SCS ENGINEERS

NEEDS ASSESSMENT FOR MUNICIPAL SOLID WASTE TRANSFER FOR THE DISTRICT OF COLUMBIA 2000

FINAL REPORT

Prepared for:

SOLID WASTE TRANSFER FACILITY SITE SELECTION ADVISORY PANEL
2000 14th Street, NW, Third Floor
Washington, D.C. 20009

Prepared by:

SCS ENGINEERS
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Reston, Virginia 20190
(703) 471-6150

November 2000
File No. 02200029.00

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INTRODUCTION

The Council of the District of Columbia passed D.C. Law 12-286 "Solid Waste Facility Permit Amendment Act of 1998" (the "Act"), effective June 11, 1999, which serves to amend the Solid Waste Facility Permit Act of 1995. This law includes the establishment of a Solid Waste Transfer Facility Site Selection Advisory Panel ("Panel").

The Panel has the following objectives:

- prepare recommendations to the D.C. Council specific to identification of tracts of land suitable for solid waste transfer operations within appropriately-zoned sections of the District that safeguard the health, safety, and welfare of residents and businesses;

- submit those recommendations in a report which identifies potential sites, rates each site according to its suitability for the purpose of solid waste transfer, and considers the proximity of other potential sites in rating each site. These potential sites shall comply with all siting requirements of the Act, shall not be inconsistent with the Comprehensive Plan, and shall not increase or compound existing detrimental environmental impacts; and,

- report on:

  - the District's reasonable carrying capacity as a regional solid waste facility site based on best practices in solid waste management;
  - an evaluation of the impact of existing solid waste facilities on local residents;
  - a study of the solid waste needs of the District;
  - the total revenue the District has received yearly from each solid waste facility operating in the District since the Certificate of Occupancy was issued for the facility, showing the kinds of taxes and fees that have been paid; and
  - the available control technologies capable of complying with the BACT standard for solid waste under the Act.

In July 2000, the Panel and the District contracted with SCS Engineers to provide engineering, technical, and environmental assistance regarding sold waste transfer, conduct a study, and prepare a Needs Assessment Report. SCS' efforts included ongoing support to the Panel on solid waste management issues and industry practices, analysis of solid waste quantities generated and managed within the District, review of existing operating solid waste handling facilities, analysis of siting criteria and application of such criteria to various potential land parcels, preliminary engineering designs for possible refurbishments at District-owned facilities, and capital cost estimates for new and refurbished solid waste handling facilities.

As part of its support to the Panel, certain basic assumptions were established for SCS Engineers as part of this focused study:

1. Provide engineering and technical assistance specific to near-term solutions for long-term solid waste transfer in the District. Waste disposal options such as incineration or landfill were not considered as part of the study.

2. Engineering analyses should emphasize conventional waste transfer via truck as opposed to barge transfer or rail haul.

3. Engineering analyses should be based on estimated waste quantities for the waste stream generated in the District as well as the waste stream imported into the District.

4. Assume that all future operating solid waste transfer stations in the District will be engineered as state-of-the-technology facilities and will be required to meet siting, operational, and reporting requirements consistent with current District law, including minimum setbacks/buffers, use of fully-enclosed buildings for waste handling, environmental controls, and general best management practices.

To this end, this report summarizes key elements of the technical support and analyses provided by SCS Engineers to the Panel. Chapter 9 presents findings and recommendations based on the study.

CHAPTER 1

REVIEW OF LEGAL AND INSTITUTIONAL FRAMEWORK

This chapter briefly describes the laws and regulations affecting solid waste management in the District of Columbia and specifically, the framework currently in place for the permitting, operation, reporting, and closure of solid waste transfer stations.

RECENT LEGISLATIVE ACTIONS

Recent legislative actions serve as the legal framework for solid waste management in the District. The enactment in 1989 of the District's recycling law ["Solid Waste Management and Multi-Materials Recycling", DC Code 6-3401 et. seq.] established waste management priorities for the District (i.e., source reduction, recycling, and landfill disposal) and banned solid waste incineration until a 25 percent recycling target could be achieved. The law also set a 45 percent recycling goal for 1994 and required the Department of Public Works (DPW) to develop a 10-year solid waste management plan. A draft plan was prepared in 1992; to date, the plan has not been finalized nor adopted by the District.

Subsequently, the Zoning Commission adopted implementing regulations in 1993 [DCMR, Title 11, sec. 800. et. seq.]. These regulations govern only those handling facilities that recover/recycle specified materials in the waste stream, defined as Intermediate Processing Facilities on the basis of the materials handled and the rate of recovery achieved. The implementing regulations do not apply to solid waste transfer facilities or to construction and demolition (C&D) handling, processing, and/or recycling facilities.

In 1993, the two District-owned waste transfer stations (Fort Totten and Benning Road Transfer Facilities) were closed to private haulers. As a result of this action, nearly a dozen privately owned and operated waste transfer stations began operations in the District under various certificates of occupancy. The District sought to shut down some of these facilities; several closed and others remain in pending litigation.

As a means to establish formal permitting requirements for solid waste transfer stations, the City Council passed the Solid Waste Facility Permit Emergency Amendment Act on February 22, 1996 [DC Code 6-3451]. This Act sought to regulate existing transfer stations by requiring preparation and submittal of applications for Interim Operating Permits by June 1995. In addition, new health and safety parameters were established for operating facilities receiving permits. Further, the Act barred any new transfer stations from opening until governing regulations were promulgated.

Following passage of the Solid Waste Facility Permit Emergency Amendment Act, the Office of Planning sought to bring the regulation of solid waste transfer stations under the jurisdiction of the Zoning Commission. The Zoning Commission published regulations in March 1998 [DCMR Title 11, sec. 802.4 et seq.].

These zoning regulations authorized the Board of Zoning Adjustment to permit transfer stations in CM (Commercial, Light Manufacturing) and M (General Industrial) zoned areas following a public hearing. The regulations also included required buffers (as measured from the property line) such that each permitted transfer station must be at least 300 feet away from a residentially zoned and occupied property (defined as a dwelling), and that each permitted transfer station be at least 50 feet from most other uses.

Subsequently, the City Council passed further legislation regarding transfer station siting as follows:

- Passed a Sense of the Council Resolution, which, among other provisions, required a minimum 500-foot setback (as measured from the facility to the nearest property line), or generally, a zone within the property of the transfer station facility;

- Amended the Comprehensive Plan to require this 500-foot setback;

- Overrode the December 1998 Mayoral veto to create the Solid Waste Facility Permit Amendment Act of 1998 which includes the above-mentioned 500-foot setback and a second setback of at least 50 feet (as measured from the operational area to the transfer station's own property line). In addition, this same legislation expanded the protective measures of the Act, created the Solid Waste Transfer Facility Site Selection Advisory Panel, and continued the prohibition on the issuance of operating permits until the Council acts on the Panel's recommendations.

LAWS AND REGULATIONS GOVERNING SOLID WASTE MANAGEMENT

Key parts of the laws and regulations governing solid waste management, and in particular, the siting of solid waste transfer stations, are discussed below.

Comprehensive Plan

The District of Columbia Comprehensive Plan Amendment of 1999 (Act 12-609) establishes objectives and policies toward solid waste management. The objective is to develop safe and effective methods for reducing, collecting, recycling, and disposing of solid waste. The policies established in support of the objective include:

- Develop and implement a reliable program of solid waste and sludge management that is cost-effective, environmentally sound, and fully coordinated with all responsible jurisdictions and regulatory bodies;

- Ensure reliable, adequate collection from residences, business establishments, and other facilities;

- Encourage the recovery and recycling of solid waste and sewage sludge materials, for both the public and private sectors, through appropriate regulatory, management and marketing strategies;

- Promote the development of cost-effective and environmentally sound techniques to extract energy from wastes, including sludge; and

- Develop and effective public education program to encourage residents and businesses to reduce litter and promote recycling.

District of Columbia Code

There are several parts of the District Code that govern solid waste management in the District. The majority of the laws are located in Title 6, Health and Safety. The following chapters in Title 6 pertain to solid waste management:

- Chapter 5 – Garbage
- Chapter 7 – Hazardous Waste Management
- Chapter 9 – Environmental Controls
- Chapter 29 (Part I) – Litter Control Administration
- Chapter 29 (Part II) – Illegal Dumping Enforcement
- Chapter 34 – Solid Waste Management and Multi-Material Recycling

Responsibility for administering the laws governing solid waste management is divided between two District agencies:

- Department of Public Works, which has primary responsibility for the collection, storage and disposal of solid waste; and

- Department of Consumer and Regulatory Affairs (DCRA), which has the primary responsibility for the management of hazardous solid waste, low level radioactive waste and medical waste, and the enforcement of the environmental protection laws that control the quality of air, soil water and wastewater.

District of Columbia Municipal Regulations

Rules implementing or affecting the various solid waste management laws are set out primarily in four titles of the District of Columbia Municipal Regulations (DCMR):

- Title 20: Environment;
- Title 21: Water and Sanitation;
- Title 22: Public Health and Medicine; and
- Title 24: Public Safety.

The DPW has promulgated rules in Title 21 with respect to solid waste management, multi-material recycling, solid waste disposal fees, and discharge standards, as well as the rules in Title 24 with respect to junk vehicles and litter control enforcement. The DCRA has issued rules in Title 20 with respect to air quality regulations and hazardous waste management, and in Title 21

with respect to water quality standards. Key parts of the DCMR for Titles 20, 21, and 22 are discussed below.

20 DCMR: Environment--

Requirements of 20 DCMR applicable to solid waste transfer facilities include provisions for air quality and noise. Air quality provisions include:

- Restricted vehicle engine idling to no more than three minutes;
- Prevention of the escape of a trail of visible vehicular exhaust fumes for more than ten consecutive seconds; and
- Prohibition of odorous or other air pollutants that interfere with the reasonable enjoyment of life and property.

Noise limits from vehicles over 10,000 pounds are limited to 60 decibels at the property line.

21 DCMR: Solid Waste Control--

21 DCMR establishes the minimum standards for the storage, collection, transportation, and disposal of solid wastes. For example, all areas where solid waste is handled, deposited, placed, processed, or disposed must be fully enclosed, have impermeable floors, and be equipped with a ventilation system that meets stated minimum requirements. Permit applications for solid waste transfer facilities are to include the following information:

- Estimated quantities of waste to be processed at a facility;
- A description of the methods used to determine and record the location where wastes were generated, where wastes were sent for disposal, and the amount of recyclable materials recovered;
- A copy of engineering plans and specifications for the proposed or existing solid waste facility, including drawings and specifications for the ventilation system, odor, smoke and air pollution abatement system, dust control system, and fire prevention measures and equipment to be used by the facility;
- A description of the methods to be used to prevent, monitor, and control the presence of vectors, odor dust, noise, and air pollutants;
- A written emergency operational plan;
- A completed District of Columbia Environmental Impact Screening Form;

- An application for an Environmental Mitigation-Closure performance bond in the amount of one million dollars ($1,000,000);

- Certificates of good standing from the Department of Consumer and Regulatory Affairs;

- A Certification from the Office of Tax and Revenue establishing that the owner and operator are registered as businesses in the District of Columbia.

22 DCMR: Public Health and Medicine--

22 DCMR contains minimum setback and buffer distances discussed previously in this chapter. Additionally, a traffic flow plan must be submitted for each solid waste transfer facility that shows the routes used by inbound refuse collection vehicles and outbound transfer trailers, and indicates routings which use arterials roads and avoid the use of residential roads.

Solid Waste Facility Permit Amendment Act of 1998

This Act, in conjunction with the Solid Waste Facility Permit Act of 1995, provides comprehensive siting, operating, and reporting requirements for permitted solid waste transfer stations and construction/demolition material handling facilities. While all the requirements of these two Acts carry significance, key elements with respect to solid waste handling facilities are discussed below.

Key Definitions --

Solid waste is defined by the Solid Waste Facility Permit Amendment Act of 1998 as "garbage, refuse, construction and demolition waste or any other waste product, including solid, liquid, semisolid, or contained gaseous material, resulting from commercial, industrial, or government operation, or residential or community activity". This definition differs from Chapter 34 Solid Waste Management And Multi-Material Recycling § 6-3403, which defines solid waste as "garbage, refuse, or any other waste product including solid, liquid, semisolid, or contained gaseous material resulting from an industrial, commercial, or government operation or a community activity".

The key difference is the inclusion of "construction and demolition waste" into the definition of the Act. "**Construction and demolition wastes**" means the waste building materials and rubble resulting from construction, remodeling, repair, and demolition operation on houses, commercial buildings, pavements, and other structures.

"**Existing solid waste facility**" means a solid waste facility in construction, including site preparation, or operating on March 23, 1995.

"**Intermediate materials recycling facility**" means a fully enclosed structure used for the receipt, separation, storage, conversion, baling, briquetting, crushing, compacting, grinding, shredding, or processing of paper, metal, glass, plastics, tires, bulk waste, or other nonbiodegradable recyclable materials for the purpose of reutilization of such materials. This

definition does not include facilities used for the storage or processing of biodegradable materials, construction and demolition wastes, white goods, and hazardous substances.

"**Recyclable material**" means material which would otherwise become solid waste, and that may be collected, separated, or processed and returned to the economic mainstream as a raw material or product.

"**Residue**" means the solid waste, as measured by weight, requiring disposal after recyclable material is removed during or after processing.

"**Solid waste facility**" means any privately owned or operated solid waste disposal facility or solid waste handling facility, which accepts solid waste that is not the incidental by-product of the facility's manufacturing or operational processes.

"**Solid waste handling facility**" means any facility where solid waste temporarily is deposited, or placed for processing, at any time prior to its final disposal at a solid waste disposal facility.

"**Arterial road**" means a traffic route of 4 or more lanes with traffic controlled by traffic signal lights.

"**Facility**" means any building, structure, or portion of a site where solid waste is handled or stored.

"**Operation area**" means any area where solid waste handling or related activities including storage, heavy equipment operations, truck idling, covering, uncovering, cleaning, queuing or parking occurs.

"**Residential street**" means any street on which 50 percent or more of the street frontage is used for residential purposes, for residential and non-business property, or is zoned as residential property. The designation of a street as a residential street shall be determined block-by-block.

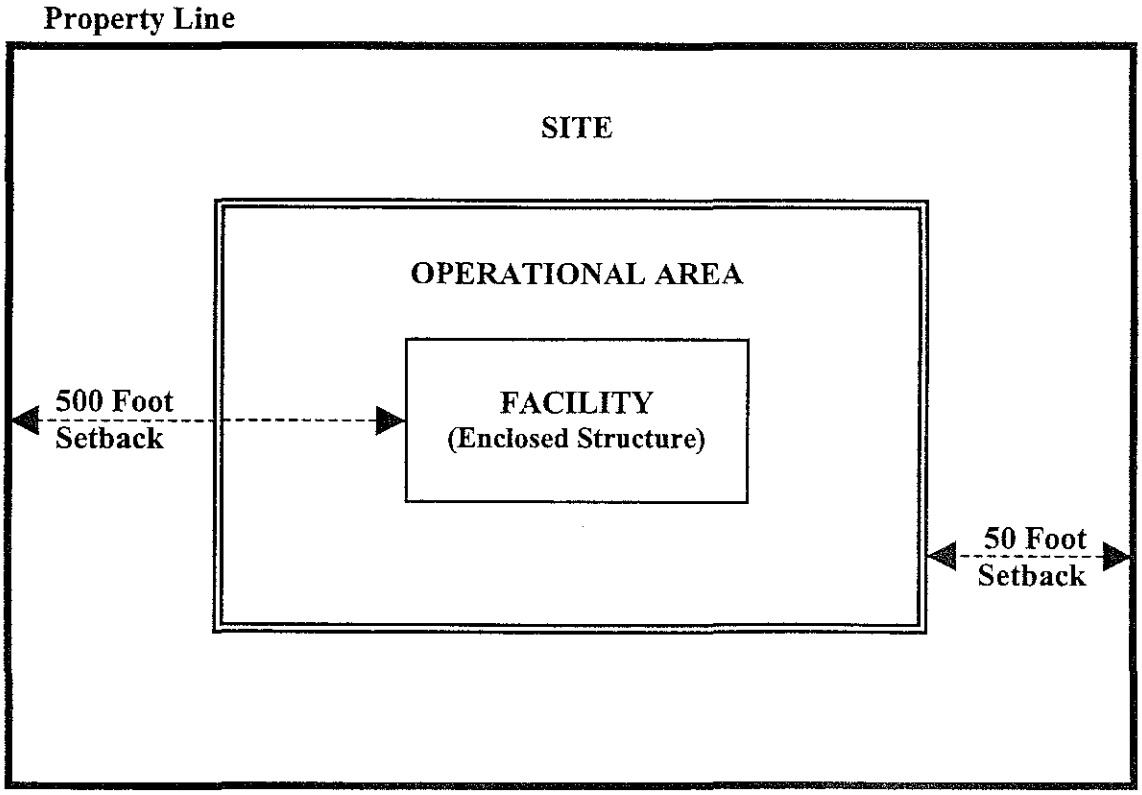
"**Site**" means the total area of any lot or lots that are partially or completely occupied by a solid waste handling facility or its operations area or any lot or lots owned or leased by the owner or operator of a solid waste handling facility that are adjacent to a lot or lots that are partially or completely devoted to solid waste handling operations.

Conceptual Areas --

As presented above, the 1998 Act serves to define specific areas of a solid waste handling facility and prescribes two setbacks, based on minimum distances, measured from the property line of the solid waste handling facility. Typically, setback requirements require a larger land parcel than would otherwise be needed for the solid waste handling facility functions.

Exhibit 1-1 depicts the conceptual areas set forth in the 1998 Act. The first specific area is the property boundary, based on land ownership. This boundary establishes the site area for the solid waste handling facility.

Exhibit 1-1
Conceptual Areas for Solid Waste Handling Facilities



* Based on the "Solid Waste Permit Amendment Act of 1998". Note that the facility area is contained within the operating area, which is contained within the site area.

Within the site area is the operation area, where solid waste handling and related activities occur. One setback requirement calls for at least 50 feet as measured from the operation area to the property line. An operation area of approximately 4 acres would require an approximate 5-acre land parcel to meet this setback requirement.

Within the operation area is the facility, defined as the area where solid waste is handled or stored within a building or structure. A second setback requirement calls for at least 500 feet as measured from the facility to the property line. A facility area of approximately 0.5 acres would require an approximate 30-acre land parcel to meet this setback requirement.

CHAPTER 2
SUMMARY OF DEMOGRAPHICS AND LAND USE

The purpose of this chapter is to summarize the current demographics in the District of Columbia specific to solid waste management needs and decision-making. In addition, the chapter discusses general land uses in the District.

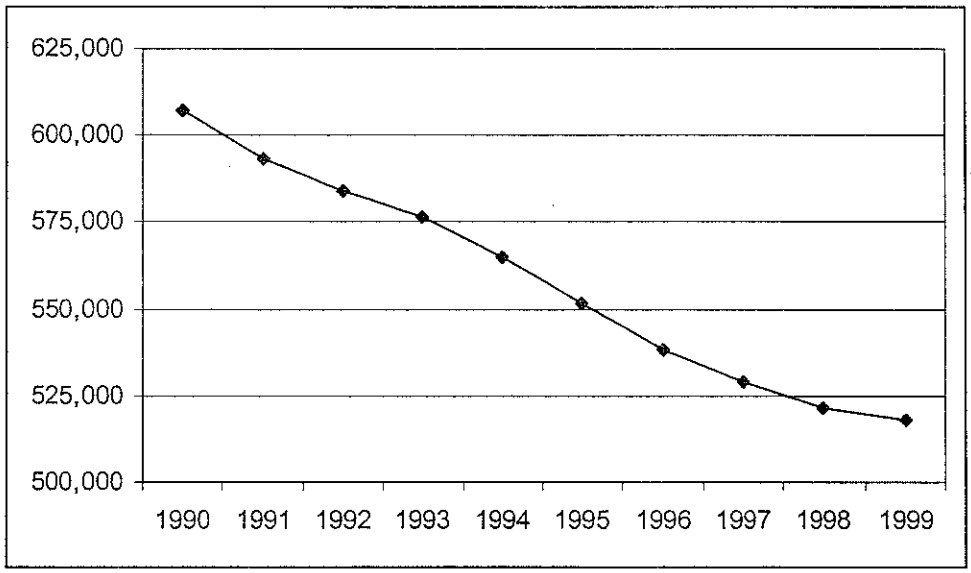
RESIDENTIAL POPULATION

Although the residential population of the District has declined in recent decades, both residential population and employment are expected to increase in the future. Both are common indicators for solid waste generation and future trends.

The population history for the past decade is shown in Exhibit 2-1. The 1990 population is an actual count from the 1990 census. The population figures shown for 1991 through 1999 are estimates from the U.S. Census Bureau, while the value shown for the Year 2000 is a forecast. During the 1990s, the residential population declined, on average, by 1.6 percent per year.

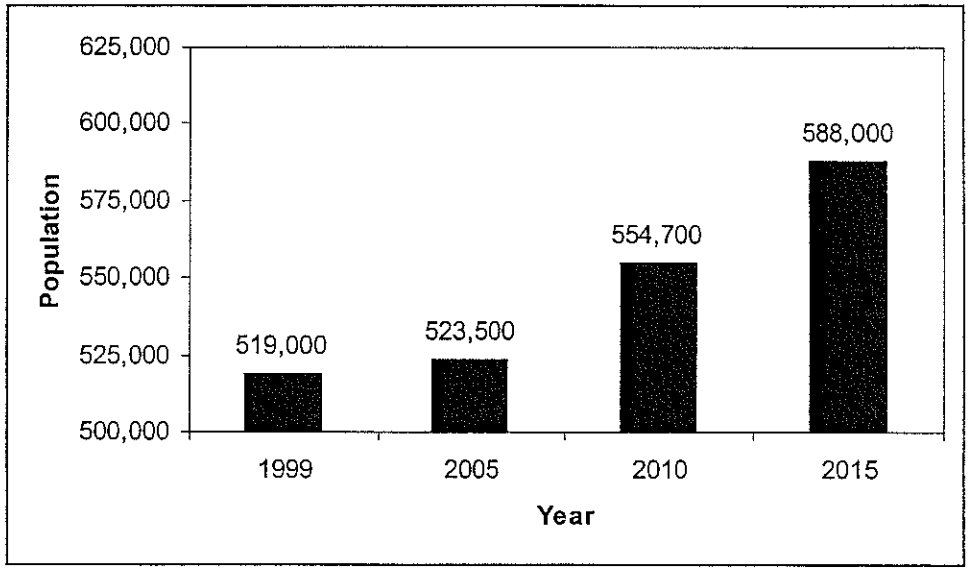
Projected population estimates for 2005, 2010, and 2015 are given in Exhibit 2-2, as provided by the Metropolitan Washington Council of Governments (MWCOG). Residential populations within the District are expected to increase by 13.5 percent over the next 15 years.

Exhibit 2-1
District Residential Population History



Source: District of Columbia Office of Planning State Data Center

Exhibit 2-2
Projected Residential Population for the District



Source: Metropolitan Washington Council of Governments

Geographical Population Distribution

The District is divided into eight political regions called wards, each with a similar population range (within 10 percent) as established by the most recent census. Based on demographic changes and trends since 1990, the current residential population for wards in the western part of the District is estimated to be greater than for the wards in the eastern part of the District. Exhibit 2-3 presents the estimated populations for each of the eight wards for 1998.

Population data were obtained from the District's Office of Planning State Data Center. It should be noted that the total population value given in Exhibit 2-3 is slightly greater than the 1998 population given in Exhibit 2-1. The Census Bureau reports the total population as 521,426; but continues to use the figure of 523,124 for population breakdowns by race and Hispanic origin. Ward populations are based on this latter figure.

Because ward boundaries are established based on an equal population distribution, the actual boundaries may change with time. Ward boundaries are scheduled to be redrawn in 2001. Based on the forecasts for the Year 2000, the average ward population will be 64,750.

Racial Population Distribution

The District is a diverse urban area. Based on 1998 Census Bureau information, about 62 percent of the population is African American, 34 percent is White, three percent of the population is Asian or Pacific Islander, and less than one percent of the population is Native American. People of Hispanic origin may be of any race; therefore, the above categories contain

Exhibit 2-3
District Residential Population by Ward (1998)

Ward	Population	Percent of Total Population
1	69,886	13.4
2	69,644	13.3
3	69,054	13.2
4	66,076	12.6
5	63,169	12.1
6	61,367	11.7
7	63,002	12.0
8	60,926	11.6
Total	523,124	100.0

Source: District of Columbia Office of Planning State Data Center

Exhibit 2-4
District Residential Population by Race and Ward (1998)

Ward	Race (by percent, %)				
	African American	White	Asian or Pacific Islander	Native American	Hispanic[1]
1	52.1	43.3	4.1	0.5	23.3
2	31.1	61.0	7.5	0.4	9.8
3	4.5	89.2	6.2	0.2	8.1
4	79.4	18.6	1.5	0.4	7.0
5	87.7	11.0	1.1	0.3	2.2
6	67.8	30.3	1.6	0.3	2.2
7	96.2	3.2	0.3	0.3	0.9
8	89.6	8.8	1.3	0.3	1.6
Total[2]	62.3	34.3	3.0	0.3	7.2

Source: District of Columbia Office of Planning State Data Center

[1] Persons of Hispanic origin may be of any race. Each racial category contains persons of both Hispanic and non-Hispanic origin.

[2] Total population = African American + White + Asian or Pacific Islander + Native American

persons of Hispanic and non-Hispanic origin. The Hispanic population in the District is about 7 percent. Exhibit 2-4 presents the estimated racial distribution for each of the eight wards in the District. These racial distribution data are from the D.C. Office of Planning State Data Center.

Housing Unit Characteristics

Census Bureau estimates for 1998 show an average of 2.15 persons per occupied housing unit in the District. The type of housing unit can be a good indicator of solid waste generation trends

due to differing product consumption/disposal practices and yard waste production rates. The District Office of Planning has developed a distribution of housing units by type within each of the eight wards using data from the 1990 U.S. Census. These data are presented in Exhibit 2-5.

EMPLOYMENT POPULATION

According to the D.C. Office of Planning, the employment population within the District is expected to increase with time, particularly over the next decade. Currently, private sector jobs outnumber public sector jobs and this trend is expected to continue. The business base primarily consists of services, federal government, trade, local government, finance/insurance and real estate, and transportation.

The D.C. Department of Employment Services maintains employment records in cooperation with the U.S. Bureau of Labor Standards. Employment numbers from 1990 to 1999 were obtained from the D.C. Department of Employment Services. Both private and public employment populations are shown in Exhibit 2-6. These data give an average annual employment population for various business classifications. Employment includes full and part-time employees in both the private and public sector. Proprietors, self-employed, unpaid family workers and private household workers are excluded. Private sector employment data are available for the following business classifications:

- Mining;
- Construction;
- Manufacturing;
- Transportation and Public Utilities;
- Trade;
- Finance, Insurance, & Real Estate; and
- Other Services.

Exhibit 2-5
Numbers of Housing Units by Ward in the District (1990)

Ward	Type of Housing Unit				
	Total	Single Family – Detached	Single Family – Attached	Apartment	Other
1	38,712	844	8,519	28,881	468
2	45,119	1,237	7,672	35,304	906
3	40,420	12,269	3,485	24,346	320
4	30,389	6,372	11,431	12,434	152
5	30,795	5,261	11,115	14,158	261
6	32,274	1,275	14,382	16,220	397
7	31,920	5,618	8,592	17,545	165
8	28,860	1,726	6,125	20,831	178
Total	278,489	34,602	71,321	169,719	2,847

Source: District of Columbia Office of Planning State Data Center

Exhibit 2-6
District Employment Population (1990 to 1999)

Employment Type	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Mining	100	100	100	100	100	100	100	100	100	100
Construction	14,400	11,100	9,000	8,600	9,000	8,700	8,900	9,100	9,000	9,000
Manufacturing	15,700	14,600	14,000	13,800	13,000	13,000	13,000	12,700	12,200	12,000
Transportation & Public Utilities	24,100	23,800	22,100	21,400	20,900	19,900	19,100	17,400	16,600	17,400
Trade	61,600	57,400	54,700	53,200	52,800	52,200	50,000	48,500	48,100	47,600
Finance, Insurance & Real Estate	34,200	34,400	32,900	31,600	31,100	29,900	28,700	28,400	29,900	31,300
Services	258,700	254,700	254,900	256,400	261,400	263,900	262,800	269,100	297,800	275,800
Private Sector Total	**408,700**	**396,100**	**387,700**	**385,000**	**388,300**	**387,700**	**382,600**	**385,200**	**387,800**	**393,100**
Federal Government	220,000	225,000	230,100	230,000	217,400	206,700	195,500	191,600	186,600	183,600
State Government[1]	52,500	51,500	51,200	50,900	48,700	44,000	41,000	37,700	35,300	35,100
Local Government[2]	4,800	4,700	4,600	4,400	4,400	4,200	4,000	3,900	3,700	4,000
Public Sector Total	**277,300**	**281,200**	**285,800**	**285,300**	**270,500**	**254,900**	**240,500**	**233,200**	**225,600**	**222,700**
Total Employment	**686,100**	**677,300**	**673,600**	**670,300**	**658,800**	**642,600**	**623,100**	**618,400**	**613,400**	**615,800**

[1] State government refers to District government
[2] Local government refers to Metro system employees
Source: D.C. Department of Employment Services

Exhibit 2-7 shows projected employment populations in the District by ward for the Year 2000. The MWCOG Cooperative Forecast Subcommittee projected these figures. The total employment population shown in Exhibit 2-7 is greater than the total employment populations shown in Exhibit 2-6 because it includes proprietors, self-employed, and private household workers. Ward 2 shows the greatest employment population among the wards.

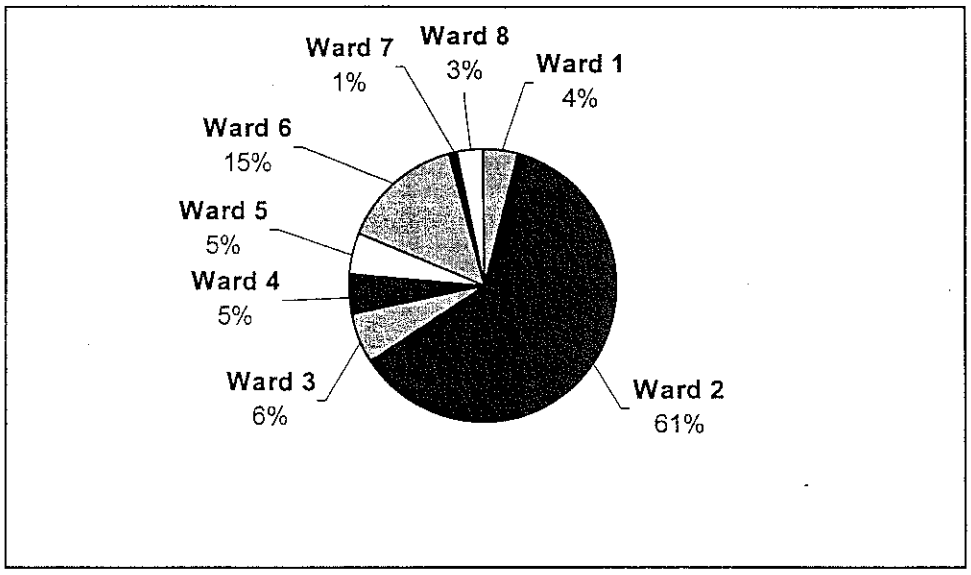
Exhibit 2-8 illustrates the previous exhibit on a percentage basis for employment populations. Note that Ward 2 is greater than any other ward by at least a factor of 4.

Exhibit 2-7
District Employment by Ward (2000)

Ward	Employment
1	29,500
2	412,200
3	43,100
4	31,100
5	33,000
6	100,700
7	8,100
8	19,900
Total	677,900

Source: District of Columbia Office of Planning State Data Center

Exhibit 2-8
District Employment by Ward (Percent Basis)



Source: District of Columbia Office of Planning State Data Center

Exhibit 2-6 shows that the employment populations in the District have, on average, declined by about 1 percent each year during the past decade. MWCOG, however, projects that employment will increase by about 1 percent annually over the next two decades. Projected populations for 2005, 2010, and 2015 as estimated by the MWCOG are shown in Exhibit 2-9. These projected employment population numbers include both private sector and public sector employment and include proprietors, self-employed, and private household workers.

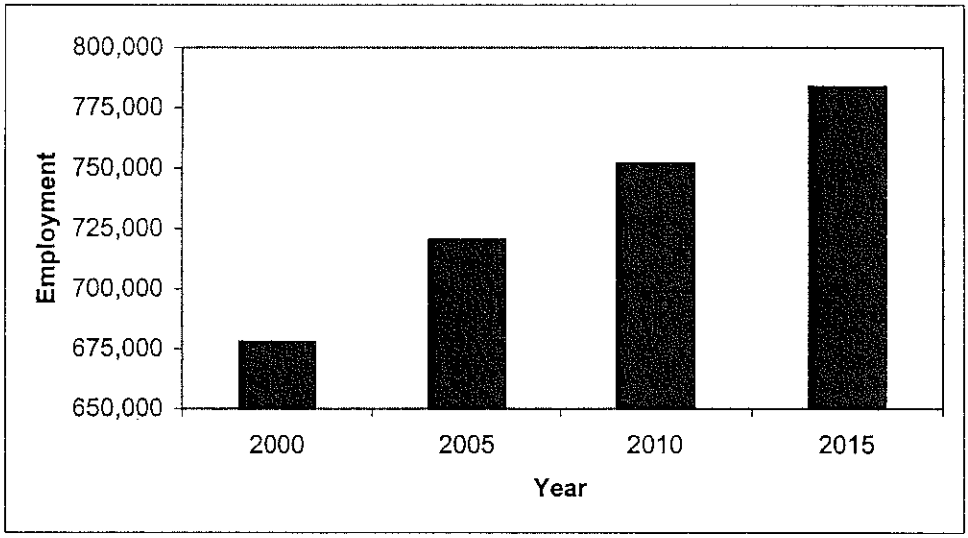
GENERAL LAND USES

The District of Columbia occupies 69 square miles, including 8 miles of water surface. The Potomac River is the southwestern boundary of the District, Montgomery County and Prince Georges County in Maryland border the District to the northwest and to the east, respectively. Arlington County, Virginia borders the District to the west, across the Potomac River. Presentation Map No. 1 is a map developed by the Office of Planning that shows general land uses in the District. General land uses include the following categories:

Residential (R-zoned)

- Low Density Residential – Single-family detached and semi-detached housing are the predominant uses.
- Moderate Density Residential – Row houses and garden apartments are the predominant uses; may also include low density housing.
- Medium Density Residential – Multiple unit housing and mid-rise apartment buildings are the predominant uses; may also include low and moderate density housing.

Exhibit 2-9
Projected Employment Population for the District of Columbia



Source: District of Columbia Office of Planning State Data Center

- High Density Residential – High-rise apartment buildings are the predominant uses; may also include low, moderate, and medium density housing.

Commercial (C-Zoned)

- Low Density Commercial – Shopping and service areas that are generally low in scale, character and activity and that provide a limited range of retail goods and services are the predominant uses.

- Moderate Density Commercial – Shopping and service areas that generally provide a much broader range of goods and services are the predominate uses. Chain drug stores and grocery stores as well as branches of department stores, some specialty shops, and personal service establishments may be present.

- Medium Density Commercial – Shopping and service areas that generally offer a large concentration and variety of goods and services outside the Central Employment area are the predominant uses. Most customers arrive by car, bus, or subway.

- Medium-High Density Commercial – The predominant use is a shopping and service area that generally offers the largest concentration and variety of goods and services outside the Central Employment Area. Most customers arrive by car, bus, or subway.

- High Density Commercial – The business and retail heart of the District and metropolitan area includes a mix of employment, retail, office, cultural, and entertainment centers.

Public and Institutional Zoned Land

- Federal – Land and facilities occupied by the federal government are the predominant uses, excluding parks and open space. Also includes the International Center.

- Local Public Facilities – Lands and facilities occupied by the District Government are the predominant uses, excluding parks, recreation centers, and open spaces.

- Institutional – Land and facilities occupied by colleges, universities, hospitals, religious institutions, and similar facilities are the predominant uses.

- Parks, Recreation and Open Spaces – District government parks and recreation centers, cemeteries, and the National Capital Open Space System are the predominant uses.

General Industrial (M-Zoned)

- Production and Technical Employment – Restructured industrial land intended to encourage growth industries and industries with a high ratio of employees to land area occupied are the predominant uses. Examples include office support systems,

communications, printing and publishing, wholesaling, transportation services, food services, and tourist support services; warehousing; and other commercial activities that generally do not occur to substantial degree in other commercial areas.

Production and Technical Employment land use areas correlate with M (General Industrial) zones as defined by the District's Office of Zoning. Based on the above definitions, waste management facilities (including transfer and processing facilities) typically would be located in these M-zoned land use areas.

Presentation Map No. 1 shows that the District consists of primarily residential-zoned land, with limited general industrial (M zone) areas. The three major land uses within each ward are detailed below.

Ward 1

The most common land use districts are:

- Moderate residential,
- Institutional, and
- Parks, recreation, and open spaces.

There are no production and technical employment land use (M zoned) districts in this ward.

Ward 2

The most common land use districts are:

- Parks, recreation, and open spaces,
- High density commercial, and
- Moderate density residential.

There are two small production and technical employment land use (M zoned) areas in this ward. The first is located along the Eisenhower Parkway (I-395) and the second is located along the Anacostia River near Buzzards Point.

Ward 3

The most common land use districts are:

- Low density residential,
- Parks, recreation, and open spaces, and
- Institutional.

There are no production and technical employment land use (M zoned) districts in this ward.

Ward 4

The most common land use districts are:

- Low density residential,
- Medium density residential, and
- Federal.

There are two production and technical employment land use (M zoned) districts in this ward. The first is located adjacent to Fort Totten Park, and the second is located along the Metro line, parallel to Chillum Place.

Ward 5

The most common land use districts are:

- Low density residential,
- Parks, recreation, and open spaces, and
- Production and technical employment.

This ward has the largest production and technical employment land use (M zoned) district in the city. This district is located along the Metro tracks running north and along the railroad tracks running parallel to New York Avenue.

Ward 6

The most common land use districts are:

- Moderate density residential,
- Parks, recreation, and open spaces, and
- Local Public Facilities.

There are a few small production and technical employment land use (M zoned) districts in Ward 6. The first is located near Union Station, the second is located along I-395, and the third is located along the Anacostia River between the 11th Street and the Sousa Bridge.

Ward 7

The most common land use districts are:

- Moderate density residential,
- Low density residential, and
- Parks, recreation, and open spaces.

There are production and technical employment land use (M zoned) districts located along Kenilworth Avenue and along Benning Road.

Ward 8

The most common land use districts are:

- Moderate density residential,
- Federal, and
- Parks, recreation, and open spaces.

There are production and technical employment land use (M zoned) districts located along Firth Stirling Avenue and in the southern tip of the ward at DC Village.

CHAPTER 3

CHARACTERIZATION OF EXISTING AND PROJECTED WASTE STREAM

The purpose of this chapter is to quantify the solid waste stream currently managed (i.e., solid waste generated, collected, and/or transferred) within the boundaries of the District of Columbia. To estimate the total quantities managed, the following were examined:

- Solid waste and recyclables collected within and by the District;
- Solid waste and recyclables collected within the District by private haulers;
- Solid waste transported from outside the District to transfer stations located within the District; and
- Solid waste transported by the District and by private haulers to disposal sites outside the District.

Quantities were estimated based on records maintained by the District Government, reports provided by operating transfer stations and private hauling companies, interviews with solid waste handling facility personnel, and related information. In addition, this chapter presents waste quantity projections for the waste stream through Year 2015.

SOLID WASTE AND RECYCLABLES COLLECTION

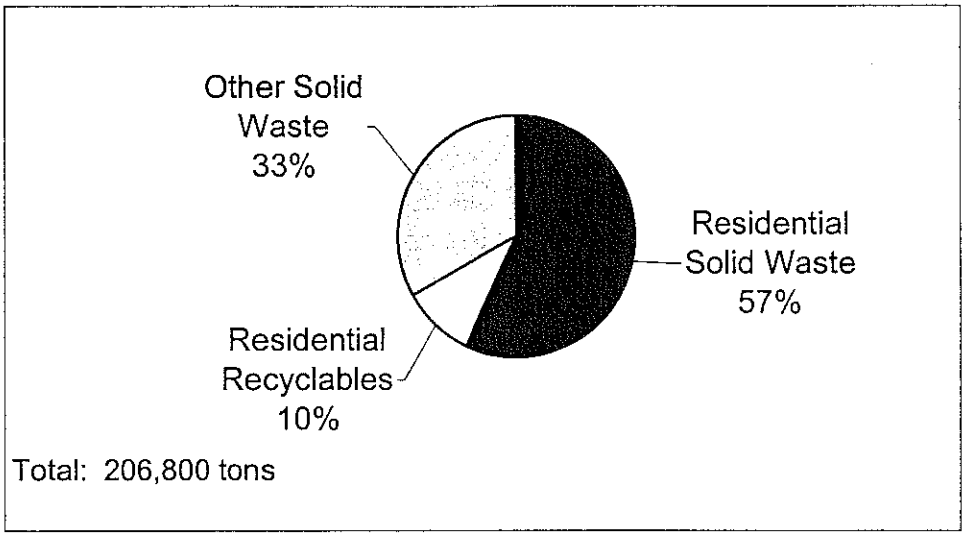
The District's waste steam is collected by two identifiable sources: District collection crews under the Department of Public Works (DPW) Solid Waste Management Administration (SWMA) and private waste management companies. As is typical in many cities, District collection crews tend to run collection programs for the pickup of residential wastes while the private companies tend to collect commercial wastes. Exceptions to this are noted below.

Waste and Recyclables Collected by the District Government

District collection crews collected approximately 206,800 tons of waste and recyclables during FY 1999. As shown in Exhibit 3-1, these quantities can be broken down by residential solid waste, residential recyclables, and other solid wastes.

District collection crews collect principally residential wastes generated within city limits from single-family residences and from multi-family residences of two or three units per structure only. Residents receive once per week collection using Super Cans in the outer-city areas, and receive twice per week service using manual collection in the inner-city areas. As depicted in Exhibit 3-1, residential solid waste makes up about 57 percent (or about 118,200 tons) of the total quantities collected by the District.

