



CITY OF SACRAMENTO

DEPARTMENT OF PUBLIC WORKS

SOLID WASTE DIVISION

September 16, 1986

JOHN F. BOSS
Solid Waste Division Manager

Transportation and Community Development Committee
Sacramento, California

Honorable Members in Session:

SUBJECT: 28TH STREET LANDFILL - MONITORING WELLS

SUMMARY

Based on recent discussions with the staff of the Regional Water Quality Control Board seven (7) new monitoring wells are proposed for construction this fall. The Regional Board staff informed the City, on August 7, 1986, that the City's inactive landfill site, between 23rd and 28th Streets, must be assessed for the potential release of hazardous wastes to underlying ground water, pursuant to AB 3525 (Calderon). Four (4) of the new wells will be located to detect potential leakage from the inactive site; the remaining three (3) wells will be installed at the active site. The technical specifications for these seven (7) wells are attached. In addition sampling equipment will be purchased and installed in these wells by City staff and a local analytical laboratory will be contracted to perform the required analytical tests.

BACKGROUND

The City of Sacramento's 28th Street Landfill consist of two separate but contiguous sites. The currently permitted landfill (order No. 84-094) is located east of 28th street and consist of a 78-acre existing site and a 35-acre expansion site. The 35-acre expansion site was constructed pursuant to the new Subchapter 15 requirements. A Closure Plan for both of these sites was completed and submitted to the Regional Board on June 20, 1986. West of 28th Street to 23rd Street (see attachment B of Technical Specifications) is the location of the City of Sacramento's inactive solid waste disposal site. Disposal of solid waste at this location began circa 1949 and continued through 1973 when disposal at the 78-acre site, east of 28th Street, began.

The inactive site consist of approximately 73 acres of both City owned (37 acres) and privately owned (36 acres) land. The City had filled in private land under written agreements with the owner. The private property filling began around 1955 and ended about 1966. The inactive site, prior to 1949, was used as a public dump and this practice continued until 1959 when the City Council closed the dump to the public. Daily burning of the public dump and the City's street cleaning materials occurred through 1959. Garbage was not burned but covered with earth. Compaction of the garbage was minimal. Not until the early 1960's was heavy equipment and thin lifts used to promote compaction.

On July 11, 1986 the City staff submitted to the Regional Board a request to waive the Solid Waste Water Quality Assessment Test requirements of AB 3525 (Calderon, 1984). At the time of this submittal City staff assumed that only the currently active site (i.e., the site currently permitted by the Regional Board) had to comply with AB 3525. Subsequent to this submittal the Regional Board informed City staff that the inactive site must also be investigated and that a Solid Waste Assessment Test (SWAT) proposal must be submitted for the inactive site. The City staff intends to investigate the ground water beneath the inactive site by installing monitoring wells at the perimeter of the site (the specifications of these monitoring wells are contained in the attached technical specifications). The Request for Waiver on the active site is still believed, by staff, to be valid. City staff contends that the active site, which has always been closed to public dumping, does not contain hazardous waste in quantities warranting enforcement action pursuant to AB 3525. City staff is concerned about the elevated concentrations of leachate parameters and the presence of vinyl chloride in the ground water but believe that current actions, including the closure of the active site, will reduce these concentrations in the near future.

The monitoring wells proposed for this site were located based on the historical ground water movement trends established at the active site to the east. Ground water movement is influenced by the stage elevations in the American River. During high flow conditions ground water moves to the south and during low flow conditions there is a northerly component to the flow. A consistent westerly component of flow occurs at the site; however, it's magnitude decreases going south across the site, with a reversal to the east at the southern limits of the active site. This effect is most apparent in the summer when the River levels are low and the pumping of an irrigation well, to the south, may be influencing ground water movement.

The existing well B4 and the proposed wells C12, C14 and C15 are located on the perimeter of the inactive site and should detect ground water contamination from the inactive site. Proposed monitoring well C13 is located west of the City-owned inactive site property and close to the center of the entire inactive site. This well will be double cased since it is expected to intersect refuse. This well will provide a leachate sample for analysis, a ground water sample for analysis in the center of the inactive site, and a point of differentiation between potential contamination emanating from City owned property and privately owned property to the west.

The proposed monitoring wells have been designed similarly to the monitoring wells existing at the active site. A 25-foot well screen set at a depth of minus 10 feet U.S.G.S. datum is necessary to sample ground water below the bottom of the refuse layer (at the active site the bottom of refuse is at elevation 20 feet U.S.G.S. datum) and to span the existing well's water level fluctuations, that have varied from 4 to 19 feet since 1981.

The double well proposed south of the freeway (C11s and C11d) is to determine if vertical movement is occurring due to the pumping of an irrigation well on this property, and to determine the areal extent of ground water contamination from the active site.

The monitoring well proposed north of the active site, well No. B6, is required because monitoring wells 5 and 6 are too shallow and dry up during summer months. Monitoring wells 5 and 6 will not be abandoned at this time.

The proposed wells will be added to the City's weekly groundwater elevation measurement program to assist staff in the understanding of ground water flow at this site.

City staff intends to purchase and install monitoring equipment within the proposed wells. Well Wizards (TM) similar to the ones installed in the existing wells will be purchased. These are constructed of Teflon (TM) and have a 1.1 gpm flow rate at 100 ft. and 100 psi.

Laboratory analyses for the inactive site monitoring wells (B4,C12,C13,C14 and C15) and for the active site monitoring wells (B1,B3 and C7) shall include:

1. EPA Test 624
2. EPA Test 625
3. ICAP Metals
4. Standard Mineral Analysis
5. COD
6. Temperature

The laboratory will be required to report all peaks.

The laboratory analyses for the proposed wells C11s,C11d and B6 will be those required in the City's quarterly monitoring program which are as follows:

1. Vinyl Chloride
2. COD
3. Hardness
4. Chlorides
5. Iron
6. E.C.
7. pH.
8. Temperature

If other constituents are detected at elevated levels in the monitoring wells, City staff will expand its quarterly monitoring program to include them.

Surface water monitoring shall consist of sampling the American River at the northwest corner of the inactive site (R3) for the chemicals listed on paragraph 4 above.

Background samples have been taken from monitoring wells C8, C9 and C10 during the City's quarterly monitoring program for those constituents identified above. To supplement this data staff proposes to sample these wells for the complete list of chemicals listed on Page 3 paragraph 4. Monitoring well C-10 will be sampled twice to satisfy the regulatory requirement of having a minimum of four samples for the background monitoring wells.

FINANCIAL

The detailed cost estimates for the installation and sampling of these new wells are attached. A summary of these costs are as follows:

<u>Item</u>	<u>Cost</u>
Construct seven (7) new wells	\$26,690.00
Purchase sampling pumps	4,525.00
Laboratory analyses	<u>13,130.00</u>
Total	\$44,345.00 =====

This estimate is less than the \$80,000 allocated for this purpose and currently available in CIP No. WST-87-006.

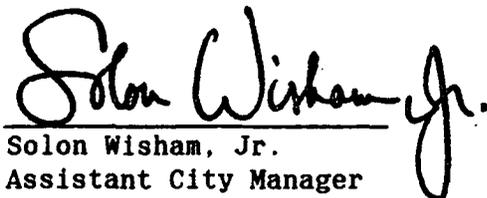
RECOMMENDATION

City staff intends to present the attached technical specification and related contract documents to City Council for approval on September 23, 1986. City staff is requesting that the Transportation and Community Development Committee endorse this water quality assessment program and recommend approval of it to the City Council.

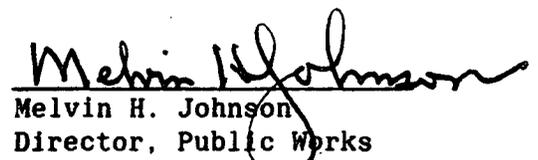
Respectfully submitted,


John Boss
Solid Waste Division Manager

RECOMMENDATION APPROVED:


Solon Wisham, Jr.
Assistant City Manager

APPROVED:


Melvin H. Johnson
Director, Public Works

JB/tc - 86036:SP

Attachments:

- 1 - Technical Specification
- 2 - Detailed Cost Estimates

ATTACHMENT 2

DETAILED COST ESTIMATE
28TH STREET LANDFILL MONITORING WELLS
SEPTEMBER 16, 1986

MONITORING WELLS

<u>ITEM</u>	<u>AMOUNT</u>	<u>COST</u>
4 inch PVC Schedule 80 Well Screen	160 L.F.	\$11,000.00
4 inch PVC Schedule 80 Well Casing	155 L.F.	10,000.00
Gravel Pack	5 C.Y.	415.00
Bentonite Seal	1 C.Y.	525.00
Cement Bentonite Grout	3.5 C.Y.	1,700.00
Conductor Casing	49 L.F.	650.00
Padlocking Cap	7	400.00
12 inch Well Casing	30 L.F.	<u>2,000.00</u>
TOTAL		<u>\$28,690.00</u>

SAMPLING PUMPS

<u>ITEM</u>	<u>AMOUNT</u>	<u>COST</u>
P-1101 Pump	5	2,000.00
PVC (Teflon Lined) Tubing	300 L.F.	825.00
Appurtenances		400.00
Pump Driver/Controller Adaptor	1	<u>1,300.00</u>
TOTAL		<u>4,525.00</u>

LABORATORY ANALYSES

<u>ITEM</u>	<u>AMOUNT</u>	<u>COST</u>
EPA 624	13	2,925.00
EPA 625	13	6,175.00
ICAP Metals	13	1,755.00
Standard Minerals	13	<u>2,275.00</u>
TOTAL		<u>\$13,130.00</u>

OVERALL TOTAL = \$44,345.00

**CITY OF SACRAMENTO
SOLID WASTE TRANSFER SYSTEM
ANALYSIS**

**CITY OF SACRAMENTO
DEPARTMENT OF PUBLIC WORKS
SOLID WASTE DIVISION**

in association with:

**JONES & STOKES ASSOCIATES, INC.
COOPER ENGINEERS
RAYMOND H. MOSLEY III**

SEPTEMBER 1986

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Solon Wisham, Jr. - Assistant City Manager
Melvin H. Johnson - Director of Public Works
Reginald Young - Deputy Director of Public Works, Public Services
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Raymond H. Mosley III

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Chapter 1

INTRODUCTION AND SUMMARY

Prepared by:

John Boss
Bruce Barboza

City of Sacramento
Department of Public Works
Solid Waste Division

INTRODUCTION

Purpose and Content of the Report

The City of Sacramento (City), Department of Public Works has evaluated implementation options for a solid waste transfer system to replace the City-owned and -operated 28th Street Sanitary Landfill, which is expected to reach capacity by late 1990. This transfer station system will allow the City's collection crews to dump their wastes in a centralized City location, for hauling in large-capacity trailers to an outlying landfill.

At its meeting of October 29, 1985, the Sacramento City Council endorsed implementation of a transfer station to handle and provide for disposal of all solid waste material collected by City forces. The Council also directed staff to complete an economic and siting study to evaluate various transfer options. Staff also would work with an independent consultant to evaluate ownership options.

Several background reports have been prepared by staff and consultants which support the evaluation. These background reports, which were originally prepared independently, have been combined in this volume to form the basis of the findings and recommendations presented. (Numbering of tables, figures, appendices, and exhibits has remained independent for each chapter.) The reports are submitted as subsequent chapters of the overall report:

- o Chapter 2 - County Transfer Station Analysis
- o Chapter 3 - City Transfer Station Site Analysis
- o Chapter 4 - City, County, and Private Transfer Station Cost Analysis/Comparison
- o Chapter 5 - City, County, and Private Transfer Station Ownership/Operation Evaluation

The solid waste transfer system evaluation as presented herein has sufficient scope to allow staff to present recommendations for a broad course of action, from among a number of policy options. However, this must be recognized as a first step in a comprehensive process. During the next years, staff will proceed with the environmental assessment, facility design, and permit procurement.

Summary of Findings and Recommendations

The following findings and recommendations have been prepared by City staff, after development and evaluation of the technical reports contained herein.

1. The cost for contracting with Sacramento County to use their two transfer stations is estimated to be significantly higher than constructing and operating a transfer station more centrally located within the City. Factors which contribute to this finding include the following:
 - o The City would be required to contribute up to \$3 million for the cost of expanding and renovating the County transfer station sites, and for the cost of purchasing additional capacity at the County's landfill.
 - o Tipping fees at the County transfer stations are expected to be \$20/ton (1986-87), without amortization of the capital costs identified above.
 - o The City would incur additional collection costs due to the relocation of disposal from the City's refuse fleet dispatch/maintenance yard to more remote locations (up to \$430,000/year).
 - o City collection crews could experience significant delays at the transfer station sites, as they would be used jointly by the City, the County, and the public-at-large.
 - o The total disposal cost for this option is expected to range from \$23-24/ton.
2. The overall estimated costs for City ownership/operation and private ownership/operation of a transfer station are approximately equal. There does not appear to be a cost advantage to either option. Disposal costs are estimated to be about \$18/ton.
3. The location with the most favorable characteristics for a centralized transfer station is the southwestern section of the 28th Street Landfill/Dispatch/Fleet Maintenance Facility.
4. There appear to be more nonmonetary benefits to a City-owned transfer station than in contracting with a privately-owned facility.
 - o Private ownership would require a long-term contract (as much as 20 years), with associated private operation. The City would not be able to use the process

of rebidding operations to maintain or lower transfer station costs.

- o Flexibility, without long-term contract constraints, to convert to alternative waste management options such as recycling, composting, waste-to-energy, waste reduction, etc.
 - o Greater control for meeting regulatory concerns; greater responsiveness to meet concerns of constituents near the facility.
 - o Consolidation of other fleet management/facility management needs with transfer station construction.
5. Preliminary responses from Sacramento County and Yolo County, regarding their willingness to contract with the City for disposal, and their general contract provisions, indicate that the County of Sacramento offers better terms and conditions. However, additional discussions are necessary. Sacramento County's preliminary contract terms and conditions are as follows:
- o Tip fees based on incremental costs to handle City wastes are comparable to fees charged the private sector. Fees for 1986-87 are anticipated to be about \$5.50-6.00/ton.
 - o A minimum contract of 5 years to allow cost recovery of additional equipment.
 - o Payment of a capacity "surcharge" to allow the County to recover lost capacity through expansion of their site.

6. Recommendations:

- o Proceed with negotiations for disposal at the Sacramento County Landfill.
- o Proceed with the design, environmental assessment, and permitting of a City-owned transfer facility to be located at the southwest section of the City's 28th Street Landfill/Dispatch/Fleet Maintenance Complex.
- o Delay the decision on City versus private transfer station operation until 1989. At that time, compare proposals for facility operation from the private sector and the Solid Waste Division. Term of contract is to be 5-7 years. This option has worked well for the Portland Metropolitan Sanitation District and the City of Phoenix.

Chapter 2

GENERAL EVALUATION FOR CITY USE OF
COUNTY TRANSFER STATIONS

Prepared by:

Bruce Barboza

City of Sacramento
Department of Public Works
Solid Waste Division

INTRODUCTION

This report presents findings regarding City use of the two Sacramento County transfer stations. It has been summarized from the information in the exhibits attached to this chapter. The report is not extensive; its primary function is to develop adequate evaluation criteria for relative comparison with other City transfer alternatives that are being studied. Three options for using the County transfer stations are evaluated in this chapter (see Exhibit I). Options 1 and 2 divert both the City's refuse and street cleaning to the County transfer stations. Option 3 transfers part of the street cleaning waste stream to L&D Landfill. Costs are evaluated on 750 tons per day, which is the projected City tonnage for 1990. The City should be prepared to implement Option 1 or 2, since they provide long-term solutions. Option 3 should be treated as a limited-term option for street cleaning wastes because L&D Landfill is expected to reach capacity shortly after the City would have a transfer system in place. (For more detail describing L&D Landfill and the County transfer stations, refer to Exhibit IV).

