

Joint Household Hazardous Waste Element

Prepared For:

Atherton	East Palo Alto	Portola Valley
Belmont	Foster City	Redwood City
Burlingame	Half Moon Bay	San Carlos
Colma	Hillsborough	San Mateo
Daly City	Menlo Park	Woodside

Unincorporated Areas of
San Mateo County

Final [REDACTED]
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SECTION 1

INTRODUCTION

1.1 PURPOSE OF STUDY/LEGAL CONTEXT

This Household Hazardous Waste Element (HHWE) was developed in response to the California Integrated Waste Management Act of 1989 (AB 939), as amended by other state legislation (AB 1820, 1990; AB 888, 1989; and AB 2707, 1990), as well as in response to San Mateo County's goal of safe management and disposal of household hazardous waste (HHW). As described in Section 1.3, the unincorporated county and 15 cities in the county agreed to develop a regional HHWE. The HHWE will be incorporated into the San Mateo County Integrated Waste Management Plan (CoIWMP), which, when locally approved, will be submitted to the California Integrated Waste Management Board (CIWMB) in compliance with state law.

Under AB 2707 (La Follette), enacted in September 1990 and implemented on January 1, 1991, the HHW portion of the integrated waste management planning process became a separate element rather than a component of the Source Reduction and Recycling Element. In addition, AB 2707 provided direction to the CIWMB with regard to criteria for evaluating and approving a HHWE, as distinct from the criteria for approving the Source Reduction and Recycling Element.

The Tanner Hazardous Waste Management Planning Act of 1986 (AB 2948) required that all counties in California develop plans to properly manage all hazardous wastes (residential, commercial, and industrial). The San Mateo County Hazardous Waste Management Plan (CHWMP), approved by the San Mateo County Board of Supervisors and a majority of the cities in San Mateo County in September 1989, established broad policies and programs for the management of these wastes.

AB 2707 requires that programs addressing HHW and included as part of the CHWMP comply with AB 939 requirements. Programs for the management of HHW are described in the

CHWMP. This HHWE uses the programs set forth in the CHWMP as the basis for a more comprehensive program dealing exclusively with HHW, including source reduction, recycling, collection, and public education programs. The HHWE is consistent with the goals and policies of the CHWMP.

1.2 ROLE OF THE HHWE

HHW is generated from a wide variety of common household products. Quantities typically vary from pints of chemical drain opener to 5-gallon containers of paint. The following are examples of some common types of HHW:

- Household cleaners
- Pesticides
- Batteries
- Wood preservatives
- Auto and furniture polish
- Fertilizers
- Automotive products
- Adhesives and sealants
- Paints and coatings
- Photographic chemicals
- Pool chemicals
- Used motor oil

The characteristics of HHW correspond to U.S. Environmental Protection Agency (EPA) and California State Department of Health Services (DHS) general criteria for identifying hazardous wastes; therefore, HHW is defined as any household product that contains an ingredient listed in the Code of Federal Regulations, Chapter 40, Part 261.33(e) or 261.33(f), or that exhibits any of the following characteristics:

- Ignitability (the ability to catch fire)
- Corrosivity (the ability to destroy other materials by chemical action)
- Reactivity (the ability to undergo a chemical reaction, usually violent)
- Toxicity (any substance having the effect of a poison).

Empty containers that retain residues of hazardous material are also regulated under guidelines contained in the California Code of Regulations (CCR), Title 22.

Residents of households generate hazardous wastes while performing regular activities such as cleaning, painting, gardening, working on hobbies or repairs, and automobile maintenance. Until recently, little information and almost no facilities were available for the proper management of such wastes. As a result, most of these materials have been improperly and illegally managed: they have been disposed of as refuse, dumped on the ground, poured into septic systems or sanitary and storm sewers, burned, or used inappropriately (such as the application of motor oil to kill weeds). Though the long-term environmental hazards associated with HHW are not completely understood, the risks associated with its disposal include the following:

- HHW entering the solid waste stream may injure sanitation workers or damage collection and processing equipment.
- Disposal of HHW at landfills may contaminate groundwater and create toxic gas.
- HHW disposed of on the ground and into storm sewers contaminates soil, groundwater, and surface water.
- Use of hazardous materials in the household may create both acute and chronic exposure which leads to illness, and even death.
- HHW disposed of in sanitary sewers contaminates effluent at sewage treatment plants, leading to the contamination of surface and groundwater.

HHW management aims to minimize these risks by:

- Reducing the amount of hazardous materials utilized or generated by households

- Providing for safe recycling or disposal
- Ensuring that residents have and use adequate safety precautions in handling the wastes.

The strategies emphasized in HHW management programs include public education, source reduction, and recycling; refuse monitoring (e.g., solid waste load-checking); HHW collection at collection events and permanent or mobile collection facilities; and ongoing program evaluation and improvement. This element explores and evaluates a range of HHW management options for enhancing the programs currently being implemented in San Mateo County.

1.3 REGIONAL PLANNING CONTEXT

San Mateo County, which covers approximately 554 square miles, is bounded by the City and County of San Francisco on the north, San Francisco Bay on the east, Santa Clara and Santa Cruz counties on the south, and the Pacific Ocean on the west. While the county is urbanized and incorporated in those areas bordering San Francisco Bay, it is generally rural and unincorporated in the central and southern mountainous areas and the areas bounded by the Pacific Coast. The county contains 20 locally governed cities and a large unincorporated area governed by the County Board of Supervisors.

To maximize the efficiency of facility and program planning, development, and operation, San Mateo County has joined with 15 cities to prepare a HHWE. By adopting this approach, the 16 participating jurisdictions have agreed in concept to sponsor or jointly develop a variety of programs and facilities. The CIWMB encourages this approach and has specified certain requirements that must be met so that this regional HHWE will satisfy AB 2707 requirements for each participant. The participating jurisdictions are:

- Atherton
- Belmont
- Burlingame
- Colma
- Daly City
- East Palo Alto
- Foster City
- Half Moon Bay
- Hillsborough
- Menlo Park
- Portola Valley
- Redwood City
- San Carlos
- San Mateo (city)
- Unincorporated areas of San Mateo County
- Woodside

The locations of these jurisdictions, transfer stations and landfills are shown in Figure 1-1. A total of 438,712 residents live in the 15 participating incorporated cities, and another 57,637 residents live in the unincorporated areas of the county. The populations and number of dwelling units of the participating jurisdictions are shown in Table 1-1. The remaining communities in the county — Brisbane, South San Francisco, Millbrae, San Bruno, and Pacifica — have independently undertaken AB 2707 planning activities.

1.4 SOLID AND HOUSEHOLD HAZARDOUS WASTE MANAGEMENT

Solid waste in San Mateo County is managed under franchise agreements by seven private collection enterprises, utilizing five permitted transfer stations and two landfills. Table 1-1 lists the jurisdictions, respective haulers, transfer stations, and the landfills used. An estimated 625,960 tons of solid waste was disposed of by the participating jurisdictions in 1991. A significant fraction (approximately 30 percent) of the waste disposed of in landfills in the county is hauled directly to the landfills or transfer stations by the general public (self-haul). Wastes are also collected by municipalities that sponsor collection events and by private contractors.

Most of the solid waste is disposed of at Ox Mountain Landfill in the unincorporated region near Half Moon Bay. A limited range of wastes such as self-hauled solid waste and inert material is disposed of at Hillside Landfill in Colma. All of the participating jurisdictions except East Palo Alto have implemented curbside recycling in single-family residential areas.

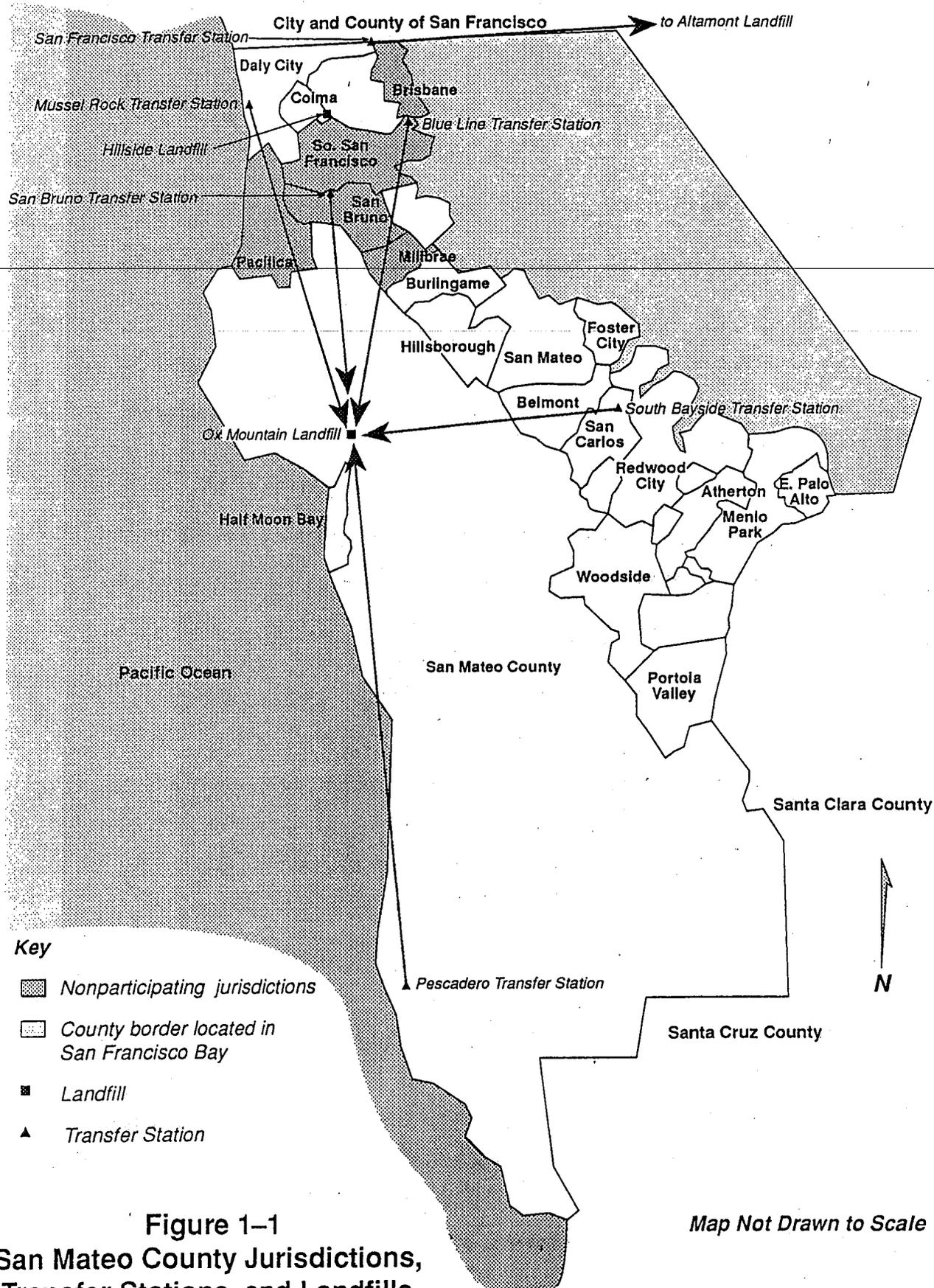


Table 1-1
1990 Demographic and Waste Management Profiles of
the Participating Jurisdictions

Jurisdiction	Population ^a	Dwelling Units	Percent Single Family	Hauler	Disposal Facility	Transfer Station
Atherton	7,163	2,518	99.1	BFI	Ox Mountain Landfill	San Carlos
Belmont	25,160	10,291	65.1	BFI	Ox Mountain Landfill	San Carlos
Burlingame	26,801	12,914	57.9	BFI	Ox Mountain Landfill	San Carlos
Colma	1,103	437	63.4	Daly City Scavenger ^b South SF Scavenger	Ox Mountain Landfill Hillside Landfill ^c	Mussel Rock
Daly City	92,311	30,162	71.5	Daly City Scavenger	Ox Mountain Landfill Hillside Landfill ^c	Mussel Rock
East Palo Alto	23,451	7,351	54.2	BFI	Ox Mountain Landfill	San Carlos
Foster City	28,176	11,747	67.4	BFI	Ox Mountain Landfill	San Carlos
Half Moon Bay	8,886	3,402	81.5	BFI	Ox Mountain Landfill	None
Hillsborough	10,667	3,789	99.5	BFI	Ox Mountain Landfill	San Carlos
Menlo Park	28,040	12,247	72.0	BFI	Ox Mountain Landfill	San Carlos
Portola Valley	4,194	1,622	86.1	Los Altos Garbage	Ox Mountain Landfill	San Carlos ^d
Redwood City	66,072	26,847	66.5	BFI	Ox Mountain Landfill	San Carlos
San Carlos	26,167	11,338	78.8	BFI	Ox Mountain Landfill	San Carlos
San Mateo (City)	85,486	36,982	62.8	BFI	Ox Mountain Landfill	San Carlos
Woodside	5,035	1,892	98.6	Los Altos Garbage	Ox Mountain Landfill	San Carlos ^d
Unincorporated Areas	57,637	20,676	88.8	BFI Los Altos Garbage San Bruno Garbage South SF Garbage Peninsula Sanitation Seacoast Disposal	Ox Mountain Landfill Ox Mountain Landfill Ox Mountain Landfill Ox Mountain Landfill Newby Island Landfill Ox Mountain Landfill	San Carlos San Carlos ^d San Carlos ^d San Bruno Blue Line None None

N/A - not applicable

^a Source: 1990 Census (includes one-unit structures such as townhouses) with the exception of Belmont, which self-reported its population data.

^b Franchised hauler

^c Hillside Landfill accepts only a limited range of wastes (e.g., self-haul, inerts, etc.)

^d Residential and commercial solid waste is hauled directly to Ox Mountain Landfill. Debris boxes (residential and commercial) are hauled to San Carlos Transfer Station prior to disposal at Ox Mountain. Debris boxes containing recyclable material such as yard waste are taken to Zanker Resource Recovery.

Because most HHW is disposed of as refuse, programs for controlling this waste have generally focused on the solid waste stream. The participating jurisdictions in San Mateo County, however, are committed to eliminating all forms of improper HHW disposal (such as dumping in storm and sanitary sewers), and to properly managing HHW and household hazardous materials.

1.5 NEW DIRECTIONS IN HHW MANAGEMENT FOR SAN MATEO COUNTY

The participating jurisdictions have expressed a commitment to the management of HHW, as demonstrated by the collection program implemented by the San Mateo County Department of Health Services (county DHS) in September 1989. Since the inception of this program, 60 HHW collection events have been conducted, with more than 12,000 residents participating. Additionally, the county DHS has undertaken to promote safe handling and disposal of HHW, as well as use of nontoxic alternatives, through the distribution of educational materials. This commitment will be further broadened to meet additional HHW management goals. At the same time, the participating jurisdictions will assume a greater responsibility for the development, implementation, and monitoring of regional and local HHW programs.

The jurisdictions will continue to place a high priority on reducing the amount of HHW generated by county residents, and providing for effective HHW collection. Because public education is the primary tool for implementing HHW source reduction and for encouraging collection program participation, the jurisdictions will expand educational efforts, with particular emphasis on disseminating information about hazardous wastes, and providing recycling and collection services that are convenient and accessible to all residents. In general, the participating jurisdictions will emphasize:

- **Monitoring and evaluating HHW source reduction, recycling, collection, and disposal activities.** The jurisdictions will assess program effectiveness, and will inform project managers, government officials, and the state regarding the success of program implementation.

- **Ensuring program accessibility.** The needs of all residents of the participating jurisdictions, including those whose primary language is not English and/or those who have limited mobility, will be addressed by the HHW education and collection program.
 - **Increasing HHW recycling efforts in the near future.** This effort will include the identification of potential collection sites for recyclable HHW, such as service stations, recycling centers, and retail stores.
-
- **Developing new programs.** Educational efforts will target public schools and local retail outlets, and curricula will be designed to emphasize selective buying as well as safe usage, storage, and disposal of HHW.
 - **Increasing available funding.** This effort will ensure program success through support and commitment by the 15 city councils and the County Board of Supervisors. Top officials of the city governments must be prepared to give consideration and priority to the recommended programs.
 - **Participating in a multijurisdictional approach to developing HHW programs.** This approach can provide for economies of scale to ensure program development and implementation, as well as the recycling and proper disposal of HHW.

1.6 STRUCTURE OF THE HHWE

The HHWE describes seven aspects of HHW program planning: existing conditions, HHW collection, HHW recycling, refuse monitoring, program funding, program implementation, and public education. It also contains supporting appendices. Facets of the HHW management program (collection and recycling, refuse monitoring, and public education) include specific alternatives selected through program planning efforts; it also considers programs that are

planned or are already being implemented independent of the HHWE, and programs that may be adopted pending further exploration by the participating jurisdictions.

1.7 OBJECTIVES OF THE HHWE

The objectives of the HHWE were developed to guide the management of household hazardous materials and wastes in the participating jurisdictions. The following objectives cover both the short-term (1991-1995) and medium-term (1996-2000) planning periods.

1.7.1 HHW Recycling, Collection, and Refuse Monitoring

- Ensure safe recycling, collection, treatment, and disposal of HHW generated by residents of participating jurisdictions; these activities will be accomplished through the operation of HHW education programs and collection facilities, and through refuse monitoring.
- To the extent possible, continue and expand the efforts to recycle HHW materials recovered through collection programs, including used oil, antifreeze, solvent, paint, and auto batteries.
- To the extent possible, reduce or eliminate improper HHW management, including the disposal of HHW at county landfills or into storm drains and sanitary systems.
- Increase the awareness of residents regarding the proper management and disposal of HHW, to reduce potential hazards that may affect waste collection personnel, the general public, and the environment.

1.7.2 Public Education and Information

- Through behavioral changes, including the purchase and use of safer substitutes, improve household management of hazardous materials, and reduce the generation of HHW by residents.
- Reduce or eliminate the improper disposal of HHW, and increase participation in HHW collection programs.
- By combining resources with other environmental and integrated waste management programs (such as residential source reduction and recycling education), ensure the maximum efficiency and effectiveness of HHW education programs.

Specific HHW public education goals and programs are discussed in Section 5.



SECTION 2 EXISTING CONDITIONS

This section presents information on HHW generation, as well as programs in San Mateo County that recycle HHW and thus decrease the amount of HHW disposed of by landfilling or other improper or illegal means.

2.1 HHW GENERATION RATES

HHW enters the solid waste stream mixed with solid wastes collected and disposed of by licensed refuse haulers. HHW is also mixed with self-haul wastes disposed of by residents or private haulers at transfer stations and landfills. In compliance with the requirements of AB 939, a Solid Waste Generation Study (SWGS) was performed by SCS Engineers for the participating jurisdictions in October 1991.

Based on data obtained from the SWGS, approximately 216,900 tons of solid waste generated by residential sectors of the participating jurisdictions were landfilled in San Mateo County in the base year 1990-1991. This study also indicated that an average of 0.33 percent of the residential solid waste stream is HHW. Therefore, as many as 790 tons of HHW generated by the participating jurisdictions may have been disposed of in county landfills during this period. Table 2-1 summarizes the total amounts of HHW and residential MSW generated and sent to landfills by each jurisdiction.

During fiscal year 1990-1991, 30,635 gallons of HHW were received at 33 collection events coordinated by the county DHS and held at various locations around the county. A total of 2,488 of the 4,002 households that brought HHW to these events were residents of the participating jurisdictions. Based on an average of 7.6 gallons of HHW per participant and an

Table 2-1
Residential HHW Disposed of by Jurisdiction
(Fiscal Year 1990-1991)^a

Jurisdiction	Residential MSW (tons)	Percent HHW ^b	HHW ^b (tons)
Atherton	4,633	0.32	15
Belmont	10,926	0.45	49
Burlingame	14,311	0.32	46
Colma	1,570	0.32	5
Daly City	26,683	0.32	85
East Palo Alto	7,115	0.32	23
Foster City	9,781	0.45	44
Half Moon Bay	3,943	0.46	18
Hillsborough	5,490	0.31	17
Menlo Park	22,345	0.32	71
Portola Valley	1,670	0.30	5
Redwood City	36,270	0.32	115
San Carlos	17,695	0.45	79
San Mateo (city)	34,449	0.45	154
Unincorporated Areas	17,931	0.32	57
Woodside	2,088	0.34	7
TOTAL	216,900	0.36	790

^a HHW collection event data were available for fiscal year 1990-1991 only.