Exhibit 3-1
Solid Waste Collected by the District (FY 1999)



The District offers to residents co-mingled bin service for recyclables. This service targets paper (i.e., newspaper, corrugated cardboard, and mixed paper), glass, aluminum, and ferrous metals. The District contracts out the actual collection of these materials to a private waste management company. In FY 1999, approximately 20,200 tons of recyclables were collected and processed under this private contract.

In addition to the above, the District conducts collection programs for other portions of the solid waste stream. These portions make up about 33 percent (or 68,400 tons annually) of the District-collected waste stream, as discussed below.

Yard Waste --

Yard waste is collected on a routine basis from residential properties during the months of October, November, December, and January. Non-routine collection is conducted throughout the year as a result of storms, tree trimming, and related services. Yard waste collected by SWMA is discharged at the Fort Totten Transfer Station. The tonnage of residential yard waste recorded for FY 1999 was 2,968 tons, a decrease compared to the 4,649 tons recorded for FY 1997.

Bulk Waste --

Bulky items are collected routinely through the SWMA Bulk Collection Program. This program was initiated in April 1997 and provides bulky item pick up for residents on an on-call basis.

During FY 1997, the District collected 1,922 tons of bulk wastes. These quantities have since increased to 2,894 tons in FY 1998, and 3,443 tons in FY 1999.

Street and Alley Cleaning --

The Street and Alley Cleaning Department (SACD) conducts routine manual and mechanical street sweeping, as well as routine and non-routine waste pickup from alleys and vacant lots. In FY 1999, the SACD collected 15,048 tons of waste from these sources. These quantities have increased in recent years; for comparison, SACD collected 9,599 tons in FY 1997, and 14,505 tons in FY 1998.

Other Routine and Non-Routine Services --

The District performs collection services for most District Government buildings, a small number of Federal Government-occupied buildings, and curbside refuse containers. In addition, District collection crews provide non-routine waste collection during special functions (such as festivals and parades) and nuisance pickups (e.g., illegal dumping, dead animals). The services resulted in approximately 46,900 tons of waste in FY 1999.

Solid waste collected by the District is transported to one of two District-owned solid waste transfer facilities: Benning Road or Fort Totten. DPW maintains daily records for wastes received and weighed at each of these facilities. Generally, the Fort Totten facility receives about two thirds (or 137,000 tons), and the Benning Road transfer station receives about a third of the incoming waste stream annually.

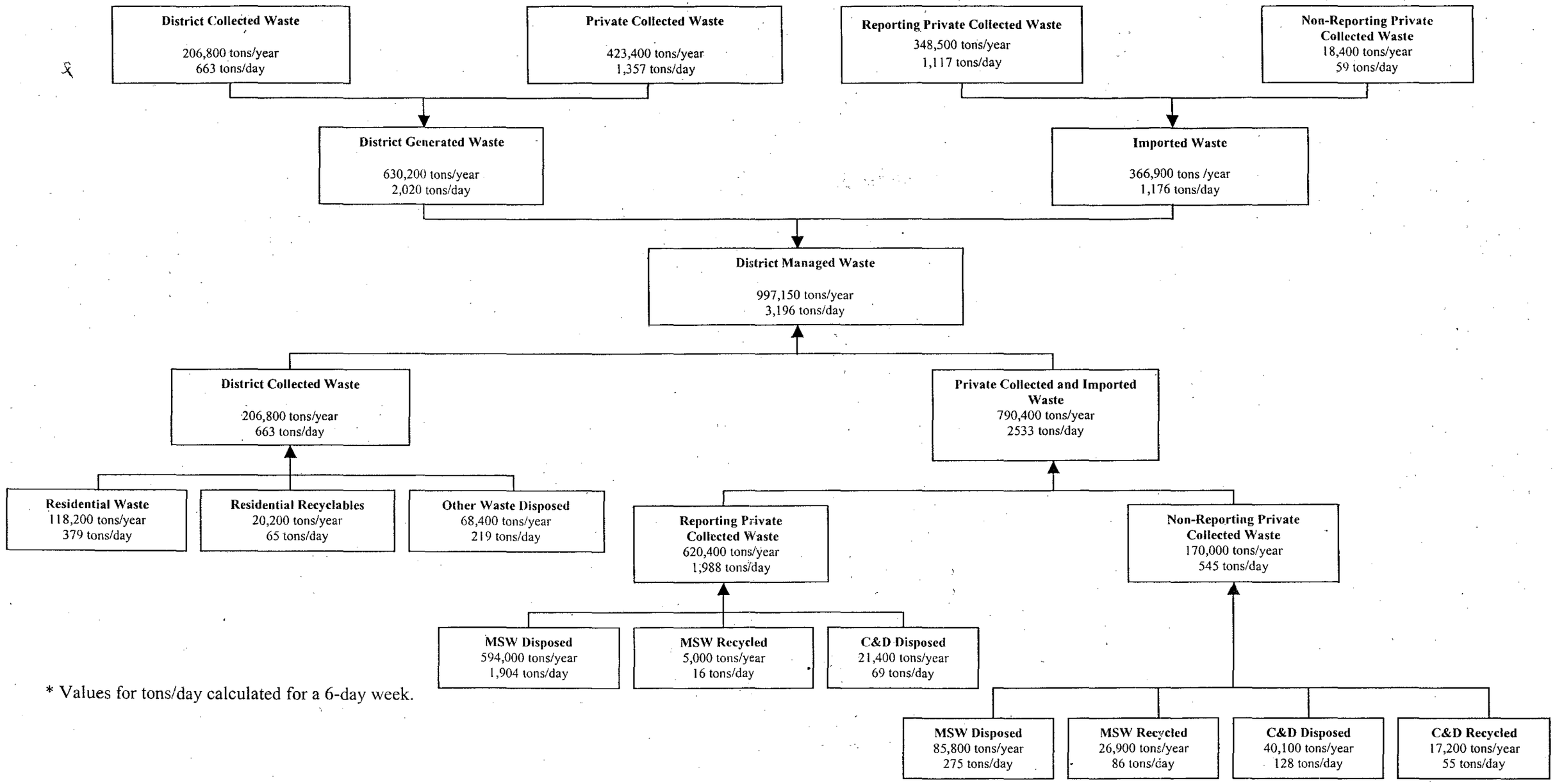
Exhibit 3-2 presents a breakdown of waste quantities generated and managed in the District. These data were assembled for the most current year and include citizen drop-off quantities from Fort Totten. As a check, annual reported quantities were compared with disposal records maintained by Fairfax County. The Fairfax County Waste-to-Energy facility serves as the receiving point and is the final disposal site for the portion of the District's waste stream collected by District collection crews.

Waste and Recyclables Collected by Private Haulers

There were 73 private solid waste collectors (haulers) licensed to operate in the District in 1999. Private waste haulers collect waste generated within District boundaries from:

- Multi-family residences (with four or more housing units);
- Commercial businesses and institutions;
- Construction and demolition operations;
- A small portion of District Government buildings; and
- Federal Government buildings.

Exhibit 3-2
Waste Managed and Generated in the District (FY 1999)*



* Values for tons/day calculated for a 6-day week.

Private haulers then transport these wastes to one of the four privately owned and operated solid waste transfer stations located in the District. Alternatively, and depending on the type of materials, some wastes are taken to and processed at one of the two privately-owned and operated construction/demolition recycling (C&D) facilities, or to one of two waste paper/recyclables processing facilities also located in the District.

For example, James Taylor Trash Removal Contractors and Rogers Brothers Custodial Services, operate processing facilities in the District. These facilities perform C&D processing and operate waste paper/recyclables processing manual sorting lines. The two facilities combined handled about 4,000 tons of solid waste and 43,000 tons of C&D debris in 1999. Almost all of the waste handled on the manual sorting line is recycled and about 40 percent of the C&D debris is recycled. Based on discussions with the facilities, these processing facilities collect waste generated only from within the District.

Three of the four private solid waste transfer stations do report the quantities of waste handled on a monthly basis to DPW. Because the remaining transfer station and the intermediate processing (i.e., C&D and waste paper/recyclables) facilities generally do not provide written records regarding solid waste quantities, facility operators were interviewed to ascertain estimated annual quantities (including total quantities collected from within the District and from outside the District). Exhibit 3-3 presents these quantity estimates by general waste type for the approximate 790,400 tons of wastes handled by the private sector (FY 1999). Note that construction and demolition (C&D) materials (i.e., C&D materials disposed and recycled) make up about 10 percent of the solid waste stream handled by the private haulers.

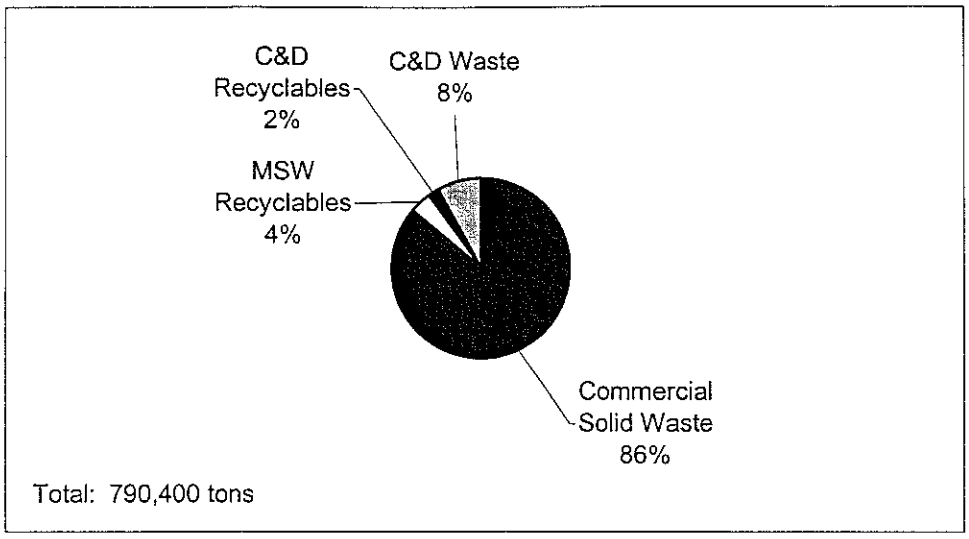
Based on available records, interviews, and related information sources, the quantity of wastes and recyclables collected within the District by private haulers in FY 1999 is estimated at 423,400 tons. This quantity, when added to the quantity of wastes collected by District collection crews (206,800 tons per year), represents the total waste amounts estimated to be generated in the District, or some 630,200 tons per year (see Exhibit 3-2).

SOLID WASTE IMPORTS

Private transfer stations accept wastes generated within the District, as well as wastes generated from outside the District. As mentioned previously, three of the four privately owned transfer stations submit records to the District indicating how much of the waste stream is imported into the District. Collectively, these three facilities handle about 620,400 tons of solid waste annually. Of this amount, about 348,500 tons are imported from outside of the District (see Exhibit 3-2). Prior to 1994, solid waste generally was not imported into the District of Columbia. Since 1994, the reported quantity of solid waste imports entering the District has been increasing.

Estimates were made for waste imports into the one non-reporting solid waste transfer station operating in the District. Based on interviews, this facility imports about 18,400 tons per year into the District.

Exhibit 3-3
Percent of Solid Waste Handled by Private Haulers Within the District (FY 1999)*



* Includes wastes generated within and imported into the District.

As discussed herein and indicated in Exhibit 3-2, the total quantity of solid waste managed within the District is estimated at 997,150 tons (FY 1999), or about 3,200 tons per day. Approximately 366,900 tons (or 37 percent) are imported into the District for purposes of solid waste transfer. Exhibit 3-4 provides a general breakdown of the waste stream generated from and imported into the District.

As a comparison, waste data from the Virginia Department of Environmental Quality (VDEQ) were examined specific to reporting facilities receiving both public and private sector wastes from the District. As indicated in Exhibit 3-5, about 1,078,000 tons reportedly were exported from the District into Virginia solid waste disposal facilities during 1999. VDEQ compiles this information based on estimates submitted annually by facility owners. Taking into account that one private transfer station in the District sends most of its quantities to Pennsylvania, Exhibits 3-2 and 3-5 are comparable (within 10 percent) for describing total waste quantities managed by the District. Exhibit 3-5 indicates that Virginia receives over 90,000 tons of C&D debris from the District. This quantity is higher than reported in Exhibit 3-2. Rodgers Brothers and James Taylor may direct some C&D debris to non-DC transfer sites. There may also be some independent haulers that haul their C&D debris directly to the landfill and do not use a transfer station located in the District.

Exhibit 3-4
Solid Waste Quantities Managed in the District (FY 1999)

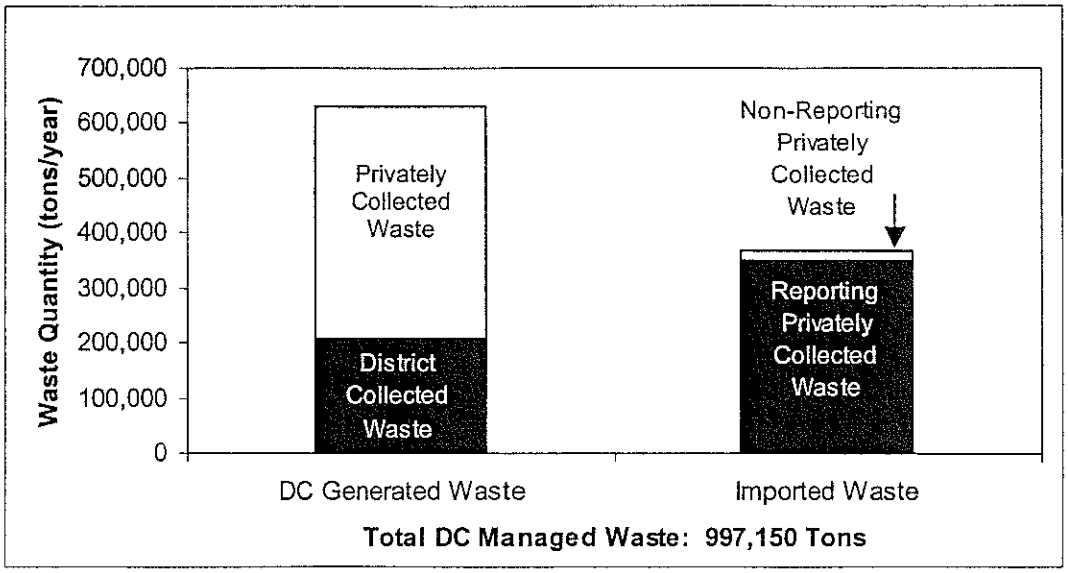


Exhibit 3-5
Quantities of Waste Received by Virginia from the District (1999)

Type of Waste	Total Waste (tons)
Municipal Solid Waste	909,045
Construction and Demolition Debris	90,796
Sludge	62,066
Tires	50
Petroleum Contaminated Soils	10,706
Industrial Waste	3,581
Friable Asbestos	200
Yard Waste	721
White Goods	180
Other	1,035
Total	**1,078,380**

Source: Virginia Department of Environmental Quality

DISTRIBUTION OF WASTES GENERATED IN THE DISTRICT

Waste Generated By Residences

Residential waste is defined in the District as those quantities from single-family residences plus multi-family residences with three or less housing units. Waste generated from multi-family

residences with more than three housing units is defined as commercial waste. However, for this analysis to estimate waste generation by ward, this portion of the waste stream was examined on the basis of typical generations rates by residents, regardless of the size of the multi-unit housing.

A recent consultant study[1] quantified District-collected residential waste generation by ward. This showed the residential waste distribution (percentage by ward single-family residences and multi-family residences with three or less housing units). To estimate the quantity of residential waste generated by each ward in 1999, it was assumed that the waste distribution among wards remained about the same with time. Based on this information, a waste generation rate in each ward was calculated using the number of each type of housing units and the quantity of waste generated in each ward.

Larger multi-family residences typically generate less waste than single-family residences and small multi-family residences. To estimate waste generated by large multi-family residences in the District (i.e., those residences with four or more units), each ward-by-ward waste generation rate was reduced (i.e., multiplied by 0.75) and was then multiplied by the number of large multi-family residential units present in each ward (as of 1999).

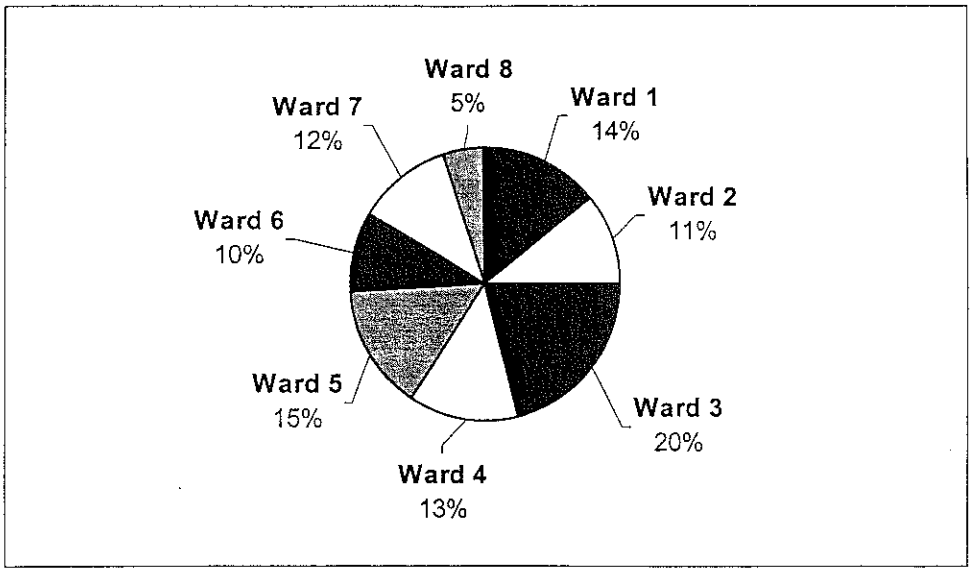
Based on the above, Exhibit 3-6 provides the estimated quantities of waste generated by all District residents by ward. Exhibit 3-7 depicts the ward-by-ward breakdown as a percentage of waste generated by residents in each ward. Although residential populations within the wards are similar (see Chapter 2), waste generation by residents varies within ward by as much as a factor of four.

Exhibit 3-6
Estimated Waste Generation by District Residents by Ward (FY 1999)

Ward	Waste from Single Family Residences with <4 units (tons)	Waste from Multi Family Residences with ≥4 Residences (tons)	Waste from all Residences (tons)
1	13,400	22,300	35,700
2	8,600	18,200	26,800
3	26,700	25,200	51,900
4	24,200	9,700	33,900
5	24,900	13,800	38,700
6	16,300	8,400	24,700
7	18,800	11,300	30,100
8	5,600	6,700	12,300
Total	**138,400**	**115,600**	**254,100**

[1] Gershman, Brickner & Bratton, Inc. 1998. Consolidated Transfer Station Cost Analysis – Draft Report.

Exhibit 3-7
Percentage of Waste Generated by District Residences by Ward (FY 1999)



Waste Generated by Employment

As a preliminary estimate of the quantity of waste generated by the District's employment population, waste totals derived for District residents (from Exhibit 3-6) were subtracted from waste totals for District-generated waste (from Exhibit 3-2). This yields an estimated 376,200 tons of waste (FY 1999) that generally can be attributed to the employment population in the District.

Waste Generated by Both Residences and Employment

Based on residential and employment population for the District, Exhibits 3-6, 3-7, 3-8, and 3-9 combine to yield an estimated total waste generation in the District by ward. Exhibits 3-10 and 3-11 provide these generation estimates (by tons and by percent) for FY 1999. Waste generation is greatest in Ward 2, followed by Ward 6 and Ward 3. Wards 7 and 8 show the lowest estimated waste generation.

SUMMARY OF WASTES MANAGED IN THE DISTRICT

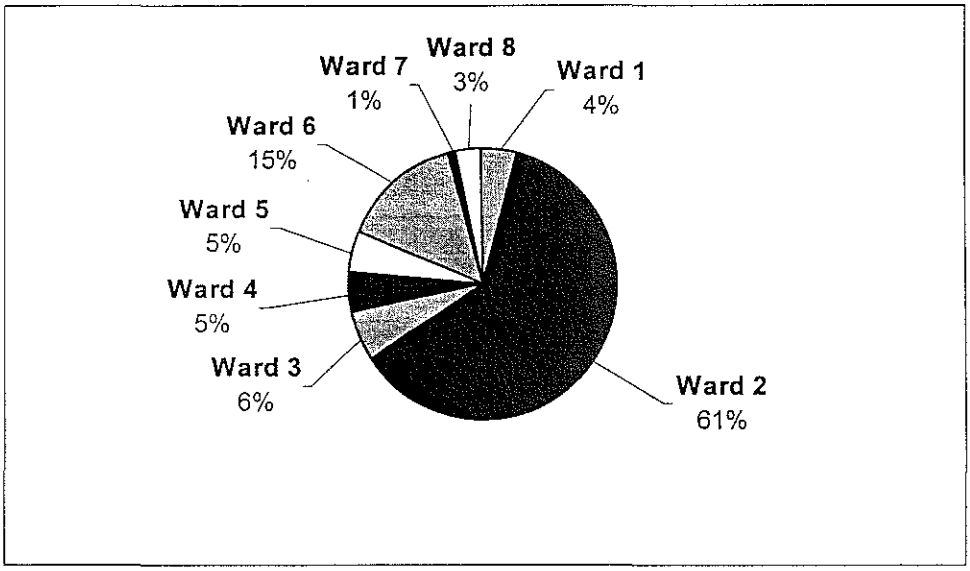
In addition to waste generated by residents and employees in the District, solid waste is imported from surrounding jurisdictions into District solid waste handling facilities. The sum of waste generated and waste imported is the total waste managed in the District. Exhibits 3-12 and 3-13 provide ward-by-ward breakdowns of the quantities and percentages of waste generated (on the basis of residential and employment populations) and quantities imported into the District.

Exhibit 3-8
Estimated Waste Generation by District Employment by Ward (FY 1999)

Ward	Employment Population	Waste From Employment (tons)
1	29,500	16,400
2	412,200	228,700
3	43,100	23,900
4	31,100	17,200
5	33,300	18,500
6	100,700	55,900
7	8,100	4,500
8	19,900	11,000
Total	**677,900**	**376,100**

Source: DC Office of Planning

Exhibit 3-9
Percentage of Waste Generated by District Employment by Ward (FY 1999)



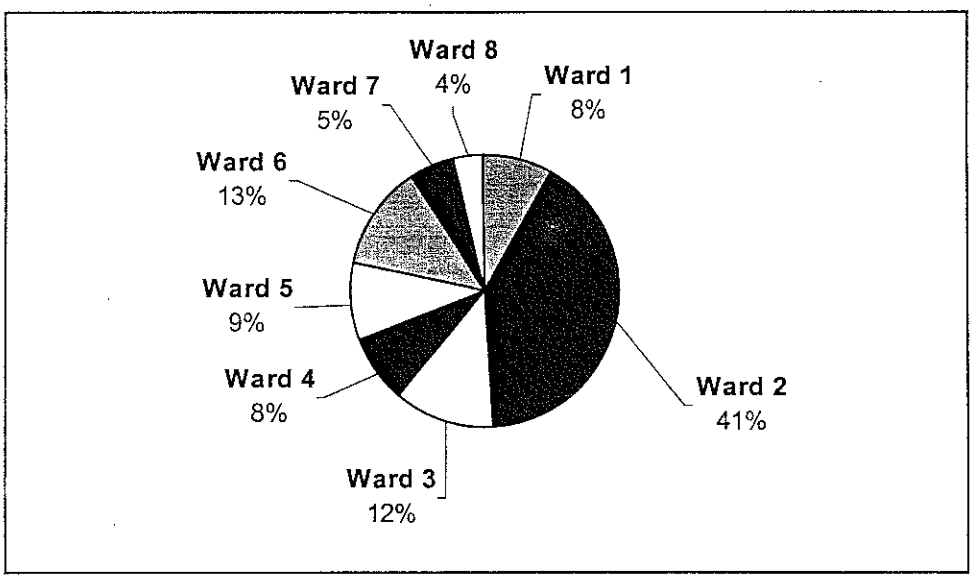
WASTE QUANTITY PROJECTIONS

For planning transfer station needs and future impacts associated with waste transfer, waste quantities are projected herein for an ensuing 15-year period.

Exhibit 3-10
Total Waste Generation by Ward in the District (FY 1999)

Ward	Residential Waste (tons)	Employment Waste (tons)	Total Waste (tons)
1	35,700	16,400	52,100
2	26,800	228,700	255,400
3	51,900	23,900	75,800
4	33,900	17,200	51,200
5	38,700	18,500	57,200
6	24,700	55,900	80,500
7	30,100	4,500	34,600
8	12,300	11,000	23,400
Total	**254,100**	**376,100**	**630,200**

Exhibit 3-11
Percentage of Total Waste Generated by Ward (FY 1999)



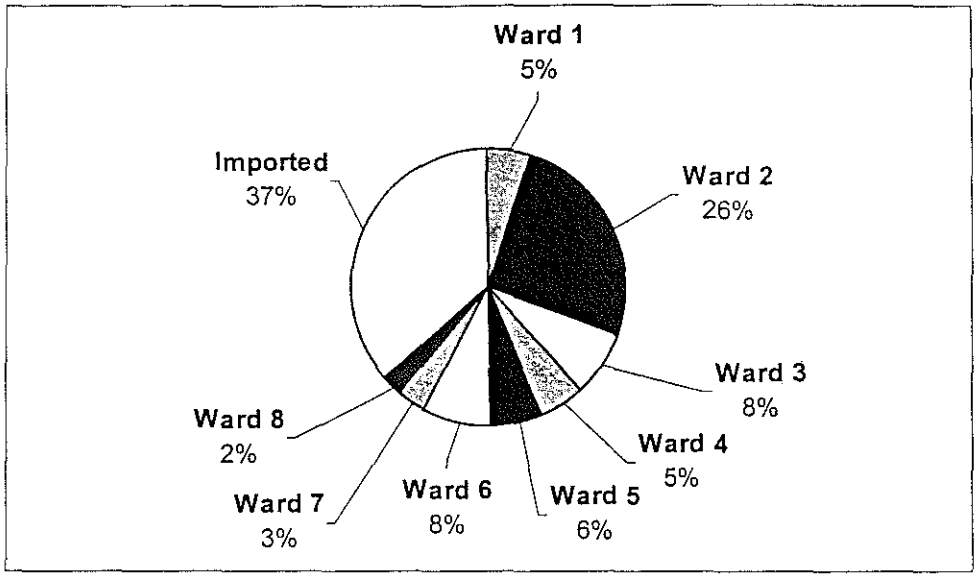
Projections For District Generated Waste

To calculate projected waste quantities, an average waste generation rate was calculated for the combined residential and employment population in the District. This average rate for FY 1999 (0.56 tons per person per year) was used to project expected solid waste quantities for 2005, 2010, and 2015 from District waste generators.

Exhibit 3-12
Total Waste Managed in the District (FY 1999)

Ward	Residential Population	Residential Waste (tons)	Employment Population	Employment Waste (tons)	Total District Generated Waste (tons)	Imported Waste (tons)
1	69,200	35,700	29,500	16,400	52,100	
2	69,000	26,800	412,200	228,700	255,400	
3	68,400	51,900	43,100	23,900	75,800	
4	65,400	33,900	31,100	17,200	51,200	
5	62,600	38,700	33,300	18,500	57,200	
6	60,800	24,700	100,700	55,900	80,500	
7	62,400	30,100	8,100	4,500	34,600	
8	60,300	12,300	19,900	11,000	23,400	
Total Waste					**630,200**	**366,900**

Exhibit 3-13
Percentage of Waste Managed by District by Ward (FY 1999)



The projected waste quantities shown in Exhibit 3-14 reflect an increase in waste generation for the District of about 1.2 percent per year. It is estimated that the District will increase to over 2,300 tons per day of solid waste by the Year 2015, without accounting for waste imports.

Projections For District Managed Waste

The quantity of waste that will be imported into the District in future years is difficult to predict. Generally, waste imports are a function of economics (including labor, travel time, tipping fees, and available transfer or disposal sites) where no legal or permitting constraints exist. The quantity of imported waste entering the District from other jurisdictions could remain the same, decrease, or increase.

For planning purposes, it is useful to assume that if waste imports continue in the future, they will be expected to increase. Based on the limited number of available transfer and disposal sites in the region, the need for waste transfer facilities operating in or very near the District, the assumption that transfer facilities will be made available to meet this need, and the assumed absence of legal barriers to restrict waste imports, a 2 percent per annum increase has been assumed for waste imports.

Given the above, Exhibit 3-15 presents estimated tonnages expected to be managed within the District in future years. As shown, wastes generated and imported in future years will result in a solid waste stream of about 1.2 million tons per year, or nearly 4,000 tons per day by 2015.

Exhibit 3-14
Projected District Generated Waste Quantities for 2005, 2010, and 2015

Year	Total Population* (Residential and Employment)		Projected District Generated Waste	
	Residential	Employment	Tons/year	Tons/day
1999[+]	519,000	677,900	630,200	2,020
2005	523,500	720,400	654,900	2,099
2010	554,700	752,000	688,900	2,205
2015	588,000	783,700	722,200	2,315

* Source: Office of Planning State Data Center
[+] Total Population and Total District Generated Waste are not projected values.

Exhibit 3-15
Projected District Managed Waste Quantities for 2005, 2010, and 2015

Year	Projected District Generated Waste	Projected Imported Waste	Projected District Managed Waste	
			Tons/year	Tons/day
1999	630,200	366,900	997,100	3196
2005	654,900	379,400	1,034,300	3315
2010	688,900	417,900	1,106,800	3548
2015	722,200	462,500	1,184,700	3797

CHAPTER 4
CHARACTERIZE EXISTING SOLID WASTE TRANSFER STATION OPERATIONS

This chapter provides descriptions of the existing solid waste transfer facilities, both public and private, known to be operating in the District. The descriptions include general layouts, real estate factors (size, location, ownership, surrounding land use), hours of operation, equipment/material handling capabilities on site, number of employees, traffic flow on-site and in the nearby street network, waste volumes handled, disposal sites used, and related information. Site photos of each facility also are provided.

According to records from the Department of Consumer and Regulatory Affairs (DCRA) and the Department of Pubic Works, the District owns and operates two solid waste transfer stations and private waste management companies own and operate a total of four solid waste transfer stations in the District.

At least two other solid waste handing facilities also are in operation. However, these facilities appear to be operating as intermediate processing facilities, with portions of their operating areas used for C&D processing/recycling and for waste paper/other recyclables processing. For purposes of this report, these processing facilities are distinguished from solid waste transfer stations. Exhibit 4-1 summarizes each of the solid waste handling facilities discussed in this report, including general location information (address, ward, property zoning, and acreage), the solid waste permit status, and annual tonnages reported (or estimated) for 1999.

DISTRICT-OWNED TRANSFER STATIONS

Fort Totten Transfer Station

The Fort Totten Transfer Station is located within Ward 4 at 4900 Bates Road, NE. The site is located along Bates Road between Fort Totten Drive and Brookland Drive. The site is bordered on the north by a concrete batch operation (owned by Silver Hill Concrete Company, operating as Super Concrete Inc.), on the east by a Metro-rail and CSX right-of-way, on the south by Bates Road and athletic fields of Catholic University, and on the east by Fort Totten Park. A general aerial view of the facility, along with surrounding properties, is presented in Exhibit 4-2.

According to the Office of Planning, the transfer station property actually is made up of three properties, all M-zoned and part of the Fort Totten Overlay district. The District owns approximately 4 acres (parcels 123/56 and 123/57). In addition, the Washington Metropolitan Area Transit Authority (WMATA) owns approximate two acres (parcels 124/74 and 124/75), and granted the District specific right-of-entry in December 1975 to build and operate the transfer station. Lastly, WMATA owns approximately 1.5 acres along the rail line (parcel 124/161), of which a portion is leased to Silver Hill Concrete Company for vehicular traffic, and a portion of which is used by the District for the same. Generally, the Fort Totten facility operates on an approximate 6.6-acre plot.

Exhibit 4 -1

Summary Of Existing Solid Waste Handling Facilities

Facility Name	Address	Permit Status	Ward	Zoning	Acreage	Annual Tonnage Reported/ Estimated (1999)
Solid Waste Transfer Stations						
1. Fort Totten – DC Government	4900 Bates Road, NE	N/A	4	M-FT Overlay	6.6	137,000
2. Benning Road – DC Government	3200 Benning Road, NE	N/A	7	M	6.9	69,200
3. Browning-Ferris, Industries	1220 W Street, NE	Interim	5	CM-1	3.1	216,400
4. Waste Management - Northeast	2160 Queens Chapel Road, NE	Interim	5	CM-2	2.3	193,500
5. Waste Management - Uline Arena	1140 3rd Street NE	Interim	6	M	2.4	210,600
6. Eastern Trans-Waste of Maryland	1329 1st Street, SE	None	6	M	1.2	121,600
Intermediate Processing Facilities (Construction/Demolition Recycling)						
1. Rodgers Brothers Custodial Services	2225 Lawrence Ave, NE	None	5	CM-1	2.7	14,900#
2. James Taylor Trash Removal Contractors	5210 Hayes Street, NE	None	7	CM-1	3.3	2,300#
Intermediate Processing Facilities (Waste Paper/Other Recyclables)						
1. Rodgers Brothers Custodial Services	2115 Bryant Street, NE	N/A	5	CM-1	3.1	1,800*
2. James Taylor Trash Removal Contractors	5210 Hayes Street, NE	N/A	7	CM-1	<1.0	2,200*

Notes: # Recycled and recovered construction/demolition materials; less than 2 percent of these materials estimated as residuals (i.e., shipped as MSW to Subtitle D landfills).

* Recycled municipal solid waste materials; less than 2 percent of these materials reported as residuals (i.e., shipped as MSW to Subtitle D landfills).

Exhibit 4-2
Aerial View of Fort Totten Transfer Station

Legend

Property Boundary

100 0 100 200 Feet

Source: D.C. Government, Office of Planning, Design Technology and Information Services Center, December 1998

The topography of the property is significant, with grade changes over 50 feet from east to west. Other land uses in the vicinity of the transfer station include industrial and commercial-zoned properties, and residential on Fort Totten Drive.

One two-story building and an operations trailer occupy the site. The upper level of the existing facility houses offices, wash areas and locker rooms, the vehicle scales and the receiving area of the 28,000 ft^2 transfer station. Eight pits are located on the floor of the upper level; however, these pits are currently not utilized for waste transfer operations. The bottom level of the facility contains used equipment and compactors that were previously used to load transfer trailers and equipment storage. General site photographs are shown in Exhibit 4-3.

The facility receives wastes picked up from District collection crews; private haulers are not permitted to discharge their vehicles at Fort Totten (except under special conditions where they have been contracted out by the District). Much of the site is used for vehicle parking, transfer trailer storage, and special waste operations. The southeast corner of the site is used by the District as a fueling station and waste oil receiving area. A new vehicle car wash and expanded fueling facilities are planned, according to DPW personnel.

Special wastes are managed on a northern portion of the property. Typically, these are materials brought in by small vehicles or open-top trucks. The special wastes processed at the facility include: white goods, C&D debris, yard wastes, bulk materials, and scrap metals. These special wastes are transferred to selected facilities outside Washington, DC.

A citizen drop-off area is present at Fort Totten for the convenience of citizens who self-haul loads. This area is located in a special turnout along Bates Road and allows direct dumping of waste materials into an open-topped container.

According to Mr. Peter Mitchell, Operations Manager at the site, the facility is staffed by approximately 23 DPW employees. Responsibilities include:

- vehicle scale operations,
- directing general facility traffic,
- responding to requests or inquires by the general public arriving at the site,
- waste screening and equipment operations on the tipping floor,
- top loading of the transfer trailers, and
- site cleanup and security.

Urban Service Systems Corporation (USS) is contracted by the District to provide waste transfer vehicles, drivers, and hauling services from the transfer station. USS retains five employees at the facility. Waste received on the tipping floor is pushed down a ramp or chute into the waiting transfer trailers. A tamping machine located outside the building serves to compact the waste and distribute the load within the trailer. The total loading time is approximately ten minutes per trailer.

Exhibit 4-3
General Site Photographs of Fort Totten Transfer Station

Source: SCS Engineers

After the transfer trailer is loaded, it is weighed on the facility scale to confirm compliance with vehicle load weight restrictions. The transfer trailer is then tarped for transport. All solid wastequantities from the Fort Totten Transfer Station are transferred to the Fairfax County Energy/Resource Recovery facility located in Fairfax County.

Outbound transfer trailers access I-395 (southbound) via Taylor Road, John McCormack Drive and New York Avenue. The distance from the facility to I-395 is approximately 3.3 miles. Inbound refuse collection vehicles access the site via Michigan Avenue to John McCormick Road to Bates Road, and also via Hawaii Avenue to Brookland Drive to Bates Road.

According to District and Fairfax County records, the Fort Totten transferred a total of approximately 137,000 tons of solid waste in 1999, an average of approximately 440 tons per day (assuming 6 days per week operations).

Benning Road Transfer Station

The Benning Road Transfer Station is located within Ward 7 at 3200 Benning Road, NE. The site is bordered on the west, north and east by the Anacostia Park, which is operated by the National Park Service. A PEPCO electric generating facility is located immediately south of the site, and the National Park Service operates a maintenance facility to the west of the transfer station facility. The site is accessed from Benning Road via a 0.3-mile service road. A general aerial view of the facility, along with surrounding properties, is presented in Exhibit 4-4.

According to the Office of Planning, the transfer station property and service road are owned by the National Park Service and leased by the District. The site is M-zoned (i.e., General Industrial use) and is approximately 6.9 acres.

The site is relatively flat. No surface water features are present at the site. Other land uses in the vicinity of the transfer station include industrial and commercial-zoned properties, and residential to the northeast, as well as south of Benning Road.

The site was built and operated by the District as a solid waste incinerator from 1972 to 1994. With the closure of incinerator operations, the facility was converted to use as a transfer station. Two levels currently are used. The lower (ground) level has offices, wash areas, locker rooms, vehicle scales, parking, transfer trailer storage, and service/access roads. The service road for incoming refuse collection vehicles ramps up to the second level on the east side of the site and into the receiving area of the approximate 17,400 ft^2 of tipping floor and 8,200 ft^2 of solid waste pits. The solid waste pits are approximately 45 feet deep. General site photographs are shown in Exhibit 4-5.

The equipment from the former incinerator operation remains present at the site. The most visible features are two 165-foot stacks designed to exhaust incinerator emissions. Some of the incinerator equipment at the site is salvageable as scrap metal.

Exhibit 4-4
Aerial View of Benning Road Transfer Station

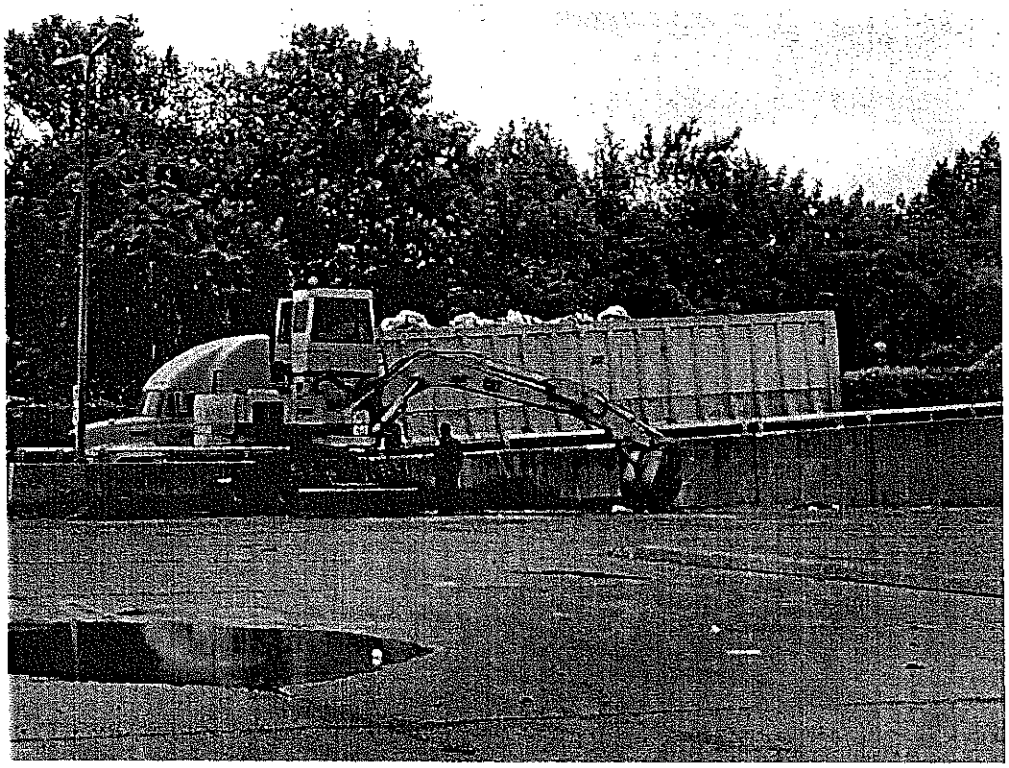
Legend

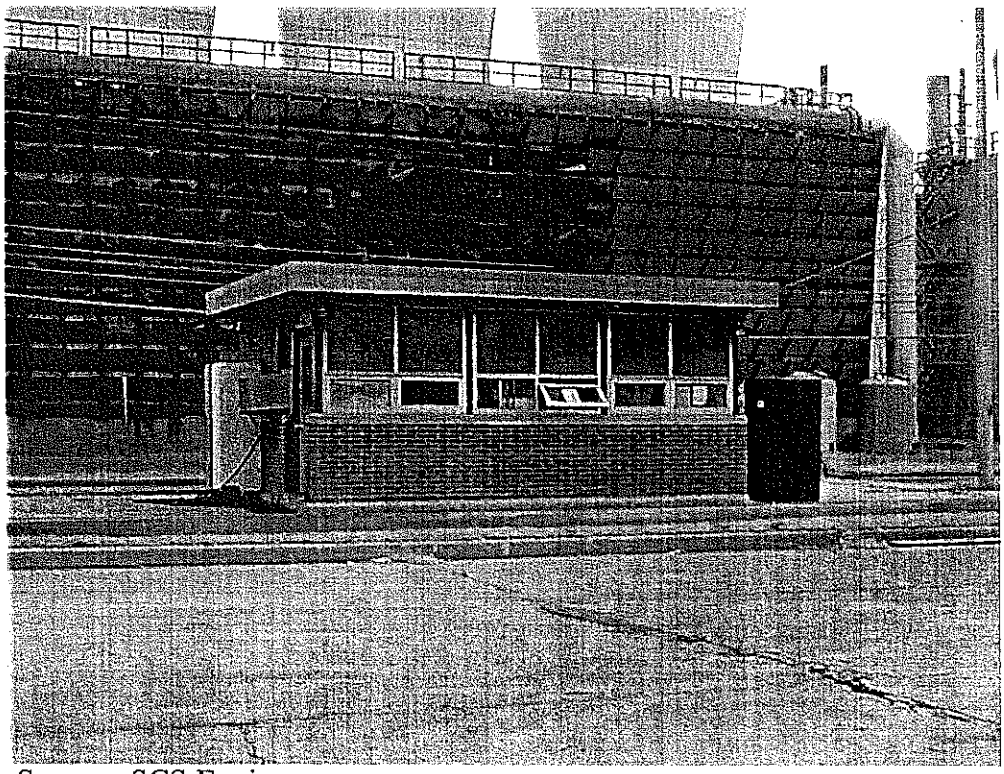
Property Boundary

Source: D.C. Government, Office of Planning, Design Technology and Information Services Center, December 1999

100 0 100 200 Feet

Exhibit 4-5
General Site Photographs of Benning Road Transfer Station





Source: SCS Engineers

There are no facilities at the site for citizen drop-off of wastes. Similar to the Fort Totten facility, private haulers are not allowed to use the Benning Road facility for solid waste transfer/disposal.

