential future Park District may necessitate donations of land, or cash in lieu of land to provide educational and recreational services to the population generated by the development.

Commercial Development Guidelines

Convenience Shopping should be provided with a minimum of curb cuts on major streets, with strip development being discouraged. Strip development relates to a string of commercial uses on individual zoning lots, extended along a public right of way. It is characterized by excessive curb cuts, turning movements, excessive signage and lack of continuity or compatibility of site planning and design.

A. Such shopping opportunities should be provided in centers of a unified design on sites not less than 3.0 acres.

B. Curb cuts should be limited, and the use of shared driveways, and side street access is encouraged whenever possible.

C. Site planning for commercial developments should protect existing trees and employ setbacks which will enhance the character of the streetscape.

D. The architectural design of commercial structures should project a design quality which enhances the economic viability of the business and the visual quality of the public right-of-way and streetscape.

Projects should incorporate: a unified tenant signage package; screening of trash collection, parking and loading areas; appropriate setbacks; properly scaled landscaping; interior and exterior lighting which will not project beyond the property line; and a unified pedestrian circulation system.

E. Outdoor storage areas associated with commercial or office/research developments should be screened from public view by a berm, fence, or landscaping, and be subject to approval by the Village Board. Such berm, fence or landscaping should be a minimum of five feet tall and achieve a year-round opacity screening of 75 percent.

F. All roof-mounted mechanical equipment should be screened from public view on all four sides of the building by parapet walls, roof-structure, or screens which are equal in height to the tallest piece of equipment. Such screens should be compatible with the materials, colors and design character of the building or which they are a part. Structures such as flues, stacks, intake and exhaust hoods, etc. which are not required to be screened should be painted to blend with the building.

Light Industrial and Office/Research Guidelines

Office/research uses are often more compatible with adjacent residential development than commercial uses. Office developments typically employ more site amenities and green space, generate fewer vehicle trips, create less noise from site activities, and have a lower intensity of lighting and signage than retail commercial uses. Office buildings are generally not utilized during the evening hours and weekends, thereby reducing the potential for conflicts with residential activities. These uses tend to generate their peak traffic during the most congested hours.

A. Developments should be compatible with the community in terms of: low pollution levels (light, noise, air, etc.); routing of heavy traffic; and design compatibility with existing land uses.

B. Industrial developments should be buffered from residential uses by means of large setbacks, landscaping or by mutually compatible land uses, such as open space, office or institutional uses.

C. Industrial uses should be located so that they are accessible from major streets. Truck and employee traffic should not be routed through residential areas. Industrial development should contribute a fair share of the cost of making public improvements necessary to service the industry and mitigate any negative impacts.

D. Site planning for office/research developments should protect existing trees and employ setbacks which will enhance the character of the streetscape.

E. Outdoor storage areas associated with industrial and office/research uses should be screened from public view by a berm, fence, or landscaping, subject to approval by the Village Board. Such berm, fence or landscaping should be a minimum of five feet tall and achieve a year-round opacity screening of 75 percent.

F. All roof-mounted mechanical equipment in excess of 36 inches in height should be screened from public view on all four sides of the building by parapet walls, a roof-structure, or screens which are equal in height to the tallest piece of equipment. Such devices should be compatible with the architectural character or the principle structure. Structures such as flues, stacks, intake and exhaust hoods, etc. which are not required to be screened should be painted to blend with the building.

Open Space/Conservation Guidelines

Open space represents a fundamental part of the rural community. The protection and preservation of open space and environmental areas can be implemented through the following guidelines:

A. Floodplains, wetlands, areas of ecological or archaeological significance and mature forests should be preserved as open space and used, where feasible, for recreational activities, wildlife habitat, and pedestrian/bikeway trail systems.

B. Easements should be dedicated to provide for trail system extensions linking major open space, parks and greenbelt areas.

C. New residential development should provide play areas for children; and other open space or linkages to the area-wide open space and recreation system.

Agricultural Policies

The preservation of agricultural land is a key component of the Lily Lake Comprehensive Plan. The following guidelines should be used to assess development in agricultural areas:

A. The Village should encourage the preservation of agricultural uses where parcels of forty acres or larger consist of a majority of prime and state significant agricultural land. Prime agriculture is defined by Class I and Class II soils according to the U.S.D.A. Soil Conservation Service.

B. The Village should consider the impact of development and public improvement proposals on those sites designated as prime agriculture.

State Route 64/47 Intersection and Special Design Area Guidelines

The Comprehensive Land Use Plan encourages controlled development of the State Route 64/47 intersection. Protection of the safe and efficient handling of traffic, and the creation of an attractive center of Lily Lake, are critical objectives of the Comprehensive Plan. Non-residential development at these intersections should follow these guidelines:

A. Buildings should be set back a minimum of 75 feet from the right-of-way.

B. Parking should be set back a minimum 40 feet from the right-of-way.

C. Curb cuts should be a minimum of 200 feet from the intersection, as measured from the centerline of the curb cut to the centerline of the right-of-way or driveway.

D. Commercial development should be permitted in no more than two of the four quadrants of the intersection. Particular attention should be paid to high quality landscape design of the perimeter and all screening.

E. The visual and functional integrity of the wetlands and steep slopes adjacent to this intersection should be preserved.

F. Signs should be set back a minimum of 15 feet from the right-of-way. Signs should be limited to nine feet in height, as measured from the top of the adjacent curb, and should be monument style in order to create a low-profile sign which will contribute to an uncluttered streetscape, reducing driver distractions and confusion. No more than one free-standing identification sign should be provided per street frontage for each development. Signs should be compatible with the architecture of the structure. Free-standing signs should relate to the design of the tenant/wall sign.

G. Lighting installed for individual developments should be shielded to prevent glare on the adjoining rights-of-way and properties, and should not include dropped lenses. Metal halide or mercury vapor luminaries should be used in lieu of high-pressure sodium in order to prevent excessively bright illumination. A continuity or light fixture design is encouraged.

Quality of Life

The Village of Lily Lake strongly wishes to maintain a quality of life that has been traditional for this semi-rural community. To preserve this character, the following will not be allowed:

A. Operations that degrade or deplete, or have the potential to degrade or deplete, the surface or groundwater resources;

B. Operations (excluding farming) that produce, or have the potential to produce, offensive smells or degrade the air quality;

C. Operations that generate excessive truck traffic, especially during the evening or night-time hours; and

D. Operations (excluding farming) that generate excessive or constant noise, especially during the evening or night-time hours. This includes, but is not limited to: production machinery operations, construction equipment and excavating equipment.

DEVELOPMENT GUIDE

The following subsections set forth summaries of the Village's Land Use Control Ordinances, Policies, and Procedures. The narrative is intended as an overview for those seeking general information about land development and improvement in the Village and is not a substitute for the detailed requirements set forth in the Village ordinances or for case by case policy decisions made by the Board of Trustees. Those interested in going ahead with any land development or improvement project must consult the full text of the applicable Village ordinances.

Zoning

A. For the purpose of zoning, the Village of Lily Lake has been divided into the following districts:

1. AP: Agriculture Preservation
2. ER: Estate Residential
3. R1: Rural Residential
4. R2: Single-Family Residential
5. R3: Multi-Family Residential
6. C: Commercial
7. IOR: Light Industrial/Office/Research
8. G: Governmental/Institutional
9. EC: Environmental Corridor

B. The Zoning Ordinance should be referenced for permitted uses, special uses, and bulk standards. On a annual basis, the Village will review and update the zoning map accordingly.

Rezoning

1.0 Standards

A parcel of property may be rezoned only if there is an error in the current zoning classification, or if there exists changed or changing conditions in the Village in general or in the immediate area of the parcel and if the rezoning would be necessary to permit the property to be properly and fully utilized in a manner conforming to the changed or changing conditions. It is the petitioner's responsibility to clearly demonstrate that one of these two situations exist before a rezoning can be granted by the Board of Trustees.

2.0 Procedures

2.1 Petition -- The petitioner shall file with the Zoning Enforcement Officer a petition including the following information:

A. Legal description of property;

B. Statement why property should be rezoned;

C. Map or plat of survey of the property showing existing zoning and the zoning of adjacent properties;

D. Report from the Kane-DuPage Soil and Water Conservation District for the parcel (if vacant);

E. List of all property owners within 250 feet with certification that all were properly notified by the petitioner (either in person or by certified mail) of the intended rezoning request, with a copy of the notice used; and

F. Any person operating a use not permitted under the current zoning shall be denied a public hearing for a period of one year and fined in accordance with Village regulations.

2.2 Public Hearing Before Planning Commission

A. The Zoning Enforcement Officer will refer the completed petitions and supporting documents to the Planning Commission for its next regularly scheduled meeting;

B. The Planning Commission will review the petition, set a public hearing date within sixty (60) days, and prepare the necessary

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C. Map or plat of survey of the property showing existing zoning and the zoning of adjacent properties;

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E. List of all property owners within 250 feet with certification that all were properly notified by the petitioner (either in person or by certified mail) of the intended rezoning request, with a copy of the notice used; and

F. Any person operating a use not permitted under the current zoning shall be denied a public hearing for a period of one year and fined in accordance with Village regulations.

2.2 Public Hearing Before Planning Commission

A. The Zoning Enforcement Officer will refer the completed petitions and supporting documents to the Planning Commission for its next regularly scheduled meeting;

B. The Planning Commission will review the petition, set a public hearing date within sixty (60) days, and prepare the necessary

public notices. The petitioner should attend the public hearing to speak in behalf of the petition; and

C. Within thirty (30) days of the hearing, the Planning Commission will forward its recommendation to the Village Board for final action.

3.0 Board Action

Within forty-five (45) days of receipt of the Planning Commission's recommendations, the Board shall either approve or disapprove the rezoning petition.

Special Uses

1.0 Standards

A. The Zoning Ordinance specifies a number of uses of a unique character which, while considered generally appropriate for the zoning districts they are specified for, might have an adverse effect on the character and future development of that district;

B. Such uses, called special uses, shall be permitted only after review and approval by the Planning Commission and the Village Board. The purpose of their review is to assess the potential impact of the use on neighboring properties and the Village generally, and to establish such conditions and restrictions as are deemed necessary to protect the public interest;

C. To qualify for a Special Use Permit, the use cannot already be in operation, the petitioner must demonstrate that the proposed use will not impair the use, enjoyment and property values of properties in the immediate vicinity, will not impede the orderly development of property in the area and, in general, will blend with and meet the requirements of the zoning district in which it is located; and

D. Any person operating a non-permitted use without securing the proper zoning or special use permit first will be denied eligibility to submit for a special use permit for one year, and fined according to Village regulations.

2.0. Procedures

2.1 Petition -- The Thursday prior to the next regularly scheduled Board

Meeting, the petitioner shall file at the Village Office a petition including the following information:

A. Legal description of property;

B. Statement why a Special Use Permit should be granted;

C. Map or plat of survey of property showing its zoning and the zoning of adjacent properties;

D. Report of Kane-DuPage Soil and Water Conservation District (if vacant); and

D. List of all property owners within 250 feet, certification that all were properly notified by petitioner (in person or by certified mail) of the proposed special use permit request, and a copy of the notice used.

3.0 Public Hearing Before the Planning Commission

A. The Village Board shall refer completed petitions to the Planning Commission, who shall review the petition, call a public hearing within sixty (60) days, and prepare the required public notices. The petitioner should attend the public hearing to speak on behalf of his petition; and

B. Within thirty (30) days after the public hearing, the Planning Commission shall forward its written recommendations to the Village Board for final action.

4.0 Board Action

Within forty-five (45) days of receipt of the Planning Commission recommendations, the Village Board shall either approve or disapprove the petition.

Variations

1.0 Standards

A. Variations from the strict letter of the regulations set forth in the Zoning Ordinance with regard to building bulk regulations, parking and loading birth requirements, or other regulations as set forth by the Village Board, not to include Zoning District Classifications, regulations, and restrictions of specified industrial, business, residential and other

uses shall be considered by the Zoning Board of Appeals and a recommendation made by it to the President and Board of Trustees;

B. Variations shall be granted by the President and Board of Trustees only when the variations are in harmony with the general purposes and intent of the regulations and only in cases where there are practical difficulties or particular hardship in carrying out the strict letter of any of the regulations; and

C. Variations cannot be sought regarding the types of uses permitted in zoning districts.

2.0 Procedures

2.1 Petition

A. Legal description of property;

B. Statement why variance should be granted;

C. Map or plat of survey of property showing its zoning and zoning of adjacent properties;

D. Report of Kane-DuPage Soil and Water Conservation District (if vacant); and

E. List of all property owners within 250 feet, certification that all were properly notified by petitioner (in person or by certified mail) of the proposed variance request, and a copy of the notice used.

3.0 Public Hearing and Final Action

A. The Board of Trustees shall review the petition, send out the required public notices, and forward the petition to the Zoning Board of Appeals such that they can conduct the public hearing and render a recommendation to the Board of Trustees within ninety (90) days of the application;

B. The petitioner should attend the public hearing to speak on behalf of his petition. It is his responsibility to demonstrate that the variation requested meets all the applicable standards of the Zoning Ordinance; and

C. Upon receipt of the Zoning Board's recommendation, the Village Board shall either grant or deny the variation requested within 45 days of the Zoning Boards recommendation. Any proposed variation which fails to

receive the approval of the Zoning Board of Appeals shall not be passed except by the favorable vote of two-thirds of the Board of Trustees.

Appeals

A. Any decision by the Village Zoning Officer Regarding the interpretation and enforcement of the Zoning Ordinance may be appealed to the Zoning Board of Appeals by the affected party.

B. Parties intending to appeal shall file a notice of appeal with the Zoning Officer within thirty (30) days.

C. The Zoning Officer shall then transmit all written records regarding the appeal to the Zoning Board of Appeals who shall hold a hearing to consider the appeal within thirty (30) days of the notice of appeal filing.

D. The filing of the appeal shall stay the decision of the Zoning Officer until the Zoning Board of Appeals renders its decision, unless such a stay involves imminent danger to life and property.

E. Within ten days of the hearing, the Zoning Board of Appeals shall render a decision on the appeal. The Zoning Board of Appeals may affirm, reverse, or modify the decision. The decision of the Zoning Board of Appeals is final with no further review or approval by the Board.

Building Permits

A. The Village requires building permits for all new construction, additions, re-roofing, residing and any remodeling that affects the structural integrity of a building.

B. Plans and specifications for any new residential construction and major additions must be reviewed and approved by the Village Planner before issuance of a building permit.

C. All commercial/industrial construction and multi-family construction plans must be reviewed by the Village's BOCA plan examiner.

D. For all construction involving the installation of wells or septic, plans must be reviewed by the Village Engineer prior to the issuance of a building permit. All septic plans must include a percolation tests.

E. Prior to issuing a building permit, the Village Zoning Officer will review the plans for building bulk, height, setbacks, off-street parking, and that all zoning requirements are met.

F. Every building permit requires specific inspections. It is the applicant's responsibility to call for the inspection when ready, allowing for twenty four (24) hour notice. If the applicant is not ready for the inspections, or if the applicant fails the inspection, the applicant will be responsible for the payment of a reinspection fee for the second inspection. When a project is completed, a final inspection will be made, and an occupancy permit will be issued upon completion of successful final inspection and payment of all re-inspections.

ANNEXATION PROCEDURE

Concept Review

1.0 Village Board Concept Review

A person, firm or organization desiring to annex to the Village of Lily Lake property in which he, she or it has a title or contract real interest, shall initially request, in writing, a concept review of the proposed annexation with the Village President and the Board of Trustees. Such request shall be accompanied by such documentation and data as will permit the Board of Trustees to fully understand the nature and scope of the proposed annexation and development. The purpose of the review shall be informative only; the Board of Trustees shall not be required to make recommendations or render a decision. The Village Board may waive the procedural requirements for annexation approval for persons, firms or organizations desiring annexation to the Village, who are not proposing any change in land use, intensity, zoning or overall impact to the community.

A. The documentation and data to be submitted for the concept review shall include as a minimum, the following:

1. A survey or sketch of the site;

2. Proposed zoning;

3. Surrounding zoning;

4. General development plan;

5. Name, address and telephone numbers of property owners, petitioners and developers; and

6. Background and experience of the developer and projects that the developer has developed.

B. The person, firm or organization requesting concept review shall submit the written request for concept review, together with eighteen copies of all documentation and data submitted, to the Village Administrator. The Village Administrator shall distribute a complete set of all documents and data to each member of the Board of Trustees, to each member of the Planning Commission and to the Village Planner.

2.0 Planning Commission Concept Review

Following the Board of Trustees concept review, a meeting shall be scheduled before the Planning Commission for its concept review of the proposed annexation and development. At said review, the Planning Commission shall:

A. Review the general feasibility of the proposal;

B. Review applicable statutes, administrative rules and regulations and local ordinances and land use plans;

C. Review existing facilities and conditions;

D. Answer questions and address problem areas; and

E. Provide the applicant with their oral suggestions, comments and recommendations.

Staff and Local Government Review

1.0 Participants

Following the Planning Commission's concept review, the applicant shall request, in writing, staff and local government review of the proposed annexation and development. The staff and local governmental bodies that shall participate in said review shall consist of the following:

1.1 Staff Members

A. Village Administrator or President;

B. Planning Commission Chairman;

C. Village Attorney;

D. Village Planner;

E. Village Engineer; and

F. Zoning Commission Chairman (If a Variance or Special Use Permit is requested).

1.2 Governmental Bodies

A. School Districts;

B. Fire and Police Districts; and

C. Townships.

2.0 Review

The staff and respective local governmental bodies shall review the applicant's request, together with all supporting documentation and data. Each staff member shall and each local governmental body may supply the Village Administrator with written comments, questions, concerns, suggestions and recommendations. Said written comments shall be submitted to the Village Administrator not later than 30 days after submission of the documentation and data to them. The Village Administrator shall promptly submit copies of said comments to the applicant, each member of the Planning Commission and each member of the Board of Trustees.

3.0 Documentation and Data

The documentation and data to be submitted for the staff and local government review shall include, as a minimum, twelve copies of each of the following:

A. Petition for Annexation which shall incorporate the names, addresses and telephone numbers of the Petitioners and their attorneys;

B. Annexation Agreement;

C. Plat of survey of the site containing the legal description and acreage of the property to be annexed;

D. Aerial photo of site;

E. Petitions, if applicable, for zoning map amendments, special use permits and variances, which shall be in compliance with the specifications and requirements of the Village of Lily Lake Zoning Ordinance;

F. Petition for approval of subdivision concept plan/preliminary plat, which shall be in compliance with the Village of Lily Lake Subdivision Control Ordinance;

G. Subdivision Concept/Preliminary Plat, which shall be in compliance with the Village of Lily Lake Subdivision Control Ordinance;

H. Topographical survey of the site which should reflect floodplains;

I. Kane-DuPage Water and Soil Conservation Land Use Opinion;

J. Detailed sketch of site showing:

1. Existing buildings, parking areas, streets and highways, lakes, streams, woods and utility easements;

2. Location of proposed improvements, parking areas, streets, utility easements, recreational facilities, open space areas and other public facilities;

3. Location of proposed entrances and exits to and from public roads and highways;

4. Location of critical soils and location of existing landscaping that will be preserved;

5. Existing Village boundaries;

6. North arrow and scale;

7. Name, address and telephone number of person, firm or organization preparing sketch; and

8. Date of the preparation of said sketch.

K. Application fee as required by Village Code; and

L. The following data should be provided if not otherwise contained as part of the aforesaid documentation:

1. Legal description of site;

2. Acreage of site;

3. Acreage of each zoning district classification requested;

4. Current zoning classifications of site;

5. Zoning map amendments, variances and special use permits required;

6. Information concerning current use of site;

7. Information concerning proposed use of site;

8. Information concerning current and proposed drainage of site;

9. Information concerning existing and proposed public improvements, public services and public utilities, including the following:

   - o Public improvements, utilities and services required by the applicant;
   - o Public improvements, utilities and services that the applicant expects the Village to construct and/or supply;
   - o Public improvements, utilities and services that the applicant intends to construct and/or supply;
   - o Schedule of the completion of public improvements and utilities;
   - o Water service;
   - o Wastewater treatment service;
   - o Storm sewers;
   - o Streets and gutters;
   - o Sidewalks;
   - o Street lighting;
   - o Open space and recreational areas;
   - o Maintenance regarding public improvements, utilities and open space/recreational areas, including organizational details of property owners associations;
   - o Architectural/Engineer drawings and sketches of all public improvements proposed, illustrating the design character of same; and
   - o Location, description and size of landscaping.

10. Parking lots proposed and off-street parking requirements and ratios;

11. Estimated population densities;

12. Size, area and location of lots and proposed building groups;

13. Protective covenants and restrictions proposed, including procedures for the enforcement of same; and

14. Information concerning financial arrangements, including:

- o Real estate tax arrangements, including real estate tax abatements and special tax districts sought;
- o Payment of applicable fees, including inspection fees, Village consultant fees, permit fees, utility connection/tap-on fees, etc.
- o Expected fiscal impact on Village budget;
- o Cost sharing for construction, public improvements, including public financing and developer contributions; and
- o Performance bonds and alternative forms of performance security.

Final Review

1.0 Application

To initiate the final review process, the applicant shall submit a written request to the Village Administrator. Such request shall be accompanied by 20 copies (25 copies if Zoning Board of Appeals approval is required). Petitions for subdivision approval and petitions for zoning map amendments, variances and special use permits shall be in conformity with and be supported by the documentation and data specified in the Village Subdivision Control Ordinance and the Village Zoning Ordinance. Upon receipt by the Village Administrator of said request and supporting documentation, he shall submit eight copies of same to the Planning Commission and eight copies of same to the Zoning Board of Appeals if zoning board approval is required.