^b HHW disposal calculations are based on data collected by SCS Engineers during the SWGS conducted for the HHWE and SRRE. Quantities of HHW disposed of outside the solid waste stream (for example poured down the sewer or storm drains) have not been estimated and are not included in these calculations.

average weight-to-volume of 8 pounds per gallon (weight of water), collection events serving the residents of the participating jurisdictions diverted approximately 76 tons of HHW from landfills or, from other improper means of disposal.

Curbside collection programs in 10 of the participating jurisdictions will also collect and recycle an estimated 22,000 gallons (88 tons) of used oil in 1991. These amounts, added to the estimates of HHW identified in the municipal solid waste stream, indicate that 954 tons of HHW were generated by residents of the participating jurisdictions. The amounts of HHW disposed of outside the solid waste stream (for example, poured down sewer and storm drains) have not been estimated and are not included in this HHW generation calculation.

Although the HHW generation data obtained from the SWGS are the best data currently available, the actual HHW generation rate is most likely somewhat higher for the following reasons:

- Since HHW constitutes only a small fraction of the total solid waste stream and HHW varies from load to load and from season to season, it is difficult to derive a statistically reliable estimate of the HHW disposed unless many tons of MSW are examined throughout the course of the year.
- HHW studies performed nationwide consistently point to a HHW generation rate equal to one percent or more of the solid waste stream, an amount greater than the estimate based on the SWGS conducted for the participating jurisdictions.
- The SWGS analyzes wastes that enter the solid waste stream; however, there are other improper methods of HHW disposal used by residents. These additional methods include disposal into storm drains and sanitary sewers and disposal directly onto the ground.

2.2 EXISTING PROGRAMS AND QUANTITIES DIVERTED

A variety of methods are used in the county to remove HHW from the solid waste stream, and generally to ensure its proper management and disposal. This section describes existing HHW recycling collection and refuse monitoring programs. Public education programs are described in Section 5.

2.2.1 Collection Events

Collection events in the county, intended to capture HHW before it enters the solid waste stream, are designed to collect all but a few of these wastes (e.g., explosive or radioactive materials). Collection events are handled by county and city personnel, with the assistance of volunteers and several key businesses. In fiscal year 1990-1991, the county DHS sponsored 33 collection events, which served over 4,002 households. Based on records maintained by county DHS personnel, 2,488 of these households were from the participating jurisdictions. The events were held in the cities of San Carlos, South San Francisco, San Bruno, Daly City, Half Moon Bay, San Mateo, and Pacifica. Table 2-2 summarizes the types and amounts of materials collected and management strategy used.

2.2.2 Recycling and Reuse

Recycling is an important facet of HHW management, due to the value of diverting HHW previously disposed through landfilling or destructive incineration. In addition to reducing the environmental impacts of landfill leachate and incinerator ash contaminated with HHW, significant cost savings may be realized through the avoidance of landfilling or incineration (typically, the costs of incineration are nearly four times the cost of recycling). HHW recycling includes the reprocessing of HHW such as latex paint, batteries, and used automotive oil; solvents and oil-base paints are burned. For residents, the reuse of HHW may include the exchange of usable products in original containers; another example is the reuse of paint by community groups or local public works departments.

Table 2-2
Summary of HHW Collected and Recycled
(Fiscal Year 1990-1991)

Waste Type	Volume (gallons)	Management Strategy
RECYCLED		
Oil-base paint/solvents	13,420	Fuel blending
Latex paint	10,130	Reuse and recycle
Motor oil	2,000	Recycle
Auto batteries	400 batteries	Recycle
Misc. reused material	525	Reuse
Subtotal - Recycled	26,075 400 batteries	
DISPOSED		
Flammable liquids	20	Landfill
Flammable solids	1,480	Landfill
Flammable pesticides	340	Landfill
Poison B pesticides	840	Landfill
Alkalies	260	Landfill
Acids	340	Landfill
Oxidizers	40	Landfill
Other Regular Material A	120	Landfill
Other Regular Material B	160	Landfill
Aerosol cans	960	Incineration
Subtotal - Disposed	4,560	
TOTAL WASTE	30,635 400 batteries	

* Source: San Mateo County Health Services Division, Department of Health Services.

San Mateo County currently recycles all usable latex paint, motor oil, and automobile batteries collected at HHW collection events. In fiscal year 1990-1991, over 85 percent of all collected materials were recycled or reused. Table 2-2 summarizes the types and quantities of the materials recycled from collection events.

A number of vendors collect used oil and automobile batteries from residents in San Mateo County. Hillside and Ox Mountain landfills, along with transfer stations in San Carlos and South San Francisco, also currently accept used oil and automobile batteries dropped off by county residents.

Ten of the participating jurisdictions have contracted with Browning-Ferris Industries (BFI) to provide curbside recycling services that include collection of used motor oil. This oil is left on the curb in sealed containers provided by the residents, collected along with other recycled materials in modified collection vehicles, and sold to be refined by All Petroleum Recovery (formerly Evergreen Oil) located in Pacifica.

2.2.3 Hazardous Waste Refuse Monitoring and Load Checking

Refuse monitoring and load checking are terms used to describe the methods of screening solid waste for hazardous wastes improperly disposed of in the solid waste stream. Refuse monitoring is conducted by the hauler at the time of collection, and load checking is conducted at solid waste management facilities. These methods of monitoring hazardous waste disposal are described in more detail in Sections 3.2.2 and 4.3.

The seven residential MSW haulers serving the participating jurisdictions in San Mateo County are currently implementing refuse monitoring activities. Operating procedures generally include removing HHW when it is detected and leaving it on the curb. All but Seacoast Disposal place a "red tag" on the material; this tag provides information on HHW and instructions for proper disposal.

Operators of Ox Mountain and Hillside landfills and San Carlos, San Bruno, Blue Line and Mussel Rock transfer stations remove HHW when it is detected during normal operations. Random load checks are also conducted at the Hillside landfill, where loads are closely examined. HHW that cannot be returned to an identified hauler is temporarily stored on site until it can be disposed of by the facility in accordance with local, state, and federal regulations.

2.2.4 Quantities Currently Diverted

The quantities of materials received at collection events in fiscal year 1990-1991 are presented in Table 2-1. These materials can be considered to have been diverted. No data are available on the amounts of HHW collected by vendors from residents of the participating jurisdictions.

2.3 ESTIMATES OF HHW ILLEGALLY DISPOSED OF

Based on the data from the SWGS, collection events, and curbside oil collection programs, approximately 954 tons of HHW are generated each year in the participating jurisdictions in San Mateo County. A total of 164 tons of this HHW was diverted from improper disposal through curbside collection, periodic collection events and load checking programs. With the exception of the HHW returned to vendors, it can be assumed that most of the remaining 790 tons of HHW were disposed of illegally or are being stored at home by residents.



SECTION 3

EVALUATION OF ALTERNATIVES

The aim of HHW management is to divert HHW from improper disposal and, through source reduction, recycling, and education, to reduce the potential hazards associated with the use of household hazardous materials. Section 18751.3 of the AB 2707 regulations requires that the HHWE include an evaluation of specific HHW management alternatives for local implementation. Programs that must be evaluated include recycling, education, collection, and monitoring. This evaluation lends itself to a numerical ranking process; however, in choosing the future mix of programs for the participating jurisdictions, local conditions, local objectives, and existing programs became important qualitative guides. The quantitative method, giving a more "objective" look at alternatives, was heavily tempered by the judgment of local representatives and the technical consultants. This section describes the alternatives evaluated, and summarizes the evaluation process. Public education and information programs for HHW source reduction and management are presented in Section 5.

HHW recycling and collection alternatives are not mutually exclusive; overall program design may combine one or more of the described options. In addition, certain programs evaluated for the participating jurisdictions are most effectively performed through a multijurisdictional system, due to the expense of developing and operating individual systems for each jurisdiction. Regional program development may require that participating jurisdictions form specific organizational structures and enter into binding agreements. Such agreements could spell out the scope of HHW management responsibilities, authorities, funding, and institutional arrangements. These regional structures may constitute binding agreements between a lead agency and the participating jurisdictions, joint powers agreements, or a special district. The county DHS is currently coordinating a countywide program that the participating jurisdictions are using to collect HHW in their respective areas. However, the management structure for coordination of a comprehensive and multijurisdictional HHWE program has not been defined.

3.1 EVALUATION PROCESS

The evaluation process involves an assessment of HHW program alternatives, and how these alternatives can meet local needs as well as state criteria presented in Section 18751.3 of the AB 2707 regulations. This section discusses the evaluation process, HHW management alternatives, ability of each alternative to fulfill evaluation criteria, scoring assigned to the alternatives, and the ranking of alternatives.

Six evaluation criteria were used to select the most appropriate HHW management alternatives:

- Minimization of improper disposal
- Hazards
- Facility program requirements
- Cost effectiveness
- Adaptability to changing economic, technological, and social conditions
- Time requirements for implementation.

These criteria cover a range of issues that reflect the needs of the participating jurisdictions regarding HHW management and the requirements of AB 2707, and focus on technical, economic, policy, and institutional concerns. With respect to the criteria, alternatives were scored high, medium, or low, depending on the ability of the alternatives to meet each criterion. The weighting factors used in program selection, as well as a general discussion of each criterion, are presented in Appendix A. These factors represent the average weight that was assigned to each criterion by each of the participating jurisdictions.

Specific alternatives, and the scores assigned for each alternative, are listed in Appendix B, which describes the issues relating each alternative to the criteria, and provides the basis for scoring the alternatives. A final score for each alternative was calculated on the basis of the weighted value assigned to each criterion, and on the ability of the alternative to meet the criterion (Appendix C).

The following criteria were considered in an unweighted form as a part of the evaluation process:

- Consistency with local conditions
- Institutional barriers to implementation.

Final scores led to a ranking of the program alternatives (see Table 4-1). Programs were selected for implementation based on numerical ranking and professional judgment.

3.2 HHW MANAGEMENT ALTERNATIVES

This section describes program alternatives for diverting HHW from improper disposal (as refuse, sewage, etc.), as required under Section 18751.3 of the AB 2707 regulations. Program evaluation includes a general description of the alternative, as well as advantages, disadvantages, and limitations of the alternative. The categories of alternatives evaluated with regard to HHW management include the following:

- Recycling and reuse options, including collection alternatives for HHW that is recyclable through the use of current technologies (HHW recycling processes are described in Appendix D)
- Collection methods suited to the full range of HHW generated
- Refuse monitoring and load checking.

3.2.1 HHW Collection and Recycling Program Alternatives

HHW collection programs nationwide have increasingly adopted recycling to reduce both HHW management costs and the adverse environmental effects of disposal via landfilling and

destructive incineration. The HHW collection options described in this section (permanent collection facilities in particular) can all include recycling in their operations.

3.2.1.1 Periodic Collection Events

A temporary collection center is set up at a paved, accessible location (e.g., a school parking lot, fire station, city facility, or privately owned industrial site) for a short period (usually one or two days). Collection facilities require a specially designed storage unit mounted on a semitrailer or a concrete slab. Residents are encouraged to bring household hazardous materials to the site on collection days. The center is staffed by trained personnel who collect, sort, and pack the HHW into 55-gallon drums. Wastes are transported by a licensed hauler to licensed hazardous waste facilities for recycling, treatment, or disposal. Collection days are widely advertised in advance, often as part of a general HHW education/awareness program. The experience of participating jurisdictions (as well as others) with one- or two-day collection events is that participation at times may exceed the handling capacity of the event staff. Participants may be required to endure long waits or be turned away, both of which occurrences are an inconvenience that leads to low participation rates in the future, or the illegal disposal of HHW that could not be delivered.

According to the county DHS, two-day collection events result in about 1 to 2 percent participation (defined as the number of participants divided by the total number of residents within the anticipated radius of participation), and the delivery of oil, paint and paint products, household cleaners, and automobile and household batteries. An average of 6 gallons or between 3 and 60 pounds of HHW per vehicle are brought to the events. It may be assumed that if the events were held more frequently, not only would participation rates be lower, but the amount of HHW per vehicle would be lower as well.

Hazards associated with most of the collection events can be minimized through proper planning for spills and emergency response, and by limiting the types of hazardous materials brought to the site. Employees who are trained in all aspects of HHW handling techniques can also minimize such hazards. Events may pose a danger to residents who improperly transport HHW

to the collection site, though the main environmental impact associated with the event is traffic near the site. The periodic nature of the events (quarterly, semiannually, or annually), however, limits the frequency of this impact.

Implementation of the collection alternative will result in an increased use of hazardous waste management (recycling, treatment, disposal) facilities. In addition, this alternative may require local, temporary storage facilities for the collected materials until they can be transported to treatment, storage, and disposal facilities. While the permitting of hazardous waste collection and storage facilities is complex, current legislation allows temporary storage facilities to receive certain types of hazardous wastes (motor oil, antifreeze, and automobile batteries) for less than 90 days without the type of permits necessary to store other types of hazardous wastes for longer periods.

If the events are held at a publicly owned facility, costs are limited to contract administration and publicity, and transportation and disposal costs. These costs vary for each event, depending on the quantity of materials collected, as well as on disposal and personnel costs (reflecting whether city or private companies provide staff), site costs, and publicity. If it is assumed that temporary facilities would be located on land owned by the local jurisdiction, no land acquisition costs would be associated with this alternative. Costs for collection events in other cities have ranged from \$100 to \$300 per participating household. Typical participation rates for collection events held throughout the United States range from 1 to 3 percent of the households within a particular service area.

A program involving collection events has the flexibility to handle changes in technology, social conditions, and/or economics. A growth in participation or in the quantity of materials collected may mean that the events could be held for longer periods (e.g., longer hours or more days), or at more frequent intervals.

This alternative can be implemented in both the short-term (1991-1995) and medium-term (1996-2000) planning periods.

3.2.1.2 Periodic Collection Programs Limited to Recyclable HHW

Under AB 2597 (Tanner, Chapter 1265/90), HHW collection programs collecting only recyclable materials such as latex paint, used oil, antifreeze, spent lead-acid batteries, and all household batteries are exempt from DHS hazardous waste vehicle and facility permit requirements. In addition, recyclable HHW can be inexpensively managed, and is relatively safe to handle, in contrast with HHW that must be incinerated or landfilled at a licensed hazardous waste facility.

A number of communities in the state have instituted collection event programs that are limited to recyclable materials.

3.2.1.3 Permanent and Satellite Collection Facilities

Permanent HHW collection facilities provide an ongoing means for residents to manage HHW properly. These facilities vary from small, often prefabricated structures to large custom buildings. A permanent site is generally equipped with a building designed to store and separate incompatible HHW. The facility must be provided with safety and fire protection equipment, and must be staffed during operating hours by one or more workers who are fully certified to handle hazardous materials. Some jurisdictions combine a custom building for functions such as administration, HHW receiving, chemical analysis, and packaging with prefabricated units for storage and other operations. Other communities maintain large permanent sites that function as central collection facilities for storage and handling of HHW which is collected at smaller satellite permanent facilities, mobile facilities, or periodic collection events.

At this time, state permitting requirements for permanent HHW collection sites are in flux. The state DHS is developing permit-by-rule regulations that will include specific, but as yet undefined, requirements. As fixed, off-site, multiuser hazardous waste facilities, permanent HHW collection sites may fall under the requirements of AB 2948 (Tanner, 1986), including participation of a local assessment committee in reviewing aspects of facility operations and mitigation measures for potential environmental impacts. In addition, depending on local requirements, siting a permanent facility may entail the preparation of an Environmental Impact Report.

Permanent collection sites, in general, entail capital costs that are larger than those for other HHW collection options. Because of their storage and waste-handling capacities, however, these facilities can help to control long-term program costs through greater flexibility and economies of scale in waste handling and disposal. Permanent facilities can also provide services to a number of cities within a watershed, to increase their cost effectiveness.

Satellite facilities can be used in conjunction with a central site. These facilities can be located at convenient sites, such as transfer stations, city yards, private industrial sites, or fire stations. Choice of the site would be dependent on a site assessment conducted by each jurisdiction. Generally, satellite facilities consist of a small, prefabricated hazardous materials storage building staffed by trained personnel. Materials are collected and periodically transported in a licensed hazardous waste vehicle to the permanent central site for processing and storage. Potentially, a participating jurisdiction could own and operate a satellite drop-off site.

A public education/outreach program is necessary to inform residents of the days and hours that collection centers are open to accept waste, the types of materials considered to be hazardous, the materials not accepted, and the procedures to be followed when bringing HHW to the site. This alternative can be implemented in conjunction with any of the other collection alternatives described in this section.

New legislation allows temporary storage facilities to be set up to receive certain types of HHW for fewer than 180 days without the types of permits necessary to store other types of hazardous wastes or to maintain the wastes for longer storage periods. Wastes that can be accepted at this type of facility include latex paint, used oil, antifreeze, spent lead acid batteries, and nickel-cadmium, alkaline, carbon-zinc, and other small batteries.

The availability of a temporary storage facility would allow residents to deliver certain types of HHW at more frequent intervals. Since legislation allowing for the establishment of these facilities is relatively new, little information exists regarding their effectiveness. In communities that have had some experience with both permanent drop-off sites and one-day collection events, it appears that permanent sites attract a greater number of users (probably due to the longer term

aspects of publicizing the facility), but also result in a smaller volume of products brought to the site per participant (presumably because of a less urgent need to dispose of unused materials).

While it is assumed that individuals handling HHW at the facilities are properly trained and supervised, incidental spills should be anticipated in conjunction with this alternative. Spills may also occur as residents transport HHW to the facilities. Contingency plans for other potential risks (e.g., fire, earthquake) would also need to be considered. To site a fully permitted facility would require a full evaluation of environmental impacts in accordance with the California Environmental Quality Act (CEQA).

Facilities would also be located on land owned by the jurisdiction. Accordingly, no land acquisition costs would be associated with this alternative. If the alternative is implemented by a participating jurisdiction, staff would need to be hired and trained to operate the facility. The cost of a properly constructed temporary storage facility (i.e., one equipped with spill containment and other necessary features) may be considerable. If materials accepted at the facility are not recyclable, costs for disposal would range from \$200 to \$500 per barrel.

This alternative is flexible with regard to the types and quantities of materials accepted, and can accommodate changes in economics. Technological changes, such as new or modified materials that may require special handling, could also be accommodated by modifying the facility design as necessary. If a particular jurisdiction is actively engaged in operating an HHW drop-off and storage facility, it would assume all liability related to facility use. If the alternative were selected, a private contractor could also be responsible for operation of the facility.

3.2.1.4 Mobile Collection Facility

A mobile HHW collection facility can consist of one or more specially designed storage structures mounted on semitrailers which are placed temporarily on an asphalt or concrete slab. Large trailers or cargo containers can be modified and outfitted with accessories to provide for adequate safety and waste handling capacity. Mobile HHW collection vehicles are manufactured by several companies, or they can be fabricated by local staff. The facility might collect

hazardous wastes from a community or neighborhood for one to four weeks, then move to another location. A mobile collection center is staffed by trained personnel who screen, sort, and package wastes, and store them in appropriate containers. Personnel can be provided by contractors, or they can be public employees.

Mobile collection programs are essentially a compromise between a one- or two-day collection event, as described in Section 3.2.1.1, and a permanent collection center, as described in Section

3.2.1.3. They provide a more convenient means for residents to dispose of HHW than at a one- or two-day event, since they remain in one location for a greater period of time. Essentially, a mobile collection vehicle would be ideally suited to a group of participating jurisdictions whose populations are not large enough to support a full-time, permanent collection center, but which might benefit from a collection event on a regular basis, once per month. For example, a mobile vehicle could be scheduled for a certain number of days during the first week of each month in jurisdiction "A," for a certain number of days during the second week in jurisdiction "B," and likewise for jurisdictions "C" and "D," after which the vehicle would again return to jurisdiction "A." Jurisdictions with large populations would benefit more from a permanent collection center, while rural areas could be adequately served by mobile or periodic collection events once or twice per year.

3.2.1.5 Collection at Vendor Locations

HHW generation results from the purchase and use of certain products and materials. Some vendors, such as automobile maintenance shops and gas stations, accept used oil and batteries for recycling. Though oil and paint are regularly handled at these businesses, personnel will need to know which materials can be accepted, and how to handle the materials. Incidental spills should be anticipated in conjunction with this alternative, and some of the materials are flammable. Furthermore, since HHW will be delivered to private businesses, such establishments may be held liable for the use or misuse of HHW. Because of the potential for liability, voluntary participation by private businesses may be limited.