According to Mr. Walter Downing, the Operations Manager at the site, the facility is staffed by approximately 23 DPW employees. Responsibilities include:

- vehicle scale operations,
- directing general facility traffic,
- waste screening and equipment operations on the tipping floor,
- top loading of the transfer trailers, and
- site cleanup and security.

Similar to Fort Totten, Urban Service Systems Corporation (USS) is contracted by the District to provide waste transfer vehicles, drivers, and hauling services from the Benning Road Transfer Station. USS retains one employee at the facility.

Collection vehicles enter the facility through the east door and dump in the shortage pit and exit through the west door. An overhead crane removes waste from the pit and loads the hopper of two conveyors. These conveyors direct the waste to the top-loading transfer trailers. Two trailers are loaded concurrently. The trucks move forward incrementally during the loading process to distribute the waste as best as practical within each trailer.

After the trailer is filled initially, it exits through the west side of the facility and proceeds to the bottom of the ramp. At this point, the waste is tamped in the trailer to reduce the volume and distribute the load; then the trailer returns into the facility to receive additional waste. After the remainder of the trailer is filled, it exits the facility. This process takes over an hour to load each trailer.

After the transfer trailer is loaded, it is weighed on the facility scale to confirm compliance with vehicle load weight restrictions. The transfer trailer is then tarped for transport. All solid waste quantities from the Benning Road Transfer Station are transferred to the Fairfax County Energy/Resource Recovery facility located in Fairfax County.

Outbound transfer trailers access I-295 (southbound) via Benning Road east. The distance from the site access road to I-295 is approximately 0.5 miles. Inbound refuse collection vehicles access site via Benning Road by Kenilworth Avenue (north and east), Anacostia Freeway (south and east), or H Street from the west and south.

According to District and Fairfax County records, the Benning Road facility transferred a total of approximately 69,200 tons of solid waste in 1999, an average of approximately 220 tons per day (assuming 6 days per week operations).

PRIVATE SOLID WASTE TRANSFER STATIONS

As indicated in Exhibit 4-1, there are four privately-owned solid waste transfer stations operating in the District. Three of these facilities are operating under interim operating permits issued by the Department of Consumer and Regulatory Affairs (DCRA) in August 1996. According to DCRA, the fourth facility (Eastern Trans-Waste of Maryland, Inc.) has not applied for a solid waste facility permit. Descriptive information regarding these four private solid waste transfer facilities is provided below.

BFI Transfer Station

Browning-Ferris Industries (BFI), in association with Consolidated Waste Industries (CWI), operates a solid waste transfer station from a building owned by CWI, located at 1220 W Street, NE. The property ownership is recorded as Square 3942 Associated Limited Partnership.

This site is located in Ward 5 in an area zoned CM-1 (commercial, light manufacturing). It consists of approximately 3.1 acres. The facility is adjacent to the intersection of W Street and Brentwood Road. The site is bounded to the north by 13th Street and a shopping center, to the south by W Street with small manufacturing facilities, to the east by small commercial businesses, and to the west by Brentwood Road and a District-owned impoundment lot. A general aerial view of the facility, along with surrounding properties, is presented in Exhibit 4-6.

Two one-story buildings occupy the site. The largest building on the east side on the property has five bay doors for access by the incoming refuse collection vehicles. Refuse discharge and transfer into top-loading trailers are conducted within the building. The transfer trailer loading bay is located on the east side on the facility that houses a vehicle scale system. Transfer trailers are top loaded by machinery operating on the tipping floor. The transfer trailers are loaded in approximately 10 minutes.

Inbound refuse collection trucks access the site from Brentwood Road via New York Avenue and Rhode Island Avenue. Outbound transfer trailers exit the facility on W Street and turn right onto Brentwood Road, turn left on Rhode Island, and access I-395 (southbound) by either 9th Street or 14th Street. According to BFI personnel, all solid waste from this facility is transferred and disposed at BFI's King and Queen Landfill, located in King and Queen County, Virginia.

According to District records, the property has a Certificate of Occupancy described as "...sorting and separating of recyclable materials/industrial processing/not sexually orientated". BFI was issued a Solid Waste Handling Interim Operating Permit on August 2, 1996. The permit specifies a maximum average daily throughput of 1,200 tons and a 360,000 tons per year limit. Under the permit, acceptable materials include:

- mixed and pre-sorted municipal solid waste;
- construction and demolition debris;

Exhibit 4-6
Aerial View of BFI Transfer Station

Legend

Property Boundary

100 0 100 200 Feet

Source: D.C. Government, Office of Planning, Design Technology and Information Services Center, December 1998

yard waste;
- recyclables; and
- white goods.

The facility is prohibited to process or transfer:

- Medical or pathological waste;
- Hazardous waste;
- Used oil;
- Antifreeze;
- Animal carcasses;
- Drums, tanks or other containers that have held hazardous waste;
- Septage or sewage scavenger waste;
- Chemical of petroleum cleanup waste;
- Liquid waste or any waste containing free liquids as determined by the EPA method 9095 paint filters test (this does not apply to de minimis quantities of household products that may occur in the waste stream);
- Radioactive waste; and
- Asbestos or asbestos-containing materials.

According to DPW records, the BFI facility transferred a total of about 216,400 tons of solid waste in 1999, or an average 694 tons per day (assuming 6-days weeks). Approximately 44 percent of this waste was generated in the District. The wastes transferred consisted of normal solid waste (89 percent by weight), C&D waste (10 percent by weight), and recyclables (1 percent by weight). The solid waste facility charge paid to the District in 1999 was approximately $379,000.

The facility has been issued multiple citations by the District's Department of Consumer and Regulatory Affairs (DCRA), Department of Health (DOH) and the Department of Public Works (DPW) during the past two years. These citations include [1]:

- Handling solid waste outside permitted hours;
- Emission of odorous pollutants (numerous violations);
- Collecting solid waste without a license;
- Engine idling more than 3 minutes;
- Fugitive dust; and
- Certificate of Occupancy violations (numerous violations).

General site photographs for this facility are shown in Exhibit 4-7.

[1] Solid Waste Facility Status Report, Department of Consumer and Regulatory Affairs, January 2000.

Exhibit 4-7
General Site Photographs of BFI Transfer Station

Source: SCS Engineers

Waste Management/Northeast Transfer Station

Waste Management, Inc. (WM) operates a solid waste transfer station at 2160 Queens Chapel Road, NE. Property ownership is recorded as Caslin Associates, LP.

The site is located in Ward 5 in an area zoned CM-2 (commercial-light manufacturing, medium bulk). It consists of approximately 2.3 acres. The facility generally is bounded to the north by the Baltimore and Ohio Railroad tracks, to the east by Queens Chapel Road (370 feet of street frontage), Adams Road to the south with 230 feet of street frontage, and warehouses to the east. A general aerial view of the facility, along with surrounding properties, is presented in Exhibit 4-8.

The site features include two buildings and a small trailer used as an office. The largest building is used for refuse discharge and transfer into top-loading transfer trailers. The smaller building is used for employee parking. The site is fenced or walled in its entirety. A deodorant spray for minimizing odors is on site.

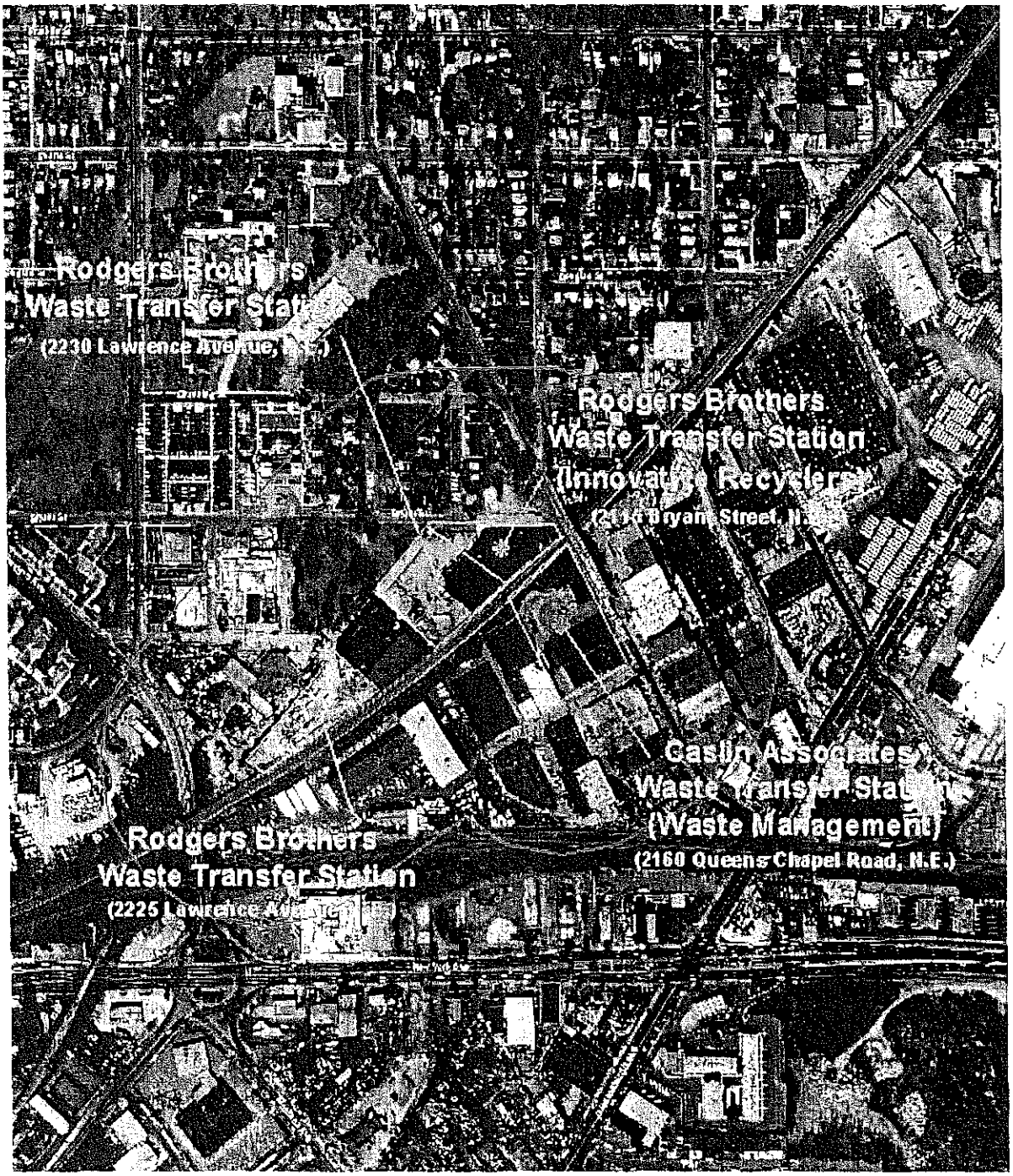
Refuse collection vehicles enter the site via Queens Chapel Road and proceed to vehicle scales for weighing. The collection vehicles then proceed into the main building to discharge vehicle loads on the tipping floor. Transfer trailers enter the lower level of the property from Adams Street for loading. Transfer trailers are weighed on vehicle scales to confirm compliance with vehicle load weight limits. Transfer trailers are queued on adjacent property to the east.

Inbound refuse collection trucks access the site from Bladensburg Road. Outbound transfer trailers exit the facility from Queens Chapel Road by turning right onto Bladensburg Road, right on to New York Avenue and on to I-395 (southbound). The distance from the facility to I-395 is approximately 2 miles. According to WM personnel, all solid waste from this facility is transferred and disposed at landfills owned and operated by Waste Management in Virginia.

According to District records, the property has a Certificate of Occupancy described as: "...light manufacturing, processing, fabricating and warehousing of steel products and office and retail construction industrial supplies; all materials non-hazardous; not sexually oriented." Waste Management of Maryland, Inc. was issued a Solid Waste Handling Interim Operating Permit on August 2, 1996. The permit specifies a maximum average daily throughput of 2,000 tons per day and a 300,000 tons per year limit. Under the permit, acceptable materials include:

- mixed and pre-sorted municipal solid waste;
- construction and demolition debris;
- yard waste;
- recyclables; and
- white goods.

Exhibit 4-8
Aerial View of Waste Management/Northeast Transfer Station



Legend

Property Boundary

100 0 100 200 Feet

Source: D.C. Government, Office of Planning, Design Technology and Information Services Center, December 1999

The facility is prohibited to process or transfer:

- Medical or pathological waste;
- Hazardous waste;
- Used oil;
- Antifreeze;
- Animal carcasses;
- Drums, tanks or other containers that have held hazardous waste;
- Septage or sewage scavenger waste;
- Chemical of petroleum cleanup waste;
- Liquid waste or any waste containing free liquids as determined by the EPA method 9095 paint filters test (this does not apply to de minimis quantities of household products that may occur in the waste stream);
- Radioactive waste; and
- Asbestos or asbestos-containing materials.

According to DPW records, the WM facility transferred a total of about 193,500 tons of solid waste in 1999, or an average 620 tons per day (assuming 6-days weeks). Approximately 37 percent of this waste was generated in the District. The wastes transferred consisted of normal solid waste (99.9 percent by weight) and the remainder was recyclables. The solid waste facility charge paid to the District in 1999 was approximately $287,000.

The facility has been issued numerous citations by the District's Department of Consumer and Regulatory Affairs (DCRA), Department of Health (DOH) and/or the Department of Public Works (DPW) during the past two years. These citations include:

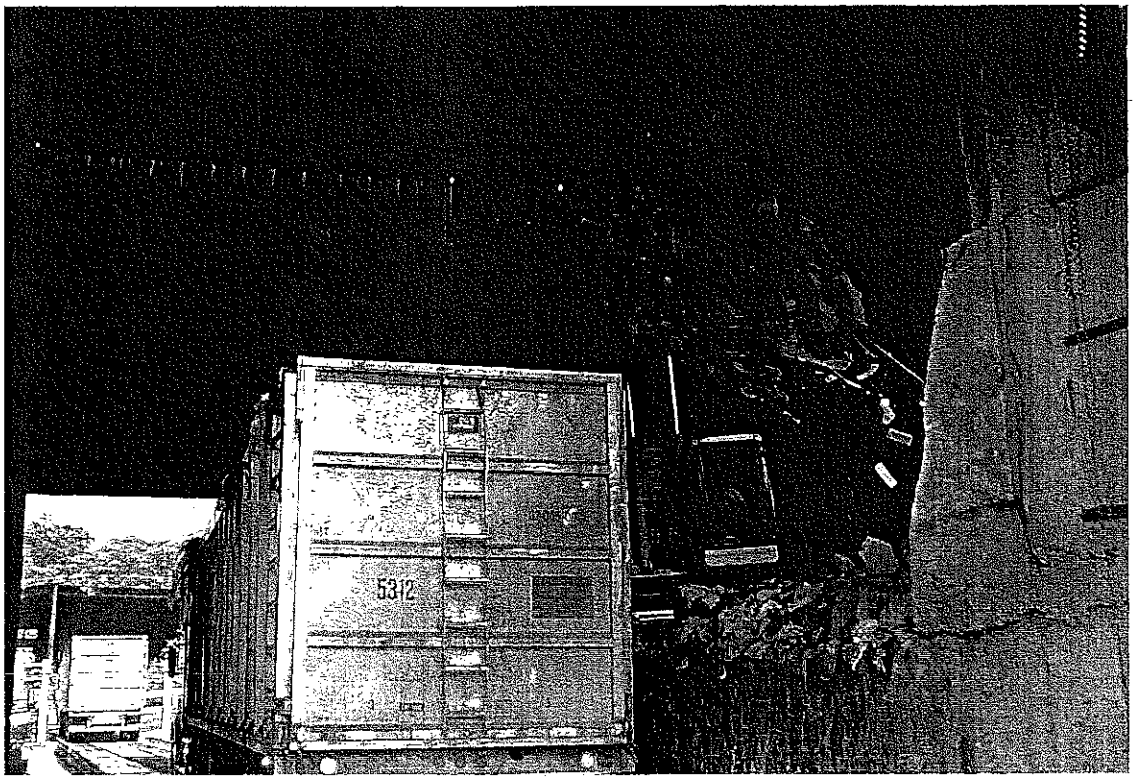
- Handling solid waste outside permitted hours (multiple citations)
- Waste out of containers/waste out overnight;
- Emission of odorous pollutants (multiple citations);
- Collecting solid waste without a license;
- Failure to operate air pollution control device (multiple violations); and
- Certificate of Occupancy violations (multiple violations).

General site photographs for this facility are shown in Exhibit 4-9.

Waste Management/Uline Arena Transfer Station

Waste Management (WM) operates a solid waste transfer station located at 1140 3rd Street, NE at the former Uline Arena. The site is located in Ward 5 in an area zoned M (General Industrial). The site is described as Square 748 Lots 8,9, 10, 11, 42, 43, 802, 808, 809, 810, 811, 812 and occupies approximately 2.4 acres. The site is generally bounded to the north by commercial warehouses and light manufacturing. Residences are located within one block of the facility

Exhibit 9
General Site Photographs of Waste Management/Northeast Transfer Station



Source: SCS Engineers

along Abbey Street. A general aerial view of the facility, along with surrounding properties, is presented in Exhibit 4-10.

Refuse collection vehicles enter the north side of the facility via M Street. The collection vehicles proceed directly to scales upon entering the building. The collection trucks are then directed to tip their waste onto a designated area of the tipping floor. The waste is top loaded into transfer trailer via heavy machinery operating on the tipping floor. After loading, the transfer trailers are weighed and exit the facility. The transfer trailers are loaded in approximately 10 minutes.

Inbound refuse collection trucks access the site from New York Avenue to North Capital Street and to M Street from the east and west. Collection trucks from the north and south access via Florida Avenue to M Street. Outbound transfer trailers exit the facility via M Street to New York Avenue for access to I-395 (southbound). According to WM personnel, all solid waste from this facility is transferred and disposed at landfills owned and operated by Waste Management in Virginia.

LG Industries, Inc. was issued a Solid Waste Handling Interim Operating Permit on August 2, 1996. The facility changed its name to USA Waste of Washington Inc. in 1999. Soon afterwards, USA Waste and Waste Management merged. Waste Management now operates the facility. The permit specifies a maximum average daily throughput of 2,500 tons per day and a 700,000 tons per year limit. Similar to the other two facilities with interim operating permits, this facility can accept:

- mixed and pre-sorted municipal solid waste;
- construction and demolition debris;
- yard waste;
- recyclables; and
- white goods.

The facility is prohibited to process or transfer:

- Medical or pathological waste;
- Hazardous waste;
- Used oil;
- Antifreeze;
- Animal carcasses;
- Drums, tanks or other containers that have held hazardous waste;
- Septage or sewage scavenger waste;
- Chemical of petroleum cleanup waste;
- Liquid waste or any waste containing free liquids as determined by the EPA method 9095 paint filters test (this does not apply to de minimis quantities of household products that may occur in the waste stream);

Exhibit 4-10
Aerial View of Waste Management/U-line Arena Transfer Station

Legend

Property Boundary

Source: D.C. Government, Office of Planning, Design Technology and Information Services Center, December 1999

100 0 100 200 Feet

According to DPW records, this WM facility transferred a total of about 210,600 tons of solid waste in 1999, or an average 675 tons per day (assuming 6-day weeks). Approximately 50 percent of this waste was generated in the District. The wastes transferred consisted of normal solid waste (98.5 percent by weight) and the remainder was C&D waste. The solid waste facility charge paid to the District in 1999 was approximately $422,000.

The facility has been issued several citations by DCRA, DOH, and/or DPW during the past two years. The principle citation has been emission of odorous pollutants.

General site photographs for this facility are shown in Exhibit 4-11.

ETW Transfer Station

Eastern Trans-Waste of Maryland, Inc. (ETW) operates a solid waste transfer station at 1315-1331 1st Street, SE in Ward 6. It is located on an approximate 1.2-acre plot of land in an M-zoned area. The surrounding land use includes industrial and commercial uses. A general aerial view of the facility, along with surrounding properties, is presented in Exhibit 4-12.

ETW personnel report that about 13 employees operate the transfer station. This facility has two bays, one bay for solid waste materials and one bay for recyclables. Refuse collection trucks enter one of the two bays and discharge their loads onto the concrete tipping floor. Transfer trailers are top loaded by machinery operating on the same level. Transfer trailers are weighed as they exit the facility.

According to ETW personnel, the facility handles about 121,600 tons of waste on an annual basis. This equates to approximately 300 tons per day of normal solid waste, 50 tons per day of construction and demolition debris, and 75 tons per day of recyclables. ETW estimates that about 85 percent of its waste is generated within the District. Waste transferred at ETW is disposed of at one of two landfills located in Pennsylvania.

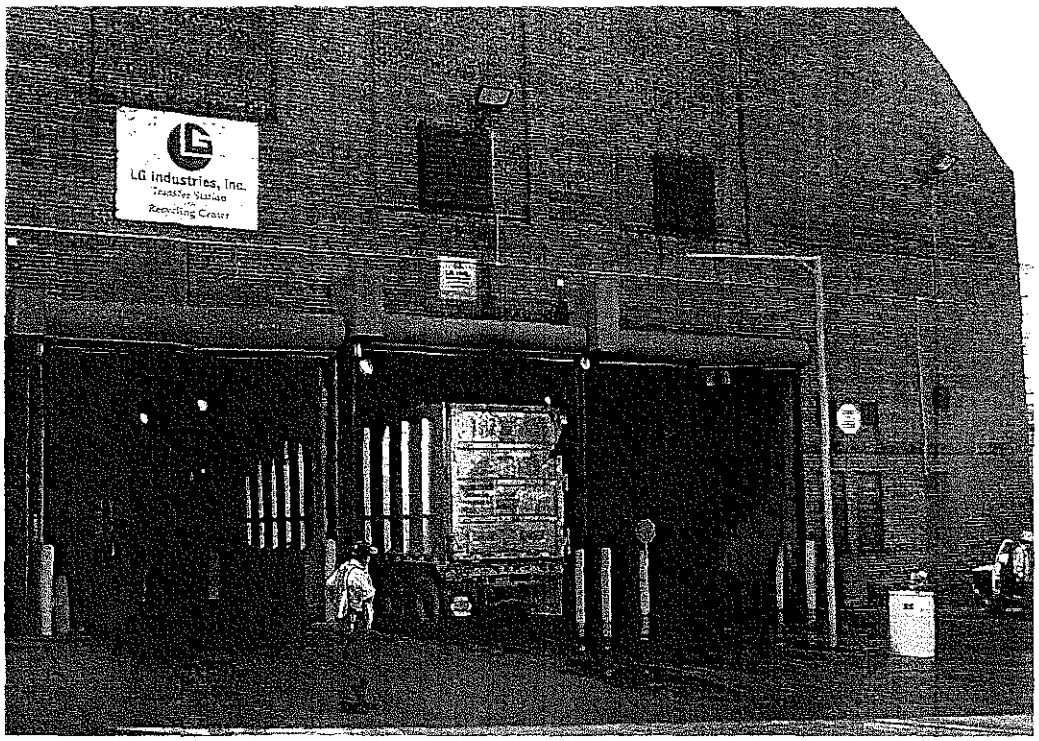
The facility has not applied for a solid waste facility permit and does not provide reports to the DCRA of the amount of solid waste deposited at the facility. Therefore, ETW has not paid a Solid Waste Facility Charge to the District since it went into operation.

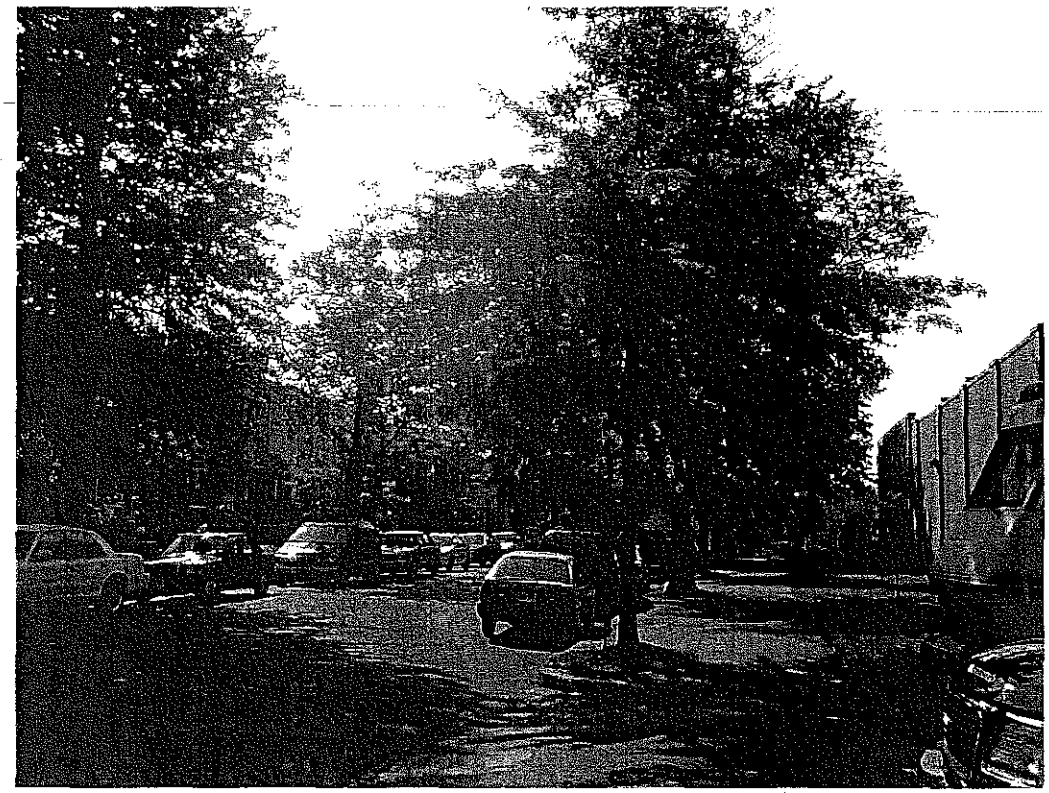
The facility has been issued numerous citations by Department of Health (DOH), principally for the emission of odorous pollutants. General site photographs for this facility are shown in Exhibit 4-13.

PRIVATE SOLID WASTE PROCESSING FACILITIES

As indicated in Exhibit 4-1, other solid waste handing or intermediate materials recycling facilities currently are operating in the District. These facilities appear to be salvage operations, intended for the purpose of material recovery and recycling, as opposed to solid waste transfer.

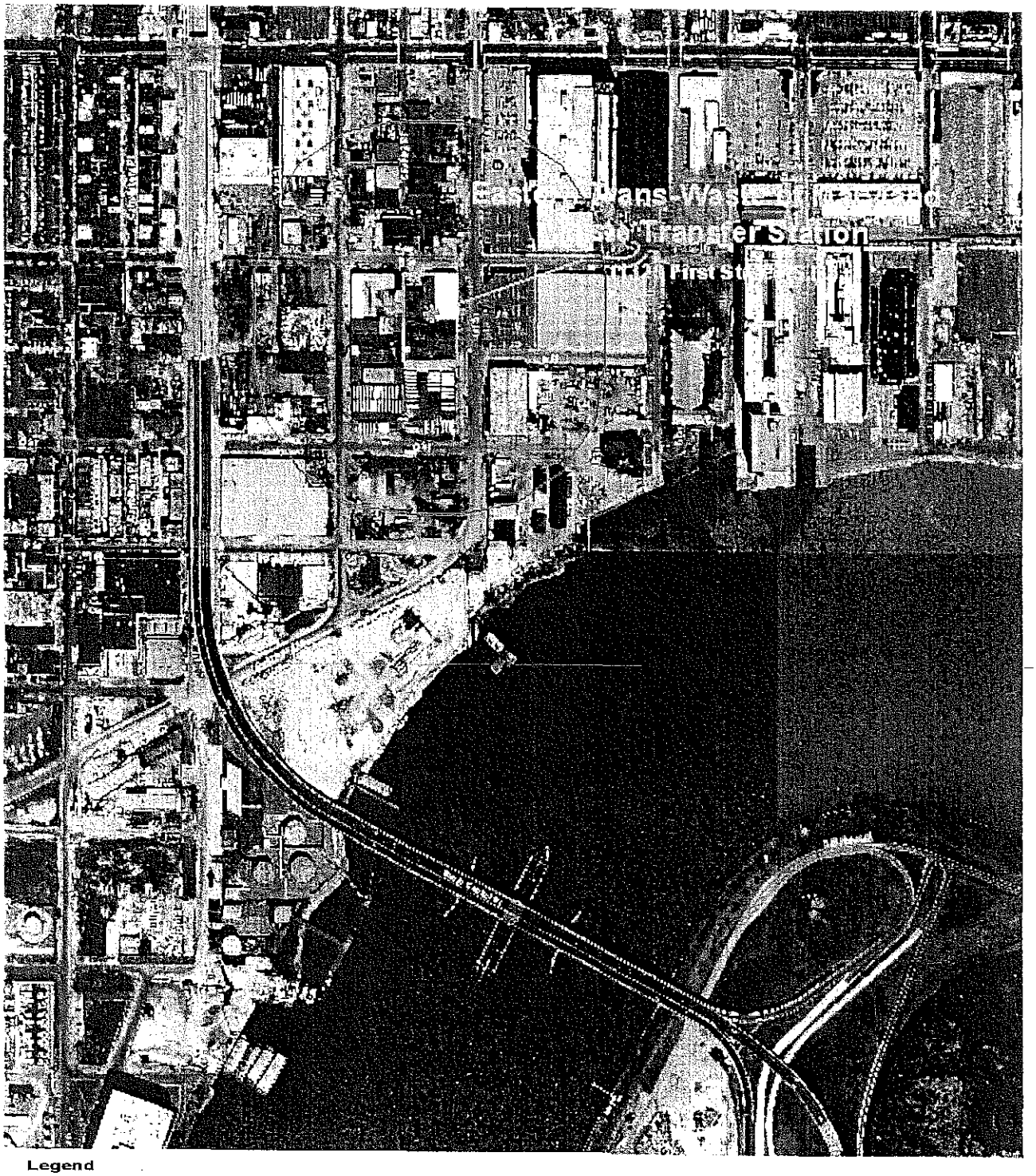
Exhibit 11
General Site Photographs of Waste Management/U-line Arena Transfer Station





Source: SCS Engineers

Exhibit 4-12
Aerial View of ETW Transfer Station



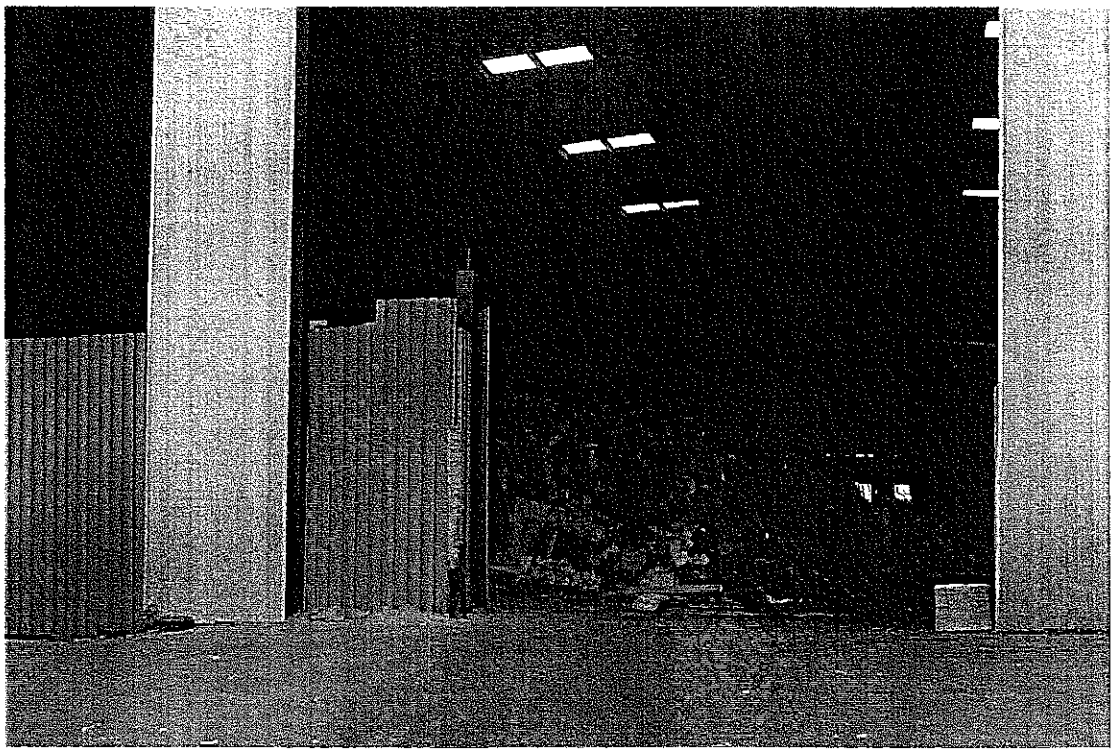
Legend

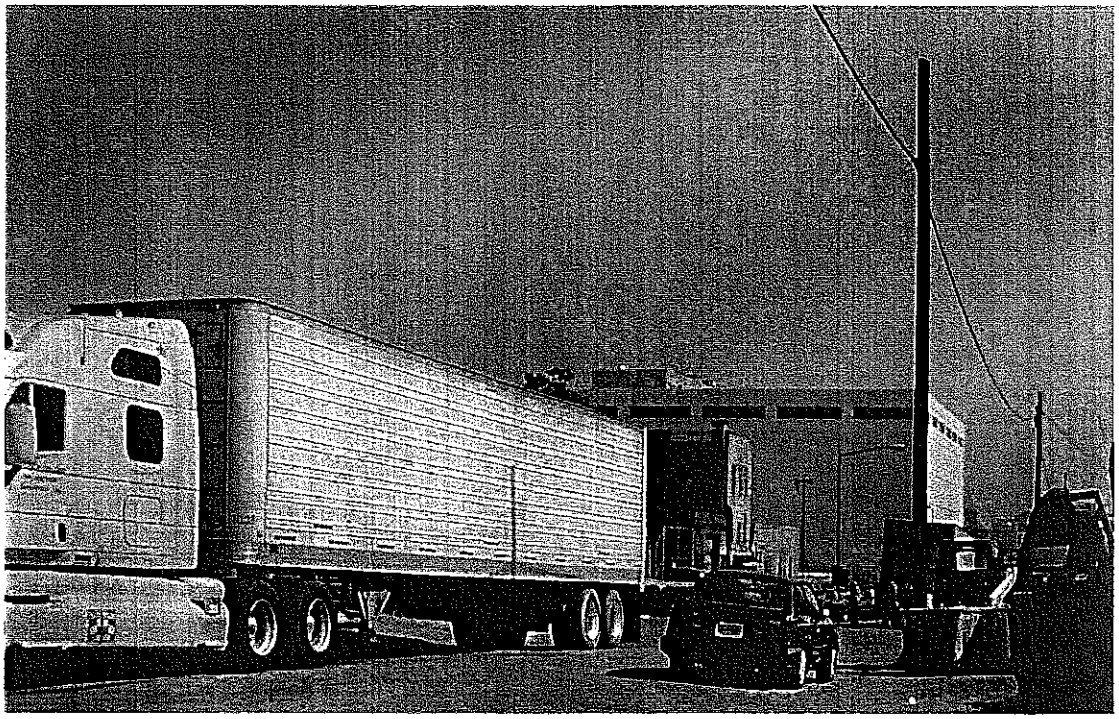
Property Boundary

100 0 100 200 Feet

Source: D.C. Government, Office of Planning, Design Technology and Information Services Center, December 1999

Exhibit 4-13
General Site Photographs of ETW Transfer Station





Source: SCS Engineers

As a result, they are discussed herein as intermediate processing facilities, either for construction and demolition material recycling, or for waste paper/other recyclables processing.

Rodgers Brothers Custodial Services

Rogers Brothers Custodial Services, Inc. owns three properties at 2225 Lawrence Avenue, NE, 2230 Lawrence Avenue, NE, and 2115 Bryant Street, NE. These properties are located in Ward 5 in a CM-1 zoning district. None of the properties has a solid waste facility permit.

The three contiguous properties are generally bounded by the Baltimore and Ohio Railroad tracks to the south and east, Adams Street to the north, and Montana Avenue to the west. The surrounding land uses are generally a mix of commercial and residential properties. A small park is located about one block north of the site. A general aerial view of the properties, along with surrounding properties, is presented in Exhibit 4-14.

Rodgers Brothers receives and processes construction and demolition (C&D) debris generated in the District. This operation is conducted at 2225 Lawrence Avenue on an approximate 2.7-acre plot. According to Rodgers Brothers personnel, this facility recycles and recovers about 14,900 tons per year (1999) of C&D materials, of which less than 2 percent is shipped as residuals to solid waste landfills. A larger percentage of residuals is shipped annually to regional C&D landfills.

Material separation is accomplished with a trommel, magnets, and related machinery, as well as through manual means.

In addition, Rodgers Brothers receives and processes bulk paper loads through a sorting line located at 2115 Bryant Street. This property is approximately 3.1 acres and is used for vehicle and container storage. According to Rogers Brothers personnel, the waste paper/other recyclables operation recycles and recovers about 1,800 tons of solid waste materials, of which less than 2 percent is shipped as residuals to solid waste landfills. Material separation generally is accomplished manually.

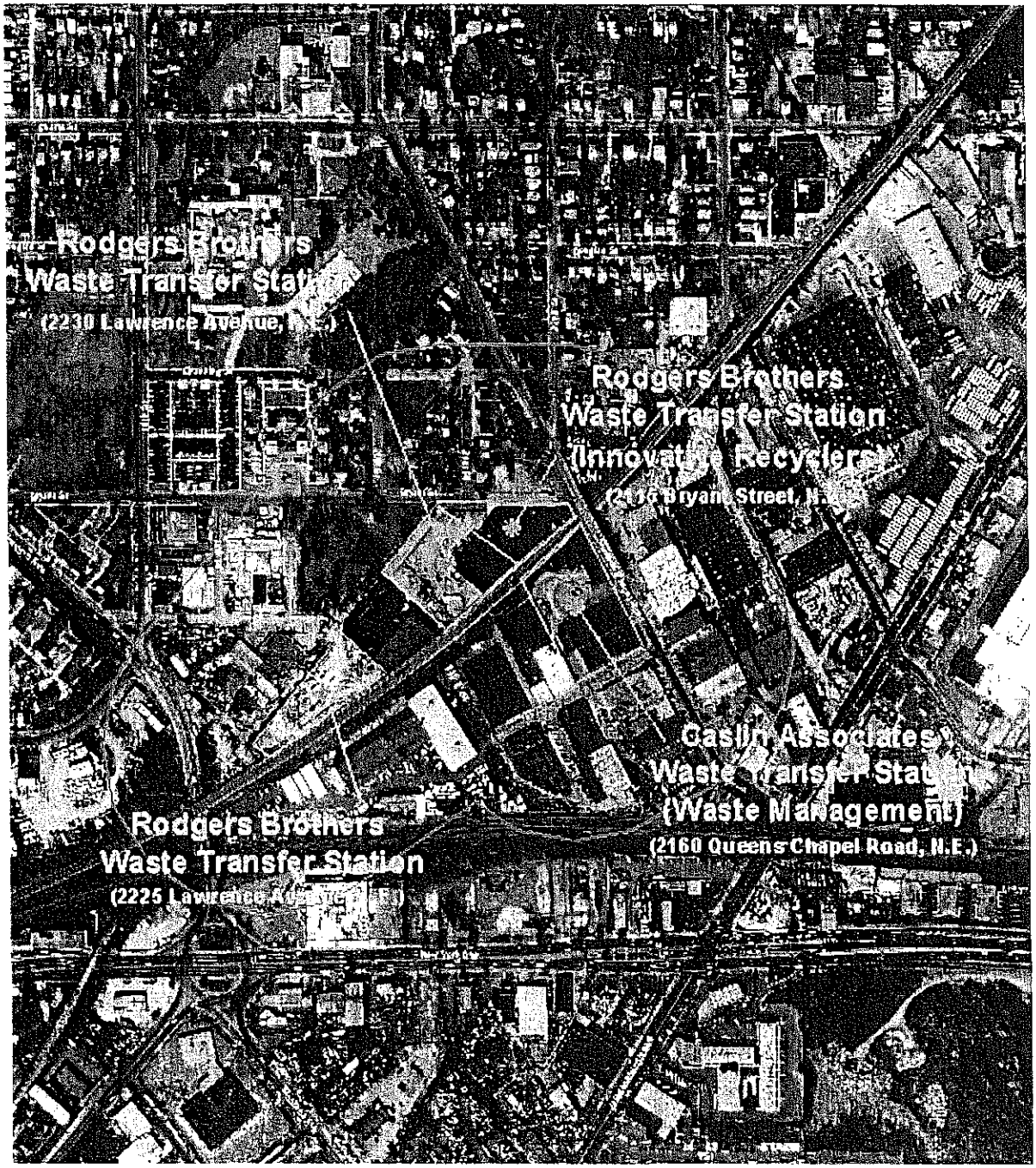
General site photographs for the Rodgers Brothers operations are shown in Exhibit 4-15.