2.0 Planning Commission Review

Following receipt of applicant's request for final review, the Planning Commission shall hold a public hearing to meet with the applicant to consider his request. Said hearing shall be scheduled for the next regularly scheduled Planning Commission meeting, provided the applicant's request for final review was submitted not later than twenty one (21) days prior to the next regularly scheduled meeting, otherwise said hearing shall be scheduled at the following month's regularly scheduled Planning Commission meeting. The Planning Commission shall promptly notify the Village Administrator of the date and time of the hearing scheduled. If the purpose of the hearing is to consider

zoning and subdivision matters which are required to be heard at a public hearing as specified by state law or by the Village Subdivision Control Ordinance or the Village Zoning Ordinance, the Planning Commission shall cause notice to be published. The Planning Commission, at said hearing shall:

A. Review the petitions, documentation and data submitted;

B. Permit the applicant to make a short presentation; and

C. Prepare its written findings of fact and recommendations regarding the annexation and zoning requests and promptly submit same to the Board of Trustees.

The Planning Commission and the applicant may mutually agree to continue the hearing to additional dates and times.

3.0 Zoning Board of Appeals Hearing

The Zoning Board of Appeals shall hold a public hearing not earlier than 21 days or later than forty five (45) days of the later to happen of the Zoning Board's receipt of the applicant's written request for final review, or, the deadline established by Village code for the submission of staff and local government comments. In proceeding with said hearing, the Zoning Board of Appeals shall adhere to the provisions of the Village of Lily Lake Zoning Ordinance. The Zoning Board's written findings of fact and decision shall be promptly tendered to the Village Board of Trustees.

4.0 Village Board Review

Upon receipt of the written findings of fact and recommendations of the Planning Commission, the written findings of fact and decision of the Zoning Board of Appeals, if applicable, the written comments of the staff and local governmental bodies, the Village Board shall consider applicant's request for annexation. Said review shall be conducted at the second regular Board of Trustees meeting following receipt by it of the aforementioned data. However, if the applicant has submitted an annexation agreement for approval and execution by the Village of Lily Lake, a public hearing must be held prior to approval and execution as is required by section 11-15.1-1 et seq. of the Illinois Municipal Code (Illinois Revised Statutes, Chapter 24, Section 11-15.1-1). Said statute substantially provides that the corporate authorities shall fix a time for and hold a public hearing upon the proposed annexation agreement or amendment, and shall give notice of the proposed agreement not more than 30 nor less than fifteen (15) days before the date fixed for the hearing. The notice shall state that a petition for annexation has been filed and give the substance thereof, including a description of the territory to be annexed, the name of the annexing municipality and the date fixed for the hearing. The notice shall be

published at least once in one or more newspapers with a general circulation within the Village. After such hearing, the agreement or amendment may be modified before execution thereof. The annexation agreement or amendment shall be executed by the Village President and attested by the Village Clerk only after such hearing and upon the adoption of a resolution or ordinance directing such execution, which resolution or ordinance must be passed by a vote of two-thirds of the corporate authorities then holding office.

Annexation Ordinance

Following approval of any requested annexation, the applicant shall submit to the Village a Plat of Annexation together with such copies as may from time to time be required by the County of Kane. Within fourteen (14) days of the Village's receipt of said plat, the Village shall cause its attorney to prepare an Annexation Ordinance, which ordinance shall be prepared and ready for signature at the second regular meeting of the Board of Trustees following the date of the applicant's submission of said plat. The obligation to record said plat shall be the Village's. The cost of recording shall be paid by the applicant.

Fees

Concurrently with the submission of a request for staff and local government review, the applicant shall deposit in escrow with the Village Treasurer, as escrowee, a sum of money that shall be used by the Village to defray the cost and expense billed it by the Village staff and such other consultants as are consulted by the Village during the review process. The amount to be deposited by the applicant shall be not less than $ 1,500.00. Said escrowed funds shall be deposited and held by the Village in an interest bearing account with the interest payable to the Village of Lily Lake. The expense of said reviews shall be borne entirely by the applicant. The Village shall make disbursements from said escrowed funds upon the receipt of billing statements from said consultants, provided said statements have been reviewed and approved by the Village Board.

Notice to the applicant shall not be a prerequisite to the making of said disbursements. If at any time after the commencement of the review process the amount deposited has been reduced to a balance of $ 750.00 or less, the applicant shall be required to deposit an additional amount with the Village so that the escrow balance is not less than the amount the applicant was originally required to deposit. Said additional amount shall be deposited with the Village Treasurer within fifteen (15) days after the applicant has been so notified. Notice shall be deemed given as of the date that a written notice requesting an additional amount is deposited in the U.S. Mail addressed to the applicant. Any funds on deposit at the conclusion of the staff's involvement with the development, provided all disbursements have been made, shall be returned to the applicant. Provided, however, that notwithstanding anything herein to the contrary, no final Village Board approval shall be granted until all of the aforesaid costs have been paid.

Pierre A. Hatch
44W210 Empire Road
St. Charles, IL 60175

Village President - Lily Lake, IL

"12"
Burlington
Hearing
9/10/92

A. (Executive Summary, page IX, paragraph 4, last sentence.), If approved technologies develop and are viable alternatives to the antiquated landfill process, and are then used in our County, would the County put less reliance on landfilling? If so, would our County also maintain no greater volume importation of solid waste?

B. (Executive Summary, page IX, paragraph 5, last sentence.),

Question: Although the future facility would be controlled by the County, would the County operate the facility itself or contract the facility operations with a private firm? If with a private firm,will this process begin the selection through publicly open bidding?

~~C. (Executive Summary, page X, paragraph 6, last sentence.),~~ FIRST

~~Question: Will implementation (for time table purposes) of the plan begin on the date of approval by the County Board or with approval by the I.E.P.A.?~~

D. Chapter 1 Introduction, Overview of Plan; page 1, listing of associated reports;

Comment: We need a Technology Assessment for those listed and not listed in the area of Emerging and Innovative Solid Waste Technologies including that entitled in the list as "Municipal Solid Waste Composting".

E. Chapter 1 cont., Solid Waste Plan Provisions; page 2, item 4;

Question: Does the life cycle cost of any of the Solid Waste Technologies reviewed include the clean up cost of hazardous wastes should the site be listed on the Super Fund Clean-up List?

F. Chapter 1 cont., Table 1.1, Statement of Goals and Objectives; Item 2;

Question: Explain the topic of "political feasibility" in regards to this sentence on solid waste importation into the County for disposal. What does politics have to do with waste disposal?

G. Chapter 1 cont., Table 1.1, Statement of Goals and Objectives; Item 4;

This statement should replace the words "as much of" with "all of" in regards to our goals of recycling waste. The people of the County now want to recycle "as much of" the waste they generate now as practically and economically possible. Some of us have better habits developed at this than others, but I believe the sentiment already currently exists for all people in the County because it is common sense and the correct practice to do to ensure a clean world for the future. It also is an example of discipline for society. As a result, we would all respect each other and our environment more.

VIRGIL TOWNSHIP SOLID WASTE DISPOSAL DISTRICT

POST OFFICE BOX 52, MAPLE PARK, ILLINOIS 60151

Christi Gee

Response to Kane County Solid Waste Management Plan

The Virgil Township Solid Waste Disposal District, after careful consideration of the Kane County Solid Waste Management Plan, believes that the recommendation to immediately site a new landfill is wrong! There is *no* immediacy!

Currently, there is 11 years of landfill capacity left at Settler's Hill. The Solid Waste Plan calls for siting an additional 11 acres which, according to the Plan, will extend capacity another 5 years. (This is with the current rate of over 50% importation of out-of-county garbage.) If 11 acres gives us 5 years, thus bringing the total landfill capacity to 16 years, would not another 10 acres then give us the landfill capacity needed for the State mandated 20 year planning period? There is no immediate need for a new mega-landfill!

Kane needs to pay more heed to the environment and less to political expediency. We need to stop being a "garbage friendly" county. The County's current contractual agreement with Waste Management includes a clause guaranteeing them a minimum amount of waste to be disposed annually. This is a complete and utter disincentive to waste reduction and recycling. Siting a new mega-landfill would only further erode waste reduction and recycling efforts.

Kane currently imports over 50% of our disposed waste. Siting a new mega-landfill will only make this County a more inviting target for outside waste. Why should the citizens of Kane County sacrifice a valuable resource – our land – as well as fund a landfill for other counties' solid waste disposal needs?

For two years our County Board publicly stated that any new waste disposal facility would be for Kane County garbage only. In fact, they passed a resolution to that effect. Suddenly, with the eminent closure of DuPage's landfills, the Solid Waste Plan states that the County *will* accept waste from another jurisdiction which accepts an equal or greater quantity of Kane waste.

The Virgil Township Solid Waste Disposal District is deeply concerned that the waste Kane may import may be much more hazardous (i.e., contaminated soil) than the waste exported (i.e., yard waste).

The Virgil Township Solid Waste Disposal District believes that waste prevention, waste reduction, recycling, and reuse are very necessary and important components of any solid waste plan. These efforts should be put into effect immediately. In addition, we also believe that the Solid Waste Plan should include a front-end materials recovery facility that would further remove all recyclables from the waste stream. This could be an integrated part of any waste disposal system.

Above all, the Virgil Township Solid Waste Disposal District adamantly believes the County must look to science and new technology for solid waste disposal methods. To immediately commit our County to a new landfill is absurd when we have the luxury of 16 years time (16 years remaining landfill space) to search for alternative disposal systems! Landfilling is rapidly becoming outmoded technology.

The criteria for selecting a solid waste disposal system should not be which facility is least expensive in the short term or which is most immediately profitable! Criteria should not be based on this sort of economics, but rather on environmentally sound principles!

Solid waste planning should be an open process. All Kane citizens have a right to input into our County's solid waste planning, now and in the future. Public comments and recommendations should be considered in developing and in implementing the Plan.

Importantly, the Virgil Township Solid Waste Disposal District by law has a key role in any solid waste disposal decisions effecting the Township.

April 12, 1990
Executive Session Re: Land Acquisition EX. 46

The Kane County Board met as the Committee of the Whole, vent into executive session commencing at approx. 9:35 a.m. on Thursday, April 12, 1990 in the Board Room, Bldg. A, Kane County Government Center, Geneva, IL.

Members present: Chairman Miller, Bermes, Cameron, Clusen, Damisch, DeStefano, Doederlein, Douglas, Elfstrom, Fleming, Hess, Kammerer, Kerasiotis, Ledebuhr, Patterson, Richards, Schoengart, Sharp, Shoemaker, Shoop, Taylor, Tooley, Vauchope, Wolff, Yurs. Also present: Development Dept. Dir. Bus, Development Dept. staff Seiben & environmental consultant Young, Ass't. State's Attnys. Jaeger and Sullivan, and County Board staff Ruppert and Keasler (recording the meeting).

Entered into executive session for the purpose of discussing land acquisition, on a motion by Elfstrom, seconded by Clusen. Motion carried unanimously.

Chairman Miller relinquished chairmanship to Landfill Liaison, Mr. Elfstrom. Elfstrom introduced Richard Young, environmental consultant and former Environmental Division Director for the County. Young commented on background of County landfills, pointing out uniqueness of Settler's Hill, where one can play golf on top of a landfill, and where methane gas is utilized for electricity.

Elfstrom explained the process that will be needed to determine a site for a new landfill: Determination of landfill site; hiring of County-wide solid waste planner. Elfstrom explained that siting a new landfill is more difficult that expanding an existing landfill. Stated that the existing landfill is being run extremely well. Need is to try to duplicate that at some other location in the County. Regardless of recycling, composting, etc., a landfill will be needed at the end of the process. The biggest deterrent to siting a landfill is the people who live in the area; therefore, siting needs to be done while a minimum number of people are living in the area; will become more difficult with time. A solid waste plan will be needed to go along with the siting of a new facility.

Elfstrom stated that a site needs to be chosen so that everybody in the County knows this is where the solid waste will be deposited. Also, recycling coordinator/landfill planner needs to be hired to put the Board's decision into a plan. Elfstrom encouraged advertising for such position immediately.

Elfstrom displayed a Proposed Landfill Concept drawing and explained the aspects of the proposed concept. Area shown in Concept was 1000 acres of landfill and 1000 acres of Forest Preserve; any actual landfill activity would be kept 1/4 to 1/3 mile minimum distance from population. Elfstrom suggested that existing farmhouses around the perimeter of the site could remain, or County could offer to purchase them rather than obtaining them by condemnation. Elfstrom suggested various uses for the buffer area around the landfill.

Elfstrom stated that condemnation will be necessary to obtain 1000 to 2000 acres. On a 2000 acre site, approx. 15-16 farmsteads can be expected to be found. Property will not need to be assembled for 4-5 years, which leaves room for negotiations in purchase of land. Obtaining property will also result in taking 2000 acres off tax rolls.

Nev landfill is projected for only Kane County garbage, unless the Board decides differently at some time in the future. Elfstrom stated that Waste Management is not a consideration in this matter; there is nothing in what is being done that will in any way tie the operation to any specific contract operator.

Elfstrom said that staff had looked for sites with less than 10 dwelling units per square mile; expects that 25-30 dwelling units will be involved in condemnation. Elfstrom requested that Board members consider the County as a whole; 12,000 people in each of their districts need a place to put their garbage in the future. Contract on nev landfill would be different from previous one; presently taking in approx. $3.2 million per year. Expects that putting together 2000 acres would cost approx. $20 million. Revenue is available without a tax burden or taking anything out of existing landfill operation.

Elfstrom asked the Board to consider: (1) If they want one landfill or two; (2) how big; (3) should it have a buffer area; (4) how much buffer; (5) early uses of buffer; (6) conceptual plan for final use of buffer; (7) where to locate landfill.

Elfstrom explained that two landfills of 500 acres each with buffers would require more total acres than one 1000 acre landfill; also, a square space is more productive than oblong; two landfills would cost double to run. Elfstrom showed a sample of a sign which would be placed around landfill area when it is chosen, to inform citizens that this is a future landfill site. Regarding size, Elfstrom stated that a larger landfill would mean more park; longer period of use. Site chosen will partly determine size. Elfstrom stated that buffers have worked well in the past; size of buffer could be determined later, as well as uses of the buffer area. Where to locate the landfill i the hardest decision.

Elfstrom turned meeting over to Development Dir. Bus to explain the criteria used by staff to locate possible sites...displaying maps and overlays:

> GROUNDWATER PROTECTION: hydrological investigations, shallow groundwater resources, prairie aquigroups, Newark Aquifer, 270,000 gpd/ft transmissivity, 50 mgd long term yield; GEOLOGIC SUITABILITY: Tiskilwa Till member, relatively uniform composition, Deposit 200 to 300 ft.thick, 10 to minus 7 cm/sec hydraulic conductivity, geology for planning in Kane County; LAND USE AND POPULATION: existing land use and 325,000 pop.-1990 est., density less than 10 d.u./sq.mi., Year 2000 proposed land use, municipal 1 1/2 mi. planning areas, 2010 population forecast of 434,000; SURFACE ENVIRONMENTAL FEATURES: floodplains and wetlands, wooded areas and prairie, wildlife habitats, slope and topography; and TRANSPORTATION AND LOCATION: 15 mi. radius of population, state and federal highways, county and township roads, weight limits and traffic impact.

Final overlay identified five best sites meeting criteria of within 15 mi. radius of population, outside of 1 1/2 mi. municipality planning area, within Tiskilwa Till 50 ft. thick, not subject to urbanization, and having no more than 10 dwelling units per square mile. Bus identified the sites by surrounding highway names; acreage was from 1,000 to 4,000 acres.

Discussion and answer period followed. Elfstrom said you may have to vacate some existing rural unpaved roads. Said that you will want to come back and see maps, see who owns property, size of farms, specifics, legals, know end use. Said that staff could do this for all 5 sites, but if staff could rank the sites, why not zero in on two or three sites for specifics. If site is 15-30 miles from population, you might want to look at a transfer station. Bus said long range - transfer & recycling station; the average pick-up truck wouldn't go to any of the landfill sites. Elfstrom said the rating could be presented the middle of May or first of June or even into June. Bus said it would take at least 30 days to do a good analysis of total 5 using a matrix and computer approach to settle on two or three. Elfstrom said these are the only sites that meet the important criteria. (Shoop left meeting)

Elfstrom asked: Is there anybody that thinks we need two landfills (no reply); Is everybody thinking that as a start, we should look for 1,000 acres with 1,000 acre buffer (affirmative response); Is anybody thinking we shouldn't try to get a buffer (no reply). Elfstrom: go back and rank 5 sites and we will do a detailed analysis for 3 sites sometime in May or early June/July, consider and adopt.

Doederlein suggested that staff prioritize the sites and provide details on 2 or 3 highest rated areas. Elfstrom suggested that the staff then make definitive site analysis on three top choices: including property owners, use, legal descriptions, any information not available from the general study. Schoengart asked if Board members had any additional criteria they would like applied to the sites (no response). Wauchope suggested 2 or 3 Board members be involved in the study to assess political impact. (Shoop and Kerasiotis left meeting). Kammerer: Doesn't object size-wise, but we should have an opportunity to make a change. Elfstrom: You will. Kammerer suggested considering the cost of improving nearby County roads. Miller suggested that the site's proximity to State highways be considered in relation to needs for future road improvements; would like State assistance to cover high costs of infrastructure. Fleming: we have a 10 yr. lead time on the operation to allow for planning (of roads). Shoemaker suggested press be informed of the landfill siting criteria. Elfstrom responded Yes, that "bus can explain it, don't you try it." Sharp expressed concern re: DeKalb Co.'s proximity to site. Doederlein responded that you could use only a portion of the acreage, and not necessarily the part closest to DeKalb County. Damisch suggested consulting with townships and school districts in priority areas--they're short of money. Schoengart responded that the Board should take those needs into consideration, but not to involve other taxing bodies during this investigatory period.

Elfstrom reviewed what had been agreed by consensus: one landfill site rather than two; site of approx. 1000 acres plus 1000 acre buffer; desire for buffer area; staff to rank the sites "1 through 5" and do detailed analysis on three sites; report back to Board at the end of May or early June for Board's consideration and approval.

Returned to regular session. on a motion by Elfstrom, seconded by Ledebuhr. Motion carried unanimously. Board Chairman Miller asked for the Committee to adjourn to Wed., May 2, 1990 at 9:30 a.m. for a special Board Meeting so the architects could provide information on the proposed new Kane County Judicial Center and Phase I of the Courthouse building program. So moved by Patterson, seconded by Wolff, and carried unanimously.

Meeting adjourned at approximately 11:50 a.m.

Bobette Keasler and Mary Ruppert,
Clerks Pro Tem

APPROVED:
Frank R. Miller,
Chairman
Kane County Board

BOARD MUST RESCIND!

STATE OF ILLINOIS

COUNTY OF KANE

RESOLUTION NO. 90 - 37

** ~~ADOPTING SOLID WASTE PLAN~~
ADOPTING A SOLID WASTE DISPOSAL PREFERENCE

WHEREAS, the County Board must have an adopted Solid Waste Plan submitted to the Illinois E.P.A. by March 1, 1991; and

WHEREAS, the Solid Waste Plan will include recommendation on waste reduction, recycling and composting, all of which enjoy the full support of the Kane County Board; and

WHEREAS, the Solid Waste Plan must also include a method, be it incineration or landfilling, as the intended and accepted means of municipal waste disposal over the next twenty (20) years; and

WHEREAS, the County Board has yet to indicate its preference for either technology;

NOW, THEREFORE, BE IT RESOLVED, by the Kane County Board, that * landfill will be the primary method of waste disposal for Kane County, and that it is the wish of the County Board that all County Solid Waste planning documents incorporate this decision.

Passed by the Kane County Board on February 13, 1990

Clerk, County Board
Kane County, Illinois

Chairman, County Board
Kane County, Illinois

* A roll call vote will be requested, and the Board Member response will be "landfill" or "incinerator".

** Name changed on floor at Board Meeting.

AMEND TO DELETE REFERENCE TO RESOLUTION 90-37

STATE OF ILLINOIS

COUNTY OF KANE

RESOLUTION NO. 90 - 115

EXCLUSIVE USE OF THE PROPOSED KANE COUNTY LANDFILL

WHEREAS, the County Board of Kane County deems it necessary and provident to plan for an adequate, safe and fiscally responsible means for the disposal of waste produced within Kane County, and

WHEREAS, the County Board has established a preference for the disposal of municipal waste by means of landfill as set forth in Resolution 90-37, and

WHEREAS, the County Board anticipates the purchase and siting of a new landfill and desires to inform and reassure the citizens of Kane County both as to the source and content of the waste to be disposed of in said landfill, and

WHEREAS, the proposed landfill to be located in unincorporated Kane County shall be owned by the County of Kane and those municipalities predominantly located within Kane County acquiring an ownership interest in said landfill,

NOW, THEREFORE, BE IT RESOLVED by the Kane County Board that the proposed Kane County landfill shall be used exclusively for the disposal of waste from the County of Kane and those municipalities in Kane acquiring an ownership of interest therein, and

BE IT FURTHER RESOLVED by the Kane County Board that the content of the waste to be disposed of in said landfill shall be restricted to municipal waste as defined by guidelines established by the United States Environmental Protection Agency.

Passed by the Kane County Board on May 29, 1990

Lorraine P. Lewis
Clerk, County Board
Kane County, Illinois

Frank R. Miller
Chairman, County Board
Kane County, Illinois

STATE OF ILLINOIS

COUNTY OF KANE

RESOLUTION NO. 90 - 116

REQUESTING THE PUBLIC BUILDING COMMISSION TO ACQUIRE
REAL ESTATE FOR LANDFILL PURPOSES AND TO IMPROVE SAID REAL ESTATE

WHEREAS, the County Board of Kane County recognizes the need to undertake the acquisition of real estate for landfill purposes and to make improvements to said real estate in connection with the use of such property for landfill purposes; and

WHEREAS, said acquisition and improvements are estimated to cost approximately $25,000,000.00; and

WHEREAS, the Public Building Commission of Kane County, in the exercise of its statutory powers, is deemed to be the appropriate vehicle for undertaking this land acquisition and improvement project;

NOW, THEREFORE, BE IT RESOLVED by the County Board of Kane County that it is in the best interest of the citizens of Kane County to request the Public Building Commission of Kane County to:

1. Undertake the acquisition of the real estate described in Exhibit A, attached hereto and made a part hereof, by purchase or eminent domain, and undertake the acquisition of the real estate described in Exhibit B by purchase only, to improve such real estate in connection with its use for landfill purposes in accordance with plans and specifications to be prepared at a later date; and with a condition that said land revert to Kane County upon the payment in full of any revenue bonds associated with this project.