SUMMARY OF FINDINGS

Economics

The estimated annual cost (1990) for Option 1, using both County Transfer Stations, is \$4,986,000 (see Exhibit II). The annual cost of Option 2 (using only the Fruitridge Transfer Station) is \$5,060,000. Option 1 costs are \$74,000 per year less than Option 2, due primarily to reduced collection fleet mileage for the North Area Collection Vehicles.

Option 3 temporarily diverts street cleaning wastes to the L&D Landfill. Its estimated annual cost is \$4,470,000. This is a projected cost advantage of about \$500,000 for the first year of operation (1990), with progressively less savings occurring each year as the City's 90-gallon container system is implemented. (The 90-gallon containers will combine municipal refuse and street cleaning wastes). This option also is based on the assumption that disposal fees at L&D Landfill will not rise dramatically, and that large quantities of yard waste will be compatible with land reclamation objectives of L&D. Under Option 3, the City would eventually be hauling its waste to the County transfer station(s) in magnitudes equal to Options 1 and 2.

There are other conditions that affect the use of Option 3. The L&D Landfill is expected to close approximately 3 years after the City has started its transfer station system. It is not known whether the L&D Landfill will be relocated, or where. Its closure would seriously affect the City and County because the 230 tons per day of street cleaning wastes would have to be handled by City or County transfer facilities. The County transfer station permit and landfill operating permit would not allow for this additional tonnage without being re-permitted; it is possible that facility modifications also would have to be made. City/County contingency plans and a properly written contract that anticipates this problem could reduce some of the potential economic problems.

Traffic Assessment

The City staff has recorded typical times for arrival of the City's collection vehicles at the existing landfill site (Exhibit V). It can be seen that, due to their distribution throughout the day, they would not represent a significant portion of the peak traffic counts even at Power Inn Road and Folsom Boulevard. It also has been estimated that by the time the County transfer station would be used by the City, Granite Construction would not be using its site any longer. This would

reduce truck traffic along Power Inn Road by approximately 220 vehicles per day. These options are still expected to meet opposition from some local residents because traffic is heavy in the general area. This is often the case when residential areas are near or within an industrial area.

Operations

Contracting with the County to transfer the City's waste would eliminate operational burdens associated with operating, directing, and maintaining a transfer facility. Heavy traffic and waiting lines at the County transfer station scalehouse, however, could reduce the efficiency of City collection crews. This could be remedied by separate access for City vehicles.

New Waste Stream Alternatives

The County will need a minimum tonnage commitment to recover its capital investments to accommodate the City's waste stream. The commitment may preclude other waste alternatives that could become available to the City in the future (e.g., waste-to-energy, materials separation, pelletization, vegetal composting, development of a new City landfill).

Land Use Considerations

Both County transfer stations are currently under permit as solid waste facilities. If the City were to divert its waste stream through these facilities, the permit for the Fruitridge Transfer Station would have to be revised. Modifications to both facilities also would be desirable. Land is available at both sites to make necessary modifications (Cooper Engineers, Report on Evaluation of Diverting Wastes Through Sacramento County's Transfer Stations, December 1984).

The County Transfer Stations are located in primarily industrial areas. Because any facilities modifications at these sites would be retained within existing site boundaries, no land use conversion would occur. The incidence of noise and traffic at the two sites would increase, but the land use would continue to be consistent with the industrial nature of the two areas.

Use of Other Background Reports

Earlier reports that provided background data for this chapter included the following:

- o The City of Sacramento Draft Environmental Impact Report on Solid Waste Disposal Alternatives, Brown and Caldwell, 1980.

- o Report Evaluation of Diverting Wastes through Sacramento County's Transfer Stations, Cooper Engineers, 1984.

EXHIBIT I

General Description of the County Transfer Station
Options Evaluated

Option 1

Divert City's waste stream generated north of the American River to the North Area Transfer Station (NATS); divert waste stream south of the River to the Fruitridge Transfer Station.

Projected Transfer Quantities for Option #1

Year	Fruitridge	NATS
1990	153,000 tons per year	62,000 tons per year
1995	176,200 tons per year	65,000 tons per year

Option 2

Direct-haul all of the City's waste stream to the Fruitridge Transfer Station.

Projected Transfer Quantities for Option #2

Year	Fruitridge
1990	215,000 tons per year
1995	241,200 tons per year

Option 3

Direct-haul the refuse collected south of the American River to the Fruitridge Transfer Station and direct haul refuse collected north of the American River to the County's NATS. Assume 50 percent of street cleaning can be diverted to the L&D Landfill and that 50 percent has become combined with refuse.

Projected Transfer Quantities for Option #3

Year	NATS (Refuse)	Fruitridge (Refuse)	L&D Landfill (Street Cleaning)
*1990	50,700	128,400	35,900
1995	60,100	140,900	40,200

* Assumes mechanical curbside collection has expanded enough to divert 50 percent of the street cleaning waste stream into the refuse waste stream.

EXHIBIT II

Annual Cost Summary Sheet for
County Transfer Station Options^a

	Option 1	Option 2	Option 3
A. Transfer tipping fee (\$20/ton; Exhibit VI)			
FTS ^b	\$3,060,000	\$4,300,000	\$2,568,000
NATS ^b	1,240,000	--	1,014,000
B. L&D tipping fee (Exhibit III)	--	--	169,000
C. Refuse collection mileage cost (increase over current cost; Exhibit III)	362,000	436,000	436,000
D. Street cleaning collection fleet mileage cost (increase over current cost; Exhibit III)	27,000	27,000	27,000
E. Supplemental charges for:			
i) Transfer station amortized construc- tion cost (\$1.15/ ton, Exhibit III)	247,000	247,000	206,000
ii) Landfill depletion cost (Exhibit III) ^c	50,000	50,000	50,000
Projected total cost	\$4,986,000	\$5,060,000	\$4,470,000

^a See Exhibit III for backup data and calculations; all calculations are based on a waste stream of 750 tons/day.

^b FTS = Fruitridge Transfer Station; NATS = North Area Transfer Station.

^c The County has expressed concern that the City's use of its landfill would deplete its life expectancy 25 percent faster. Since the City either has to buy property now or in the future, it should set aside a fund for early depletion during the remaining 20 years of life at the County landfill. This would provide assistance for the County to expand its landfill another 20+ years or it could be used toward an alternate solid waste solution that becomes feasible during the next 20 years. The fee could terminate when the fund has reached \$1 million.

EXHIBIT III

Details of Cost Calculations
for County Transfer Station Options

Transfer tipping fees for all options include:

1. County landfill tip fees
2. Modification costs of transfer station
(Provided that contract period is long enough; \$20/tons)
3. Total tonnage assumed to be 750/day in 1990

Option 1

A) Tipping fees

Fruitridge Transfer Station (FTS)		
153,000 ton/year (1990) x \$20/ton	=	\$3,060,000 ^b
North Area Transfer Station (NATS)		
62,000 ton/year (1990) x \$20/ton	=	\$1,240,000 ^b
L&D Landfill	=	not considered

B) Increased route collection mileage costs

Refuse

Daily travel FTS and NATS	1,414 miles
Daily travel 28th Street	-783 miles
	<u>631 miles</u>

631 miles x 287 workdays/year X \$2/mi = \$362,000^b

Street cleaning:

FTS	483 miles/day
28th Street landfill	-443 miles/day
	<u>40 miles/day</u>

Cost:

40 X \$2.31/mile X 287 workdays/year = \$27,000^b

C) Supplemental fee charges:

- i) Transfer station amortized construction
\$2,000,000 construction x 10/years
@ 7% interest = \$284,000/year
Average tons/year = 246,000

use: $\frac{\$284,000}{246,000 \text{ tons}} = \$1.15/\text{ton} \times 215,000 = \$247,250$ USE: \$247,000^b

ii) County landfill replacement^a . . . $\frac{\$1,000,000}{20 \text{ years}} = \$50,000^b$

Option II

A) Tipping fees:
FIS and NATS
L&D Landfill

Same as Option I
Same as Option I

B) Increased route
collection mileage cost

Refuse
FIS 1,543 miles
28th Street Landfill -783 miles
760 miles

Cost
760 miles x \$2 x 287 workdays \$436,000^b

Street cleaning Same as Option I

C) Supplemental fee charges Same as Option I

Option III

A) Tipping fees:
NATS 50,700 x \$20/ton \$1,014,000^b

FIS 128,400 x \$20/ton 2,568,000^b

L&D Landfill:
\$33/vehicle x $\frac{35,900 \text{ tons}}{7 \text{ ton vehicle}}$ \$169,000^b

B) Increased route collection mileage cost

Refuse Same as Option II

Street cleaning
The distance to NATS is about the same as to the 28th Street yard where waste is now disposed of. No charge

C) Supplemental fee charges:

i) \$1.15/ton x 179,100 tons \$206,000^b
ii) County landfill replacement \$ 50,000^b

^a City supplements \$1,000,000 or buys 200 acres.

^b in 1986 dollars.

EXHIBIT IV

Landfill and Transfer Station Locations and Projected Increases in Waste Tonnage

L&D Landfill

The L&D Landfill (see Figure IV-1) is a privately-owned and operated landfill located on Fruitridge Road, very close to the County transfer station. It is an unclassified landfill that handles only construction waste. Yard waste collected by the City can be received at this site. The tipping fee is equal to about \$4.00/ton. The L&D Landfill is expected to reach capacity at its present site and close by 1994. Plans for relocation are unknown at this time. Because of this impending closure, any plans to use L&D for a portion of the City's yard waste stream should be considered temporary. Plans should provide for eventually passing the City's entire municipal waste stream (yard waste and refuse) through transfer stations.

County Transfer Stations

Fruitridge Transfer Station. The FTS (see Figure IV-1) is located approximately 12 miles from the Sacramento County Landfill, on Fruitridge Road near the Army Depot. The site includes about 12 acres. The transfer facility would need major improvements to accommodate the City's waste stream. Details of the necessary improvements are available in a report prepared for the City by Cooper Engineers, dated December 1984.

North Area Transfer Station. The NATS (see Figure IV-1) is located on Roseville Road and is on property leased from McClellan Air Force Base (approximately 15 acres). During summer 1987, the County will demolish this facility and construct a new one. If the City does not contract for use of this facility in the near future, the County will not include capacity for City refuse in the NATS design. The NATS is being designed for 235 tons/day. The City's waste stream to this station would be an additional 225 tons/day by 1995.

Population and Waste Quantities Projection

The following information sources were used to evaluate the City's current and projected waste needs:

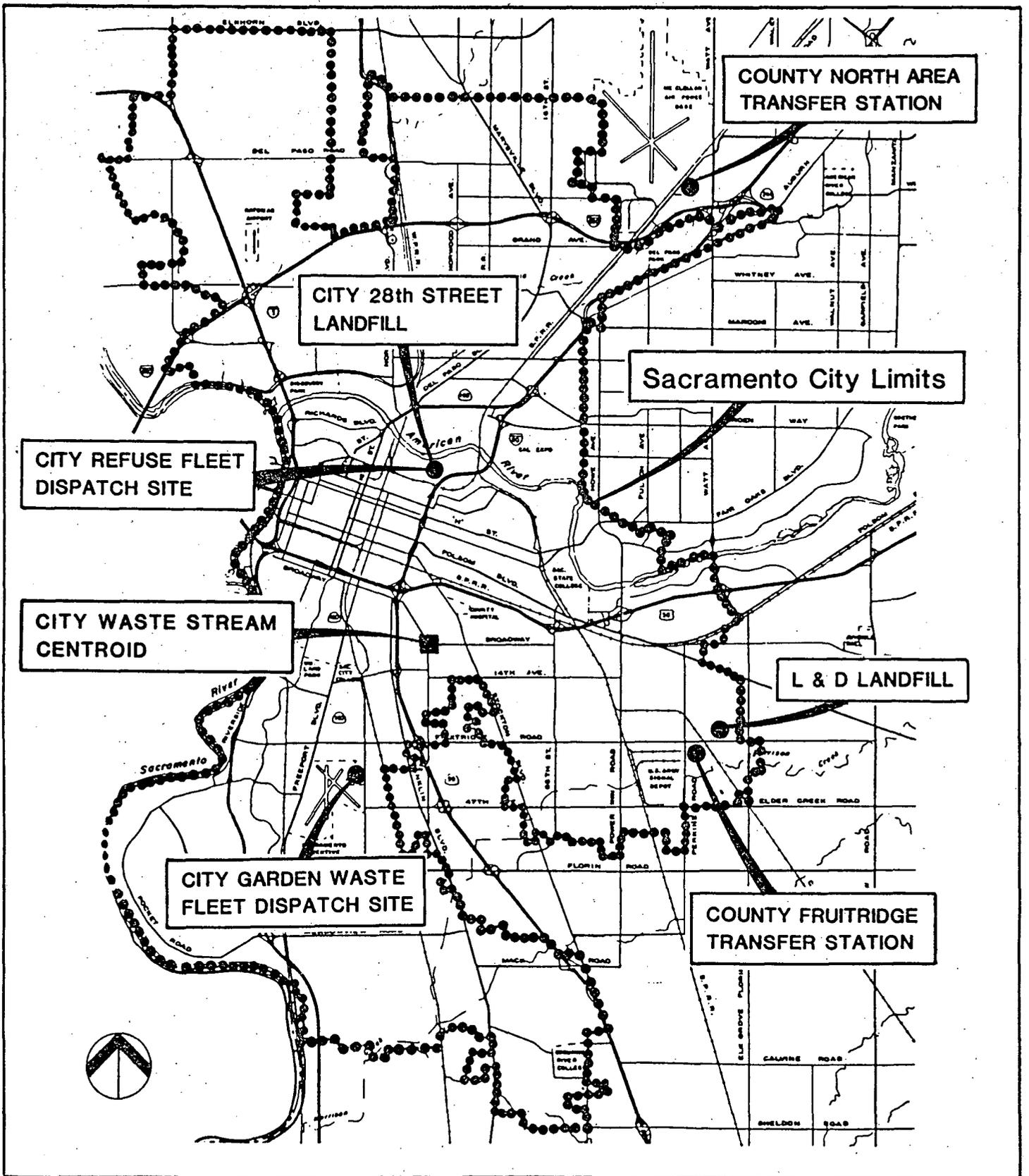


FIGURE IV-1. LOCATION OF SOLID WASTE SYSTEM FACILITIES

- o The 1980 Sacramento Regional Area Planning Commission information used in the Sacramento County Management Plan Update, 1983 Revision.
- o The North Natomas Community Plan

Existing and projected population numbers used to estimate the volume of the City's future waste stream are presented in Tables IV-1 and IV-2. The numbers are segregated into various waste generation areas for the entire County in Table IV-1. The areas considered to be part of the City's waste stream are shown in Figure IV-2 and are reflected in the population numbers of Table IV-2.

Waste stream data collected for the week of October 7, 1985-October 12, 1985 was used to determine the City's waste stream centroid(s) (see Figure IV-1) and percentage of waste generated north and south of the American River. Results are as follows:

October 7, 1985 through October 12, 1985	Percentage of Waste Collected North of the American River	Percentage of Waste Collected South of the American River
Refuse (residential)	25%	75%
Garden waste	20%	80%

Waste generated per capita has been tabulated as follows:

Year	Waste Type (tons)		Population	Tons Per Capita		Per Capita Total
	Refuse	Garden Waste		Refuse	Garden Waste	
1975	90,305	53,945	259,467	.359	.214	.573
1980	105,823	61,544	274,400	.385	.224	.609
1985	126,000	63,000	309,354	.407	.203	.610

The projected waste quantities shown in Table IV-2 are based on a straight line population growth and using 0.61 tons per capita.