James Taylor Trash Removal, Inc.

The James Taylor Trash Removal Contractors, Inc. facility is located at 5201 Hayes Street, NE. The facility is located in Ward 7 in an area zoned CM-1. The facility has a Certificate of Occupancy described as "...warehouse – general merchandise".

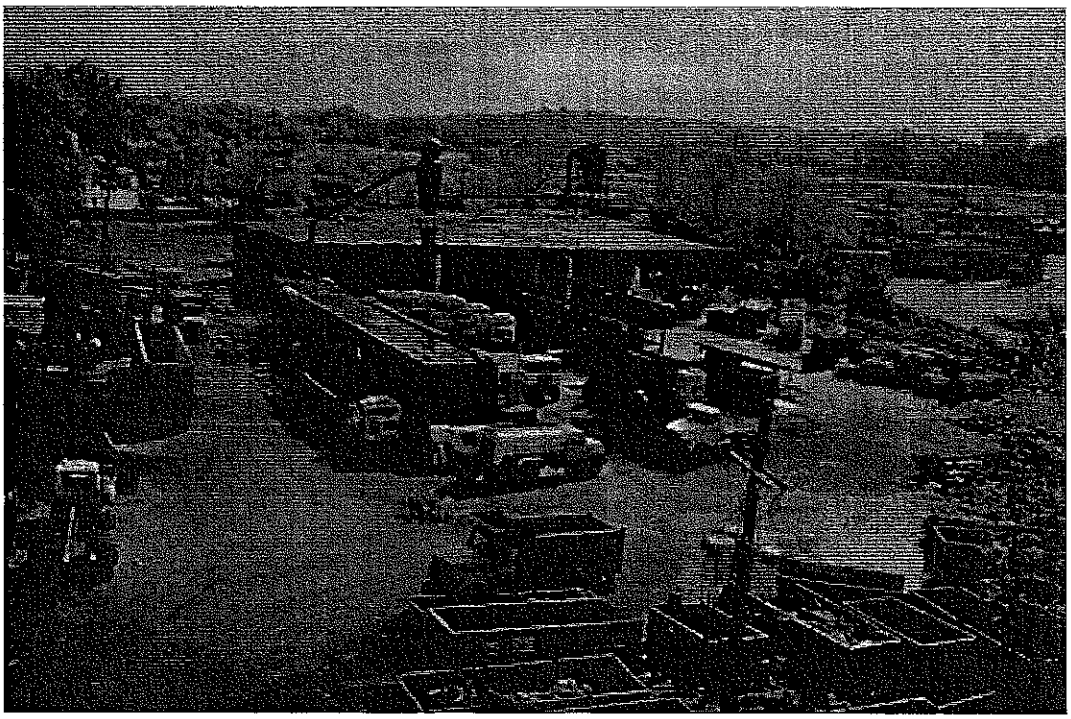
The area surrounding the site is generally occupied by commercial and residential properties. The site is bounded by Hayes Street to the north, Burroughs Avenue to the south, Division Avenue to the east, and Lowrie Avenue to the west. Access to the site is via Hayes Street and Burroughs Avenue. A general aerial view of the property, along with surrounding properties, is presented in Exhibit 4-16.

Exhibit 4-14
Aerial View of Rodgers Brothers Processing Facility



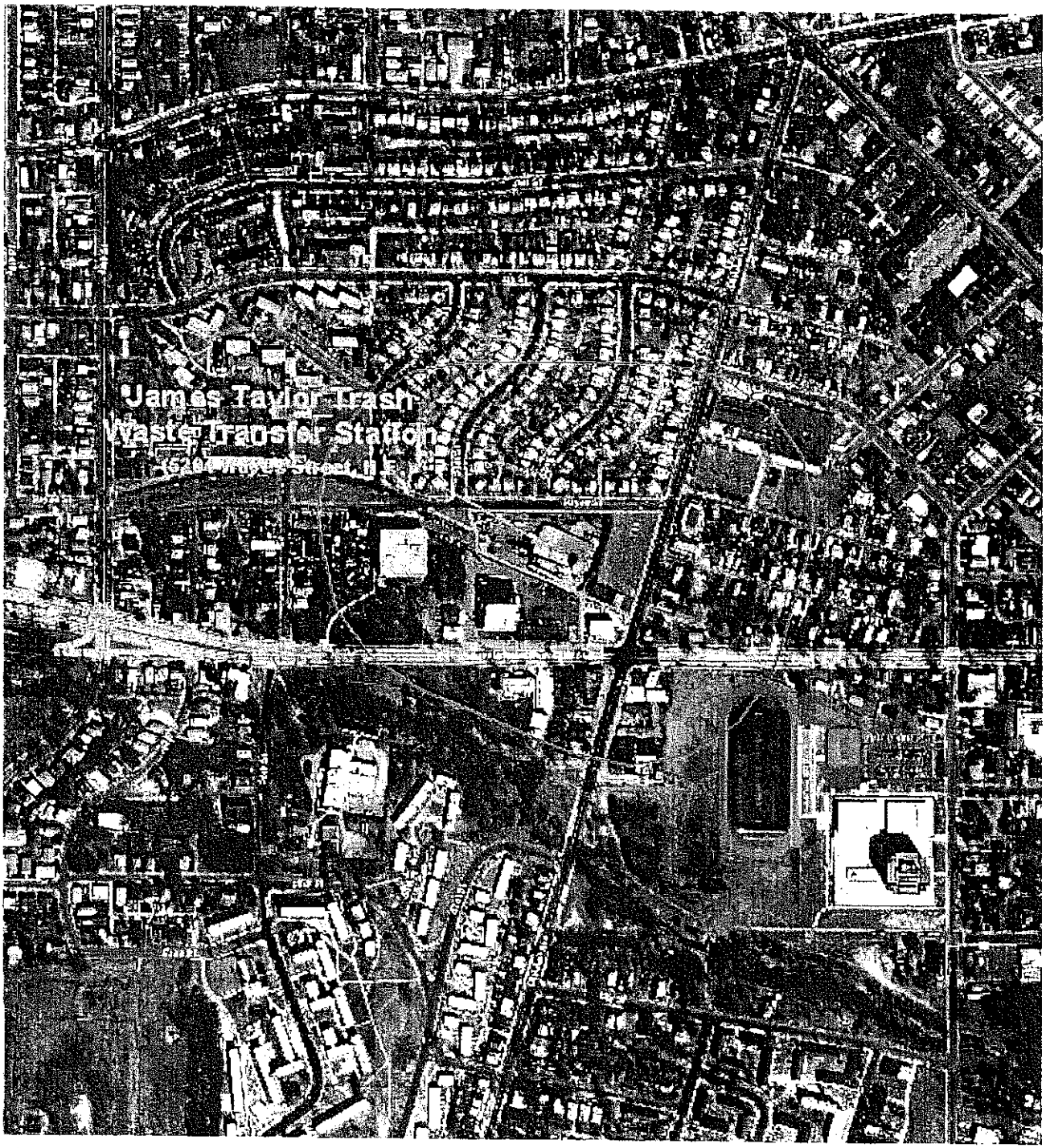
Source: D.C. Government, Office of Planning, Design Technology and Information Services Center, December 1988

Exhibit 4-15
General Site Photographs of Rodgers Brothers Processing Facility



Source: SCS Engineers

Exhibit 4-16
Aerial View of James Taylor Processing Facility



Legend

Property Boundary

100 0 100 200 Feet

Source: D.C. Government, Office of Planning, Design Technology and Information Services Center, December 1999

the northeast corner of the property, 2) a large parking and storage area located primarily on the north and west portions of the property; and 3) an outdoor processing area for salvaged concrete, metal and dirt.

James Taylor receives and processes construction and demolition debris generated in the District. This operation is conducted on an approximate 3.3-acre portion of the site. According to James Taylor personnel, this facility recycles and recovers about 2,300 tons per year (1999) of C&D materials, of which less than 2 percent is shipped as residuals to solid waste landfills. A larger percentage of residuals is shipped annually to regional C&D landfills. Material separation generally is accomplished manually and with some machinery.

In addition, James Taylor receives and processes refuse from selected office buildings through a sorting line located within a building on the site. According to James Taylor personnel, the waste paper/other recyclables operation recycles and recovers about 2,200 tons of solid waste materials, of which less than 2 percent is shipped as residuals to solid waste landfills. Materials that are recovered include various grades of paper, aluminum cans, plastics, cardboard, tires, and glass. The recovered materials are baled and then stored until a sufficient volume is available for sale. Material separation generally is accomplished manually.

The facility has been issued numerous citations by the DCRA, DOH, and DPW during the past two years. These citations include:

- Operating an open solid waste facility;
- Operating a solid waste facility without a permit;
- Fugitive dust; and
- Operating outside the term of the Certificate of Occupancy.

General site photographs for the James Taylor operations are shown in Exhibit 4-17.

Exhibit 4-17
General Site Photographs of James Taylor Processing Facility

Source: SCS Engineers

CHAPTER 5

HEALTH RISK IMPACTS ATTRIBUTABLE TO TRANSFER STATION OPERATIONS

The purpose of this chapter is to assess potential health impacts that can be associated with solid waste transfer facilities. This report acknowledges that there is a lack of data in the technical literature to confirm or deny an association between adverse human health effects and measureable exposures to community residents from solid waste transfer facilities including those located in the District of Columbia. Therefore, general health impacts and nuisances are discussed herein.

Specific to the several operating transfer facilities in the District, no epidemiological studies of residential communities were identified, either from the published technical literature or from the Department of Health. However, in July of 1999 the DC Department of Health, in response to citizens' concerns, requested the Agency for Toxic Substances and Disease Registry (ATSDR) to perform a public health assessment for the existing transfer facilities. ATSDR found no evidence of releases of hazardous substances to the environment from the facilities and concluded that there was no basis for a public health assessment at these facilities.

There have been a few occupational epidemiological studies that have assessed the health effects on workers who work with solid waste. Workers have the most significant risks for diseases and health-related problems due to their close contact with disposed liquid and solid wastes. Musculoskeletal, dermal, and respiratory health effects, both acute and chronic, are relatively well documented among workers in the field of solid waste.

There also have been studies that have examined the health effects present in communities that surround landfill or active incinerator sites. No documentation in the technical literature has been identified that correlates direct health problems to residents living near waste transfer facilities. Measurements at six materials recovery facilities in the United States showed that airborne bacterial and fungi concentrations measured inside the facilities were roughly one order of magnitude higher than the levels found outside the facility. By comparison, residents living in nearby communities would have much reduced exposure to the waste stream and thus, would not be expected to experience the same magnitude of health effects reported by solid waste workers.

Nuisances are considered to reduce the quality of life for people. Several nuisances are typically associated with solid waste transfer facilities. While solid waste transfer facilities may be the only source of certain nuisances, there are other nuisances that may come from other sources than the waste transfer station. Many nuisances attributable to waste transfer facilities can be abated or minimized given proper operational practices. Common methods of nuisance abatement include the establishment of facility setbacks internal to the property, minimum buffer distances from the facility to likely receptors or populations of concern, and the adherence to standard operating practices within the industry.

HEALTH EFFECTS

There are two major concerns with respect to health effects related to solid waste transfer facilities. The first is the health effects on workers and residents attributable to management of the solid waste stream. People are often concerned that odors, bacteria, fungi and related sources associated with waste transfer facilities will have a negative effect on their health.

A second concern stems from the increased vehicular traffic associated with a waste transfer facility. The concern is that respiratory effects may increase with additional traffic and thus, may impact the health of residents.

Worker Studies

There are limited epidemiological and medical studies regarding the health effects of people working in the field of solid waste and there are no epidemiological studies regarding the potential health effects on people living in close proximity to a transfer station. Workers at solid waste facilities are assumed to have higher exposures to various hazards than those residents in the community. It is, therefore, likely that workers would be expected to have the more severe health effects as related to solid waste.

There have been a few studies, primarily in the United States and Denmark, that have evaluated the health effects on refuse collectors. Refuse collectors are those workers in the field of solid waste that have the most contact with the waste and who, therefore, would be expected to have the most severe health effects. Data from these studies are limited and may not be comparable in other locations. Results from these studies have been questioned because of small study size, lack of a good control population, and other statistical considerations.

Injury and Musculoskeletal--

Waste collection can be a physically demanding and strenuous job. Workers may be exposed to a variety of hazards such as traffic and large machinery. The types of injuries sustained are typical for other manual labor jobs as well. Waste collection workers may perform significant heavy lifting, as well as pushing and pulling of heavy objects. This manual labor many cause injuries to the back, knees, or hands. Heavy lifting and such activities are also linked to musculoskeletal disorders of the neck, shoulders, and back. Fractures and sprains can occur due to hazards in the field or in the facility.

Dermatological--

Dermal contact with solid waste may occur frequently with waste collection crews. Dermal contact with waste may lead to the presence of microorganisms (i.e., bacteria, fungi) on the worker's hands and clothing. Dermal contact with some types of waste may result in skin irritation. Punctures, lacerations, and abrasions from contact with objects found in the waste stream also may occur.

Mucous Membrane--

A study of waste collectors in the United States found that the concentrations of chemicals, dusts, and other irritating compounds found in solid waste may cause irritation and inflammation of the eyes and face. Another study found that there was a relationship between exposure to automobile exhaust and irritation of the eyes and nose.

Respiratory--

Waste collectors have demonstrated higher levels of respiratory disorders than other workers. A Danish study of waste collectors found that they had elevated risks for allergic (2.6 times more frequently) and non-allergic (1.4 times more frequently) respiratory diseases, and higher levels of infectious respiratory diseases (6.0 times more frequently). Danish and Swiss studies have found that bronchitis was also more prevalent (2.5 times more frequently) with solid waste collectors.

Scientists hypothesize that a high level of exposure to microorganisms found in municipal solid waste may induce dry cough with exercise-induced dyspnea, asthma, and organic dust toxic syndrome. Chest tightness, fever, chills, and flu symptoms have also been associated with direct contact with solid waste.

Several studies conducted in the United Stats have linked exposure to mold spores, those types detected in solid waste, with allergic pulmonary diseases such as asthma and allergic alveolitis. High levels of dusts containing endotoxins and mold spores may also be linked with non-allergic pulmonary disorders and impaired lung function. Gram negative bacteria, also found in municipal waste, can cause inflammation of the respiratory airways when inhaled.

Waste collectors also may suffer respiratory problems associated with exposure to diesel exhaust. Waste collectors may be exposed to diesel exhaust for many hours each working day. Exposure to diesel exhaust has been linked to decreased lung function, upper respiratory tract irritation, and, in a few cases, lung cancer.

Cardiovascular--

Minimal data are available linking cardiovascular health effects with solid waste collection. A study did find that waste collectors did have a greater incidence of coronary heart disease and myocardial infarctions than general laborers.

Gastrointestinal--

Studies conducted in the United States have found that many waste collectors report a high frequency of nausea and diarrhea. These workers who experience nausea on the job have indicated that they believe the smell of decomposing waste causes these symptoms. These odors may be linked to some of the sulphur-containing volatile organic compounds that have been reported to cause gastrointestinal symptoms. High levels of bacterial and endotoxins, which are present in municipal solid waste, are also linked with these gastrointestinal symptoms.

Neurological--

There have not been any studies, to date, that have reported a link between waste collectors and neurological disorders.

Health Effects Associated with Vehicle Emissions

Citizens are concerned that the increased truck traffic associated with waste transfer stations will have a negative effect on their health. The Metropolitan Washington Council of Governments (MWCOG) identified vehicle emissions as the largest source of air pollution in the metropolitan Washington, D.C. area. There are about 250,000 motor vehicles registered in the District and about 2.8 million vehicles registered in the metropolitan area. The District estimates that each weekday about 800,000 vehicles enter the District. These vehicles are significant contributors of ozone and other pollutants. Non-point source air pollution from these vehicles is an environmental concern.

There are four major pollutants associated with automobiles: ozone, particulate matter, carbon monoxide, and nitrous dioxide. Exhibit 5-1 summarizes the health effects associated with each of these air pollutants.

Diesel Exhaust--

Waste collection and transport vehicles usually are operated by diesel fuel. Diesel exhaust is a complex mixture of particles and gasses with hundreds of compounds, including many organic compounds, present on the particles and in the gases.

Health effects of diesel exhaust are as follows:

- Mucous membranes can become irritated and inflammation of the eyes and nose may occur;

- Acute exposures of diesel exhaust can irritate the respiratory system may cause a variety of inflammation-related symptoms such as headaches, eye discomfort, asthma-like reactions, nausea, and exacerbation initiation of allergenic hypersensitivity;

- Particulates may increase the risk of heart disease and respiratory illness. They can lead to the aggravation of existing chronic conditions such as asthma, upper respiratory or cardio-respiratory symptoms; and

- Chronic health concerns may include nonmalignant respiratory effects and lung carcinogenicity.

According to the EPA's 2000 Health Assessment Document for Diesel Exhaust (Draft), diesel exhaust is "likely" to be carcinogenic by the inhalation route of exposure. High exposures of

Exhibit 5-1
Health Effects Of Air Pollutants Emitted From Vehicles

Pollutant	Source	Health Effects
Ozone	• Automotive combustion	• Eye irritant • Decreased lung function • Increased airway reactivity, lung inflammation, asthma, and respiratory symptoms
Particulate Matter	• Automobile exhausts • Diesel emissions • Smokestacks • Construction • Other natural sources	• Decreased lung function • Increased respiratory illnesses and symptoms • Aggravates asthma and other respiratory diseases • May cause cardiovascular disease • Persistent cough with phlegm
Nitrogen Dioxide	• Automotive combustion	• Decreased lung function • May weaken defenses against respiratory diseases
Carbon Monoxide	• Automotive combustion	• May cause decreased mental and physical energy • Can compound difficulties in those with heart diseases, emphysema, bronchitis and sickle cell anemia.

diesel exhaust have been shown to lead to increased lung cancer in laboratory animals; however, studies do not show that the lung cancer hazard is present at environmental levels of exposure.

Although diesel exhaust has been characterized as likely to be a lung cancer hazard, available data are currently unsuitable to make a confident quantitative statement about the magnitude of the lung cancer risk attributable to diesel exhaust at ambient exposure levels.

Air Quality in the District--

The Clean Air Act and Amendments of 1990 define a "nonattainment area" as a locality where air pollution levels persistently exceed National Ambient Air Quality Standards. Designating an area nonattainment is a formal rulemaking process and EPA normally takes this action only after

Exhibit 5-2
Attainment Status for Criteria Pollutants in the District (2000)

Pollutant	Status
Ozone	Non-attainment
Carbon Monoxide	Attainment
Nitrous Dioxide	Attainment
Sulfur Dioxide	Attainment
Particulate Matter	Attainment

Source: United States Environmental Protection Agency

air quality standards have been exceeded for several consecutive years. The EPA published the most current listing of nonattainment areas in July 2000. Exhibit 5-2 presents attainment status for Washington D.C.

In 1993, Washington D.C. ranked 4th in overall air quality using EPA's Pollutant Standard Index. Based on the ranking criteria used, only Honolulu, Saint Louis, and San Francisco had better air quality.

NUISANCE EFFECTS

Many of the complaints that citizens have regarding waste transfer stations fall into the category of nuisance effects. Some nuisance effects could have a potential impact on the health of an individual (increased truck traffic, odor), while others typically do not affect human health (litter, noise). While nuisance effects do not necessarily affect the health of the individual, they do affect the individual by altering their perception of the quality of life in the community. It is important that a waste transfer station minimize the nuisance effects that may affect others. Many of the nuisance effects can be minimized or eliminated if the waste transfer station is operated in a state of the art manner. Exhibit 5-3 shows the most common nuisance effects and describes some of the best management procedures (BMPs) that can minimize or eliminate these effects.

Odor

Most waste transfer station operations occur indoors, however, odors may escape, especially if doors are left open and proper ventilation systems are not used. According to the Smell and Taste Treatment and Research Foundation, odors can have physical and psychological effects.

Physical effects of strong odors may affect the respiratory system by causing shallow breathing and coughing. Respiratory conditions such as asthma or bronchitis may be exacerbated by odor. Unpleasant odors also may cause headache, nausea, and/or vomiting. Immune functions may be compromised either as a direct result by olfactory/neural projections to lymphoid tissue or indirectly as a result of induced depression and negative mood states. In addition, permanent damage of or loss of smell can occur with prolonged exposure to certain chemicals. Psychological effects of unpleasant odors may cause anger, tension, or depression.

Exhibit 5-3
Best Management Procedures Used To Minimize Or Eliminate Nuisances

NUISANCES	PROBLEMS	BEST MANAGEMENT PRACTICES
Litter	• Litter falling from trucks onto streets • Litter blows out of facility when trucks dump garbage	• Sweeping roads and floors to pick up debris • Install fencing and netting to prevent litter from blowing. • Daily litter patrols to collect litter • Utilize truck covers
Noise	• Loud operations due to machinery • Trucks make loud noises at facility and driving to and from facility	• Buffer zone to absorb noise • Build facility to absorb noise • Mufflers on trucks • Doors closed during operation hours • Construction design assist in attenuating off-site noise levels
Odor	• Odors from liquid and solid waste falling out of trucks • Odors from waste located inside the transfer facility	• Proper ventilation systems to restrict odor from escaping • Keep trucks, station, and machinery clean • Trucks should be sealed so no leachate or odors can escape • Buffer zone • Remove all waste from tipping floor or pit at end of each day • Treat area with odor neutralizing solutions
Truck Traffic	• Increased traffic and back-ups on public streets • Trucks full of garbage parked overnight • Increased dust particles • Increased air emissions from diesel trucks	• Good vehicle maintenance • Dust suppression misting or spraying • Restrict incoming and outgoing truck traffic to commercial routes • Queuing space on-site or at a nearby off-street location • Separate area unloading area for self-haulers
Vectors	• Carry diseases • Populations grow quickly • Devalue property	• Good hygiene of plant • Eliminate or screen cracks or opening in and around building foundations and waste containers • Fence and gate area • Offer abatement programs in community • Routinely inspect facility

Typical practices that have been employed to minimize odors include:

- Evaluate prevailing wind direction to establish building orientation and reduced impact on neighboring buildings;

- Design tipping floor to be easily cleaned, including a concrete surface with a positive slope to drainage systems. Eliminate crevices, corners and flat surfaces where waste residues can accumulate. Clean catch basins, floor drains and drainage systems regularly so that odors do not build up;
- Remove all waste from the tipping floor or pit at the end of each operating day and clean those areas to remove residues;
- Treat drainage areas periodically with odor-neutralizing and bacteria-inhibiting solutions;
- Seal concrete or other semi-porous surfaces to prevent absorption of odor-producing residue;
- Minimize on-site storage of waste;
- Use odor-neutralizing systems; and
- Use enclosed trailers for transfer.

Truck Traffic

Truck traffic may pose a public health, occupational, and environmental hazard that include vehicular accidents (including pedestrian accidents), releases of materials from collection vehicles, and emission of air pollutants. Increased truck traffic often occurs near waste transfer facilities. If there is insufficient queuing area, trucks may back up on public streets creating traffic congestion on city streets. Increased truck traffic also may lead to increased litter in the area if trucks are not properly sealed.

The following BMPs are typical measures used to reduce traffic impacts so as to improve safety and reduce emissions in surrounding areas:

- Locate transfer stations close access to expressways or major truck routes;
- Locate transfer facilities in a central location to minimize drive time to facility;
- Restrict incoming and outgoing truck traffic to commercial routes;
- Provide queuing space on-site or at a nearby off-street location;
- Direct traffic on one-way loop if possible;
- Arrange buildings and roads to eliminate or minimize intersections; and
- Maintain trucks and engines by performing routine tune-ups.

Noise

Noise pollution can occur if noise is excessive or if noise occurs at unpermitted or inappropriate times. Solid waste transfer stations typically use heavy, noisy equipment and machinery during operations. Loud noises over a sustained period of times may affect workers' hearing causing temporary or permanent damage to the ear. Loud noise may also disturb other citizens located nearby. Trucks with loud engines driving down neighborhood streets to get to and from the

facility also may be disturbing, especially if these trucks are operating outside of the permitted hours.

Transfer activities should only occur during permitted hours. The following BMPs will help to minimize noise during permitted hours.

- Place facility doors towards street or away from nearest occupied buildings.
- Provide sound-absorbing materials on ceiling and wall surfaces.
- Provide natural or man-made sound barriers around the facility.
- Confine, to the maximum extent possible, noisy activities to the inside of buildings.
- Keep as many doors closed during operating hours as practically possible.

Vectors

Vectors such as rodents, birds, and insects are attracted to solid waste transfer facilities because there is an abundant food source. These vectors can spread disease. Rodents, in particular, harbor many pathogens and diseases that can be transmitted to humans. These diseases can be transmitted if humans come into contact with rat feces, urine, saline, or eggs. A high vector population can also decrease the property value in surrounding areas.

The following BMPs will help to minimize the presence of vectors around the solid waste transfer station:

- Routinely inspect the facility for potential vector habitat.
- Eliminate or screen cracks or openings in or around building foundations and waste containers.
- Fence and gate the entire area to prevent larger vectors from entering.
- Install bird and rodent deterrent measures, including suspended or hanging wires and rat traps.

Safety

Worker safety is an operations issue at solid waste transfer facilities. There are also several safety hazards that may affect citizens. Increased truck traffic on residential streets can constitute a safety hazard, especially if the streets are not equipped with traffic lights and wide lane to accommodate transfer trailers. Another safety hazard is the risk of fire, which is a concern with operations that involve the storage of materials. Explosions may occur if improper wastes are placed into a shredder chamber, crusher, or bailer.

To protect workers, the following BMPs should be practiced:

- Comply with all Occupational Safety and Health Association (OSHA) and American National Standards Institute (ANSI) regulations; and
- Train employees in proper safety procedures and on the proper means to identify and handle hazardous materials, should they appear in the municipal waste stream.

Litter

Litter may fall off of improperly sealed refuse collection trucks or transfer trailers. Litter also may blow off the site of the waste transfer station if the doors to the facility are left open or if the waste is stored improperly outside of the facility.

To minimize litter in the areas surrounding the waste transfer station, the following BMPs should be followed:

- Install fencing and netting systems to keep litter from blowing out of the facility;
- Orient the building so that wind is less likely to blow through the building and carry litter outside the building;
- Locate doors in areas that are less likely to have potentially litter-producing materials stored near them;
- Minimize horizontal ledges where litter can accumulate;
- Have daily litter patrols to collect trash on-site and in the immediate outside of the facility; and
- Enforce load covering requirements for incoming refuse collection vehicles and outgoing transfer trailers.

COMPLAINTS REGARDING SOLID WASTE TRANSFER FACILITIES

Complaints from Residents

Citizens that live near some waste transfer facilities in the District have written letters to District Council members regarding their complaints and have petitioned to have operations at these waste transfer facilities cease. These letters and petitions have been forwarded to the Department of Consumer and Regulatory Affairs (DCRA) Office of Compliance. Many citizens have also formally submitted their complaints with the Department of Consumer and Regulatory Affairs (DCRA). Many of the complaints filed are about nuisances caused by the waste transfer facilities. These nuisances often can be abated by proper operations of the waste transfer station.

Common complaints filed by citizens include:

- Odors – Decomposition of municipal waste emits foul odors;
- Vectors – Increased rodent, bird, and insect populations may occur with the presence of a waste transfer station;
- Respiratory problems – Respiratory problems (asthma, bronchitis) may be exacerbated;
- Dust – Dumping outside of enclosed facility may produce dust;
- Truck traffic – Increased truck traffic near waste transfer facilities leads to increased noise, air pollution, and damage to roads and property;
- Noise – Excessive noise and noise during unpermitted hours often occurs;
- Proximity to residences – Solid waste transfer facilities are located too close to residences;
- Litter – Solid and liquid waste from trucks spill onto neighborhood streets; and
- Real estate value – Real estate value may decrease due to one or more of the above nuisances.

Complaints from District Government Agencies

In February 1998, the District Zoning Board approved rules creating new standards for siting transfer facilities and gave the power of enforcement to the DCRA. In April 1998 DCRA began to use its new powers to enforce these regulations. Since that time there have been several civil infraction actions against each of these private waste transfer facilities. These actions have been published in the *Solid Waste Facility Status Report, Department of Consumer and Regulatory Affairs, January 2000 Update*. Exhibit 5-4 shows a partial list of civil infractions regarding solid waste transfer facilities filed by District agencies to the DC Department of Consumer and Regulatory Affairs. This list only includes those infractions that are related to human health.

HEALTH CONCERNS SPECIFIC TO DISTRICT RESIDENTS

With respect to waste transfer facilities, the primary health concern for residents is respiratory health. To assess if the presence of waste transfer facilities have an effect on respiratory health, it may be useful to determine if the prevalence of respiratory diseases is higher in those neighborhoods located near waste transfer facilities. The District of Columbia Department of Health (DOH) does not record disease rates by neighborhood; however, it does record disease incidence rates by ward.

Exhibit 5-4

Complaints Filed with the Department of Consumer and Regulatory Affairs (DCRA) by District Agencies

Solid Waste Facility	Facility Address	Civil Infraction	Agency Filing Complaint[1]
Waste Management – Northeast	2160 Queens Chapel Road, NE	• Handling of solid waste outside permitted hours	• DPW – ECU
		• Emission of odorous pollutants	• DOH
		• Failure to operate air pollution control device	• DOH
Waste Management – Uline Arena	1140 Third Street, NE	• Collecting solid waste outside permitted hours	• DPW – ECU
		• Emission of odorous pollutants	• DOH
		• Fire code violations	• DCFD
		• No approved and sediment control plan on site	• DOH
Browning Ferris, Industries	1220 W Street, NE	• Collecting solid waste before 7 a.m	• DPW – ECU
		• Engine idling for more than three minutes	• DOH
		• Emitting odorous pollutants	• DOH
		• Fugitive dust	• DOH
Eastern Trans-Waste of MD	1329 First Street, SE	• Emission of odorous air pollutants	• DOH
Rogers Brothers Custodial Services	2225 Lawrence Avenue, NE	• Fugitive dust	• DOH
James Taylor Trash Removal Contractors	5201 Hayes Street, NE	• Fugitive dust	• DOH
		• Litter and debris in unenclosed area	• DCRA

[1] Department of Public Works Environmental Crimes Unit (DPW-ECU)
Department of Health (DOH)
DC Fire Department (DCFD)

Source: DCRA, Solid Waste Facility Status Report January 2000 Update.

Exhibit 5-5 presents the number of cases and deaths attributed to by ward in 1996. Ward 4 has the highest number of cases of lung cancer. Wards 5 and 7 have the second and third highest number of cases of lung cancer, respectively.

There are risks and other factors associated with lung cancer. These factors are discussed in detail.

- Age: Lung cancer age–specific incidence rates increase with age peaking in the age group of 80-84. No cases of lung cancer were diagnosed in persons less than 35 years of age;
- Gender: Incidence rate is higher in males than in females;
- Race: Incidence rate is higher among African Americans than other ethnic groups;
- Diet: Diets high in fresh fruit and vegetations have been associated with significant risk reduction;
- Occupation: Occupational or environmental exposure to asbestos, radon, polycyclic aromatic hydrocarbons (PAHs are a standard product of combustion from automobiles. and airplanes and some are present in charcoal broiled hamburgers) and other substances increase the risk; and
- Other: Cigarette smoking, including exposure to second-hand smoke, is the most important risk factor accounting for over 85 percent of lung cancer deaths.

Exhibit 5-5
Incidences of Lung Cancer for the District of Columbia by Ward

Ward	Total Cases	Deaths
1	48	38
2	42	28
3	40	28
4	69	60
5	65	63
6	41	32
7	60	50
8	28	28

Source: DC Department of Health

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CHAPTER 6

SITING CRITERIA FOR SOLID WASTE HANDLING FACILITIES

The purpose of this chapter is to recommend specific criteria for siting solid waste handling facilities in the District. In part, many criteria associated with siting are already contained in current permitting requirements for the District. This chapter serves to reassess those criteria in light of the existing solid waste handling facilities (transfer stations and C&D recycling facilities) and standard industry practices, particularly for urban areas. Recommended siting criteria are presented based on property zoning, environmental/health impacts, transportation impacts, and operational area size.

PROPERTY ZONING CRITERIA

The zoning and surrounding land uses, including future land use planning, should be compatible with siting a solid waste handling facility. In addition, such facilities should not be located on residential streets (as defined under the 1998 Act) due to potential adverse impacts to the general public that may be associated with increased truck traffic and on-site solid waste handling operations. As indicated previously in Exhibit 4-1, the existing public and private solid waste handling facilities in the District are located on property zoned either CM (Bulk Commercial Light Manufacturing), or M (General Industry). At least one of these facilities is located on a residential street.

The current zoning designations for the District were established in 1958 and include amendments through April 1, 1996. The M and CM zoning designations represent the most appropriate land uses within current District zoning classifications that are compatible with siting solid waste handling facilities. Generally, M-zoned land is bordered by commercial or other non-residential uses, separated from residential uses. However, in some cases, residential neighborhoods have been developed in commercially-zoned property or co-exist within 100 feet of an industrially-zoned property. CM-zoned land areas often are bordered by residential uses, and thus, by residential streets.

Recommendation

1. Require that permitted solid waste handling facilities only be allowed on property consistent with the zoning requirements for M (General Industry) or CM (Bulk Commercial Light Manufacturing) zoned land parcels, taking into account surrounding industrial and residential uses, as well as other siting requirements for such facilities.

ENVIRONMENTAL/HEALTH CRITERIA

Siting criteria typically are established to avoid adverse impacts on the environment and the health of the general public. Typical considerations include prescribed setbacks and/or buffers (e.g., based on minimum distances, or physical separations such as visual barriers, public right-of-ways, fencing) from the solid waste transfer handling facility to neighbors, dwellings, or other

potential receptors of adverse impacts. In addition, certain lands may be restricted from facility siting due to other location reasons (such as geologic restrictions or areas subject to flooding, etc.).

Setbacks and Buffers

Solid waste handling facilities typically are isolated from potentially-impacted properties, land uses, and receptors through the use of setbacks and/or buffers. Many U.S. communities use setbacks or buffers, alone or in combination, to establish what is considered protective in that locality. Setbacks, generally considered internal to the property boundary, serve to increase the size of the contiguous property holding the solid waste handling facility. On the other hand, buffers generally are considered external to the property boundary and allow a smaller land parcel for the solid waste handling facility within compatible surrounding land uses. Both methods commonly are used in U.S. communities.

As discussed in Chapter 1, the Solid Waste Facility Permit Amendment Act of 1998 contains two setback requirements related to siting solid waste handling facilities:

- A setback requirement of at least 50 feet measured from the operation area to the nearest property line; and

- A setback requirement of at least 500 feet measured from the facility to any property line.

As a form of a buffer requirement, District regulations (District of Columbia Municipal Regulations [DCMR] 11, Section 800) identify "garbage piled or deposited within three hundred feet (300') of any place of worship or other dwelling, or unloaded along the line of any railroad, or in any street or public way" a nuisance injurious to health.

Exhibit 6-1 provides a comparison of these current setback and buffer requirements to the existing solid waste handling facilities operating in the District. None of the existing facilities conforms with the 50-foot setback requirement from the operation area.

Similarly, Exhibit 6-1 indicates there are no existing facilities that conform to the 500-foot setback requirement as measured from the facility to any property line. Generally, assuming typical transfer station facility areas (meaning the enclosed structure for the tipping floor) of at least 0.5 acres, conformance with this requirement would require a land parcel on the order of at least 30 acres.

Given the urban setting of the District and the general lack of 30-acre land parcels suitable for solid waste handling facilities, a buffer requirement may have merit as a substitute for or alternative to the District's 500-foot setback requirement. Exhibit 6-1 compares the 300-foot buffer requirement to the District's existing facilities and finds that several meet this distance:

- Fort Totten;
- Benning Road;

Exhibit 6-1
Comparison of Setback and Buffer Requirements per District Regulations to Existing Solid Waste Handling Facilities

Existing Facilities	Address	Setback Requirements		Buffer Requirement
		Are there at least 50 feet from current Operation Area to the site property line?[1]	Are there at least 500 feet from Facility to any property line?[1]	Are there at least 300 feet from the site property line to nearest dwelling?[2]
Solid Waste Transfer Stations				
1. Fort Totten – DC Government	4900 Bates Road, NE	No	No, less than 10 feet.	Yes, approximately 550 feet.
2. Benning Road – DC Government	3200 Benning Road, NE	No	No, approximately 100 feet.	Yes, approximately 1100 feet.
3. Browning-Ferris Industries	1220 W Street, NE	No	No, less than 10 feet.	No, approximately 200 feet.
4. Waste Management/Uline	1140 3rd Street NE	No	No, less than 10 feet.	No, approximately 75 feet.
5. Waste Management /Northeast	2160 Queens Chapel Road, NE	No	No, less than 10 feet.	Yes, approximately 300 feet.
6. Eastern Trans-Waste of Maryland	1329 1st Street, SE	No	No, less than 10 feet.	Yes, approximately 800 feet.
Construction/Demolition Recycling Facilities				
1. Rodgers Brothers Custodial Services	2225 Lawrence Ave, NE	No	No, less than 10 feet.	Yes, approximately 500 feet.
2. James Taylor Trash Removal Contractors	5210 Hayes Street, NE	No	No, less than 10 feet.	No, approximately 50 feet.
Intermediate Processing Facilities (Waste Paper/Other Recyclables)				
1. Rodgers Brothers Custodial Services	2115 Bryant Street, NE	No	No, less than 10 feet.	No, approximately 100 feet.
2. James Taylor Trash Removal Contractors	5210 Hayes Street, NE	No	No, about 40 feet.	No, approximately 50 feet.

[1] From "Solid Waste Facility Permit Act of 1995" and "Solid Waste Facility Permit Amendment Act of 1998".
[2] From 11 DCMR, Section 800.et.seq. (Zoning).

- Waste Management/Northeast;
- Eastern Trans-Waste of Maryland; and
- Rogers Brothers Construction/Demolition Recycling Facility.

A substitute or alternative buffer requirement similar to current law would be a distance of 500 feet as measured from the solid waste handling facility property line to the nearest dwelling.

Other Restrictions

Some U.S. jurisdictions consider other restrictions when permitting solid waste handling facilities. Examples include minimum distances to airports or waterways, limited construction in geologic fault zones or areas prone to flooding, and advance planning for site closure. Specific to the District of Columbia, there may be merit in considering the following:

- a minimum setback distance for the operation area of a solid waste handling facility to any nearby waterways;
- a location restriction that avoids placement of solid waste handling facilities on lands subject to flooding, commonly referred to as the 100-year flood plain; and
- a permit application requirement that includes submittal of a site closure plan.

Recommendations

1. Allow a minimum buffer requirement (e.g., at least 500 feet as measured from the solid waste handling facility property line to the nearest dwelling) to be considered as an alternative or equivalent requirement to the current 500-foot setback requirement (as measured from the facility to the any property line).
2. Require that a minimum setback distance (e.g., at least 50 feet) be established from the operation area of a permitted solid waste handling facility to the nearest surface stream.
3. Require a setback criterion that the operation area of a permitted solid waste handling facility be outside of the established 100-year flood plain.
4. Require a permit application for a solid waste handling facility to include a site closure plan.

TRANSPORTATION CRITERIA

Siting criteria should consider reduction of transportation impacts. Typical considerations include access to nearby transfer routes (to disposal facilities) and proximity to waste collection areas.

Access to Nearby Transfer Routes to Disposal Facilities

Access to convenient transfer routes is a fundamental siting criterion. To reduce haul time, local truck traffic, and potential impacts on local communities, solid waste transfer stations typically are located near expressways or other major truck routes, particularly where convenient access to these routes coincides with a central location of the collection routes.

The major expressways in the District that serve as transfer routes to disposal facilities are interstates 295 and 395. Exhibit 6-1 details the distances from each of the current solid waste transfer stations to an expressway. The existing facilities with the greatest distance to nearby transfer routes are Fort Totten and Browning-Ferris Industries.

Exhibit 6-2
Distances from Waste Handling Facilities to Transfer Routes

Existing Solid Waste Handling Facility	Closest Expressway	Approximate Distance to Closest Expressway (miles)
Fort Totten	I-395	3.3
Benning Road	I-295	0.5
Browning-Ferris Industries	I-395	2.3
Waste Management/Uline	I-395	1.2
Waste Management/ Northeast	I-395	2.0
Eastern Trans-Waste of MD	I-395	0.9
Rogers Brothers Custodial Services	I-395	2.0
James Taylor Trash Removal Contractors	I-295	1.6

Proximity to Waste Collection Areas

In the District, solid waste currently is collected by both public and private haulers. The District collects residential waste from both single-family homes and multi-family homes with three units or less per structure. As presented in Chapter 3, over half of this residential waste currently collected by the District is generated in the northern portion of the District (Wards 3, 4, and 5). Only ten percent of the residential waste collected by the District is generated in the central and southern areas (Wards 2 and 8)

Private haulers collect solid waste from businesses, institutions, and multi-family homes with four or more units per structure. Over 60 percent of commercially-generated waste in the District is collected from Ward 2. All other wards generate less than 10 percent of commercial waste; the exception to this is Ward 6, which generates 15 percent.

Examination of the full waste stream generated and collected in the District (both District and private collection crews) indicates an apparent balance on a geographic (i.e., northern and southern District areas) basis. That is, a conceptual division of the District for waste collection can be made along New York Avenue. This division would yield to the north, all of Wards 1, 3, and 4, and approximately half of Wards 2 and 5. To the south, this division would include all of Wards 6, 7, and 8, and approximately half of Wards 2 and 5. Based on the data presented in Exhibit 3-10, the District's waste generation can be calculated to originate from two central areas as follows:

Northern Portion

- made up of Wards 1,3, and 4, plus approximately half of Wards 2 and 5
- access to I-395
- generating approximately 53 percent (334,000 tons of waste) of the District's waste stream per year.

Southern Portion

- made up of Wards 6,7, and 8, plus approximately half of Wards 2 and 5
- access to I-295
- generating approximately 47 percent (296,000 tons of waste) of the District's waste stream per year.

Siting a solid waste transfer station in central locations to waste generation areas (and thus, waste collection routes) tends to reduce hauling distances, vehicle travel times, and the number of required collection routes. The above division of the waste stream generally reflects current transportation patterns for the District-generated waste stream. Currently, each of the two District-operated solid waste transfer stations is located in one of these areas.

Recommendations

1. At least two solid waste transfer stations should be located within the District, one in the northern portion and one in the southern portion, with capacities to manage the estimated waste quantities expected through at least the Year 2015.