2. Finance the cost of said land acquisition by way of the receipt of grants from the County of Kane in the amount of $18,000,000.00 payable in installments of $3,000,000.00 per year for six (6) years;

3. Finance any land acquisition and improvement costs not covered by the grants referred to hereinabove by the issuance of Revenue Bonds; and

BE IT FURTHER RESOLVED that the County of Kane enter into a lease with the Public Building Commission of Kane County for the use and occupancy of the property and improvements described in Exhibits A & B, attached hereto and made a part hereof, by the County of Kane for a term certain. It is the intention of the Kane County Board to abate any and all levies adopted to fund the lease payments under any lease with the Public Building Commission of Kane County utilizing additional sums from the Enterprise Surcharge and Enterprise Landfill Funds, as may be deemed appropriate by the Kane County Board; and

BE IT FURTHER RESOLVED that the County Clerk of Kane County send a certified copy of this Resolution to the Secretary of the Public Building Commission of Kane County.

TABLED
~~Passed~~ by the Kane County Board on _____.

_____
Clerk, County Board
Kane County, Illinois

_____
Chairman, County Board
Kane County, Illinois

Committee

STATE OF ILLINOIS

COUNTY OF KANE

RESOLUTION NO. 90 - 117

REQUESTING SPECIFIC STUDIES CONCERNING
SOLID WASTE DISPOSAL

WHEREAS, the Kane County Board is required by the Illinois Solid Waste Planning and Recycling Act to submit a solid waste plan to the Illinois E.P.A. by March 1, 1991; and

WHEREAS, the Kane County Board has by Resolution 90-37 adopted a solid waste preference of landfilling as the primary method of waste disposal for the next twenty years;

NOW, THEREFORE, BE IT RESOLVED by the Kane County Board that it recognizes it responsibility to be fully informed as to the available options of volume and waste reduction, source recycling, composting and waste to energy systems as they relate to siting and space requirements of landfilling; and

BE IT FURTHER RESOLVED that a solid waste advisory committee be formed to include members from Kane County, Kane County municipal governmental bodies, civic and industrial organizations, environmental groups, and the Kane County solid waste industry to provide information, leadership and expertise to accomplish volume reduction at the source; recycling options and establishing methods to attain those goals; development and siting of composting facilities; waste to energy options; and cost estimates of developing a comprehensive plan to be implemented over a twenty-year period.

BE IT FURTHER RESOLVED that the Kane County Board vote to determine the size of and site for any future landfill within Kane County only after completion of the aforementioned studies.

Passed by the Kane County Board on _____.

_____	_____
Clerk, County Board Kane County, Illinois	Chairman, County Board Kane County, Illinois

Referred to Co Development Co.
(Rules not suspended to read Resolution)
See June 12th meeting Res # 90-144.

AMEND 10: DELETE REFERENCE TO RESOLUTION 90-37

DELETE "AS THEY RELATE TO SITING AND SPACE REQUIREMENTS OF LANDFILLING"

STATE OF ILLINOIS

COUNTY OF KANE

RESOLUTION NO. 90 - 144

REQUESTING SPECIFIC STUDIES CONCERNING
SOLID WASTE DISPOSAL

WHEREAS, the Kane County Board is required by the Illinois Solid Waste Planning and Recycling Act to submit a solid waste plan to the Illinois E.P.A. by March 1, 1991; and

WHEREAS, the Kane County Board has, by Resolution 90-37 adopted a solid waste preference of landfilling as the primary method of waste disposal for the next twenty years; and by Resolution 90-115 established exclusive use of the proposed Kane County landfill;

NOW, THEREFORE, BE IT RESOLVED by the Kane County Board that it recognizes its responsibility to be fully informed as to the available options of volume and waste reduction, source recycling, composting and waste to energy systems as they relate to siting and space requirements of landfilling; and

BE IT FURTHER RESOLVED that a solid waste plan advisory committee be formed to include members from Kane County, Kane County municipal governmental bodies, civic and industrial organizations, environmental groups, and the Kane County solid waste industry to provide information, leadership and expertise to accomplish volume reduction at the source; recycling options and establishing methods to attain those goals; development and siting of composting facilities; waste to energy options; and cost estimates of developing a comprehensive plan to be implemented over a twenty-year period.

Passed by the Kane County Board on June 12, 1990

Lorraine P. Sauer
Clerk, County Board
Kane County, Illinois

Frank R. Mueller
Chairman, County Board
Kane County, Illinois

Exhibit 14 Burling 1337
Name 9/11/12

My name is Charles Sauber. I have lived the first 72 years of my life in Kane County - most of it in Virgil. My farther Paul P. Sauber served on the County Board of Supervisors for many years. My wife and I raised fifteen children, have 42 grandchildren and three great grandchildren. I am an inventor with more than two dozen patents and founded a company that develops and markets these products. We have sixty-two people working with us in a company called Sauber Mfg. in Virgil. I'm telling you this to let you know, as they say, where I'm coming from.

Inventors believe in the future, in change, and most of all in hunting truth. About this land fill - pilling refuse up is strictly the way of the past. Japan, for example cubes and compacts their refuse and turns it into energy and composted plant food. It is my belief that the future is not a pile of debris that blows around fouling the air and polluting the water and covering productive farm land.

Time is really on our side if we do not commit to these methods of the past. If a barn were to burn in 10 to 15 years would we send the fire truck out there now? The song "Fools rush in where angles dare to tread" highlights this folly.

The county board members of the recent past can be remembered for a $ 30 million bond issue for the forest preserve to circumvent the law, a $ 30 million plus new court house and a $ 5 million ball park and a ton of offices in many county-owned and rented locations.

Will they please stop this farce and let new and hopefully brighter minds look to the way of the future with solutions instead of repeating the failures of the past.

Kane County
Solid Waste Management Plan

Addendum Number 1

To

Volume IV

Comments
Received During June 3 - September 2, 1992
Public Review Period

October, 1992

ADDENDUM NUMBER 1

TO

VOLUME IV: Comments Received During June 3 - September 2, 1992 Public Review Period

Note: These comments had been received by the Hearing Officer from interested parties, but had not been submitted to the County until after the Volume IV compilation of public comments had been printed.

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My name is Jerry Zakosek. I am a graduate of Northern Illinois University with a degree in Accounting. I am a licensed CPA and currently work as the Vice President of Finance in a private sector. I am a member of a number of professional accounting and financial associations. My experience includes 7 years in Big 8 public accounting and 15 years in industry. I offer this information as evidence of my ability to competently speak of financial and economic issues, including cost of capital investments.

Before I address the economic issues of the plan, I would like the hearing officer, board members and solid waste committee members to consider the feelings of local residents. As far as I can see, this plan does not contain any limitation as to size. I believe board members that I have talked to that said the 1,000 acre landfill is dead. The problem is that a 500 acre landfill will grow to 800 acres or more when you have a contract that guarantees importation of garbage and you have a plan that readily accepts importation of garbage.

I hope everyone has taken the opportunity to look at the original concept drawing that showed the whole 2,000 acre project. The Lily Lake school which is located only a few miles from here was to be replaced free as part of this project. On May 29, 1990, the county was ready to vote to acquire a central piece of land and then buy land as prices fell. Phil Elfstrom even had signs printed up that were to be placed on this land so that people would know that this was a future landfill site. What would that have done to prices? The real problem is that no one officially has said in public that the original plan was wrong and that the county really caused a lot of suffering by families in this area that was unnecessary.

2

The first issue that I would like to address is the cost of disposal. Many people believe that their cost of the waste service that they receive is in fact the tipping fee. That is not true. The cost that the citizen pays for curbside disposal includes much more than a tipping fee. It includes the cost of the person picking it up as well as the trucking cost and the profit for the hauler. The tipping fee is the cost of dumping a truck load of garbage at a landfill. The most recent rule of thumb that I have heard for our area is that $1 of every $3 paid by the customer goes for the tipping fee. Thus, $2 pays for other costs and the hauler profit. That is an important point to remember when you address the major concerns regarding the cost of disposal.

Gary Mielke has concluded in this report that landfilling is the cheapest form of disposal. To one not accustomed to financial analysis, that may appear to be true; however, in fact, he is wrong. A landfill is the easiest form of disposal and the most profitable to the landfill operator. (I have attached an article from the Wall Street Journal that supports this profitability comment.) (Exhibit I)

A landfill is nothing more than a box to store waste. If you fill your closet with garbage, at some point it will begin to ooze under the door and you will have to effectively do something with it. You simply can't ignore it. Landfills, while they are in the ground, are no different. Last week you saw the estimated clean up for the Tri-County landfill of $13 million, which will only contain the problem and not really eliminate it. That landfill will be monitored forever – for as long as your children's grandchildren, and so on, are in Kane County.

The real cost of a landfill comes 10 or 15 years after it accepts garbage or after it closes. Our county is currently paying Waste Management a post closure fee of $5.21 per ton tipped at Settler's Hill. If this money was put in a trust at an 8% interest rate, the fund would have $79,000,000 at the closure time. Ten years later this fund would be worth $175,589,000. (Exhibit II) This should be an indication of the second cost of a landfill. Unfortunately our county does not have a fund set up, this money goes to Waste Management profits.

When a landfill becomes old, it doesn't go to a nursing home. Someone must take care of it forever because what is put into a landfill never goes away. Settler's Hill will be there forever and future residents of Kane County will pay for the care once the operator is able to walk away from it in 20 years. There is no trust fund established for it. State and Federal dollars will pay for a clean up when it is needed, just like Tri-County which has a current first phase price tag of $13,000,000. Wouldn't that money be better spent on education? How could these post closure costs or concerns not be included as costs?

Blackwell and Tri-County landfills were once "state of the art" facilities. Every landfill was created with the best technology available at the time, but twenty years later they leak. Who would even site a landfill using "old technology"?

Thus the cost of a landfill is the cost now and the cost later. If there is no later cost, why are we paying the operator of Settler's Hill the equivalent of $175,000,000 for post closure? We all know that local governments are talked into using the covered garbage until there is a problem with the cap, like Tri-County.

4

I think that when you look at all costs, landfills are not the cheapest form of disposal. They last forever. The cost never ends. The cost never ends -- until the taxpayer pays for the clean up.

The cheapest form of disposal is composting and recycling because the waste is gone. You never have a second cost.

The second financial myth that must be addressed is the fact that we need land "now". (Exhibit III)

The last point I would like to be considered is at any time one makes a decision that is far different from what people do, one should know why they see the situation/circumstances differently. At times there are certainly valid reasons for not following the crowd and doing different things. However, before you site a landfill, wouldn't it be advisable to consider why most areas of this state that are in areas of high economic development, do not want landfills? Look to McHenry County, look to surrounding counties, look to Will County and perhaps even talk to people in other states and find out why they do not want landfills. But what perhaps you should really ask the planners of this county is why they want one here when other areas prefer not to exist with them. If someone can come up with the answer of why a landfill is good for Kane County when it is not good for McHenry County, etc., then perhaps many of us could accept it. The answer, however, is not one I think that most of the people of this county would like to hear. There is no reason to have a new landfill in Kane County, other than the fact that this county has tainted itself by taking contributions that should never have been accepted.

The only thing that makes sense for this county to do is recycle every possible bit of

waste and avoid putting it into a container that will be dealt with at some later time. And most assuredly, we must stop taking in garbage from other areas. Why do we need their problems? The reason we have their problems is economic. It is because there is such a profit in garbage. You simply need to consult an annual report to find out the profit that is available for landfills. Landfills are like gold mines because most people do want to be associated with them. They leak, they smell, they cause problems, but when one is sited, it is in fact a gold mine.

In Kane County, we even take part of the money and pay for projects that local citizens would not approve spending tax dollars on. These are stadium projects, canoe chutes, and so on. How are these recreational activities related to garbage? I understand why downstate counties site landfills, because they have little economic security. But in Kane, we sell prime property to build golf courses and canoe chutes and other "recreation".

JFZ
Exhibit
8/11/92

ORIGINAL ELFSTROM CONCEPT

The plan from day one was for a huge facility that would open immediately.

Original proposal -- $20,000,000 investment.

Interest annually -- $20,000,000 x 8% = $1,600,000 annual cost

Cost of maintenance?

Assume Cost	$20,000,000
Interest $1,600,000 for 15 years	24,000,000
	$44,000,000

Where would the $44,000,000 have come from? No change to existing landfill, no taxes.

The only conclusion is that this $44,000,000 would come from opening the landfill to out-of-county and out-of-state immediately.

Elfstrom said that staff had looked for sites with less than 10 dvelling units per square mile; expects that 25-30 dvelling units will be involved in condemnation. Elfstrom requested that Board members consider the County as a vhole; 12,000 people in each of their districts need a place to put their garbage in the future. Contract on nev landfill vould be different from previous one; presently taking in approx. $3.2 million per year. Expects that putting together 2000 acres would cost approx. $20 million. Revenue is available without a tax burden or taking anything out of existing landfill operation.

Elfstrom asked the Board to consider: (1) If they vant one landfill or tvo; (2) hov big; (3) should it have a buffer area; (4) hov much buffer; (5) early uses of buffer; (6) conceptual plan for final use of buffer; (7) vhere to locate landfill.

Elfstrom explained that tvo landfills of 500 acres each vith buffers vould require more total acres than one 1000 acre landfill; also, a square space is more productive than oblong; tvo landfills vould cost double to run. Elfstrom shoved a sample of a sign vhich would be placed around landfill area vhen it is chosen, to inform citizens that this is a future landfill site. Regarding size, Elfstrom stated that a larger landfill vould mean more park; longer period of use. Site chosen will partly determine size. Elfstrom stated that buffers have vorked vell in the past; size of buffer could be determined later, as vell as uses of the buffer area. Vhere to locate the landfill is the hardest decision.

Elfstrom turned meeting over to Development Dir. Bus to explain the criteria used by staff to locate possible sites...displaying maps and overlays:

> GROUNDVATER PROTECTION: hydrological investigations, shallov groundvater resources, prairie aquigroups, Nevark Aquifer, 270,000 gpd/ft transmissivity, 50 mgd long term yield; GEOLOGIC SUITABILITY: Tiskilva Till member, relatively uniform composition, Deposit 200 to 300 ft.thick, 10 to minus 7 cm/sec hydraulic conductivity, geology for planning in Kane County; LAND USE AND POPULATION: existing land use and 325,000 pop.-1990 est., density less than 10 d.u./sq.mi., Year 2000 proposed land use, municipal 1 1/2 mi. planning areas, 2010 population forecast of 434,000; SURFACE ENVIRONMENTAL FEATURES: floodplains and vetlands, vooded areas and prairie, vildlife habitats, slope and topography; and TRANSPORTATION AND LOCATION: 15 mi. radius of population, state and federal highvays, county and township roads, veight limits and traffic impact.

Final overlay identified five best sites meeting criteria of within 15 mi. radius of population, outside of 1 1/2 mi. municipality planning area, within Tiskilva Till 50 ft. thick, not subject to urbanization, and having no more than 10 dvelling units per square mile. Bus identified the sites by surrounding highvay names; acreage vas from 1,000 to 4,000 acres.

April 12, 1990
Executive Session Re: Land Acquisition EX-46

The Kane County Board met as the Committee of the Whole, vent into executive sessio commencing at approx. 9:35 a.m. on Thursday, April 12, 1990 in the Board Room, Bldg. A Kane County Government Center, Geneva, IL.

Members present: Chairman Miller, Bermes, Cameron, Clusen, Damisch, DeStefano Doederlein, Douglas, Elfstrom, Fleming, Hess, Kammerer, Kerasiotis, Ledebuhr Patterson, Richards, Schoengart, Sharp, Shoemaker, Shoop, Taylor, Tooley, Vauchope Wolff, Yurs. Also present: Development Dept. Dir. Bus, Development Dept. staff Seiben environmental consultant Young, Ass't. State's Attnys. Jaeger and Sullivan, and Count Board staff Ruppert and Keasler (recording the meeting).

Entered into executive session for the purpose of discussing land acquisition, on motion by Elfstrom, seconded by Clusen. Motion carried unanimously.

Chairman Miller relinquished chairmanship to Landfill Liaison, Mr. Elfstrom. Elfstro introduced Richard Young, environmental consultant and former Environmental Divisio Director for the County. Young commented on background of County landfills, pointin out uniqueness of Settler's Hill, where one can play golf on top of a landfill, an where methane gas is utilized for electricity.

Elfstrom explained the process that will be needed to determine a site for a ne landfill: Determination of landfill site; hiring of County-wide solid vaste planner Elfstrom explained that siting a nev landfill is more difficult that expanding a existing landfill. Stated that the existing landfill is being run extremely well. Nee is to try to duplicate that at some other location in the County. Regardless o recycling, composting, etc., a landfill will be needed at the end of the process. Th biggest deterrent to siting a landfill is the people who live in the area; therefore siting needs to be done while a minimum number of people are living in the area; wil become more difficult with time. A solid vaste plan will be needed to go along with th siting of a nev facility.

Elfstrom stated that a site needs to be chosen so that everybody in the County knov this is where the solid vaste will be deposited. Also, recycling coordinator/landfil planner needs to be hired to put the Board's decision into a plan. Elfstrom encourage advertising for such position immediately.

Elfstrom displayed a Proposed Landfill Concept drawing and explained the aspects of th proposed concept. Area shovn in Concept was 1000 acres of landfill and 1000 acres o Forest Preserve; any actual landfill activity would be kept 1/4 to 1/3 mile minimu distance from population. Elfstrom suggested that existing farmhouses around th perimeter of the site could remain, or County could offer to purchase them rather tha obtaining them by condemnation. Elfstrom suggested various uses for the buffer are around the landfill.

Elfstrom stated that condemnation will be necessary to obtain 1000 to 2000 acres. On 2000 acre site, approx. 15-16 farmsteads can be expected to be found. Property will no need to be assembled for 4-5 years, which leaves room for negotiations in purchase o land. Obtaining property will also result in taking 2000 acres off tax rolls.

Nev landfill is projected for only Kane County garbage, unless the Board decide differently at some time in the future. Elfstrom stated that Vaste Management is not consideration in this matter; there is nothing in what is being done that will in an vay tie the operation to any specific contract operator.

Comments on the Kane County Solid Waste Management Plan, May 1992, Public Review Draft

My name is David Gossman. I have a B.S. and M.S. from Michigan State University in Interdisciplinary Physical Science. I have spent the last 12 years in industrial waste recycling and am currently President of Gossman Consulting, Inc. I live at 45W962 Plank Road, Hampshire, IL. My comments are those of an individual with no affiliation whatsoever.

As I examined the plan, on the surface, I got a good impression, but in reality the plan is badly flawed. What should be the last resort - a landfill, is the first resort. The plan is technically and factually flawed. In order to focus on just one aspect of the plan, I examined Appendix G in some detail, focussing on the cost estimates. Landfill costs are drastically understated.

- Land acquisition costs show $1,500 an acre. This might be possible - at the point of a gun.
- Post closure costs are given for only five years, but the law requires thirty years.
- Leachate disposal costs are given at 6 cents a gallon. That might pay for the transportation of the waste, but not the disposal.
- New regulations will substantially increase all the costs given. Leachate may be a hazardous waste under proposed EPA regulations, and thus it will be much more expensive to dispose of.
- Groundwater monitoring is estimated at only one to two tests a year for the first 5 years of closure, but in reality, much more extensive testing will be required. (Section 811.319 of the Illinois Solid and Special Waste Management Regulations requires quarterly testing for 15 years).
- There is no provision for estimating the cost of preventing surface runoff from the landfill, or treating surface runoff that might be collected.
- Siting and permitting costs assume an uncontested process, which is absurd.
- A financial assurance fund was not provided as required.

- No synthetic liner or cap is called for in the landfill cost estimate, only a clay liner and cap. Landfills are no longer constructed in this manner. Illinois regulations require a five foot thick clay liner, not the three foot specified in the plan. It is doubtful that a permit would be approved without the use of a synthetic liner.

A $20.00 per ton tipping fee cost is given in the appendix, but a $30 fee is given in the plan. This option needs a complete revision and reconsideration. I suspect the other options may be as severely flawed in their analysis. (Pages F-30 through F-37 were missing: they apparently contain the cost estimate for thermal treatment).

A major omission in the plan is the lack of coordination with the other waste management units in the county. Nor are there are any projections on how recycling and waste reduction will impact the existing landfill lifetimes. The plan violates the solid waste hierarchy established by state law and federal regulations. There is no provision in the plan for monitoring changes in regulations.

There is no provision in the plan for dealing with special waste and contaminated soils. Organically contaminated soils should be thermally treated and should be banned immediately from landfills. Tires should also be immediately banned from landfills. Tires are too valuable a resource to be disposed of in landfills.

For chemical and hazardous waste: why not set up household hazardous waste collection programs now? Why wait for the IEPA to fund with a grant some program in the unknown future?!

Refuse derived fuel (RDF) plants should be examined as an alternative to a landfill. Cement plants can use RDF as a fuel. Power plants may also use RDF. A single cement plant could burn 50-100 tons/day of RDF, power plants even more.

Instead of siting a new facility over the next 5 years, and monitoring alternatives, why not spend the next five years developing alternatives and monitoring the need for a new landfill?!

Attorney Robert Foote
8 E. Galena Ave.
Aurora, IL 60507

August 14, 1992

Dear Bob:

I would like these remarks entered into the public record as testimony from me as a private citizen.

I have been involved with and read the submitted Solid Waste Plan for Kane County, and as I reread the document that has been submitted for public hearing I kept asking myself the following questions.