Collection opportunities remain specific to the product or materials sold by each type of vendor, and may be limited by cost or the potential for liability. This alternative is not very flexible with regard to the types and quantities of waste materials accepted. However, most or all of the materials collected by vendors are destined for recycling and some are accepted as trade-in. This program targets HHW for which stable markets exist, such as waste oil, batteries, and solvents. Opportunities for recycling paint could also include donations of such material to local organizations, the establishment of a paint exchange located at a HHW drop-off facility, or the use of paint by municipal services departments.

The alternative can be implemented by means of voluntary action or through an ordinance. Using a voluntary approach, cities can assist in publicizing locations that accept HHW, and work with businesses to encourage residents to deliver their recyclable wastes. Voluntary waste diversion is common at various locations throughout the state. If a regulatory approach is used instead, cities enact an ordinance which requires businesses that sell recyclable products to provide collection services for these products.

Presently, this alternative targets the diversion of only certain types of HHW (paint and automobile-related wastes). Additional programs would be required to divert other forms of HHW. Methods to increase vendor participation in HHW collection include identifying additional materials and vendor types (e.g., paint stores for collection of discarded paint), and providing education and/or incentives to vendors. If this alternative is selected, individual jurisdictions would assume the costs related to coordinating and monitoring the activities of the participating businesses, and the costs of publicizing locations of businesses that choose to cooperate in program implementation. This alternative will not create the need for other facilities.

3.2.1.6 Curbside Collection Programs: Full Range or Only Recyclable HHW

Curbside collection programs provide residents with the convenience of having the collection program brought to the household. This type of program is best suited for single-family dwellings. In a curbside collection program, residents place their hazardous wastes at the

curbside on designated days, and specially equipped trucks staffed by trained workers collect these wastes. The wastes then are classified with respect to compatibility, properly packaged as part of the collection process, and delivered to a commercial treatment, recycling, and disposal facility. Using properly outfitted vehicles, collection may be performed in conjunction with refuse collection or curbside recycling. Because of safety concerns, an alternative curbside collection program might target only a limited type of HHW, primarily used oil. Participation rates should be higher for curbside collection programs than for other alternatives, because the collection is accomplished at the site of generation.

Curbside used oil programs have been implemented by BFI in 10 of the participating jurisdictions. A total of 19,200 gallons of used oil were collected at curbside from these jurisdictions in the first nine months of 1991; it is anticipated that 22,000 gallons of used oil will be collected during the entire year.

Several potential hazards related to this type of program exist. Accidental spills that require special cleanup are possible, and HHW left overnight at the curb poses hazards to persons who might come in contact with the waste. The danger to children is of particular concern. Appropriate storage containers and properly trained personnel can minimize the risks associated with collection, handling, and transporting HHW after it is collected. Depending on the frequency of collection and/or the use of dedicated collection vehicles, the operation of transport vehicles could result in incremental increases in traffic, air emissions, and fuel consumption.

Implementation of the alternative may result in an increased need for hazardous waste treatment, storage, and disposal facilities if nonrecyclable HHW are included in the program. If a local jurisdiction provides this service, the acquisition of vehicles, equipment, and personnel would be required. The jurisdiction would also be responsible for the development of or access to a temporary storage facility, and the costs associated with providing containers to residents. Operations and maintenance costs would involve the collection, transportation, and disposal of HHW, as well as personnel training, safety equipment, and publicity.

AB 2707 exempts any city, county, or local agency operating an HHW collection, recycling, and disposal program from damage or liability for injury, except in the case of negligence or bad faith. On the other hand, federal legislation (specifically, the Comprehensive Environmental Response, Compensation and Liability Act - CERCLA) holds private companies liable when providing this service.

3.2.1.7 Door-to-Door Collection Program

Door-to-door collection is most appropriate for residents with limited options for transporting HHW to a collection site, and for the collection of waste that is sufficiently hazardous that it should not be transported by the resident. Door-to-door collection varies from curbside collection in several respects. Wastes are collected by appointment only rather than on designated days, and because wastes are not left at the curb, such programs can collect a wider range of materials. Also, door-to-door costs may be higher because each pickup must be arranged, thus increasing administration effort and transport time, and limiting economies of scale.

3.2.1.8 Collection at Solid Waste Facilities

Regulations developed under AB 2707 require the consideration of HHW collection at solid waste facilities such as landfills and transfer stations. Depending on their level of service, these facilities may accept only recyclable HHW (such as oil and automobile batteries) or recyclable and nonrecyclable wastes. A materials exchange program for reusable household hazardous materials (e.g., paints, unopened solvents, and cleaners) can be established at the facilities. In concept, this alternative is similar in its operational characteristics to the permanent facility described above. As detailed in Section 4.1.4, most of the solid waste facilities in San Mateo County currently accept used motor oil.

3.2.1.9 Collection by Commercial Hazardous Waste Facilities

Hazardous waste management facilities are licensed primarily to receive hazardous waste from commercial and industrial generators. Some of these facilities may accept HHW from individuals; in general, however, residents are charged for the service, and fees may range from \$10 to \$50 per gallon. A few commercial hazardous waste facilities accept HHW at a reduced cost as a service to the community.

At present, there are two commercial off-site hazardous waste treatment and storage facilities in San Mateo County. Romic Chemical Corporation, in East Palo Alto, serves as a major chemical recycler for businesses using solvents and other organic compounds. Quicksilver Products, Inc., in Brisbane, recycles materials containing mercury, such as fluorescent light tubes. Neither of these facilities has a program to accept hazardous wastes from the general public. If either facility should institute an HHW collection program, the cost for the service would likely be prohibitive for most residents. Consequently, this alternative was not considered for implementation in San Mateo County.

3.2.2 Refuse Monitoring and Load Checking

Refuse monitoring (at the time of collection) and load checking (at the time of processing or disposal) are programs that seek to prevent HHW from entering the solid waste stream, to ensure the proper management of hazardous wastes delivered to solid waste facilities, and to identify generators who place hazardous wastes in the solid waste stream. These programs require the efforts of landfill operators and waste collectors in San Mateo County.

Refuse monitoring occurs when refuse is first collected by a hauler from residential customers. Refuse collection workers are trained to visually examine garbage prior to collection. Any improperly disposed waste can be left for the customer and "red-tagged" with information which explains the proper procedures for managing HHW. This method is usually technically unfeasible with fully automated collection systems, because collection workers have limited opportunity to visually inspect the refuse as it is being loaded into collection vehicles. None of

the residential solid waste haulers serving the participating jurisdictions use fully automated collection vehicles. All franchised residential waste haulers serving the participating jurisdictions have implemented refuse monitoring programs (see Section 2.2.3).

In load checking programs, refuse is monitored at transfer stations and at the landfill. Refuse is visually screened for HHW at the gate (uncompacted loads), and selected loads of waste are emptied onto a pad and examined for hazardous wastes. Any hazardous materials identified are either removed for proper management by the facility operator or returned to the hauler. Because it is virtually impossible to detect or to determine the origins of HHW in the residential waste stream, the load checking program is beneficial primarily in deterring identifiable generators from attempting to illegally dispose of large quantities of hazardous wastes. The program provides almost no opportunity to educate householders who improperly dispose of HHW. Load checking programs are in place at all the transfer stations and landfills in San Mateo County.

The Ox Mountain load checking program specifies that if any hazardous or other unacceptable wastes are identified, the entities responsible for generating and delivering the waste will be notified that the wastes were illegally disposed of, and will be charged for additional analysis and disposal costs as incurred. Significant incidents will be reported to the San Francisco Bay Regional Water Quality Control Board and the San Mateo County Environmental Health Department.

Waste hauling and disposal methods for wastes of known and unknown origin discovered at Ox Mountain Landfill are described in Appendix G.

SECTION 4

PROGRAMS SELECTED FOR THE PARTICIPATING JURISDICTIONS

This section describes the HHW recycling, collection, and refuse monitoring programs selected by the participating jurisdictions to meet the goals and objectives for HHW management. The nine collection, recycling, and refuse monitoring alternatives described in Section 3 were evaluated and numerically ranked according to the criteria previously described. All alternatives were examined to determine their feasibility for each of the participating jurisdictions. This section also briefly discusses why certain alternatives were not selected.

For each numerically ranked program, information and concerns related to the evaluation criteria were addressed, and programs were evaluated by using the scoring technique defined in Section 3.1. The results of this evaluation are presented in Table 4-1, which ranks the programs by preference. Each program selection is based on the needs of the according to participating jurisdictions, on existing conditions, and on the results of the SWGS data analysis. Recycling, collection, and refuse monitoring programs are discussed in this section; public education and information programs are discussed in Section 5.

At present, it is not anticipated that the participating jurisdictions will implement programs individually; rather, each jurisdiction will participate with other jurisdictions in the selected programs. San Mateo County will continue to sponsor collection events for HHW. Some programs in the list are not appropriate for the participating jurisdictions (e.g., door-to-door collection of HHW), and are not scheduled for implementation; these programs may be viewed as contingency measures that could be added if the diversion and recycling goals are not met.

**Table 4-1
HHW Program Evaluation Results**

Alternative	Score	Ranking
Curbside Program (Only Recyclable)	243	1
Periodic Collection Events (All HHW)	241	2
Permanent and Satellite Collection Facilities	240	3
Collection at Solid Waste Facilities	231	4
Collection at Vendor Locations	224	5
Mobile Collection Facility	201	6
Periodic Collection Events (Only Recyclable)*	190	7
Curbside Collection (All HHW)*	180	8
Door-to-Door Pickup Program*	140	9

* Programs not currently considered for implementation.

4.1 PROGRAMS SELECTED FOR IMPLEMENTATION

Several of the alternatives received high rankings, and a clear demarcation in rankings differentiated the selected from the nonselected programs. The following programs were selected for implementation by the participating jurisdictions. Each of the selected alternatives is consistent with local conditions, and no institutional barriers to implementation were identified. Each program, and the basis for its selection, is briefly discussed in subsequent paragraphs:

- Curbside collection of recyclable HHW
- Periodic collection events
- Permanent and satellite collection facilities
- Collection at solid waste facilities
- Collection at vendor locations
- Mobile collection facility.

4.1.1 Curbside Collection of Recyclable HHW

In 10 of the participating jurisdictions (Atherton, Belmont, Burlingame, Foster City, Half Moon Bay, Hillsborough, Menlo Park, Redwood City, San Carlos, and the city of San Mateo), homeowners are able to place used oil at the curb along with other recyclables. This alternative, along with periodic collection events, and the establishment of a number of permanent collection facilities, was ranked very highly among the nine options assessed.

4.1.2 Periodic Collection Events

In fiscal year 1990-1991, over 2,488 households in the participating jurisdictions participated in periodic collection events. Such events can be expanded or modified into a mobile collection program to increase the accessibility of collection and educational services to residents of the participating jurisdictions. This alternative may play a long-term role in San Mateo County's HHW management plan, in conjunction with the development of one or more permanent collection sites in the county and/or a mobile collection program.

4.1.3 Permanent and Satellite Collection Facilities

The county DHS has initiated actions to implement a permanent HHW collection and storage facility. This facility would be permitted to accumulate materials, accept materials from the public on a drop-off basis, and haul large loads to disposal facilities, thus accruing some savings through reduced transport. The facility would also include recycling capabilities (see Appendix D).

A network of collection facilities may eventually replace one-day collection events as the local drop-off point for residents of jurisdictions with large populations. These satellite facilities could be located at existing transfer stations or city and county corporation yards. Such facilities could store materials for a short period, and then move them to the central facility for bulking, consolidation, and long-term storage. It is anticipated that satellite facilities would be open on a regular basis, depending on demand. A facility might begin by remaining open one day per

month, and expand operations as necessary. Effectiveness would be enhanced by regular hours and by a strong public education program.

4.1.4 Collection at Solid Waste Facilities

Currently, collection of recycled oil is available at the Ox Mountain and Hillside landfills, San Carlos Transfer Station (operated by BFI), and the Blue Line Transfer Station (operated by the South San Francisco Scavenger Company). The Blue Line Transfer Station may expand the range of recyclable HHW collected.

4.1.5 Collection at Vendor Locations

A major advantage of vendor collection programs is that most or all of the collected materials can be readily reused or recycled, though some materials can be accepted on a trade-in-only basis. At a minimum, the participating jurisdictions will encourage the continuation and expansion of HHW recycling by promoting the participation of vendors through HHW public education and information programs, as presented in Section 5.

To a certain extent, this alternative is already in operation in San Mateo County (a number of gasoline stations accept used oil from residents of the participating jurisdictions), and HHW collection and recycling by vendors is consistent with a policy of providing cost-effective, convenient collection of HHW and preference for recycling options. The participating jurisdictions are actively exploring the expansion of vendor collection, such as used-oil recycling at additional service stations.

Vendors not already recycling HHW may be reluctant to participate because of concerns about cost and liability. Jurisdictions will examine and attempt to ameliorate the valid reasons for this reluctance, which can stem from local, state, or federal regulations concerning storage tanks and hazardous wastes, as well as from insurance concerns that are beyond the control of the participating jurisdictions.

4.1.6 Mobile Collection Facility

A mobile collection program was evaluated as having moderate potential to minimize the improper disposal of HHW. This program may be particularly useful for application in smaller jurisdictions and rural areas of the county having low population densities. One barrier to implementation, however, is that of finding suitable locations to site the facility because of variables such as traffic access, general safety, and land-use requirements. Similar to periodic collection events, other concerns include liability because of the potential for spills and the exposure of the public.

Regulations currently being developed by the state DHS will probably allow mobile facilities to operate under a permit-by-rule; however, approval by other agencies (such as local land-use authorities) may be required for each site. As with periodic collection events, a mobile collection system may impose some limitations on the types of wastes that can be bulk-packaged for recycling or disposal.

4.2 PROGRAM ALTERNATIVES NOT SELECTED

The following programs were not selected for implementation:

- Periodic collection programs for recyclable HHW
- Curbside collection of all HHW
- Door-to-door pickup program.

4.2.1 Periodic Collection Programs for Recyclable HHW

Compared to other HHW collection efforts, periodic collection programs limited to recyclable HHW avoid some barriers to implementation because of reduced costs and regulation; however, communities have often found that administration, advertising, and other program needs may not be reduced enough to justify the limited acceptance of some waste types. Because of such

restrictions, participants whose nonrecyclable wastes are turned away may then become discouraged from future efforts to handle HHW properly.

4.2.2 Curbside Collection of the Full Range of HHW

A curbside collection program for the full range of HHW was not selected as a collection option. The most significant aspect of a curbside program remains the issue of liability, because of a potential for spills and accidental poisoning; therefore, until safeguards can be developed to reduce the likelihood of accidents, the curbside pickup of HHW will remain limited to only certain types of recyclable HHW (e.g., used oil).

4.2.3 Door-to-Door Pickup Program

Door-to-door collection programs provide convenience to residents, particularly those with limited options for transporting HHW to a collection site. HHW is usually collected by appointment only, rather than on designated days. Because the wastes are not exposed (e.g., on the curb), these programs can collect a wider range of wastes. Costs, however, are higher because each pickup must be specifically arranged, thereby limiting economies of scale.

The participating jurisdictions do not choose to implement such a program at this time. However, if the evaluation of programs in the future shows that the jurisdictions are not reaching goals for diversion, this type of program could supplement selected programs to increase the participation of otherwise nonparticipating residents.

4.3 REFUSE MONITORING AND LOAD CHECKING

State law requires load checking programs as a condition of any solid waste facility permit; therefore, this type of program is not viewed as being optional for the participating jurisdictions. As described in Section 3.2.2, refuse monitoring and load checking programs have limited effectiveness in identifying and removing HHW that has been improperly placed into the solid

waste stream; a certain amount of HHW disposed of as refuse will thus remain undetected due to these inherent limitations. These programs can, however, provide valuable data for monitoring the effectiveness of other HHW source reduction, recycling, and collection activities performed within participating jurisdictions.

4.4 NEW AND EXPANDED PROGRAMS AND FACILITIES

As described in Section 4.1.3, the participating jurisdictions plan to establish a permanent HHW collection facility. To the extent possible, materials collected at the facility will be recycled; however, HHW that is not recyclable will be disposed of at a hazardous waste treatment, storage, and disposal facility.

4.5 ANTICIPATED END-USES FOR RECOVERED PRODUCTS

The most commonly recycled HHW includes used oil, latex paint, and automobile batteries. Solvents can also be recycled; however, solvent recycling tends to be more specialized, and these substances are usually not collected from residents in sufficient quantities to make recycling feasible. Used oil is by far the most marketable HHW, since its market is well established. The price for used oil fluctuates, depending on current petroleum prices.

Automobile batteries can usually be sold to local battery recyclers for an average price of \$1.50 each. Recyclers will pick up the batteries as well. Latex paint can also be recycled. A paint company typically charges up to \$2.50 per gallon for reprocessing the paint. Unused latex paint can be donated to local organizations, such as church and theater groups, or it can be exchanged from one participant to another. In addition, recycled or reused latex paint can be used for covering surfaces vandalized with graffiti. The county currently contracts with SEM Products for the processing of latex paints.

To encourage the development of markets for recycled HHW, participating jurisdictions may establish procurement policies for recycled products. State law already requires local agencies to purchase recycled oil if it is comparable to virgin oil products. Quality standards can be established and procurement policies developed for recycled paint, auto batteries, antifreeze, and other products, as well as used oil. By procuring recycled HHW and requiring contractors that do business in the participating jurisdictions to follow suit, jurisdictions will help to establish a stable market and will encourage others by example. Technologies for commonly recycled HHW, as well as costs, potential limitations, and local factors that may affect implementation, are presented in Appendix D.

As an added service to residents, participating jurisdictions could set up a waste exchange program whereby residents could bring materials that can be reused. San Francisco currently operates such a program, and paint contributes a major percentage of the household hazardous materials collected.

4.6 HANDLING AND DISPOSAL REQUIREMENTS

Waste management methods that will be used in conjunction with HHW collection, recycling, and refuse monitoring have been presented in this section and in Section 2. Hazardous waste must be handled, stored, treated, and disposed of according to various federal, state, and local laws and regulations. Staff operating the load checking program should be properly trained and certified to handle these hazardous materials.

SECTION 5
EDUCATION AND PUBLIC INFORMATION

Public education and information are indispensable to the accomplishment of goals for HHW management that were identified by the participating jurisdictions. An informed and motivated public will result in the reduction of the hazardous materials generated by residents in San Mateo County as residents learn to use safer substitutes for toxic products and to purchase and use hazardous materials in a way that reduces waste. Public education teaches people about the hazards of improper disposal of HHW, notifies San Mateo residents of the county's specific HHW management programs, and encourages a widespread participation in these recycling and collection programs.

To maximize the results and cost savings associated with proper management of HHW, the participating jurisdictions will, to the extent possible, coordinate the development and implementation of public education programs. This approach may require that the jurisdictions enter into specific organizational structures and agreements, which could define the scope of responsibility, authority, funding, and institutional arrangements for the public education programs.

This section identifies education and public information strategies that promote participation in the HHW recycling and collection programs.