OPERATIONAL AREA CRITERIA

Design Capacity

Solid waste handling facilities should be placed on property that is of adequate size to accommodate all required setbacks and operations. The operation area is a function of the design capacity of the facility (such as trucks per day or per year, tons per day or per year, etc.), design life, operational hours, vehicle queuing and storage requirements, traffic flow patterns and parking, and additional elements such as offices, vehicle scales, tire wash equipment, and citizen drop-off areas.

District laws and regulations do not set a minimum size for solid waste handling facilities. However, each permitted facility has certain operational requirements that can affect the land area. For example, each permitted facility is required to have adequate space for a tire wash system in the operating area, and storage for regulated medical waste, hazardous waste, radioactive waste, or other unacceptable waste should these be received.

Generally, solid waste handling facilities should have large enough capacities to manage the wastes that are estimated to be received throughout the expected operating life. As detailed in Chapter 3, the quantity of solid waste generated in the District during 1999 was approximately

630,000 tons. An additional 367,000 tons of waste generated in neighboring jurisdictions was brought to solid waste transfer facilities located in the District during the same year. These quantities are expected to increase annually to a combined total of about 4,000 tons per day after 2015.

Citizen Convenience Centers

Many jurisdictions establish publicly-accessible drop-off points as an added service to residents. These drop-off points (sometimes termed citizen convenience centers) may be used for home-generated solid waste, construction debris from small remodeling projects, recyclables, and for special waste items such as brush/yard wastes, bulk items/white goods, tires, used oil, or household hazardous waste programs. The provision of such citizen convenience centers can reduce demand on collection crews, enhance recycling and other special collection programs, and retard illegal dumping.

Citizen convenience centers can be as simple as an isolated dumpster container for mixed solid wastes to a large area with multiple containers handling a variety of waste materials. To avoid improper waste disposal and site cleanliness problems, such centers typically are fenced and secured, with staff during prescribed hours. When co-located at a solid waste transfer station, staffing and on-road transport of collected material needs are decreased.

Citizen convenience centers co-located at transfer stations typically are designed to isolate traffic flow from the large refuse collection and transfer vehicles due to safety and congestion concerns. Residents deliver waste materials in smaller vehicles, usually must get out of their car to unload, take more time to unload, and may have children present in the unloading areas. These aspects require adequate space to accommodate traffic and pedestrian flow.

As alternatives to co-location at transfer stations, citizen convenience centers can be located at permanent or temporary, stand-alone facilities. Permanent facilities are considered costly on a relative basis due to siting, design, construction, and operational issues. Temporary facilities, including "parkouts" (where a refuse and/or recycling collection vehicle simply parks at a designated location for prescribed hours), can be cost-effective and provide flexibility.

Currently, the Fort Totten Transfer Station is the only solid waste handling facility to which residents can self-haul refuse. The drop-off areas include an open dumpster for mixed solid waste materials, and an area for brush/yard waste and bulk items/white goods. Services at Fort Totten do not include recyclables drop off.

Recommendations

1. The total design capacity of permitted solid waste transfer stations should accommodate expected waste volumes through at least 2015.

2. The placement of citizen drop-off centers in conjunction with permitted solid waste transfer stations should be a priority when compared to stand-alone, permanent citizen drop-off centers.

CHAPTER 7

APPLICATION OF RECOMMENDED SITING CRITERIA TO EXISTING FACILITIES AND POTENTIAL NEW SITES

The purpose of this chapter is to apply the recommended transfer station siting criteria developed in Chapter 6 to the existing solid waste handling facilities present in the District. In addition, the selection process is described specific to the identification of potential property sites for new solid waste handling facilities that may be needed. Lastly, the recommended transfer station criteria are applied to the potential property sites identified and a simplified ranking of the sites is presented.

APPLICATION OF SITING CRITERIA TO EXISTING TRANSFER STATIONS

Several siting criteria were recommended in Chapter 6 for purposes of siting and permitting new facilities in the District, most of which are consistent with current District laws. As a first step, the recommended siting criteria relevant to distance, zoning, and location are applied herein to the existing solid waste handling facilities operating in the District. These selected siting criteria are:

- a minimum 500-foot setback as measured from the facility area to any property lines;
- a minimum 50-foot setback as measured from the operation area to the site property line;
- a minimum 500-foot alternative buffer as measured from the site property line to the nearest dwelling;
- zoning consistent with requirements for CM and M-zoned land parcels;
- the operation area located outside of the 100-year floodplain; and
- the operation area located at least 50 feet from the nearest surface stream.

Exhibit 7-1 presents the selected siting criteria as applied to the existing solid waste handling facilities in the District. Note that none of the existing facilities meet the setback distances contained within under current District law. If the alternative 500-foot buffer is applied to these facilities, three existing transfer stations (including the Fort Totten and Benning Road facilities) and one construction/demolition recycling facility have adequate buffer distances.

Exhibit 7-1 indicates that all the existing facilities currently are on property zoned M or CM (however, these properties may or may not be compatible with surrounding land uses), that most of the facilities are located outside of the 100-year floodplain, and that all the facilities are located at least 50 feet from the nearest surface stream.

Exhibit 7-1
Comparison of Selected Recommended Criteria to Existing Solid Waste Handling Facilities

Facility Name	Address	Setbacks		Alternative Buffer	Zoning	Location	
		At least 500 feet from facility area to any property lines?	At least 50 feet from operation area to property line?	At least 500 feet from property line to nearest dwelling?	Currently within M or CM –zoned parcels? #	Is operation area located outside of 100-year floodplain?	Is operation area located at least 50 feet from nearest surface stream?
Solid Waste Transfer Stations							
1. Fort Totten – DC Government	4900 Bates Road, NE	No	No	Yes	Yes	Yes	Yes
2. Benning Road – DC Government	3200 Benning Road, NE	No	No	Yes	Yes	*	Yes
3. Browning-Ferris Industries	1220 W Street, NE	No	No	No	Yes	Yes	Yes
4. Waste Management/Uline	1140 3rd Street NE	No	No	No	Yes	Yes	Yes
5. Waste Management /Northeast	2160 Queens Chapel Road, NE	No	No	No	Yes	Yes	Yes
6. Eastern Trans-Waste of Maryland	1329 1st Street, SE	No	No	Yes	Yes	*	Yes
Construction/Demolition Recycling Facilities							
1. Rodgers Brothers Custodial Services	2225 Lawrence Ave, NE	No	No	Yes	Yes	Yes	Yes
2. James Taylor Trash Removal Contractors	5210 Hayes Street, NE	No	No	No	Yes	Yes	Yes
Intermediate Processing Facilities (Waste Paper/Other Recyclables)							
1. Rodgers Brothers Custodial Services	2115 Bryant Street, NE	No	No	No	Yes	Yes	Yes
2. James Taylor Trash Removal Contractors	5210 Hayes Street, NE	No	No	No	Yes	Yes	Yes

* Determination pending from Federal Emergency Management Agency (FEMA).

Does not take into account compatibility with M or CM-zone restrictions, or with the surrounding industrial and residential uses.

IDENTIFICATION OF POTENTIAL SITES FOR NEW TRANSFER STATIONS

Identification of land parcels suitable for solid waste transfer facilities is challenging because land is a limited resource within the District. As a result, the site selection process for this project consisted of:

1. Elimination of general land areas or parcels due to current land use and ownership;

2. Identification (and elimination) of specific vacant lands based on minimum size, current land use and ownership; and

3. Identification of other potential land parcels based on input from the District's Office of Planning and other sources.

Elimination of General Land Areas

Various land areas and parcels were deemed not suitable as potential sites for new transfer stations, principally due to current land use or ownership. Land areas of this kind include:

- Historic Districts
- Prominent Federal Lands (e.g., Mall, National Observatory, Bolling Air Force Base)
- Parks (e.g., Rock Creek Park, Anacostia River Park, River Parks, Haines Point Park)
- Georgetown Waterfront
- Southwest Waterfront
- Southeast Federal Center
- Cemeteries
- University Campuses
- RFK Stadium
- Blue Plains Treatment Plant

These land areas were reviewed and assessed based on current land use maps (see Presentation Map No. 1), aerial photographs, and discussions with Office of Planning personnel as to the potential and practicality of siting a solid waste transfer station. Generally, these land areas were eliminated at the onset from further consideration due to the current land use or ownership.

Identification Of Vacant Lands Based On Minimum Size

The next step in the process was to identify existing vacant land areas and parcels in the District based on a minimum size. Given typical operation areas for today's state-of-the-technology transfer stations where all operations (e.g., queuing, storage, etc.) are contained to the site, a minimum size of approximately four acres was selected. As a starting point, the Office of Planning conducted a computer search of vacant lands within the District listed as owned by the District or WMATA. This search was limited to parcels of at least two acres. Search results are marked and located on Presentation Map No. 2, included herein.

Presentation Map No. 2 identifies 34 land parcels located throughout the District. Exhibit 7-2 describes the location and acreage of properties/parcels by ward location, property/parcel, street, and acreage. Note that no parcels were identified within Ward 1, and Ward 7 contained the greatest amount of identified parcels.

Exhibit 7-2
Location of Vacant District Owned Properties in the District of Columbia

Property	Ward	Property/Parcel ID	Address	Acreage
1	2	0336 0828	11th St	2.5
2	2	0455 0047	F St	5.0
3	2	0268 0812	Maine Ave	2.7
4	2	1361 0801	Canal Rd, NW	2.8
5	3	1840 0807	Chesapeake St, NW	3.0
6	3	2030 0803	Broad Branch St, NW	5.6
7	3	1768 0806	Chesapeake St, NW	2.9
8	3	2145 0827	Massachusetts Ave, NW	14.1
9	3	2299 0800	Military Rd, NW	8.8
10	4	0796 0114	Minnesota Ave, NE	2.2
11	4	0089 0052	13th St, NW	2.6
12	5	0132 0093	Kearny St	3.6
13	5	0160 0042	26th St, NE	12.2
14	5	0154 0019	Adams Place, NE	2.4
15	5	0124 0166	3rd St, NE	2.9
16	5	3767 0808	3rd St, NE	2.4
17	5	3768 0804	Hamilton St, NE	2.0
18	6	1094 0800	A St, NE	2.9
19	6	1108 0800	A St, SE	2.9
20	6	1109 0800	A St, SE	2.7
21	6	1067 0815	L St, SE	2.0
22	7	5219 0801	53rd St, NE	3.2
23	7	5218 0801	55th St, NE	2.6
24	7	0170 0027	Anacostia Ave, NE	7.2
25	7	5223 0814	Foote St, NE	3.0
26	7	5053 0821	Minnesota Ave, NE	2.9
27	7	02130043	Fort Baker St, NE	3.7
28	7	02070085	Alabama Ave, NE	13.4
29	7	5359 0307	Benning Rd, NE	3.9
30	7	0135 0078	Porto Rico, NE	2.4
31	8	02620001	Impoundment Lot, SW	15.9
32	8	02530028	Anacostia, SW	4.9
33	8	02530025	Overlook Rd, SW	11.6
34	8	02420096	South Capitol St, SW	3.9

These 34 properties were reviewed and assessed based on current land use maps, aerial photographs, and discussions with Office of Planning personnel. The potential and practicality of siting a new solid waste transfer station on one of these locations was weighed on the basis of minimum size and current land use.

About a third (12) of the 34 properties were located within general land areas already eliminated from the site selection process; namely, within parks or in existing historic districts. Of the remaining 22 properties, 19 were between two and four acres in size and had other significant barriers or constraints that made further consideration or analysis not practical. The three remaining sites (of approximately four acres or more) were examined specific to current land use. Two of these sites were eliminated because the site was either zoned residential, or the site property boundary was adjacent to or in close proximity (i.e., within 300 feet) to a residential area.

One of the 34 potential sites, the District-owned southern impoundment lot in DC Village (Ward 8), was retained for further analysis, as discussed below.

Identification of Other Potential Properties

The District Office of Planning and other sources were queried specific to potential properties within the District that might be considered for use as a solid waste transfer facility. A listing of 12 additional properties was developed based on these queries, knowledge of planned developments in the District, and recent property listings. Added to this listing was the southern impoundment lot in DC Village from above.

Exhibit 7-3 lists the 13 properties that were evaluated at this stage of the site selection process. These properties are listed by ward location, zoning, approximate acreage, and approximate distance to the nearest dwelling as measured from the property line (a measure of existing buffer distances).

Based on information obtained for these 13 land parcels, the potential for placement of a new solid waste handling facility is discussed below. According to the Office of Planning, many of the parcels could be eliminated from consideration due to other scheduled development.

SuperConcrete, Inc.—

This property has several advantages as a potential transfer station site. It is large (approximately 12 acres), M-zoned property, well buffered, generally has good access to transfer routes, and is centrally-located for waste collection routes in that portion of the District. Because this site sits adjacent to the existing Fort Totten transfer station, it could be developed as a stand-alone transfer station or alternatively, could be considered for possible future expansion/improvements of the Fort Totten facility. Disadvantages include that the property is privately-owned and supports an operating concrete batch plant (thus, it may not be available for purchase or lease by the District).

Exhibit 7-3
Summary Of Other Properties Considered Under Site Selection Process

Land Site Name	Address/General Location Description	Ward	Zoning	Acreage (est.)	Ownership	Approximate Distance from Site Property Line to Nearest Dwelling (ft)
1. SuperConcrete, Inc.	North of Fort Totten	4	M-FT	~12	Private	>500
2. McMillan Sand Filtration Site	East of Howard University	5	Unzoned	~25	District Government	<500
3. Steuart Petroleum	East of Fort Totten	5	M-FT	7.3	Private	>500
4. DC Impoundment Lot	Brentwood Road	5	M	~14.5	District Government	<100
5. Fort Lincoln	Off NY Ave – near eastern border of District	5	Unzoned, R-1-B, CM	>25	District Government	<500
6. North of Amtrak	Located north of Amtrak Yard	5	M	~20	Private	<100
7. Washington Gas Site	Near 13th Street Bridge	6	M	12	District Government	>500
8. Kenilworth Park	North of Benning Rd Transfer Station	7	Unzoned	>25	Federal	>500
9. Oxon Cove	Oxon Cove	8	Unzoned	~30	Private	>1000
10. DC Southern Impoundment Lot	DC Village	8	C-M-1	>30	DC Government	>1000
11. West Campus of St. Elizabeth's Hospital	West Campus of St. Elizabeth Hospital	8	Unzoned	~20	Federal	<100
12. Camp Simms	North of MS Ave and east of 15th Street	8	R-3 R-5-A C-2-B	25	Federal	<100
13. Bolling Air Force Base	Along eastern bank of Potomac River	8	Unzoned	>25	Federal	>500

McMillan Sand Filtration Site--

McMillan Sand Filtration Site is a large vacant site owned by the District. This property is currently unzoned and is surrounded by parks, institutional properties, and residential properties. Residences and Children's Hospital are close to this property. This property was designated as an historic landmark in 1991. According to the Office of Planning, this property has been slated for future mixed development of this property. Conceptual plans are in the preliminary stages

and include usages such as: a regional recreation/sports complex, a multipurpose senior center, various housing types, a municipal owned conference center, a research and development complex, and neighborhood restaurants, stores, and offices.

Steuart Petroleum --

Similar to the SuperConcrete parcel, this property has several advantages as a potential transfer station site. It is of sufficient size (approximately 7 acres), M-zoned property, well buffered, and is centrally-located for waste collection routes. Access is somewhat constrained (refuse vehicles would need to travel through a portion of a nearby residential neighborhood). Because this site sits less than a mile from the existing Fort Totten transfer station, it could be developed as a staging area for empty transfer vehicles or for some related use as part of solid waste management within the District. Disadvantages include that the property is privately-owned and is listed for sale (as of October 2000) for approximately $7 million.

DC Impoundment Lot at Brentwood Road --

The Brentwood Road Impoundment Lot is a large, M-zoned parcel (approximately 14 acres) owned by the District. This site generally has good access for waste transfer vehicles to I-295 and is centrally-located for refuse collection routes in that portion of the District. Its current use is as an impoundment lot and salt storage facility for the Department of Public Works. According to the Office of Planning, this property has been slated for future mixed commercial development. Conceptual plans are in the preliminary stages and include usages such as large retail (i.e., home improvement center, grocery, etc.).

Fort Lincoln--

Advantages to this property are that it is a large vacant parcel (over 25 acres) with good access to New York Avenue for transfer routes. However, it is located on the border of Prince Georges County, Maryland, and thus, is not centrally-located for refuse collection routes. A significant disadvantage is the planned proximity to new residential areas.

The property has mixed and special zoning and much of the acreage currently is vacant. According to the Office of Planning, Fort Lincoln is subject to an urban renewal plan that was adopted by the National Capital Planning Commission on May 19, 1972, and approved by the District of Columbia Council on July 26, 1972. The general development objectives for this renewal plan include the construction of about 4,600 dwelling units that will house a community of about 16,000 individuals, a multifunctional town center, public and private facilities including schools, and public parks. A beverage distribution center is scheduled on the site as well.

North of Amtrak Yard--

This tract consists of approximately 20 acres of M-zoned land near 9th Street and Brentwood road, just north of the Amtrak yard. This property is bounded by V and W Streets on the north, 12th Street on the east, T and U streets on the south, and 7th street on the west. A significant

disadvantage to this property is the proximity (less than 100 feet) to residential areas. In addition, the property is not owned by the District.

Washington Gas Site--

This Brownfield property consists of about 12 acres of M-zoned land in the area near the 11th Street Bridge. This site generally has good access to I-295 transfer routes, generally is well buffered, and is centrally-located for refuse collection routes. According to the Office of Planning, District and federal officials have approved a cleanup plan for the site as a means to allow future development of a planned office/hotel complex.

Kenilworth Park--

This unzoned land tract, owned by the National Park Service, sits adjacent to the existing Benning Road solid waste transfer facility. This property has several advantages as a potential transfer station site. It is large (approximately 25 acres), M-zoned, well buffered, generally has good access to I-295 waste transfer routes, and is centrally-located for waste collection routes for that portion of the District. This site sits adjacent to the existing Benning Road transfer station; it could be developed as a stand-alone transfer station or alternatively, could be considered for possible future expansion/improvements of the Benning Road facility. Disadvantages include that the property is Federally-owned (and thus, may not be available to the District for solid waste management purposes), and environmental concerns due to previous waste disposal.

Oxon Cove--

This unzoned property consists of at least 30 acres of land in the D.C. Village area of Ward 8. According to the Office of Planning, this property has been transferred to a private party. This property has several advantages as a potential transfer station site. It is large (approximately 25 acres), well buffered, and generally has good access to I-295 transfer routes. Disadvantages include that the property is now privately-held, it sits adjacent to a major waterway, and it is not centrally-located for District waste collection routes.

DC Southern Impoundment Lot--

The DC southern impoundment lot in Ward 8 is adjacent to the above Oxon Cove parcel. Advantages of this site are that it is large (approximately 20 acres) and part of a larger 160-acre District-owned parcel containing all of DC Village. The impoundment lot is well buffered, likely could meet current setback requirements under District law, and generally has good access to I-295 waste transfer routes. Disadvantages include that the property currently is being used as an active impoundment lot and adjacent parcels include residential and occupational uses. Use of the property would be reduced by approximately 5 acres to accommodate waste transfer. Also, this southern location is not centrally-located for District waste collection routes.

West Campus of St. Elizabeth's Hospital--

This land parcel is unzoned and owned by the Federal government. While it is a large site (approximately 20 acres), there is no existing access to the site for collection vehicles and access to I-295 is limited. The land is currently undeveloped and includes a ravine/surface stream with significant slopes. According to the Office of Planning, this property is part of an historic site. Another disadvantage is that the site is not well buffered; residences and St. Elizabeth's hospital are located nearby.

Camp Simms--

Camp Simms is another large land parcel (nearly 25 acres) and is owned by the Federal government. Disadvantages of this site include the close proximity to existing residences and the general lack of access for refuse collection routes and transfer routes. In addition, the property is planned for future retail uses, according to the Office of Planning.

Bolling Air Force Base--

Vacant land areas exist on this Federally-owned Air Force base, some in excess of 25 acres. The land is unzoned and has generally good access to I-295. According to the Office of Planning, a significant barrier to development of this land is national security.

APPLICATION OF RECOMMENDED CRITERIA TO POTENTIAL NEW SITES

The properties listed in Exhibit 7-3 were reviewed for their advantages, disadvantages, and practicality for use as a potential new solid waste transfer site in the District. In addition, selected siting criteria recommended in Chapter 6 were applied to these 13 sites as a means to develop a simplified ranking. These criteria include:

- a minimum 500-foot setback as measured from the conceptual facility area to any property lines;
- a minimum 50-foot setback as measured from the conceptual operation area to the site property line;
- a minimum 500-foot alternative buffer as measured from the site property line to the nearest dwelling;
- zoning consistent with requirements for M and CM-zoned land parcels;
- the conceptual operation area located outside of the 100-year floodplain; and
- the conceptual operation area located at least 50 feet from the nearest surface stream.

Exhibit 7-4 applies these criteria to the 13 potential new sites. In addition, other considerations are examined regarding relative central locations for collection routes, access to transfer routes, and the presence (or lack thereof) of significant constraints or barriers for use of the property as a transfer station (e.g., planned development, national security).

Exhibit 7-4
Comparison of Selected Recommended Criteria to Potential Property Sites

Land Site Name	Setbacks		Alternative Buffer	Zoning	Location		Other Considerations		
	At least 500 feet from conceptual facility area to any property line?	At least 50 feet from conceptual operation area to property line?	At least 500 feet from property line to nearest dwelling?	Zoning compatible with M or CM restrictions?	Is conceptual operation area located in 100-year floodplain?	Is conceptual operation area located within 50 feet of a surface stream?	Central Location for Collection Routes	Short Access to Nearby Transfer Routes	Lack of Significant Constraints or Barriers
1. Super Concrete, Inc.	No	Yes	Yes	Yes	No	No	Yes	No	Yes
2. McMillan Sand Filtration Site	Possibly	Yes	No	Yes	No	No	Yes	No	No
3. Steuart Petroleum	No	Yes	Yes	Yes	No	No	Yes	No	Yes
4. DC Impoundment Lot (Brentwood)	No	Yes	No	Yes	No	No	Yes	Yes	No
5. Fort Lincoln	Possibly	Yes	No	Possibly	*	No	No	Yes	No
6. North of Amtrak	No	Yes	No	Yes	No	No	Yes	Yes	Yes
7. Washington Gas Site	No	Yes	Yes	Yes	*	No	Yes	Yes	No
8. Kenilworth Park	Possibly	Yes	Yes	Yes	*	No	Yes	Yes	Yes
9. Oxon Cove	Possibly	Yes	Yes	Yes	*	No	No	Yes	Yes
10. DC Impoundment Lot (DC Village)	Yes	Yes	Yes	Yes	*	No	No	Yes	Yes
11. St.Elizabeth's Hospital Site	No	Yes	No	Yes	No	Yes	No	No	No
12. Camp Simms	Possibly	Yes	No	Possibly	No	No	No	No	No
13. Bolling Air Force Base	Possibly	Yes	Yes	Yes	*	No	Yes	Yes	No

* Determination pending from Federal Emergency Management Agency (FEMA)

To develop a simplified ranking of the remaining sites, the above criteria were applied in conjunction with the assumptions discussed in Chapter 6 regarding the need for two transfer stations within the District. Properties with significant constraints or barriers are ranked downward. In addition, those properties within close proximity to residential areas are not ranked.

As shown in Exhibit 7-5, five sites are ranked by location within the northern-most wards (i.e., Wards 1, 3, 4, and 5), and in the vicinity of the I-295 corridor. Based on the criteria shown, the southern impoundment lot in DC Village is the most favorable site of the five remaining properties.

Exhibit 7-5
Simplified Ranking of Potential New Sites

Ranking of Sites Within Northern Wards	
Top-Ranked Sites	**Comment**
1. Super Concrete, Inc.	Privately held; not needed if Fort Totten facility is expanded/refurbished; could allow expansion of Fort Totten.
2. Steuart's Petroleum	Privately held; not needed if Fort Totten facility is expanded/refurbished.
Ranking of Sites Within Southern Wards (in vicinity of I-295 corridor)	
Top-Ranked Sites	**Comment**
1. Southern Impoundment Lot/ DC Village	District land; sufficient acreage; good access; not needed if Benning Road is expanded/refurbished.
2. Kenilworth Park	Federal land; access and existing environmental condition concerns; not needed if Benning Road facility is expanded/refurbished.
3. Oxen Cove	Privately held; near waterway; not needed if Benning Road is expanded/refurbished.

CHAPTER 8

TRANSFER STATION FACILITY AND MANAGEMENT OPTIONS

The purposes of this chapter is to present an analysis of selected facility options associated with the District's continued use of either the Fort Totten or Benning Road transfer stations (or both) so as to meet current and future waste transfer needs. Conceptual engineering layouts are provided for each of the District-owned facilities, as well as for potential new facilities at unknown locations, along with related capital costs. In addition, this chapter discusses typical management options that could be considered by the District for solid waste transfer station services and responsibilities.

OPTIONS FOR DISTRICT-OWNED TRANSFER STATIONS

As part of this study, SCS Engineers made observations at the District-owned transfer stations in July/August 2000 as to the usefulness of such facilities to meet the District's current and future waste transfer needs. These observations are summarized below and serve as the basis for recommendations given in Chapter 9.

Observations at Fort Totten Transfer Station

The existing Fort Totten Transfer Station was built in the mid-1970's as a "stationary compactor transfer facility" on a site previously occupied by an incinerator. The incinerator was demolished to make way for the transfer station.

Refuse trucks entered the facility off of Bates Road onto the upper level tipping floor. The trucks then would discharge refuse directly into one of six "push pits". Hydraulically-controlled push-out heads activated by hydraulic rams would "push" the waste into the charging chambers of stationary compactors located on the lower level (25 feet below the tipping floor). The waste was then ejected into transfer trailers locked onto the compactors. Several cycles were necessary to load the transfer trailers that were also the compaction chambers.

This method of compaction and transfer is still used at U.S. transfer facilities. However, the method has many drawbacks as follows:

- The transfer of waste is relatively slow since the charging chamber of the compactors only holds approximately 180 cubic feet of refuse; this volume reduces by about a third when compacted and the transfer trailers have a volume of approximately 80 to 100 cubic feet. Under normal conditions, it would take 20 to 30 minutes to transfer enough waste to fill the trailers. This equates to a throughput of approximately 200 to 250 tons per 8-hour day per unit.

- The trailer loads are not consistent in density because the first blocks of waste transferred usually loosen up as the following blocks are ejected into the trailer. This can result in an

uneven load, where the more dense waste is loaded over the rear axle of the transfer trailer than over the rear axle of the truck. Consequently, the trailers often may have overloaded rear axles even though the vehicle gross weights may be within legal highway limits.

- When the transfer trailer is unlocked and moved away from the compactor, some refuse may spill out prior to closing the rear trailer door(s).

- The system requires significant downtime maintenance.

- Efficiency is lost because the transfer trailers have to remain hooked up to the compactors for a relatively long period of time, thus keeping drivers idle.

The transfer operations at Fort Totten have been modified over time. The compactor transfer operation is no longer used. Currently, a front-end loader is used to push refuse that has been deposited on the tipping floor onto a steel slide where the refuse is directed into a transfer trailer parked on the pavement below. Transfer times have been improved and the operation allows some inspection of the waste following discharge and prior to loading.

One disadvantage of the current operation is that the transfer truck/trailer is parked outside the facility building during loading. This aspect tends to slow operations during inclement weather and also contributes to blowing litter and site cleanliness concerns.

Observations at Benning Road Transfer Station

The existing Benning Road Transfer Station was originally built as the District's Incinerator No. 5 in the late 1960's. Refuse was delivered to the incinerator and directly discharged into 45-foot deep by 280-foot long refuse pits. The east and west ends of the pits are 40 feet from the exterior walls of the 360-foot wide building. The tipping floor, where incoming refuse collection vehicles deposit waste, is accessed by ramps at the east and west sides of the building and is 23 feet above the existing exterior grade. The bottom of the refuse pits is approximately 22 feet below grade.

During the time that the incinerator was operational, refuse was lifted out of the pits by a traveling bridge crane equipped with a grappler device and deposited on a charging floor where it was then fed into the furnaces.

Today, the incinerator is no longer operational, but the facility continues to be operated as a transfer station. Waste that is deposited into the refuse pits is lifted by the bridge crane and placed on feed conveyors that subsequently deposit the waste onto load-out conveyors that load transfer trailers. The transfer truck/trailers are parked under the load-out conveyors on the existing 65-foot wide tipping floor.

The current transfer operation is limited in capacity due to the many steps required between depositing waste into the refuse pits and the loading of waste out into long-haul transfer

truck/trailers. Also, the tipping floor is congested at times because the refuse collection vehicles occupy the same floor as the long-haul truck/trailers.

Another disadvantage of the current operation is that there are no means to distribute waste in the long-haul trailers except by moving the trailer back and forth under the load-out conveyor or using the trailer's hydraulically operated "live floor". The axle weights and gross weight of the transfer truck/trailers cannot be determined until the vehicle leaves the building and crosses one of the facility's exit scales. In the event the vehicle is overloaded, it must return to the tipping floor to eject part of its load and then re-weigh at the exit scale. In order to limit the necessity of reentering the facility, many transfer vehicles leave the facility with "light loads" or in other words, not loaded to capacity.

REFURBISHMENT OF FORT TOTTEN TRANSFER STATION

Based on site observations made by SCS Engineers, review of facility design drawings, and discussions with District operations personnel, the Fort Totten facility could be successfully refurbished in order to accomplish several objectives, including:

- Increase the design capacity to meet estimated future transfer needs of the District;
- Enclose all waste handling activities;
- Add vehicle scales and equipment to improve transfer trailer loading and improve traffic flow; and
- Change traffic flow to add vehicle parking and storage space.

To this end, a refurbishment of the Fort Totten facility is proposed herein.

Description of Proposed Refurbishment--

The modifications conceived for the Fort Totten are relatively simple in scope. An operation similar to the current is anticipated. Conceptual building modifications are illustrated in the drawings in Appendix A and summarized below:

- Remove all of the existing push plates, hydraulic rams, compactors and control units.

- Construct reinforced concrete floors, flush with the existing tipping floor, over the existing push-pits as shown on the Conceptual Tipping Floor Plan (Appendix A).

- Construct an approximate 36-ft by 212-ft, two-story, pre-engineered metal building adjacent to the existing transfer building. The second floor (reinforced concrete on steel beams) of the building will be approximately 9 feet below the existing tipping floor. (Refer to the Conceptual Site Plan and the Lower Level Plan- Appendix A).

- Construct new steel trash chutes to direct refuse through load-out openings in the new 2nd floor into transfer trailers situated below. (See the Conceptual Tipping Floor Plan and Section – Appendix A).

- Install material handlers equipped with grappling devices on the new 2nd floor to distribute waste within the transfer trailers. If too much waste happens to be pushed down the chutes, the handlers can pick it out of the trailers and replace it on the tipping floor.

- Construct axle scales such that they will be located under the rear truck axles and rear semi-trailer axles. Axle weights will automatically register on panels located in plain view of the loader operator and the material handler operator. In this way, the operators can ensure maximum payloads without exceeding legal highway limits.

- As required by DC Code, install tire wash systems at the transfer truck/trailer tunnel exit and at the tipping floor exit to ensure that the tires of trucks or other facility vehicles that use public roads shall be cleaned before the trucks or other vehicles are allowed to exit the facility.

- Install a ventilation system that complies with the ventilation requirements of Title 21 DCMR, Article 731.15(d)(6). The system will be designed to provide a complete air change in the waste handling and transfer tunnel areas approximately four times per hour. Roof mounted exhaust ducting will direct the exhausted air through dust collectors for the removal of particulate matter.

- Install a misting system at the ceiling level of the tipping floor above the waste handling areas and above the load-out pits to control dust. The facility operations will include monitoring of the misting system and addition of odor controlling compounds.

- Construct openings with new roll-up doors in the south wall of the new addition in line with doors and openings in the existing building south wall to accommodate continued use of existing facilities such as tractor and collection vehicle maintenance areas.

- No site work other than pavement striping is anticipated.

Refurbished Facility Capacity--

Site observations at other facilities have shown that transfer trailers can be top-loaded with maximum payloads (approximately 23 tons) in 5 to 9 minutes. This equates to a design throughput capacity for the facility of 2,500 tons per eight-hour workday assuming two load-out stations are utilized. This would handle estimated waste flows through at least 2015, as well as expected daily waste flow surges as they may arise. Alternatively, the design capacity would be reduced if one of the load-out stations is reserved for redundancy purposes. Additional capacity can be gained by extending the workday. For example, a ten-hour workday will increase the tonnage throughput for the upgraded facility to more than 3,000 tons per day.

The expansion of the existing citizen convenience center was considered for Fort Totten. However, the turning radius for the fully loaded exiting transfer trailers prohibits the addition of more 40-yard roll-offs at the existing drop-off area.

Estimated Costs--

Estimated cost for the Fort Totten refurbishment described above is $2,800,000. A detailed breakdown of the estimated costs, including assumptions, is provided in Appendix D. Design and construction cost contingencies appropriate for the level of detail have been included in the construction cost estimate.

REFURBISHMENT OF BENNING ROAD TRANSFER STATION

Based on site observations made by SCS Engineers, review of facility design drawings, and discussions with District operations personnel, the Benning Road facility could be successfully refurbished in order to accomplish several objectives, including:

- Increase the design capacity to meet estimated future transfer needs of the District;
- Add vehicle scales and equipment to improve transfer trailer loading and improve traffic flow;
- Add a citizen convenience center for drop-off of household refuse and recyclables; and
- Change traffic flow to add vehicle parking and storage space.

To this end, a refurbishment of the Benning Road facility is proposed herein.

Description of Proposed Refurbishment --

The proposed modifications to the existing Benning Road Transfer Station will serve to eliminate the existing problems and inefficiencies so that the throughput capacity is increased significantly to approximately 2,750 tons per eight-hour workday. Similar to Fort Totten, it is assumed two load-out stations will be utilized at times. This would handle estimated waste flows through at least 2015, as well as expected daily waste flow surges as they may arise. Alternatively, the design capacity would be reduced if one of the load-out stations is reserved for redundancy purposes. Additional capacity can be gained by extending the workday. For example, a ten-hour workday will increase the tonnage throughput for the upgraded facility to more than 3,000 tons per day.

The proposed concept is to modify the existing Benning Road facility as follows (conceptual drawings for the modifications described below are provided in Appendix B):

- Remove the existing feed/load-out conveyor systems.

- Raise the existing tipping floor roof to increase the clear height from approximately 20 feet to 28 feet as indicated on the Conceptual Transverse Building Section. This will allow more flexibility in depositing and handling waste.

- Construct a new reinforced concrete floor over the existing refuse pits at the same level as the existing tipping floor as shown on the Conceptual Tipping Floor Plan and the Conceptual Transverse Building Section. This will increase the operational width of the tipping floor from 65 feet to 100 feet, thereby reducing or eliminating congestion on the tipping floor. The new tipping floor will have openings (load-out pits) through which waste can be pushed into transfer trailers located directly below.

- Construct a reinforced concrete tunnel floor in the existing refuse pits at approximately 16 feet below the new tipping floor (14 feet minimum clear from the new tipping floor structure) as shown on the Conceptual Tunnel Floor Plan, the Conceptual Transverse Building Section and the Conceptual Longitudinal Building Section. This will allow for waste deposited on the tipping floor to be pushed through the load-out pits directly into the long haul transfer trailers parked below. The waste can be compacted in the transfer trailers by the loader operator using the loader bucket or by optional material handlers with grappler attachments.

- Construct axle scales that will be located under the rear axles of the transfer truck and semi-trailer. The axle weights will be displayed on digital read-out panels above the tipping floor such that the loader and/or material handler operators can ensure that each trailer is loaded to maximum capacity.

- As required by DC Code, install tire wash systems at the transfer truck/trailer tunnel exit and at the tipping floor exit to ensure that the tires of trucks or other facility vehicles that use public roads shall be cleaned before the trucks or other vehicles are allowed to exit the facility.

- Install a ventilation system that complies with the ventilation requirements of Title 21 DCMR, Article 731.15(d)(6). The system will be designed to provide a complete air change in the waste handling and transfer tunnel areas approximately 4 times per hour. Roof mounted exhaust ducting will direct the exhausted air through dust collectors for the removal of particulate matter.

- Install a misting system at the ceiling level of the tipping floor above the waste handling areas and load-out pits to control dust. The facility operations will include monitoring of the misting system and addition of odor controlling compounds.

- Demolish existing building components that interfere with the new construction. Care will be taken to maintain full access to all parts of the existing facility.

- As an option, material handlers with grappler attachments can also be installed. The grapplers will increase efficiency since it will be much easier to ensure that each transfer trailer is loaded to maximum capacity, but will slightly decrease the operational width of the tipping floor. The cost of material handlers is approximately $100,000 each plus shipping and installation. One material handler would be located at the centerline of each

load-out pit on the side opposite the tipping floor. The total cost impact to the facility would be approximately $300,000. The conceptual plans provided in Appendix B do not include the optional material handlers with grapplers.

Citizen's Drop-Off Facility--

In addition to the above, modifications to the facility will include demolition of at least one of the existing incinerator stacks and adjacent equipment in order to construct the Citizen's Drop-Off Facility shown on the Conceptual Site Plan. The Drop-Off Facility is sized to allow vehicles to drop off a variety of materials types, such as household hazardous wastes, recyclables (e.g., newsprint, cardboard, aluminum, plastics, glass, etc.), used tires, white goods, and household refuse.

Estimated Costs--

Estimated cost for the Benning Road refurbishment described above is $3,900,000. A detailed breakdown of the estimated costs, including assumptions, is provided in Appendix D. As noted above, demolition of one of the towers is included in the estimated construction costs.

Note that the costs of the optional material handlers with grappling devices described above have not been included. Design and construction cost contingencies appropriate for the level of detail have been included in the estimated costs.

DESIGN AND CONSTRUCTION OF A NEW "GENERIC" TRANSFER STATION

Facility Criteria

A conceptual plan for a new transfer station, with adjacent citizen convenience center, is provided in Appendix C. The basis for the concept design of the facility is as follows:

- The site is rectangular in shape and contains a minimum of 5.9 $\pm$ acres.
- The site has full access from at least one side.
- The tipping (dumping) of waste and transfer into long-haul vehicles must take place inside a totally enclosed building.
- The facility must have the capacity to transfer a minimum of 2,500 tons of MSW in an 8-hour workday. Additional capacity can be gained with an extended workday.
- The facility must have the capability to accurately record both incoming and outgoing waste.
- The general public must have access to the facility to drop off household refuse, recyclables, or household hazardous wastes.

- The facility must have the capability of receiving used tires and old appliances at the drop-off area.

- The facility must have on-site general offices, employee facilities and adequate visitor and employee parking.

- The design of the facility must conform to all local building and environmental code requirements.

- The facility must have access for fire safety equipment.

- There must be a minimum 50-foot wide setback as measured from the operation area to the property line.

Description of Generic Facility

Transfer Station--

In general, the transfer facility consists of a pre-engineered metal building approximately 47,000 square feet in size. The building dimensions, 224 feet wide by 210 feet deep, allow for refuse collection vehicles to enter the building, maneuver within the building, discharge the contents of the vehicle in a designated location, and exit the building without interfering with transfer operations or other vehicles. The refuse deposited on the tipping floor is pushed by front-end loader through one of two load-out openings in the tipping floor into a transfer trailer parked in the tunnel below.

The building perimeter walls are reinforced concrete for the lower eight feet. The entire building floor and exterior paved areas are reinforced concrete except for the visitor and employee asphalt/concrete parking lot. There is a tunnel extending the full width of the building along one side with access ramps for truck/semi-trailer vehicles at each end.

As an option, the facility may have fixed material handlers, equipped with grappling devices, to distribute and compact refuse in the transfer trailers. These material handlers would be located at the center of the load-out pits on the side opposite from the tipping floor. The conceptual plans provided in Appendix C do not include the optional material handlers with grapplers.

Ventilation--

A ventilation system will be installed that complies with the ventilation requirements of Title 21 DCMR, Article 731.15(d)(6). The system will be designed to provide a complete air change in the waste handling and transfer tunnel areas approximately four times per hour. Roof-mounted exhaust ducting will direct the exhausted air through dust collectors for the removal of particulate matter.

Odor Control--

A misting system will be installed at the ceiling level of the tipping floor above the waste handling areas and the load-out pits to control dust. The facility operations will include monitoring of the misting system and addition of odor controlling compounds.

Office—

The facility office building will house the administrative offices, computer equipment, communication system, employee facilities, etc.

Facility Entrance and Scales--

Commercial and public vehicles will enter the facility and queue in one of two lines to await access to facility scales. Vehicles intending to enter the main transfer building may use either line. Vehicles intending to use the citizen's drop-off area will be directed by signage to one specific lane. A third traffic lane has been provided to by-pass the scales. Service and/or emergency vehicles will use the latter.

Vehicles will be directed to approach and drive onto one of the two scales by traffic lights controlled by the scale house attendant. Once on a scale, the vehicle gross weight (contents plus tare weight) will be recorded automatically along with owner information for billing purposes. Note that most commercial vehicle tare weights and many private vehicle tare weights will be stored in the facility computer system such that the empty vehicles will not need to be re-weighed upon exiting.

Scale House

The scale house is an enclosed building housing one office and a unisex restroom for the attendant. The office is equipped with telephone and computer equipment that automatically records the date, vehicle gross weight, ownership data, etc. and calculates and records the weight of the vehicle contents.

Citizen Convenience Center

Those vehicles headed for the citizen's drop-off area will leave the scale and stop at one or more of the following:

- Household hazardous waste (HHW) facility where pesticides, oil, paint, batteries, cleaning agents and other household hazardous materials may be dropped off.
- White goods area where items such as refrigerators, stoves, water heaters, freezers, etc. may be left.
- Used tire bunker where old tires may be dropped off.

- Recyclable bin area where glass, plastic, aluminum, ferrous metals, newspapers, cardboard, etc. may be left.

- A bin or "roll-off" container where household refuse may be dropped off.

Site Traffic Flow—

Those vehicles leaving the scale and entering the main transfer building will be directed by a spotter (facility employee) to a specific location within the building to dump their vehicle's contents. After dumping their waste on the tipping floor, vehicles with recorded tare weights will exit the building and the facility. Vehicles without recorded tare weights will be directed to return to a scale at the scale house or stop on the exit scale, if one is provided, prior to exiting the facility.