1. Was a resolution made by the Advisory Committee to pass this document on to the Development Committee?

2. What is the plan? I don't see a plan in this document:

3. Is the Development Committee to draft a plan from this document?,

4. How will changes in Federal and State law effect a plan?

5. What size is needed if all the 3 R's (recycle, reuse, reduce) are done?

6. Isn't the data in this document outdated, it is 2 years old or more; haven't things changed?

Some of my suggestions to the plan are these:

1. the plan in its present form has to have some directions, we have the specs now lets have a blueprint to start building.

2. The plan as presented doesn't mention a site close to where the solid waste is produced. I think it should be to save time and money.

3. What size if all the alternatives are used.

4. We should work very hard to have State and Federal laws passed to mandate reduction of waste, and mandated recycling done by everyone.

5. I agree that a Solid Waste Authority should be established by the County Board, appointment by the County Board Chairman, and approval by the County Board to be done as soon as feasible.

6. Solid Waste Authority would adopt and administrate the plan, hire the staff, run the programs, and set the budget.

7. The Solid Waste Authority should establish to operate a budget from the user fees, tipping fees, license fees, not tax dollars.

I compliment the Citizens Advisory Committee, and Gary Mielke for their many hours of dedicated service for gathering all of the information that they gave to us in this document, we could not have come to this point without their help.

I look forward to working for and with these fine people in the future to development of the very best solid waste plan for the citizens and future citizens of Kane County.

Respectfully submitted,

Patricia Sjurseth

Patricia Sjurseth
12N040 Randall Rd.
Elgin, IL 60123

Copy to: Gary Mielke, Director
Kane County Solid Waste.

AN ANALYSIS OF THE KANE COUNTY SOLID WASTE MANAGEMENT PLAN

August 30, 1992

by

THOMAS N. OSRAN

EDKO Board member

Contains:

1. The 32 factual misstatements in the Plan;
2. EDKO's Thomas N. Osran's report;
3. Osran's Beacon-News columns dated 7/21 and 8/24;
4. Kane Co. Board minutes of closed meeting on 4-12-90 where Elfstrom's landfill plan was shared with the rest of the Board.

Thomas N. Osran analysis of 32 specific errors, mistatements or false statements of fact in the Kane County Solid Waste Management Plan.

LIE: 1. That the Kane County Solid Waste "Mangement" Plan is, in fact, a solid waste plan.

TRUTH: The Plan is a thin, shabby sham plan that is totally devoid of the solid waste science and analysis that is required by Illinois law. The Plan is so poor that it indicates Mielke's contempt for the intelligence of the Kane County Board, taxpayers and citizens. It appears to be a blatant ripoff off the Lake County Solid Waste Plan.

LIE: 2. The County must immediately begin selecting a site for a new landfill in western Kane County.

TRUTH: There is no rush; the plan points out that current landfills have 16 years of life left. The plan contains no anaylsis supporting the immediate need for new landfill. In fact, the plan states a new landfill for Kane won't be needed until the year 2008. By that time, waste alternatives to landfills will be far more available than today. There's no hurry. But if a new landfill site is acquired, there will be no landfill alternatives in Kane County's future.

LIE: 3. The Plan complies with the Illinois law: the Solid Waste Planning and Recycling Act.

TRUTH: The Plan does not comply with the law in several basic ways. It does not contain a description of the facilities proposed and the cost and economic impact of the facility. The S.W.P. & R Act also requires compliance with the Illinois Solid Waste Act's solid waste heirarchy. Since the Plan does not comply with the hierarchy, it also violates the S.W.P. & R. Act.

LIE: 4. The Plan complies with the Illinois Solid Waste Management Act.

TRUTH: The Plan reversed the mandatory solid waste heirarchy contained in this law. That law states that landfills are the least desirable garbage option and should be used only as a last resort after alternatives have been used. The Kane Plan leaps to a landfill as the first option, thus violating the Act.

LIE: 5. The County will just select and acquire the site now, but not use it for 16 years.

TRUTH: If the County acquires the land, it will need to open the

landfill as soon as possible just to pay off the bonds used to buy the land.

LIE: 6. The County needs to select the site to "save" the land from development.

TRUTH: The County controls development in unincorporated areas of Kane County through the development department. The County's "fear" that all potential sites will be developed by the time a new dump is needed is ludicrous given the fact that their own development department controls growth in Kane County. If the County wants to "save" a potential landfill site, it can easily be done without selecting and acquiring the site now.

LIE: 7. By acquiring the land for the new landfill now, the County will save money because of the rising land values.

TRUTH: The cost of paying interest on bonds for 16 years for a dump that's not needed during that period will far exceed any potential increase in land values. Also, if alternatives become available during the next 16 years that eliminate the need for a new dump, then no land need be acquired and the money spent on land would be saved.

LIE: 8. The proposed landfill is the cheapest option for disposing of waste.

TRUTH: Mielke deliberately lies about the cost, drastically understating costs (as demonstrated below). The true costs of a landfill include post-closure, and potential cleanup of leachate contamination, which can run into the 10's or 100's of millions.

LIE: 9. The proposed landfill will only cost $4-$7 million:

<u>LANDFILL LIES in plan:</u>

LIE: 10. Land acquisition will cost only $1,500.00 an acre. (p. G-37)

TRUTH: Land in western Kane County costs at least $5,000. to $10,000. an acre, not $1,500.

LIE: 11. A 3-foot single clay liner will be sufficient for the landfill. (G-35 & 37)

TRUTH: New Illinois and federal regulations require much more extensive landfill liners than simple clay liners. Illinois laws that will apply to the proposed new landfill will require very costly and extensive liners and leachate collection systems. Mielke's plan calls these regulations, passed a

year and a half ago, "proposed regulations."

LIE: 12. That clay for the 3-foot liner will be available "on-site." (G-34)

TRUTH: How can anyone know what will exist "on-site" when the sites are not even part of the plan? Again, this is done to deliberately understate the cost since it is cheaper to assume that clay will be available on site, than it is to actually truck in and buy clay.

LIE: 13. There will be no opposition during the proposed landfill's siting (SB-172) and permiting hearings and thus legal and engineering costs will be low. (p. G-35)

TRUTH: There will be fierce, vociferous, continuous and tenacious opposition to the siting and permiting of any new garbage dump in Kane County. It will involve extensive engineering and legal challenges to any proposed dump.

LIE: 14. That a cell cap of "simple clay and sand" will be sufficient for the landfill. (G-35)

TRUTH See Truth No. 11.

LIE: 15. Gary Mielke is competent and qualified to write a County solid waste plan.

TRUTH: Virtually every other County is using professional solid waste engineers to draft their plans. Engineers have professional licenses and reputations at stake when they draft solid waste plans. Mielke can say anything he wants with no scientific support since he has no reputation or professional license at stake.

LIE: 16. Kane County's new garbage dump will end the County's current practice of being the garbage dump for all of Northern Ilinois. (plan p. 40)

TRUTH: The new dump will accept large amounts of garbage from out of County and possibly from out of state. Under the Plan, out of County garbage will continue to stream to existing and proposed dumps. Also, the State may change the law to require all counties to accept garbage from other counties.

LIE 17. The new dump will only accept solid waste from outside the County from a county that accepts an equal or greater amount of Kane garbage. (No such place exists on the

planet Earth.) How will this unintelligible provision be enforced? Is it no surprise Mielke doesn't say.

TRUTH: Such a regulation will be impossible to enforce, which appears to be exactly what Gary Mielke and Waste Management want. Garbage from one county looks exactly like garbage from another. It is virtually impossible to discover where garbage is coming from. Also, there appear to be no counties which accept more waste from Kane County than they ship to Kane County since Kane is the dumping ground for several other counties. This practice is going to continue if the new dump site is acquired. Most suburban landfills will be closing by the year 2000.

LIE: 18. The County can bar out-of-County and out-of-State garbage from the new garbage dump.

TRUTH: The County may not be able to bar out-of-State or out-of-County garbage at the proposed garbage dump.

LIE 19. That alternatives will be looked at in five years despite the fact that the new landfill site will have been selected and acquired.

TRUTH: If the County selects a new landfill site, the County will be forced to use that site as a landfill merely to pay off the bonds. That reality will foreclose the possibility of alternatives to landfills. Any alternative technology would require a waste stream that will be diverted to the proposed landfill.

LIE: 20. The S.W. Advisory Committee reviewed the plan as required by law.

LIE: 21. The S.W. Advisory Committee approved or even read the final draft of the plan.

LIE: 22. The S.W. Advisory Committee mandated that site seletion immediately begin.

LIE: 23. The S.W. Advisory Committee decided that the new landfill should take out-of-county waste.

TRUTH: The Kane County Solid Waste Advsiory Committee never saw the final Plan. Mielke and Bus dismissed the committee two weeks before the Plan was drafted. The Committee members were merely sent copies of it in the mail but never met to discuss or review it which the law requires. Over two years, it was given various sections of appendices, but the Committee was never shown the entire Solid Waste Plan. Why didn't Mielke show them the Plan? Since the plan has been released, Mielke has blamed the Advisory Committee for some of the most controversial aspects of the Plan that they never even saw. Again, this constitutes another deliberate deception or lie about the

Solid Waste Plan. Someone should ask Mielke: Why was the plan deliberately kept from the Advisory Committee?

LIE: 24. The Plan contains a description of the facilities proposed for the management of garbage in Kane County.

TRUTH: The Plan does not specify the size of the proposed landfill in terms of acres. Instead, the Plan describes the landfill in terms of "Tons per Day" ranging from 321 "TPD" to 544 "TPD" to 1,000 "TPD." Solid waste professionals indicate that "Tons per Day" is meaningless nonsense that no professional would ever use to describe a landfill. When describing landfill size, solid waste professionals use the same term as farmers: acres.

LIE: 25. The Plan minimizes the environmental and economic impact on air, water and land quality in Kane County.

TRUTH: It does not.

LIE: 26. That 55 percent of the garbage currently being disposed of in Kane landfills is generated within Kane County. (P. 9 of Plan, and A-11-12)

TRUTH: This figure is utter nonsense, wholly plucked from thin air. Mielke supposedly bases this figure on gate surveys done for a few weeks two years ago at Kane landfills. But, curiously, no data from those surveys is presented in the Kane plan or the appendix. No facts, figures or raw data from those surveys, or the analysis used to evaluate those figures are given. For example, Mielke says the figures were "seasonally adjusted." How? As in the entire plan, the actual facts, figures, and mathmatical calculations are absent. Even in high school math courses, one must show their work or no credit is given for answers. No credit should be given Mielke for his 55 percent figure of Kane waste generation until he shows his math.

LIE: 27: That a two-year old gate survey conducted by asking garbage truck drivers where they came from, conducted only during the summer for a mere 20 days, can reveal an accurate picture of how much out-of-county garbage is coming into Kane landfills.

TRUTH: It cannot. For example, what "seasonal" correction was used? Is more or less garbage generated during the summer? Mielke doesn't say. Mielke also says the gate survey figures "agreed with" the operator's reports to the County. What figures are shown in those reports? Again, the actual data is missing. Absent the hard data, all of Mielke's conclusions must be rejected as baseless.

LIE: 28: Post closure costs for a landfill will only last 5 years. (G-38) $750,000 Annual post closure.

TRUTH The County will be required to fund the post closure costs for at least the 30 years required by Ill. law. Mielke's Plan figures the post-closure costs for only 5 years. Thus the $750,000 should be: 750,000 x 10 (7.5 mill) x 3 = $ 22.5 million.

LIE: 29: Only Composting systems and Incinerators need insurance, landfills do not.

TRUTH All facilities need insurance. Mielke's plan contains figures for insurance costs for incinerators and composting systems, but no insurance costs are included in the landfill costs. This is yet another way Mielke attempts to overstate the costs of alternatives, and understate the costs of a landfill.

LIE: 30 That if the new landfill pollutes the wells of surrounding property owners, the County should "guarantee the provision of adequate water supplies." (M-5)

TRUTH The County is going to do nothing when the new landfill leaks and contaminates area wells. The County has no way of providing water in western Kane County since the County does not own a single water plant in the County.

LIE: 31 Leachate disposal at the proposed landfill will cost only 6 cents a gallon.

TRUTH You can barely transport leachate for that amount. Leachate is considered a hazardous waste under proposed EPA regulations and will be very costly to dispose of in the future.

LIE: 32 Groundwater monitoring at the new landfill will only require one or two tests of the monitoring wells a year for the first 5 years.

TRUTH Testing required by law will be much more extensive and costly.

EDKO'S THOMAS N. OSRAN'S REPORT ON THE KANE COUNTY SOLID WASTE PLAN.

The Kane County Solid Waste Plan is a dishonest sham. The Plan is nothing more than window dressing around a new landfill. It is the skimpiest, thinnest plan I've seen of any solid waste plans I've seen. The Plan also violates the law, the Illinois Solid Waste Planning and Recycling Act, in several ways.

While the entire Plan is a web of dishonesties and lies, the Plan can be boiled down to what I call "A Trilogy of Lies." You see, Kane County, unlike every other area county, has an abundance of remaining landfill capacity. So, in order to write a plan to give Phil Elfstrom a new garbage dump, Mielke had to create three basic lies. First, that Kane County residents are creating 55 percent of the garbage going into Kane dumps; second, that alternatives to landfills are vastly more expensive than landfills; and third, that landfills are a very cheap garbage disposal option. I will explore these lies later.

The biggest problem with the Plan is that it calls for the immediate acquisition of a new landfill when the plan clearly states that the County's current landfill will last 16 more years. Why? The plan doesn't say. That's another dishonesty. In fact, the plan itself totally fails to justify the immediate need for a new landfill. That's another dishonesty. Further, the plan calls for very little action, mostly study, on alternatives to landfills like recycling, reduction and composting, but calls for the immediate siting of a new landfill. (p.56) More dishonesty.

To make sense of these dishonesties, you have to realize first of all that the plan's author, Kane County bureaucrat Gary Mielke, wrote the plan. Mielke's qualification for this task is a bachelor's degree in Earth Science. Mielke, I'm sorry to say, is basically not competent to write a valid solid waste plan. Most Counties in the State use professional solid waste engineers to draft their solid waste plans. DeKalb County, with one-third the population, is hiring a professional engineer to draft their solid waste plan. You know, just because I like to fly kites, that doesn't qualify me to

fly the space shuttle.

Now, this may seem like a small point -- using an imcompetent to write a plan -- but it's not. Throughout the plan, it's obvious to anyone with a professional background in Solid Waste that Gary Mielke has cooked the books, stacked the deck, in favor of immediately acquiring a new landfill. The Plan's immediate demand for a new landfill site of an unspecified size is done in a dishonest manner that no engineer would do. Mielke's plan has absolutely no scientific analysis supporting the call for a new landfill. Engineers don't do this because they understand that calling for a landfill without establishing the need for it is ridiculous. Engineers have their professional reputations at stake when they write a solid waste Plan. Gary Mielke can say anything he wants in the plan because he has no professional experience or credibility in this area. But somebody has to point out that the Emperor has no clothes: Gary Mielke is not competent to write a solid waste plan. And the plan that he has written is not a legal, valid plan.

Without supporting the need for the new proposed landfill, the language calling for a new landfill must be removed from the plan.

In short, the plan is a dishonest sham, but if you recall the history of the County's solid waste efforts, it's about as honest as we at EDKO expected. Remember, the County did not even begin working on the Solid WAste Plan until a court order forced the County to take no new steps toward siting the MEGA-DUMP until a Solid WAste Plan was written and submitted to the IEPA.

Here, a bit of history will help explain why the Kane Solid Waste Plan is such a dishonest sham. In April, 1990, with garbage czar Phil Elfstrom presiding, the Kane County Board illegally met in secret to discuss spending $30 million on a 2,000-acre MEGA landfill. Five landfill sites in Western Kane were discussed. Educated Disposal for Kane County later sued the County for violating the Illinois Open Meetings Act and the County agreed that the meeting was an illegal violation of the Open Meetings Act. The sites were

leaked to the press, and Educated Disposal for Kane County rapidly formed to fight the proposed MEGA-DUMP.

EDKO's was able to block the dump in a lawsuit by western Kane county townships and villages as plaintiffs. The suit charged that the County's proposed MEGA-DUMP was violating the Illinois Solid Waste Planning and Recycling Act because the MEGA-DUMP constituted an illegal solid waste plan. Before a judge could agree with our suit, the County capitulated, signing a consent order requiring that the County draft a solid waste plan before any action could be taken toward a new landfill.

So Phil Elfstrom and Frank Miller went back to the drawing board, and in 1990, hired Gary Mielke to write a plan that would get them their beloved new landfill. In short, to get the landfill, the County had to do a Waste Plan. So is it any surprise to us the new plan calls for a totally unneeded landfill? No. Gary Mielke was hired by Phil Elfstrom for one purpose only: to get him his huge new landfill, whether its needed or not. And Mielke's done a good job for Phil, writing a sham plan for Kane Co. that calls for a new landfill of unspecified size without any justification.

Thus, two years ago, the County put the cart before the horse: they tried to get a huge new unnecessary landfill before writing a plan that would justify the need for it. And now, two years later, the car remains before the horse -- the proposed solid waste plan calls for a new landfill despite the fact that it is totally unnecessary (and the plan even says that it won't be needed until 2008). This is called a waste plan in reverse: the plan's starting point was a new landfill, despite the total lack of need for it. It's also totally dishonest. This plan was written around the landfill. It was written to fit a solution.

By the way, this waste plan in reverse also violates the law governing solid waste plans. The Solid Waste Planning and Recycling Act requires that waste plans comply with Illinois law establishing a solid waste hierarchy.

The heirarchy states that landfills are the least desireable method of garbage disposal, recycling and waste reduction are the best. Waste plans are supposed to recognize this heirarchy and follow it. 2.

THE TRILOGY OF LIES AT THE BASE OF THE PLAN

In order to justify a large new garbage dump, when its not justified under the Plan, Mielke had to create a Trilogy of Lies. You see, Kane, unlike all other suburban counties, has an abundance of landfill capacity: 16 years. First, that Kane County residents are creating 55 percent of the garbage going into Kane dumps; second, that alternatives to landfills are vastly more expensive than landfills; and third, that landfills are a very cheap garbage disposal option.

1. Mielke's first lie, that 55 percent of the garbage currently going into Kane dumps is from Kane County, is easily demolished since there is no scientific or mathmatical analysis in the Plan that supports such a high percentage of Kane waste generation. Mielke supposedly bases the 55 percent on an 1989 and 1990 survey for a few weeks done at Settler's Hill and Woodlands landfills. How were these supposed "surveys" done? What was the methodology? What numbers did they generate? How were those numbers extrapolated into the "conclusion" that 55 percent is Kane garbage? Nobody knows because Mielke doesn't include any data, facts or mathmatical calculations in the plan. Math was always my worst subject, but I remember from my high school and college algebra class that you had to show your work to get any credit for an answer. Since Mielke doesn't show his work, he shouldn't get any credit for his 55 percent answer.

Mielke admits in the Plan that these numbers are flawed, pointing out that summer surveys do not accurately reflect a year-round waste stream. (A-11-12) But, he says, the numbers were "seasonally corrected" to adjust for this. BUT HE FAILS TO SAY HOW the figures were corrected. What number was the seasonal correction? Mielke says the figure is accurate to within 3.8

percent based on comparison to WMI's numbers but AGAIN HE FAILS TO PROVIDE THE ACTUAL NUMBERS.

The reason Mielke didn't put the analysis in to support his 55 percent conclusion is because there isn't any analysis to support it. He picked a number out of thin air that would suit his purposes and he went with it. This is something I'm specifically asking Mielke to respond to in his reply: where is the analysis and documentation supporting this 55 percent figure. I submit it does not exist.

2. The second lie is that alternatives are vastly more expensive than a new landfill. While I do not support an incinerator, Mielke's Plan states that an incinerator would cost $94.6 million. (p. 35) Not only is this figure ridiculously high, it ignores the fact that many incinerator companies (like in Robbins) would build an incinerator for Kane County at ZERO cost to the County. That's right: many companies would be more than willing to build a Kane County incinerator on their nickel, in exchange for a guaranteed waste stream from municipalities. The Robbins incinerator is being built with no local tax dollars but completely financed by the company proposing it. I'm not saying this because I'm in favor of an incinerator, I'm just pointing out the lies in the Plan. (There's also $7.7 million in "contingency" costs written into the composting system, and a few thousand written into the landfill costs.)

3. The third lie is that a new landfill would only cost $4-$7 million. This is based on several lies:

1. Land in Western Kane County costs only $1,500 an acre. (G-37)
2. That a 3-foot clay liner and sand and clay cap will be sufficient for the landfill. (G-35 & 37) That's wrong under Illinois law that went into affect a year and a half ago. (Mielke calls it "proposed" regulations.)
3. There will be no opposition during the proposed landfill siting hearings and thus legal and engineering costs will be low. (G-35) (No opposition? Where's Mielke proposing this landfill? On the Moon? The truth is there will be fierce, vociferous, continous and tenacious opposition to the siting and permiting of any new garbage dump in Kane County.

The Trilogy of Lies provides a backdrop for what Mielke wanted to accomplish: by closing Kane landfills sooner than in reality, overstating the costs of alternatives and understating the cost of a new landfill, Mielke attempts to justify the call for a new landfill. This Trilogy forms the basis of Mielke's attempted justification for a new landfill.

A further dishonesty in the plan is the internal inconsistency of it. For example, the plan states that alternative technology that may eliminate the need for a new landfill should be "monitored" and examined for the plan's five year update in 1997. But the plan calls for the immediate acquisition of a new landfill. Once the County acquires a new landfill, the economics of that acquisition, the huge cost, will require that the facility begin accepting waste in order to pay off the bonds. This will require a steady stream of garbage that effectively forecloses any possibility of alternative technology for Kane County such as an incinerator, recycling plant, an RDF facility, or a mixed waste composting facility.