5.1 OBJECTIVES

Short-term and medium-term objectives for public education are stated in Section 1.7. Broader objectives for education and public information related to HHW are described below. Specific objectives concerning the programs selected in Section 4 are summarized in Table 5-1. The general objectives of HHW management programs are:

Table 5-1
 Education and Public Information Activities
 for Household Hazardous Waste Programs

Category	Objectives	Task	Date
Publicize HHW Collection Events	Develop public education program for collection program. Publicize information including location, times, acceptable materials, and proper packaging for facility use.	Write and place newspaper ads	Ongoing
		Issue public service announcements (PSAs)	Ongoing
Use HHW Facility as Educational Resource	Distribute educational materials to users of HHW collection events.	Develop and distribute brochure at facility/collection events.	Ongoing through the medium term
		Develop displays and demonstrations on HHW hazards at permanent facilities/collection events.	
Consumer Information	Empower consumers to make wise product choices; teach them how and where to discard household hazardous materials	Design and implement media placement campaign for public awareness of HHW.	Ongoing
		Develop a list of "safe substitutes."	Ongoing
General	Brochure regarding HHW issues	Design brochure that includes all HHW source reduction, collection, and recycling efforts. Integrate efforts with general recycling information.	January 1993

Table 5-1 (cont.)
 Education and Public Information Activities
 for Household Hazardous Waste Programs

Category	Objectives	Task	Date
Multimedia Public Education Campaign	Public Service Announcements (PSAs)	Write and distribute PSAs to local papers, television stations, and local radio.	Ongoing
	Develop and distribute educational video	Investigate the feasibility of hiring an expert to develop/produce a video program or minidocumentary on HHW materials management. Show the program on local cable stations. Distribute video to community groups, libraries, and schools.	November 1992 Semiannually
Education Programs	Implement a K-12 HHW program.	Research existing HHW and recycling educational materials, and adopt a model curriculum for use in all schools. Obtain or print curriculum. Develop field trip program to local HHW collection site and/or special assemblies.	September 1992 School year 1992/1993 Annually

Table 5-1 (cont.)
 Education and Public Information Activities
 for Household Hazardous Waste Programs

Category	Objectives	Task	Date
Education Programs (cont.)		Develop teacher workshops through School Education Task Force (as proposed in SRRE Education and Public Information Component).	June 1993
		Develop HHW presentations for school assemblies.	September 1993
		Investigate coordinating a student internship program with high schools and colleges.	September 1993
Speakers' Bureau	Develop speakers' bureau using volunteers from local colleges, nonprofit environmental organizations, and city/county staff specializing in hazardous materials management.	Develop an informational brochure outlining program and mail to prospective speakers. Promote each speakers' forum through flyers, posted announcements, and PSAs.	December 1993
Technical Assistance	Provide technical assistance to residents and businesses.	Design workshops for residents and businesses. Promote date, time, and place of workshops. Conduct workshops.	September 1993 November 1993 Annually

Table 5-1 (cont.)
 Education and Public Information Activities
 for Household Hazardous Waste Programs

Category	Objectives	Task	Date
Annual Evaluation and Monitoring of Program Effectiveness	Assess pre-awareness of HHW programs through a base year survey. Assess post-awareness of available programs and participation through an annual survey. Alter materials and methods to incorporate results of survey to the degree possible.	Design survey. Develop phone list. Conduct survey. Design survey. Develop phone list. Conduct survey. Analyze information.	July 1993 (annually) August 1993 (annually) November 1993 (annually)

- Reduce the generation of HHW through behavioral change, including the purchase and use of safe substitutes and the improvement of residents' management of household hazardous materials.
 - Reduce or eliminate the improper disposal of HHW.
 - Ensure the maximum efficiency and effectiveness of HHW education programs by combining resources and efforts with other environmental and integrated waste management education programs, such as residential solid waste source reduction and recycling education.
-

Activities related to the achievement of objectives will be aimed at promoting the use of safer substitutes for household hazardous substances, and the development of prudent purchasing habits; these activities will encourage recycling options such as waste exchange and the use of recycled HHW, and will promote HHW recycling and collection programs. Techniques that may be used for HHW education could include advertisements through local media (newspapers, radio, and television), demonstrations and displays at special events, signs in public places (billboards, transit benches, shelters, and bus signs), utility bill inserts, doorhangers, videos, speakers' bureaus, internship programs, newsletters and brochures distributed directly or by mail, school programs and presentations, special events, and workshops. These activities will be integrated with the education programs presented in the Source Reduction and Recycling Element for the participating jurisdictions.

For the above-listed efforts to succeed, HHW education programs must be implemented throughout all of the communities in San Mateo County; these programs will be most effective if they can help to develop proper habits of household hazardous materials use and disposal in the county's younger citizens through school programs in the county. Most of the activities are scheduled for implementation in the short term (1991 through January 1, 1995), and will continue to be implemented in the medium term (1995 through January 1, 2000).

5.2 CURRENT ACTIVITIES

Under the auspices of the county DHS, public education efforts have been undertaken to ensure a high rate of participation in existing collection programs. These efforts include the dissemination of 40,000 informational brochures, displays at area fairs, advertising HHW collection events, and presentations to selected organizations.

5.3 EVALUATION OF PUBLIC EDUCATION PROGRAM ALTERNATIVES

Household hazardous materials and HHW education and public information techniques are described below. Public education programs were evaluated and selected based on whether they would increase public awareness, and whether they had been used successfully in other jurisdictions. The public education and information programs include multijurisdictional efforts to be carried out by a regional entity, as well as public education and information activities that each jurisdiction can implement on its own.

5.3.1 Recycling and Collection Programs as an Educational Resource

HHW collection events and facilities can promote source reduction and educate residents about other HHW management practices. The presence of an HHW collection and recycling facility sends a strong signal to residents about the problem of toxics; program participants have reported a reduction in the use of hazardous materials in response to new awareness. As such, HHW collection facilities can become centers for the dissemination of educational materials on HHW source reduction.

Educational techniques that will be considered for implementation by the jurisdictions include the following:

- An HHW hotline can be developed as a fully staffed telephone and information resource center, where all county residents may call to request information on a wide range of integrated waste management issues, including proper HHW management.
 - Recycling and collection program staff can distribute pamphlets on safe substitutes and alternative ways to perform household tasks without using hazardous materials. Materials for advertising the program can also provide source reduction and recycling information.
-
- A permanent or satellite collection facility can include a small reference library to guide residents in HHW source reduction. A number of educational materials that describe safe substitutes or simple techniques and recipes for safer household cleaners and other products are available. Additional materials appropriate for the library could include Material Safety Data Sheets for solvents, pesticides, and other household hazardous materials. These data sheets can easily be obtained from vendors and manufacturers.
 - Collection events and permanent facilities can include displays and demonstrations on the hazards of certain common household products, and the use of convenient and inexpensive safe substitutes.
 - Field trips to collection events or collection facilities can become part of HHW and environmental awareness programs in schools. The benefits of HHW awareness may not be limited to the students themselves, since children are often excellent conduits of information to their parents. A list of sources of HHW curricula and reference materials is included in Appendix E.

As evidenced by their acceptance of HHW recycling and collection programs, county residents will be especially open to information that can assist them in reducing the amount of HHW generated in the household and, where possible, can increase their participation in HHW programs. The costs of both short-term and medium-term implementation of these programs

would include staff time for administration, editing and production of educational materials, and monitoring and evaluation of the program. Other costs would include fees for production, services of outside contractors (if any), supplies, and reproduction.

5.3.2 K-12 Programs

Many schools have incorporated an HHW program into their curricula, often connected with other environmental programs such as solid waste and recycling education. A variety of curricula have been used across the country for grades K-5 and 6-12 (Appendix E lists available educational resources). In addition, the CIWMB is preparing materials, in English and Spanish, suitable for educating students at the high school level. The state DHS also has a speakers' bureau for school presentations. Field trip programs could transport students to an HHW collection facility or event in the immediate area; and classroom presentations on household hazardous materials management and recycling, safe substitutes and HHW source reduction, and proper HHW disposal could be developed. Interested professional or community theater groups could produce these presentations.

A K-12 curriculum and educational program would be an effective means of contributing to an increased awareness of HHW management problems, and what students and parents might do to address these problems. Costs of implementation would include staff time for coordination with school personnel.

The participating jurisdictions can publicize collection events by sending notices home with schoolchildren for their parents.

5.3.3 Local Media Participation

Individual jurisdictions could propose that local cable access channels show educational video programs or minidocumentaries on HHW management. Jurisdictions could use videos that have been produced by other communities, or could hire a firm to produce a new documentary to better target local needs. A well-recognized member of the community who is involved with

the local cable system could also be encouraged to produce the documentary. In addition to showing this program on television, the documentary could be released as a video to community groups, schools, and other institutions. Copies could be maintained at local libraries, and could be loaned out for use at meetings and special events (a list of available video resources is included in Appendix E).

Use of the local cable system could be expensive with respect to the audience reached. This option should therefore be researched prior to a major commitment of materials and funding. A less expensive alternative would be the production and broadcasting of a radio program.

Local newspapers could be encouraged to print articles regarding household hazardous materials and HHW. The articles could cover a range of specific or general subjects. The participating jurisdictions should work to maintain public education through newspaper articles, press releases, and other efforts; newspaper coverage should focus on collection program scheduling and on seasons when high levels of HHW are generated. Public service announcements via television and radio require relatively little effort, and could be part of an ongoing public education and information program.

Costs for short-term and medium-term implementation of this program would include staff time for the production of announcements, and administration and coordination of participating media outlets.

5.3.4 Consumer Information

Environmental consciousness in California and nationwide has created consumer demand for safe products, and has prompted manufacturers to create merchandise marketed (often misleadingly) as less polluting, "ozone-safe," etc. Legislation has been developed to prevent the false advertisement of goods as environmentally superior, and labeling organizations such as Green Cross and Green Seal have been formed to guide concerned consumers.

To encourage prudent and well-informed purchasing habits, consumer information can be provided through a variety of means, including local advertising, bill inserts, billboards, point-of-purchase fliers, and posters. Information can cover many aspects of HHW, including publicity for permanent and satellite facilities, and the use of safe alternatives to household hazardous materials. The participating jurisdictions can develop an environmental shopper campaign, coordinating these efforts with residents and retailers. Short-term and medium-term costs would result from administration, coordination of participating information outlets, and editing of information that is generated in-house. Costs for production, for the services of outside contractors (if any), for supplies, and for paper and reproduction would also be important.

5.3.5 Newsletter and Brochures

The participating jurisdictions could issue a semiannual newsletter and brochures describing all aspects of HHW source reduction, collection, and recycling efforts in the county. The newsletter and brochures could be distributed to households as well as to retail centers, particularly where hazardous materials are sold. Costs for both the short and medium terms would include administration, editing, paper, and reproduction. Jurisdictions could work with the associations and organizations that distribute newsletters (such as the chamber of commerce) to encourage the announcement of collection events in newsletters.

5.3.6 Internship Program

An internship program coordinated with local high schools and community colleges can provide low-cost staffing for many public education activities, such as the HHW hotline, school presentations, or informational booths. Costs for implementation would be limited to administration, intern training, and ongoing communication.

5.3.7 Block Captain Program

Block captain programs facilitate neighborhood participation in environmental activities. The block captain is a volunteer who performs services such as informing new neighbors about available HHW management options, and encouraging neighbors to improve personal and environmental safety through careful handling of household hazardous materials. The block captain may combine HHW management and recycling efforts with access to HHW information and materials management. Block captain programs require significant coordination, and may be implemented only after other public education programs have been tried or have resulted in low participation. Short-term and medium-term implementation costs will be limited to those for administration, supplies, and reproduction associated with training and ongoing communication.

5.3.8 Speakers' Bureau

A speakers' bureau that specializes in waste-related issues, including HHW and solid waste management, can be established to make presentations to community organizations, neighborhood groups, and schools. Volunteers for this program can be selected from local colleges (especially environmental engineering classes), nonprofit environmental organizations, and city or county staff who are knowledgeable in hazardous materials and waste-related issues.

Implementation costs for both the short and medium terms include those for administration, supplies, and reproduction associated with training and ongoing communication.

5.3.9 Displays

Displays can be set up at fairs and other community events to educate the public concerning household hazardous materials and HHW. Displays may include examples of household hazardous materials and safe substitutes, and photographs and posters that demonstrate the serious impacts of improper use and disposal of household hazardous materials. Displays can be used to disseminate written information on HHW, and staff can be provided to answer

questions directly. Costs for implementation in the short and medium terms include administration, supplies, and production. Displays could be staffed by volunteers or interns.

5.3.10 Technical Assistance

Technical assistance to county residents can be provided in a variety of ways, including the design and conduct of workshops, seminars, and public demonstrations that focus on safe use, recycling, and disposal of household hazardous materials and wastes, potentially in conjunction with other environmental topics. Costs for implementation in the short and medium terms include administration, coordination, and training of technical assistance personnel, as well as the production of informational literature. County DHS staff could also provide technical assistance.

5.4 SELECTION OF PROGRAM ALTERNATIVES

Public education and information programs were selected for their ability to generate participation in HHW source reduction, recycling, and collection programs. The following programs will be implemented by the participating jurisdictions during the short-term planning period and will continue during the medium-term planning period:

- K-12 programs
- Consumer information (newsletter and brochures)
- Publication of the HHW collection program
- Utilization of the HHW collection program as an educational resource
- Displays
- Local media participation
- Technical assistance.

Specific educational objectives, programs, costs, and an implementation schedule are outlined in Table 5-1.

5.5 PROGRAM IMPLEMENTATION

The programs shown in Table 5-1 will be implemented at the regional and local levels. Each participating jurisdiction will participate in these efforts to ensure that the programs are accessible to residents. Each participating jurisdiction will, under the guidance of the county DHS, accomplish the following tasks to help implement the multijurisdictional programs:

-
- Participate as necessary in the development of education and promotion programs
 - Provide information to develop materials specific to each participating jurisdiction
 - Assist in the development and distribution of educational materials.

Carrying out a comprehensive HHW education program includes the determination of tasks for the short- and medium-term planning periods. It also requires the identification of agencies or departments to manage public information and education efforts, identifying target audiences (in particular, persons who may be difficult to reach or who have a relatively lower level of environmental awareness), and evaluating programs and their appropriateness for the needs of each jurisdiction. For cost of efficiency, HHWE education and public education programs will be implemented together with SRRE education and public information programs (e.g., administration, publications, curricula, internship programs) whenever possible. Program funding, including the identification of public and private implementation costs and revenue sources, is presented in Section 6.

SECTION 6

FUNDING

The success of the HHW programs depends on adequate funding. Regulations under AB 2707 require that the HHWE demonstrate that there is sufficient funding and allocation of resources for HHW program planning, development, and implementation. These requirements include:

- Providing cost estimates for each program scheduled for implementation in the short-term planning period (1991 - 1995)
- Identifying revenue sources sufficient to support programs adopted under the HHWE
- Identifying sources of contingency funding to support HHW programs should the preferred funding sources prove insufficient.

Ensuring adequate funds may require the expansion of existing funding sources; for example, by increasing the rates paid for garbage collection, or by increasing local tipping fees. The participating jurisdictions may also be required to explore new ways to fund future programs and facilities, such as parcel fees, bonds, and grants.

This section provides information on funding for HHW programs. Cost estimates for planning and development, implementation, and evaluation and monitoring of the selected HHW programs are presented, and revenue sources sufficient to support these programs are documented as well.

6.1 ESTIMATED PROGRAM COSTS

Tables 6-1 and 6-2 show the estimated HHW program costs and the selected primary and contingency revenue sources for the short-term planning period (a breakdown of costs is presented in Appendix F).

Table 6-1
Estimated Costs and Required Revenues for
Multijurisdictional HHW Programs^a

Program ^d	Capital Expenditure ^b	Year of Implementation	Average Annual Costs ^c 1991 - 1995	Revenue Source:
Periodic collection events ^e	--	Existing	272,558	Tipping fees ^f
Vendor collection program ^e	--	Existing	9,720	Tipping fees
Permanent collection facility	522,480	1993	543,674	Tipping fees
Satellite and solid waste facility collection program	24,510	1993	124,818	Tipping fees
Mobile collection program ^e	--	1994	266,040	Tipping fees
Education and public information programs ^g	--	1992	134,000	Tipping fees

a Capital and annual costs are based on average costs for similar programs implemented in other jurisdictions throughout the country and actual costs will therefore vary depending on factors such as the scope of the program, HHW generation rates, program participation rates, ratio of wastes recycled versus disposed through the program, costs of disposal and recycling methods used, and type of facility constructed and equipment used. Cost breakdowns and the assumptions used to generate these HHW program cost estimates are included in Appendix F. The estimates were developed as if each program existed independently; however, since most of these programs could be operating simultaneously, some of the required facilities and equipment could be shared by multiple programs. Program costs could also be reduced with donated equipment, supplies, and labor.

b Capital costs include design, permitting (if required), and equipment and facility construction costs.

c Annual costs include program development and administration, monitoring and evaluation, labor, training, overhead (insurance, etc.), materials and supplies, services, utilities, fuel, materials transportation, recycling and disposal, and amortized capital (20 years) and equipment costs (replacement every seven years) where applicable.

d These programs are best developed and implemented on a multijurisdictional level; program costs would be allocated to participating jurisdictions.

e Cost estimates for periodic, vendor, and mobile HHW collection programs assume services will be provided by contractors: therefore, there will be no capital expenditures incurred by jurisdictions to operate these programs. Periodic collection event costs are based on data provided by the county DHS for 33 collection events held in fiscal year 1990-1991.

f It is assumed that tipping fees will be the preferred funding mechanism used by the county to fund multijurisdictional programs; the amount collected from each jurisdiction will therefore be proportional to the amount of solid waste disposed of.

g Includes full-time multijurisdictional HHW education coordinator (\$45,000/yr + 20% benefits) and outside services (e.g., printing; photography; video production; and TV, newspaper, and yellow page advertising).

Table 6-2
Funding Sources for Multijurisdictional HHW Programs

Program	Funding Source*	Contingency Funding Source
Periodic collection events for general HHW	TF	ADJ
Solid waste facility collection	CR	ADJ
Vendor collection	TF	ADJ
Permanent central and satellite facility	TF	ADJ
Refuse monitoring and load checking	CR	ADJ
Mobile collection	TF	ADJ
Education and public information	TF	ADJ

* Preferred funding source based on information obtained from county DPW representative.

Key:

- TF - Tipping fee
- ADJ - Fee will be adjusted to provide adequate funding
- CR - Increased collection rate

The county DHS currently administers a regional HHW collection program. The capital and annual operating program costs presented for the programs will be funded primarily through tipping fees assessed by the county; the amount collected from each jurisdiction will therefore be proportional to the amount of solid wastes disposed of. Costs for a percentage of staff time required by the jurisdictions are included in the annual cost. Unlike solid waste recycling programs, no significant revenue from the sale of recycled HHW exists to offset recycling program costs.

6.2 FUNDING SOURCES FOR NEW PROGRAMS

Multijurisdictional HHW programs primarily will be funded through the collection of tipping fees; however, some of the costs (such as those for monitoring and evaluation) can be

appropriately offset through local funding mechanisms. This section will identify both the primary and contingency funding sources available for the new programs.

6.2.1 Primary Revenue Sources for HHW Programs

Tipping Fees

The primary funding source for HHW management programs in San Mateo County is the tipping fee assessed on behalf of the county by the operator of Ox Mountain Landfill. Increased funding of HHW programs could be accomplished by increasing the present tipping fee surcharge, or by a collection rate increase that is channeled directly into a dedicated fund.

The tipping fee has the advantage of applying to all waste generators in proportion to the amount of waste disposed of. Tipping fees collected from commercial haulers are, of course, passed to customers through collection rates; self-haulers pay at the gate. A possible disadvantage of tipping fees is that higher fees may result in increased illegal disposal. Differential tipping fees based on toxicity are not recommended, because higher fees would likely encourage the illegal disposal of the more toxic wastes.

General Fund

Each of the participating jurisdictions currently uses some local money to pay for staff time spent on the investigation of waste management issues. Some of this cost is covered by franchise fee contributions, where applicable; however, property taxes and other sources of General Fund revenue make up any remaining balance.

Collection Rates

Currently, residents are assessed refuse collection rates, and are billed by their respective haulers. These rates could be increased to offset the cost of HHW program costs.

6.2.2 Contingency Funding Sources

In the event of a revenue shortfall, it is likely that the multijurisdictional entity will increase the amounts generated from the existing funding sources, rather than switch to a different funding mechanism. However, if additional funding sources are desired or are found necessary, the following mechanisms may be considered.

Advance Disposal Fees

This funding mechanism is still in the conceptual stage, and is under consideration by the state. Advance disposal fees generate revenues by adding a surcharge to the price of products at either the wholesale or retail level. This surcharge could be applied to HHW products to generate funds to cover the costs of proper disposal and recycling of HHW; it would be administratively burdensome for the multijurisdictional entity, and even more difficult at the local level. The advantages are that the surcharge acts as a built-in source reduction incentive, and is a completely user-based funding mechanism.

Parcel Fee

This method is similar to the collection of revenues by special districts, which provide services such as sewage treatment and water treatment and supply. For hazardous waste services, property owners could be assessed a fee that is proportional to waste generation as a function of their land use. The parcel fee is a mechanism that gives a population/geographical base to a multijurisdictional entity. The method is used by Kern County, which owns and operates 14 landfills, but it is administratively burdensome, and does not create an incentive for individual waste reduction.

Bond Issues

San Mateo County or any of the participating jurisdictions may use general obligation bonds, revenue bonds, or other forms of public debt to provide capital for the facilities and equipment necessary as part of full participation in HHW programs.

Grant Program

Two types of grants are offered by the CIWMB to cities and local agencies that have implemented HHW management programs in the past: nondiscretionary and discretionary grants. Nondiscretionary grants are available to jurisdictions that have implemented HHW programs in the fiscal year previous to the grant application cycle. Discretionary grants are funds allocated to jurisdictions that have just begun HHW programs. San Mateo County has been successful in obtaining grant monies from the CIWMB.