The transfer truck/trailer vehicles having entered the site proceed down a ramp into a tunnel below the tipping floor and stop directly under the load-out holes. The rear axles of the truck and semi-trailer are positioned on scales such that the loader operator can read the vehicle axle weights on panels above the tipping floor. In this way, the loader operator can control both the gross and individual axle weight of the transfer vehicle.

Upon exiting the tunnel, the gross weight of the transfer truck/trailer vehicles may be verified on a 70-foot long truck scale, if provided.

Tire Wash--

As required by DC Code, a tire wash system will be installed at the transfer truck/trailer tunnel exit and at the tipping floor exit to ensure that the tires of trucks or other facility vehicles that use public roads will be cleaned before the trucks or other vehicles are allowed to exit the facility.

Estimated Costs

Estimated cost for the Generic Transfer Station and Citizen's Convenience Center, excluding land acquisition costs, is $8,000,000. A detailed breakdown of the estimated costs, including assumptions, is provided in Appendix D. Note that the costs of the material handlers with grappling devices described above have not been included. Design and construction cost contingencies appropriate for the level of detail, however, have been included.

SUMMARY OF FACILITY OPTIONS AND ASSOCIATED CAPITAL COSTS

As discussed in this chapter, three transfer station alternatives and associated costs are presented above as follows:

- Conceptual plan to refurbish the Fort Totten Transfer Station
- Conceptual plan to refurbish the Benning Road Transfer Station

- Conceptual plan to construct a new "generic" transfer station.

Based on findings made in this report, at least two solid waste handling facilities are recommended to meet the District's current and future municipal solid waste demands. Accordingly, the following transfer station facility options are available:

- Refurbish both the Fort Totten and Benning Road transfer stations;
- Refurbish Fort Totten and a construct a new "generic" facility;
- Refurbish Benning Road and construct a new "generic" facility; or
- Construct two new "generic" facilities.

Exhibit 8-1 provides a summary of the estimated costs for these options. It is important to note the following:

- The costs presented for refurbishment of the Benning Road Transfer Station include only the costs for demolition of one of the existing incinerator towers to accommodate the proposed citizen convenience center.

- Abandonment of the Fort Totten or Benning Road facilities will require demolition of the existing facilities. These estimated costs are included.

- The 1998 GBB Report[1] estimated that the total cost for demolishing the Benning Road facility was approximately $1,000,000, excluding removal of hazardous wastes materials on site. This figure is likely on the low side and could be two or three times this estimated amount, depending on disposal costs.

- The 1998 GBB Report[1] estimated that the total cost for demolishing the Fort Totten facility was approximately $300,000, including the exit ramp but excluding removal of hazardous wastes materials on site. Again, this figure is likely on the low side and could be two or three times this estimated amount, depending on disposal costs.

- The estimated costs for the "Generic" transfer station exclude the cost of land acquisition.

MANAGEMENT OPTIONS FOR DISTRICT TRANSFER STATIONS

There are several typical management options that could be considered by the District for refuse and recyclables collection, transfer station refurbishment/construction, daily operations, and long-haul (transfer) responsibilities. Because the District has the need for significant waste transfer within its borders and it owns two solid waste handling facilities with potential to handle such transfer needs, the District has several options for the improvement and management of the current solid waste management system.

[1] Gershman, Brickner & Bratton. 1998. Consolidated Transfer Station Cost Analysis-Draft Report

Option	Description	Benning Road		Fort Totten		Generic Transfer Station[1]	Cost for Option[2]
		Refurbishment Costs	Demolition Costs[4]	Refurbishment Costs	Demolition Costs[4]	Costs	
1	Refurbish Transfer Facilities at Fort Totten and Benning Road	$3,900,000[3]		$2,800,000			$6,700,000
2	Refurbish Transfer Facility at Fort Totten and New Generic Facility		$1,000,000	$2,8000,000		$8,000,000	$11,800,000
3	Refurbish Transfer Station at Benning Road and New Generic Facility	$3,900,000[3]			$300,000	$8,000,000	$12,200,000
4	Construct Two New Generic Facilities		$1,000,000		$300,000	$16,000,000	$17,300,000

[1] Excludes land acquisition costs
[2] Refer to Appendix D for cost estimates
[3] Includes demolition costs associated with the southwest tower/stack
[4] Includes demolition of entire facility

For example, the District could sell its facilities to private service providers resulting in little to no District involvement in future operations. Alternatively, the District could contract out all transfer station services that it controls, in whole or in part, to private service providers. Another alternative would be for the District to simply own, operate, and perform all services related to waste transfer within its borders. Detailed cost, risk, and technical analyses (not included herein) are necessary to determine if private service providers are needed and to what extent.

On one hand, the use of private service providers for traditional sold waste management functions is typical for many U.S. jurisdictions. Common reasons cited for using private service providers for solid waste management activities, as noted in a 1998 consultant report[2], include:

[2] Gershman, Brickner & Bratton. 1998. Consolidated Transfer Station Cost Analysis-Draft Report

- Provides a way to reduce costs when faced with the loss of grants and/or revenue sharing, to lessen budget pressures, and to reduce the level of responsibility and need for trained staff within public works departments;

- Provides alternative means to finance substantial capital improvements;

- Provides a means to shift and/or share the risks, liabilities, and responsibilities specific to stringent environmental requirements and response to regulatory pressures;

- Provides a means to streamline certain solid waste operations so as to minimize costs, often in conjunction with obtaining new or expanding services (e.g., citizens' drop-off operation, leaf or yard waste composting operation, and household hazardous waste or other special waste management services);

- Provides a mechanism to expand or upgrade facilities or services more rapidly than would be the norm under public procurement rules;

- Provides an ability to obtain long-term guarantees in terms of cost, performance standards, and regulatory compliance;

- Tax-driven cost savings that can be passed on by the private owners; and

- May enhance the ability to obtain and market project bonds, if used to finance the construction/capital improvements, because of a perceived positive impact (i.e., track record) of an established private operator.

On the other hand, many U.S. jurisdictions have expanded the responsibilities of their sold waste departments in that most of the collection and management services are provided by public service providers. Due to the unique circumstances regarding solid waste collection and transfer in the District, management options may be available to the District specific to:

1. Collection services
   - Residential refuse and recyclables collection
   - Commercial refuse and recyclables collection
   - Construction/demolition waste processing and transfer

2. Construction and operations
   - Solid waste handling facility design and capital refurbishment
   - Transfer station daily operations
   - Daily operations of citizen convenience centers

3. Waste transfer (long haul) to disposal locations.

Typical management options include:

- No public sector involvement,
- Providing services directly through District-employed public service providers,
- Providing services by contract with one or more private service providers,
- Providing services jointly with public and private service providers, and
- Privately-owned and operated facilities for contract term with subsequent ownership transfer to the District.

These options are discussed briefly below, principally with regard to waste transfer. Variants of each option are possible for the many solid waste services currently provided to residents and businesses within the District. Exhibit 8-2 provides a summary of advantages and disadvantages for involvement of private sector providers for District solid waste services.

No Public Sector Involvement

There are many examples of municipalities that have no involvement with either solid waste collection (residential or commercial wastes) or waste transfer/disposal within their jurisdictions. These open systems operate with minimal public sector staff or monitoring. This reflects how most of the commercial waste stream currently is collected and transferred within the District. As a result, this option functions without District involvement in the planning, ownership, or operation of (private) transfer stations. District control of the quality of private transfer facilities is limited to permitting and enforcement responsibilities only. Private service providers simply operate transfer stations in the free market provided that they meet permitting requirements.

One disadvantage to this option (no public sector involvement) is loss of control by the District. That is, the District needs sufficient waste transfer/disposal capacity for the waste stream it collects and manages. If transfer station services were limited to private service providers only and there were only a limited number of transfer stations in the District, a few or even one company could set tip fees well above market value with an effective monopoly. While this option removes many of the burdens for solid waste management from the District, the District is still ultimately responsible for quality and cost effective solid waste management for its citizens. The District would need to be assured that the market would foster sufficient competition for transfer station services before proceeding with this option.

Providing Services Directly Through District-Employed Public Service Providers

In this option, the District would own the transfer facility and all applicable equipment, and also staff the facility with District employees. This is the case currently for the daily operations at the Fort Totten and Benning Road transfer stations. One advantage of this option is full District control over the level, type, and quality of services provided. If changes in service, staffing or management are necessary, the District is free to make those decisions without being bound to a contract with a private service provider. The responsibility is with the District to recruit, train, and retain staff with the proper technical and managerial expertise to operate modern, high-capacity transfer stations at an acceptable level of service for citizens while controlling costs.

Exhibit 8-2
Advantages and Disadvantages to Involvement of Private Sector Providers

Solid Waste Services	Advantages	Disadvantages
COLLECTION	• Private company assumes costs and risks associated with capital costs including equipment • Private firms may have more experience with large waste collection operations • Costs to customers may be lower • Competitive bids can save money	• Loss of control • Need for contract monitoring • Private company my acquire control of regional market • May lead to lower quality service • Public sector may need to sell equipment and eliminate positions • Special waste services need to be established
REFURBISHMENT AND OPERATION	• Can finance/transfer capital investments • Refurbishment/building time can be reduced • Private firms may have more experience with large waste transfer operations	• Loss of control • Need for strict contract monitoring • Loss of direct interface with the citizens
TRANSFER AND DISPOSAL	• Final disposal destination determined by private hauler • Private company supplies necessary supplies and equipment • Private firms may have more experience with large long-haul operations • Competitive bids can save money	• Splitting contract tasks may lead to higher costs • Need for contract monitoring

Disadvantages from this option are predominantly those associated with facility ownership. The District is responsible for making transfer station modifications and financing future expansions/improvements, for accommodating more stringent regulations over time, and for financial risks associated with lost revenues should waste flows be lost to more cost competitive transfer/disposal options.

Providing Services by Contract with One or More Private Service Providers

Under this option, the District would provide its existing transfer facilities or the land for a new transfer station site, while responsibilities for construction, ownership, and operation would be contracted to a private sector firm. The District could maintain a control through preliminary engineering design of the facilities, contract specifications, and monitoring requirements without the day-to-day responsibility for the transfer operations.

One advantage of this option is that the responsibility for daily transfer operations is given to trained and experienced personnel. In addition, financing and construction responsibilities could be shifted to the private sector, possibly reducing procurement and construction schedules while achieving infrastructure improvements. Other technical and institutional issues can be managed through a qualifications and bid process for potential contractors, followed by contract monitoring. Disadvantages include the financial failure of the private company selected to provide such services.

Providing Services Jointly with Public and Private Service Providers.

This option, in its most common form, would entail District ownership of the transfer facility and contracted private service providers responsible for transfer operations. The transfer facility (new or existing) would be constructed/refurbished under the specifications required by the contractor while the District maintains the facility as an asset. The District may own the rolling stock or have that provided by the contractor. In many markets, private service providers are able to supply labor and management of publicly-owned facilities with lower overhead and final costs.

Under this option, the District assumes responsibilities associated with transfer station ownership. Should waste flow, and subsequently revenue, be lost to lower priced disposal options, the District is faced with the capital debt incurred from the construction of the transfer facility. The District could also face costs for renovations needed to comply with regulatory changes that may be promulgated in the future, or for needed additional waste flow capacity. Modifications in operational requirements would be the responsibility of the contractor.

Privately Owned and Operated With Subsequent Ownership Transfer

This option provides flexibility once the contract term with the service provider has ended. At the outset, the risks and benefits are as above with a privately owned and operated facility, but at the end of the contract term the District assumes ownership of the facility and all upgrades made during the course of the contract.

CHAPTER 9

FINDINGS AND RECOMMENDATIONS

This chapter provides findings and recommendations based on the analyses provided herein.

FINDINGS

The following summarize the key findings of SCS Engineers. Based on solid waste quantities expected to be generated and managed within the District through 2015, existing arterial roads and transportation patterns, our understanding of the District's solid waste management system, and our experience within the waste management industry specific to solid waste transfer:

1. Current District laws are similar to laws in regional and other U.S. jurisdictions with established permitting requirements for state-of-the-technology solid waste handling facilities, including siting, operational, and reporting requirements, many of which reflect Best Management Practices in the industry. There are needs to add certain conditions to the District's solid waste handling facility siting requirements which may provide greater protection to human health and the environment.

2. Solid waste tonnages imported by private haulers into the District were more than a third of the total amount of solid waste managed within the District in 1999.

3. There are incomplete data in the technical literature to confirm or deny an association between adverse human health effects and measurable exposures to community residents from solid waste handling facilities, including those facilities located in the District.

4. There are needs for at least two solid waste handling facilities within the District, each with the primary function of waste transfer to disposal/treatment facilities located outside the District.

5. There are needs for at least two publicly-accessible locations in the District for the purpose of citizen drop-off of home-generated solid waste and materials acceptable to the District's recycling programs.

6. There are needs for locally-based material recovery operations, including construction and demolition (C&D) recovery/recycling facilities, waste paper recycling facilities, and related recyclables recovery facilities.

7. Based on the available areas and existing infrastructures, the two existing District-owned solid waste handling facilities (i.e., Fort Totten and Benning Road Transfer Stations) could be refurbished successfully to handle the entire District waste stream (including all solid waste generated and imported) through at least the Year 2015.

8. There are very few choices of other available properties in the District suitable to accommodate and compatible with existing siting requirements for new solid waste handling facilities under current District laws and regulations. Certain properties were identified within two geographic areas (the northern and southern wards) and ranked as part of this study. In the event that a new transfer station site would be required, the top-ranked site was the District-owned southern impoundment lot (DC Village), located in Ward 8.

9. Estimated costs to refurbish the District-owned Fort Totten and Benning Road transfer stations into state-of-the-technology solid waste handling facilities are less than half the estimated costs to build new equivalent solid waste handling facilities elsewhere in the District.

RECOMMENDATIONS

Based on the above findings and other analyses made part of this report, the following summarize the key recommendations of SCS Engineers for consideration by the Solid Waste Advisory Panel:

1. Additions/amendments should be made to current siting/permitting requirements for solid waste handling facilities under District law to:

    - Require a minimum setback distance (e.g, at least 50 feet) from the operation area of a permitted solid waste handling facility to the nearest surface stream;
    - Require a setback criterion that the operation area of a permitted solid waste handling facility be outside of the established 100-year flood plain;
    - Require a permit application for a solid waste handling facility to include a site closure plan;
    - Require that a permitted solid waste handling facility only be allowed on property consistent with the zoning requirements for M or CM-zoned land parcels, taking into account surrounding industrial and residential uses; and
    - Allow a minimum buffer requirement (e.g., at least 500 feet as measured from the solid waste handling facility property line to the nearest dwelling) to be considered as an alternative or equivalent requirement to the current 500-foot setback requirement (as measured from the facility to the any property line).

2. Special conditions and requirements should be considered for locally-based construction and demolition (C&D) recycling facilities.

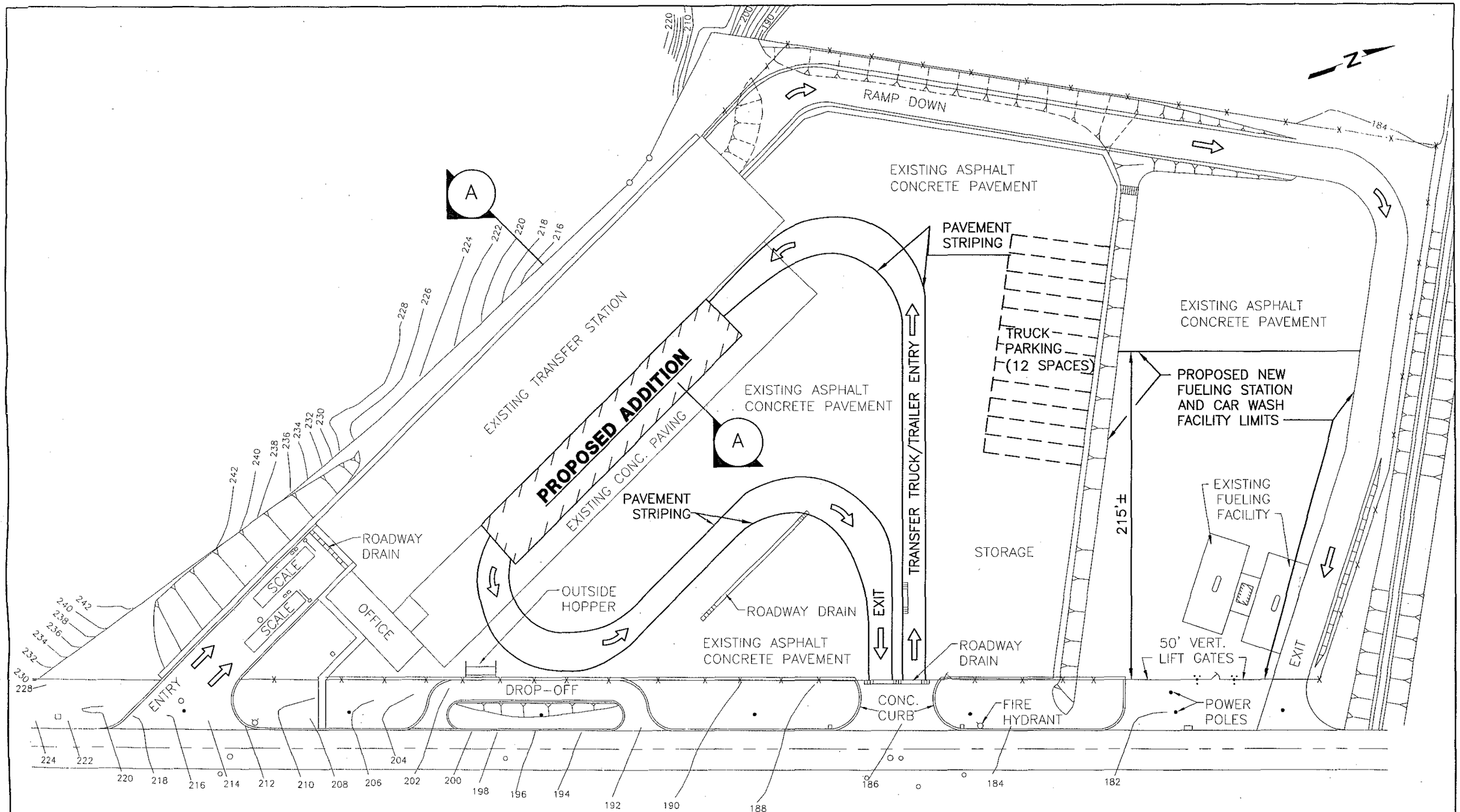
3. Significant capital and operational improvements should be made for purposes of refurbishing the Fort Totten Transfer Station into a state-of-the-technology facility. The current design capacity should be increased to accommodate expected waste volumes through at least 2015.

4. Significant capital and operational improvements should be made for purposes of refurbishing the Benning Road Transfer Station into a state-of-the-technology facility. The current design capacity should be increased to accommodate expected waste volumes through at least 2015.

5. As part of the above-recommended refurbishments, citizen convenience centers should be established at the Fort Totten and Benning Road facilities for purposes of citizen drop-off of home-generated solid waste and of materials acceptable to the District's recycling programs.

6. Further study and analysis should be conducted specific to certain elements of the District's solid waste management system and waste transfer, including:

    - Cost analysis related to various contracting options, including financing/design/construction of District transfer station refurbishments, day-to-day operations responsibility of waste receipt, handling, and placement functions, and day-to-day operations responsibility of waste transfer (long haul);
    - Cost analysis and related needs for residential waste collection;
    - Cost analysis and related needs for recyclables collection;
    - Public education needs associated with recycling, citizen drop-off services, and other solid waste programs and services; and
    - Need for employee training for operations and monitoring of solid waste handling facilities.



SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20190
PH. (703) 471-6150 FAX. (703) 471-6676

Capacity: 2,500 tons per 8-hour work day

GRAPHIC SCALE
60 0 60 120
SCALE IN FEET

DATE:	9/26/00
DRAWN:	IC
APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (F.Totten C-2)
REVISION:	

SHEET TITLE
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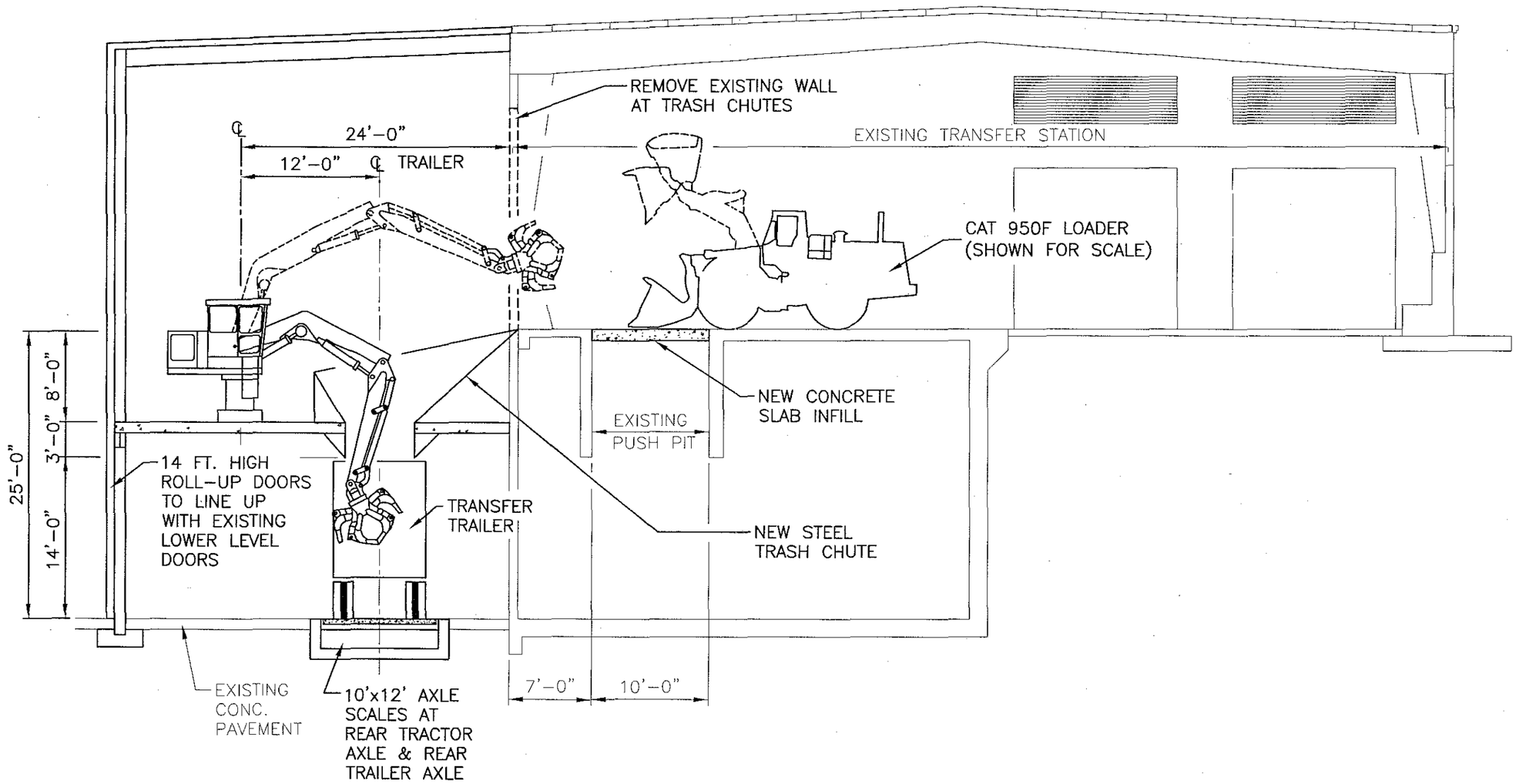
PROJECT TITLE
FORT TOTTEN TRANSFER STATION AND CITIZEN'S DROP OFF FACILITY



SECTION A

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20190
PH. (703) 471–6150 FAX. (703) 471–6676

GRAPHIC SCALE
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SCALE IN FEET

DATE:	9/26/00
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APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (F.Totten S–1)
REVISION:	

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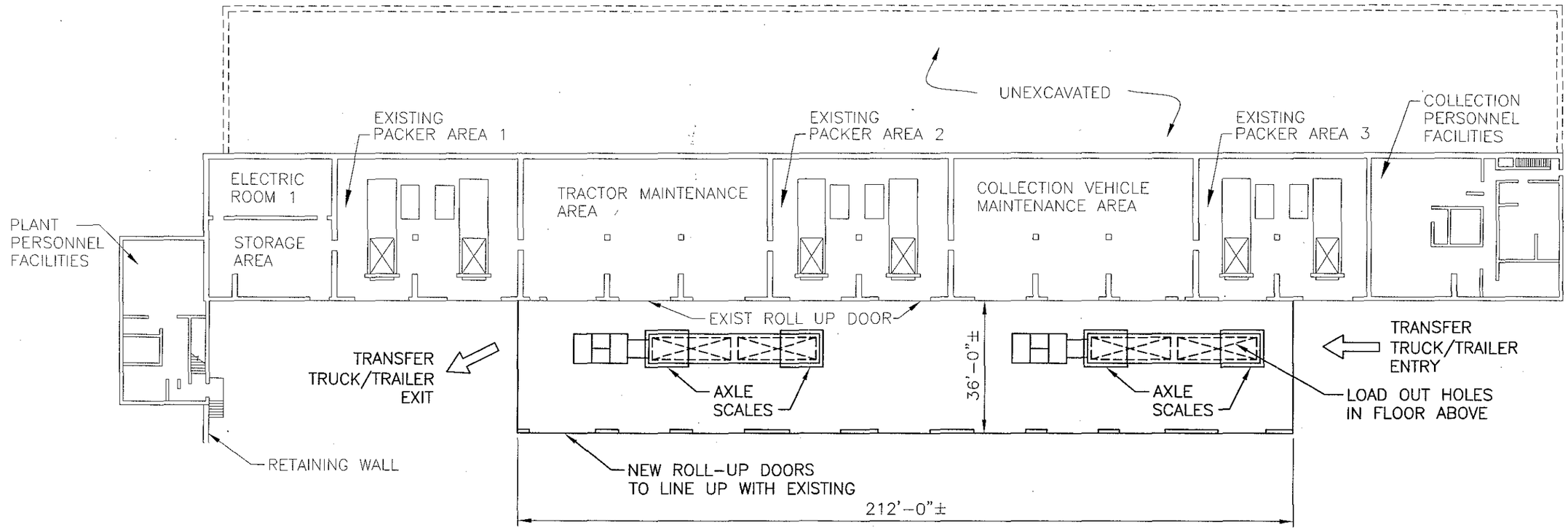
PROJECT TITLE
FORT TOTTEN TRANSFER STATION AND CITIZEN'S DROP OFF FACILITY



SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20910
PH. (703) 471-6150 FAX. (703) 471-6676

GRAPHIC SCALE
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SCALE IN FEET

DATE:	9/26/00
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APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (F.Totten A-1)
REVISION:	

SHEET TITLE
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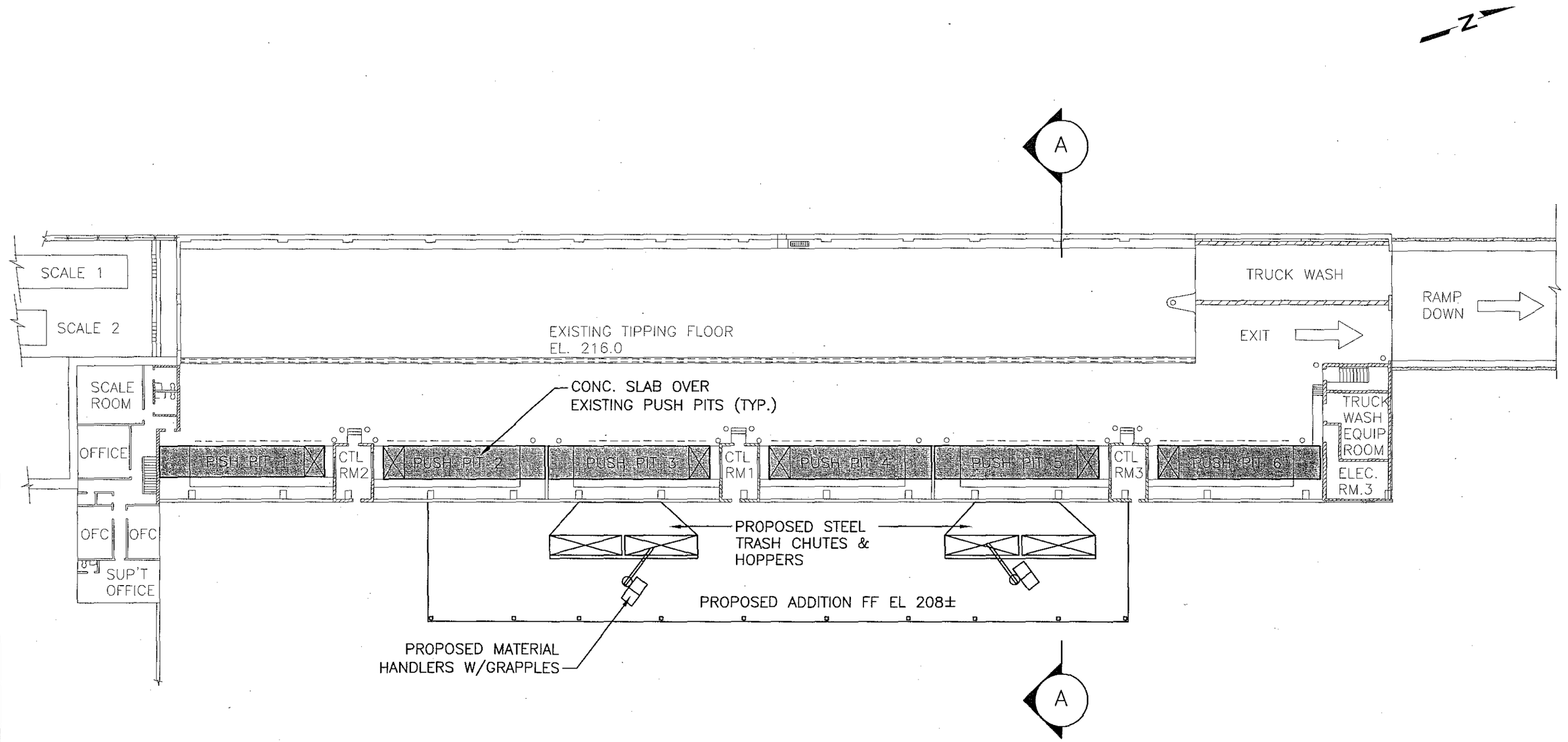
PROJECT TITLE
FORT TOTTEN TRANSFER STATION AND CITIZEN'S DROP OFF FACILITY



SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20190
PH. (703) 471-6150 FAX. (703) 471-6676

GRAPHIC SCALE
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SCALE IN FEET

DATE:	9/26/00
DRAWN:	IC
APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (F.Totten A-2)
REVISION:	

SHEET TITLE
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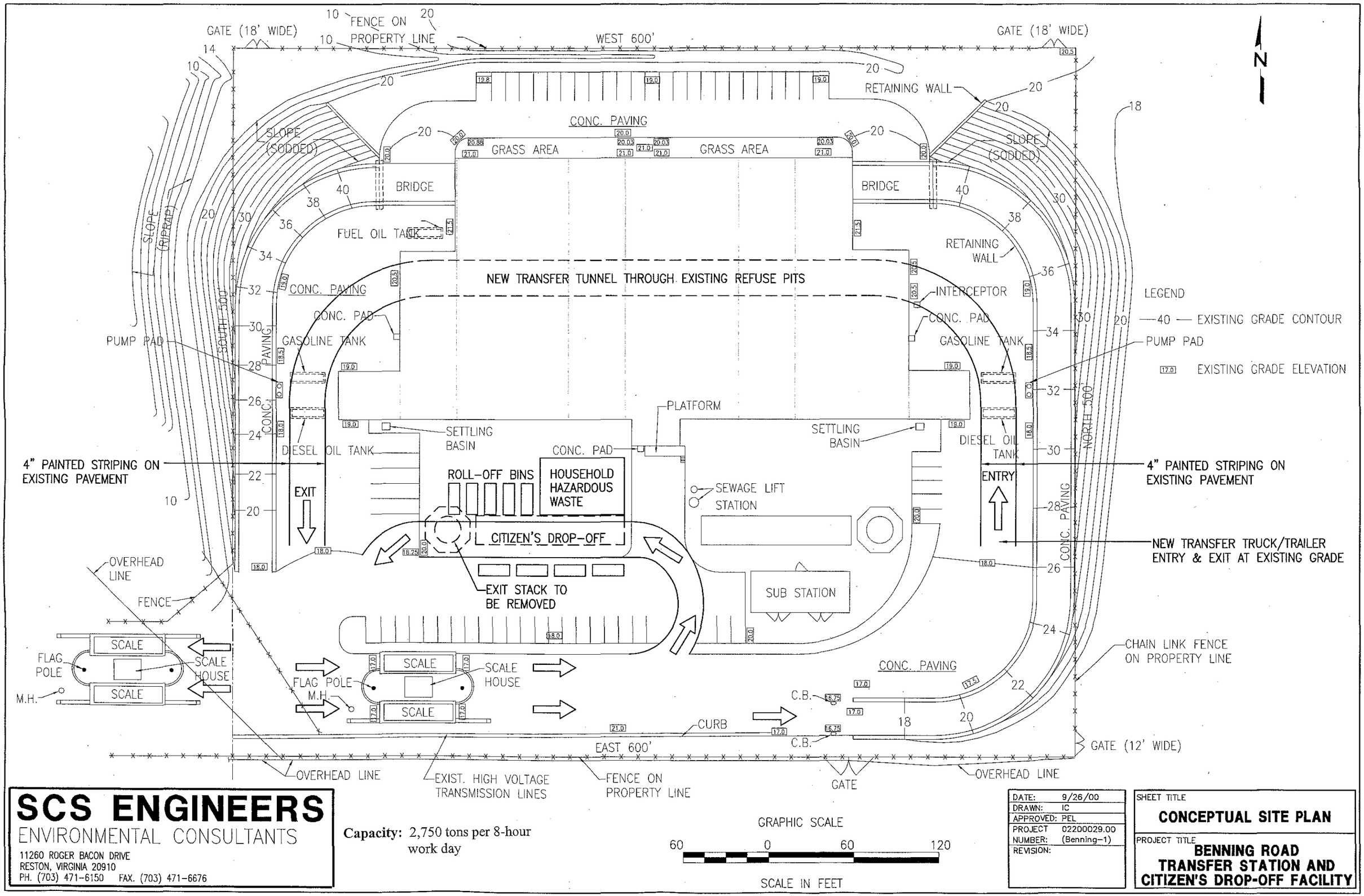
PROJECT TITLE
FORT TOTTEN TRANSFER STATION AND CITIZEN'S DROP OFF FACILITY



SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20910
PH. (703) 471-6150 FAX. (703) 471-6676

Capacity: 2,750 tons per 8-hour work day

GRAPHIC SCALE
60 0 60 120
SCALE IN FEET

DATE:	9/26/00
DRAWN:	IC
APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (Benning-1)
REVISION:	

SHEET TITLE
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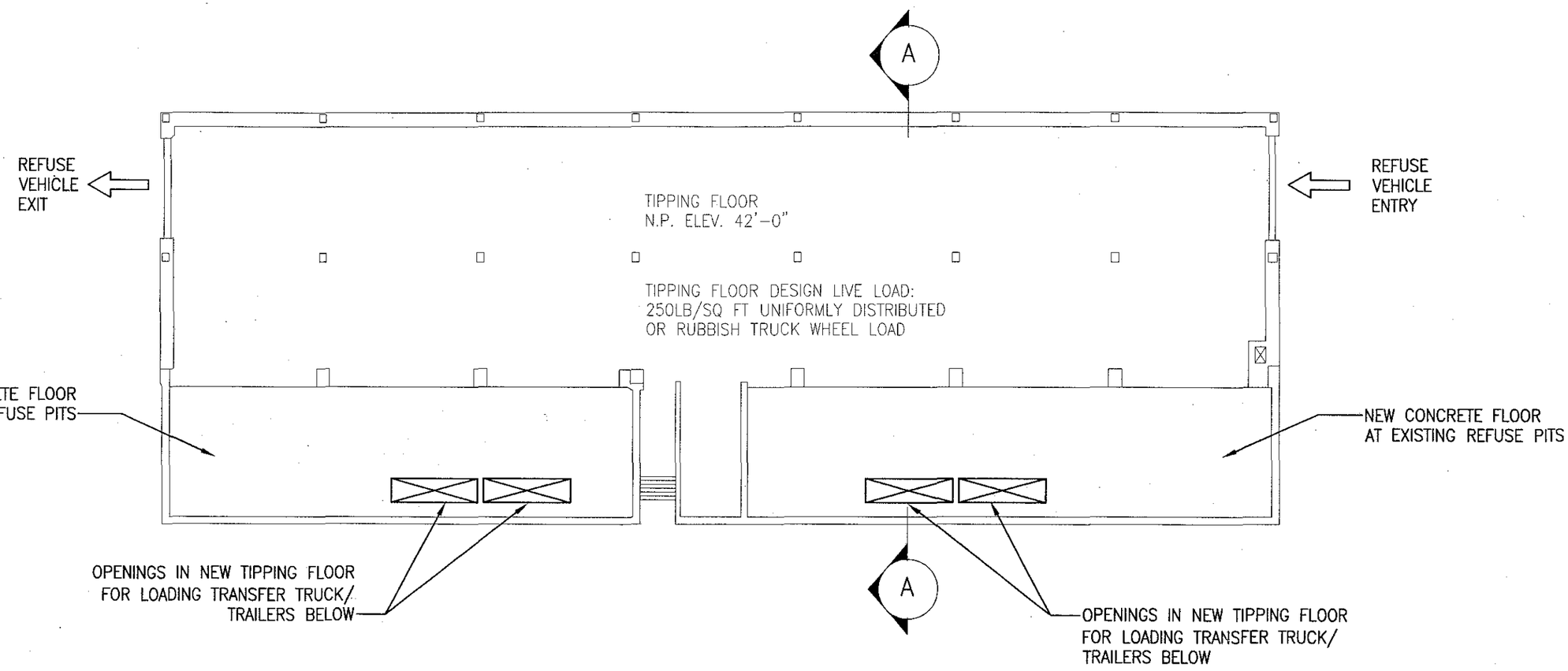
PROJECT TITLE
BENNING ROAD TRANSFER STATION AND CITIZEN'S DROP-OFF FACILITY



SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20910
PH. (703) 471-6150 FAX. (703) 471-6676

GRAPHIC SCALE
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SCALE IN FEET

DATE:	9/26/00
DRAWN:	IC
APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (Benning-2)
REVISION:	

SHEET TITLE
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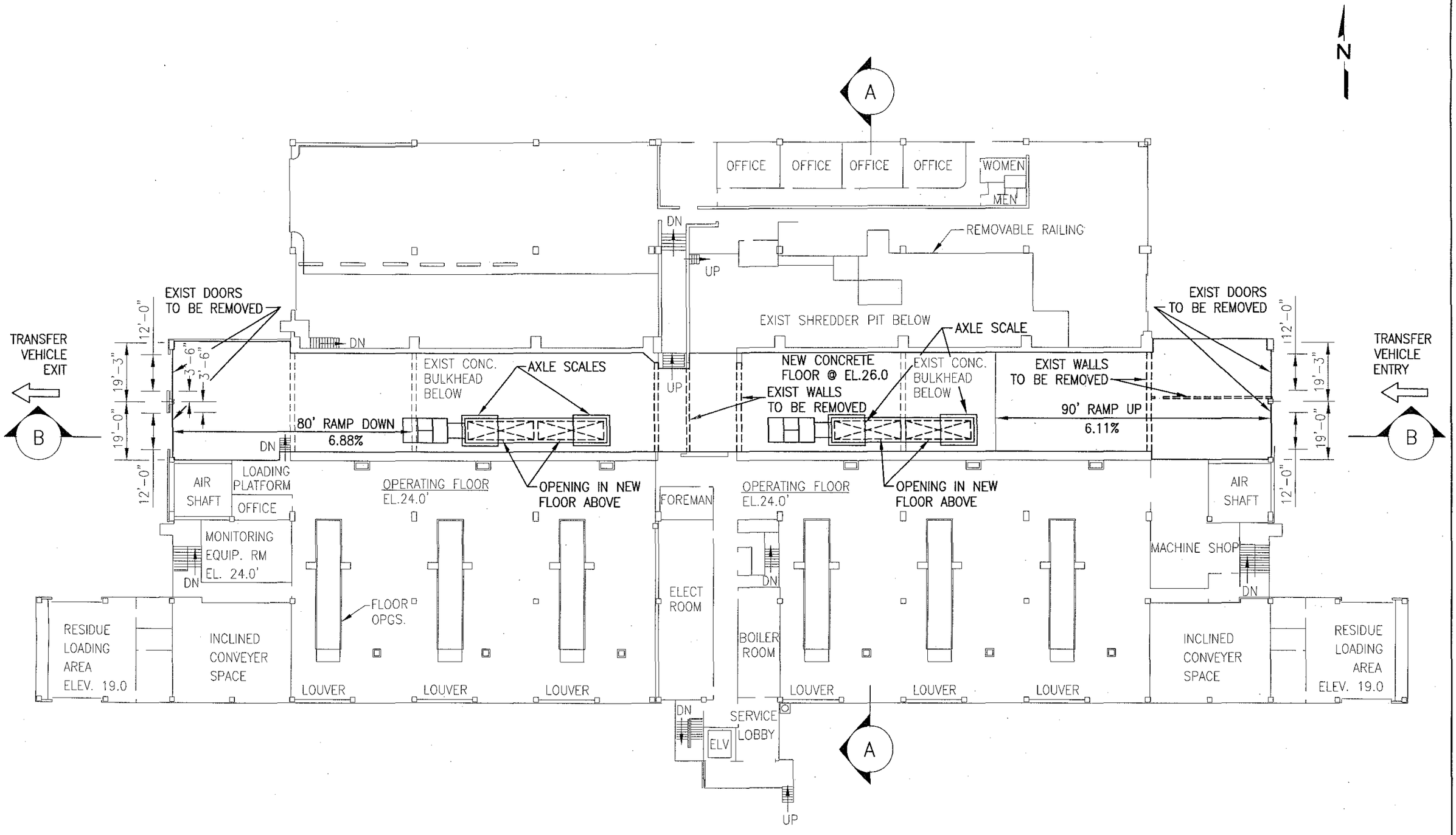
PROJECT TITLE
BENNING ROAD TRANSFER STATION AND CITIZEN'S DROP OFF FACILITY