Table IV-1
EXISTING POPULATION

<u>Waste Generation Area</u> (See Figure IV-2)	<u>1975</u>	<u>1980</u>	<u>1985</u>
1	15,169	15,169	17,623
2	18,708	22,082	21,365
3	16,111	26,814	23,907
4	16,018	19,172	19,552
5	14,944	27,163	26,913
6	17,767	20,440	18,933
7	18,135	20,266	19,897
8	18,268	19,626	20,684
9	16,667	17,075	18,062
10	18,226	18,363	17,781
11	17,817	21,085	21,829
12	17,860	17,110	18,466
13	17,922	16,683	17,595
14	15,732	16,342	16,671
15	21,875	22,000	21,938
16	14,810	14,125	14,377
17	12,333	11,811	13,453
* 18 S	19,192	22,248	28,429
* 19 S	15,213	16,770	19,576
* 20 S	13,231	13,160	15,265
21 S	16,427	15,760	17,403
22 S	13,266	13,105	14,654
23 S	16,043	15,421	17,097
24 S	20,407	23,155	25,647
25 S	17,148	16,404	18,013
26 S	12,558	11,920	13,129
27 S	20,624	20,003	21,983
28 S	20,060	19,562	21,678
29 S	10,922	10,794	11,907
30	23,657	22,043	19,628
31 S	17,148	18,343	20,456
32 S	16,899	20,988	23,204
33 S	19,898	20,233	22,288
34	13,297	15,188	18,410
35	16,965	27,918	26,421
36	12,738	13,695	14,425
37	12,114	13,395	13,892
38	23,133	32,507	34,403
39	15,526	21,890	25,366
40 F	9,212	11,315	15,773
41	5,040	5,012	6,926
42 I	896	930	967
43 G	4,032	5,400	8,000
<u>44 S</u>	<u>16,349</u>	<u>16,534</u>	<u>18,624</u>
Total County	684,739	769,419	838,071
Total City of Sacramento	251,485	274,400	309,354

January 1985

Per City Planning

S = Sacramento City

F = Folsom

I = Isleton

G = Galt

Source: Staff calculations based on information
supplied by the Sacramento Regional Area Planning
Commission for 1975 and 1980.

* North of the American River

Table IV-2

Projected Population and Waste Tonnage:

<u>POPULATION</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
* North of American River	81,894	101,578	120,304	144,550	167,232
** South of American River	227,460	250,206	275,226	302,749	333,021
Total Population	309,354	351,734	395,530	447,300	500,253
<u>WASTE TONNAGE</u>					
Refuse North of American River	33,304	41,308	48,923	58,784	68,000
Garden Waste North of American River	14,650	18,654	22,462	29,391	34,000
Total Waste North of American River	<u>49,955</u>	<u>61,962</u>	<u>73,385</u>	<u>88,175</u>	<u>102,000</u>
Refuse South of American River	92,500	101,750	111,925	123,118	135,430
Garden Waste South of American River	48,250	52,875	57,962	61,559	67,714
Total Waste South of American River	<u>138,750</u>	<u>152,625</u>	<u>167,888</u>	<u>184,677</u>	<u>203,144</u>
*** Total City Waste Tonnage	<u>188,705</u>	<u>214,587</u>	<u>241,273</u>	<u>272,852</u>	<u>305,144</u>
Average Daily @ 287 Days Per Year	660	747	840	950	1,063

* Population rate north of the American River:

- Use: North Natomas projects a growth of 63,400. Planning indicates most of the growth will be during the last ten years:
- Assume Growth rate = 15% each five year interval + North Natomas growth.
(7,400-1990, 12,000-1995, 20,000-2000, 24,000-2005)

** Population rate south of the American River:

- Use: 10% each five year interval (2%/year)

*** The tonnage figures reflect only the waste stream quantities that can be transferred. Heavy materials from street maintenance and water sewer that were hauled directly to the landfill will not be brought to the transfer station.

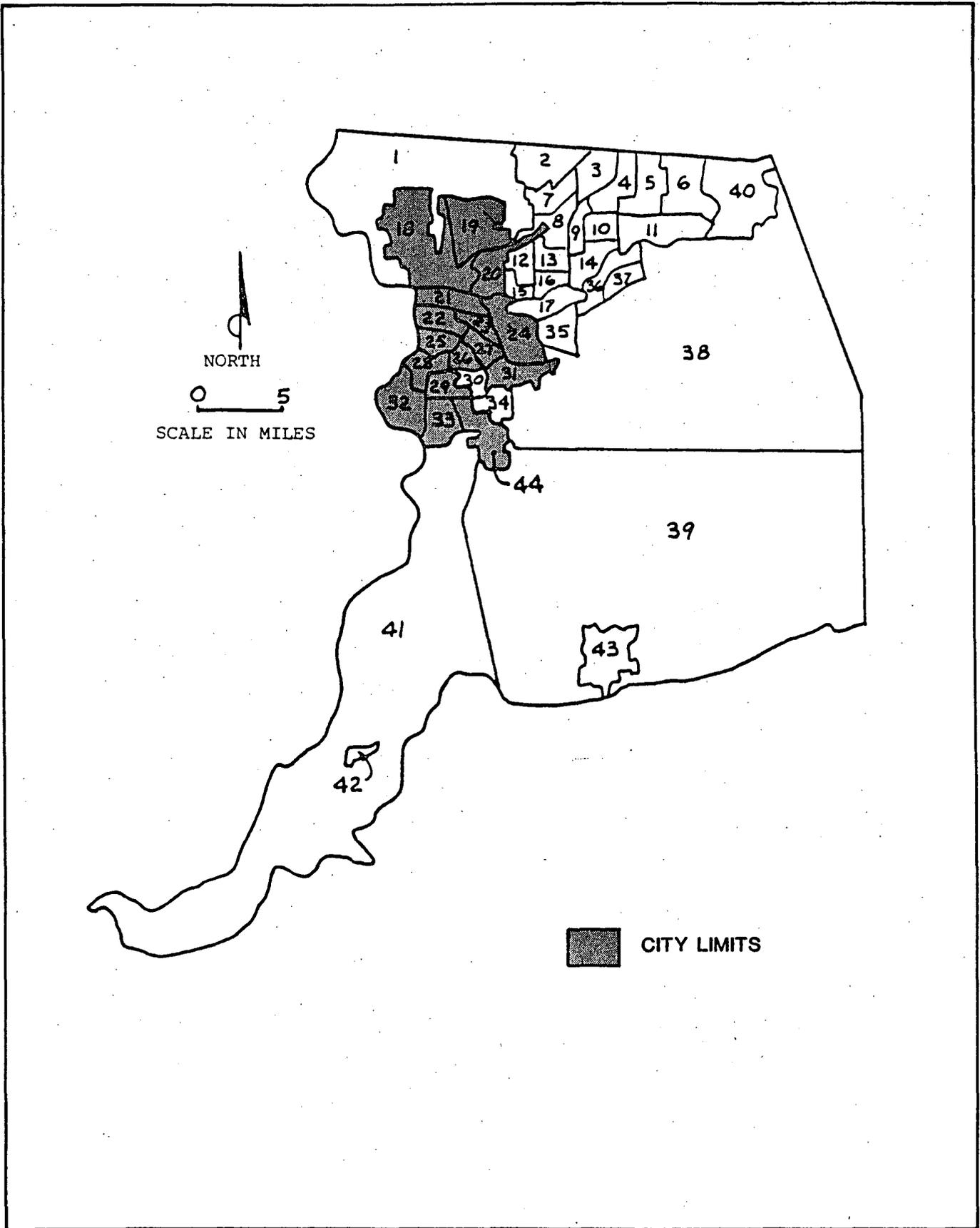


FIGURE IV-2. POPULATION AND WASTE GENERATION AREAS IN SACRAMENTO COUNTY

EXHIBIT V

City Waste Collection Truck Traffic
Pattern Analysis

Table V-1. Collection Vehicle Arrival Counts
 28th Street Landfill
 February 10-14, 1986

Day of Week	Arrival Hour												
	5-7 a.m.	7-8	8-9	9-10	10-11	11-12	12-1 p.m.	1-2	2-3	3-4	4-5	5-6	6-7
<u>Refuse</u>													
Monday	5	4	7	18	13	19	15	10	3	1	1		
Tuesday	5	6	3	10	16	24	15	11	1		1		
Wednesday	2	4	4	17	15	13	19	13	3			2	
Thursday	1	6	3	11	13	22	10	2	4		1		
Friday	1	6	3	8	22	13	17	5	1				
Daily average number of vehicles	3	5	4	13	16	18	15	8	3	<1	<1	<1	0
<u>Street Cleaning</u>													
Monday		3	10	6	8	3				1	4	1	
Tuesday	1	4	10	4	10	3		1	2		2	4	
Wednesday		6	7	11	2				1	1	2	5	
Thursday	1	6	11	5	3						3	2	3
Friday		7	13	3					1	2	2	5	
Daily average number of vehicles	<1	5	10	6	5	1	0	<1	<1	<1	3	4	<1

EXHIBIT VI

City-County Correspondence Regarding
Use of County Solid Waste Facilities



COUNTY OF SACRAMENTO

DEPARTMENT OF PUBLIC WORKS

COUNTY ADMINISTRATION BUILDING • ROOM 304 • 827 SEVENTH STREET
SACRAMENTO, CALIFORNIA 95814

January 24, 1986

RECEIVED

FEB 6 - 1986

CITY OF SACRAMENTO
WASTE REMOVAL DIVISION

Melvin H. Johnson, Director
City of Sacramento
Department of Public Works
915 I Street
Sacramento, CA 95814-2608

Dear Mel:

This is in response to your letter of January 9 in regard to general terms and conditions of a potential agreement for disposal of City of Sacramento wastes at County facilities. The County's position relative to the specific issues raised in your letter are as follows:

1. CONTRACT TERM: We are in agreement with your proposal for a five year contract with options to renew for three additional five year increments if the City provides the County with a minimum of 90 days written notice of its intent to exercise their option to extend the contract term.
2. EFFECTIVE DATE: We are in agreement with a start date of January 1990 or an earlier date based on mutual agreement of the parties.
3. WASTE QUANTITIES:
 - a) LANDFILL: The quantities of City wastes and the conditions under which these wastes would be delivered to the County's landfill are acceptable.
 - b) FRUITRIDGE TRANSFER STATION: The waste quantities specified for the Fruitridge Transfer Station could not be handled without major modification to this facility. We are prepared to discuss this option further.
 - c) NORTH TRANSFER STATION: We are currently evaluating our North Transfer Station and are considering major modifications to this facility. Delivery of 45,000 tons of City wastes would be an important factor in our evaluation, therefore, we need to know your intentions regarding this option as soon as possible.
4. OPERATING HOURS: The landfill operating hours are as stated. Our transfer stations are open 8:30 a.m. to 4:45 p.m. seven days a week.
5. WEIGH TICKETS: Your proposal to weigh transfer trailers at the proposed City Transfer Station is acceptable provided the County may weigh these vehicles at the landfill on a spot check basis.

6. CONSULTANT STUDY: The firm of HDR Techserv recently completed a study of our North Transfer Station at a cost to the County of \$25,000. This study included evaluating the impact of handling City wastes at this facility. It is the County's position that the City should finance a consultants study of handling City wastes at the Fruitridge Transfer Station.
7. OPERATION/OWNERSHIP OF TRANSFER STATIONS: After careful consideration of this matter, the County has concluded that it is not interested in transferring ownership and/or operation of its transfer station(s) to the City. We are prepared, however, to negotiate an agreement for handling City wastes at one or both transfer stations as previously discussed.
8. FEES: The current tipping fees are \$4.60 per ton at the Landfill and \$16.75 per ton at Transfer.

The firm of Price Waterhouse has been retained to conduct a rate study for our Refuse Enterprise with completion scheduled for mid-April. We will not have a good estimate of FY 1986-87 tipping fees at Landfill and Transfer until completion of this study. However, our best estimate is \$19.00 - \$20.00 per ton at Transfer, subject to approval by our Board of Supervisors.

We are reluctant, however, to project a tipping fee at Landfill pending completion of the Price Waterhouse study. Our rates at the Landfill have remained unchanged since 1981 and we anticipate major cost increases in this operation next year associated with intermediate and final earth cover work and costs resulting from the Calderon bill (AB 3525). As soon as we have more definitive information in this regard we will advise you accordingly.

With regard to the determination of future tipping fees, we would prefer to base this on actual costs associated with the operation. In our opinion, it is not practicable to escalate tipping fees over a long-term contract based on some form of price indices. This is especially true at Landfill where changing and increasingly stringent State and Federal regulations are having major cost impacts.

We would propose that gate fees be established at rates adequate to compensate the County for: operation and maintenance expense; depreciation; allowance for inflation in regard to equipment replacement; allocated expense for division, department, and Countywide overhead; reasonable provision for landfill closure and monitoring costs; a reasonable operating contingency; loan repayment, if any; allocation of transfer deficits, if any, financed through landfill gate fees.

M. JOHNSON
JANUARY 24, 1986
PAGE 3 OF 3

Conclusion

Fortunately, the County's landfill has a remaining life of 20 years or more depending on assumptions relative to waste loadings, densities and final grades. Nevertheless, landfill site life will be reduced significantly if City wastes are received beginning in 1990. In our opinion, this is not in the best interest of either party.

We propose, therefore, that the subject of purchasing additional land immediately adjacent to the County's existing landfill site be included in our negotiations. The acquisition of additional land would: increase site capacity, compensate the County for reduced site life associated with receiving City wastes, and provide a buffer between landfill operations and adjacent property owners.

It is hoped that this adequately responds to your request for a County position on the various issues outlined in your letter of January 9. Please be assured that we are cognizant of the City's need to develop a long-term solid waste disposal plan and are prepared to work cooperatively with you and your staff to attain that goal. In order to expedite the negotiation process, it may be advisable to have your attorney's prepare a draft agreement for our review.

If we can be of further assistance, please contact me at 440-6581 or Denny Kerton at 366-2625.

Very truly yours,


D.W. McKenzie

DWM:HDK:dh
1717A

cc: Brian H. Richter
W.C. Wanderer
H.D. Kerton
Walter J. Slipe
Reg Young
John Boss

Chapter 3

TRANSFER STATION SITE ANALYSIS

Prepared by:

Jones & Stokes Associates, Inc.

and

Cooper Engineers

INTRODUCTION

The City of Sacramento Department of Public Works identified 11 properties it wished to investigate as potential sites for solid waste transfer station operations. Jones & Stokes Associates and its subcontractor, Cooper Engineers, were asked to aid in the evaluation and screening of these sites. This report presents the findings of the Jones & Stokes/Cooper Engineers analysis.

The objective of the analysis was to identify the sites with the greatest potential for use as transfer stations, and to eliminate those sites with potentially significant engineering, cost, or environmental shortcomings.

Jones & Stokes Associates staff prepared the site descriptions and conducted the policy and environmental evaluations contained in this report. Cooper Engineers prepared the cost and engineering evaluations. The recommendations were developed jointly. Earlier transfer station analyses prepared for the City were thoroughly reviewed and considered in developing these recommendations. This includes reports prepared by Brown and Caldwell in 1979 and 1980 (see Appendix B at the end of this chapter).

DESCRIPTION OF SITES ANALYZED

Site No. 1

Site No. 1 is located in the southeastern portion of the Sacramento County Regional Sanitation District (SCRSD) buffer lands (see Figure 1). The site is located in the County, approximately 1 mile south of the Sacramento City limit. It is bounded by the Western Pacific Railroad tracks on the west, the SCRSD buffer lands on the north, Franklin Boulevard on the east, and Simms Road on the south. The site constitutes approximately 200 acres and is located 12.7 miles from the Sacramento City landfill. Of the six sites analyzed in detail in this report, it is the farthest from the City's waste collection centroid (about 10 miles distant). Access to the site is from Franklin Boulevard and Simms Road. According to the Sacramento County General Plan (1982), the site is designated as public/quasi public. The site is currently zoned Industrial Reserve.