Mielke's plan says the bonds will be paid for with revenue generated from landfill, but the plan says the new landfill will not be needed for 16 years. If the County buys the land now but doesn't build a landfill immediately, how will the bonds be paid off? The answer is, by opening the new landfill immediately, and accepting thousands of tons of out of County and out of state waste in order to generate the revenue to pay off the bonds. Also under the Plan, the new landfill will continue to take out of County garbage.

Mielke has said that the reason for immediately acquiring the site is to save the land from development. That's another lie. The County controls development in the area where a landfill would go. The County can stop any development it doesn't want by refusing to issue building and development permits.

Mielke has also justified the immediate acquisition by claiming that it

will save money to acquire the land now. This is another lie: the bonds will cost the taxpayers a fortune in interest costs if the land is acquired and a landfill is not immediately built to pay off the bonds.

Acquiring the land now to save money is another big lie. Imagine how much money the taxpayers will save if after the 16 years left at Settler's Hill, we discover alternative technologies that eliminate the need for a new landfill? If that happens we save the taxpayers $20 or $30 million. Instead, Mielke is proposing a new landfill for the express purpose of killing any possibility of an alternative to a landfill. This is dishonest, plain and simple. Any person with an ounce of intelligence can see through the tissue of lies Mielke has weaved together in drafting this so-called waste plan.

What calling for a new landfill now really does is force the County to continue its past practice of accepting out of county waste for the purpose of making money. Kane County is currently a garbage prostitute, accepting half out of county waste at the county-owned landfill. This is bound to continue if the language calling for the immediate siting of a new landfill is retained in the plan.

I would like to point out: I don't blame the current County Board, or the development committee, for the plan's flaws, the flat out lies. The County Board didn't hire Gary Mielke, Phil Elfstrom did. They are stuck with him just like we are. I do ask the development committee to correct the lies in the plan and remove the language calling for a new landfill since those provisions violate the law and a new landfill is not justified or needed. The County Board must edit the plan, change it, and take out the illegal, undesirable language in it calling for a new landfill. By doing that, they may save the County future legal fees in litigation over the Plan.

As I've said, the plan violates the Illinois Solid Waste Planning and Recycling Act in several ways.

The Act requires all solid wasete plans contain, among other things,

the following:

1. "A description of factilities and programs that are proposed for the management of municipal waste generated within the county's boundaries during the next 20 years, including, but not limited to their size, expected cost, and financing method."

2. Evaluation of environmental, energy, life cycle cost and economic advantages and disadvantages of the proposed waste management facilties and programs. Mielke claims those are contained in Chapter 8.

3. Identity of proposed sites or method to select. Mielke claims those are contained in Chapter 9.

Are these elements in the Plan? The answer is No.

In support, Mielke says, see chapters: 3, 4, 5, 6, 7 & 8.

Chapter 3 can be summarized as follows: Waste reduction programs that set no goals for reduction but merely call for educational efforts. No facility is proposed in chapter 3 for w-reduction. But Mielke, empire builder that he is, calls for a "waste reduction staff" of 1 & 1/2 staff.

Chapter 4 can be summarized as: recycling programs include providing "technical assistance" to 8 communities without curbside programs, encourage existing programs, increase education, etc. No concrete program of any substance is requested. For example, re construction waste: "conduct a survey" and "closely monitor" developments. On p. 24, "county should not consider develoment of central processing plants but encourage private sector efforts in this area." No facility is proposed but Mielke asks for 2 & 1/2 staff increase for recylcing.

Chapter 5: Hazardous waste programs: pursue funding for pilot programs, monitor legislation, encourage and educate citizens, etc. No facilities are proposed in this chapter nor is any new staff requested.

Chapter 6: Alternative technologies: no new facilities are proposed only more study and monitoring of technology. Ironically, the plan not only does

not call for a new facility, but states that "any future facility should be controlled by the County." This is ironic given that the plan explicitly rules out a new alternative technology facility. How can a new facility be controlled by the County when it doesn't want to do it? The real reason for the provision appears to be to rule out the possibility of a private operator opening up such a facility at no cost to the taxpayers. You would think the County would welcome that possibility. But Mielke's plan continues the County's commitment to owning costly landfill facilities where Waste Management gets the huge profits and the taxpayers get stuck with the bills. Mielke also creates a curious "checklist of questions" to apply to alternative technologies. One question is what are the siting requirements and whether sites exist? Why isn't that question asked of landfills?

Chapter 7: Landfilling. County says 11 acres will last the County five years, but that involves the current Settler's Hill contract which requires 50 percent importation of out of county waste. That means 11 acres would last the County alone 10 years. This means the new landfill, if at all, to take care of the remaining 4 years left in the plan, should be 5 acres.

As far as compliance with the Illinois Solid Waste Planning and Recycling Act, the plan does not describe the proposed facility by size and cost. The Plan only says that with 47 percent recycling and an incinerator, "321 TPD" of landfill capacity would be required, with "full" recycling and a MSW composting facility 544 TPD of landfill capacity would be needed. When? The plan doesn't say. On Page G-33, yet another size is given: 300 to 1,000 "Tons Per Day."

What is this "tons per day?" No professional solid waste engineer would describe a landfill in this manner. When engineers describe landfill size they use the same word as farmers: acres. The only valid way to describe a landfill is by acreage. Remember, the author of the plan, Gary Mielke, has only a bachelor's degree in earth science.

TOM OSRAN

Waste plan just a sham

The Kane Count Solid Waste Management Plan is a sham — nothing more than window dressing around a new landfill.

The plan calls for acquiring property for a new garbage dump immediately, though it also says current landfills will last 16 years, even with importing 50 percent waste from other counties.

EDKO expected a plan calling for a new landfill because Kane County bureaucrats were committed to a huge, unnecessary landfill long before they thought about drafting a solid-waste plan.

Remember, Kane County didn't even begin writing a solid-waste plan until a court order required it. An EDKO-backed lawsuit contended a 2,000-acre proposed mega-dump was, in effect, an illegal solid-waste plan.

A court order also blocked the county from buying a new landfill until it drafted a state-required, 20-year, solid-waste plan. Illinois law does not force counties to have landfills; it merely requires them to plan garbage disposal.

To comply with the court order, County Board member and garbage czar Phil Elfstrom and then-County Board Chairman Frank Miller, hired solid-waste bureaucrat Gary Mielke to draft a plan that would get them their beloved new landfill, and that's exactly what Mielke has done.

He drafted a waste plan that calls for a new landfill — a disaster for taxpayers and environmentalists. This virtually guarantees the county will continue to be a garbage dump for all of Northern Illinois.

The main problem with the Kane waste plan is that Mielke is not an engineer. Virtually every other solid-waste plan in the state is being written by professional, solid-waste engineers. DeKalb County, for example, recently hired an engineering firm to draft its waste plan.

It's obvious that Mielke has cooked the books and stacked the deck in favor of a new landfill.

For example, the plan calls for immediately selecting a new landfill site but outlines little or no action on landfill alternatives like recycling, solid-waste composting or waste reduction. The plan utterly fails to justify the immediate need for a new landfill, other than to say that a new dump might be needed by the year 2008.

Mielke's plan also appears to violate the Solid Waste Planning and Recycling Act. Illinois laws state that landfills are to be used as a last resort — only after all alternatives are exhausted.

By requiring a new landfill site now, instead of when it's needed, the county will eliminate the possibility of trying alternatives to landfills for the next 40 years.

Landfills, however, are a Stone Age solution to a modern problem. We must explore alternative technologies and, perhaps, start a pilot composting project with a state grant. Mielke ignored alternatives that could be funded with state grants at no cost to County taxpayers.

The Kane County Board should remove from the plan all language that says a new landfill site should be acquired immediately.

There is no hurry. Illinois law requires updates to solid-waste plans every five years. When the County gets closer to actually needing a new landfill, that's when they should start talking about acquiring a new site. Until then, let's recycle, reduce and reuse as much as possible and reduce our reliance on landfills.

The public is invited to comment on the County Solid Waste Management Plan during public hearings to be held at 1:30 p.m. July 29 at the Kane County Government Center, Geneva; at 7 p.m. August 4 at Waubonsee Community College, Sugar Grove; at 7 p.m. August 6 at Elgin Community College, and at 7 p.m. August 11 at Burlington Central High School.

Tom Osran is an EDKO board member

TUESDAY, JULY 21, 1992

The Beacon-News

TOM OSRAN Leader 8/24/92

Kane County waste plan poorly drafted

Guest column

A parade of engineers and solid-waste professionals trashed the Kane County Solid Waste Management Plan during the final hearing in Burlington.

The engineers and experts denounced the plan as a fiasco, poorly drafted and badly lacking in scientific data to support its sweeping conclusions. The plan demands that Kane County immediately buy a new landfill site despite the 16 years of life left at current landfills.

Dr. Michael Cailas, professor of environmental engineering at the University of Illinois (Chicago) and engineer Lee Barrett said the remaining life of Settler's Hill can be extended far beyond the 20-year planning period by using synthetic daily cover (instead of 6-inches of dirt, which takes up more volume) and by slightly increasing compaction of garbage. Cailas said adding the 11-acre expansion to Settler's Hill, with the above techniques, can extend the life to beyond the year 2016.

The plan contains grossly insufficient data and a number of blatant errors, Cailas said. For example, he said, the plan has little data supporting its very high "waste-generation rate," the estimated amount of garbage generated in Kane County by each person each day, of 8.4 pounds.

Dr. Cailas testified the waste-generation figures appear to have been copied from Lake County's plan, adding that the lower waste generation rate of Will County (6.8 pounds) is probably closer to Kane's rate, given the rural nature of both counties. The Illinois average is about 7 pounds, he said.

Engineer John Thompson said a high generation rate would require the county to dispose more garbage than it should and create facilities that are too large for the county's needs, resulting in continuing or increased importation of out-of-county garbage.

Cailas and a graduate student also pointed out how landfill costs were underestimated by 72 percent. While the Plan's landfill-cost estimates are $4 million to $7 million, the actual costs are closer to $7 million to $20 million, they said.

David Gossman, a solid-waste professional engineer/consultant, described numerous inconsistencies and errors in landfill costs. For example, the plan discusses the need for a five-foot clay liner, but the price estimate is for a three-foot clay liner. At any rate, Gossman said, a much thicker and costlier liner is required by existing state and federal laws.

Also, land costs are estimated at $1,500 an acre, which may be possible, he said, "at the point of a gun."

Jerry Zakosek, a certified public accountant and EDKO member, refuted the county's argument that a landfill site must be acquired now because of rising land values, saying that claim ignores the costs of interest on bonds. Zakosek's analysis indicated that, to buy $10,000-an-acre land now and keep it for 16 years would cost $25,000 and acre. According to the plan, the landfill will be financed by revenue bonds, which means it would have to open immediately to generate revenue to repay the bonds.

The plan's rash call for a new landfill immediately also violates Illinois law, which details a "solid-waste hierarchy" for garbage disposal, with landfills the least-desirable option.

After hearing the engineers trash the plan, state Senate candidate Steven Rauschenberger suggested the county rethink it. Why not wait or, at the very least, remove the language calling for the immediate acquisition of a new site?

Gary Mielke, Kane County waste planner, and Pat Jaeger, assistant state's attorney, already are pressuring the County Board to move quickly on the plan, saying delay would violate Illinois law.

It doesn't appear, however, that the state or anyone else will care if the county waits a little longer and approves a good plan. After all, the law required the plan to have been written by March of 1991, a deadline missed by almost all counties with no penalty.

EDKO and others will mind a lot more if the county rushes to approve the current bad plan than if they delay and approve a better one.

Furthermore, since this plan will set the county's garbage policy for the next 20 years, shouldn't the new County Board to be seated in December vote on the plan, rather than a board with so many lame ducks?

Tom Osran is an EDKO board member.

KANE CO. BOARD MINUTES OF CLOSED 4-12-90 MEETING

The following minutes are not offered to embarrass anyone but merely to show that the County's original plan was to acquire an huge new landfill and then write a Solid Waste Plan that justified it. The underlined portion of the minutes show that Elfstrom told the Board that after acquiring the new landfill site, "a solid waste plan will be needed to go along with the siting of a new facility." The minutes also say: "A recycling coordinator/landfill planner needs to be hired to put the Board's decision into a plan."

This constitutes a "waste plan in reverse." What that means is, the County was committed to a new landfill, then wrote a plan to justify it.

The minutes from this meeting show that the County's intent all along was to draft a sham plan to justify a new landfill. And this continues to be the County's philosophy in drafting the Waste Plan that is currently being reviewed. It appears from the minutes and from what has since transpired, that Elfstrom was able to hire a "recycling coordinator/landfill planner to put the board's (landfill) deicision into a plan."

April 12, 1990

Executive Session Re: Land Acquisition EX. 46

The Kane County Board met as the Committee of the Whole, went into executive session commencing at approx. 9:35 a.m. on Thursday, April 12, 1990 in the Board Room, Bldg. A, Kane County Government Center, Geneva, IL.

Members present: Chairman Miller, Bermes, Cameron, Clusen, Damisch, DeStefano, Doederlein, Douglas, Elfstrom, Fleming, Hess, Kammerer, Kerasiotis, Ledebuhr, Patterson, Richards, Schoengart, Sharp, Shoemaker, Shoop, Taylor, Tooley, Vauchope, Wolff, Yurs. Also present: Development Dept. Dir. Bus, Development Dept. staff Seiben & environmental consultant Young, Ass't. State's Attnys. Jaeger and Sullivan, and County Board staff Ruppert and Keasler (recording the meeting).

Entered into executive session for the purpose of discussing land acquisition, on a motion by Elfstrom, seconded by Clusen. Motion carried unanimously.

Chairman Miller relinquished chairmanship to Landfill Liaison, Mr. Elfstrom. Elfstrom introduced Richard Young, environmental consultant and former Environmental Division Director for the County. Young commented on background of County landfills, pointing out uniqueness of Settler's Hill, where one can play golf on top of a landfill, and where methane gas is utilized for electricity.

Elfstrom explained the process that will be needed to determine a site for a new landfill: Determination of landfill site; hiring of County-wide solid waste planner. Elfstrom explained that siting a new landfill is more difficult that expanding an existing landfill. Stated that the existing landfill is being run extremely well. Need is to try to duplicate that at some other location in the County. Regardless of recycling, composting, etc., a landfill will be needed at the end of the process. The biggest deterrent to siting a landfill is the people who live in the area; therefore siting needs to be done while a minimum number of people are living in the area; will become more difficult with time. A solid waste plan will be needed to go along with the siring of a new facility.

Elfstrom stated that a site needs to be chosen so that everybody in the County know this is where the solid waste will be deposited. Also, recycling coordinator/landfill planner needs to be hired to put the Board's decision into a plan. Elfstrom encouraged advertising for such position immediately.

Elfstrom displayed a Proposed Landfill Concept drawing and explained the aspects of the proposed concept. Area shown in Concept was 1000 acres of landfill and 1000 acres of Forest Preserve; any actual landfill activity would be kept 1/4 to 1/3 mile minimum distance from population. Elfstrom suggested that existing farmhouses around the perimeter of the site could remain, or County could offer to purchase them rather than obtaining them by condemnation. Elfstrom suggested various uses for the buffer area around the landfill.

Elfstrom stated that condemnation will be necessary to obtain 1000 to 2000 acres. On 2000 acre site, approx. 15-16 farmsteads can be expected to be found. Property will not need to be assembled for 4-5 years, which leaves room for negotiations in purchase of land. Obtaining property will also result in taking 2000 acres off tax rolls.

New landfill is projected for only Kane County garbage, unless the Board decides differently at some time in the future. Elfstrom stated that Waste Management is not a consideration in this matter; there is nothing in what is being done that will in any way tie the operation to any specific contract operator.

Elfstrom said that staff had looked for sites with less than 10 dvelling units per square mile; expects that 25-30 dvelling units will be involved in condemnation. Elfstrom requested that Board members consider the County as a whole; 12,000 people in each of their districts need a place to put their garbage in the future. Contract on nev landfill vould be different from previous one; presently taking in approx. $3.2 million per year. Expects that putting together 2000 acres would cost approx. $20 million. Revenue is available without a tax burden or taking anything out of existing landfill operation.

Elfstrom asked the Board to consider: (1) If they want one landfill or two; (2) hov big; (3) should it have a buffer area; (4) hov much buffer; (5) early uses of buffer; (6) conceptual plan for final use of buffer; (7) where to locate landfill.

Elfstrom explained that two landfills of 500 acres each with buffers would require more total acres than one 1000 acre landfill; also, a square space is more productive than oblong; two landfills vould cost double to run. Elfstrom showed a sample of a sign which would be placed around landfill area when it is chosen, to inform citizens that this is a future landfill site. Regarding size, Elfstrom stated that a larger landfill would mean more park; longer period of use. Site chosen will partly determine size. Elfstrom stated that buffers have worked vell in the past; size of buffer could be determined later, as well as uses of the buffer area. Where to locate the landfill is the hardest decision.

Elfstrom turned meeting over to Development Dir. Bus to explain the criteria used by staff to locate possible sites...displaying maps and overlays:

> GROUNDWATER PROTECTION: hydrological investigations, shallov groundvater resources, prairie aquigroups, Nevark Aquifer, 270,000 gpd/ft transmissivity, 50 mgd long term yield; GEOLOGIC SUITABILITY: Tiskilva Till member, relatively uniform composition, Deposit 200 to 300 ft.thick, 10 to minus 7 cm/sec hydraulic conductivity, geology for planning in Kane County; LAND USE AND POPULATION: existing land use and 325,000 pop.-1990 est., density less than 10 d.u./sq.mi., Year 2000 proposed land use, municipal 1 1/2 mi. planning areas, 2010 population forecast of 434,000; SURFACE ENVIRONMENTAL FRATURES: floodplains and vetlands, vooded areas and prairie, vildlife habitats, slope and topography; and TRANSPORTATION AND LOCATION: 15 mi. radius of population, state and federal highways, county and township roads, veight limits and traffic impact.

Final overlay identified five best sites meeting criteria of within 15 mi. radius of population, outside of 1 1/2 mi. municipality planning area, within Tiskilva Till 50 ft. thick, not subject to urbanization, and having no more than 10 dvelling units per square mile. Bus identified the sites by surrounding highvay names; acreage was from 1,000 to 4,000 acres.

Discussion and answer period followed. Elfstrom said you may have to vacate some existing rural unpaved roads. Said that you will want to come back and see maps, see who owns property, size of farms, specifics, legals, know end use. Said that staff could do this for all 5 sites, but if staff could rank the sites, why not zero in on two or three sites for specifics. If site is 15-30 miles from population, you might want to look at a transfer station. Bus said long range - transfer & recycling station; the average pick-up truck wouldn't go to any of the landfill sites. Elfstrom said the rating could be presented the middle of May or first of June or even into June. Bus said it would take at least 30 days to do a good analysis of total 5 using a matrix and computer approach to settle on two or three. Elfstrom said these are the only sites that meet the important criteria. (Shoop left meeting)

Elfstrom asked: Is there anybody that thinks we need two landfills (no reply); Is everybody thinking that as a start, we should look for 1,000 acres with 1,000 acre buffer (affirmative response); Is anybody thinking we shouldn't try to get a buffer (no reply). Elfstrom: go back and rank 5 sites and we will do a detailed analysis for 3 sites sometime in May or early June/July, consider and adopt.

Doederlein suggested that staff prioritize the sites and provide details on 2 or 3 highest rated areas. Elfstrom suggested that the staff then make definitive site analysis on three top choices: including property owners, use, legal descriptions, any information not available from the general study. Schoengart asked if Board members had any additional criteria they would like applied to the sites (no response). Wauchope suggested 2 or 3 Board members be involved in the study to assess political impact. (Shoop and Kerasiotis left meeting). Kammerer: Doesn't object size-wise, but we should have an opportunity to make a change. Elfstrom: You will. Kammerer suggested considering the cost of improving nearby County roads. Miller suggested that the site's proximity to State highways be considered in relation to needs for future road improvements; would like State assistance to cover high costs of infrastructure. Fleming: we have a 10 yr. lead time on the operation to allow for planning (of roads). Shoemaker suggested press be informed of the landfill siting criteria. Elfstrom responded Yes, that "bus can explain it, don't you try it." Sharp expressed concern re: DeKalb Co.'s proximity to site. Doederlein responded that you could use only a portion of the acreage, and not necessarily the part closest to DeKalb County. Damisch suggested consulting with townships and school districts in priority areas--they're short of money. Schoengart responded that the Board should take those needs into consideration, but not to involve other taxing bodies during this investigatory period.

Elfstrom revieved what had been agreed by consensus: one landfill site rather than two; site of approx. 1000 acres plus 1000 acre buffer; desire for buffer area; staff to rank the sites "1 through 5" and do detailed analysis on three sites; report back to Board at the end of May or early June for Board's consideration and approval.

Returned to regular session. on a motion by Elfstrom, seconded by Ledebuhr. Motion carried unanimously. Board Chairman Miller asked for the Committee to adjourn to Wed., May 2, 1990 at 9:30 a.m. for a special Board Meeting so the architects could provide information on the proposed new Kane County Judicial Center and Phase I of the Courthouse building program. So moved by Patterson, seconded by Wolff, and carried unanimously.

Meeting adjourned at approximately 11:50 a.m.

Bobette Keasler and Mary Ruppert,
Clerks Pro Tem

APPROVED:
Frank R. Miller,
Chairman
Kane County Board

August 31, 1992

Kane County Development Committee Landfill Subcommittee
Hearing Officer - Attorney Robert Foote

In the next few weeks or days, you will have the opportunity to review the public comments that we made during the review hearing concerning the Kane Solid Waste Plan. Over the last couple of years the issue of solid waste disposal has become extremely volatile, primarily as a result of the Elfstrom plan for a super dump. This plan was offensive to most who read it because of the size and urgency of need which appears to correlate with acceptance of donations from the landfill operator.

I have been involved with the major group of people that have challenged the county's plan. My reasons for involvement were the location, concern over the damage to the aquifer and the environment and finally, professional concern with the economic presentations that were made.