GRAPHIC SCALE

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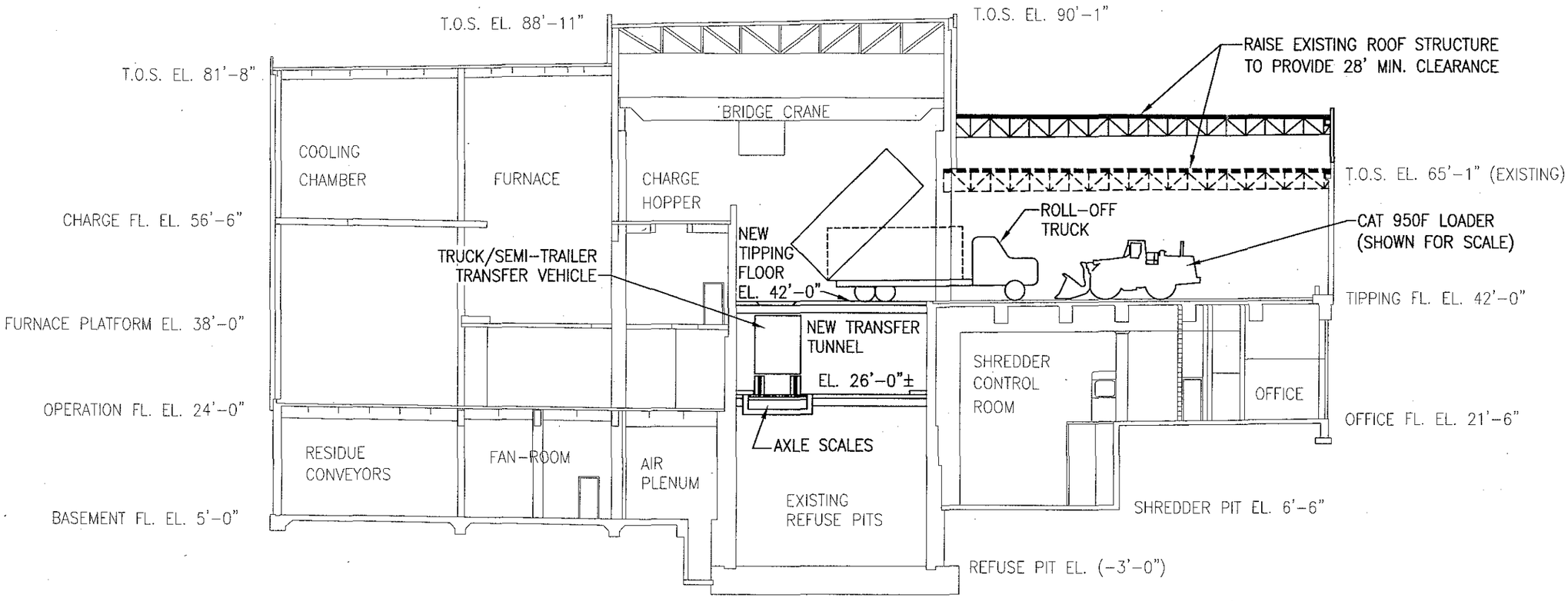
SCALE IN FEET

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20910
PH. (703) 471-6150 FAX. (703) 471-6676

DATE:	9/26/00
DRAWN:	IC
APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (Benning-4)
REVISION:	

SHEET TITLE
CONCEPTUAL TUNNEL FLOOR PLAN

PROJECT TITLE
BENNING ROAD TRANSFER STATION AND CITIZEN'S DROP OFF FACILITY



SECTION A

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20910
PH. (703) 471-6150 FAX. (703) 471-6676

GRAPHIC SCALE
20 0 20 40
SCALE IN FEET

DATE:	9/26/00
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APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (Benning-6)
REVISION:	

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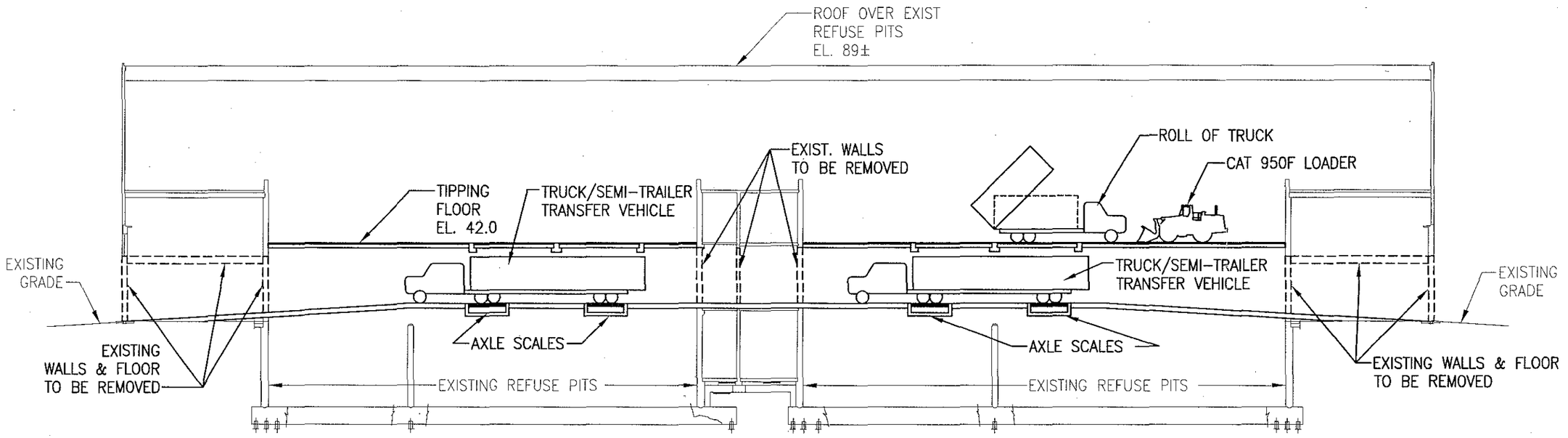

SECTION B

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20910
PH. (703) 471-6150 FAX. (703) 471-6676

GRAPHIC SCALE
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SCALE IN FEET

DATE:	9/26/00
DRAWN:	IC
APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (Benning-7)
REVISION:	

SHEET TITLE
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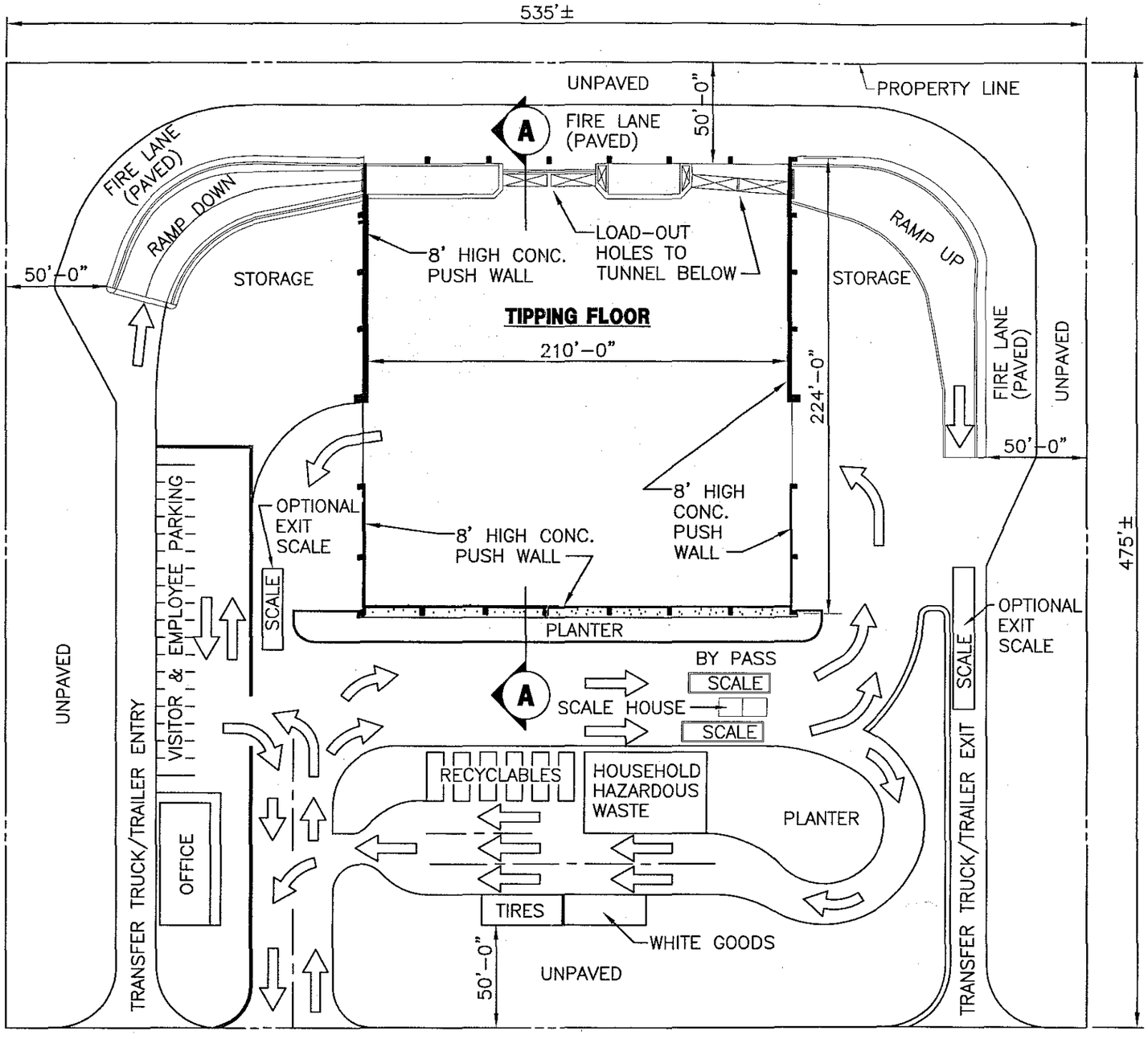
PROJECT TITLE
BENNING ROAD TRANSFER STATION AND CITIZEN'S DROP OFF FACILITY



Capacity: 2,500 tons per 8-hour work day

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20190
PH. (703) 471-6150 FAX. (703) 471-6676

GRAPHIC SCALE
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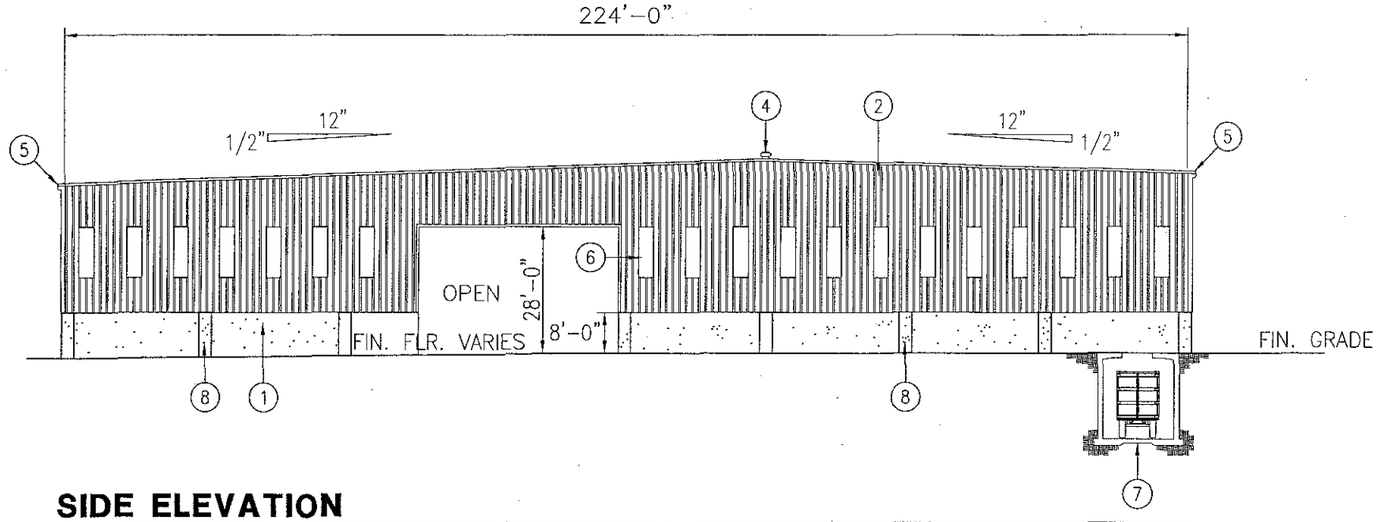
SCALE IN FEET

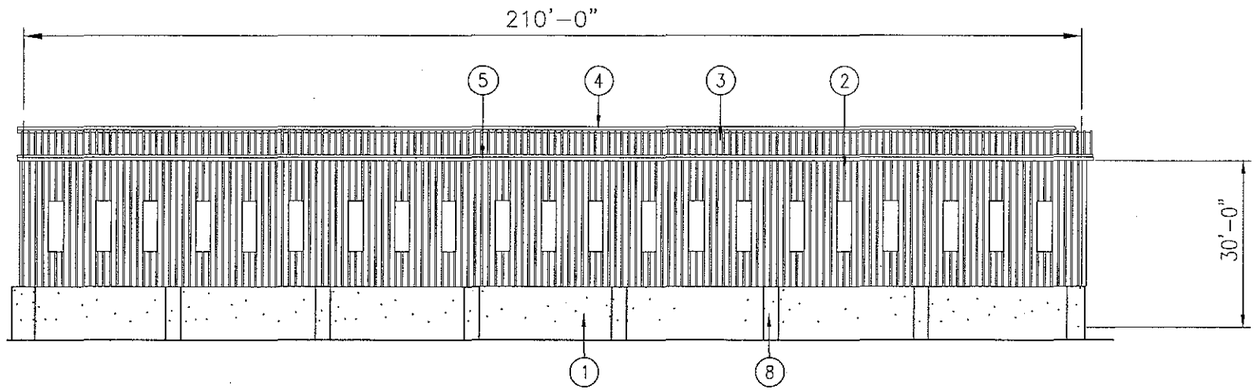
DATE:	9/26/00
DRAWN:	IC
APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (GENERIC/SHT1)
REVISION:	

SHEET TITLE
CONCEPT SITE PLAN

PROJECT TITLE
TRANSFER STATION AND CITIZEN'S DROP OFF FACILITY



SIDE ELEVATION



FRONT ELEVATION

ELEVATION NOTES

1. CONCRETE WALL
2. METAL SIDING
3. METAL ROOFING
4. CONTIN. RIDGE VENT
5. RAIN GUTTER
6. 3'X10' TRANSLUSCENT LITE PANEL
7. TUNNEL
8. CONCRETE PIER

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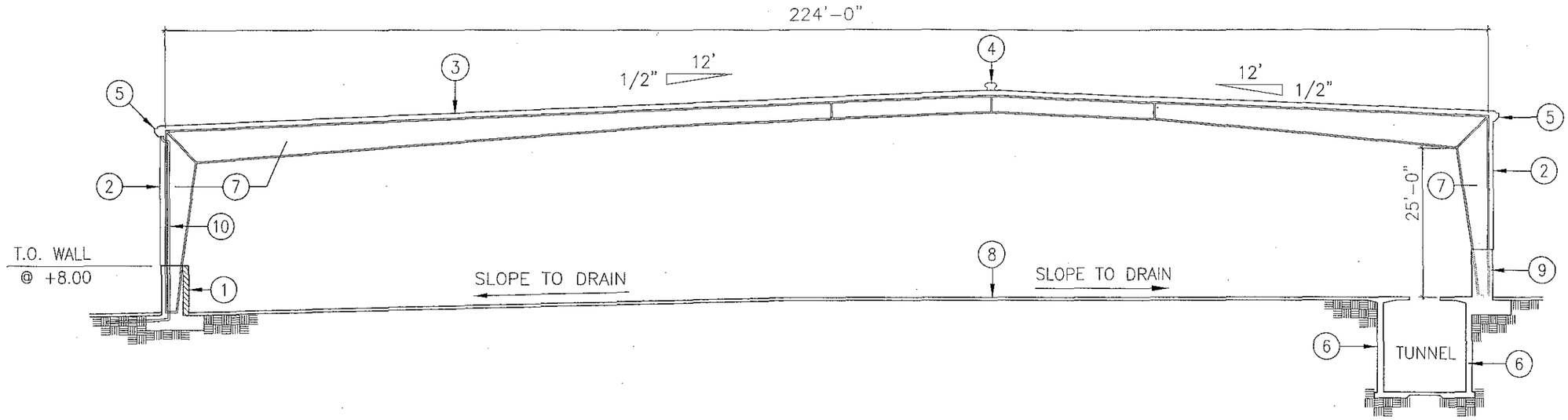
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20190
PH. (703) 471-6150 FAX. (703) 471-6676

GRAPHIC SCALE
30 0 30 60
SCALE IN FEET

DATE:	9/26/00
DRAWN:	IC
APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (Generic/SHT2)
REVISION:	

SHEET TITLE
ELEVATIONS

PROJECT TITLE
TRANSFER STATION AND CITIZEN'S DROP OFF FACILITY



SECTION A

SECTION NOTES

1. CAST-IN-PLACE CONCRETE WALL
2. METAL SIDING
3. METAL ROOFING
4. CONT. RIDGE
5. RAIN GUTTER
6. RETAINING WALL
7. PRE-ENGINEERED METAL BUILDING FRAME
8. CONCRETE FLOOR
9. CONCRETE PIER
10. DOWNSPOUT

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
11260 ROGER BACON DRIVE
RESTON, VIRGINIA 20190
PH. (703) 471-6150 FAX. (703) 471-6676

GRAPHIC SCALE
20 0 20 40
SCALE IN FEET

DATE:	9/26/00
DRAWN:	IC
APPROVED:	PEL
PROJECT NUMBER:	02200029.00 (Generic/SHT3)
REVISION:	

SHEET TITLE
SECTION

PROJECT TITLE
TRANSFER STATION AND CITIZEN'S DROP OFF FACILITY

Noel J. Fearon Associates Inc.
Construction Cost Consultants
23323 Los Codona Avenue, Torrance CA 90505

Telephone : (310) 378-0595
Fax : (310) 378-2035

CONCEPT DESIGN
CONSTRUCTION COST ESTIMATE

for

PROPOSED ADDITION TO EXISTING
WASTE TRANSFER STATION

at

FORT TOTTEN
WASHINGTON, D.C.

27-Sep-00

NJF Associates Inc.

BASIS OF THE COST ESTIMATE

			Dated	Received
Drawings:	Engineering:	Conceptual Site Plan	24-Aug-00	11-Sep-00
		Tipping floor plan	24-Aug-00	11-Sep-00
		Lower level floor plan	24-Aug-00	11-Sep-00
		Section of existing building and proposed addition	24-Aug-00	11-Sep-00
		Existing site plan, floor plans & section, for reference	Dec-74	11-Sep-00
Documents:		"Builtrite" materials handler cut sheet		
Meetings and discussions:		Discussions with Engineers		

PRICING ASSUMPTIONS

Bidding: Assumed that the project will be competitively bid by at least three competent General Contractors.

Labor costs: Assumed that prevailing wage contract conditions **WILL** apply to this project.

Line item pricing: Estimate line items are priced as "Subcontractor net price to General Contractor", including Subcontractor's overhead, profit and sales tax as appropriate. Allowances for General Contractor's overhead, profit and/or management fee are added on the estimate summary page.

Cost escalation: Estimate line items are priced at current market rates, including allowance for cost escalation during construction. As the anticipated bid date is not known, **NO** allowance for cost escalation to anticipated bid date or construction start date is added.

Construction schedule: Overall construction period of 5-6 months assumed for estimating purposes.

SCOPE OF WORK INCLUDED

New addition: New pre-engineered steel frame building, 35' span lean-to structure; reinforced concrete strip and pad foundation system assumed; uninsulated metal cladding to roof and exterior walls; Structural steel and reinforced concrete upper floor structure with discharge hoppers in floor; Minimal space heating and powered ventilation; Water spray misting system over waste materials; Lighting and fire sprinkler installation throughout.

Existing tipping floor: Demolition and removal of redundant equipment; Reinforced concrete infill panels to existing push pit floor openings; Minimal space heating and powered ventilation; Water spray misting system over waste materials.

Continued....

BASIS OF THE COST ESTIMATE

Continued....

Siteworks : Traffic lane markings for transfer truck routes; Allowance for (2) truck wash facilities.

EXCLUSIONS

General :

- Legal and financing costs
- Fire and all-risk insurance
- Construction contingency cost allowance
- Telephone and computer equipment, data transmission equipment, A/V equipment
- Work outside the areas impacted by construction, other than for utility connections.
- Utility connection charges
- Handling, removal or encapsulation of hazardous materials or contaminated soil

Project specific :

- Work to the existing building or structures, except where impacted by new work.
- Odor trapping filter system on exhaust fans
- Security and surveillance installations
- Emergency generator and UPS systems
- Cost escalation beyond December 2000, other than escalation during construction

NJF Associates Inc.

CONCEPT DESIGN STAGE COST ESTIMATE
CONSTRUCTION COST SUMMARY

			$/SF	$,000	$,000
Waste Transfer Building	45,000	SF	39.00		**1,755**
Site improvements					**546**
BUDGET FOR CONSTRUCTION BIDS - Oct/Dec 2000					**$2,301**
Recommended allowances for soft costs:					
Architectural & Engineering feees				10%	230
Survey and site investigation costs					10
Owner's fees and permit costs - assumed not applicable					N/A
Construction stage contingency fund				10%	230
RECOMMENDED CONSTRUCTION BUDGET					**$2,771**

NJF Associates Inc.

CONCEPT DESIGN STAGE COST ESTIMATE
CSI FORMAT COST SUMMARY

		Work to Existing & New Addition	Site	TOTAL
Gross impacted areas (SF):		*45,000*		*45,000*
Division				$
2 Sitework		29,674	60,063	**89,737**
3 Concrete		255,061	10,000	**265,061**
4 Masonry		0	0	**0**
5 Metals		196,800	0	**196,800**
6 Wood and plastics		1,000	0	**1,000**
7 Thermal and moisture protection		35,167	0	**35,167**
8 Doors and windows		33,300	0	**33,300**
9 Finishes		1,500	0	**1,500**
10 Specialties		59,400	0	**59,400**
11 Equipment		215,000	300,000	**515,000**
12 Furnishings		0	0	**0**
13 Special Construction		92,400	0	**92,400**
14 Conveying systems		0	0	**0**
15 Mechanical		221,760	0	**221,760**
16 Electrical		100,100	17,400	**117,500**
17 Communications Systems		4,000	0	**4,000**
Subtotal :		**$1,245,162**	**$387,463**	**$1,632,625**
1 General Conditions and Site management	8.0%	99,613	30,997	**130,610**
Contractor Insurances	2.0%	26,896	8,369	**35,265**
Bonds	2.0%	27,433	8,537	**35,970**
General Contractor's Fee	12.0%	167,892	52,244	**220,136**
Design Contingency	12.0%	188,040	58,513	**246,553**
BUDGET FOR CONSTRUCTION BIDS - Oct/Dec 2000		**$1,755,036**	**$546,123**	**$2,301,159**
Cost per SF of gross impacted area:		*$39.00*		*$51.14*

NJF Associates Inc.

FORT TOTTEN WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Work to Existing and New Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
02	**SITE WORK**							
02200	Site Preparation							
	Building Demolition							
	Strip areas of existing metal wall siding and framing for new openings; remove debris to	EA	1,200.00	2	**2,400**		**0**	2,400
	- for structural steel connections to existing framing	EA	110.00	12	**1,320**		**0**	1,320
	- for structural support to new upper floor	LF	19.00	220	**4,180**		**0**	4,180
	Disconnect and remove existing push pit ram, power unit and associated equipment	EA	2,500.00	6	**15,000**		**0**	15,000
	Truck stop rails; patch and refinish existing floor surface	EA	200.00	24	**4,800**		**0**	4,800
	Site Demolition							
	Sawcut existing reinforced concrete paving for new footings	LF	5.30		**0**	1,100	**5,830**	5,830
	Break up sections of existing concrete paving for new footings	SF	2.40		**0**	2,800	**6,720**	6,720
	Load and remove debris to dump	CY	49.30		**0**	75	**3,698**	3,698
02300	Earthwork							
	Excavation and Fill							
	Excavation							
	Excavation for footings, backfill and disposal	CY	28.20	70	**1,974**		**0**	1,974
02500	Utility Services							
	Water and fire mains							
	Extend existing site water main piping and fittings to serve new truck wash units; including excavation and backfill - 3"-4" diameter	LF	20.00		**0**	350	**7,000**	7,000
	Sanitary sewer drains							
	Allowance for modifications to existing sanitary sewer drainage system for new	LS	5,000.00		**0**	1	**5,000**	5,000
02600	Drainage and Containment							
	Storm drainage							
	Storm water drain piping and fittings, in trenches, 8" diameter	LF	14.70		**0**	450	**6,615**	6,615
	Catch basin and grating - allow	EA	1,900.00		**0**	4	**7,600**	7,600
	Sawcut and break existing paving for pipe trenches; reinstate on completion	LF	28.00		**0**	450	**12,600**	12,600
	Allowance for modifications to existing storm drainage system for new building	LS	5,000.00		**0**	1	**5,000**	5,000
	Total for Division 02 SITE WORK :				**$ 29,674**		**$ 60,063**	$ 89,737

FORT TOTTEN WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE		Unit	U/price	Work to Existing and New Building		Site		Total
CSI FORMAT			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
03	**CONCRETE**							
03300	Cast-in-place Concrete							
	Poured in place structural concrete, including forms and reinforcing bar							
	Footings, pumped - allow	CY	169.00	40	**6,760**		**0**	6,760
	Scale pit walls, slab and support curbs, 12' x 10'	EA	5,850.00	4	**23,400**		**0**	23,400
	Equipment pads and similar - allow	CY	195.00	5	**975**		**0**	975
	Infill floor slabs, pumped, 10" thick - in existing buildings	CY	137.00	80	**10,960**		**0**	10,960
	Galvanized metal deck permanent soffit	SF	1.90	2,500	**4,750**		**0**	4,750
	Steel reinforcing bar - allow 3.5 #/SF	#	0.73	8,750	**6,388**		**0**	6,388
	Surface finish - non-slip wearing surface	SF	1.20	2,500	**3,000**		**0**	3,000
	Trench drain walls and base	LF	98.00	70	**6,860**		**0**	6,860
	Sump pit	EA	540.00	2	**1,080**		**0**	1,080
	Ramps, pit and equipment bases for truck wash units - allow	EA	5,000.00		**0**	2	**10,000**	10,000
	Reinforced concrete upper floor slab - assume 12"							
	Poured in place structural concrete, pumped; to slab and beam casings	CY	111.00	400	**44,400**		**0**	44,400
	Formwork and propping, 14'-16' high, to slabs	SF	7.20	7,600	**54,720**		**0**	54,720
	, to beams	SF	8.50	5,700	**48,450**		**0**	48,450
	Steel reinforcing bar - allow 3.5 #/SF	#	0.64	26,600	**17,024**		**0**	17,024
	Surface finish - non-slip wearing surface	SF	1.20	7,600	**9,120**		**0**	9,120
	Slab on grade							
	Poured in place structural concrete, in repairs to existing paving - 8" thick	CY	83.00	70	**5,810**		**0**	5,810
	Compacted gravel base and vapor barrier-6" thick	SF	2.44	2,800	**6,832**		**0**	6,832
	Forms and joints - allow	LF	2.00	600	**1,200**		**0**	1,200
	Steel reinforcing bar	#	0.64	3,500	**2,240**		**0**	2,240
	Curing and broom finish	SF	0.39	2,800	**1,092**		**0**	1,092
	Total for Division 03 CONCRETE :				**$ 255,061**		**$ 10,000**	**$ 265,061**
04	**MASONRY**							
	NOT USED							
	Total for Division 04 MASONRY :				**$ -**		**$ -**	**$ -**

FORT TOTTEN WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE		Unit	U/price	Work to Existing and New Building		Site		Total
CSI FORMAT			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
05	**METALS**							
05100	Structural Metal Framing							
	Structural steel							
	Structural floor framing; WF sections, welded fabrication and site bolted	TN	1,560.00	25.5	**39,780**		**0**	39,780
	Steel support angles to concrete infill panels, allow 20 #/LF	TN	2,060.00	6.5	**13,390**		**0**	13,390
	Drill and bolt to existing concrete	EA	31.00	120.0	**3,720**		**0**	3,720
	Allow for support steel and weather-proofing to roof mounted exhaust fans and unit heaters	EA	600.00	36	**21,600**		**0**	21,600
05500	Metal fabrications							
	Railings							
	Trench drain gratings and support angles, cast	LF	70.00	70	**4,900**		**0**	4,900
	Protective bollards and wall guards							
	Painted steel pipe bollards, set in concrete base - allow	EA	880.00	26	**22,880**		**0**	22,880
	Protective steel plate corner guards to existing columns and slab	LF	44.00	120	**5,280**		**0**	5,280
	Steel plate and support framing to floor openings - allow	TN	1,550.00	55	**85,250**		**0**	85,250
	Total for Division 05 METALS :				**$ 196,800**		**$ -**	**$ 196,800**
06	**WOOD AND PLASTICS**							
06100	Rough carpentry							
	Miscellaneous rough carpentry and rough hardware - allow	LS	1,000.00	1	**1,000**		**0**	1,000
06200	Finish carpentry							
	No work							
	Total for Division 06 WOOD AND PLASTICS :				**$ 1,000**		**$ -**	**$ 1,000**
07	**THERMAL AND MOISTURE PROTECTION**							
07400	Roofing and Siding Panels							
	Siding panels							
	Repairs and trims to new openings in existing siding at new push pits	LF	26.90	130	**3,497**		**0**	3,497
	- for structural steel connections to existing framing	EA	310.00	12	**3,720**		**0**	3,720
	- for structural support to new upper floor	LF	40.00	220	**8,800**		**0**	8,800
	Form and trim new openings in existing metal roofing for new exhaust fans	EA	450.00	12	**5,400**		**0**	5,400

FORT TOTTEN WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Work to Existing and New Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
07800	Fire and Smoke Protection							
	Sprayed fireproofing on structural steel members							
	Structural columns to new addition - allow	SF	1.50	8,500	**12,750**		**0**	12,750
07910	Joint sealants and caulking							
	Caulking and sealants							
	Allowance	LS	1,000.00	1	**1,000**		**0**	1,000
	Total for Division 07 THERMAL AND MOISTURE PROTECTION :				**$ 35,167**		**$ -**	**$ 35,167**
08	**DOORS AND WINDOWS**							
08300	Specialty Doors							
	Roll up doors							
	Prefinished steel fabrication, including hardware; motorized operation - approx.	EA	3,700.00	9	**33,300**		**0**	33,300
	Total for Division 08 DOORS AND WINDOWS :				**$ 33,300**		**$ -**	**$ 33,300**
09	**FINISHES**							
09900	Painting							
	Exterior and interior							
	Allowance for miscellaneous painting to exposed metals	LS	1,500.00	1	**1,500**		**0**	1,500
	Total for Division 09 FINISHES :				**$ 1,500**		**$ -**	**$ 1,500**
10	**SPECIALTIES**							
10520	Fire extinguishers and cabinets							
	Fire extinguisher and surface mounting bracket	EA	150.00	4	**600**		**0**	600
10880	Scales							
	Truck scales, including steel weigh-bridge							
	Axle scales, 12' x 10' platform, 50 Ton capacity	EA	14,700.00	4	**58,800**		**0**	58,800
	Total for Division 10 SPECIALTIES :				**$ 59,400**		**$ -**	**$ 59,400**
11	**EQUIPMENT**							
11500	Industrial and Process Equipment							
	Industrial equipment							
	"Builtrite Model 2100" fixed material handler;							
	3 - 10 ton capacity; including operator cab	EA	100,000.00	2	**200,000**		**0**	200,000
	Hoist, install and connect	EA	7,500.00	2	**15,000**		**0**	15,000
	Budget allowance for truck wash facilities	EA	150,000		**0**	2	**300,000**	300,000
	Total for Division 11 EQUIPMENT :				**$ 215,000**		**$ 300,000**	**$ 515,000**

FORT TOTTEN WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE		Unit	U/price	Work to Existing and New Building		Site		Total
CSI FORMAT			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
12	**FURNISHINGS**							
	NOT USED							
	Total for Division 12 FURNISHINGS :				**$ -**		**$ -**	**$ -**
13	**SPECIAL CONSTRUCTION**							
13120	Pre-Engineered Structures							
	Pre-Engineered Steel Buildings							
	Clear single-span lean-to frame; 35' clear span; 48' exterior eave height; single skin prefinished metal roof and exterior wall cladding	SF	12.00	7,700	**92,400**		**0**	92,400
	Total for Division 13 SPECIAL CONSTRUCTION :				**$ 92,400**		**$ -**	**$ 92,400**
14	**CONVEYING SYSTEMS**							
	NOT USED							
	Total for Division 14 CONVEYING SYSTEMS :				**$ -**		**$ -**	**$ -**
15	**PLUMBING AND MECHANICAL**							
15400	Plumbing Systems							
	Plumbing equipment							
	Sump pumps in scale pits	EA	1,800.00	4	**7,200**		**0**	7,200
	Allowance for water spray misting system to reduce dust and prevent combustion; hand/auto control system	SF	0.65	14,000	**9,100**		**0**	9,100
15500	Fire Protection Systems							
	New wet pipe fire sprinkler system - allow	SF	1.65	15,400	**25,410**		**0**	25,410
15700	Mechanical System Piping and Equipment							
	No work							
15800	Heating, Ventilation and Air-Conditioning							
	Exhaust ventialtion system							
	Allowance for roof mounted exhaust air handlers, dust filters, stub ducts and grilles; 4 air changes per hour	CFM	1.10	80,000	**88,000**		**0**	88,000
	Exhaust ductwork to serve tunnel - allow	#	4.00	2,200	**8,800**		**0**	8,800
	Space heating							
	Allowance for suspension mounted warm air blower type unit heaters, gas or oil fired; including piping and storage tank; to maintain 60 deg F	SF	2.25	37,000	**83,250**		**0**	83,250
	Total for Division 15 PLUMBING AND MECHANICAL :				**$ 221,760**		**$ -**	**$ 221,760**

FORT TOTTEN WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE		Unit	U/price	Work to Existing and New Building		Site		Total
CSI FORMAT			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
16	**ELECTRICAL**							
16200	Electrical Power							
	Sub-main panelboards and feeders for new expansion - allow	EA	7,500.00	2	**15,000**		**0**	15,000
	Demolition/modification of existing power supplies to redundant equipment - allow	LS	5,000.00	1	**5,000**		**0**	5,000
	Utility and convenience power outlets, WP/GFI; including conduit and wiring - allow	EA	450.00	10	**4,500**		**0**	4,500
	Power connections to exhaust fans, heater units, sump pumps, scales etc.	EA	700.00	42	**29,400**	6	**4,200**	33,600
	- material handler control panel, feeder and connection	EA	3,500.00	2	**7,000**		**0**	7,000
	- truck wash panelboard, feeder and	EA	3,000.00		**0**	2	**6,000**	6,000
16500	Lighting							
	Interior lighting, including conduit and wiring							
	New high-bay lighting fixtures in Waste transfer	EA	800.00	36	**28,800**		**0**	28,800
	Watertight fixtures in truck wash units	EA	600.00		**0**	12	**7,200**	7,200
	Exterior flood lights on new building addition - allow	EA	800.00	8	**6,400**		**0**	6,400
	Lighting switches and control panels - allow	EA	2,000.00	2	**4,000**		**0**	4,000
	Total for Division 16 ELECTRICAL :				**$ 100,100**		**$ 17,400**	**$ 117,500**
17	**COMMUNICATIONS SYSTEMS**							
17110	Raceways, Boxes and Fittings							
	Fire alarm system							
	Allowance for manual pull stations and alarm devices in building addition	EA	1,000.00	4	**4,000**		**0**	4,000
	Total for Division 17 COMMUNICATIONS SYSTEMS :				**$ 4,000**		**$ -**	**$ 4,000**

Noel J. Fearon Associates Inc.
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Telephone : (310) 378-0595
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CONCEPT DESIGN
CONSTRUCTION COST ESTIMATE

for

WASTE TRANSFER STATION and CITIZENS' DROP-OFF FACILITY

at

BENNING ROAD
WASHINGTON, D.C.

27-Sep-00

NJF Associates Inc.

BASIS OF THE COST ESTIMATE

			Dated	Received
Drawings:	Engineering:	Conceptual Site Plan	24-Aug-00	11-Sep-00
		Tunnel floor plan	24-Aug-00	11-Sep-00
		Tipping floor plan	24-Aug-00	11-Sep-00
		Transverse building section	24-Aug-00	11-Sep-00
		Building section X-X	24-Aug-00	11-Sep-00
		Typical original construction details, for reference		01-Sep-00
Documents:		None		
Meetings and discussions:		Discussions with Engineers		

PRICING ASSUMPTIONS

Bidding: Assumed that the project will be competitively bid by at least three competent General Contractors.

Labor costs: Assumed that prevailing wage contract conditions **WILL** apply to this project.

Line item pricing: Estimate line items are priced as "Subcontractor net price to General Contractor", including Subcontractor's overhead, profit and sales tax as appropriate. Allowances for General Contractor's overhead, profit and/or management fee are added on the estimate summary page.

Cost escalation: Estimate line items are priced at current market rates, including allowance for cost escalation during construction. As the anticipated bid date is not known, **NO** allowance for cost escalation to anticipated bid date or construction start date is added.

Construction schedule: Overall construction period of 6-7 months assumed for estimating purposes.

SCOPE OF WORK INCLUDED

Transfer tunnel: Demolition of sections of existing walls and floor slabs; new precast and/or poured in place reinforced concrete ramp and tunnel slabs and supporting beams and corbels

Tipping floor: Demolition of existing roof deck and roof finish; removal and re-installation of existing roof trusses at higher roof level; extended exterior wall and parapet construction; new roof deck and roof finish; modifications and repairs to adjoining exterior wall siding where impacted by new work; Minimal space heating and powered ventilation; Water spray misting system over waste materials.

Continued....

BASIS OF THE COST ESTIMATE

Continued....

Siteworks : Minor repairs only to existing paving at citizens' drop-off area; allowance for adjusting existing grade levels for new drop-off bay; traffic lane markings for transfer truck routes; Covered storage for household hazardous wate area; Allowance for (2) truck wash facilities.

EXCLUSIONS

General :

- Legal and financing costs
- Fire and all-risk insurance
- Construction contingency cost allowance
- Telephone and computer equipment, data transmission equipment, A/V equipment
- Work outside the areas impacted by construction, other than for utility connections.
- Utility connection charges
- Handling, removal or encapsulation of hazardous materials or contaminated soil

Project specific :

- Demolition of the west chimney stack and removal of debris
- Work to the existing building or structures, except where impacted by new work.
- Odor trapping filter system on exhaust fans
- Security and surveillance installations
- Emergency generator and UPS systems
- Cost escalation beyond December 2000, other than escalation during construction

NJF Associates Inc.

CONCEPT DESIGN STAGE COST ESTIMATE
CONSTRUCTION COST SUMMARY

			$/SF	$,000	$,000
Waste Transfer Building	40,000	SF	66.65		**2,666**
Site improvements					**600**
BUDGET FOR CONSTRUCTION BIDS - Oct/Dec 2000					**$3,266**
Recommended allowances for soft costs:					
Architectural & Engineering feees				10%	327
Survey and site investigation costs					10
Owner's fees and permit costs - assumed not applicable					N/A
Construction stage contingency fund				10%	327
RECOMMENDED CONSTRUCTION BUDGET					**$3,930**

NJF Associates Inc.

CONCEPT DESIGN STAGE COST ESTIMATE
CSI FORMAT COST SUMMARY

		Work to Existing Building	Site	TOTAL
Gross impacted areas (SF):		*40,000*		*40,000*
Division				$
2 Sitework		285,237	83,988	**369,225**
3 Concrete		868,918	10,000	**878,918**
4 Masonry		0	0	**0**
5 Metals		259,793	0	**259,793**
6 Wood and plastics		2,000	0	**2,000**
7 Thermal and moisture protection		146,050	0	**146,050**
8 Doors and windows		0	0	**0**
9 Finishes		2,000	0	**2,000**
10 Specialties		600	0	**600**
11 Equipment		0	305,400	**305,400**
12 Furnishings		0	0	**0**
13 Special Construction		0	9,000	**9,000**
14 Conveying systems		0	0	**0**
15 Mechanical		218,060	0	**218,060**
16 Electrical		100,900	17,400	**118,300**
17 Communications Systems		8,000	0	**8,000**
Subtotal :		**$1,891,558**	**$425,788**	**$2,317,346**
1 General Conditions and Site management	8.0%	151,325	34,063	**185,388**
Contractor Insurances	2.0%	40,858	9,197	**50,055**
Bonds	2.0%	41,675	9,381	**51,056**
General Contractor's Fee	12.0%	255,050	57,411	**312,461**
Design Contingency	12.0%	285,656	64,301	**349,957**
BUDGET FOR CONSTRUCTION BIDS - Oct/Dec 2000		**$2,666,122**	**$600,141**	**$3,266,263**
Cost per SF of gross impacted area:		*$66.65*		*$81.66*

NJF Associates Inc.