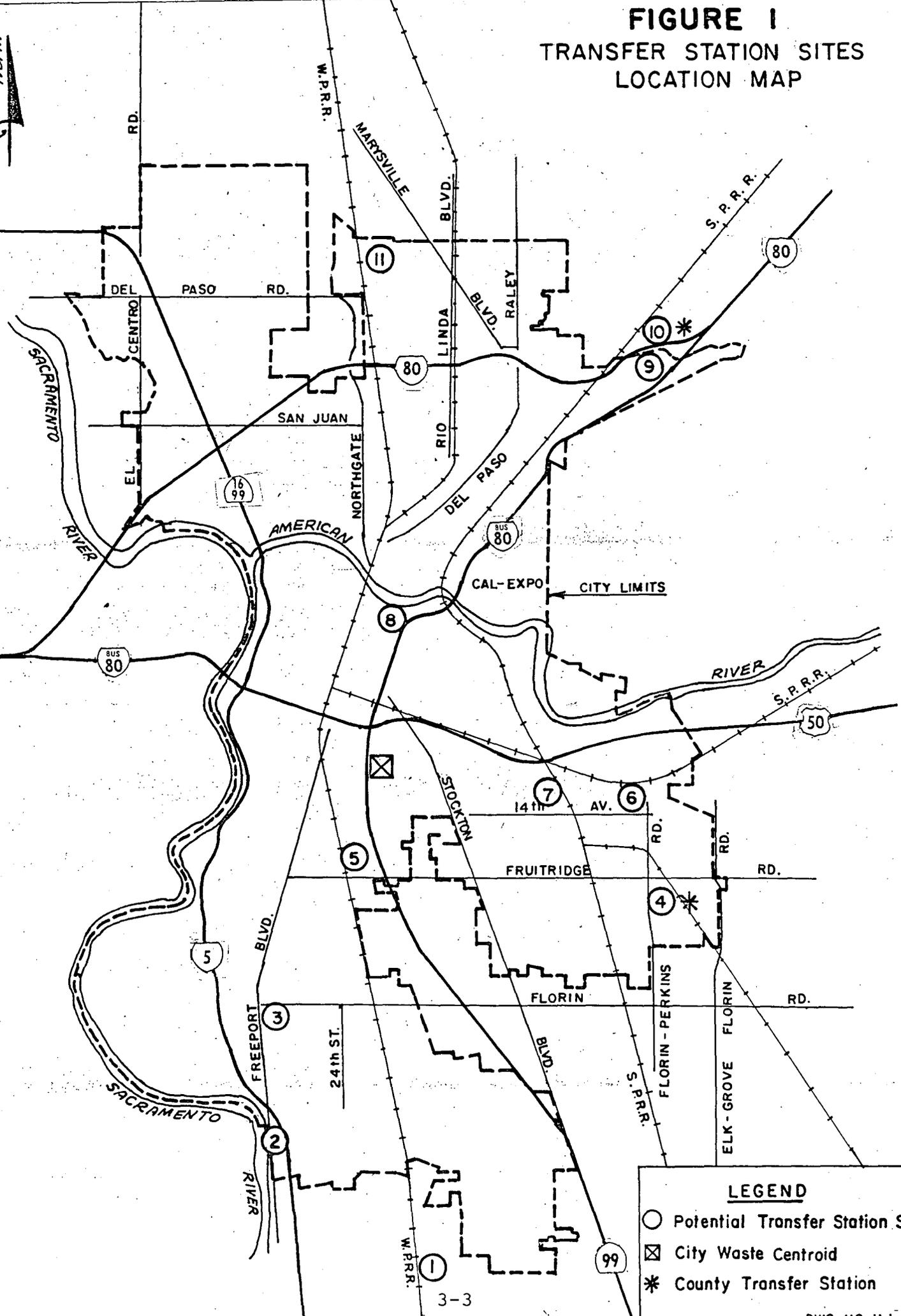
At present, the site is owned by the County of Sacramento and is rural, open space, consisting of pasture. Both established and developing residential areas are located approximately 1 mile to the northeast and the SCRSD wastewater treatment plant is located approximately 2 miles to the northwest. Pasture and agricultural land is adjacent to the site to the east and south. Several scattered residences are located along Franklin Boulevard.

Site No. 2

Site No. 2 is located at the Meadowview wastewater treatment plant. The site is located within the City of Sacramento and is bounded by Interstate Highway 5 on the north and northeast, Freeport Boulevard and the Southern Pacific Railroad tracks on the east, the Sacramento River on the south and southwest, and vacant land on the west. The site constitutes approximately 16 acres and is located 11 miles from the Sacramento City landfill. It is about 8 miles south of the City's waste centroid. Access to the site is from Freeport Boulevard. According to the Sacramento General Plan, the site is designated major public/quasi public. The South Pocket Specific Plan (1976) shows the site as the Meadowview wastewater treatment plant. The Sacramento General Plan (1974) designates the site as major public/quasi public. The site is currently zoned agriculture.

At present, an estimated 2.6 acres of the site is occupied by the remains of a City-owned wastewater treatment plant. The plant is no longer used and is slowly being dismantled. The

FIGURE I
TRANSFER STATION SITES
LOCATION MAP



LEGEND

- Potential Transfer Station Site
- ⊠ City Waste Centroid
- * County Transfer Station

3-3

remaining 8.5 acres are characterized as rural open space, consisting of pasture. Residential development is located approximately 0.5 mile to the northwest. Vacant land lies adjacent to the site to the north, east, southeast, and south.

Site No. 3

Site No. 3 is located at the Willow Rancho Little League Park. The site is located within the City of Sacramento and is bounded by Florin Road on the north and Freeport Boulevard on the west. The site encompasses approximately 5.4 acres and is located 7.5 miles from the Sacramento City landfill. It is about 6.5 miles from the City waste centroid. Access to the site is from Amherst Street. According to the Sacramento General Plan, the site is designated residential. The site is currently zoned Executive Airport overlay/single-family residential (EA/R).

At present, the site is owned by the City of Sacramento and is used as a park. The park consists of open, grassy areas with one baseball diamond. Adjacent land uses include commercial uses to the north and west and residential areas to the east and south.

Site No. 4

Site No. 4 is an existing transfer station, owned and operated by the County of Sacramento. This site is not being evaluated in the Jones & Stokes/Cooper Engineers study, but is being reviewed independently by the City of Sacramento Department of Public Works staff.

Site No. 5

Site No. 5 is located within the abandoned Western Pacific Railroad yards. The site is located within the City of Sacramento and is bounded by vacant land on the north, residential development on the east, Sutterville Road and Deeble Street on the south, and the Western Pacific Railroad tracks and Hughes Stadium on the west. It is approximately 40 acres in size and is located 3.4 miles from the Sacramento City landfill. It is the closest site to the City waste centroid (less than 1 mile away). Access to the site is from Sutterville Road and Deeble Street. According to the Sacramento City General Plan, the site is designated as major public/quasi public and major transportation. The site is presently zoned heavy industrial (M-2).

At present, the site is owned by the Western Pacific Railroad, with approximately 40 acres being deeded to the City.

Site No. 6

This site is located within an aggregate pit in east Sacramento. The site is bounded by Highway 16 on the north, Florin-Perkins Road on the east, light industrial uses on the south, and Power Inn Road on the west. It comprises approximately 100 acres and is located 6.7 miles from the Sacramento City landfill. It is about 6 miles from the City waste centroid. Access to the site is from Highway 16 and Florin-Perkins Road. According to the Sacramento City General Plan, the site is designated industrial. However, the site has been designated as regional recreation in the City's Parks Master Plan (1984). The site is presently zoned heavy industrial (M-2) with certain regulations designed to obtain industrial park developments. It is owned by the City of Sacramento.

Adjacent land uses include residential development, approximately 0.5 mile to the north, office and commercial uses immediately to the north, vacant land to the east, light industrial uses to the south, and an ongoing gravel quarry operation to the west.

Site No. 6 has been considered as both a landfill site and a site for waste-to-energy facilities in previous studies.

Site No. 7

This site is located in east Sacramento. It is bounded by Highway 50 and the Southern Pacific Railroad (SPR) tracks on the north, the SPR tracks on the east, San Joaquin Street on the south, and a bus storage facility on the west. The site is 9.3 acres in size and is located 5.4 miles from the Sacramento City landfill. The City waste centroid is about 4 miles distant. Access to the site is from San Joaquin Street and Redding Avenue. According to the Sacramento City General Plan, the site is designated as industrial. However, the site is presently used as a recreational area. The site is currently zoned light industrial (M-1).

At present, the site is owned by the City of Sacramento and used as a park. The park consists of an open grassy area with two baseball diamonds. Adjacent land uses include industrial uses to the north and east. Residential development is located approximately 0.25 mile to the west. The Sacramento City Unified School District uses the land immediately west of the site for school bus storage and fleet dispatch.

Site No. 8

This site is located at the existing Sacramento City landfill. The site is bounded by the American River on the north, Interstate 80 on the east, the SPR tracks on the south, and the

Western Pacific Railroad tracks, and the Almond Growers energy plant on the west. It is approximately 16 acres in size. The landfill is about 3 miles north of the City waste centroid. Access to the site is from 28th Street. According to the Sacramento City General Plan, the site is designated as major recreation/open space. The site is currently zoned heavy industrial/parkway corridor (M-2/PC).

Site No. 8 is owned by the City of Sacramento. It is an abandoned landfill area used from the 1940s to the 1970s. The site has been filled and lies vacant. Adjacent land uses include landfill operations immediately to the north and east, residential development two blocks to the south, and vacant land to the west.

Site No. 9

Site No. 9 is located within Del Paso Park. It is within the City of Sacramento and is bounded by open space on the north, Business 80 on the south, Watt Avenue on the east, and the Haggin Oaks Golf course on the west. The site is 400 acres in size and is located 7.8 miles from the Sacramento City landfill. It is nearly 11 miles northeast of the City's waste centroid. Access to the site is from Business 80, Watt Avenue, and Longview Drive. According to the Sacramento City General Plan, the site is designated major recreation/open space. The site is currently zoned single-family residential (R-1).

At present, the site is owned by the City of Sacramento and planned as additional parkland to Del Paso Park.

Site No. 10

This site is an existing transfer station, owned and operated by the County of Sacramento. This site is not being evaluated in the Jones & Stokes/Cooper Engineers study; City Department of Public Works staff is investigating its use.

Site No. 11

Site No. 11 is located in North Sacramento and is bounded by Ascot Avenue on the north, Dry Creek on the south, open space on the east, and the Western Pacific Railroad tracks on the west. It is approximately 180 acres in size and is located about 12 miles from the Sacramento City landfill. It is about 15 miles north of the City waste centroid. Access to the site is from West 6th, via Elkhorn Boulevard. According to the North Sacramento Community Plan (1984), the site is designated as parks and open space. The site is currently zoned agriculture.

At present, the site is owned by the City and is characterized as rural, open space, consisting of pasture. Residential development is located immediately to the north. Pasture and agricultural land is adjacent to the site on the east, south, and west.

INITIAL SITE SCREENING

Prior to conducting the field survey of the 11 sites described on preceding pages, City of Sacramento staff decided that the two existing Sacramento County transfer station sites (Nos. 4 and 10) should not be evaluated in this report. This decision was based on economic and policy considerations. Because these two sites are ongoing transfer station operations and the other sites are undeveloped or in other uses, the comparison would be unequal. The City is conducting a separate evaluation of the County transfer station sites.

On March 18, 1986, the nine remaining potential transfer station sites were reviewed in the field. Staff from Jones & Stokes Associates, Cooper Engineers, and the the City Department of Public Works collected data on existing land use, adjacent street pattern, potential access routes, topography, biological resources, drainage, electrical service, aesthetics, and ground disturbance. The distance from the 28th and C Street landfill site also was noted. Following the field review, three of the nine sites were dropped from the evaluation.

Site No. 3, located at the intersection of Florin Road and Freeport Boulevard, was determined to be too small (5.4 acres). It also appeared to have significant land use compatibility problems, as it was immediately adjacent to residences and a church. Site No. 9, located at the eastern end of the Haggin Oaks golf course, was found to be currently under construction. Subsequent checking determined that the site was being developed by the City as a regional sports complex and park. This pre-empts the construction of a transfer station on the site. Site No. 11, located at the extreme north end of the City, south of Ascot Avenue, has extremely poor access to any major right-of-way and is immediately adjacent to or within the Dry Creek floodplain. The poor access and extreme distance from the City's waste centroid were sufficient to warrant dropping the site from further consideration.

At the conclusion of the initial site screening, six sites (Nos. 1, 2, 5, 6, 7, and 8) remained for a more detailed evaluation.

SITE EVALUATION

Introduction

The following text and matrix (Table 1) present the results of the Jones & Stokes/Cooper Engineers evaluation of six potential transfer station sites in the City of Sacramento area. These sites have been evaluated in a number of policy, economic, engineering, and environmental categories. The matrix is a graphic portrayal or summary of the evaluation described in the text. It is not intended to be a method of quantitatively summing the pluses and minuses of each site, but simply shows a relative comparison of each site in each evaluation category.

Policy Conformity

Consistency with Land Use Plans

This criterion compares the proposed transfer station facilities to the existing land use plan designations for the area in which the facilities are to be located. Land use planning consistency must be judged from two perspectives, the local level and the state level. From the local perspective, a site should be designated as either solid waste facility or industrial on the General Plan Land Use Element, and zoned industrial before it would be judged totally consistent (Dee pers. comm.). From the state perspective, however, the California Waste Management Board requires a site to be designated as a solid waste facility in the General Plan Land Use Element before a finding of consistency can be made.

Of the six sites being considered, only Site No. 8 could be considered currently consistent with the General Plan from both a local and state perspective. The site is zoned industrial and designated as solid waste facility/open space/parks in the General Plan. Site Nos. 1, 5, and 7 are currently zoned industrial, but their General Plan designations range from public/quasi public to recreation. A change in General Plan designation would be required before consistency could be achieved either from a local or state perspective. Site No. 6 is zoned industrial and designated as industrial on the 1974 General Plan. Therefore, its use would be consistent from a local perspective, but not a state perspective. Site No. 2 is zoned agriculture and designated as major public/quasi public on the General Plan. A General Plan Amendment and zoning change would be necessary for a consistency finding on this site.

Table 1. City of Sacramento Transfer Station Options: Matrix Evaluation

Evaluation criteria	Site no.					
	1	2	5	6	7	8
<u>Policy conformity^a</u>						
Consistency with land use plans	●	●	●	●	●	○
Consistency with COSWMP	●	●	●	●	●	○
<u>Economic character^b</u>						
Site development cost	○	○	○	●	○	●
Operation and maintenance cost	●	●	○	●	●	○
Alternate use value	○	○	○	●	●	●
<u>Engineering character^b</u>						
Ease of permitting	○	○	○	○	○	○
Geotechnical	○	○	○	○	○	●
Drainage	●	○	○	●	●	○
Use of existing equipment	●	●	●	●	●	○
Site access	●	●	○	○	●	○
Size constraints for maintenance facility	○	○	○	○	●	N/A
Accommodate alternative technology	○	○	○	○	●	○
Effect of transport distance	●	●	○	●	●	○
<u>Environmental character^c</u>						
Soil loss	○	○	○	○	○	○
Water quality	○	○	○	○	○	○
Flooding	○	○	○	○	○	○
Biological resources	○	○	○	○	○	○
Noise	○	○	●	○	○	○
Land use conversion	○	○	○	○	○	○
Land use compatibility	○	○	●	○	○	○
Traffic/circulation	○	○	●	○	○	○
Public services	○	○	○	○	○	○
Energy	○	○	○	○	○	○
Health	○	○	○	○	○	○
Cultural resources	○	○	○	○	○	○
Aesthetics	○	○	○	○	○	○
Public acceptance	○	○	○	○	○	○

^a ○ = consistent; ● = marginally consistent; ⊕ = inconsistent

^b ○ = good; ○ = adequate; ● = poor; N/A = not applicable

^c ○ = no impact; ○ = potential minor impact; ⊕ = potential major impact

The City of Sacramento currently has a state-imposed moratorium on General Plan Amendments, pending a General Plan update. The first phase of the update process is expected to be completed in January of 1987 (Dee pers. comm.). Until that time, the City cannot expect to proceed with solid waste facilities permits on any of the six transfer station sites considered in this report except Site No. 8.