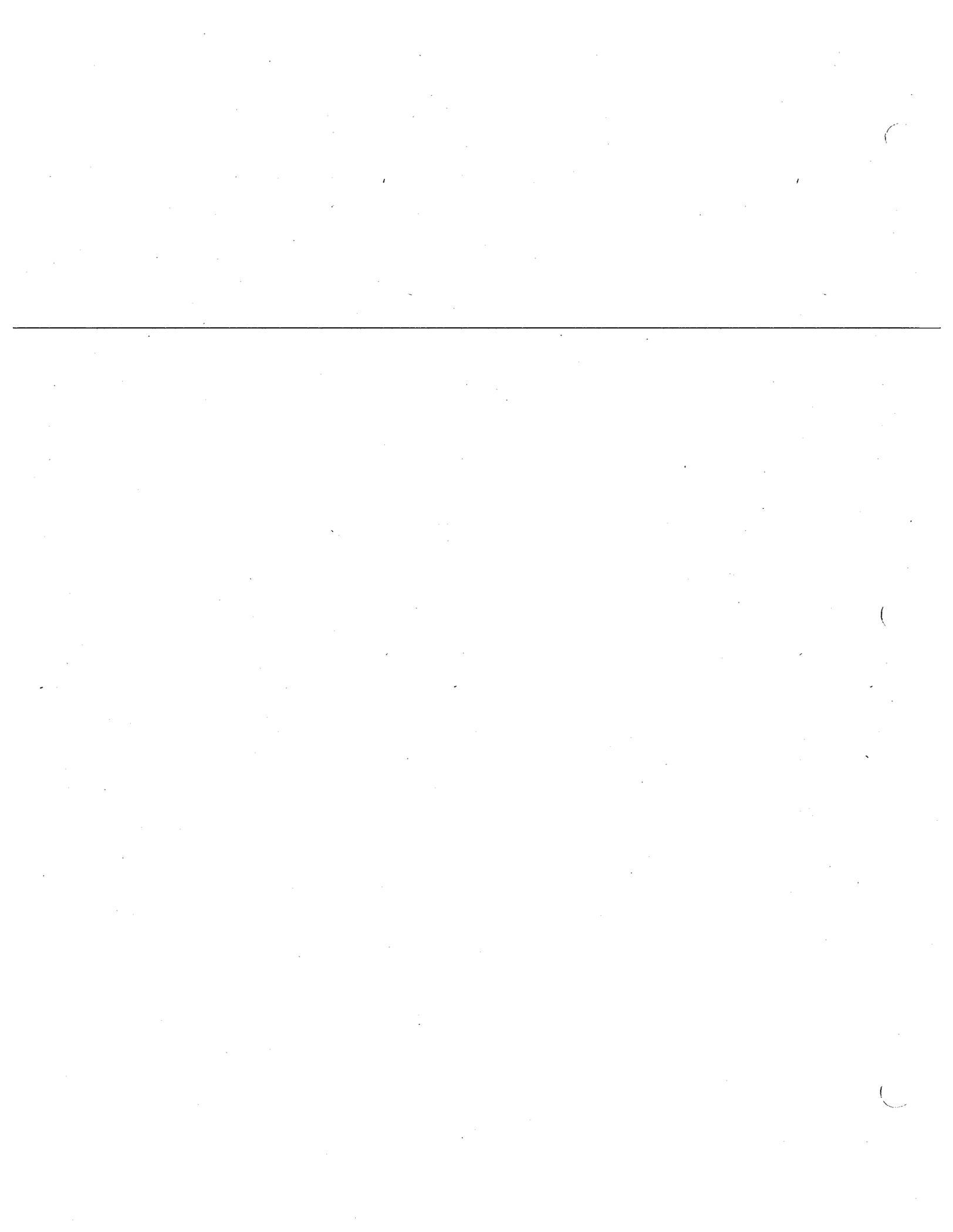
New Development Fee

New development in any of the participating jurisdictions could be assessed a fee to help supply capital for HHW collection facilities and equipment made necessary by the new development. A tiered fee would distinguish among different types of development and their expected impacts on the HHW waste stream.

6.3 FUNDING PROGRAM FOR THE PARTICIPATING JURISDICTIONS

Based on HHW program costs, existing funding sources, and conversations with city and county staff, a HHW funding program was developed through the short-term planning period. As previously discussed, if shortfalls develop, the most appropriate contingency mechanism involves the use of rate or tipping fees established by the prospective multijurisdictional entity to increase revenues. As an alternative, the contingency funding sources listed above may be used.

The tipping fee surcharge (levied at the landfill, transfer stations, or a possible materials recovery facility) is the primary mechanism to be considered for the financing of multijurisdictional programs. Individual jurisdictions will depend on franchise fees, if applicable, or general fund monies to fund the staff necessary to monitor collection programs and to assist in the implementation of public education programs.



SECTION 7
PROGRAM IMPLEMENTATION AND SCHEDULING

This section describes program implementation and scheduling for the HHW recycling, collection, and refuse monitoring programs selected by the participating jurisdictions. These programs are summarized as follows:

- Continuation of a collection events program for both recyclable and nonrecyclable HHW
- Development of a permanent HHW collection facility with satellite facilities at selected locations
- Expansion of the vendor collection activities already occurring in San Mateo County, to include more vendors and types of recyclable HHW
- Development of markets and end-uses to expand the range of HHW currently being recycled and reused
- Augmentation of refuse monitoring at landfills and transfer stations to prevent illegal disposal of hazardous wastes
- Public education and information as presented in Section 5.

To carry out the selected HHW management programs successfully, the participating jurisdictions have:

- Identified parties responsible for implementing local programs, and programs that will be operated through multijurisdictional coordination

- Identified the tasks necessary to establish new programs or to expand existing ones
- Developed a schedule that addresses each of the tasks
- Evaluated program costs and available revenues.

Section 7 presents these facets of HHW program development. Several other aspects of HHW program implementation, such as funding and public education and information programs, are described in greater detail elsewhere in this document.

7.1 RESPONSIBLE ENTITIES

This section describes the entities responsible for coordinating and implementing the HHW program.

Programs suited to local implementation, including those that meet specific local needs (such as curbside collection of recyclable HHW, or the siting of a local HHW collection center), are best implemented by individual cities. Where possible, cooperation among cities and the county is intended for HHW programs in San Mateo County.

7.1.1 Parties Responsible for Multijurisdictional Programs

Large-scale or capital-intensive programs, such as the establishment of a permanent HHW storage facility, will be most effective if they are operated at the multijurisdictional level. Other multijurisdictional programs include public education and periodic HHW events.

At the present time, multijurisdictional programs are administered by the county DHS. In the future, this multijurisdictional program development will be accomplished through a single entity agreed to by participating jurisdictions. Typically, an agreement would specify institutional

arrangements, including responsibilities, authorities, and funding. The multijurisdictional structure for San Mateo County has not been determined at this time.

Parties Responsible for Local Programs

In individual jurisdictions, the entity responsible for managing HHW programs is designated at the local level. Table 7-1 shows responsible governmental entities at the local level. The private sector will continue to be involved in San Mateo County's HHW programs, supplying trained personnel and equipment for events and facilities.

7.2 REQUIRED TASKS, PROGRAM SCHEDULING, AND FUNDING

Specific tasks for implementing each HHW recycling, collection, and monitoring program are described in Table 7-2, which includes an implementation schedule and the information necessary to establish a work plan, allocate hours, and obtain funding. The parties responsible for each task are also included. Calculations for determining implementation costs, along with a discussion of the process used to identify funding sources and the approach utilized in implementing the programs, are presented in Section 6.

7.2.1 Short-Term Implementation Tasks

In the short term, the 15 participating jurisdictions will focus on expanding vendor collection activities to include more vendors and a wider range of recyclable HHW, and on working with the county to expand the number of collection day events. Individual cities will participate in multijurisdictional efforts to site a permanent collection facility, and will develop public education and information programs. Tasks to be accomplished in the short term are:

Table 7-1
Parties Responsible for Ensuring Implementation of HHW Programs
in the Participating Jurisdictions

Jurisdiction	Responsible Party
Atherton	City Manager
Belmont	Director of Public Works
Burlingame	Finance Director
Colma	Town Manager
Daly City	City Manager
East Palo Alto	Director of Public Works
Foster City	City Manager
Half Moon Bay	Director of Public Works
Hillsborough	City Engineer
Menlo Park	City Engineer
Portola Valley	Chief Administrative Officer
Redwood City	City Manager
San Carlos	Planning Director
San Mateo (City)	Director of Public Works
Woodside	Planning Director
Unincorporated Areas	County Director of Environmental Health Services Division

Table 7-2
HHW Program Implementation in the Short Term

Objective	Task	Responsible Party	Date
Support recycling of HHW	Expand vendor collection programs <i>source table 3/95</i>	Individual jurisdictions/co. DHS	September 1992
Increase participation in existing programs	Continue support and monitoring of curbside oil collection <i>- expanded</i>	Individual jurisdictions/co. DHS	Ongoing
Develop new programs to manage HHW	Continue to schedule collection events	Individual jurisdictions/co. DHS	Ongoing
	Expand public information and education related to collection events	Individual jurisdictions/co. DHS	Ongoing
	Preliminary evaluation related to siting permanent HHW collection and storage facility	Cooperative agreement between jurisdiction(s) and county DHS	September 1992
	Preliminary evaluation related to siting satellite HHW collection and storage facilities	Individual jurisdictions/co. DHS	March 1993
	Design permit, and construct a permanent HHW collection and storage facility. Begin phasing out one-day collection events.	Cooperative agreement between jurisdictions and county DHS	June 1993
	Design, permit, and construct satellite HHW collection and storage facilities. Continue phasing out one-day collection events.	Individual jurisdictions/co. DHS	October 1993

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- Expand vendor collection activities to include additional participating vendors and a wider range of recyclable wastes.
- Expand the number of collection day events and develop educational and promotional materials with the objective of increasing participation in HHW programs. Collection day events will be gradually phased out as the control and satellite permanent HHW collection and storage facilities are developed.
- Participate in efforts to develop a centralized permanent facility for storing and recycling wastes from local collection programs.
- Ensure that HHW workers are adequately trained, particularly in the safe management of hazardous wastes.
- Set up and annually implement the monitoring and evaluation program to monitor program effectiveness.

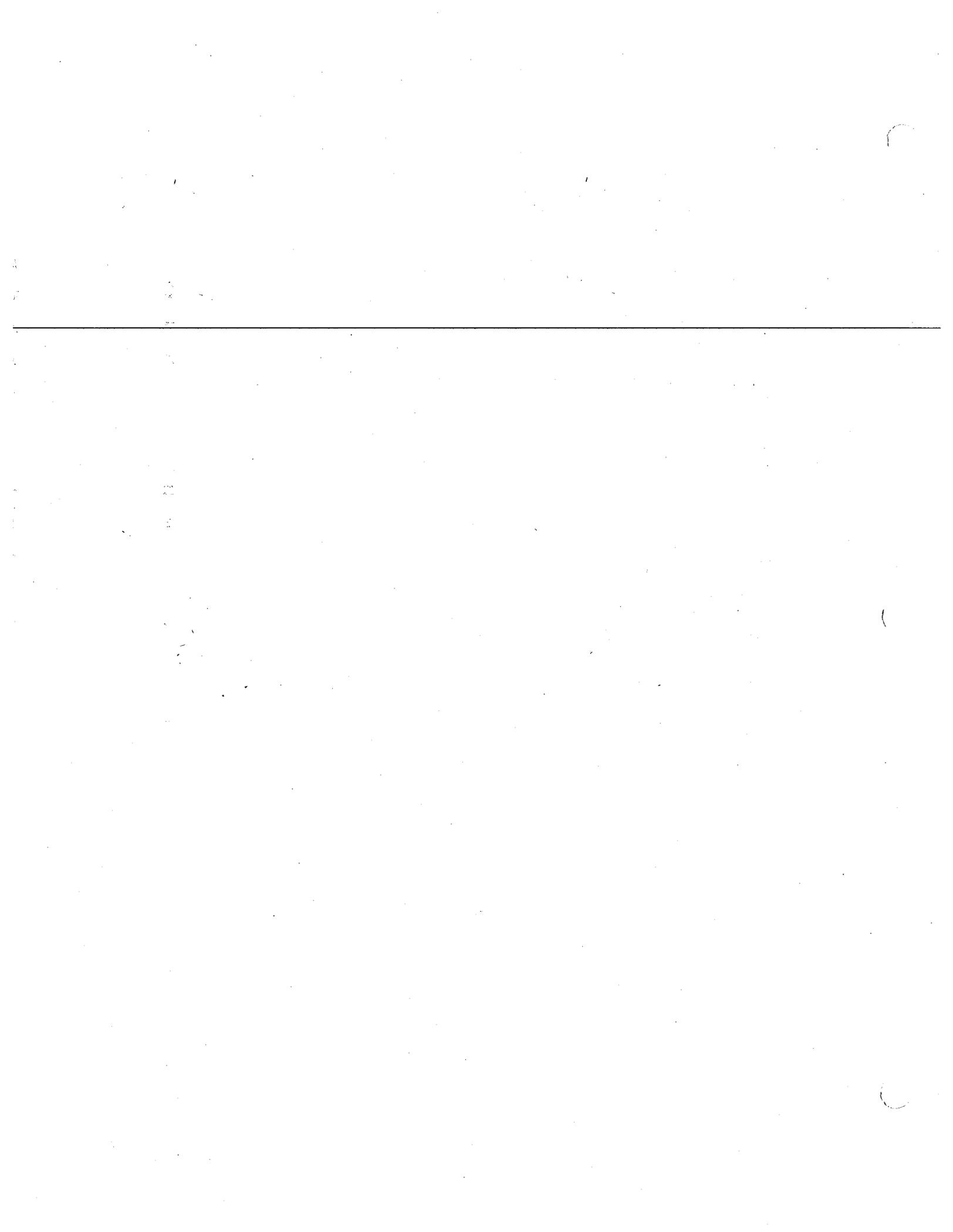
7.2.2 Medium-Term Implementation Tasks

Medium-term implementation tasks are designed to enhance and modify actions taken during the short term. During the medium term, participating jurisdictions will continue to encourage increased participation in, and further refinement of, the existing programs. In addition, based on information obtained from monitoring and evaluation of short-term programs and facilities, new programs and facilities will be developed to continue to meet the needs of the participating jurisdictions.

Tasks designated for implementation during the medium term are:

- Implement measures to keep abreast of current HHW recycling technology and trends in the secondary materials market.

- Continue to monitor and improve programs and facilities established during the short term.
 - Plan and implement new programs and facilities that are determined to be appropriate for meeting the jurisdiction's needs, with the purposes of eliminating improper hazardous waste disposal and managing as much waste as possible through source reduction or recycling.
-



SECTION 8 MONITORING AND EVALUATION

Monitoring and evaluation of HHW programs are critical to the planning, evolution, and improvement of HHW management. The programs identified in the HHWE for implementation by the participating jurisdictions of San Mateo County will require periodic review to ensure that the county's objectives are achieved. Section 18751.6 of the AB 2707 regulations outlines the requirements for monitoring and evaluation.

This section describes the methods used to quantify and monitor the success of the HHW program; it also presents the criteria for evaluating program effectiveness; the entities responsible for program monitoring, evaluation, and reporting; funding requirements; and contingency measures to be implemented if program goals are not fulfilled.

The monitoring and evaluation of HHW education programs are discussed in Section 5.

8.1 PROGRAM MONITORING AND EVALUATION PROCESS

The monitoring and evaluation process for HHW programs measures the amount of HHW reduced at the source or diverted to proper disposal through recycling, collection, and refuse monitoring; the process evaluates the effectiveness of the programs, and offers contingency steps for improving program effectiveness. Figure 8-1 shows the monitoring and evaluation process for the recycling, collection, and refuse monitoring programs; evaluation activities for HHW public education are presented in Section 5.



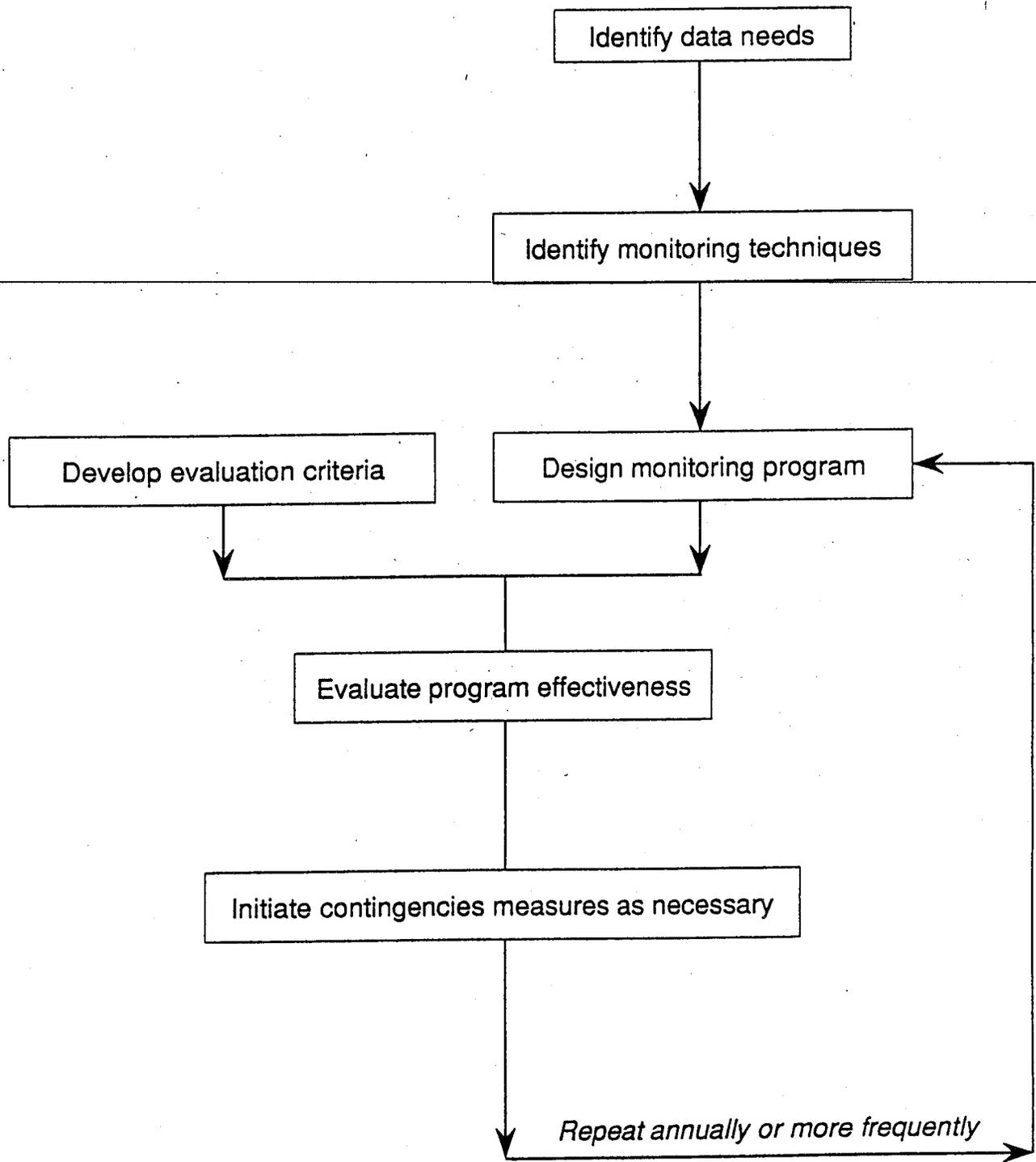


Figure 8-1
Monitoring and Evaluation Process for
Household Hazardous Waste Programs in the Participating Jurisdictions

8.2 DATA NEEDS

HHW program monitoring first requires the identification of sources and types of data that can be used to evaluate HHW programs. The HHW programs selected by the jurisdictions focus on significantly reducing or eliminating improper disposal of HHW, and on ensuring its proper management and disposal through recycling, collection, and refuse monitoring. This section describes program monitoring techniques that will yield the best data for measuring the success of HHW programs both quantitatively and qualitatively.

8.2.1 Monitoring Techniques

Monitoring techniques can include written records, written surveys and targeted written surveys, telephone surveys, waste sorts and targeted waste sorts, and required reporting for recycling programs sponsored through grants and loans.

The monitoring techniques target data that are obtainable and cost-effective to collect. The specific monitoring activities selected to assess HHW recycling, collection, and refuse monitoring programs fall into two categories: recordkeeping and targeted surveys. These activities are described below.