BENNING ROAD WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT *Division* / *Description*	*Unit*	*U/price* $	Work to Existing Building *Quantity*	Work to Existing Building *Cost* $	Site *Quantity*	Site *Cost* $	Total $
02 SITE WORK							
02200 Site Preparation							
Building Demolition							
Demolish and remove existing roll-up doors	EA	222.00	4	**888**		**0**	888
Sawcut existing reinforced concrete walls and slabs prior to demolition	LF	22.00	2,070	**45,540**		**0**	45,540
Burn or cut wall and slab reinforcement	LF	13.00	1,220	**15,860**		**0**	15,860
Demolish sections of existing reinforced concrete walls, 12" - 18" thick	CF	28.00	4,800	**134,400**		**0**	134,400
- reinforced concrete suspended slabs, 12"-15" thick	SF	5.00	3,000	**15,000**		**0**	15,000
Demolish columns at East and West entry doors	LF	28.20	36	**1,015**		**0**	1,015
Temporary propping and supports to walls and slabs	LF	37.60	270	**10,152**		**0**	10,152
Demolish sections of existing concrete curb at Tipping floor	LF	3.80	222	**844**		**0**	844
Strip existing metal wall siding for raised roof structure above Tipping floor	SF	0.70	3,000	**2,100**		**0**	2,100
Strip existing roof finish and remove metal deck roofing above Tipping floor	SF	1.60	19,600	**31,360**		**0**	31,360
Cut or unbolt existing roof truss support ends, and provide temporary support for	EA	140.90	48	**6,763**		**0**	6,763
Load and remove debris to dump	CY	49.00	435	**21,315**		**0**	21,315
Site Demolition							
Break up sections of existing concrete slabs and remove debris - allow	SF	2.40		**0**	6,100	**14,640**	14,640
02300 Earthwork							
Grading							
Excavate and regrade sections of existing paved areas - allow	SF	2.35		**0**	6,100	**14,335**	14,335
Haul and dump off site	CY	15.02		**0**	100	**1,502**	1,502
02500 Utility Services							
Water and fire mains							
Extend existing site water main piping and fittings to serve new truck wash units; including excavation and backfill - 3"-4" diameter	LF	20.00		**0**	250	**5,000**	5,000
02600 Drainage and Containment							
Storm drainage							
Allowance for modifications to existing storm drainage system at regraded paved areas and new truck wash facilities	LS	5,600.00		**0**	1	**5,600**	5,600
Catch basin and grating - allow	EA	1,900.00		**0**	3	**5,700**	5,700

BENNING ROAD WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Work to Existing Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
02700	Bases and Pavements							
	Asphalt Paving							
	Work to existing A.C. paving for roadways							
	Pavement marking lines, thermoplastic	LF	1.00		0	1,500	1,500	1,500
	Concrete Paving							
	Paving in repairs							
	Replace sections of regraded paving - 8" base, 6" reinforced concrete	SF	3.41		0	6,100	20,801	20,801
	Work to existing concrete paving to access roads and drop-off areas							
	Patch repair and refinish existing paving -	SF	0.73		0	15,000	10,950	10,950
	Patch repair existing concrete curb and gutter	LF	9.75		0	50	488	488
	Concrete curb only	LF	8.68		0	400	3,472	3,472
	Total for Division 02 SITE WORK :				**$ 285,237**		**$ 83,988**	$ 369,225
03	CONCRETE							
03300	Cast-in-place Concrete							
	Poured in place structural concrete, including forms							
	Ramp walkways, 6" thick	CY	146.00	35	5,110		0	5,110
	Equipment pads and similar - allow	CY	195.00	6	1,170		0	1,170
	Trench drain walls and base	LF	98.00	66	6,468		0	6,468
	Sump pit	EA	540.00	2	1,080		0	1,080
	Ramps, pit and equipment bases for truck wash units - allow	EA	5,000.00		0	2	10,000	10,000
	Structural columns, piers and beams; framing to new openings in concrete walls							
	Trim and prepare existing concrete surfaces for new work	SF	20.00	750	15,000		0	15,000
	Poured in place structural concrete, pumped; placed in small sections by hand	CY	223.00	120	26,760		0	26,760
	Formwork, assume 2 uses	SF	14.00	4,000	56,000		0	56,000
	Drill, tie-in and grout new work to existing	LF	39.00	620	24,180		0	24,180
	Steel reinforcing bar - allow 150 #/CY	#	0.73	18,000	13,140		0	13,140
	Surface finish - sack & patch	SF	0.76	4,000	3,040		0	3,040
	Structural beams and corbels to support new tunnel slabs							
	Cut chase in existing reinforced concrete structural walls; expose reinforcing bars	SF	19.50	2,200	42,900		0	42,900
	Poured in place structural concrete, pumped; placed in small sections by hand	CY	223.00	230	51,290		0	51,290
	Formwork, assume 2 uses	SF	15.60	9,500	148,200		0	148,200
	Drill, tie-in and grout new work to existing	LF	39.00	2,680	104,520		0	104,520
	Steel reinforcing bar - allow 175 #/CY	#	0.73	40,250	29,383		0	29,383
	Surface finish - sack & patch	SF	0.76	8,000	6,080		0	6,080
	Scaffold or work platform over existing refuse	LF	39.00	1,100	42,900		0	42,900

BENNING ROAD WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Work to Existing Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
	Precast concrete structural slabs, 33' span; reinforced concrete structural topping slab							
	Precast concrete structural slabs, 33' span, 100 #/SF; allow 12" thick	SF	7.00	17,200	**120,400**		**0**	120,400
	Miscellaneous metal cast-ins and ties; allow 1 #/SF	SF	1.20	17,200	**20,640**		**0**	20,640
	Poured in place structural topping concrete, direct chute	CY	84.00	390	**32,760**		**0**	32,760
	Forms and joints - allow	LF	2.00	3,000	**6,000**		**0**	6,000
	Steel reinforcing bar - allow 1.5 #/SF	#	0.64	25,800	**16,512**		**0**	16,512
	Surface finish - non-slip wearing surface	SF	1.20	17,200	**20,640**		**0**	20,640
	Form openings, trimmer beams and curbs	CY	975.00	50	**48,750**		**0**	48,750
	Slab on grade							
	Poured in place structural concrete, 10" thick	CY	83.00	125	**10,375**		**0**	10,375
	Compacted gravel base and vapor barrier-sloping, average 12" thick	SF	2.44	4,000	**9,760**		**0**	9,760
	Forms and joints - allow	LF	2.00	550	**1,100**		**0**	1,100
	Steel reinforcing bar	#	0.64	5,000	**3,200**		**0**	3,200
	Curing and broom finish	SF	0.39	4,000	**1,560**		**0**	1,560
	Total for Division 03 CONCRETE :				**$ 868,918**		**$ 10,000**	**$ 878,918**
04	**MASONRY**							
	NOT USED							
	Total for Division 04 MASONRY :				**$ -**		**$ -**	**$ -**
05	**METALS**							
05100	Structural Metal Framing							
	Structural steel							
	Steel framing to extend height of columns and exterior wall framing to the existing Tipping floor - allow	TN	3,090.00	16.0	**49,440**		**0**	49,440
	Allowance for modifications and stiffening to existing steel framing at bridge crane lvel, to support raised roof	LF	46.00	280	**12,880**		**0**	12,880
	Hoist and reinstall existing roof trusses, 68' long; bolted or welded connections to existing and new steel framing; temporary supports	EA	1,575.90	48	**75,643**		**0**	75,643
	Allow for support steel and weather-proofing to roof mounted exhaust fans and unit heaters	EA	600.00	30	**18,000**		**0**	18,000
05300	Metal decking							
	Steel deck							
	Galvanized steel open cell decking; allow 3"x 20gauge; spot welded connections	SF	1.90	20,000	**38,000**		**0**	38,000

BENNING ROAD WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Work to Existing Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
05500	Metal fabrications							
	Railings							
	Trench drain gratings and support angles, cast	LF	70.00	66	**4,620**		**0**	4,620
	Protective bollards and wall guards							
	Painted steel pipe bollards, set in concrete base - allow	EA	880.00	12	**10,560**		**0**	10,560
	Protective steel plate corner guards to existing columns and walls	EA	515.00	16	**8,240**		**0**	8,240
	Steel plate and support framing to floor openings - allow	TN	2,010.00	18	**36,180**		**0**	36,180
	Steel protective angles to drop pits in new tunnel slab	LF	44.50	140	**6,230**		**0**	6,230
	Total for Division 05 METALS :				**$ 259,793**		**$ -**	**$ 259,793**
06	WOOD AND PLASTICS							
06100	Rough carpentry							
	Miscellaneous rough carpentry and rough hardware - allow	LS	2,000.00	1	**2,000**		**0**	2,000
06200	Finish carpentry							
	No work							
	Total for Division 06 WOOD AND PLASTICS :				**$ 2,000**		**$ -**	**$ 2,000**
07	THERMAL AND MOISTURE PROTECTION							
07400	Roofing and Siding Panels							
	Siding panels							
	New metal siding panels and girts, to match existing; at raised roof to Tipping floor	SF	5.80	4,800	**27,840**		**0**	27,840
	Temporarily remove existing siding panels and parapet capping; reinstall	LF	36.00	420	**15,120**		**0**	15,120
	Temporarily lift existing siding panels and reinstall	LF	22.00	284	**6,248**		**0**	6,248
	Parapet capping, upstand strip and flashings	LF	14.30	420	**6,006**		**0**	6,006
	Eave and gutter detail - allow	LF	22.00	420	**9,240**		**0**	9,240
	Scaffolding to existing Tipping floor exterior wall elevation	SF	0.70	10,000	**7,000**		**0**	7,000
	Repairs to existing siding at East and West	LF	26.90	156	**4,196**		**0**	4,196
07500	Membrane roofing							
	Built up bituminous roofing							
	Built up roofing, 3 ply with capping sheet	SF	1.50	20,000	**30,000**		**0**	30,000
	Insulation board underlayment and crickets - allow	SF	0.90	20,000	**18,000**		**0**	18,000
	Cant, upstand and flashing	LF	5.30	700	**3,710**		**0**	3,710

BENNING ROAD WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE		Unit	U/price	Work to Existing Building		Site		Total
CSI FORMAT			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
07700	Roof Specialties and Accessories							
	Roof accessories							
	Skylights and smoke vents - allow	SF	11.20	1,200	**13,440**		**0**	13,440
07800	Fire and Smoke Protection							
	Sprayed fireproofing on structural steel members							
	Steel framing to Tipping floor	SF	1.50	1,500	**2,250**		**0**	2,250
07910	Joint sealants and caulking							
	Caulking and sealants							
	Allowance	LS	3,000.00	1	**3,000**		**0**	3,000
	Total for Division 07 THERMAL AND MOISTURE PROTECTION :				**$ 146,050**		**$ -**	**$ 146,050**
08	**DOORS AND WINDOWS**							
	No work							
	Total for Division 08 DOORS AND WINDOWS :				**$ -**		**$ -**	**$ -**
09	**FINISHES**							
09900	Painting							
	Exterior and interior							
	Allowance for miscellaneous painting to exposed metals	LS	2,000.00	1	**2,000**		**0**	2,000
	Total for Division 09 FINISHES :				**$ 2,000**		**$ -**	**$ 2,000**
10	**SPECIALTIES**							
10520	Fire extinguishers and cabinets							
	Fire extinguisher and surface mounting bracket	EA	150.00	4	**600**		**0**	600
	Total for Division 10 SPECIALTIES :				**$ 600**		**$ -**	**$ 600**
11	**EQUIPMENT**							
11500	Industrial and Process Equipment							
	Industrial equipment							
	Fire safety storage cabinet - allow	EA	5,400.00		**0**	1	**5,400**	5,400
	Budget allowance for truck wash facilities	EA	150,000		**0**	2	**300,000**	300,000
	Total for Division 11 EQUIPMENT :				**$ -**		**$ 305,400**	**$ 305,400**
12	**FURNISHINGS**							
	NOT USED							
	Total for Division 12 FURNISHINGS :				**$ -**		**$ -**	**$ -**

BENNING ROAD WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE		Unit	U/price	Work to Existing Building		Site		Total
CSI FORMAT			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
13	**SPECIAL CONSTRUCTION**							
13120	Pre-Engineered Structures							
	Prefabricated or site-constructed buildings							
	Open shed in HHW compound - 30'x20'	SF	15.00		**0**	600	**9,000**	9,000
	Total for Division 13 SPECIAL CONSTRUCTION :				**$ -**		**$ 9,000**	**$ 9,000**
14	**CONVEYING SYSTEMS**							
	NOT USED							
	Total for Division 14 CONVEYING SYSTEMS :				**$ -**		**$ -**	**$ -**
15	**PLUMBING AND MECHANICAL**							
15400	Plumbing Systems							
	Roof drainage							
	Remove and reinstall existing OR provide new roof outlets - allow	EA	170.00	8	**1,360**		**0**	1,360
	Overflow scuppers - allow	EA	350.00	6	**2,100**		**0**	2,100
	Extend existing downspouts to raised roof over Tipping floor - allow	EA	750.00	8	**6,000**		**0**	6,000
	Plumbing equipment							
	Sump pumps in trench drains	EA	1,800.00	2	**3,600**		**0**	3,600
	Allowance for water spray misting system to reduce dust and prevent combustion; hand/auto control system	SF	0.65	16,000	**10,400**		**0**	10,400
15500	Fire Protection Systems							
	Modification and expansion of existing wet pipe fire sprinkler system - allow	SF	1.25	40,000	**50,000**		**0**	50,000
15700	Mechanical System Piping and Equipment							
	No work							
15800	Heating, Ventilation and Air-Conditioning							
	Exhaust ventialtion system							
	Allowance for roof mounted exhaust air handlers, dust filters, stub ducts and grilles; 4 air changes per hour	CFM	1.20	60,000	**72,000**		**0**	72,000
	Exhaust ductwork to serve tunnel - allow	#	4.00	2,400	**9,600**		**0**	9,600
	Space heating							
	Allowance for suspension mounted warm air blower type unit heaters, gas or oil fired; including piping and storage tank; to maintain 60 deg F	SF	2.25	28,000	**63,000**		**0**	63,000
	No work							
	Total for Division 15 PLUMBING AND MECHANICAL :				**$ 218,060**		**$ -**	**$ 218,060**

BENNING ROAD WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		*Unit*	*U/price*	Work to Existing Building		Site		Total
Division	*Description*		*$*	*Quantity*	*Cost $*	*Quantity*	*Cost $*	*$*
16	**ELECTRICAL**							
16200	Electrical Power							
	Allowance for modifications to existing panelboards and feeders	LS	5,000.00	1	**5,000**		**0**	5,000
	Utility and convenience power outlets, WP/GFI; including conduit and wiring - allow	EA	450.00	10	**4,500**		**0**	4,500
	Power connections to exhaust fans, heater units, sump pumps, scales etc.	EA	700.00	32	**22,400**	6	**4,200**	26,600
	- truck wash panelboard, feeder and	EA	3,000.00		**0**	2	**6,000**	6,000
16500	Lighting							
	Interior lighting, including conduit and wiring							
	Watertight fixtures in tunnel, ramps, truck wash units and extended Tipping floor	EA	600.00	50	**30,000**	12	**7,200**	37,200
	Remove and reinstall existing OR provide new lighting fixtures to Tipping floor raised roof area; extend existing conduit and wiring, and reconnect - allow	EA	850.00	40	**34,000**		**0**	34,000
	Lighting switches and control panels - allow	LS	5,000.00	1	**5,000**		**0**	5,000
	Total for Division 16 ELECTRICAL :				**$ 100,900**		**$ 17,400**	**$ 118,300**
17	**COMMUNICATIONS SYSTEMS**							
17110	Raceways, Boxes and Fittings							
	Fire alarm system							
	Allowance for manual pull stations and alarm devices in Tunnel and extended Tipping floor	EA	1,000.00	8	**8,000**		**0**	8,000
	Total for Division 17 COMMUNICATIONS SYSTEMS :				**$ 8,000**		**$ -**	**$ 8,000**

Noel J. Fearon Associates Inc.
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CONCEPT DESIGN
CONSTRUCTION COST ESTIMATE

for

GENERIC WASTE TRANSFER STATION
AND CITIZENS' DROP-OFF FACILITY

at

WASHINGTON, D.C.

27-Sep-00

NJF Associates Inc.

BASIS OF THE COST ESTIMATE

			Dated	Received
Drawings:	Engineering:	Concept Site Plan Typical construction details, for reference only	23-Aug-00	
Documents:		None		
Meetings and discussions:		Discussions with Engineers		

PRICING ASSUMPTIONS

Bidding: Assumed that the project will be competitively bid by at least three competent General Contractors.

Labor costs: Assumed that prevailing wage contract conditions **WILL** apply to this project.

Line item pricing: Estimate line items are priced as "Subcontractor net price to General Contractor", including Subcontractor's overhead, profit and sales tax as appropriate. Allowances for General Contractor's overhead, profit and/or management fee are added on the estimate summary page.

Cost escalation: Estimate line items are priced at current market rates, including allowance for cost escalation during construction. As the anticipated bid date is not known, **NO** allowance for cost escalation to anticipated bid date or construction start date is added.

Construction schedule: Overall construction period of 9-10 months assumed for estimating purposes.

SCOPE OF WORK INCLUDED

Project Location: Assumed for cost estimating purposes that the project site will be located in Washington D.C. metropolitan area, adjacent to public roadways and utilities, cleared, levelled and rough graded ready for construction.

Waste Transfer Building: New pre-engineered steel frame building, 224' clear span structure; reinforced concrete drilled caisson foundation system assumed; reinforced concrete push walls and piers to building perimeter; uninsulated metal cladding to roof and exterior walls; Reinforced concrete ramps and tunnel structure below discharge hoppers in floor; Minimal space heating and powered ventilation; Water spray misting system over waste materials; Lighting and fire sprinkler installation throughout.

Continued....

BASIS OF THE COST ESTIMATE

Continued....

Office building: Single story detached CMU or stud framed, stucco finish building; flat roof; standard office interiors; Staff toilets, showers and locker rooms for 15-20 persons; roof mounted HVAC units.

Siteworks : Finish grading only; vehicular paving and walkways; truck scales and scalehouse structure; Allowance for (2) truck wash facilities; Site utility connections from adjoining public thoroughfare; perimeter site security fence and access gates; Irrigation and landscaping to planters and perimeter set-back strip; ramps and retaining walls to tunnel under Transfer building.

EXCLUSIONS

General :

- Legal and financing costs
- Fire and all-risk insurance
- Construction contingency cost allowance
- Telephone and computer equipment, data transmission equipment, A/V equipment
- Work outside the areas impacted by construction, other than for utility connections.
- Utility connection charges
- Handling, removal or encapsulation of hazardous materials or contaminated soil

Project specific :

- Demolition, site clearing, cut and fill excavation to form new grades
- Curb cuts, modifications or repairs to existing public roads and sidewalks
- Odor trapping filter system on exhaust fans
- Waste material handling equipment
- Intercom/Paging systems
- Computer and data-processing systems
- Security and surveillance installations
- Emergency generator and UPS systems
- Cost escalation beyond December 2000, other than escalation during construction

NJF Associates Inc.

CONCEPT DESIGN STAGE COST ESTIMATE
CONSTRUCTION COST SUMMARY

			$/SF	$,000	$,000
Waste Transfer Building	47,000	SF	76.04	**3,574**	
Single story Office and Staff facilities building - allow	2,000	SF	144.00	**288**	
Total for Buildings	49,000	GSF	78.82	**$3,862**	
Site improvements				**$3,032**	
					$6,894

BUDGET FOR CONSTRUCTION BIDS - Oct/Dec 2000		**$6,894**
Recommended allowances for soft costs:		
Architectural & Engineering feees	10%	689
Survey and site investigation costs		16
Owner's fees and permit costs - assumed not applicable		N/A
Construction stage contingency fund	7%	483
RECOMMENDED CONSTRUCTION BUDGET		**$8,082**

NJF Associates Inc.

CONCEPT DESIGN STAGE COST ESTIMATE
CSI FORMAT COST SUMMARY

		Material Recovery Building	Site	TOTAL
Gross areas (SF):		*47,000*		*47,000*
Division				$
2 Sitework		169,732	1,142,860	**1,312,592**
3 Concrete		706,131	294,557	**1,000,688**
4 Masonry		90,520	117,695	**208,215**
5 Metals		137,946	72,960	**210,906**
6 Wood and plastics		3,900	0	**3,900**
7 Thermal and moisture protection		94,668	27,136	**121,804**
8 Doors and windows		0	0	**0**
9 Finishes		9,400	5,000	**14,400**
10 Specialties		86,900	86,300	**173,200**
11 Equipment		0	305,400	**305,400**
12 Furnishings		0	0	**0**
13 Special Construction		846,000	30,220	**876,220**
14 Conveying systems		0	0	**0**
15 Mechanical		354,408	30,200	**384,608**
16 Electrical		134,500	128,000	**262,500**
17 Communications Systems		12,000	4,500	**16,500**
	Subtotal :	**$2,646,105**	**$2,244,828**	**$4,890,933**
1 General Conditions and Site management	7.5%	198,458	168,362	**366,820**
Contractor Insurances	1.8%	51,202	43,437	**94,639**
Bonds	2.0%	57,915	49,133	**107,048**
General Contractor's Fee	10.0%	295,368	250,576	**545,944**
Design Contingency	10.0%	324,905	275,634	**600,539**
BUDGET FOR CONSTRUCTION BIDS - Oct/Dec 2000		**$3,573,953**	**$3,031,970**	**$6,605,923**
Cost per SF of gross area:		*$76.04*		*$140.55*

NJF Associates Inc.

GENERIC WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Material Recovery Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
02	**SITE WORK**							
02200	Site Preparation							
	Building Demolition							***Excluded***
	Site Demolition							***Excluded***
	Site clearing							***Excluded***
02300	Earthwork							
	Grading							
	Fine grade areas to be paved	SF	0.08		**0**	207,000	**16,560**	16,560
	Excavation and Fill							
	Excavation							
	Excavation for footings, backfill and disposal	CY	17.37	600	**10,422**		**0**	10,422
	Bulk excavation for ramps and tunnel	CY	6.10	4,650	**28,365**	5,100	**31,110**	59,475
	Backfill and compact	CY	7.51	2,100	**15,771**	1,900	**14,269**	30,040
	Haul and dump off site	CY	15.02	3,200	**48,064**	4,000	**60,080**	108,144
	Dewatering - allow	Day	140.00	30	**4,200**	30	**4,200**	8,400
	Slab on grade							
	Rough and fine grading for new slabs on	SF	0.23	47,000	**10,810**		**0**	10,810
02450	Foundation and Load Bearing Elements							
	Bored piles							
	Caisson footings, including excavation and concrete - 48" diameter	LF	58.40	400	**23,360**		**0**	23,360
	Steel reinforcing bar	#	0.68	30,500	**20,740**		**0**	20,740
	Load, haul and dump spoil off site	CY	20.00	200	**4,000**		**0**	4,000
	Mobilization and de-mobilization	LS	4,000.00	1	**4,000**		**0**	4,000
02500	Utility Services							
	Water and fire mains							
	New site water main piping and fittings to serve new hydrants and buildings; including excavation and backfill - 8" diameter	LF	31.20		**0**	1,425	**44,460**	44,460
	Fire hydrant, base and connection	EA	1,300.00		**0**	4	**5,200**	5,200
	Point of conncection to public main and service piping to site boundary - allow	EA	10,300.00		**0**	1	**10,300**	10,300
	Main shut off valve, backflow preventor, meter and box - allow	EA	15,000.00		**0**	1	**15,000**	15,000
	Service branches to buildings - 2"	LF	13.10		**0**	250	**3,275**	3,275
	- to truck wash units - 4"	LF	20.00		**0**	200	**4,000**	4,000

GENERIC WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Material Recovery Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
	Sanitary sewer drains							
	Sewer drain piping and fittings, in trenches; UPVC, 4" diameter	LF	14.60		0	700	10,220	10,220
	Pressure grade piping, fittings and supports from sump pumps - 3 and 4"	LF	22.54		0	400	9,016	9,016
	Manholes - allow	EA	2,100.00		0	4	8,400	8,400
	Point of conncection to public sewer main and service piping to site boundary - allow	EA	6,100.00		0	1	6,100	6,100
	Gas mains							
	New gas main piping to Office/Storage building; including excavation and backfill -	LF	15.02		0	100	1,502	1,502
	Point of conncection to public main and service piping to site boundary - allow	EA	3,300.00		0	1	3,300	3,300
	Main shut off valve, meter and box - allow	EA	2,300.00		0	1	2,300	2,300
	Electrical & Communications structures							
	Allowance for underground duct banks, including trenching and backfill	LF	25.54		0	750	19,155	19,155
02600	Drainage and Containment							
	Storm drainage							
	Storm water drain piping and fittings, in trenches, 12" diameter	LF	26.90		0	1,600	43,040	43,040
	- 8" diameter branches to building downspouts	LF	14.70		0	520	7,644	7,644
	Catch basin and grating - allow	EA	1,900.00		0	12	22,800	22,800
	Settlement/Clarifier tank - allow for 10,000 gallon capacity	EA	10,300.00		0	1	10,300	10,300
	Sump and cover at roadway entry points; 3'x4'x4'	EA	1,900.00		0	3	5,700	5,700
	SW pollution prevention holding tanks, on grade, 500-1000 gallon capacity - allow	EA	1,400.00		0	4	5,600	5,600
	Point of conncection to public storm sewer main and service piping to site	EA	6,100.00		0	1	6,100	6,100
02700	Bases and Pavements							
	Asphalt Paving							
	Asphalt concrete paving for roadways							
	Bypass road paving; 2-1/2" binder course, 1-1/2" wearing courseconcrete	SF	0.79		0	19,200	15,168	15,168
	Compacted gravel base for A.C. paving- 6" thick	SF	0.83		0	19,200	15,936	15,936
	Concrete Paving							
	Reinforced concrete vehicular paving, including joints, curing and finishing							
	Exterior paving; 8" concrete	SF	2.87		0	96,500	276,955	276,955
	- 6" concrete	SF	2.09		0	300	627	627
	Steel reinforcing bar	#	0.66		0	106,450	70,257	70,257
	Compacted gravel base and vapor barrier for paving- 6" thick	SF	1.01		0	96,500	97,465	97,465
	- 4" thick	SF	0.48		0	300	144	144
	Curing and broom finish	EA	0.39		0	96,800	37,752	37,752
	Concrete curb and gutter	LF	11.94		0	3,400	40,596	40,596
	Concrete curb only	LF	8.68		0	1,250	10,850	10,850

GENERIC WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Material Recovery Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
	Reinforced concrete sidewalk paving, including joints, curing and finishing							
	Exterior paving; 6" concrete, mesh reinforcement, broom finish	SF	3.58		**0**	2,650	**9,487**	9,487
	Compacted gravel base - 4" thick	SF	0.48		**0**	2,650	**1,272**	1,272
02800	Site Improvements and amenities							
	Fences and Gates							
	Perimeter site security fence	LF	51.00		**0**	1,800	**91,800**	91,800
	Rolling gate, motorized; 25' wide	EA	6,600.00		**0**	2	**13,200**	13,200
	- 40' wide	EA	11,300.00		**0**	1	**11,300**	11,300
	Chain link fence and gate to HHW compound	LF	19.00		**0**	200	**3,800**	3,800
02900	Planting							
	General planting							
	Budget allowance for irrigation, ground cover planting, shrubs and trees to planter areas	SF	2.82		**0**	25,000	**70,500**	70,500
	Hydroseeding only to perimeter strip	SF	0.09		**0**	68,000	**6,120**	6,120
	Total for Division 02 SITE WORK :				**$ 169,732**		**$ 1,142,860**	$ 1,312,592
03	CONCRETE							
03300	Cast-in-place Concrete							
	Poured in place structural concrete, including forms							
	Footings	CY	169.00	520	**87,880**	370	**62,530**	150,410
	Stem walls to tunnel retaining walls	CY	293.00	52	**15,236**	370	**108,410**	123,646
	Ramp slab, 8" thick	CY	156.00		**0**	160	**24,960**	24,960
	Ramp walkways, 6" thick	CY	146.00	16	**2,336**	29	**4,234**	6,570
	Equipment pads and similar	CY	195.00	32	**6,240**	27	**5,265**	11,505
	Curb walls to North elevation - allow	LF	34.00	140	**4,760**		**0**	4,760
	Scale pit walls, slab and support curbs, 12' x 10'	EA	5,850.00	4	**23,400**		**0**	23,400
	By pass scales, 40' x 10'	EA	11,700.00		**0**	2	**23,400**	23,400
	Optional exit scale, 70' x 10'	EA	16,100.00		**0**	1	**16,100**	16,100
	Trench drain walls and base	LF	98.00		**0**	24	**2,352**	2,352
	Sump pit	EA	540.00		**0**	2	**1,080**	1,080
	Steel reinforcing bar	#	0.66	41,900	**27,654**	41,100	**27,126**	54,780
	Ramps, pit and equipment bases for truck wash units - allow	EA	5,000.00		**0**	2	**10,000**	10,000
	Structural columns, piers and walls							
	Poured in place structural concrete, pumped	CY	103.00	410	**42,230**		**0**	42,230
	Formwork, assume 4 uses	SF	6.00	19,500	**117,000**		**0**	117,000
	Pour joint and keyway	LF	3.41	700	**2,387**		**0**	2,387
	Steel reinforcing bar	#	0.66	39,300	**25,938**		**0**	25,938
	Surface finish - sack & patch	SF	0.76	19,500	**14,820**		**0**	14,820
	Slab on grade							
	Poured in place structural concrete, 10" thick	CY	83.00	1,330	**110,390**		**0**	110,390
	Compacted gravel base and vapor barrier-6" thick	SF	1.01	43,000	**43,430**		**0**	43,430
	Forms and joints - allow	LF	2.00	5,500	**11,000**		**0**	11,000
	Steel reinforcing bar	#	0.64	43,000	**27,520**		**0**	27,520
	Curing and broom finish	SF	0.39	43,000	**16,770**		**0**	16,770

GENERIC WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Material Recovery Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
	Suspended tunnel slab and tapered support beams - allow	SF	34.00	3,500	**119,000**		**0**	119,000
	Form openings, trimmer beams and curbs	LF	37.00	220	**8,140**		**0**	8,140
	Non-structural concrete, including forms							
	Capping to retaining walls, 8"x4"	LF	14.00		**0**	650	**9,100**	9,100
	Total for Division 03 CONCRETE :				**$ 706,131**		**$ 294,557**	**$ 1,000,688**
04	**MASONRY**							
04200	Masonry units							
	Reinforced concrete masonry units							
	Fully grouted reinforced CMU security wall at entry, including footing, pilasters and capping - 8" thick x 8' high	LF	140.00		**0**	100	**14,000**	14,000
	Miscellaneous CMU site walls - allow	LF	100.00		**0**	100	**10,000**	10,000
	Reinforced CMU retaining walls, fully grouted							
	12" thick	SF	9.58	4,400	**42,152**	5,900	**56,522**	98,674
	12" thick in piers for structural columns	SF	9.58	1,100	**10,538**		**0**	10,538
	Grout fill to piers	CY	195.00	4	**780**		**0**	780
	16" thick	SF	13.33	1,300	**17,329**	1,200	**15,996**	33,325
	Rubbed joint finish	SF	0.43	5,700	**2,451**	7,100	**3,053**	5,504
	Steel reinforcing bar	#	0.66	24,000	**15,840**	24,900	**16,434**	32,274
	Expansion joint, filler and sealer	LF	6.50	220	**1,430**	260	**1,690**	3,120
	Total for Division 04 MASONRY :				**$ 90,520**		**$ 117,695**	**$ 208,215**
05	**METALS**							
05100	Structural metal framing							
	Allow for support steel and weather-proofing to roof mounted exhaust fans and unit heaters	EA	600.00	40	**24,000**		**0**	24,000
05500	Metal fabrications							
	Railings							
	Painted steel guardrails to retaining walls and around floor openings	LF	88.00	32	**2,816**	650	**57,200**	60,016
	Trench drain gratings and support angles, cast	LF	70.00		**0**	24	**1,680**	1,680
	Protective bollards and wall guards							
	Painted steel pipe bollards, set in concrete base - allow	EA	880.00	10	**8,800**	16	**14,080**	22,880
	Steel plate with weld-on Nelson studs, cast in to walls and piers - 3/4" thick	SF	39.00	820	**31,980**		**0**	31,980
	Steel plate and support framing to floor openings - allow	TN	2,010.00	35	**70,350**		**0**	70,350
	Total for Division 05 METALS :				**$ 137,946**		**$ 72,960**	**$ 210,906**

GENERIC WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Material Recovery Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
06	**WOOD AND PLASTICS**							
06100	Rough carpentry							
	Miscellaneous rough carpentry and rough hardware - allow	LS	3,900.00	1	**3,900**		**0**	3,900
06200	Finish carpentry							
	No work							
	Total for Division 06 WOOD AND PLASTICS :				**$ 3,900**		**$ -**	**$ 3,900**
07	**THERMAL AND MOISTURE PROTECTION**							
07100	Dampproofing and Waterproofing							
	Retaining walls							
	Membrane waterproofing and drain board to	SF	3.10	7,200	**22,320**	6,100	**18,910**	41,230
	Pressure relief drain, gravel fill and filter	LF	11.20	420	**4,704**	650	**7,280**	11,984
	Weep holes	EA	11.00	54	**594**	86	**946**	1,540
07200	Thermal Protection							
	Batt insulation							
	No work							
07800	Fire and Smoke Protection							
	Sprayed fireproofing on structural steel members							
	Main portal frames and wind columns	SF	1.50	40,000	**60,000**		**0**	60,000
07910	Joint sealants and caulking							
	Caulking and sealants							
	Allowance	SF	0.15	47,000	**7,050**		**0**	7,050
	Total for Division 07 THERMAL AND MOISTURE PROTECTION :				**$ 94,668**		**$ 27,136**	**$ 121,804**
08	**DOORS AND WINDOWS**							
	No work							
	Total for Division 08 DOORS AND WINDOWS :				**$ -**		**$ -**	**$ -**
09	**FINISHES**							
09900	Painting							
	Exterior							
	Allowance for miscellaneous painting to exposed metals	LS	5,000.00		**0**	1	**5,000**	5,000
	Interior							
	Allowance for miscellaneous painting to exposed metals and attchments to	SF	0.20	47,000	**9,400**		**0**	9,400
	Total for Division 09 FINISHES :				**$ 9,400**		**$ 5,000**	**$ 14,400**

GENERIC WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Material Recovery Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
10	**SPECIALTIES**							
10400	Identifying Devices							
	Allowance for building sign	EA	25,000.00	1	**25,000**		**0**	25,000
	Miscellaneous code required signs	EA	500.00	5	**2,500**	5	**2,500**	5,000
10520	Fire extinguishers and cabinets							
	Fire extinguisher and surface mounting bracket	EA	150.00	4	**600**		**0**	600
10880	Scales							
	Truck scales, including steel weigh-bridge							
	By Pass scales, 40'x10', 100 ton capacity	EA	22,500.00		**0**	2	**45,000**	45,000
	Axle scales, 12' x 10' platform, 50 Ton capacity	EA	14,700.00	4	**58,800**		**0**	58,800
	Optional exit scale, 70' x 10', 100 Ton capacity	EA	38,800.00		**0**	1	**38,800**	38,800
	Total for Division 10 SPECIALTIES :				**$ 86,900**		**$ 86,300**	**$ 173,200**
11	**EQUIPMENT**							
11500	Industrial and Process Equipment							
	Industrial equipment							
	Fire safety storage cabinet - allow	EA	5,400.00		**0**	1	**5,400**	5,400
	Budget allowance for truck wash facilities	EA	150,000		**0**	2	**300,000**	300,000
	Total for Division 11 EQUIPMENT :				**$ -**		**$ 305,400**	**$ 305,400**
12	**FURNISHINGS**							
	NOT USED							
	Total for Division 12 FURNISHINGS :				**$ -**		**$ -**	**$ -**
13	**SPECIAL CONSTRUCTION**							
13120	Pre-Engineered Structures							
	Pre-Engineered Steel Buildings							
	Clear span tapered beam frame; 220' clear span; 30'-32' exterior eave height; single skin prefinished metal roof and exterior wall	SF	18.00	47,000	**846,000**		**0**	846,000
	Prefabricated or site-constructed buildings							
	Scalehouse - steel stud framed, metal clad structure; flat roof; windows to front and both sides; Counter and shelving; accessible	SF	120.00		**0**	194	**23,220**	23,220
	Open shed in HHW compound - 12'x20'	EA	7,000.00		**0**	1	**7,000**	7,000
	Total for Division 13 SPECIAL CONSTRUCTION :				**$ 846,000**		**$ 30,220**	**$ 876,220**
14	**CONVEYING SYSTEMS**							
	NOT USED							
	Total for Division 14 CONVEYING SYSTEMS :				**$ -**		**$ -**	**$ -**

GENERIC WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Material Recovery Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
15	**PLUMBING AND MECHANICAL**							
15400	Plumbing Systems							
	New plumbing fixtures, including service and waste pipework							
	W.C.and lavatory basin; standard commercial grade fixtures	EA	1,500.00		**0**	2	**3,000**	3,000
	Fire hose reel	EA	1,200.00	3	**3,600**	3	**3,600**	7,200
	Washdown hose bib	EA	850.00	6	**5,100**	6	**5,100**	10,200
	Floor drains and floor sinks	EA	850.00		**0**	1	**850**	850
	Plumbing equipment							
	Water heater, instantaneous electric; 3000W	EA	650.00		**0**	1	**650**	650
	Sump pumps in trench drains	EA	1,800.00	2	**3,600**		**0**	3,600
	Sump pumps in scale pits and SW pollution prevention sump pits - allow	EA	3,500.00	4	**14,000**	3	**10,500**	24,500
	Sump pump control panel and wiring -	EA	6,500.00		**0**	1	**6,500**	6,500
	Allowance for water spray misting system to reduce dust and prevent combustion; hand/auto control system	SF	0.85	15,000	**12,750**		**0**	12,750
15500	Fire Protection Systems							
	Exposed wet pipe fire sprinkler system in Waste transfer building and tunnel	SF	1.85	49,950	**92,408**		**0**	92,408
15700	Mechanical System Piping and Equipment							
	No work							
15800	Heating, Ventilation and Air-Conditioning							
	Exhaust ventialtion system							
	Allowance for roof mounted exhaust air handlers, dust filters, stub ducts and grilles; 4 air changes per hour	CFM	1.10	100,000	**110,000**		**0**	110,000
	Exhaust ductwork to serve tunnel - allow	#	4.00	1,800	**7,200**		**0**	7,200
	Space heating							
	Allowance for suspension mounted warm air blower type unit heaters, gas or oil fired; including piping and storage tank; to maintain 60 deg F	SF	2.25	47,000	**105,750**		**0**	105,750
	Total for Division 15 PLUMBING AND MECHANICAL :				**$ 354,408**		**$ 30,200**	**$ 384,608**

GENERIC WASTE TRANSFER STATION CONSTRUCTION COST ESTIMATE CSI FORMAT		Unit	U/price	Material Recovery Building		Site		Total
			$	Quantity	Cost $	Quantity	Cost $	$
Division	Description							
16	**ELECTRICAL**							
16200	Electrical Power							
	Allowance for main switchboard and feeders from utility company substation; exterior mounted; allow for 220//110V, 3P, 500A main	EA	30,000.00		**0**	1	**30,000**	30,000
	Sub-main panelboards and feeders - allow	EA	5,500.00	1	**5,500**	2	**11,000**	16,500
	Utility and convenience power outlets, WP/GFI; including conduit and wiring - allow	EA	450.00		**0**	20	**9,000**	9,000
	Power connections to exhaust fans, heater units, sump pumps. scales etc.	EA	700.00	50	**35,000**	6	**4,200**	39,200
	- truck wash panelboard, feeder and	EA	3,000.00		**0**	2	**6,000**	6,000
16500	Lighting							
	Interior lighting, including conduit and wiring							
	New high-bay lighting fixtures in Waste transfer building, including conduit and wiring	EA	1,000.00	64	**64,000**		**0**	64,000
	Watertight fixtures in tunnel, ramps and truck wash units	EA	600.00	40	**24,000**	12	**7,200**	31,200
	Exterior lighting, including trenching, conduit and							
	Wall mounted floods	EA	900.00		**0**	14	**12,600**	12,600
	Lighting poles to parking and roads	EA	7,000.00		**0**	6	**42,000**	42,000
	Lighting switches and control panels - allow	LS	6,000.00	1	**6,000**	1	**6,000**	12,000
	Total for Division 16 ELECTRICAL :				**$ 134,500**		**$ 128,000**	**$ 262,500**
17	**COMMUNICATIONS SYSTEMS**							
17110	Raceways, Boxes and Fittings							
	Telephone and communications							
	Allowance for remote data connections from scales to offices	EA	1,500.00	4	**6,000**	3	**4,500**	10,500
	Fire alarm system							
	Allowance for manual pull stations and alarm devices in Waste transfer building	EA	1,000.00	6	**6,000**		**0**	6,000
	Total for Division 17 COMMUNICATIONS SYSTEMS :				**$ 12,000**		**$ 4,500**	**$ 16,500**

OFFICE BUILDING **2,000 SF approx. floor area** **CONCEPT DESIGN COST ESTIMATE**	*Quantity*	*Unit*	*U/price* $	*Assembly Subtotal* $	*Total* $
Substructure	2,000	SF	5.76		11,520
Reinforced concrete strip footings	24	CY	230.00	5,520	
Slab on grade	2,000	SF	3.00	6,000	
Structure	2,000	SF	8.30		16,600
Allow for miscellaneous steel framing	2	TN	2,800.00	5,600	
Roof structure	2,000	SF	5.50	11,000	
Exterior envelope	3,900	SF	12.65		49,350
CMU or metal stud framed exterior wall construction; cement plaster exterior finish; painted gypsum board interior finish; batt insulation	1,900	SF	12.50	23,750	
Windows and exterior doors	14	EA	800.00	11,200	
Flat roof finish and insulation	2,000	SF	6.00	12,000	
Skylights	4	EA	600.00	2,400	
Interior construction	2,000	SF	27.25		54,500
Interior walls	250	LF	50.00	12,500	
Interior doors	12	EA	800.00	9,600	
Floor finishes and bases - vinyl tile	1,300	SF	2.00	2,600	
Sheet vinyl in locker rooms	400	SF	6.00	2,400	
Ceramic tile in shower areas	200	SF	11.00	2,200	
Ceilings	1,900	SF	3.00	5,700	
Counters and fixed casework	60	LF	175.00	10,500	
Miscellaneous specialties and millwork	1	LS	5,000.00	5,000	
Lockers	16	EA	250.00	4,000	
Mechanical & electrical installations	2,000	SF	40.38		80,750
Plumbing fixtures & piping	15	EA	1,800.00	27,000	
Water heater	1	EA	2,000.00	2,000	
Roof mounted HVAC package units, ductwork and	2,000	SF	14.00	28,000	
Electrical:					
Sub-main panelboard and feeders	1	EA	7,500.00	7,500	
Lighting	2,000	SF	4.00	8,000	
Receptacles & small power outlets	30	EA	150.00	4,500	
Motive power outlets	6	EA	350.00	2,100	
Telephone/data outlets and wiring	15	EA	110.00	1,650	
				Sub-total :	$212,720
General Conditions and Site management				7.5%	15,954
Contractor Insurances				1.8%	4,116
Bonds				2.0%	4,656
General Contractor's Fee				10.0%	23,745
Design Contingency				10.0%	26,119
					$287,310
				Cost per SF of gross area:	*$143.66*