Consistency with the County Solid Waste Management Plan

The Sacramento County Solid Waste Management Plan (COSWMP) recognizes the use of transfer stations as a viable option for consolidating and hauling the City's solid waste. It lists several potential options being investigated in this regard, including use of the existing landfill site (No. 8). It does not exclude consideration of other sites, however; it simply indicates that transfer stations are being considered. It appears, therefore, that use of any of the six transfer station sites being considered would be consistent with the COSWMP discussion of future solid waste facilities options for the City. Only Site No. 8, however, is designated as a specific site for a proposed transfer station. Use of Site Nos. 1, 2, 5, 6 or 7 would require a change in the COSWMP before a finding of plan consistency could be made. The County intends to review and revise the COSWMP in the summer of 1986, so other specific transfer station location options could be added to the plan at that time (Maxfield pers. comm.).

Economic Character

The City staff has specified that the evaluation be on the basis of a 1986 refuse generation rate of 460 tons per day (287 days per year), except that the transfer station be oversized to accommodate the 1,000 tons per day estimated to be generated in 2005. The City also specified that the refuse be assumed to be delivered to the Sacramento County Landfill at a tipping fee of \$6 per ton.

Capital Costs

This matrix item considers, in a qualitative manner, special factors at each site which may increase costs. These factors include poor foundation conditions, inadequate access, or other large site development requirements. This matrix item does not consider the assessed valuation of the land, i.e., the value of the property if it was under private ownership (refer to Appendix A for dollar estimates).

O & M and Transport Costs

The O & M costs at each transfer station are assumed to be about equal. Cost difference will occur primarily because of differences in transport costs. Transport costs will involve two factors: the off-route collection haul cost, and the transfer haul cost. A subjective evaluation was performed which ranked the transfer station sites (refer to Appendix A).

Alternative Waste Disposal Related Use Value

The matrix item considers the potential for each site to economically accommodate, in lieu of a transfer station, an alternate waste handling or disposal facility such as a baling station, a waste-to-energy plant, etc.

Engineering Character

Ease of Permitting

The principal operations permit that is required is the Solid Waste Facilities Permit issued by the County Department of Health. In general, the procedure for obtaining this permit is as outlined below:

- o The City or County must modify its general plan to allow the transfer station operations at the location selected. Site No. 1 is located in the County with all other sites located within the City limits.
- o The County Department of Public Works must amend the County Solid Waste Management Plan to reflect the transfer station operation.
- o Application must be made to the County Department of Health for a Solid Waste Facilities Permit. The County Department of Health is the local enforcement agency for the California Waste Management Board (CWMB).
- o After submittal, the application is reviewed by both the County Department of Health and the CWMB.
- o After final approval of the application by the County Department of Health and the CWMB, the Solid Waste Facilities Permit is issued by the County Department of Health.

In addition to the above permit, City or County permits for building, electrical, plumbing, grading, drainage, and encroachment may be required to construct the facility.

At this time, the only perceived difference between the sites for ease of permitting is that Site No. 8 is an existing solid waste facility and, therefore, would require only a modification to an existing Solid Waste Facilities Permit to operate a transfer station.

Geotechnical Setting

The six alternative sites are located in the southeastern portion of the Sacramento Valley. This area forms a portion of a large inland trough. The trough is comprised of sequences of interbedded layers of gravel, sand, silt, and clay, which are reflective of its older, former marine environment and its more recent fresh water alluvial environment. The depositional sequences may be composed of relatively thick channels of coarse-grained sediments or thinner channels with fine-grained materials interspersed between the sands and gravels.

Based on our very preliminary study, consisting of a "windshield" site survey and brief examination of large-scale geologic and soil mappings, all six sites occupy similar geotechnical settings. A more detailed investigation would be required in order to further distinguish between the sites. However, certain observations can be made concerning some of the sites simply from their relative proximity to gross geotechnical features, the existing site conditions, and the site's past development and use. Site No. 2 is located immediately adjacent to the Sacramento River, and any construction activity may encounter near-surface groundwater. This represents a similar consideration at Granite Site No. 6. The current pit excavation has encountered groundwater.

Site No. 8 represents the most complex and potentially most difficult setting in which to construct any permanent facility. If any construction is founded over refuse, it must be built to accommodate potentially extreme settlement, differential settlement, low subgrade bearing capacities, and problems presented by methane gas migration.

Drainage Facilities

All sites except No. 1 and No. 2 are in urban areas, and it is assumed that City storm drainage facilities such as ditches, pipelines, etc. are available. The distances that the station's storm drainage will have to be conveyed to connect to these facilities is not known at this time. Also, it is not known if the existing facilities are of sufficient capacity to accommodate flows from the station without modification.

If the station is located inside the quarry at Site No. 6, the storm drainage may have to be pumped out of the quarry.

Site Nos. 1 and No. 2 are in a rural setting, but it appears storm drainage can readily be conveyed in existing or new ditches to an appropriate discharge point.

Potential for Utilizing Existing Facilities and Equipment

Site No. 8, which is adjacent to the City's refuse maintenance yard, is the only site with existing facilities and equipment. It is not anticipated that a significant interchange of facilities and equipment between a transfer station and the maintenance yard would occur. The maintenance yard's scale facility, wash rack, fuel dispensing and storage facilities, etc., might be used as transfer station equipment if they were of the proper size and capacity, were at the right location, or could readily be relocated to optimally serve both facilities.

If the maintenance yard and transfer station are adjacent to one another, the travel time required for personnel and equipment to perform periodic maintenance is reduced.

Site Access

All sites are accessible by paved streets or roads. All sites, except No. 1, are within approximately 1 mile of a freeway or state highway. Site No. 1 is approximately 4 miles from State Highway 99.

At all or most sites, the width, configuration, and load-carrying capacity of the portions of existing roads to be used for access will have to be modified to some degree to accommodate the truck traffic.

At Sites No. 1 and No. 6, the total land area under consideration is relatively large (200 and 100 acres, respectively). Depending on the precise location of the transfer station within this large area, the distance from the nearest existing roads to the transfer station site itself could require up to 0.50 mile of new access road construction. This would not be required at other sites where existing roads would be relatively close to the transfer station itself.

The effects of the transfer station on traffic at each site are evaluated as a separate matrix item.

Adequacy for Construction of a New Refuse Maintenance Facility

The City staff has indicated that the existing refuse maintenance facility is very antiquated, and as a result the

City is currently studying alternate locations for a new refuse maintenance facility. One of these alternatives is to locate a new refuse maintenance facility adjacent to the new transfer station.

This matrix item is evaluated on the basis of whether the total area at a given site is adequate to accommodate both a transfer station and a new refuse maintenance facility.

The City staff has indicated the minimum area required for a 1,000-ton-per-day transfer station is about 8.5 acres. This includes areas for the transfer station structure, roadways, transfer truck parking, transfer trailer maintenance facility, employee and visitor parking, resource recovery, RDF processing and storage, fuel facilities, and a buffer zone.

If the City refuse maintenance facility is relocated to the transfer station site (not required if Site No. 8 is selected), the City staff indicates an additional 6.5 acres is required. This includes maintenance shops, steam cleaning facilities, dispatch office, and parking for more than 100 vehicles.

The outcome of the City's current study of locations for a new refuse maintenance facility site could affect this transfer station evaluation. The construction of a refuse maintenance facility adjacent to the transfer station or at some other location would affect the off-route distances traveled by the collection trucks. Also, it may be desirable to station the collection trucks at the transfer station to save the travel time of returning to a distant maintenance yard at the end of the day. However, this advantage may be offset by the difficulties in performing maintenance on the collection trucks when they are stationed at a location distant from the maintenance facility.

Potential for Accommodating Alternate Waste Disposal Technology

This matrix item evaluates each site's ability to accommodate, from an engineering perspective, an alternate waste handling or disposal facility such as a baling station, a waste-to-energy plant, etc. in lieu of a transfer station.

Effect of Transport Distances

Transport distances are evaluated in the matrix on the following basis:

- o It has been commonly found that transfer stations are not cost effective unless the landfill site is greater than about 15 miles from the transfer station. Therefore, all sites within approximately 15 miles of the landfill are considered as "poor," i.e., it would be

better to direct-haul the refuse than to double-handle the refuse through a transfer station.

- o The remaining sites are evaluated on the basis that sites with short collection haul and a 15-mile or greater transfer haul are "adequate," and sites with long collection haul and a 15-mile or greater transfer haul are "poor." Because a detailed analysis of collection distances for individual waste areas within the total service area is beyond the scope of this study, the collection haul was evaluated in the matrix on the basis of its distance from the waste centroid of the entire service area.

Environmental Character

Soil Loss

None of the six sites contains soils considered as prime agricultural land. Site Nos. 1 and 2, however, contain soils that still support agricultural production. In contrast, past and present land use practices have eliminated the agricultural value of the soils at Site Nos. 5, 6, 7, and 8. Therefore, the soil loss would be greatest with development of either Site Nos. 1 or 2.

Water Quality

If properly constructed and operated, solid waste transfer stations should not generate significant water quality impacts. If on-site drainage is captured and all equipment wash water is collected and discharged to the regional sewer system, local groundwater and surface water should not be affected. If, however, drainage or wash water were allowed to flow off the site, location would be important in assessing potential impacts.

The sites with the greatest potential for creating a surface water contamination are Site Nos. 1 and 2. Site No. 1 drains directly into Laguna Creek, which is located just to the north of this site. Any significant surface runoff from this site would probably end up in Laguna Creek. Site No. 2 drains into a large ditch that borders the site on the east. Water from this ditch is pumped up over the levee into the Sacramento River, which borders the site on the southwest. None of the other sites drains directly into a surface water body.

Use of any of the sites could lead to contamination of usable groundwater supplies if wash water or drainage were allowed to percolate through surface soils. The sites central

to the Sacramento urban area (Site Nos. 5, 6, 7, and 8) would be of greatest concern, as they are closer to more domestic groundwater extraction points. The two rural sites (Nos. 1 and 2) would be less likely to generate significant groundwater contamination concerns, although there may be domestic wells serving individual rural homes in the vicinity.

Flooding

The potential for flooding impacts was assessed by reviewing the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. These maps depict the 100-year and 500-year flood zones. Site Nos. 2, 5, 7, and 8 are located totally outside all flood hazard zones. Site Nos. 1 and 6 are located in areas subject to the 500-year flood. Site No. 1 is partially within the zone, along its western border. Site No. 6 is entirely within the zone.

Biological Resources

Three of the six sites have essentially no biological resource value in their present condition. Site Nos. 5, 7, and 8 have undergone significant modification, to the point where they are of little value to either vegetation or wildlife. Site No. 5 is paved, with no vegetation; Site No. 7 supports introduced grasses in the form of a little-used playing field; and Site No. 8 is an old landfill site that attracts primarily nuisance rodent and bird species.

A portion of Site No. 2 is currently an agricultural field used for growing fodder or grain crops. This type of habitat typically supports a number of rodents and birds, including raptors. The proximity of residential development, the highway and the wastewater treatment plant limits the value of this agricultural land relative to similar habitat in a more rural setting. The Granite gravel pit (Site No. 6) currently has some wildlife value, as it contains a pond and associated willows. It attracts water birds seasonally, but it also is subject to extreme seasonal fluctuation. The intensity of surrounding urban development diminishes its value considerably. Site No. 1, located in a completely rural setting, is used for production of field crops and supports animal grazing. This type of agricultural land has a relatively high wildlife value for rodents, small mammals, and a wide variety of birds, including raptors and migratory water birds. Site No. 1 has the greatest biological value of the six sites being analyzed.

Noise

Noise concerns related to site alternatives involve the issues of truck traffic noise and localized site noise at trans-

fer stations. Site No. 6 would not create significant noise impacts. Existing traffic levels in the vicinity of Site No. 6 are so high that project-generated noise would not represent a significant impact.

Noise from truck traffic and transfer station operations could become a minor impact for Site No. 1 as proposed development occurs near the site and along major access routes. At present, truck traffic would affect only a limited number of rural residents. Noise from transfer station operations could become a minor impact for Site No. 2 as proposed development occurs near the site. At present, noise is not expected to create a significant impact at this site.

Site No. 7 is located approximately 0.25 mile east of residential development. Even though adjacent land uses are industrial, noise impacts at this site could be a minor problem because the access route would pass through a residential area. The access route to Site No. 8 also passes through an established residential neighborhood. Resident complaints about noise are likely to continue if use of Site No. 8 continues.

Noise from truck traffic and transfer station operations would adversely impact residential development located immediately to the east of Site No. 5. Truck traffic along 12th Avenue would affect noise-sensitive development (residences).

Land Use Conversion

The land use conversion criterion relates to the types of land use that would be directly replaced by construction and operation of a transfer station. Site Nos. 5, 6, and 8 would provide a positive land use conversion impact. Construction of a transfer station at Site Nos. 5 and 6 would allow reclamation of land with no other useful value in its present condition. Site No. 5 presently consists of an old abandoned Western Pacific Railroad yard. Site No. 6 consists of an open aggregate pit. Use of Site No. 8 would allow reclamation of a closed portion of City landfill.

Use of Site No. 1 would convert rural, open space/grassland. Although this is not a limited land resource in the County, it continues to have some agricultural value. Therefore, a minor land use conversion impact would be expected. Site No. 2 includes a wastewater treatment plant which is being dismantled by the City. However, the treatment plant constitutes only 2.6 acres. Construction of a transfer station would require expanding onto an additional 5.9 acres. The additional 5.9 acres would require the conversion of agricultural land. This would be a minor impact. Site No. 7 is presently used as a park. The park consists of overgrown grass and two baseball diamonds. Although the park does not appear to be used or

maintained regularly, its conversion would be a minor impact from a land use standpoint.

Land Use Compatibility

Land use compatibility measures the compatibility of a transfer station with existing and future land uses adjacent to the proposed site. Site Nos. 6, 7, and 8 show the greatest degree of long-term compatibility. Sites 6 and 7 are surrounded primarily by industrial uses, which buffer the sites from residential areas. Site No. 8 is buffered from residential and recreational areas by berms and/or open space. It is unlikely that future land use changes will alter the situation at these three sites.

Site Nos. 1 and 2 have no immediate land use compatibility problems, as they are surrounded by open space and agricultural land at present. Planning is underway, however, for residential development near these sites. It is very likely that incompatibility would develop at both of these locations as residential build-out occurs.

A significant land use incompatibility would be created at Site No. 5. The transfer station would create incompatibilities with the residential development located immediately adjacent to the east and Hughes Stadium, located a short distance to the west.

Traffic/Circulation System

Access to Site No. 1 would most likely occur via Mack Road, Franklin Boulevard, and Simms Road. None of these streets has a serious traffic problem, and the streets themselves are generally adequate to handle the truck traffic expected from a transfer station. It may be necessary to widen Franklin Boulevard near Simms Road and provide better turning lanes, but major reconstruction would not be necessary. The biggest circulation system drawback is the extreme distance from the closest freeway exchange at Mack Road/99. This is about 4 miles.

Site No. 2 access roads would include Freeport Boulevard and Meadowview Road. There are no traffic congestion problems on these streets, but Freeport Boulevard is narrow and in generally poor condition where it passes Site No. 2. The road would have to be widened and the roadbed would have to be improved to accommodate transfer station truck traffic. Site No. 2 has easy nearby freeway access.

Site No. 5 also has relatively close freeway access, but the 12th Avenue/99 interchange is frequently congested and poorly designed for truck use. Sutterville Road from the freeway to Deeble is heavily traveled with four narrow lanes.

Residential areas about Sutterville. Heavy truck traffic would not be advisable on this street.

Traffic conditions around Site No. 6 are currently very congested. Both Power Inn Road and Florin-Perkins Road are especially congested at morning and evening rush hours. U. S. 50 access is nearby, but most truck traffic using U. S. 50 would travel through the Power Inn/Folsom Boulevard intersection, unless specific alternate routes were assigned. This intersection already experiences significant truck traffic. Road improvements are planned for the area (Florin-Perkins widening), and up to 220 truck trips per day will be removed from the road net in the area when the Granite aggregate operation ceases (within 3-5 years). Also, the bulk of the solid waste truck traffic would occur at the site in off-peak hours. While the addition of truck traffic to the Power Inn/Folsom Boulevard and Florin-Perkins/Jackson Highway intersections would add to existing traffic problem areas, the actual impact could be small if the City assigned specific routes to each truck and planned road improvements were to occur.