As you are probably aware, significant problems were found with the plan. The most important of these is the waste generation rate. This rate of 8.4 pounds per person per day is simply wrong and too high given the demographics and the fact that many residents work and thus generate waste 5 days a week in other areas. Another error involves the amount of garbage importation by Kane County. Two years ago we heard that we imported 10%. Now apparently, the county recognizes that it is 40%. In fact, others now feel that we import 65+%. The real number must be determined and should be a result of an independent review. How are we to plan for Kane County if most of the waste is not from county residents?

The area, however, that I most object to involves costs. The costs for landfills presented in this plan are absurd. They are so low and the waste generation so high that landfills are the only conclusion that can be reached. The design of the landfill liner, etc. do not meet current laws and land costs are at only a fraction of what the real cost is likely to be. I have attached an article from the Wall Street Journal (Exhibit I) that discusses the costs of landfill development. Waste Management, the Kane County operator, quotes costs as being $100,000 - $500,000 per acre. The article also discusses the profits to the operator which is part of our Kane County problem.

The most glaring omission by the authors of the plan, however, is the fact that post closure costs are ignored for all intents. In the recent contract approved for the operation of Settler's Hill, the operator is receiving payments that if put in a fund would be worth over $100,000,000 (Exhibit II). Landfills do not disappear, nor do they just sit there when they are closed or in the process of being filled. Landfills must be monitored, lechate processed and eventually cleaned up. These costs never end. We have recently seen the initial cost for collecting and treating lechate from the Tri-County landfill. This will result in a $13 million initial cost, which does not include clean up which will come years later. Just ask yourself how can a cost that has no end ever be cheaper than one that does. Recycling and composting have no ongoing costs.

I realize that the reaction by many board members when we criticize the selection of landfill as the primary waste disposal method is to tell us what we should select. I wish that I could tell the county what is the best, but I cannot. While many of us have a great interest in waste disposal, we are not able to spend as much time as we would like due to family, career and other responsibilities. However, many of us have spent a good deal of time researching techniques such as composting, waste to energy, etc. So much of the emerging technology makes sense as does recycling and waste reduction. It hardly seems to make sense that Kane County would select the same form of disposal that the cave man started. The earth has only so many raw materials. How can we justify not reusing what we have?

The need to acquire land in a hurry is also wrong. Exhibits III and IV explain in economic terms why such an argument is simply not true.

I have one last concern. I do not believe that personnel in the Kane County Development Department should in any way be allowed to condense the public comments. There is a built in conflict of interest since this plan was developed or influenced by the Development Department. Most of the comments have been extremely critical of the people who assembled and guided this planning process. The Development Department also does not have on staff engineering or financial personnel. Third party experts may be needed if the serious questions that have been raised will be answered appropriately. As I said previously, the financial data presented is absolutely absurd.

I would be pleased to discuss my concerns with the financial information or capital costs presented in the plan with Kane County board members or Development Department employees.

Jerry Zakosek

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THE WALL STREET JOURNAL.

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Economics of Trash

Some Big Waste Firms Pay Some Tiny Towns Little for Dump Sites

What Localities Get Depends On Their Bargaining Skill, And Fees Vary Widely

Landfills' Fat Profit Margins

By Jerry Bailey
Staff Reporter of The Wall Street Journal

Two years ago, Waste Management Inc. won the hearts of people in Mobile, Ariz.

When the tiny desert town approved construction of a 640-acre garbage dump, the big trash hauler showed its appreciation by donating a $17,500 school air-conditioning system, a two-trailer community center and $5,000 for camp scholarships. It also threw a big Christmas party.

"They go out of their way to help," says Jerry Bergsman, the administrator of Mobile's 25-student school district. "I'd love to have another half-dozen Waste Managements here."

Actually, one should have been plenty. For what Mr. Bergsman and other residents of Mobile never realized is that the town might have got millions of dollars from Waste Management.

Secret Arrangements

The nation's garbage industry, which is dominated by Waste Management and Browning-Ferris Industries Inc., frequently agrees to pay local communities handsome "host fees" in return for allowing dumps or, as the industry calls them, landfills. But these arrangements are usually kept secret. The secrecy helps the companies because some towns and counties are shrewder negotiators than others. And a few, such as Mobile, don't even bother to ask about fees at all.

The resulting disparities are huge. In contrast to the modest gifts to Mobile, Riverside County, Calif., arranged more than $16 million in annual host fees from Western Waste Industries for a planned 1,020-acre dump expansion.

The industry acknowledges its desire to keep host fees quiet—not because it views them as questionable but because publicity could cost the companies a lot of money. "Your advantage, if you have any in the marketplace, is your ability to gauge the market and price yourself accordingly," a Browning-Ferris spokesman says. A Waste Management official says host fees are "not something we want to discuss."

Difficult Comparisons

The industry also says that its compensation arrangements with communities are often complex and that comparing the economics of one dump site to another can be difficult or unfair. The National Solid Waste Management Association doesn't collect data on host fees, a spokesman says, because "our members wouldn't appreciate it." And though the Environmental Protective Agency issues voluminous technical rules on dumps, it offers little financial guidance to local officials.

Yet because new federal and state environmental laws will force the closing of about half the nation's garbage dumps in the next few years, more communities than ever before are under pressure to build new ones. To the small, out-of-the-way towns typically targeted for haulers' sales pitches, a favorable fee deal could make the difference between continued poverty and relative affluence. But many either lack good information or can't afford the lawyers and consultants needed to help get a good deal.

"Waste dumpers look for powerless communities," says Luke Cole, a lawyer at the California Rural Legal Assistance Foundation who fights siting of dumps and incinerators. "They look for desperate areas and then take advantage." The companies deny doing that but concede that many dumps are being sited near small towns. They say it's because that's where space is likely to be available.

Securing the Countryside

At any one time, both Waste Management, based in Oak Brook, Ill., and Browning-Ferris, of Houston, have dozens of salesmen out in the countryside trying to get communities to accept dumps. In some initial discussions, the subject of host fees doesn't even come up. When it does, companies usually begin with a low-ball offer of, say, $1 a ton, although they might be willing to pay five times that. Local officials inexperienced in landfill economics may see this as a windfall and not ask for more.

Large municipalities experienced in running their own big dumps do better. Robert Nelson, the Riverside County trash chief, says he often hears from companies greeting to build dumps in the desert east of Los Angeles. "They all want to pitch to a dollar or so a ton" in host fees, he says. "We just say no."

With a 50-person engineering and administrative staff to analyze proposals, Mr. Nelson got $6 to $7 a ton from Western Waste for one proposed disposal site and more than $4 a ton on a new Browning-Ferris dump that would be the nation's biggest. Together, the two could bring the county more than $60 million a year.

The county justifies such hefty fees on the ground that they compensate it for putting up with a dump that takes trash from other areas. Scores of trucks arriving every day can clog traffic and bring dust, odor and vermin. And environmental damage due to hazardous materials improperly dumped or design flaws is possible.

Despite host fees, moreover, garbage dumps are so profitable that the companies can earn big returns. Although they

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The lack of a host fee, confides Jim Tyler, a Waste Management vice president, "is unusual in this day and age."

But many other municipal officials are also at a disadvantage, finding it hard to get financial information on which to base decisions, says Steve Cramer, a Minneapolis councilman who heads the National League of Cities' task force on garbage issues. Garbage has joined crime, taxes and schools "on that list of issues that drive local officials nuts," he adds.

Waste Management's reaction to a Kentucky law that lets communities take a percentage of a dump's revenue, instead of a per-ton amount, shows how jealously the companies guard their financial data. "Our biggest beef isn't the amount" of money, says Don Drummond, Waste Management's dump manager in Estill County, Ky. "They want us to open our books."

Other communities have known enough to ask yet failed to drive a hard bargain. Gilliam County, Ore., a poor farming and ranching area 150 miles east of Portland, was already home to a Waste Management hazardous-waste dump. So, a simple garbage dump was hardly frightening.

In 1987, Waste Management approached Laura Pryor, the county administrator, and said it needed quick approval on if could bid on Portland's municipal hauling contract. She had heard that another community got 50 cents a ton, and she asked for more. Gilliam County got 75 cents to $1.25 a ton, and the company got a 40 million-ton dump, where it now buries Portland's and Seattle's trash for $25 a ton.

"I guess those big bucks would've been wonderful," Ms. Pryor says. "But you've got to be reasonable." Waste Management did agree to hire local residents, currently about 100 of them, and buys some supplies from local merchants. Those benefits have "stabilized our economy," Ms. Pryor says. Gilliam County also will get a second chance when the dump contract comes up for renewal in 1997.

Secrecy can backfire on a company. Browning-Ferris last year approached officials of Caswell County, N.C., with a proposal tailored to the poor tobacco-growing area's problems: The company would help pay the cost of closing the old dump, which is fouling groundwater; trash disposal would be free for the whole county; and the host fee of $1.25 to $2 a ton would produce about $1 million a year, enough to solve Caswell's budget problems and perhaps expand the overcrowded jail.

But Browning-Ferris insisted that county officials keep the proposal secret while the company quietly optioned land. That kept Gordon Satterfield, a tire dealer and chairman of the county commissioners, from shopping for a better deal.

When Caswell residents found out about the proposed dump, many felt betrayed. National environmental groups showed up to help organize the opposition. Mr. Satterfield, who had viewed the Browning-Ferris proposal as "a windfall," backed off.

Confused and afraid to make an unpopular decision, the commissioners put the proposal to a vote, and the dump was voted down last month by a 3-to-1 margin. The opposition was so strong that Browning-Ferris never sweetened its offer. "We're not lightweights," says Neil H. Clark Jr., vice president of Southwestern operations. "But no amount of money would've helped."

Economics of Trash: Some Tiny Towns Get Little for Dump Sites

Continued From First Page

don't disclose those profits, industry insiders and knowledgeable municipal officials say gross margins—before taxes and corporate overhead—typically run 50% or more of revenue at big dumps. Sanifill Inc., a Houston company that gets all its revenue from dumps, had profits, before taxes and overhead, of $34 million last year on revenue of just $59 million—a 61.3% margin.

At one dump, Chambers Development Co. pays Charles City County, Va., a poor farming area, a host fee running about $4.2 million a year. The Pittsburgh-based company reaps a gross margin of 60% to 70% at the dump.

Dumps are profitable both because of a shortage of disposal sites and because of their unique economics. Although every site is different and costs vary, Waste Management says permit and construction costs generally run between $100,000 and $500,000 an acre. But because a dump is built in small sections, with revenue coming in as each section is filled, much of the investment occurs after the money has started rolling in.

In addition, operating expenses are a minor fraction of fixed costs; so profits rise rapidly as disposal volume increases. Tom J. Fatjo Jr., a former chairman of Browning-Ferris, says a dump can earn gross profit of 15% at 1,000 tons of trash a day but 40% at 4,000 tons a day.

And if the operators can hold down the local community's share of the action, their profits soar. At Waste Management's Mobile, Ariz., dump, preparing the 320 acres that will actually hold garbage will cost a maximum of $260 million in today's dollars. But at current fees, those acres, with a capacity of 96 million tons, will bring in $2.26 billion over the dump's 30-year life. And because Mobile didn't negotiate any fees for itself, Waste Management will keep all the revenue.

CALCULATION OF THE VALUE OF POSTCLOSURE PAYMENTS IF FUND ESTABLISHED

YEAR	POSTCLOSURE (1) FEE PAID TO WMI	INTEREST RATE	YEARS TO CLOSURE	VALUE OF PAYMENT AT JUNE 2008
1992	$1,221,094	8%	16	$4,373,219
1993	$2,442,188	8%	15	$8,076,123
1994	$2,442,188	8%	14	$7,457,182
1995	$2,442,188	8%	13	$6,885,674
1996	$2,442,188	8%	12	$6,357,966
1997	$2,442,188	8%	11	$5,870,700
1998	$2,442,188	8%	10	$5,420,778
1999	$2,442,188	8%	9	$5,005,338
2000	$2,442,188	8%	8	$4,621,736
2001	$2,442,188	8%	7	$4,267,533
2002	$2,442,188	8%	6	$3,940,475
2003	$2,442,188	8%	5	$3,638,483
2004	$2,442,188	8%	4	$3,359,635
2005	$2,442,188	8%	3	$3,102,158
2006	$2,442,188	8%	2	$2,864,413
2007	$2,442,188	8%	1	$2,644,888
2008	$1,221,094	8%	0	$1,221,094
TOTAL FUND BALANCE				$79,107,395

FUND VALUE AFTER CLOSURE

2013	$79,107,395	X	8%	5 YR.	=	$117,875,813
2018	$117,875,813	X	8%	5 YR.	=	$175,589,957
2023	$175,589,957	X	8%	5 YR.	=	$261,601,944
2028	$261,601,944	X	8%	5 YR.	=	$389,746,532

(1) Assumes no CPI increase

(2) Calculated at contract minimum tonnage 468,750 x $5.21 (contract payment) = $2,442,188 - first and final years were calculated at 1/2 because they are 6 month periods.

EXHIBIT II

JFZ
9/1/92

TOTAL COST OF LAND PURCHASED
IN 1992 AND HELD UNTIL "NEEDED"

500 acres at $11,000	$5,500,000
Annual cost mowing, etc.	$60,000
Interest cost $5,500,000 x 8%	440,000
Total Annual Cost	$500,000

WHO WOULD PAY THE $500,000 ANNUAL COST -- THE TAX PAYER!

ASSUME LAND IS HELD FOR 15 YEARS:

15 years x $500,000 - Annual Cost	$7,500,000
plus Land Cost	5,000,000
Total Investment	$12,500,000

COUNTY INVESTMENT IN LAND AFTER 15 YEARS --

$12,500,000 / 500 = $25,000 ACRE

Tax payers will pay $12,500,000 over the next 15 years.

Exhibit IV

JFZ
9/1/92

Do we need the land now?

1. The county controls development in the unincorporated areas. They can protect open space for farms and waste disposal.

2. Land prices go up and down. You cannot assume an escalation of land prices. Yes, they will increase, but not dramatically.

3. What is the cost of land held for future use?

   Assume 500 acres – current prices in the area are $10,000/acre. In 15 years the county could afford to pay $25,000/acre.

4. The cost of a landfill, according to sources at Waste Management (WSJ article 12/3/91), is $100,000-$500,000 an acre. Therefore, land cost is a small component of the total cost.

5. To grab land now would simply cost taxpayers and encourage little else in alternatives.

Exhibit III

Critical Analysis of the Kane County Solid Waste Management Plan

by

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August, 1992

Executive summary

- The Kane County Solid Waste Management Plan should contain sufficient data and a detailed analysis in order to facilitate public understanding of how the County proposes to manage its solid waste for the 20-year planning period which began in 1990. Unfortunately, such requirements have not been met, especially in the most essential components of the plan included in the Assessment of Solid Waste Needs (Appendix A), the Technology Assessment: Landfills (Appendix G), and the Evaluation of Defined Solid Waste Management Systems (Appendix L). Furthermore, the Kane County plan contains a number of computational and methodological errors which renders its effectiveness and reliability questionable.

- Kane County reported the volume of waste received at the two county landfills was 2,860,098 gate cubic yards. However, this amount is 10% less than the volume reported to the IEPA by the landfill operators. The 55% figure used for the proportion of solid waste landfilled and originating within Kane county was estimated from two 20 day gate surveys conducted during the summers of 1989 and 1990. Estimating the sources of waste by using such limited data does not accurately assess this quantity which is severely influenced by seasons and weather conditions, among others. For instance, a 10% difference in the amount of imports will result in a significantly different generation rate, 7.1 pounds per person per capita per day compared to 8.4. Additionally, the conversion factor of 3.915, used to convert gate cubic yards to tons, in relatively high compared to other county reports. However, this value along with the percent of compacted and loose waste, and per capital solid waste generation rate are questionably similar to Lake County. Such "similarities" are extremely rare and highly unlikely given the vast differences in socio-economic characteristics between Lake and Kane counties.

- The use of alternative landfill operation methodologies, including alternative cover and compaction would increase the lifetimes of both Kane County landfills. In the case of Settler's Hill landfill, the implementation of these measures would allow the landfill to last beyond the time period of this plan, the year 2010. Additionally, alternative cover and increased compaction will have a beneficial effect on gross revenues. The added landfill space translates into an increase in revenue.

- The landfill costs presented in the Kane County plan are underestimates of the true costs of a landfill. If the data in the Kane County plan is to be truly representative and to take economies of scale into account, an average total capital cost per ton must include the data from Minnesota. The inclusion of this data would increase the estimated capital and total annual cost per ton of solid waste. Additionally, the use of a $30 tipping fee estimated from Settler's Hill operation and maintenance expenses to predict landfill costs again does not account for economies of scale due to landfill size. Furthermore, increasingly stringent regulations related to landfill design and operation are likely to substantially increase landfill costs in the future. Without valid cost estimates, its is difficult, if not impossible, to plan the solid waste needs of the future.

- It is the conclusion of this report that various quantities used to determine the solid waste generation rate of 8.4 pounds per capita per day will likely lead to a biased estimate. The use of this value as the foundation of a solid waste plan predisposes the plan to inaccuracy thereby rendering the plan unreliable

- The Kane County plan appears not to embrace the intent of the goals set forth by the State of Illinois with respect to the solid waste priorities. This is demonstrated by the lack of diligence in assessing alternative solid waste management options especially involving landfills, transfer stations and incineration. A feasibility study has only been completed for Municipal Solid Waste Composting (Appendix J). All the other alternatives are basically literature reviews. Literature reviews are appropriate for informational purposes only and are not satisfactory for solid waste management decision making process.

- It is recommended that the county reevaluate its solid waste management plan. For this reevaluation more reliable estimates of critical parameters such as the total volume of solid waste disposed and percentage of imported waste should be determined after a thorough and well-planned study. Additionally, more valid cost estimates are required to more accurately predict the cost of this or any other solid waste management plan.

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1. Introduction

The enclosed report is an analysis of Kane County's solid waste management plan for the period 1989 to 2010. The plan was written to fulfill the requirements of the Solid Waste Planning and Recycling Act. The United States Environmental Protection Agency's (USEPA) preferred hierarchy of solid waste disposal practices in this order of preference are (Eldredge Engineering Associates Inc., 1989, p. 5.):

- Source reduction
- Recycling and reuse
- Combustion with energy recovery
- Combustion for volume reduction
- Disposal in landfills

This report is divided into three major sections. In the first section, the solid waste generation rate estimate used by the authors of the Kane County solid waste plan is evaluated. The results of the potential use of alternative methods of landfill operation, including daily cover and compaction, are included in the second section of this report. The third section is an analysis of landfill costs if alternative methods of landfill operation are employed.

The report presented here does not discuss various other issues associated with the Kane County plan. These issues include the public health risk associated with landfills, the solid waste option chosen by the authors of the Kane County plan. These risks include the potential for water as well as air contamination of pollutants in the landfill. Additionally, a detailed economic evaluation of the plan, although necessary was not performed. Each of these areas should be explored when evaluating this or any other plan.

Long term solid waste management plans should be based on well justified assumptions and reliable estimates of parameters describing the waste stream of the county (e.g. solid waste generation rate, amount of imports, etc.). This information is an essential requirement since erroneous assumptions, or the use of unreliable parameters, will render long term predictions totally inaccurate due to the additive nature of the

calculations involved. Unfortunately, the solid waste management plan of Kane County lacks appropriate justifications for the assumptions and parameters presented in the report. Furthermore, the plan contains a number of computational and methodological errors which renders its conclusions and recommendations highly questionable. These drawbacks are revealed in the following sections which analyze the specific parameters used in the plan as well as the methodologies employed.

2 Solid waste generation rate estimate

Table I gives a detail outline of the methodology which was used to estimate the solid waste generation rate in Kane County based on the county's Solid Waste Management Plan, Vol. II, Appendix A. This rate is one of the most important estimates for solid waste planing since it indicates the amount of waste which is generated by each person per day. Additionally, this rate value is used as the basis for the long term predictions of solid waste generation. From this Table it can be seen that there are three quantities which will influence the solid waste generation rate estimate. These quantities include, the total volume of solid waste disposed in landfills, the percent of Kane County solid waste received in Kane County landfills, and the overall conversion factor. Each of these quantities are evaluated in the following sections.

2.1 Total volume of solid waste disposed in landfills

According to the Kane County Management Plan, the total amount of solid waste received in the two county landfills during 1989 was 2,860,098 gate cubic yards (Kane County, Vol. II, pp. A-10 and A-11). This volume has been estimated "according to reports made to the county by landfill operators" (Kane County, Vol. II, p. A-10). However, this amount is 10% less than the volume reported to the IEPA by the landfill operators (i.e. 3,181,276 gate yards for 1989) (IEPA, 1990; see also Kane County, Vol. I, p. 39, Table 7.1). A volume measurement inconsistency of this magnitude should have been addressed in Kane County's plan as such a large difference casts aspersions on the estimates, based on this volume figure, used to determine long term solid waste plans.

Table I Methodology used for estimating solid waste generation rate for Kane county		
Quantity/estimate	Units	Notes
2,860,098	Cubic gate yards	**Landfilled solid waste volume** estimated "according to reports made to the county by landfill operators" (Vol. II, pg. A-10)
÷ 3.915	Cubic gate yards per ton	**Overall conversion factor**
730,566	tons	(Vol. II, pg. A-12)
x 0.550	-	**Percent of Kane county waste received at landfills.** Estimated by gate surveys during the summers of 1989 and 1990 (Vol. II, pg. A-11)
401,890	tons	Amount of solid waste generated in Kane county
+ 36,325 + 7,977 + 44,628	tons tons tons	exports to other counties on site recycling
490,820	tons	total generated waste (by weight)
x 2,000 ÷ 320,000 ÷ 365	pounds per ton 1989 population days	
8.4	pounds per capita per day	Solid waste generation rate

Another methodological inconsistency in the plan is that this volume is erroneously regarded as a reference number since it is used to evaluate the gate survey results. This is evidenced by the statement in the plan, "The amount of solid waste accepted at both facilities during the gate surveys was extrapolated to a 12 month period, seasonally corrected, and agreed with the operation's [probably the landfill operator's] reports to the county within 3.8 percent, indicating a certain degree of accuracy of the gate survey results " (Kane County, Vol. II, p. A-11). No effort has been made to substantiate the accuracy or to assess the variability of either the operator's numbers reported to the county or the gate survey results.