Recordkeeping

- Inventories will be conducted of wastes collected at one-day or two-day events, the permanent collection facility (when sited), and load checking programs. Information will include waste types and amounts collected, types and quantities of recycled materials, form of disposal, and participation rates. Reports will be compiled biannually.
- Vendors participating in HHW collection will be asked to provide each of the participating jurisdictions with quarterly reports on the types and amounts of waste collected.

Targeted Surveys

Attendees at current collection day events and users of the proposed HHW permanent center (when sited) will complete surveys that will be analyzed annually. The survey provides such information as participation by jurisdiction, efficiency of public information, previous disposal methods, and general comments and concerns for program improvement.

As required by AB 939, the jurisdictions will participate in a waste composition study in 1995. This study will help determine overall effectiveness of the HHW programs by comparing 1990 HHW disposal data with 1995 disposal data.

8.3 EVALUATING HHW PROGRAM EFFECTIVENESS

This section presents an approach to HHW program evaluation that meets the requirements of Section 18751.6 of the AB 2707 regulations to ensure effective implementation of HHW programs and to support their improvement. In addition, this approach supports the design and implementation of selected HHW programs, and makes effective use of data collection techniques that are most appropriate to the needs of the participating jurisdictions. Elements of HHW program evaluation include:

- Establishing criteria for evaluating program effectiveness
- Identifying parties responsible for program monitoring, evaluation, and reporting
- Identifying contingency measures to be carried out if HHW programs fail to meet the program objectives.

8.3.1 Criteria for Evaluating Program Effectiveness

Program effectiveness can be evaluated on the basis of quantitative measures, such as the program's ability to divert HHW from improper disposal, and qualitative measures, such as the availability of services to residents. A specific set of criteria, applied to each HHW program activity, will be used to measure program effectiveness and to identify areas where ~~improvements are required. The jurisdictions will consider contingency measures for~~ improvement of HHW management programs that fail to meet these criteria. Section 8.3.3 describes those contingency measures.

The criteria for assessing HHW recycling, collection, and refuse monitoring programs are described below (criteria for HHW education programs are presented in Section 5).

1. How much HHW generated by San Mateo County residents was safely recycled, collected, treated, and disposed of through HHW programs?
2. Did the responsible entities execute the tasks required? (Responsible entities are described in Section 8.3.2).
3. Were the tasks implemented on schedule? (Task timing is outlined in Section 7).
4. Did targeted sectors participate in the anticipated manner? (The targeted sectors are households and small-quantity generators).
5. Were all recyclable materials successfully marketed or used? (Anticipated markets/end-users are described in Section 2).
6. Were all activities executed in an environmentally acceptable and approved manner? Do the HHW program activities meet all local, state, and federal regulations?

8.3.2 Parties Responsible for Program Monitoring

The local implementing agencies identified in Section 7 will be responsible for monitoring and evaluation of locally implemented programs. For programs that warrant a multijurisdictional approach, such as the proposed permanent collection and storage facility, a designated lead agency will carry out the monitoring and evaluation.

8.3.3 Contingency Measures

The monitoring and evaluation process will identify which programs are, and which are not, meeting their goals; it will also identify areas that can be improved beyond the established goals. Contingency measures to improve HHW recycling, collection, and refuse monitoring programs in San Mateo County are described below.

1. **Were the anticipated levels of HHW safely collected, recycled, treated, and disposed of?** HHW collection program records, survey data on HHW source reduction (e.g., use of safer substitutes), and refuse monitoring program records may indicate a shortfall in HHW diversion that is due to programmatic problems. If the HHW objectives are not met, the following actions will be considered:

- Review the HHW collection program and identify potential areas of improvement (such as increasing the hours or frequency of operation).
- Study the possibility of adding collection program options to increase program participation, such as curbside and door-to-door collecting. Additional programs may be designed to target specific wastes, such as recyclable HHW, or specific generators, such as apartment dwellers.
- Review the public education program efforts and increase the level of information provided by increasing publicity (see Section 5).

- Develop ordinances or legislation to enforce proper HHW management.

2. **Did responsible entities execute required tasks?** Program analysis may indicate that one or more responsible agencies failed to carry out assigned program tasks. Contingency measures to correct this situation include:

-
- ~~Reevaluating the adequacy of HHW program staffing, including the number of assigned employees, job descriptions, and assignments.~~

- Examining coordination among various agencies and making improvements through program restructuring and clarification of roles and authority. In particular, this effort may include improving coordination between the HHW and recycling programs to share resources and technical expertise.

- Analyzing and improving program funding in terms of sufficiency and efficient use of funds.

3. **Were tasks implemented on schedule?** If program monitoring demonstrates delays in the completion of one or more tasks, the following actions will be considered:

- Reexamine the schedule and, if needed, make adjustments to reflect more realistic time frames. Where possible, scheduled changes will be designed to meet HHW program objectives by the end of the applicable planning period.

- Identify any need for changes in staffing, job descriptions, facilities, or other important program factors. Changes and corrections will be geared to minimizing schedule disruption.

- Adjust the schedule. Changes that impact timely meeting of diversion goals will be considered only if all other feasible means of program improvement or expansion are

exhausted. Any schedule changes will be discussed in the HHW program reports, and plan revisions will be presented to the CIWMB.

4. **Did households participate in an anticipated manner?** If surveys, waste sorting, or other studies or indicators demonstrate that residents failed to participate adequately or as anticipated, the following actions will be considered:

-
- Reevaluate program activities to determine the reasons for insufficient program participation.
 - Target specific neighborhoods or residence types characterized by low participation, adjust collection programs (such as operating hours or services provided), and enhance education efforts to improve participation.
 - Provide additional training to current HHW program staff.

5. **Were recovered materials successfully marketed or used?** If any of the participating jurisdictions has difficulty finding sufficient markets or end-users for recyclable hazardous materials, the following actions will be considered:

- Perform a market survey to determine constraints to purchasing or using recycled HHW, and identify any market or end-use problems, such as the lack of awareness of product availability and uses, distribution methods that may be inconvenient to customers, inadequate product quality, or need to develop a broader product line.
- Explore alternative markets and end-users, including expanded procurement and use of recovered products.
- Investigate marketing and coordination with other jurisdictions to improve salability of recycled HHW.

6. **Were all activities executed in an environmentally sound manner?** If the activities of the HHW program are not executed in an environmentally acceptable manner, the following actions will be considered:

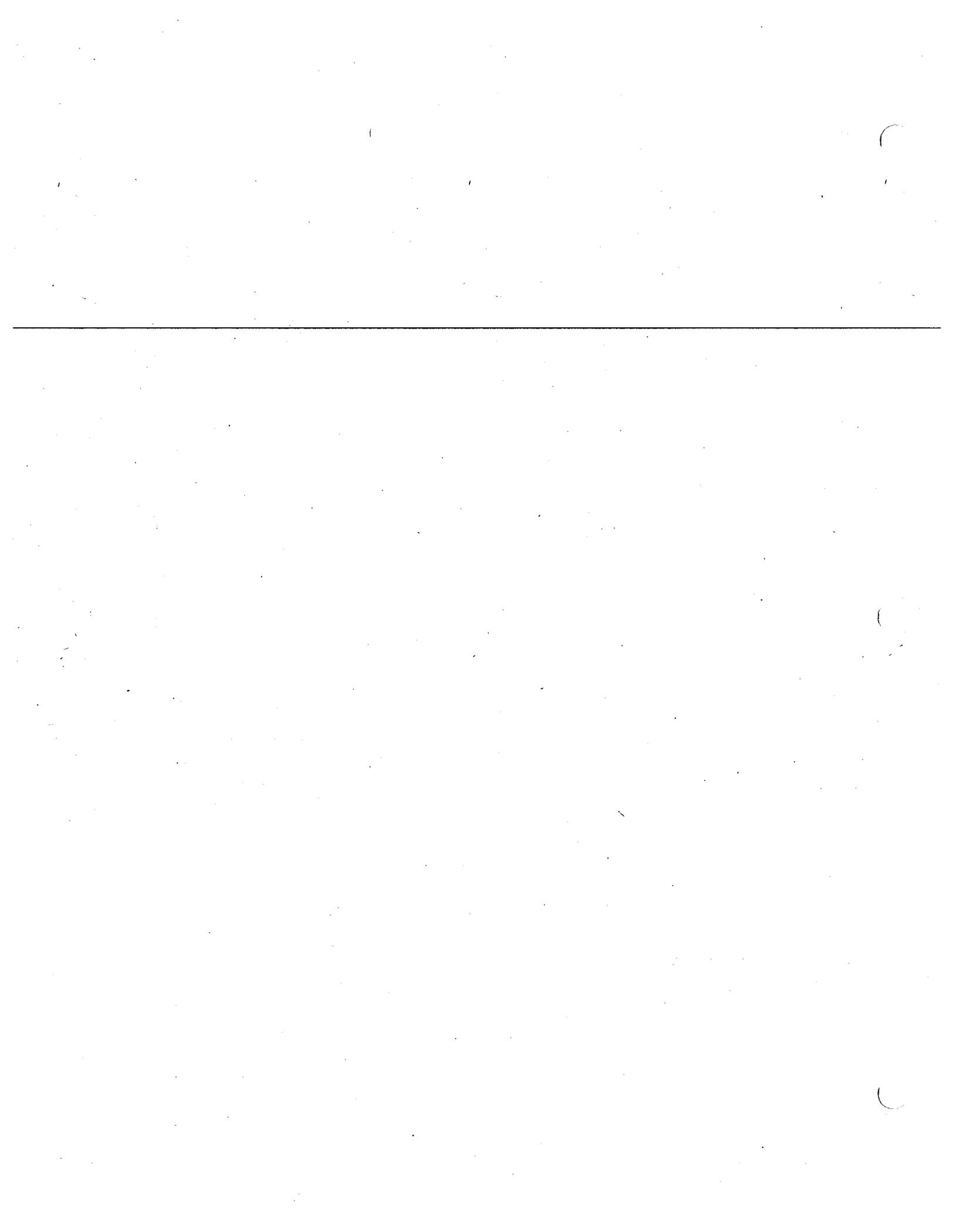
- Identify problem areas; for example, examine collection site operations and make necessary corrections; monitor private-sector operations that provide services such as HHW handling and recycling; and, if necessary, find alternate providers.
- Consult with the local and regional regulatory agencies, CIWMB, and state DHS to establish correct procedures.
- Correct problems to meet local, state, and federal requirements.

8.4 FUNDING REQUIREMENTS FOR MONITORING AND EVALUATION

The funding requirements for the annual monitoring and evaluation program are shown in Table 7-1. These include adequate staff time for collecting data, for conducting periodic surveys to determine program effectiveness and public participation rates, and for preparing written reports that evaluate the progress of HHW programs. Recordkeeping will be carried out either by local implementing agencies (local programs) or by the lead agency program staff. The annual evaluation for the local programs will be carried out by the same entities. Annual funding for staff time will be required from the HHW program operations budget to accomplish both recordkeeping and evaluation.

APPENDIX A

**~~CRITERIA FOR EVALUATING HOUSEHOLD~~
HAZARDOUS WASTE MANAGEMENT ALTERNATIVES
FOR SAN MATEO COUNTY JURISDICTIONS**



APPENDIX A
CRITERIA FOR EVALUATING HOUSEHOLD HAZARDOUS WASTE
MANAGEMENT ALTERNATIVES FOR SAN MATEO COUNTY JURISDICTIONS

Technical Criteria

1. **Minimization of Improper HHW Disposal: Effectiveness in reducing the amount of HHW materials that are improperly disposed. Weighting Factor: 29 points**
-

Low: Alternative has generally low effectiveness in reducing the amount of HHW that is improperly disposed of.

Medium: Alternative has relatively moderate potential for promoting proper HHW management.

High: Alternative has the highest potential to promote source reduction and proper management of HHW, and reduce improper disposal.

2. **Hazards: The extent to which the alternative minimizes environmental impacts or hazards to workers and the general public, including noise, air emissions, leachate, odors, vectors, and visual aesthetics. Also considers broader environmental impacts (e.g., impact on energy or natural resources consumption). Weighting Factor: 18 points**

Low: The option has environmental impacts or hazards that are not completely understood, or has a history of chronic environmental nuisance effects on the community. Requires significant energy or natural resources use.

Medium: The option has environmental impacts or hazards that are known and controllable; some nuisance effects are evident. May require relatively moderate energy/natural resources use.

High: There are few or no instances of environmental violations or hazards; little or no nuisance effects. Pollutants can be adequately contained. Requires little or no energy/natural resources use.

3. Facility/Program Requirements: Extent to which the alternative can be built on successful programs and activities already established in the community or at waste management facilities. Weighting Factor: 12 points
-

Low: The alternative will require the development of major new facilities or programs in the community.

Medium: The alternative will require some new capacity development for an existing program or facility.

High: The alternative can be easily integrated into existing facilities or programs without large alterations.

4. Cost Effectiveness: Extent to which the alternative minimizes capital or first-year expenditures. Weighting Factor: 22 points

Low: Capital cost is among the highest for the alternative considered.

Medium: Capital cost is between the highest and lowest alternative.

High: Capital cost is among the lowest for the alternative considered.

Policy and Institutional Criteria

5. Adaptability to Changing Economic, Technological, and Social Conditions: this weighs the extent to which the alternative can adapt to changing economic climates, technological advancements, and increasing and shifting populations. Weighting factor: 10 points.

Low: The alternative is not readily adaptable either because of operational limitations, economic considerations, or lack of generator involvement in diversion.

Medium: The alternative is adaptable to changes in technology and the economic and social environment, but may require significant program alteration.

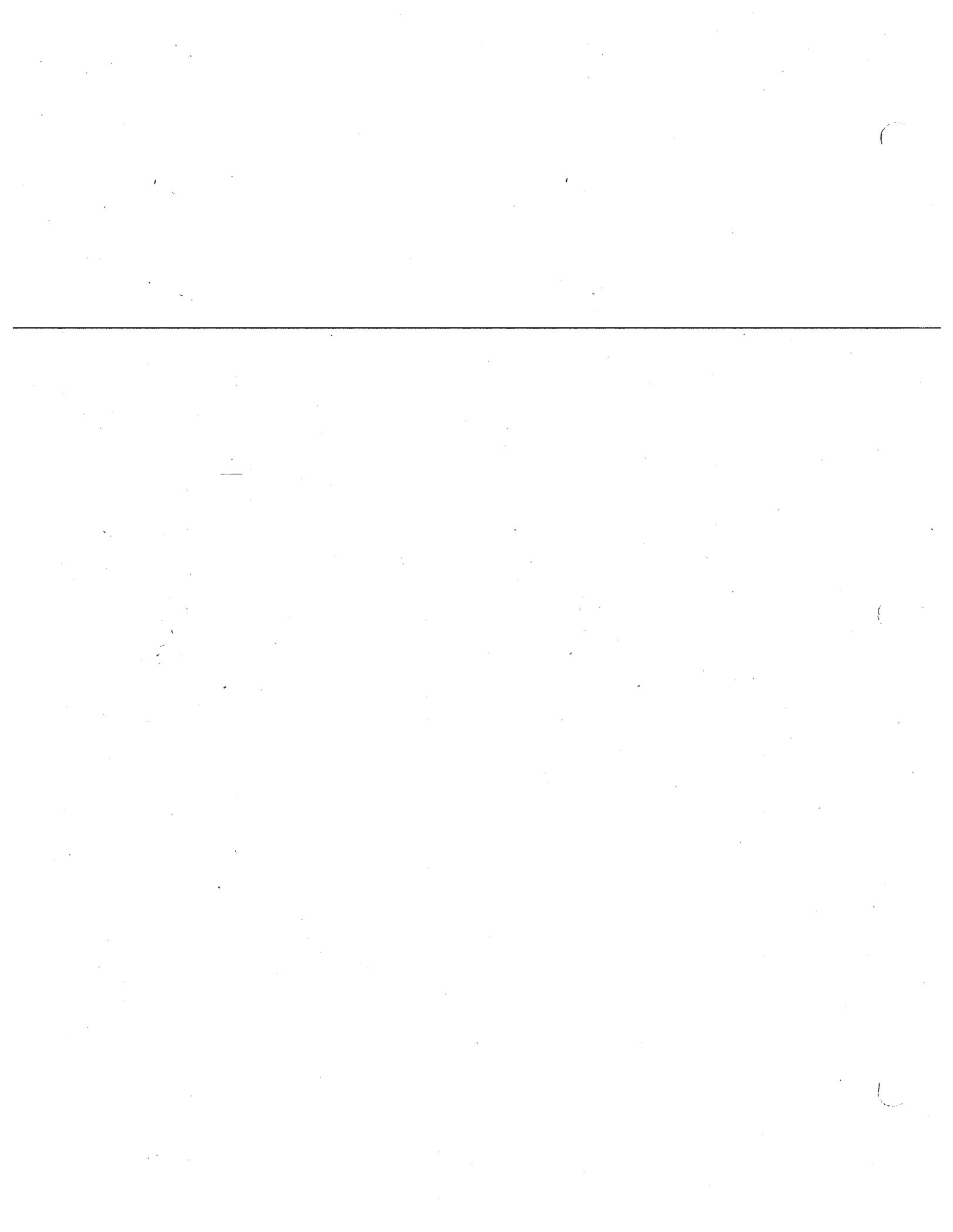
High: The alternative is readily adaptable to changes in technology and the economic and social environment without significant alteration.

6. Time Requirements for Implementation: Extent to which alternative minimizes time/effort required for implementation. Weighting Factor: 9 points

Low: Implementation time is greater than three years. Would require significant local staff time to implement.

Medium: Implementation time is one to three years. Little or no local staff time required for implementation.

High: Alternative can be implemented in less than one year. Little or no local staff time required for implementation.