Access to Site No. 7 could be achieved by a number of routes. The 65th Street/U. S. 50 interchange is within 0.5 mile, but surface streets (San Joaquin Street and Redding Avenue) traverse residential areas and are narrow. A route via 65th, Q Street, and Redding Avenue would bypass most of the residential area, but this would carry transfer station truck traffic past a light rail station being constructed on Q Street. The City traffic engineer feels this would be an inappropriate mix of traffic (Bloodgood pers. comm.). Road improvements would be necessary to use Redding Avenue and Q Street.

The site access pattern and level of truck traffic is already established to Site No. 8 due to the landfill operation. Use of the site as a transfer station would simply continue the current traffic pattern. Some consideration would have to be given to the movement of large transfer trailers on the surface streets near Site No. 8, but no major circulation or traffic congestion problem would be anticipated.

Public Services

At present, water and sewer service is available to Site Nos. 2, 7, and 8 (Hocot pers. comm.). Site No. 2 would be served by water and sewer mains located within both the Meadowview Lane and Freeport Boulevard. Site No. 7 would be served by water and sewer mains located within San Joaquin Street. Site No. 8 would be served by water and sewer mains which currently serve the Sacramento City landfill.

Site Nos. 1, 5, and 6 could easily be provided sewer service (Karr and Hocot pers. comm.). A sewer line extends the

full length of the western property line of Site No. 1 and the eastern property line of Site 6 (Karr pers. comm.). Water is currently unavailable to these sites. However, Site Nos. 5 and 6 are adjacent to uses which have water service. No water district currently serves Site No. 1. However, there is a well located at the southwest corner of Simms Road and Franklin Boulevard. As proposed development occurs east of Franklin Boulevard, the County of Sacramento will operate and maintain a water district. According to the County, a well system could be drilled, with no restrictions, to provide water service to the site (Nischina pers. comm.).

Electric service is currently available to all proposed sites.

Energy

The energy criterion relates to the amount of energy resources (e.g., oil, gasoline) consumed daily to transport solid waste. Conclusions are based on the average mileage traveled from the collection zone centroid to the proposed transfer station sites and back again, and the distance from the existing City landfill to the proposed sites.

The distance from the existing 28th Street landfill to the proposed transfer station sites are listed below:

<u>28th Street Landfill to:</u>	<u>Total miles</u>
Site 1	12.7
Site 2	11.0
Site 5	3.4
Site 6	6.7
Site 7	5.4
Site 8	0

In terms of daily haul miles from the various collection zones to the transfer station sites, Site Nos. 5 and 8 would be most energy efficient (see Table 2). This is true even though Site Nos. 6 and 7 are not significantly farther from the 28th Street landfill site. Both Site Nos. 1 and 2 would create significant impacts in the amount of energy resources utilized, as they are far removed from the City's waste centroid.

Public Health

Transfer stations are not normally a public health concern. If not properly operated, there is some potential for nuisance pests (flies, rats) and water contamination (discussed earlier), but because there will be no public access to the City transfer station, human health risks should be low regardless of which site is selected.

Table 2. Cumulative Daily Mileage from Collection Zone to Proposed Transfer Station Sites

Collection zone	Number of routes	Number of double trips	Daily haul miles per zone					
			Site 1	Site 2	Site 5	Site 6	Site 7	Site 8
A	11	3	347	291	81	179	137	34
B	8	2	230	172	42	134	104	32
C	11	3	323	189	72	200	162	89
D	10	3	201	149	91	198	171	129
E	10	3	329	334	155	262	223	96
F	10	3	409	357	192	253	214	67
Subtotal			1,839	1,492	633	1,226	1,011	447
Dispatch miles from 28th Street			336	336	336	336	336	336
Total mileage per day			2,175	1,828	969	1,562	1,347	783

Source: Barboza pers. comm.

If on-site pest problems are allowed to occur, the significance of the health risk would depend upon the uses of adjacent property. The sites in residential neighborhoods (Site Nos. 5, 6, 7, and 8) would have the greatest potential for pest complaints, while those in rural settings (Site Nos. 1 and 2) would be least likely to create pest problems. Planned land use changes in the vicinity of Site Nos. 1 and 2, however, also would place residential development near these sites (see the land use analyses).

Cultural Resources

Cultural resource impacts have been assessed without seeking an official records search through the California Archeological Inventory or contacting the State Historic Preservation Office. The National Register of Historic Places was reviewed and each site was visited to determine the degree of ground disturbance and to note the presence of structures.

None of the six sites was found to contain cultural resources listed in the National Register of Historic Places. Significant ground disturbance at Site Nos. 5, 6, and 8 preclude the discovery of significant cultural resources in those areas. A large portion of Site No. 2 also has been modified by construction of a wastewater treatment plant. Site No. 7 has been modified at the surface by development-related grading, but Site No. 1 has received only agricultural use. These two sites (Nos. 1 and 7) have the greatest potential for discovery of archeological materials during transfer station construction.

Aesthetics

Aesthetics deals with the visual character of the proposed project. The degree of visual impact relates to the number of residents, motorists, or pedestrians who would view the transfer station. Site Nos. 1, 2, and 5 have the potential for major visual impact.

Franklin Boulevard, which has light to moderately heavy traffic, runs along the east side of Site No. 1. Adjacent to Franklin Boulevard are several established and developed residential areas. Numerous additional residential developments are planned for the area. The visual character of the site would change from one of rural, open space to that of a transfer station. Site No. 2 is visible from the Interstate 5 overpass. The transfer station would replace a wastewater treatment plant and would create visual impacts to existing and proposed residential development immediately to the northwest. Residential development immediately abuts Site No. 5. Although the quality of the view would change only slightly, the residential area would be in clear view of the transfer station. At present, the site is an abandoned Western Pacific Railroad yard.

Site No. 6 is adjacent to several heavily-traveled roads, but the floor of the excavated area is well below the road level. A transfer station could be located in the depression and be screened from the adjacent streets as long as the facilities were not elevated by the addition of new fill. Adjacent uses with a view of the quarry bottom are primarily industrial.

The visual character of Site No. 7 would change from a park to a transfer station. However, the park consists of overgrown grass and two baseball diamonds. The park does not appear to be used or maintained regularly. The park is not viewed by residents or motorists.

Site No. 8 would not create a visual impact to the general public because it is immediately adjacent to the existing City landfill and is screened from roadways and residential areas by a berm along its southern edge.

Public Acceptance

Public acceptance is an extremely subjective evaluation criterion, but is worthy of some consideration. Our evaluation is based on experience with siting of public facilities, especially solid waste handling and disposal facilities. Experience gained in evaluating landfill sites for the City also has aided in this effort.

Public support or opposition to locating solid waste facilities is based almost exclusively on the types of land use that border the site and its major access routes. Sites close to residential areas or major recreation facilities invariably receive public criticism. If access routes extend through residential areas or along already congested arterials, complaints are likely. All of the downtown sites (Nos. 5, 6, 7, and 8) have the potential for public criticism due to the proximity of existing residential development. Both Site Nos. 6 (the Granite site) and 8 (the existing City landfill site) have been subjected to public review and have been strongly opposed as sites for continuing solid waste disposal. The fact that the access pattern to Site No. 8 is already established and used may reduce opposition to continued use of this site, as long as the filling operation is terminated. Use of Site No. 5 would likely be strongly opposed by the well-organized Curtis Park residents; their neighborhood immediately abuts the site on the east. Site No. 7 is close to residential areas along 65th Street and San Joaquin Street, but its immediate surroundings are institutional and light industrial. Access may be available that avoids residential streets.

Site Nos. 1 and 2 should attract the least public opposition because of their rural setting. Site No. 1 is the most removed from residential or recreational development. Planned

land use changes in both of these areas may change this situation; currently, there is no adjacent population base to support opposition to Site Nos. 1 and 2. Therefore, these sites are likely to have the greatest public acceptance at this time.

SCREENING RECOMMENDATIONS

From policy conformity and environmental perspectives, Site No. 8, the existing City landfill site, appears to be the best candidate site for location of a solid waste transfer station. The presence of the current landfill operation and the buffering and screening provided by railroad berms reduce the chances that the transfer station operation would create significant environmental impact. The pattern of solid waste handling is well established on the site. Local opposition to its continued use, however, may be strong.

Of the remaining sites, Nos. 6 and 7 also show some promise from an environmental perspective. The transfer station use would be in keeping with adjacent industrial land uses, but residential areas are not far removed. The biggest disadvantage for these two sites is related to the congested nature of freeway and surface access routes. Traffic problems already exist in these two areas, and the addition of transfer station truck traffic would be a negative factor. Site No. 5's location immediately adjacent to a well-established residential area could lead to a number of serious adverse impacts (noise, traffic conflicts, land use compatibility, aesthetics). Site No. 5 is the least desirable site from an environmental perspective.

Site Nos. 1 and 2 offer an advantage in that they are removed from present urban areas, but residential growth is expected to occur in both areas in the near future. This could foster land use incompatibilities and related environmental concerns. The biggest environmental drawback for these two sites is their excessive energy demand, related to their great distance from the City's waste centroid. Site Nos. 1 and 2 should be considered only if none of the other sites is found to be acceptable after more detailed analysis.

The evaluation of the six potential transfer station sites from economic and engineering perspectives indicates that the two most favorable sites are Nos. 5 and 8.

An obvious drawback to Site No. 8 is that it would have to be constructed on a closed landfill. The economic and regulatory impact of this drawback is beyond the scope of this evaluation. Site Nos. 1 and No. 2 are farthest from the waste centroid and would require the longest off-route collection haul. As previously mentioned, Sites No. 6 and No. 7 are within 15 miles of the landfill, and the transfer haul distance is probably too short to justify the expenses related to a transfer station. An economic comparison that should be made for all sites, but which was not part of this evaluation, is a

comparison of transfer station costs and associated haul costs to the costs of collection truck direct haul to the landfill.

In summary, Site No. 8 shows the best potential as a transfer station site when all evaluation criteria are considered. Choices of other sites require balancing of environmental versus cost and engineering advantages. Site No. 6 would appear to offer the best alternative to Site No. 8 should the City desire to continue with an analysis of more than one transfer station site. Site No. 5 has significant environmental drawbacks because it immediately abuts a well-established residential neighborhood and would create significant circulation system problems. Site No. 7 has a significant size constraint and suffers from a number of other engineering-related shortcomings. Site Nos. 1 and 2 show the fewest advantages due to their remoteness and current rural setting.

PERSONAL COMMUNICATIONS

Barboza, Bruce. March 17, 1986. Associate Civil Engineer. Waste Management Division, City of Sacramento Department of Public Works. Memorandum.

Bloodgood, James. March 27, 1986. Senior Traffic Engineer. City of Sacramento Department of Public Works. Meeting.

Dee, Steven. April 29, 1986. Associate Planner, City of Sacramento Planning Department. Telephone conversation.

Hocot, Lacey. March 25, 1986. City of Sacramento Department of Water and Sewers. Telephone conversation.

Karr, Joseph. March 25, 1986. Engineering Aide. Sacramento County Department of Public Works. Telephone conversation.

Maxfield, Patrick. April 29, 1986. Senior Civil Engineer. Sacramento County Department of Public Works. Telephone conversation.

Nischina, Will. March 25, 1986. Water Engineer. Sacramento County Department of Water Resources. Telephone conversation.

APPENDIX A

Order of Magnitude Cost Estimate

The following cost estimates are attached:

1. Order of magnitude transfer station costs (capital costs and annual costs)
2. Order of magnitude collection haul costs
3. Order of magnitude transfer haul costs

The above listed cost estimates are based on the following criteria:

1. All costs are 1986 dollars.
2. Land costs are not included because the City is assumed to own the property at each site considered.
3. Tonnage of refuse generated is assumed to be 460 tons per day (287 days per year) in 1986, increasing to 1,000 tons per day (287 days per year) in 2005.
4. Annual operation and maintenance costs are applicable to 1986 only and will increase in succeeding years as the waste tonnage increases.
5. Capital costs include site development, utilities, building and concrete work, scale house, scales, station mobile equipment, engineering, finance costs, and transfer truck. The City staff has indicated their existing maintenance facility is not large enough to service the transfer trailers. Therefore, the capital cost of a transfer trailer maintenance facility has been included.
6. Annual costs include labor, utilities, maintenance on structure and site, operations, equipment maintenance, insurance, and administration for transferring 460 tons per day, and annual capital costs for a 1,000-ton-per-day transfer station. Transfer haul costs include the estimated capital cost of the trucks together with estimated costs for labor, fuel, lubrication, maintenance, tires, etc. associated with its operation. Off-route collection haul costs were provided by the City staff and were assumed to include all capital, maintenance, and operation charges.

CITY OF SACRAMENTO
TRANSFER STA SITE ANALYSIS

Prepared By	Initials	Date
Approved By		

ORDER OF MAGNITUDE TRANSFER STATION COSTS
 JUN 11 1986
 DDH 3/25/86
 1ST REV. 4/18/86
 2ND REV 4/30/86

OC-3
MATERIALS BUFF
MATERIALS CHECK

ITEM DESCRIPTION	EST COST IN 1986						DOLLARS
	1	2	5	6	7	8	
A CAPITAL COSTS							
1. LAND							
2. EXTRAORDINARY FOUNDATION CONSTRUCTION							
3. EXTRAORDINARY ACCESS RD & UTILITY CONSTRUCTION							
4. STATION CONSTRUCTION, INCLUDING STA EQUIP. (1000 TONS/DAY)							
5. TRANSFER TRUCKS (FOR TONS/DAY)							
6. TRANSFER TRAILER MAINTENANCE FACILITY							
7. TOTAL							
ALL COSTS ASSOCIATED WITH REQUIRED OR POSSIBLY REQUIRED WORK IDENTIFIED IN A2-B-A3 BUT NOT QUANTIFIED UNDER THIS SCOPE OF WORK.							
B ANNUAL COSTS							
1. COLLECTION COST - 460 TONS/DAY							
2. STATION COST - ANNUAL CAPITAL COSTS - 100 TPD, OPERATIONS COST - 460 TPD							
3. TRANSFER TRAILER COST - 460 TONS/DAY							
4. TIPPING COST AT SACRAMENTO CO LANDFILL - 460 TONS/DAY AT \$/TON							
5. TOTAL							
③ \$/TON PER CITY STREET							
② UNITS AT \$/UNIT = 1,000,000							
① DOES NOT INCLUDE EIR PREPARATION, PERMITS, OR CAPITAL COST OF COLLECTION TRUCKS							

CITY OF SACRAMENTO
TRANSFER STATION SITE ANALYSIS

Prepared By	Initials	Date
Approved By		

ORDER OF MAGNITUDE COLLECTION TRUCK COST
(ALL COSTS IN 1986 DOLLARS)

DDH 1/18/86

3-31

1	2	3	4	5	6	7	8	9	10	11	12	13
SITE NO	LOCATION	TOTAL OFF ROUTE MILES TRAVELED PER DAY ①	TOTAL TON-MILES PER DAY AT 77 TONS PER TRIP ②	TOTAL TON-HOURS OF TRIP PER DAY AT AVERAGE SPEED OF 30 MPH	TOTAL TON-HOURS OF TRIP PER DAY AT 77 TONS PER TRIP ②	TOTAL TON-HOURS PER DAY AT 77 TONS PER TRIP ②	TOTAL TON-HOURS PER DAY AT 77 TONS PER TRIP ②	TOTAL TON-HOURS PER DAY AT 77 TONS PER TRIP ②	TOTAL TON-HOURS PER DAY AT 77 TONS PER TRIP ②	TOTAL TON-HOURS PER DAY AT 77 TONS PER TRIP ②	TOTAL TON-HOURS PER DAY AT 77 TONS PER TRIP ②	TOTAL TON-HOURS PER DAY AT 77 TONS PER TRIP ②
1	SIMS & PR	2175	16740	559.2	78.5	136.7	78.5	136.7	78.5	136.7	78.5	136.7
2	I-5 & HWY 160	1923	14076	469.2	78.5	547.7	78.5	547.7	78.5	547.7	78.5	547.7
5	SUTTERVILLE & RR	969	7461	249.7	78.5	322.2	78.5	322.2	78.5	322.2	78.5	322.2
6	GRANITE PARK	1562	12027	400.9	78.5	479.4	78.5	479.4	78.5	479.4	78.5	479.4
7	SAN JOAQUIN & REDDING	1847	10372	345.7	78.5	424.2	78.5	424.2	78.5	424.2	78.5	424.2
8	CITY REFUSE MAINT. YD.	783	6027	201.0	78.5	279.5	78.5	279.5	78.5	279.5	78.5	279.5