2.2 Percent of Kane County solid waste received in local landfills

The authors of the Kane County plan state that only 55% of the solid waste received by the county's two landfills originate in the county (Kane County, Vol. II, p. A-12, Table 7). Hence the county appears to import 45% of its solid waste. This quantity has been estimated from two 20 day gate surveys conducted during the summers of 1989 and 1990. Estimating the sources of waste by using such limited data does not accurately assess this quantity, which is severely influenced by a large number of factors including the season and the weather conditions. Furthermore, no actual survey data and analysis are given in the county's plan. The inaccuracy of the surveys themselves is acknowledged in the plan. The authors of the plan wrote that "Gate surveys conducted during other, non-summer, periods would be useful in quantifying these monthly variations in import amounts" (Kane County, Vol. II, p. A-12; see also Table 5, p. A-11, for year to year variability). Additionally, the survey data were seasonally corrected, but the factors used to make this correction were not provided. The actual survey data and a reliability analysis should be included in the plan in order to substantiate the 55% figure. Such a rigorous scientific approach is needed because the percentage amount of imports is critical for the estimation of the county's own generation rate. The plan itself contains the information to discredit the reliability of the 55% estimate. This can be seen in Table 5 of the plan (Kane County, Vol. II, p. A-11), where it becomes obvious that this estimate has a high year to year variability.

The importance of this number, in terms of long term planning, can be seen in

Table II below in which alternative estimations of the solid waste generation rate have been made using all the assumptions of the Kane County plan and a variable percent of imported waste. From Table II and Figure 1 , it can be seen that even a 10% difference in the amount of imports will result in a significantly different generation rate (i.e. 7.1 pounds per capita per day compared to 8.4). If this generation rate were used the future solid waste plans would be substantially altered. Unfortunately, as demonstrated in the above analysis, the 55% figure used in the county plan, or equivalently a 45% figure for imports, lacks sufficient justification. This fact in itself makes questionable the long term solid waste plans which have been proposed.

Table II Estimations of solid waste generation rates based on alternative percent of imports

Assumed percent of Kane county solid wastes received in local landfills	45	50	55	60	65
Assumed percent of imports	55	50	45	40	35
Estimated SW generation rate (same assumptions as in the plan)	7.1	7.8	8.4	9.0	9.7
Estimated tons per year	414,000	455,500	490,600	525,000	563,797

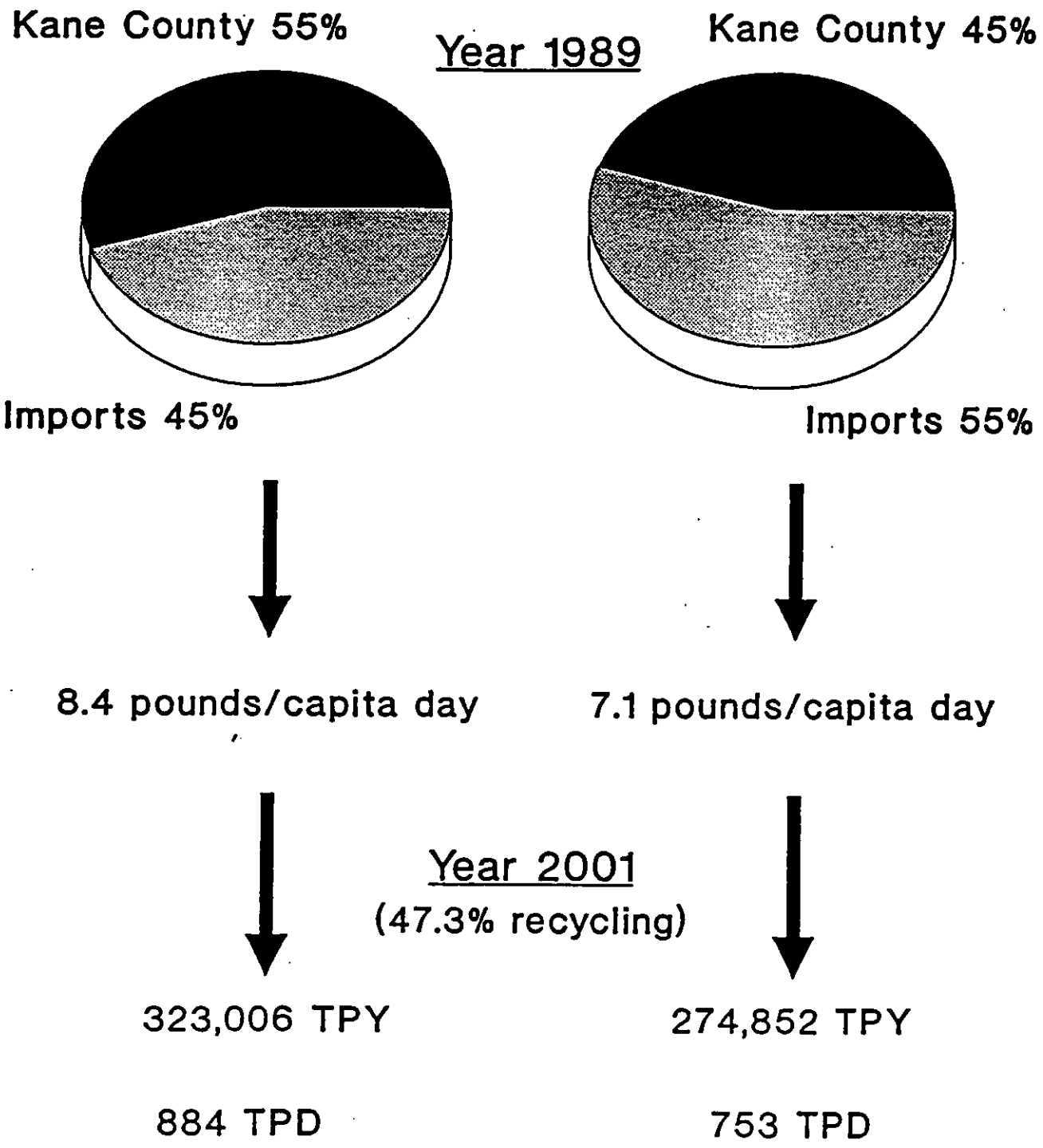

Figure 1 Influence of imports on long term planning

2.3 Overall conversion factor

To convert gate yards into tons an overall conversion factor of 3.915 gate yards per ton was used in the Kane county plan which was derived by dividing the aforementioned 2,860,098 gate cubic yards by the tonnage amount, 730,566, reported in Table 7 of the plan (Kane County, Vol. II, p. A-12). This overall conversion factor accounts for differences in the density composition of the waste and it is very useful for making comparisons of counties in terms of their solid waste streams. As seen in Table III above, the 3.915 conversion factor used in the Kane County plan is relatively high. The average conversion factor used by the IEPA is 3.33 gate cubic yards per ton (see also section 3 for further discussion on this topic)

Table III Overall conversion factor for a number of Illinois counties

County	Conversion factor	% Compacted	% Loose	Generation Rate
West Cook	2.83	76	24	10.44
IEPA	3.33	-	-	7.0
Kane	3.915	65	35	8.4
Bi-State	3.5	-	-	7.32
Lake	3.97	67.8	32.2	8.5
McHenry	3.28	83.8	16.2	7.73
Will	2.58	-	-	6.8

It is obvious from the values presented in this table that the Kane conversion factor, the percent of compacted and loose waste, and the per capita solid waste generation rate all appear questionably similar to Lake County figures. Such "similarities" are extremely rare and highly unlikely given the vast differences in socio-economic characteristics between Lake and Kane county. For instance, Lake County is much more developed

than Kane in terms of urban population centers. The former has only 27.6% percent of its land committed to farmland, compared to Kane's 68.2%. These differences are presented in Table IV which demonstrate that Kane county is more socio-economically comparable to Will County. As noted above, Kane and Lake counties report similar waste generation rates of 8.4 and 8.5 pounds per capita per day, respectively. From the results presented in Table IV, it would seem more likely for Kane County to have a generation rate closer to the rate reported by Will County, which is 6.8 pounds per capita per day.

Table IV Socio-economic characteristics and generation rates

Demographic variable	KANE	LAKE	WILL
Population	317,471	516,418	357,313
Area (square miles)	521.9	467.9	847
number of farms farmland as percent of total	824 68.2	446 27.6	1239 60.7
Households (number)	106,914	173,887	117,209
Employment (% of population): executive, administrative & managerial	18	25	17
Technical, Admin. support & clerical	18.7	22.16	17.4
Household Income (% population): less than $20,000 more than $20,000 less than $100,000 more than $100,000	 20.3 73.8 5.9	 16.3 70.3 13.7	 19.6 75.9 4.5
Household density (% population): 1 or 2 persons/household 3 or 4 persons/household more than 5 persons/household	 48.54 36.13 15.33	 48.92 37.97 13.11	 44.62 39.26 16.12
Educational level (% population): bachelors degree graduate or professional degree	 9.3 4.5	 13.7 7.1	 8.1 3.6
Generation rate (pounds per capita per day)	8.4	8.5	6.8

In Figure 2 the cumulated waste deposited in Settler's Hill is presented. As seen from this figure, the Settler's Hill landfill would suffice to provide all the required volume for the waste generated in Kane County far beyond the year 2010. Unfortunately, due to the 468,750 tons per year contract allowance with Waste Management, a significant amount of solid waste has to be imported from other counties in order to meet the terms of the contract. Due to these imports, the landfill capacity will be depleted by the year 2004 or approximately around the year 2010 is the additional 11 acres become operational (see Figure 2). For this reason, it is essential to assess alternative methods which will extend the life of the landfill owned by the county.

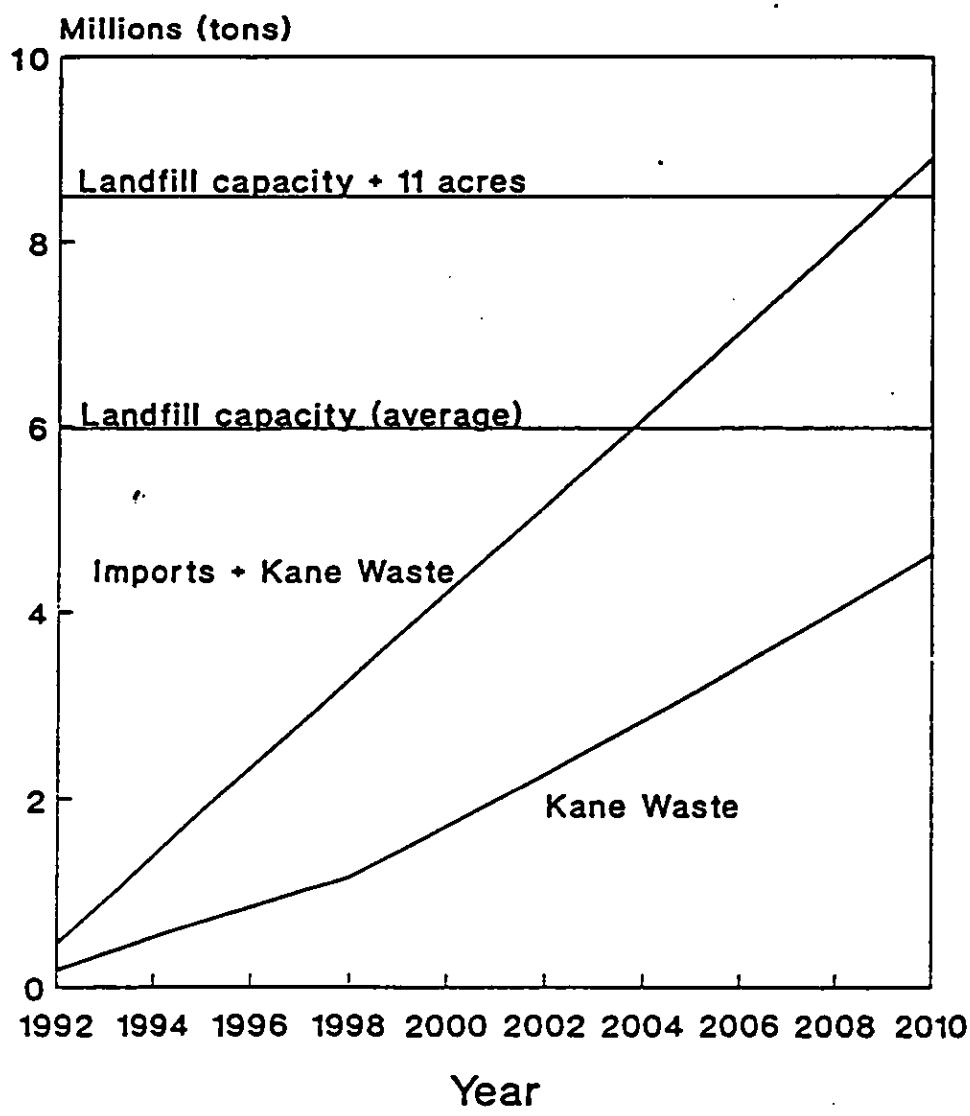

Figure 2 Cumulative waste in Settler's Hill

3. Alternative methods

Alternative methods of landfill operation include, among others, compaction and alternative daily covers. Compaction refers to the decrease in volume, and hence the increase in density, of waste as it is placed in the landfill. Daily cover, often soil or other material, is placed over the "cell" (the portion of the landfill which is currently being filled with waste) at the end of each workday. Each of these alternatives and the combined effect of both on landfill longevity are presented below.

3.1 Compaction

Waste arriving at a landfill is quantified in terms of gate cubic yards. Gate cubic yards have certain densities, usually measured and stated by the operator of the landfill or by the county in which the landfill exists after gate surveys have been performed. The Kane County plan supplies an overall conversion factor of 3.9 gate cubic yards per ton (Kane County Vol. I, 1992, p. A-11; see also section 2.3 above). This translates into a density of 513 pounds per gate cubic yard. After the waste is received at the landfill premises, it is further compacted before it is placed in the landfill. The higher the density of the waste being placed in the landfill, the greater the amount of waste that the landfill can hold. In a landfill worksheet supplied to the IEPA, Settler's Hill Landfill reports that 2.83 gate yards can be further compacted to fit into one "in-place" cubic yard (Solid Waste Landfill Capacity Certification, 1992, p. 2). The term in place means the volume the waste becomes once it is compacted in the landfill. The ratio of the gate yard to in-place yard is referred to as the compaction factor. This translates into an in place density of 1,452 pounds per cubic yard (513 lbs/cubic yard x 2.83). The actual density is probably a little higher. The ratio of 3.9 gate cubic yards per ton stated earlier is high. A better approximation would be 3.54 gate cubic yards per ton, this number is more in line with other counties and is also stated in another Kane County document. The value of 3.54 gate cubic yards per ton translates into approximately 565 lbs. per cubic yard, thus changing the in place density to 1599 lbs. per cubic yard (3.54 X 565). If this density can be increased by improved compaction techniques, more gate cubic yards would fit into an in-place cubic yard. Hence the life of the landfill would be extended. Hypothetically speaking, if the ratio of gate yards to in-place yards were increased to 3.2,

a density of approximately 1,800 lbs. per cubic yard, the life of Settler's Hill Landfill would be increased from 13 years to just over 15 years. Table V below gives various compaction ratios, their corresponding densities (for a conversion factor of 3.54 gate cubic yards per ton) and the corresponding effects on remaining life.

Higher compaction ratios can be achieved through improved compaction methods and technologies. The answer to the question of whether or not to employ alternative compaction techniques is usually based on money. In order to be efficient, it must be shown that the new strategy is economically feasible. Simply put, this means that the revenues generated by tipping fees, incurred through extra landfill space provided by higher compaction ratios, must be greater than the costs involved in acquiring and operating the new compaction equipment. Such an analysis should have been a component of the Kane County plan.

3.2 Daily cover

Landfill regulations stipulate that a minimum of 6 inches of soil be added to the exposed surface of the waste (the cell) each day. The various purposes of daily cover are to (Eldredge Engineering Associates Inc., 1990, p. 130.):

Shed storm water to minimize leachate production
Control short-term odors
Minimize blowing litter
Discourage vectors (rodents, flies, birds)

The cost of daily cover is site specific. If the clay soil that is preferred for daily cover is not indigenous to the site or neighboring area, the cost of importing it can be costly, otherwise it can be comparatively inexpensive.

At a landfill, daily cover can use a large percentage of air space that is available for waste disposal. Figure 3 below shows the relationship between the percent of daily cover and the disposal rate in cubic yards per day for hypothetical dimensions of a landfill (USEPA Seminar, 1992, p. 57). At a disposal rate of 800 cubic yards per day the

TABLE V EFFECT OF INCREASED COMPACTION ON REMAINING LIFE AT SETTLER'S HILL LANDFILL FOR CONVERSION FACTOR OF 3.54 GATE CUBIC YARDS PER TON						
DENSITY (LB./CU.YD.)		COMPACTION FACTOR		REMAINING LIFE		DEPLETION YEAR
1469		2.60		12.31		2004
1526		2.70		12.78		2005
1582		2.80		13.26		2005
1638		2.90		13.73		2006
1695		3.00		14.20		2006
1751		3.10		14.68		2007
1808		3.20		15.15		2007

density of gate cu. yd. = 565 lbs. per cu. yd.
calculated from a ratio of 3.54 gate
cu. yd. per ton

compaction factor is calculated by dividing the required density by the current density

average remaining volume = 9,363,958 in place cubic yards
computed by taking the average of the reported remaining capacities from 1987–1992 with the exception of 1988 which is an outlier value
data from IEPA's Available Disposal Capacity for Solid Waste in Illinois, 1987–1991
and from IEPA's Solid Waste Landfill Capacity Certification for Settler's Hill, 1992
per the Certification for 1992, a compaction factor of 2.83 and a daily cover amount of 20% of remaining total volume were used to calculate net remaining volume for waste disposal, these values were held constant while calculating the reported net available volumes back to total volumes available for disposal

yearly volume is derived from the Settler's Hill contract which allows a minimum of 468,750 tons per year to be deposited at the site, these tons are converted to gate cubic yards by multyplying by a factor of 3.54 (discussed in the text)

remaining life is calculated by dividing the net remaining volume by the yearly amount of waste deposited in the landfill, note that the remaining volume is in place cubic yards and must be converted to gate cubic yards by multiplying by the corresponding compaction factor for the appropriate density and that the net remaining volume reflects 20% daily cover

percentage of daily cover reaches a lower bound of about 15%. In the worksheet supplied to the Illinois Environmental Protection (IEPA) by Settler's Landfill, Solid Waste Landfill Capacity Certification, dated 4/23/92, the percentage allowance for daily cover is reported to be 20% of total available air space.

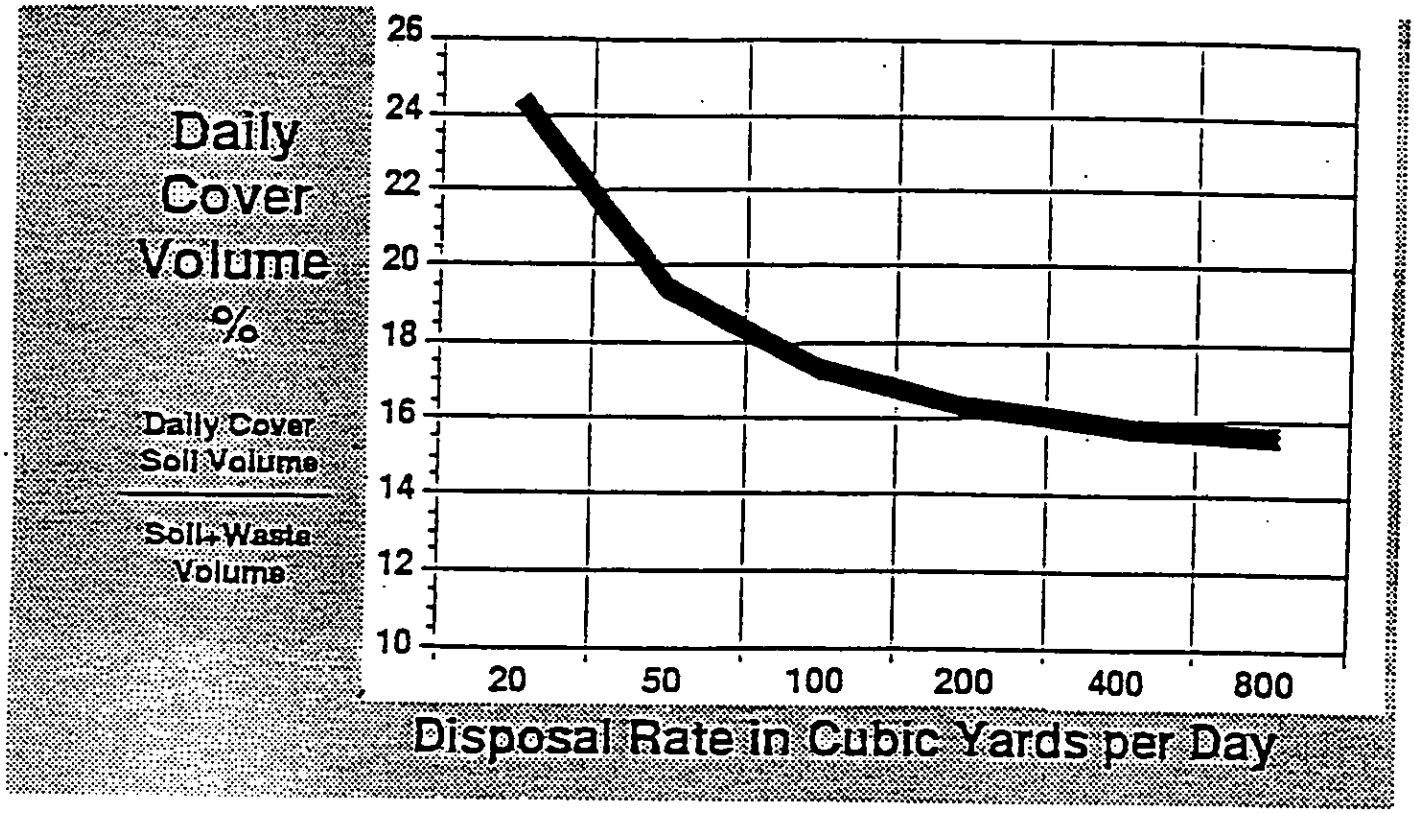

Figure 3 Daily cover as a function of disposal rate (from USEPA, 1992)

There are other options to using soil as daily cover. Alternative daily cover is allowable in landfills if its performance meets the intent of a 6-inch soil cover and it is approved by the director in a USEPA approved state (USEPA Seminar, 1992, pp. 57 and 58). Types of alternative daily covers include; geotextiles, polymer bonded materials, foams, sludges and others (USEPA Seminar, 1992, p. 57). One type of alternative daily cover is Fabrisoil, manufactured by Phillips Fiber Corporation. According to the corporation, Fabrisoil is a panel of fabric designed to give the benefits of daily soil cover without taking up landfill disposal volume. Fabrisoil can be placed over the compacted

waste using existing landfill equipment such as a bulldozer or other compacting equipment. At the start of each workday in the landfill cell, the Fabrisoil cab be pulled off the compacted refuse and reinstalled at the end of the workday. The life of a Fabrisoil panel is generally about 15 days, so it must be replaced periodically. Fabrisoil has been used at the Sexton Landfill in McLean County, Illinois. Alternative daily covers can increase the efficiency of a landfill by allowing more waste to be deposited in the landfill by increasing the air space available for disposal.