APPENDIX B

**HOUSEHOLD HAZARDOUS WASTE MANAGEMENT
ALTERNATIVES FOR SAN MATEO COUNTY JURISDICTIONS**



APPENDIX B
HHW Management Alternatives for the Participating Jurisdictions
(H = high, M = moderate, L = low)

CRITERIA	HHW PROGRAM ALTERNATIVES		
	Solid Waste Facility Collection	Collection at Vendor Locations	Recyclable HHW Collection Events
1. Minimization of Improper Disposal	Moderate potential to minimize improper disposal of a range of recyclable HHW with adequate program advertising and convenient site location. (M)	Convenience increases effectiveness of option; range of wastes is limited. (M)	Potentially significant diversion of recyclable HHW (oil, paint, automobile batteries). Frequent events and adequate publicity of each event necessary. (M)
2. Hazards	Controlled environment and low-hazard wastes reduces likelihood of impacts and reduces potential seriousness. (M)	Requires oversight to minimize likelihood of impacts and their potential seriousness. (M)	Similar to collection events; moderate potential for impacts such as spills. (M)
3. Facility/Program Requirements	Moderately easy to incorporate into most solid waste facility operations. (M)	Already operating; expanded collection could build on existing operations. (H)	Moderately easy to implement. San Mateo county has considerable experience staging collection programs for all types of HHW. (M)
4. Cost Effectiveness	Low capital cost site modifications would include prefabricated storage buildings and oil collection tank. (H)	Low capital cost to vendors; none to jurisdiction. (H)	Low capital cost, limited site and equipment needs. (M)
5. Ability to Accommodate Changing Social, Economic, and Technological Conditions	Fixed locations inhibit accommodation of changing population centers; however, changes in collection and processing technology could be readily accommodated. (M)	With little financial reward, businesses have minimal incentive to adapt to changing conditions. (L)	Limited types of HHW restricts flexibility of program. (L)
6. Time Requirements for Implementation	Moderately easy to implement; no permit required from DHS if only specified recycled wastes are collected. (H)	Some vendors already participating, other vendors may have cost and liability concerns that could inhibit participation. (M)	Moderately easy to implement; no permit required from DHS if only specified recycled wastes are collected. (M)

APPENDIX B (cont.)
HHW Management Alternatives for the Participating Jurisdictions
(H = high, M = moderate, L = low)

CRITERIA	HHW PROGRAM ALTERNATIVES		
	Curbside Collection of Recyclable HHW	Permanent Central/Satellite Facility	Mobile Collection
1. Minimization of Improper Disposal	Convenience encourages participation and therefore reduces improper disposal of collected materials; however, range of wastes is limited. (M)	High potential to minimize improper disposal with adequate program advertising and good site location. (H)	Significant potential to minimize improper disposal because of program convenience and visibility. (M)
2. Hazards	Potential for spills may impact public health and safety; however, recyclable HHWs are generally not highly toxic. (M)	Controlled environment significantly reduces likelihood of impacts and reduces potential seriousness. (M)	Controlled environment minimizes impacts such as spills. Localized traffic impacts may occur. (M)
3. Facility/Program Requirements	Curbside recyclable HHW collection programs (motor oil) have already been implemented in most jurisdictions. (H)	Program may be incorporated into existing solid waste management facility operations. (L)	No existing mobile program; however, would be compatible with a permanent facility. (M)
4. Cost Effectiveness	Low capital cost; would require only slight modifications to refuse collection vehicles. (H)	Moderate capital cost for sophisticated facility. Significant disposal costs associated with non-recyclable HHW. (H)	Low to moderate capital cost; limited site and equipment needs, depending on program sophistication. (M)
5. Ability to Accommodate Changing Social, Economic, and Technological Conditions	Readily accommodates shifting populations; minimal equipment requirements also accommodates changes in technology. (M)	Fixed location inhibits changing population centers; however, changes in collection technology readily accommodated. (H)	Flexibility in operations accommodates changing conditions. (H)
6. Time Requirements for Implementation	Moderately easy to implement; would require ongoing risk reduction program, modification of collection equipment, construction of storage facilities, worker training, and ongoing management. (H)	Potentially extensive implementation requirements, including permitting and site development. (L)	If private contractor is used, moderately easy to implement. (L)

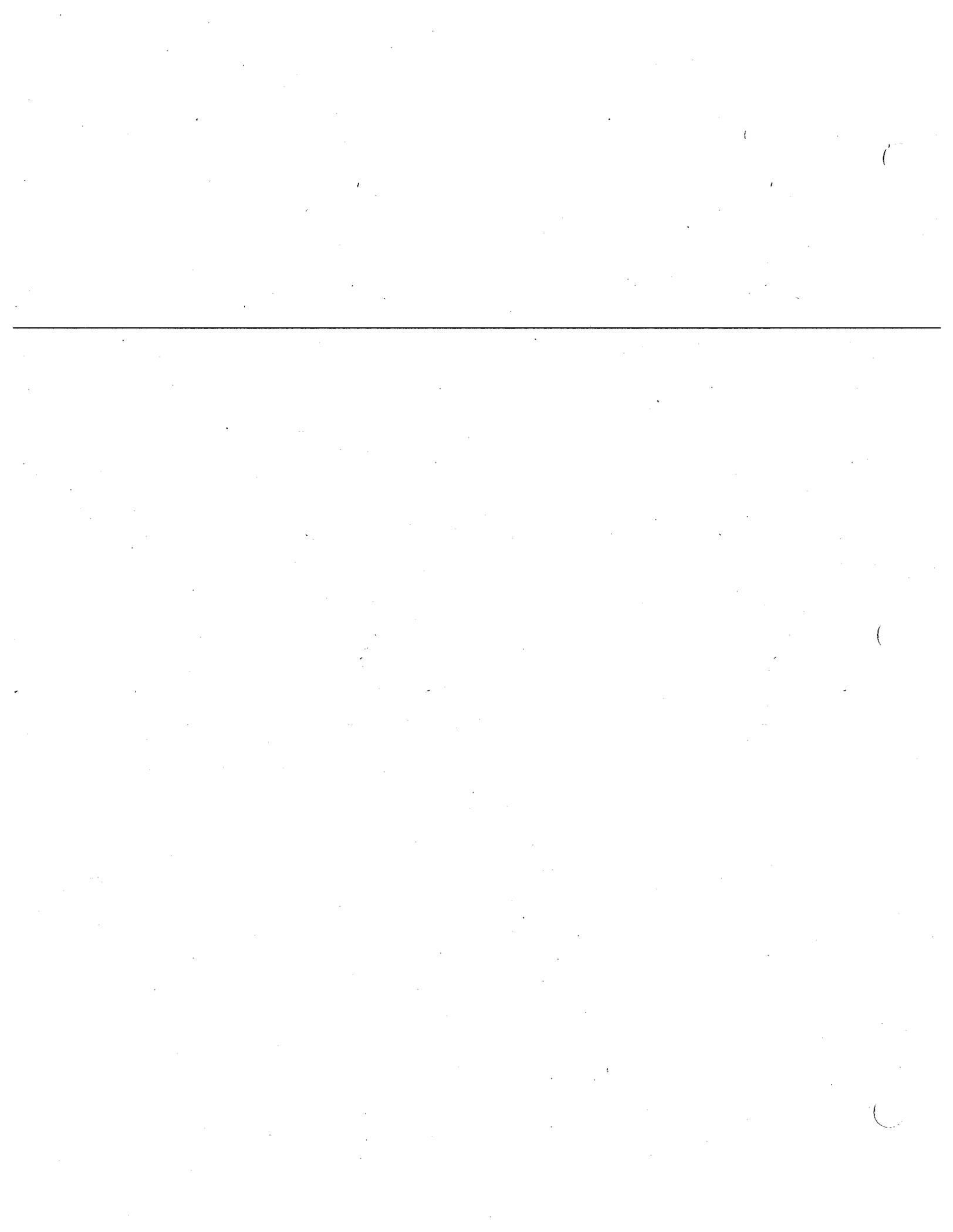
APPENDIX B (cont.)
HHW Management Alternatives for the Participating Jurisdictions
(H = high, M = moderate, L = low)

CRITERIA	HHW PROGRAM ALTERNATIVES		
	Curbside Collection of All HHW	Collection Events	Door-to-Door
1. Minimization of Improper Disposal	Very convenient; however, potentially high costs to the public. (H)	Moderate potential to minimize improper disposal with frequent events and adequate program advertising. (M)	Convenient with large range of wastes accepted; however, overall volumes are limited. (L)
2. Hazards	Placement of HHW at curb creates significant public safety and liability concerns. (L)	Controlled environment minimizes impacts such as spills. Localized traffic impacts may occur. (M)	Slight potential for impacts. (M)
3. Facility/Program Requirements	No existing program. Will require changes in facilities operations, development of collection vehicles, personnel training, and extensive public information efforts. (M)	Program is well established in San Mateo County. (M)	No existing program to build on; however, would be compatible with a permanent and satellite facility program. (M)
4. Cost Effectiveness	Depending on program design, capital costs to operator may be significant. Some costs may be passed on to residents. (L)	Capital costs are moderate. Disposal costs are very high depending upon amounts of nonrecyclable HHW collected. (H)	Development of specialized collection vehicle and personnel training expenses could be significant. (L)
5. Ability to Accommodate Changing Economic, Technological and Social Conditions	Operating as a service to the community, facilities can make significant adjustments to accommodate changing conditions. (M)	Flexibility in operations accommodations changing conditions. (H)	Readily accommodates shifting population and changes in technology and economic conditions. (M)
6. Time Requirements for Implementation	Difficult to implement. (L)	Relatively easy to implement; with adequate commitment of administrative resources. (H)	Difficult to implement; would require purchase of equipment, worker training, and ongoing management. (L)



APPENDIX C

SCORES FOR HOUSEHOLD HAZARDOUS WASTE ALTERNATIVES



APPENDIX C
Scores for Household Hazardous Waste Alternatives

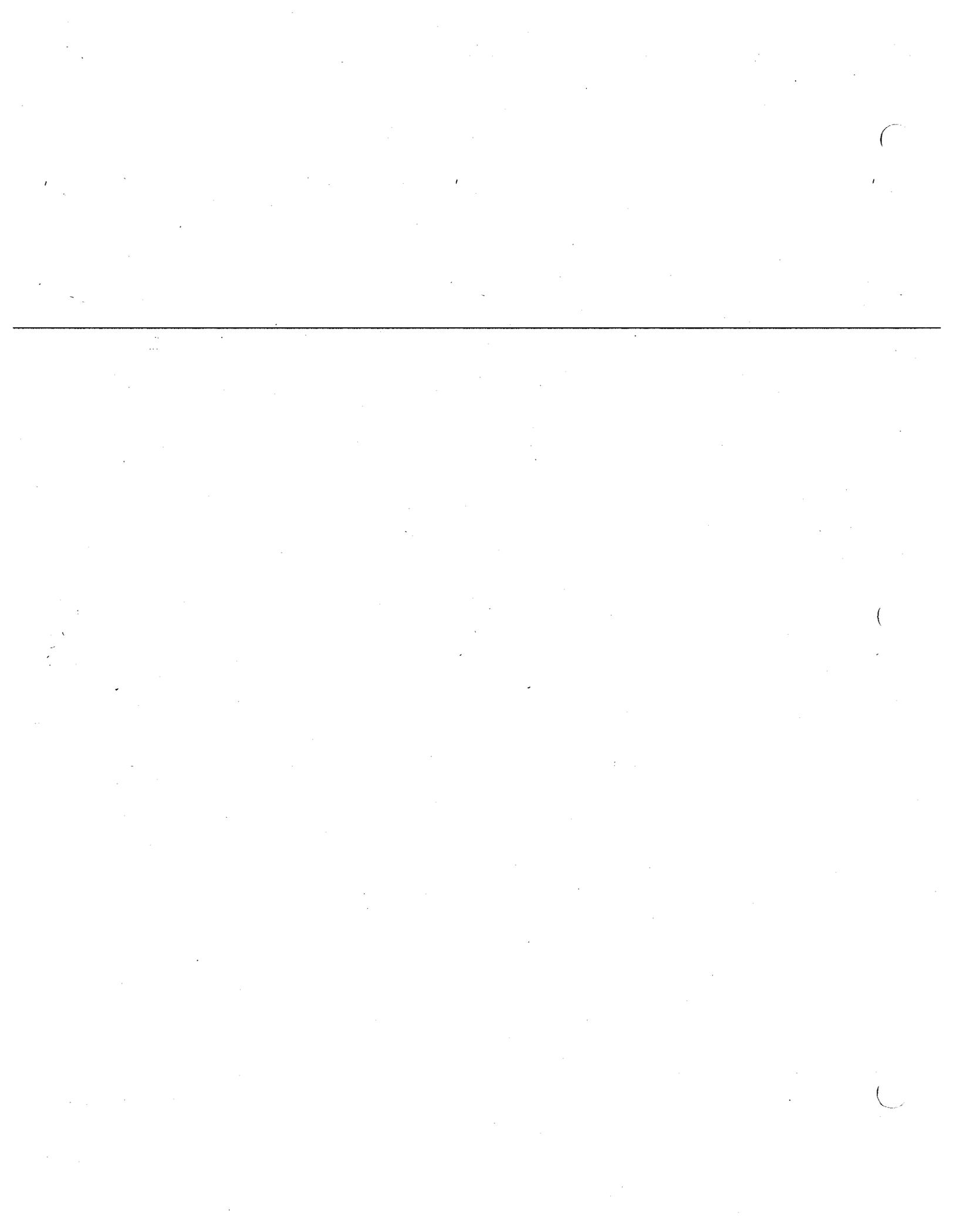
Criteria	Weighting Factor	HHW Program Alternative					
		Curbside Collection of Recyclable HHW		Periodic Collection of All HHW		Permanent Collection Site	
		Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score
1. Minimization of Improper Disposal	29	2	(58)	2	(58)	3	(87)
2. Hazards	18	2	(36)	2	(36)	2	(36)
3. Facility/Program Requirements	12	3	(36)	2	(24)	1	(12)
4. Cost Effectiveness	22	3	(66)	3	(66)	3	(66)
5. Ability to Accommodate Changing Social, Economic, and Technological Conditions	10	2	(20)	3	(30)	3	(30)
6. Time Requirements for Implementation	9	3	(27)	3	(27)	1	(9)
TOTAL			243		241		240

**APPENDIX C (cont.)
Scores for Household Hazardous Waste Alternatives**

Criteria	Weighting Factor	HHW Program Alternative					
		Solid Waste Facility Collection		Vendor Collection		Periodic Collection (Recyclable HHW)	
		Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score
1. Minimization of Improper Disposal	29	2	(58)	2	(58)	2	(58)
2. Hazards	18	2	(36)	2	(36)	2	(36)
3. Facility/Program Requirements	12	2	(24)	3	(36)	2	(24)
4. Cost Effectiveness	22	3	(66)	3	(66)	2	(44)
5. Ability to Accommodate Changing Social, Economic, and, Technological Conditions	10	2	(20)	1	(10)	1	(10)
6. Time Requirements for Implementation	9	3	(27)	2	(18)	2	(18)
TOTAL			231		224		190

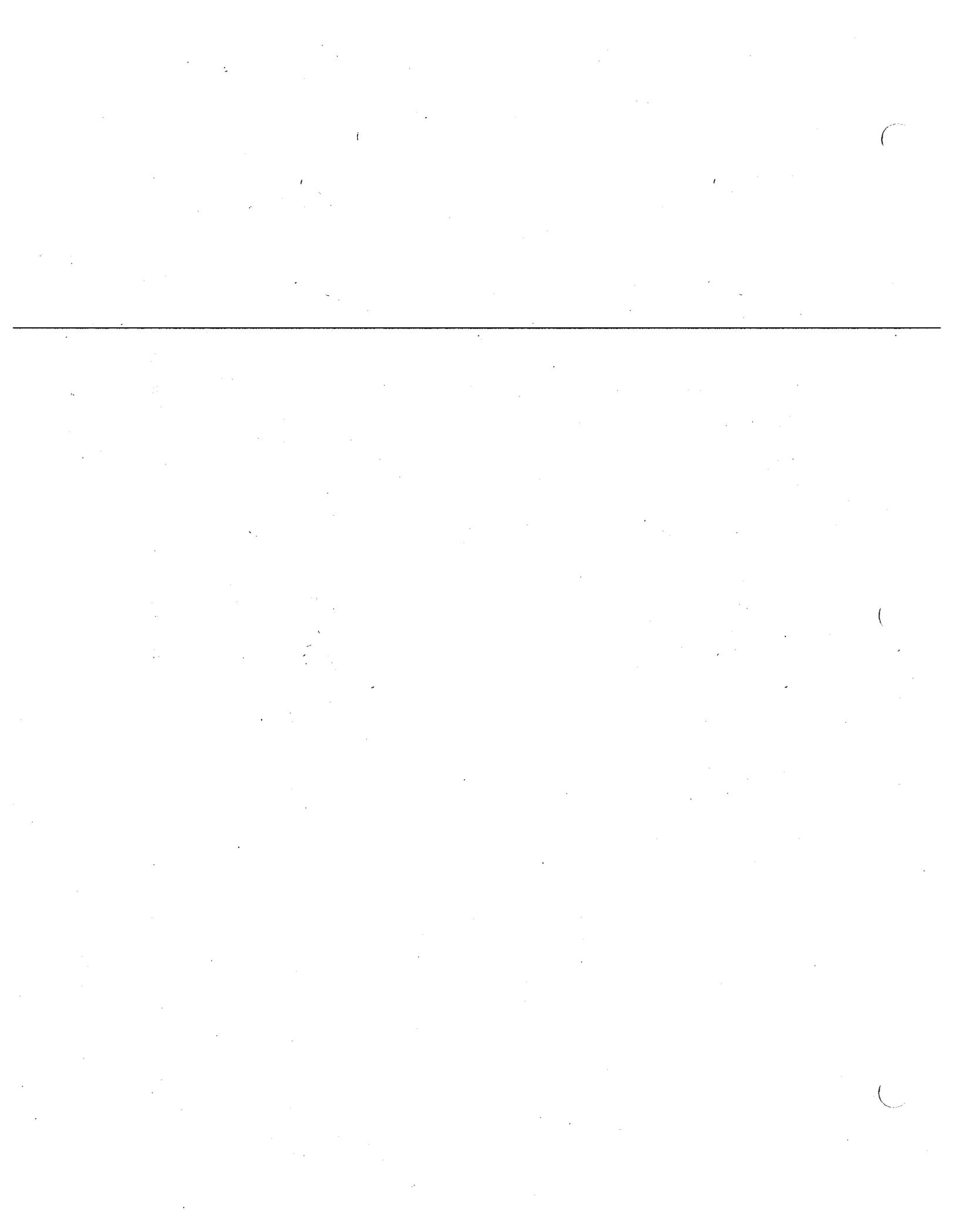
APPENDIX C (cont.)
Scores for Household Hazardous Waste Alternatives

Criteria	Weighting Factor	HHW Program Alternative					
		Mobile Collection		Curbside Collection of All HHW		Door-to-Door Pickup	
		Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score
1. Minimization of Improper Disposal	29	2	(58)	3	(87)	1	(29)
2. Hazards	18	2	(36)	1	(18)	2	(36)
3. Facility/Program Requirements	12	2	(24)	2	(24)	2	(24)
4. Cost Effectiveness	22	2	(44)	1	(22)	1	(22)
5. Ability to Accommodate Changing Social, Economic, and, Technological Conditions	10	3	(30)	2	(20)	2	(20)
6. Time Requirements for Implementation	9	1	(9)	1	(9)	1	(9)
TOTAL			201		180		140



APPENDIX D

HOUSEHOLD HAZARDOUS WASTE RECYCLING TECHNOLOGIES



APPENDIX D

HOUSEHOLD HAZARDOUS WASTE RECYCLING TECHNOLOGIES

Certain types of HHW deserve particular attention: They are generated in large quantities, are frequently disposed of improperly, and can be readily recycled through existing technologies and markets. The targeted HHW types discussed below include used oil, solvents, batteries, antifreeze, and paint. Recent legislation will permit local jurisdictions to collect and bulk-package certain HHW types for recycling without regulation by the Department of Health Services.

Used Oil

Used oil can be re-refined for use as a lubricant or as a waste-derived fuel. Recovery efficiency of the re-refining process reaches 60 percent. Used oil can be collected at gas stations, attended recycling centers, and county-sponsored HHW collection programs. Recyclers would pick up used oil from these locations at a cost or profit that will depend on the current market value of the material and its condition. Used oil collected from households is often transported and managed by recycling firms at minimal or no cost to collection programs.

Although increasing the amount of used oil collected by service stations and other commercial locations is an important part of expanding the jurisdiction's used-oil collection efforts, service stations are sometimes reluctant to accept used oil from households due to the potential presence of contaminants that can significantly increase the cost of management. If household oil is commingled with commercially generated used oil (such as oil generated by service stations), it becomes a state-regulated hazardous waste and costs about \$0.25 per gallon for transportation and recycling.¹ If used oil from service stations (including commingled household oil) contains high levels of certain contaminants, then the oil falls under federal Resource Conservation and

¹ Paula Kehoe and Bill Quan, "Issues and Approaches to the Expansion of a Permanent Household Hazardous Waste Collection Program, The San Francisco Perspective," presented at EPA Conference HHW Management, November 1990.

Recovery Act (RCRA) regulations and the cost for transportation and disposal rises to as much as \$2.25 per gallon.

Solvents

Solvent recycling can be part of a permanent facility, mobile collection program, or collection event. ~~Solvents recycled by HHW programs are collected, stored, and eventually picked up by~~ a recycler. Much like used oil, the solvent may be re-refined and returned to use as solvent or burned as waste-derived fuel. Collection, packaging, storage, and transport costs for recycled solvents are similar to those for other liquid HHW collected for recycling. A primary limitation on solvent recycling is the potential commingling of contaminants such as pesticides and paint with used household solvent. Adequate characterization and analysis of collected solvent can control this problem.

Used Auto Batteries

Used auto batteries are collected at HHW collection sites and by vendors such as car repair shops. Collected batteries are shipped to auto battery recycling facilities for rebuilding or recovery of constituent materials. Approximately 70 to 80 percent of auto batteries nationwide are recycled as trade-ins to battery dealers. Major concerns about auto battery recycling include potential acid leakage and proper storage and transport. Increased recycling through vendors will require improved education of vendors and purchasers.

Auto batteries are recycled at vendor locations in nearly every jurisdiction of San Mateo County, although exact figures are unavailable. Battery recovery throughout the county could possibly be expanded by encouraging vendor collection. The existence of an established recycling market for car batteries shows that, except for collection costs, recycling would be inexpensive and even potentially profitable.

Used Household Batteries

Used household batteries make up a tiny fraction of the solid waste stream in the United States, but account for more than half the cadmium and mercury found in refuse. Other metals in household batteries include lead, lithium, manganese, silver, nickel, and zinc. The contribution of heavy metals from household batteries to landfill leachate is not known but may be significant.² Collection of used household batteries could be operated through the city- and/or county-sponsored HHW collection programs. In addition, an undetermined number of recyclable batteries are likely already to be recycled through vendors such as hearing-aid shops.