FOOTNOTES

- ① OFF ROUTE MILES TRAVELED PER DAY WERE PROVIDED BY THE CITY STAFF AND ARE MILES ANTICIPATED TO BE TRAVELED TO TRANSFER STATION AND RETURN TO THE MAINTENANCE YARD AFTER COLLECTION PROCESS IS COMPLETE
- ② PER CITY STAFF THERE WOULD BE A TOTAL OF 60 COLLECTION TRIPS PER DAY TO THE PROPOSED TRANSFER STATION AT 60 TONS/DAY TOTAL REFUSE COLLECTED. THE AVE COLLECTION TRUCK PAYLOAD IS 460 TONS/DAY ÷ 60 TRUCKS/DAY = 7.7 TONS/TRUCK
- ③ 11.75/TON-HR IS CALCULATED AS FOLLOWS:
PER CITY STAFF THE AVE. COLLECTION TRUCK HAS A CREW OF TWO AND COSTS ARE:
TRUCK - \$204/MI. CREW MEMBER 1 - \$11.02/HR x 1.3 = \$14.33/HR; CREW MEMBER 2 - \$10.02/HR x 1.3 = \$13.03/HR. FROM THIS DATA TON-HR COST ARE CALCULATED BELOW ASSUMING AN AVE 30MPH SPEED FOR OFF ROUTE TRAVEL
- TRUCK \$204/MI x 30 MPH = \$6120/HR
 - CREW - 15.86 + 14.33 = \$30.19/HR
 - TOTAL HOURLY COST = \$90.39/HR
 - HOURLY COST PER TON AT 7.7 TONS/TRUCK = 11.75/TON HOUR
- THE ABOVE DERIVED COST APPEARS TO BE SIGNIFICANTLY HIGH. OTHER SOURCES INDICATE IT SHOULD BE IN THE RANGE OF \$9.00 TO \$11.00. ALSO THE TRUCK COST DERIVED ABOVE GIVES AN HOURLY RATE FOR THE TRUCK W/O DRIVER OF \$60.00/HR. PRIVATE INDUSTRY SOURCES INDICATE THE COST OF TRUCK AND DRIVER SHOULD BE IN THE RANGE OF \$60.00/HR.

CITY OF SACRAMENTO
TRANSFER STA. SITE ANALYSIS

Prepared By	Initials	Date
Approved By		

ORDER OF MAGNITUDE TRANSFER HAUL COST.
(CALLS IS IN 1986 DOLLARS)

JOB# 2795C
DDA 3/25/86
REV 4/8/86

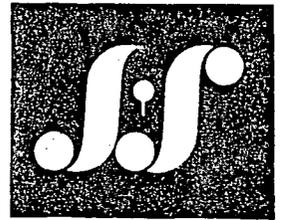
1	2	3	4	5	6	7	8	9	10	11	12	13							
SITE #	ASSUMED TRANSFER TRUCK HAUL ROUTE TO LANDFILL	TRANSFER STATION TO LANDFILL IN MILES ONE WAY	10 MINUTE LOAD TIME AT TRANSFER STATION IN HRS	MILES TRAVELED AT 20 MPH	TRAVE IN HRS	MILES TRAVELED AT 30 MPH	TIME IN HRS	MILES TRAVELED AT 40 MPH	TIME IN HRS	MILES TRAVELED AT 50 MPH	TIME IN HRS	TO MUNICIPALITY THROUGH TIME A COUNTY LANDFILL IN HRS	TIME TRAVE	ROUND TRIP (HR)	FEST. COST/TON AT \$3.10 /TON-HR	TOTAL ANNUAL TRANSFER HAUL COST AT \$3.10 /TON-HR = 132,000 TONS/YR	1986 DOLLARS	1986 DOLLARS	FOOTNOTES
1.	SIMS RD TO SHELTON RD TO STATE 99 TO GRANT LINE RD TO LANDFILL	22	0.17	6	0.30	28	0.93			10	0.20	0.33	1.93	5.98	\$ 500,000				
2.	HWY 160 TO MEADOW VIEW ROAD TO I-5 TO I-80 TO US 50 TO STATE 16 TO GRANT LINE RD TO LANDFILL	27	0.17	2	0.10	6	0.20	22	0.55	24	0.48	0.33	1.83	5.67	\$ 700,000				
5	SUTTERVILLE RD. TO STATE 99 TO US 50 TO STATE 16 TO GRANT LINE RD TO LANDFILL	20	0.17	2	0.10	6	0.20	22	0.55	10	0.20	0.33	1.55	4.81	\$ 600,000				
6.	POWER LINE RD TO STATE 16 TO GRANT LINE RD TO LANDFILL	15	0.17	2	0.10	6	0.20	22	0.55			0.33	1.35	4.19	\$ 600,000				
7	JOAQUIN RD TO RECORDS AVE TO 65 TH ST TO STATE 16 TO GRANT LINE RD TO LANDFILL	16	0.17	2	0.10	6	0.20	24	0.60			0.33	1.40	4.34	\$ 600,000				
8	29 TH /29 TH TO I-8 TO US 50 TO STATE 16 TO GRANT LINE RD TO LANDFILL	20	0.17	2	0.10	6	0.20	22	0.55	10	0.20	0.33	1.55	4.81	\$ 600,000				

FOOTNOTES
① \$3.10 /TON-HR. EST FROM COOPER ENGINEERS SOURCE

3-32

APPENDIX B

Correspondence from Jones & Stokes Associates
to City Department of Public Works



JONES & STOKES ASSOCIATES, INC. / 2321 P STREET / SACRAMENTO, CA. 95816

916/444-5638

June 30, 1986

Mr. John Boss
City of Sacramento
Department of Public Works
Engineering Division, Room 300
915 I Street
Sacramento, CA 95681-2684

Dear John:

In the process of preparing its transfer station siting analysis for the City of Sacramento, Jones & Stokes Associates reviewed earlier siting evaluations prepared by Brown and Caldwell. This included the 1979 Site Evaluation - City of Sacramento Solid Waste Transfer Station, and the 1980 City of Sacramento Draft Environmental Impact Report On Solid Waste Disposal Alternatives. These documents provided background data for our analysis and reduced the work effort necessary to complete our report. The discussion in the 1979 document about the screening process (page 12), and environmental implications (page 30), and the analysis in the 1980 document about the City landfill site (Chapter 4) were especially helpful.

The conclusions reached in the Jones & Stokes Associates/Cooper Engineers transfer station site analysis reflect the earlier efforts for the City. Some of the circumstances pertaining to the existing City landfill site have changed, however, in the 6-year hiatus between the Brown and Caldwell and Jones & Stokes Associates efforts. The City has rezoned its landfill site to reflect combined solid waste/open space/park use of the area, making the proposed transfer station use more consistent with City plans for the site. Also, the time frame for need of a solid waste disposal option to landfilling has been altered. Under existing planning and land use settings for the site, we believe that the transfer station could be developed on a portion of the City landfill property that would not cause a significant conflict with existing or planned uses of the site or adjacent properties. Information provided in the Brown and Caldwell reports does not alter this opinion.

Mr. John Boss
June 30, 1986
Page Two

As the City continues its review of solid waste disposal options, Jones & Stokes Associates staff are available to discuss the findings of its study with City staff and citizen advisory groups or the general public. We feel our report provides a comprehensive update of the transfer station analyses initiated by the City in the late 1970s.

Sincerely,

Michael Rushton

Michael Rushton

cc: Howard Arita, Cooper Engineers

Chapter 4

COST ANALYSIS AND SUMMARY COMPARING
CITY, PRIVATE, AND COUNTY
TRANSFER STATION OPERATIONS

Prepared by:

Bruce Barboza
City of Sacramento
Department of Public Works
Solid Waste Division

and

Cooper Engineers

INTRODUCTION

The City of Sacramento, Department of Public Works, has prepared or has obtained engineering and cost information for an economic comparison of transfer station options. The information is contained in the following documents:

- o City of Sacramento, Request for Proposal, Solid Waste Disposal Options.
- o Proposals for a transfer station and its operation from two private vendors.
- o A spread sheet prepared by the City showing their cost for a City-owned and -operated facility.

The options under consideration include:

- o A City-owned and -operated transfer station
- o A privately-owned and -operated transfer station.
- o A City-owned transfer station with contracted operation
- o Utilization of the existing County Fruitridge Transfer Station

In addition to a cost comparison of the options described above, review comments are provided with regard to the proposals for a privately constructed transfer station and with regard to the capital costs between a City-constructed and privately-constructed transfer station.

Whenever a privately-developed transfer station is discussed, the discussion is somewhat generic, based upon selectively combining information from the two private development proposals.

REVIEW COMMENTS ON THE PRIVATE
TRANSFER STATION PROPOSALS

A general technical review was performed on private transfer station proposals. Review comments are as follows:

- o The operating capacity and design of the proposed stations appear to have significant differences.
- o Total building floor areas also differ significantly, partly as a result of the difference in apparent design capacity, but primarily because the truck maneuvering area in one of the proposals is within the building. The number of tipping slots is 6 in one case and 16 in the other. The City's RFP describes 16 slots.
- o One proposal was based on transfer hauling to the Yolo County Landfill, and the other was based on hauling to the Sacramento Landfill.
- o The issue of construction on the closed landfill was not clearly addressed by the RFP or by the proposals. Construction on a landfill generally involves increased design and construction costs and a landfill gas monitoring program.

CAPITAL COST COMPARISON

In general, the magnitude of capital costs estimated thus far by the City and the private transfer station developers is within reason for the facilities proposed, but the estimates may not be sufficiently accurate for use as budget estimates.

The City's cost estimate is \$1.8 million higher than that proposed by a private developer; however, \$1.3 million of the difference is attributable to estimated finance charges which do not appear to apply in the privately financed proposals.

An overall project cost identification needs to be performed if estimates for budget allocation are needed. The cost of land/lease agreements and the City's cost of administering the transfer station project, whoever owns/constructs the facility, should be included in the estimates. Other hidden costs may be present but cannot be identified until the project responsibilities between owner, builder, and operator are more clearly defined. For example, site development costs related to construction in a landfill, or to provide utility service to an undeveloped property, do not appear to be included in the estimates.

There was insufficient information in the private development proposals to determine whether or not specific items of equipment such as a truck scale were included. However, the City's estimate for station equipment is approximately \$275,000 lower than that of the private proposals. Therefore, the private proposals appear to adequately cover equipment needs.

Finally, the City staff has indicated that a transfer trailer maintenance facility will be needed. No description, specification, or cost estimate for a maintenance facility is available.

ANNUAL COST

Estimated annual costs for a City-owned and -operated, a privately-owned and -operated, and a City-owned and privately-operated transfer station have been prepared. An estimate of the annual cost to use the County's Fruitridge Station is so large as to effectively eliminate the alternative from consideration.

Except for the Fruitridge Station option, the transfer station and haul cost per ton of waste range from \$10.12 to 10.33 based on 215,250 tons per year of waste. Since the accuracy of the cost estimates are not within 10 percent, the unit transfer station and haul costs are primarily indicative; e.g., approximately \$10 per ton of solid waste, and not firm costs. The unit costs also respond directly to annual costs; if the annual cost changes by 10 percent, the unit cost will change by approximately \$1.00.

Based on the unit cost for each alternative, there does not appear to be a clear-cut economic advantage for any alternative. Further, because the differences in cost estimates are so small, relatively minor changes to the project design concepts or facilities could easily shift any cost advantage from one alternative to the other.

The following table (Table IV-1) is a summary of the costs discussed above for each alternative, with the landfill tip fees added.

Table IV-1. Ownership/Operation Alternatives
Cost Summary

<u>Description of Transfer Station Ownership and Operation</u>	<u>Estimated Annual Cost for Transfer Station, Transfer Haul, and Landfill Disposal (assumes \$6/ton tip fee at landfill)</u>	
	<u>Total Cost in \$</u>	<u>Unit Cost in \$/ton at 215,250^a tons/yr^a</u>
City-owned and -operated	3,514,000 ^b	16.33
Privately-owned and -operated	3,469,000 ^b	16.12
City-owned and privately-operated	3,491,000	16.22
Utilize County's Fruitridge Station	5,060,000	23.51

^a 750 tons/day x 287 days/yr = 215,250 tons/yr.

^b Average of private companies which were reviewed.

CONCLUSIONS

This review of technical and cost data for transfer station ownership and operations has identified some differences in the alternatives which should be resolved. The number of options should be reduced perhaps to City ownership with contracted operation versus private ownership and operation. Greater project detail should then be developed, such as a delineation of responsibilities for each option.

The unit cost in dollars per ton indicates that there is no significant economic benefit among the alternatives, but there appears to be a distinct economic disadvantage in using the existing County transfer station.

Chapter 5

PLANNING AND POLICY
COMPARISONS OF CITY, PRIVATE, AND COUNTY
TRANSFER STATION OPERATIONS

Prepared by:

Jones & Stokes Associates, Inc.
and
Raymond Mosley

INTRODUCTION

The consultant team of Jones & Stokes Associates, Inc. and Raymond Mosley was retained by the City of Sacramento Department of Public Works to review and compare public and private approaches to construction and operation of a solid waste transfer station to serve the City. The City provided the consultant team with a general description of a City-owned and -operated facility, the existing County facility, and two proposals for privately-owned and -operated facilities.

The following sections present the results of the analysis. The planning and environmental discussion was prepared by Jones & Stokes Associates; the policy comparison was developed jointly by Raymond Mosley and Jones & Stokes Associates.

PLANNING AND ENVIRONMENTAL CONSIDERATIONS

Planning Consistency

Land Use Plans

From a land use planning perspective, it makes no difference whether the proposed transfer station is owned and operated by the City, the County, or a private vendor. The type of activity that would occur would be the same in any case. Of greater importance is the location of the transfer station and the site of ultimate disposal. Under the City's proposal, the transfer station would be located at the existing City landfill site (28th and A Streets). The same location would be used in the private vendor operations. If the County option were pursued, the existing County transfer stations would receive City wastes. The preferred site of ultimate disposal would be the Sacramento County Landfill on Kiefer Road. The Yolo County Landfill northeast of Davis is an alternate site.

Construction and operation of a transfer station at the 28th and C Street site would be consistent with the current City General Plan. The site is designated as a solid waste facility on the City Land Use Element. No General Plan change would be required. This would not be true for City use of the County's Fruitridge Transfer Station, which is located within the City limits. This site is currently designated as industrial on the South Sacramento Community Plan. It is likely that the site's land use designation would have to be changed to solid waste facility prior to City use of the transfer station. The California Waste Management Board probably would require this change before approving a revision to the County's solid waste facilities permit for the transfer station. The County's North Area Transfer Station could be used without changes in planning designation, as the site is designated as a transfer station on the County General Plan land use map (Taylor pers. comm.).

The City's solid waste could be hauled to either the Yolo County or the Sacramento County landfills without modification to General Plan documents. Both are existing landfill operations with considerable remaining fill capacity.

In summary, there appears to be no advantage, from a land use planning standpoint, to the City or private transfer station options being considered by the City. A General Plan amendment may be necessary, however, to pursue the County transfer station option. The City is currently under a moratorium on General

Plan amendments until a General Plan update is complete (expected by early 1987).

County Solid Waste Management Plans

Construction of City or private transfer stations at the existing City landfill site would be consistent with the Sacramento County Solid Waste Management Plan (COSWMP). No revision to the COSWMP would be necessary, as the site is already designated as a potential transfer station location. Similarly, City use of existing County transfer stations would be consistent with the COSWMP and would require no revision to the Plan.