The percentage amount of air space needed at a landfill, using an alternative cover, will now be estimated. Given that a landfill requires 6 inches of daily cover and a 6 day work week, some basic calculations can be made to determine the amount air space an alternative daily cover, such as Fabrisoil, can save at a landfill. It is advised that a landfill should still have 1 day per week of soil cover to guard against fire (Richardson, 1992). This advice seems quite logical and will be used in the following calculations. In a 6 day work week, if alternative daily cover can be used on 5 of those days with no net use of available air space and using soil on a 6th day, airspace savings will equal 1/6 of the original amount allotted for daily cover. In the case of the Settler's Hill Landfill, recall that daily cover was estimated to be 20% of the total remaining volume. One sixth (1/6) of 20% is 3.33%. By using an alternative daily cover, the volume of daily cover would drop from 20% of the total to just 3.33%. In the aforementioned IEPA worksheet, Settler's Hill reports an estimated 9,820,414 cubic yards of remaining air space, an in-place cubic yard to gate cubic yard ratio of 2.83:1 and a previous 12 month amount of waste received of 1,768,205 gate cubic yards (Solid Waste Landfill Capacity Certification, 4/23/92). The IEPA calculates remaining life for a landfill by multiplying the remaining available air space (total minus daily and final cover) by the in place to gate cubic yard ratio, in this case 2.83, and then dividing by the current year disposal volume. Using 20% of available air space as the needed amount of daily cover, these numbers estimate the remaining life to be approximately 12.5 years, which was reported to the IEPA. Using 3.33% as the amount of needed daily cover yields a remaining life of 15.2 years, which represents an increase of almost three years. This represents a remaining volume of 9,493,394 cubic yards versus the reported amount of 7,856,331 cubic yards, a difference of 1,637,063 cubic yards. To normalize for the variability in remaining landfill volume reported to the IEPA an average of the last five years has been used for calculations in Table VI below. As can be seen in the table, decreasing the percentage of daily cover from 20 to 5

percent, will increase the life of the landfill by over two years.

TABLE VI EFFECT OF ALTERNATIVE COVERS ON REMAINING LANDFILL LIFE AT SETTLER'S HILL		
PERCENTAGE DAILY COVER	REMAINING VOLUME (cu. yd.)	REMAINING LIFE (yrs.)
20	7491166	11.99
10	8427562	13.49
5	8895760	14.24

NOTES: Compaction factor = 2.83 gate cubic yards per 1 in place cubic yard
total remaining volume = 9,363,958 avg. in-place cubic yards
previous 12 months waste disposal amount = 1,768,205 cubic yards
data gathered from IEPA's Solid Waste Landfill Capacity Certification for Settler's Hill for 1992.
Daily cover is subtracted from total remaining volume to arrive at remaining volume available for waste disposal and then multiplied by 2.83 and divided by the previous 12 months waste disposal volume to calculate remaining life.

In the new contract between Settler's Hill and Kane County, Section 5.15 Daily Cover states that "the Company shall use alternative daily cover on at least 40% of the area upon which daily cover is placed if permitted by the Operating Permits". Earlier it was stated that the percent of daily cover bottoms out at about 15% for disposal rates greater than 800 cubic yards per day, which Settler's Hill exceeds. (See Figure 2 above.) This amount of daily cover, 15%, is also noted in Eldridge Engineering Associates' Municipal Solid Waste Landfills, Volume II, Technical Issues, p. 89, Table 3.5). Since Settler's Hill estimates 20% daily cover, given the large difference between percentage values for soil daily cover versus alternative daily cover, it seems logical to conclude that Settler's Hill is not employing the use of alternative daily cover at the present time.

Not only does the use of alternative cover save space, thus adding to the remaining life, but since the landfill can accept more waste, it can also increase the

revenue generated by tipping fees (see Table VII below). In Section 9.1 of the Amended and Reinstated Agreement For Operation of Landfill at Settler's Hill, Section 9.1, Payment to the Company, the county has acknowledged that commencing July 15, 1992 the owner of the landfill, Waste Management Corporation, will be compensated at a rate of $16.99 per ton of waste deposited at the site, subject to yearly revisions, as well as in an annual amount of waste not to be less than 468,750 tons.

3.3 Effect of alternative cover and compaction on remaining landfill life

Earlier it was established that daily cover could provide extra landfill air space. Following the procedures used in the IEPA worksheets, remaining landfill air space is multiplied by the compaction factor to arrive at the total amount of gate cubic yards that can be accepted over the life of the landfill. The available gate cubic yards are then divided by the last year of measured disposal volume, in gate cubic yards, to determine the remaining years of life. By using different percentages of daily cover various scenarios can be formed to predict the remaining years, including depletion year for the Settler's Hill landfill (See Table VIII below).

As can be seen in the Table VIII, increasing the compaction factor while decreasing the percent daily cover, would increase the life of Settler's Hill landfill. At 5% daily cover and an compaction factor of 3.3, the landfill will last until the year 2010, the ending period for the current solid waste management plan. More dramatically, the planned expansion of Settler's Hill by the addition of 11 acres, coupled with alternative cover and compaction techniques, will increase the life of the landfill under most scenarios. See Table IX below.

Additionally, alternative cover and increased compaction will have a beneficial effect on gross revenues. The added landfill space translates into an increase in revenue. Each extra ton of waste accepted is multiplied by the tipping fee at that time to arrive at gross revenues. The next step in the evaluation process would be to compare costs of the alternative cover and the compaction equipment to the extra gross revenue generated by the new technology. The Kane County Solid Waste Plan should have performed a cost-benefit analysis to determine the economic feasibility of employing both alternative cover and compaction techniques.

TABLE VIII COMBINED EFFECTS OF DAILY COVER AND INCREASED COMPACTION ON REMAINING CAPACITY AT SETTLER'S HILL LANDFILL

PERCENT DAILY COVER	COMPACTION FACTOR	DENSITY (lbs./cu. yd.) (1)	GATE CU. YDS. FOR DISPOSAL (2)	REMAINING LIFE (yrs.) (3)	DEPLETION YEAR (4)
20	2.60	1469	19477033	11.74	2004
20	2.70	1526	20226149	12.19	2004
20	2.80	1582	20975266	12.64	2005
20	2.90	1639	21724383	13.09	2005
20	3.00	1695	22473499	13.54	2006
20	3.10	1752	23222616	13.99	2006
20	3.20	1808	23971732	14.45	2006
10	2.60	1469	21911662	13.20	2005
10	2.70	1526	22754418	13.71	2006
10	2.80	1582	23597174	14.22	2006
10	2.90	1639	24439930	14.73	2007
10	3.00	1695	25282687	15.24	2007
10	3.10	1752	26125443	15.74	2008
10	3.20	1808	26968199	16.25	2008
5	2.60	1469	23128976	13.94	2006
5	2.70	1526	24018552	14.47	2006
5	2.80	1582	24908128	15.01	2007
5	2.90	1639	25797704	15.55	2008
5	3.00	1695	26687280	16.08	2008
5	3.10	1752	27576856	16.62	2009
5	3.20	1808	28466432	17.15	2009
5	3.30	1865	29356008	17.69	2010

1: Density values were determined by multiplying 565 lbs. per cubic yard by each row's compaction factor. The value of 565 is given in the text.

2: Gate cubic yards for disposal is determined by multiplying the average remaining volume of 9,363,958 in–place cubic yards by the quantitiy (1 – each row's daily cover/100) and multiplying by each row's compaction factor.

3: These values were determined by dividing the respective gate cubic yards for disposal by 1, 659,375. This last figure is determined by multiplying 468,750 tons, the contractual minimum of waste to be landfilled each year, by 3.54 gate cubic yards per ton.

4: These values were determined by adding the remaining life in years to the base year, 1992.

4. Landfill costs

The Kane County Plan uses two methods to estimate the costs associated with constructing a new landfill. The first method establishes the average capital cost per ton from different landfills. An average of these values is then applied to different sizes of landfills, in tons per day, to estimate the capital costs. The second method uses the annual operating and maintenance cost per ton of Settlers Hill Landfill to estimate the annual operating and maintenance cost for different size landfills. Both methods of cost estimation are flawed. Their respective downfalls will be analyzed in the proceeding discussion.

Table 5.3 (p. G-41) of the Kane County Solid Waste Management Plan is a comparative table of landfills illustrating such variables as; acres, life, tons per day (TPD), total capital cost, total capital cost per ton per day and per acre, and total cost per ton. (The contents of this table are reprinted below, Table X.) The stated average total capital cost per ton per day is $12,500. In subsequent chapters of the Kane County Plan, this figure was used to estimate the total capital costs of different sized landfills. Landfill size is quantified in terms of tons per day. In the Kane County plan the TPD is multiplied by the average cost per ton per day to determine the total capital cost for each landfill size.

Data on total capital cost per ton and per acre for the landfill site in Minnesota were excluded from Kane County's Table 5.3 noted above. The Kane County plan states that the Minnesota data is inconsistent with the other data (see Table XI below). For example, the total capital cost per ton for the Minnesota facility is $76,000. If this figure is compared to the previously stated average of $12,500 (which does not include the Minnesota data) found in Table X, is appears quite high. However, when stating unit costs, there exist economies of scale. For instance, if two manufacturers of an identical product have the same overhead costs, but one of the manufacturers produces more of the product, that manufacturer's overhead cost per product will be lower than the other manufacturer. In the case of the Minnesota facility, the TPD is 90, while the average of all the others is 1,158. This does not mean the data is inconsistent, in fact quite the opposite, it is entirely consistent. Landfills that have a lower amount of tons per day of processing capacity will naturally have a higher value for total capital cost per ton per day and hence total cost per ton. If the data presented by Kane County is to be truly

representative and to take economies of scale into account, an average total capital cost per ton must include the data from Minnesota. Table XI accounts for this omission (See Table XI below.

TABLE X SUMMARY OF REPORTED LANDFILL COSTS IN DOLLARS (original)

Source	acres	life (yrs.)	TPD	Total Capital Cost	Total Capital Cost/Ton	Total Capital Cost/Acre	Total Cost Per Ton
Illinois	150	10	1000	$5,090,000	$5,090	$33,933	$19.33
Lake County	–	20	1000	$9,484,000	$9,484	–	$18.77
	–	20	1000	$12,429,000	$8,286	–	$15.89
Massachusetts	88	33	330	$9,532,000	$28,885	$108,318	$18.91
Minnesota	45	42	90	$6,840,000	($76,000)	($152,999)	$29.98
Will County	–	20	1300	$10,358,000 –19895000	$7,968 –15304	$51,790 –99475	$17.10 –24.53
AVERAGE					$12,500	$38,808	$20.64

TABLE XI SUMMARY OF REPORTED LANDFILL COSTS (corrected)

Source	acres	life (yrs.)	TPD	Total Capital Cost	Total Capital Cost/Ton	Total Capital Cost/Acre	Total Cost Per Ton
Illinois	150	10	1000	$5,090,000	$5,090	$33,933	$19.33
	85	10	300	$3,450,000	$11,500	$40,588	$35.99
Lake County	–	20	1000	$9,484,000	$9,484	–	$19.57
	–	20	1500	$12,429,000	$8,286	–	$16.48
Massachusetts	88	33	330	$9,532,000	$28,885	$108,318	$18.91
Minnesota	45	42	90	$6,840,000	$76,000	$152,000	$30.14
Will County	200	20	1300	$10,358,000 –19895000	$11,636	$75,633	$19.57
AVERAGE					$21,554	$82,095	$22.86

Other amendments to Kane County's Table 5.3 (reprinted here as Table X) are required. Inconsistencies, omissions, updates, and problems with assumptions need to be addressed. Estimated upper and lower cost ranges were determined by the authors of the Will County solid waste report. The Kane County plan used high and low estimates from Will County's draft report of 1990. The final report, The County of Will, Solid Waste Management Plan, January 1991, has since been published. The capital costs remain the same, however, the high and low estimates for the total cost per ton change to $23.58 and $15.56, respectively. This represents a new average cost per ton of $19.57. This is down slightly from the earlier reported value of $20.82. Additionally, no acreage is reported in the Kane County Plan for Will County, however total capital cost per acre is given (Kane County, Vol. II, Table 5.3, p. G-43). By back calculation it was found that Will County has 200 acres of landfill space remaining. (Will County's solid waste report, 1991, also uses the same figure, 200 acres [The County of Will, vol. VI, 1991, p. 3-2]). The 1991 Will County Plan used 1990 dollars for their study (The County of Will, vol VI, 1991, p. 3-3).

The Kane County plan lists Lake County's second landfill as having a size of 1000 acres. However, by back calculating as above, the actual size of the landfill is 1,500 acres. Lake County's report also provides a figure of 1,500 acres (Lake County, Appendix A, 1989, p. 13-56). Cost estimates in this report are reported in 1988 dollars in Tables 13-15 and 13-16 (Lake County, Appendix A, 1989, pp. 13-57 and 13-58). In the estimation of annual costs, the authors of the Kane County plan have excluded the Annual Replacement Fund Contribution, which allows for a replacement fund equal to 10% of the mobile equipment capital cost. If the costs of this fund are included, the 1988 cost per ton for 1,000 TPD and 1,500 TPD are $19.57 and $16.48, respectively. The Lake County Plan uses a 5% inflation factor to bring the annual operating and maintenance fee up to 1993 dollars. The initial capital costs including land acquisition, equipment, structures, first cell development, et cetera, are commonly financed by the issuance of a general obligation bond. The interest payments which account for a portion of the annual operating and maintenance costs are fixed and are therefore not affected by inflation (Lake County assumes 312 days year in their TPD calculations).

The data for the Minnesota and the Massachusetts facilities are found in WastePlan, User Guide, Version 90-6 (WastePlan is a computer software package which

allows solid waste planners to estimate the costs of waste plans based on various parameters. The program is marketed by Tellus Institute). The capital cost figures for both facilities are the same in the Kane County Plan and in WastePlan, however the tipping fee for the Minnesota facility differs. The Minnesota site reports a total cost per ton of $30.14 versus $29.98 in the Kane county Plan. The post closure time frame for the Minnesota facility is only 20 years, 10 years shy of the USEPA's required 30 years (WastePlan, Table 4-14, p. 4-45). (According to the USEPA's new landfill regulations, a 30 year post closure period is required [EPA 40 CFR Part 258 Subpart F].) The Massachusetts facility also makes no provision for leachate treatment (WastePlan, Table 4-14, p. 4-45). While it is difficult to estimate the cost implications of these differences, it is evident that they will increase costs, especially at the Minnesota site.

The landfill cost estimate provided in the Kane County Plan was taken from an IDENR report entitled Municipal Solid Waste Management Options: Landfills, 1989. On page G-11 of the Kane County Plan, one of the assumptions is the cost estimates provided for a 300 TPD and a 1,000 TPD facility. The Kane County report only provides the 1,000 TPD estimate. The estimate for the 300 TPD facility can be found in Table 6.2 (pp. 6-7 and 6-8) of the IDENR report. Briefly, the estimate calls for a tip fee of $35.99 per ton. This omission is noted in Tables XI (above) and XII (below). The term tip fee in these estimates may be misleading. They are actually costs per ton. If the landfill is under public administration, these could be the actual tipping fees. If the landfill is run by an entity outside the local government, the cost per ton will have to be raised to account for a level of profit for the owner/operator. The cost estimates, both 300 and 1,000 TPD, only have a 5 year post closure period added to the cost. The new USEPA rulings, noted above, require a 30 year post closure period. Additionally, on page G-11 of the Kane County report, it states that the bottom liner must be at least 5 feet thick, however the cost estimate only cites a 3 feet liner. This will also effect the final cover. The United States EPA 40 CFR 258 Subpart F also requires that the final cover have permeability equal to or less than the bottom liner. Both these omissions will lead to dramatically higher cost. Further in depth analysis will surely lead to other cases of underestimation of cost. For example, the stated price of land is only $1,500 per acre. Land prices are site specific, but will be dramatically higher than those reported in the Kane County Plan. It is stated in the IDENR report that the cost estimates provided are generic and that many things can add to increased costs. These areas of potential cost increases should

have been more thoroughly researched before including the IDENR estimates in the Kane County Plan as fact.

Table XI above reflects the average costs, including the Minnesota facility, and the aforementioned amendments and errors in calculation. The total capital cost per ton per day is shown in the shaded area. As can be seen, by correctly including the Minnesota data as well as the other changes, the average cost increases substantially, from $12,500 to $21,554 (compare Tables X and XI). This represents an increase of approximately 72%.

In Section L, Table 1 (p. L-6) of the Kane County Plan, the estimated capital and total annual costs for landfills of different capacities is presented. (The portions of this table which are used here are reprinted in Table XII below.) The amounts shown for capital costs were found by multiplying the TPD by the average capital cost per ton per d ay. This table uses the incorrect average capital cost per ton per day of $12,500 (see Table X above). By using the correct average of $21,554 (from Table XI) the estimated costs in Table XII jump dramatically. For example, System #2 of the plan which represents the option of recycling and landfilling would have a cost of $19,075,290. This amount is $8,012,790 over the original estimate.

TABLE XII ESTIMATED CAPITAL COSTS FOR LANDFILLS
(KANE COUNTY PLAN, VOL. II, APPENDIX L, TABLE 1)

SYSTEM	LANDFILL SIZE (tpd)	ORIGINAL CAPITAL COST	CORRECTED CAPITAL COST	DIFFERENCE
#1	321	$4,012,500	$6,918,834	$2,906,334
#2	885	$11,062,500	$19,075,290	$8,012,790
#3	544	$6,800,000	$11,725,376	$4,925,376
#4	342	$4,275,000	$7,371,468	$3,096,468

NOTES: System #1 represents a waste management plan including landfill, combusiton, and recycling
System #2 represents a waste management plan including landfill and recycling.
System #3 represents a waste management plan including landfill, composting, and recycling.
System #4 represents a waste management plan including landfill, composting, combustion, and recycling.

In Table 2 (p. L-7) of the Kane County Plan, cost summaries are given for the facilities and systems. The change in the landfilling component of each system will not change the cost ranking, because it is a proportional increase across all the systems. However, it does make the systems considerably more expensive. Additionally, the relationship between capital costs and annual costs is unclear in this table. For example, capital costs are often financed by the issuance of a general obligation (G.O.) bond. Debt service is paid on these bonds every year, usually semi-annually. The annual debt service is included the annual costs of operating the landfill and thus reflected in the tipping fee. The $30 tipping fee is given as a basis for annual cost. The $30 tipping fee is the approximate existing price at Settler's Landfill in Kane County (Kane County, 1992, p. L-5). Included in this price should be a portion that takes into account the debt service paid on the bonds issued for capital costs. This of course is only an assumption; the method of funding of Settler's Hill Landfill is unknown. However, different scenarios can be presented. First, for example, by assuming the $30 tipping fee in the Kane County Plan, the capital cost, annual operating, and maintenance cost and the amount of debt service of the facility are basically irrelevant in determining the tipping fee. This can be seen in Table 2 noted above; no matter what the size of the facility, the tipping fee remains the same. This of course is not the case, as evidenced by the previously mentioned Table 5.3 (reprinted as Table X here), which clearly shows differences in tipping fees given different sizes. Due,to economies of scale, higher TPD landfills usually have lower tipping fees than lower TPD landfills.

Second, if debt service is not assumed to be included in the $30 tipping fee, the tipping fee needs to be adjusted upward to offset the cost of the interest payments. Assuming the original cost of $11,062,500 (see Table XII), an estimated 8% interest compounded semi-annually, and using 10 years and 20 years as bond lives, the debt service would be $6.43 and $4.42 per ton per day, respectively. Using the new capital cost of $19,075,290 (see Table XII) and the same assumptions, the amount of debt service reflected in the tipping fees would be $11.09 and $7.61 respectively. In other words, if the $30 does not reflect the annual debt service to pay for the capital cost, these amounts must be added on, bringing tipping fees to a range of between $34.42 and $41.09. Either way, the use of $30 to estimate costs seems not to be justified.

In addition, the calculations involving the portion of the tipping fees that go to debt

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