Each of the public and private transfer station proposals is associated with a disposal location. The City and County options are linked to use of the Sacramento County Landfill. The private vendor option could involve use of either Sacramento County or Yolo County Landfill sites. Review of the two COSWMPs and discussion with County staff indicate that City wastes could be accommodated at the two landfills without change in the COSWMPs or their solid waste facilities permits. It should be noted, however, that the Cities of Davis and Woodland opposed importation of City of San Francisco solid waste to Yolo County 2-3 years ago. While these cities would have no legal veto power over a similar plan to import Sacramento's solid waste, they could influence such a proposal indirectly through political pressure, or through their approval authority in future revisions to the Yolo COSWMP. This could prove to be a disadvantage to those private vendor transfer station options designating the Yolo County Landfill as the disposal site.

Environmental Concerns

CEQA Review Needs

Construction and operation of a new transfer station would be subject to the California Environmental Quality Act (CEQA) review process. This would be true for City or privately-operated transfer stations. A full Environmental Impact Report (EIR) likely would be required. A project that would use existing County transfer stations also would be subject to the CEQA review process, but it is possible that the EIR could be focused on a small number of issues because the transfer station operation already exists. An analysis of traffic, noise and air quality would be needed because of the increased traffic to the transfer stations, but land use, biological, water quality and public health issues should not require reanalysis. The CEQA process may be slightly shorter, therefore, for the County transfer station option.

Comparison of Environmental Issues

The environmental issues associated with the City and the private vendor transfer station options would be the same at the transfer station location, as it is assumed all would use the 28th and C Streets site. The City and the private vendor options could use the Sacramento County Landfill for final disposal; the private vendor operation, however, might also use the Yolo County Landfill for final disposal. The environmental differences in these options, therefore, are strictly associated with the impact of transporting and disposing of waste in the Sacramento County Landfill versus the Yolo County Landfill.

Since both of the County landfills are already in existence and are operating under environmental constraints imposed by the California Regional Water Quality Control Board, there should be little difference in the impact of the expanded filling operation at the two sites. There is a slightly greater potential for surface and groundwater contamination at the Sacramento County site due to physiographic and geologic conditions, but this is not deemed significant. Use of the Sacramento County site would require slightly more energy, as it is 2 miles more distant from the City waste centroid. The access routes also require more travel on heavily-used surface streets (e.g., Watt Avenue, Jackson Highway) than would use of the Yolo County site. These too are minor differences.

The County transfer station option poses a considerable difference in environmental impact. Solid waste-related truck traffic would be relocated from the 28th and C Street site to the County transfer station sites. Truck movements through residential areas south of the existing landfill would be reduced; this traffic would be displaced to surface streets that traverse industrial or commercial areas (Old Roseville Road and Watt Avenue at the North Area Station; Florin-Perkins Road at the Fruitridge Station) and streets that traverse residential areas (Fruitridge Road and Florin Road). The surface access streets around the Fruitridge Station already are congested; truck traffic increases on these streets could represent a significant adverse impact. This would have to be analyzed through the environmental process.

The two County transfer stations are located in industrial areas, so the increase in activity on the sites would not be likely to create land use compatibility concerns.

In summary, the only significant environmental difference between the public and private transfer station options is that use of the County's Fruitridge Transfer Station could have serious traffic-related impacts while the other options would not.

CONTROL, ECONOMIC, AND POLICY CONSIDERATIONS

Introduction

This evaluation discusses the pros and cons of the three ownership/operation options against the following parameters: control, economics, and policy concerns. To simplify the evaluation, it was assumed that the owner of the transfer station also would be the operator, unless stated otherwise. Several jurisdictions which have recently established transfer stations or are contemplating construction of a transfer station were contacted. They were Berkeley, Phoenix, Portland, San Jose, Covina, and the Los Angeles County Sanitation District.

Control

Waste Stream

Control of the waste stream can be an asset to a local jurisdiction should a transfer station be a medium-term solution for waste disposal and the long-range solution be a new landfill or a waste-to-energy facility. A City-owned and -operated transfer station would allow for complete control of the waste stream prior to disposal and therefore maximum flexibility in future planning. With the private and County transfer station options, the City would lose control of the wastes after unloading at the transfer station. The City would have to either negotiate control of the waste beyond that point in a contract or only contract for a short period of time. This would provide the City with control but not without some effort. In addition, a private owner would require a guaranteed waste stream for at least the term of the financial indebtedness it incurs. This would make it difficult to negotiate a short-term contract with a private firm in hopes of retaining some flexibility in waste stream control.

A City operation would provide the most consistent control. The City currently collects the residential refuse and disposes of it in the City landfill. A City transfer station would provide the City with control until the waste reaches either the County or a private landfill. The operation would also allow for maximum responsiveness to comments and concerns of City residents. Problems occurring at the County or private transfer stations would be less easily rectified, even though the City would be the major user of the facility.

Level of Service and Operations

With a City-owned and -operated transfer station, the City would retain complete control of the type of operation and level of service provided at the facility. The City collection vehicles would not have to compete with public or private waste haulers for use of the scales or for unloading sites. The entire operation would be geared to meeting City needs. The City could ensure that staffing at the transfer station would always be adequate to maintain a smooth operation. If operational adjustments were deemed desirable to improve the efficiency of the collection fleet, this could be accomplished easily.

With City use of private or County transfer stations, service level and operational control would extend only as far as the contract for use would allow. Specific service level items such as availability of recycling bins, hours of operation, and accommodation of City vehicles would have to be contractually negotiated to guarantee the service. Operational items such as noise control, response to public criticism, and compliance with regulatory agency requirements would not be within the City's control. With the County and private options, however, the City could take advantage of the experience these groups already have in the transfer station business. Also, private operations often can more readily change labor practices and incorporate new equipment and technology into the system than can public entities.

Economics

Financing

There are several methods available for financing transfer station construction. The following are discussed: Pay-as-you-go, lease/lease-purchase, borrowed funds, equity funds, and leveraged leasing.

Pay-as-you-go. This method appropriates money annually to finance requirements. The advantages are: 1) generally the least expensive; 2) accumulated funds provide maximum flexibility to meet unanticipated needs; 3) more certain than subsidies or bond issues requiring vote; 4) statutory debt limitations, interest costs and election avoided; and, 5) entire jurisdiction pays for facility. The disadvantages are: 1) exclusive use usually results in a significant increase; and, 2) relieves future citizens from responsibility of paying for facilities/equipment from which they will benefit.

Funds obtained from this method must be accumulated before the construction of the facility may begin. This method is

useful where the capital required is relatively small. Revenues can be generated by service charges, or special assessments based on solid waste generation, property zoning, or other criteria. Pay-as-you-go could be employed by any of the ownership options.

Leasing/Lease-Purchase. This method is useful in financing facilities that are too expensive to acquire outright, and where there is insufficient time to accumulate the required funds. Under this arrangement, the jurisdiction or private firm pays rent to a private company that holds title to the solid waste facility. The advantages are: 1) no capital investment required since the facility is financed by a private firm; 2) elections debt restrictions are avoided; 3) negotiating agreement is a relatively simple procedure; 4) only minor legal work is required; and, 5) lease arrangement offers high degree of flexibility in meeting changing conditions. The disadvantages are: 1) most expensive type of long-term financing; 2) municipalities are constitutionally forbidden to make payment commitments of more than 1 year's revenue without two-thirds majority vote of the people; and, 3) year-to-year renewable lease may not provide sufficient security for capital-intensive investment by private firm.

This method of financing could be employed by any of the ownership options, but the private operation has the advantage.

Borrowed Funds. This is long-term debt financing--analogous to mortgage financing. Several methods are available such as: revenue/JPA bonds, solid waste revenue bonds, commercial bank loans, corporate bonds. These vary in interest rates and support sources. Their advantages are: 1) reducing immediate financing requirements; 2) permits construction of critical facilities without delay; and, 3) may provide some savings through earlier construction/acquisition. The disadvantages may be: 1) interest costs, which can exceed 100 percent of principal depending on repayment schedule, schedule of principal retirement and interest rate; and, 2) limits (practical and legal) to the amount of borrowing that can be used.

This method provides benefits for all the ownership options. The one selected would depend on some discrete cash flow analyses.

Equity Funds. In addition to debt, private industry can provide equity funds in the form of cash contributions, land and equipment, retention of earnings, and leverage leasing. The advantages of this method are: 1) equity is a means of reducing risk to debt holders and lowering the cost of amortization of the debt; and, 2) use of these funds does not compete with other public projects. The disadvantages are: 1) cost is determined by the risk and essential earning power of the private corporation but, in general, is substantially higher than corporate debt.

This is only a method for the private option.

Leverage Leasing. This is a technical term for defining a financial package that combines several financial mechanisms. It involves two major participants: a lessor and a lessee (government agency). The advantages of this method are: 1) lessor puts up 20-30 percent of the facility costs and obtains an ownership tax shelter; 2) government agency finances only remaining portion through typical borrowing method, thus reducing the demand on municipal funds. The disadvantage is: 1) it is somewhat new, legally complex, and requires time to develop.

This is a method which could benefit both the City and private options, and perhaps the County option, depending on how the expansion of the existing transfer station is financed.

Cost Control

This aspect relates to the ability of the owner to know and control the cost components of the project. These components include: labor, maintenance, and debt service. The City, by owning the transfer station, can completely know and control the cost components. The City, by exercising the County option, can know all the cost components, in that it would be dealing with a public agency, but it could not control the components. The private option, unless specified in contract language to the contrary, would not allow for the City to either know or control cost components.

Liability

Liability is a significant economic consideration. It also is difficult, however, to make absolute judgements on advantages and disadvantages. With a City-owned and -operated facility, the City would retain all liability for transfer of solid waste and for hauling the waste to a disposal site. With a private or County transfer station, some of the liability would be retained by these entities. They would be responsible for maintaining insurance and controlling what material moved through the transfer station and into the landfill. It is unclear, however, how well-insulated the City would be from suits filed for damages or contamination cleanup at either the transfer station or landfill. With the City being a major contributor to the waste stream and major facility user, it is unlikely that liability would be totally transferred to the County or a private vendor. Ultimate liability would undoubtedly be established in the courts.

Capital and Operating Costs

Chapter 4 of this report provides some specific comparisons of capital and operating costs for the public and private transfer station options being analyzed. Generally, other entities

that have looked into the economics of public versus private construction of a transfer station have found little difference in capital cost (Wietting pers. comm.). Larger private companies may be able to provide some advantages in purchasing equipment by buying in quantity. Operational cost advantages are typically found with the private sector, especially if operational contracts are relatively short-term so that there is periodic competition through a bidding procedure.

Policy Considerations

Intergovernmental Cooperation

The three transfer station options provide the City with a chance to establish a policy of cooperation, either with the County or the private sector. Attempts to negotiate and consummate a deal with the County for expansion and use of the existing County transfer stations could be used to enhance a spirit of intergovernmental cooperation on a local level. This could have future economic, as well as political, advantages. A similar spirit of cooperation could be established with private business by opting for a privately-owned and -operated transfer station. The intangible benefits of this cooperation must be weighed against other factors discussed in this report.

Government Service/Private Service

The City also should consider the policy implications of opting for the use of private sector employees rather than public employees in providing solid waste service to City residents. There are no City employees that would be immediately replaced if the City opted for a private transfer station operation, but there would be no opportunity for City employees to expand into and gain experience from the transfer station operation. This could have long-term policy implications for the City in providing other services to its residents. Conversely, opting for a private operation would allow the City to avoid the recruitment and hiring processes needed to staff the new facility.

Contract Concerns

If the City were to opt for a private or County transfer station as its waste stream end point, it would have to develop a contract for use of these facilities. In this contract, the City would have to address such items as waste stream control, operations specifications, cost, liability, term of service, and waste stream volume. For the City to minimize its loss of control, liability, and cost, and maximize its flexibility, it would have to prepare a very detailed, specifically-worded

contract. This would be the key to a relationship that the City could feel comfortable with over a period of time.

To maintain some control over the waste stream and transfer station operations, the City would want to keep the term of the contract relatively short. This may be difficult to achieve, however, because both the private vendor and the County are going to want a guaranteed waste stream to recoup capital costs. This conflict could be reduced or avoided by opting for City ownership of the transfer station, but contracting out the operation to a private vendor. This option would not be available if County transfer stations were used. The Cities of Phoenix and Portland have successfully used the City-owned but privately-operated transfer station approach to reduce costs. Operation contracts of 5-7 years are preferred under this arrangement.

From the liability standpoint, the contract should establish insurance requirements for the transfer station owner/operator to buffer the City. The effectiveness of this buffering through contract specifications is difficult to assess, however; the court system ultimately makes many of the liability decisions. Liability clauses would demand careful consideration by the City's attorneys.

SUMMARY

The following section summarizes the advantages and disadvantages of the City, County and private transfer station options from both planning and policy perspectives.

City Option

Advantages

- o Consistent with current City planning and zoning
- o Allows maximum control and flexibility of waste stream
- o Allows maximum responsiveness to public and regulatory agency concerns about operation
- o Provides maximum opportunity to alter operation or level-of-service at transfer station to meet City needs
- o Minimum potential for interference with City collection operations
- o Allows maximum control of cost components
- o No contract required
- o Environmental advantage over County option

Disadvantages

- o Would require full environmental analysis
- o Financing options limited
- o City would retain all liability
- o Would foster no spirit of intergovernmental or private sector cooperation
- o Lack of existing transfer station operator experience would require recruitment and hiring

County Option

Advantages

- o Environmental analysis could be focused because transfer stations already exist
- o Could take advantage of County operational experience
- o Allows for some transfer of liability
- o Could foster spirit of intergovernmental cooperation

Disadvantages

- o Requires change in City land use designation for Fruitridge Transfer Station
- o Use of Fruitridge Transfer Station could generate significant traffic-related impacts
- o Would require a long-term waste stream guarantee
- o Operational control limited
- o Could adversely affect collection operation through delays or interference
- o Financing options limited
- o Cost control limited
- o Requires detailed contract for services

Private Option

Advantages

- o Could be consistent with current City planning and zoning if 28th Street Landfill site used
- o Could take advantage of private vendor operational experience
- o Typically able to adjust to improved technology and equipment more rapidly than public operations
- o Has more financing options available
- o Allows for some transfer of liability
- o Could establish spirit of cooperation with the private sector

Disadvantages

- o If the private proposal depended on use of Yolo County Landfill, it could be opposed by cities in Yolo County
- o Would require full environmental analysis
- o Would require a long-term waste stream guarantee
- o Operational control limited
- o Could adversely affect collection operation through delays or interference
- o Cost control limited
- o Requires development of detailed contract for services

PERSONAL COMMUNICATIONS

Armstrong, Sy. May 14, 1986. California Waste Management Board. Telephone conversation.

Barboza, Bruce. Various dates in May 1986. Associate Civil Engineer. Waste Management Division, City of Sacramento, Department of Public Works. Meetings and memoranda.

Boss, John. Various dates in May 1986. Manager. Waste Management Division, City of Sacramento, Department of Public Works. Meetings.

Crowley, Ed. May 13, 1986. Assistant Director. Yolo County Community Development Agency. Telephone conversation.

Dee, Steven. April 29 and May 13, 1986. Associate Planner. City of Sacramento Planning and Community Development Department. Telephone conversation.

Holmquist, Jay. May 13, 1986. Senior Civil Engineer. Yolo County Department of Public Works. Telephone conversation.

Lynch, George. May 13, 1986. Sacramento County Department of Public Works. Telephone conversation.

Maxfield, Patrick. April 29 and May 14, 1986. Senior Civil Engineer. Sacramento County Department of Public Works. Telephone conversations.

Roberts, Lloyd. May 13, 1986. Director. Yolo County Department of Public Works. Telephone conversation.

Taylor, Susanne. May 14, 1986. Planner. Sacramento County Planning Department. Telephone Conversation.

Walker, Price. May 14, 1986. Planner. City of Sacramento Planning and Community Development Department. Telephone conversation.

Wietting, Norman. September 2, 1986. Operations Manager. Metropolitan Sanitation District (Portland, Oregon). Telephone conversation.