There are several significant barriers to recycling household batteries. A recent study of household battery recycling found limited options for recycling most types of household batteries and questioned the safety and environmental practices of some of the U.S. firms that recycle the most common types. In addition, 75 to 80 percent of nickel-cadmium batteries are encased in rechargeable appliances and are not readily removed.³ These concerns, therefore, may limit the breadth of household battery recycling programs during the near future.

In addition, costs for household battery recycling may be significant per ton of material. These costs include collection at HHW collection sites, sorting according to type, packing them for safe shipment, and transportation to a recycling firm. Collection for recycling would be labor intensive because many batteries are quite small and can be distinguished according to type only by close examination. Finally, the majority of household batteries are not currently recyclable and it is likely that householders will deliver both recyclable and nonrecyclable batteries to the collection site; there will be additional costs for the safe disposal of nonrecyclable batteries. Some types of household batteries require careful handling because of the toxicity of their components or, in the case of lithium cells, chemical reactivity.

² Nancy Reutlinger, "Batteries in the Waste Stream: A Feasibility Study of Household Battery Recycling and Collection for the County of Santa Cruz," Santa Cruz County Planning Department, 1990.

³ Ibid.

Paint

Paint often comprises over half of HHW disposed through collection programs and can consume a significant portion of the collection budget. Paint recycling greatly reduces disposal costs by eliminating the need for destructive incineration, which typically costs four times the price of recycling. Paint wastes (except spray paint) are generally consolidated (bulk-packed) into 55-gallon drums, which greatly reduces storage and transport costs and facilitates the recycling process.

Paint recycling options depend on the condition of the paint and on whether the paint is water or solvent based. Latex paint in good condition can be reformulated by paint manufacturers for sale as recycled paint. Until recently, characteristics of the product (including a narrow color range of beige and browns) limited use of recycled latex paint to situations where aesthetics were not a primary concern; however, both the quality and color range of recycled latex paint are steadily improving. Solvent-based paints may be distilled to extract the solvent (as in oil and solvent recycling).

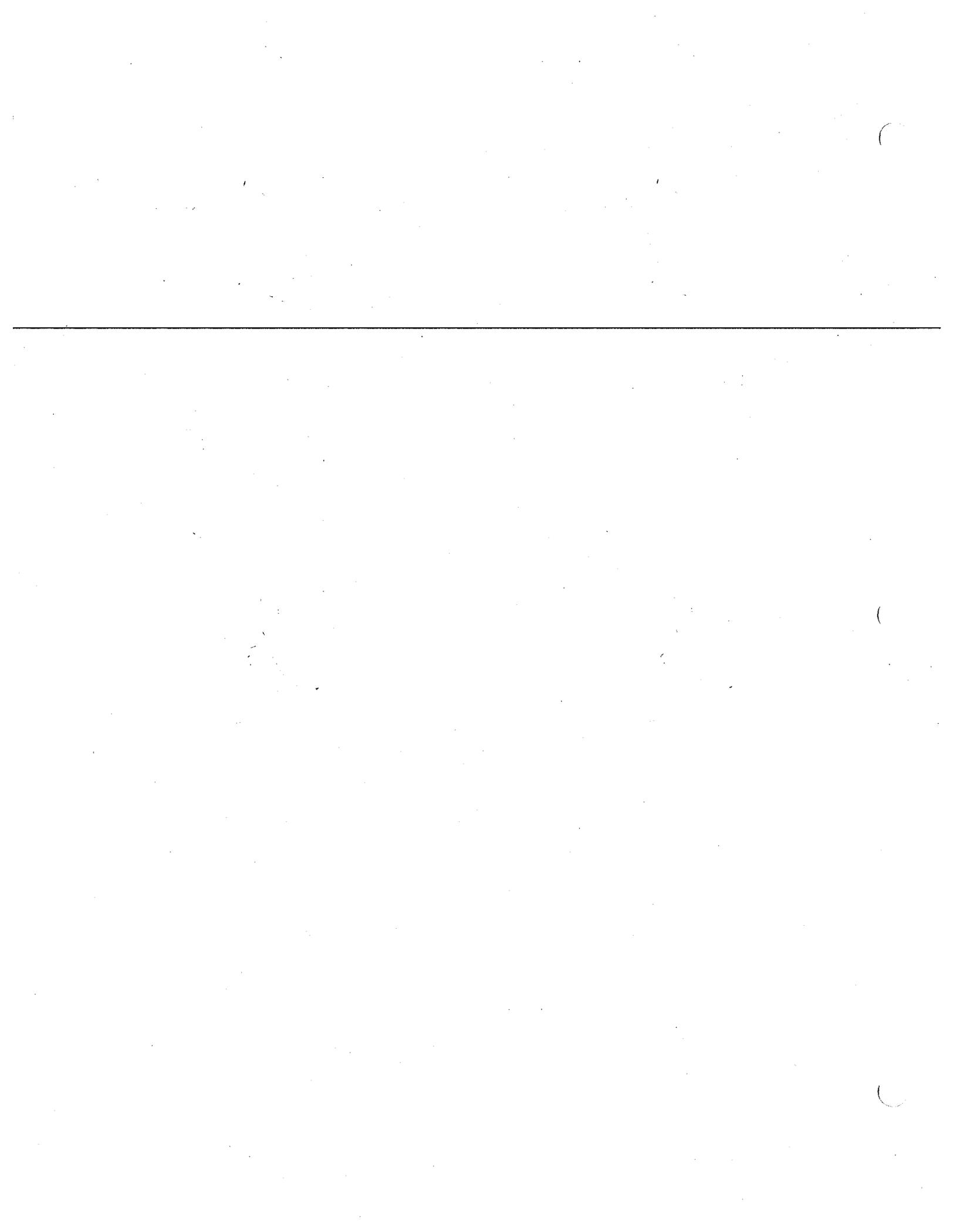
Paint reuse methods include using collected paint without a reprocessing step. The paint can be bulked and mixed together or used "as-is" for municipal needs (such as graffiti cleanup), donated to a paint-exchange system at HHW collection sites, and/or donated to theater groups and nonprofit organizations.

Used Antifreeze

Antifreeze contains ethylene glycol, a sweet-tasting but toxic liquid that makes antifreeze particularly hazardous to children and pets. Used antifreeze often contains materials such as copper, zinc, lead, and gasoline. More than 1,500 antifreeze poisonings occur annually nationwide.

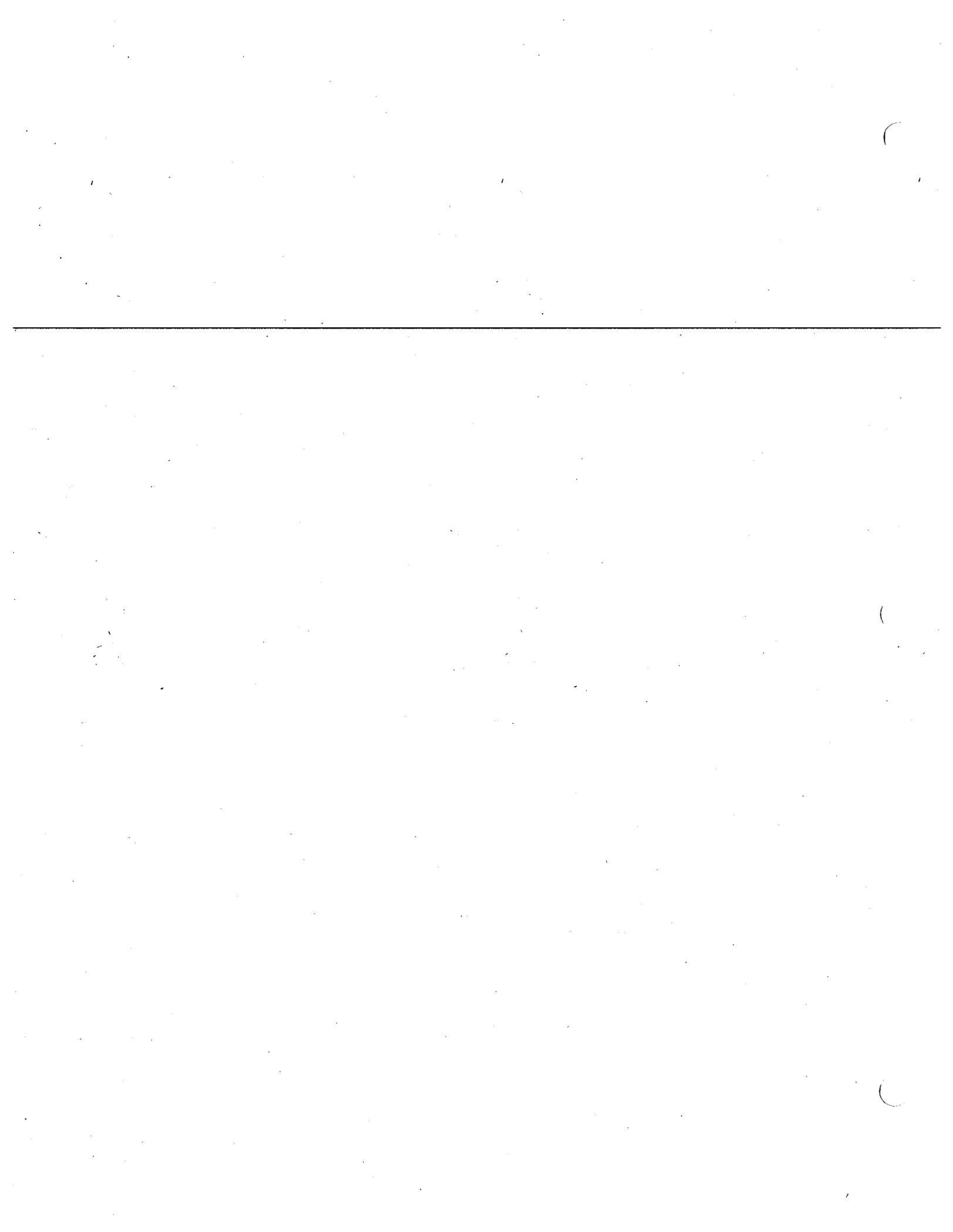
Used antifreeze can be collected by vendors (e.g., service stations) and by city- and/or county-sponsored HHW collection programs. The used material is recycled by the glycol industry to

make new antifreeze, airplane de-icing solution, and other products. It can also be used in the coal-mining industry and in cement grinding and brake fluid. However, antifreeze recycling firms and vendors that could accept used household antifreeze are concerned about potential contamination with other materials. This problem can be ameliorated through public education to discourage commingling of antifreeze with other materials and through screening of antifreeze delivered to HHW collection sites.



APPENDIX E

REFERENCE MATERIAL FOR SCHOOLS



APPENDIX E
REFERENCE MATERIAL FOR SCHOOLS¹

VIDEO

Cleaning Up Toxics at Home

Produced by League of Women Voters. 1996 (1-800-475-2638)

Time: 30 minutes

Grades: 9-12

Provides information on alternatives to hazardous household products and safe and proper disposal of household hazardous waste.

Hazardous Wastes In Our Homes?

Produced by the Household Hazardous Waste Project, Springfield, Missouri. 1989

7 minutes

Grades: K-6

Introduces the problems of and solutions for household hazardous waste.

Mr. Roger's Neighborhood: The Environment and Recycling

Produced by HDR Engineering, Inc. 1990

30 minutes

Grades: Pre K-2

Mr. Rogers and Mr. McFeely bring their bottles and cans to a recycling center, where they watch glass and cans being crushed. In the Land of Make Believe, there is too much garbage and the people try to find a solution to the problem. Song, examples of creative reuse.

Trashing The Oceans

Produced by National Oceanographic and Atmospheric Administration (NOAA): 1988

Time: 7 minutes

Grades: 4-12

Overview of problems caused by dumping trash in the ocean. Provides statistics on quantities of trash dumped in the ocean. Contains pictures of sea animals killed by plastic trash.

The Haz-Kid Report: Household Hazardous Waste

Produced by San Bernardino Department of Health Services. 1987

Time: 11 minutes

Grades: 2-12

Haz-Man uses student reporters to explain what hazardous waste is, different kinds of hazardous substances, and health and environmental problems caused by hazardous waste. Includes

¹ Developed by the San Francisco Recycling Program 1990.

information on what to do if hazardous waste is discovered and where to take HHWs. For more information on San Francisco HHW Facility, call (415) 554-4333.

Why Recycle?

Produced by San Bernardino Department of Health Services. 1987

Time: 11 minutes

Grades: 3-6

Three students discuss why recycling is important in order to write a report to the teacher about it.

The Groundwater Adventure

Produced by the Water Pollution Control Federation.

Time: 9 minutes

Grades: 5-9

Dino Sorrus and a young girl interacting in a videogame format including the concept of groundwater.

GO

Produced by Dowling-Shepherd Productions. 1978

Time: 10 minutes

Grades: K-5

What makes things go? This film describes what energy is and how energy is conserved through reuse and recycling.

Aluminum Recycling: Your Next Assignment

Produced by Aluminum Recycling Association. 1988

Time: 18 minutes

Grades: 3-9

A boy uses a computer to learn about aluminum can recycling. The computer takes him to a recycling center, a landfill, and an aluminum recycling plant. Good footage of the recycling process.

The Rotten Truth: A 3-2-1 Contact Extra

Produced by: Public Broadcasting Service. 1990

Time: 30 minutes

Grades: 3-12

Stephanie Yu conducts a thorough exploration of garbage issues: why there is no 'away,' that reducing volume does not reduce weight, biodegradation, cycles, composting, and over packaging.

Not Another Science Show: Waste Not Want Not

Produced by: Ontario Educational Communications Authority

Time: 30 minutes

Grade: 5-12

Take a look at Canada's waste disposal problems and solutions. Find out where garbage goes after it leaves the curb. Look at cycles of nature and see how man made products fit or don't fit the cycle. Visit a transfer station, incinerator, and recycling paper plant.

Too Close for Comfort: Reducing Household Toxics

Produced by Prevention Program, 75 Santa Barbara Road, Pleasant Hill, CA 94523

19 Minutes

Grade: Not listed.

A discussion of health and environmental problems associated with common household products. Safer alternatives are demonstrated and proper handling and disposal methods are discussed.

Making the Connection: A Teacher's Guide to Household Hazardous Substances and the Classroom

Produced by The Ecology Center of Ann Arbor, 417 Detroit Street, Ann Arbor, MI 48104

Time: 13-1/2 minutes

Grade: Not listed.

Presentation of ideas for incorporating household toxics issues into health and science curricula

SLIDE SHOW

Marine Debris and Entanglement

Produced by: National Oceanic and Atmospheric Administration

Time: Approximately 30 minutes

*Grades: 3-12 (if under 4th grade the script needs slight modification)

The slides graphically portray the problems of trash in the ocean and the effects on animals.

Plastics are very visible and suggestions on how to combat the problems are given.

*Some slides are very graphic; please review for a young audience.

BOOKS

The Art of Composting (1985) Metro's Recycling Information Center

About Acid Rain (1988 booklet) Channing L. Bete Co., Inc.

Bottles and Cans Using Them Again (1977) McPhee Gribble

Egg-Carton Zoo (1986) Haas, Rudi; Hans Blom, and David Suzuki

Energy - Boy Scouts of America Merit Badge Series (1976) Woodburn, John H., Ph.D.

Environmental Science (1983) Boy Scouts of America Merit Badge Series

Holt Science (1986) Abruscato, Joseph; Joan Wade Fossaceca; Jack Hassard and Donald Peck

How Paper is Made (1985) Perrins, Lesley

How Glass is Made (1985) Paterson, Alan J.

The Lorax (1971) Dr. Seuss

Paper By Kids (1980) Grummer, Arnold E.

Soil and Water Conservation (1983) Boy Scouts of America Merit Badge Series

Solving the Hazardous Waste Problem (1986) EPA's RCRA Program

Worldwatch Paper 76 - Mining Urban Wastes: The Potential for Recycling (1987) Pollock, Cynthia

Worms Eat My Garbage (1982) Appelhoff, Mary

Acclimatization - A Sensory and Conceptual Approach to Ecological Involvement (1972) van Matre, Steve

A Citizen Guide to Plastic in the Ocean - More Than A Litter Problem (1988) Katheryn J. Ohara

Earthkeepers - Four Keys for Helping Young People Live in Harmony with the Earth (1968) Steve van Matre and Bruce Johnson

Fences - Real or Invisible? Breakthroughs, Strategies for Thinking (1990) Tinzman, Margaret

Geography - Key Concepts and Basic Skills (1989) Lefkowitz, William

Hints for a Healthy Planet (1990) Heloise

Handmade Hot Water Systems (1978) Sussman, Art and Frazier, Richard

In Search of: ENERGY (1982) Taffel, Alexander

Personal Responsibility, A Handbook for K-5 Teachers (1989) Choy, Kanani V, Lai, Penn

School Energy Action, Sussman, Art and Tannenbaum, Judith

Recycling Activities for the Classroom (1987) Eric Document Reproduction Service (EDRS)

50 Simple Things Kids Can Do To Save The Earth (1990) Javnarama, The Earth Works Group

50 Simple Things You Can Do To Save The Earth (1990) Javnarama, The Earth Works Group

30 Simple Energy Things You Can Do To Save The Earth (1990) Earth Works and PG&E

Save Our Planet - 750 Everyday Ways You Can Help Clean Up The Earth (1990) MacEachern, Diane

CURRICULA

TITLE: A-Way with Waste
SUBTITLE: A Waste Management Curriculum for Schools, 2nd Ed.
DATE: July 1985
PUBLISHER: Washington State Department of Ecology
ADDRESS: 4350 - 150th Ave., N.E., Redmond, WA 98052
GRADE LEVEL: K-12th

TITLE: Bags, Breakers, and Barrels: An Action Curriculum Toward Resolving Hazardous Materials Issues
DATE: 1987
PUBLISHER: Industrial States Policy Center
ADDRESS: 691 North Haight Street, Columbus, OH 43215
GRADE LEVEL: Middle and High School

TITLE: Bilingual Education Implementation Manual
DATE: August 1986
PUBLISHER: San Francisco Unified School District Board of Education
ADDRESS: 135 Van Ness Avenue, San Francisco, CA 94102-5299
GRADE LEVEL: K-12th

TITLE: CHEM: Chemicals, Health, Environment and Me
DATE: 1990
PUBLISHER: Chemical Education for Public Understudy Program (CEPUP)
ADDRESS: Lawrence Hall of Science, University of California, Berkeley, CA 94720
GRADE LEVEL: Middle or Junior High School

TITLE: A Collection of Energy Activities
PUBLISHER: PG&E Educational Activities
ADDRESS: 77 Beale St., San Francisco, CA 94106
GRADE LEVEL: Elementary School

TITLE: Connections
SUBTITLE: A Curriculum in Appropriate Technology
DATE: 1980
PUBLISHER: National Center for Appropriate Technology
ADDRESS: Box 3838, Butte, MT 59701
GRADE LEVEL: 5th-6th

TITLE: Conservation for Children, Copy 1
SUBTITLE: An ESEA Title IV C Project
DATE: 1972
PUBLISHER: Cupertino Union School District
ADDRESS: John Muir Elementary School, 6560 Hanover Dr., San Jose, CA 95129
GRADE LEVEL: Elementary School

TITLE: The Environment and the Community: Environmental Health Lessons for Grades 10-12
DATE: Not listed.

PUBLISHER: Resource Senter for ECHSI, Brookwood II
ADDRESS: 45 Knightsbridge Road, Piscatawny, NJ 08854
GRADE LEVEL: 10th-12th

TITLE: Environmental Education Guide, Vol. 1
SUBTITLE: An Environmental/Energy Education Primer
DATE: 1981
PUBLISHER: Office of the Alameda County Superintendent of Schools
ADDRESS: 224 W. Winton Ave., Hayward, CA 94544
GRADE LEVEL: K-3rd

TITLE: Environmental Education Guide, Vol. 2
SUBTITLE: An Environmental/Energy Education Primer
DATE: 1981
PUBLISHER: Office of the Alameda County Superintendent of Schools
ADDRESS: 224 W. Winton Ave., Hayward, CA 94544
GRADE LEVEL: 4th-6th

TITLE: Environmental Education Guide, Vol.3
SUBTITLE: An Environmental/Energy Education Primer
DATE: 1981
PUBLISHER: Office of the Alameda County Superintendent of Schools
ADDRESS: 224 W. Winton Ave., Hayward, CA 94544
GRADE LEVEL: 7th-9th

TITLE: Environmental Education Materials for Teachers and Young People (Grades K-12)
SUBTITLE: A Partial Listing of Items Available from Public and Private Sources
DATE: August 1987
PUBLISHER: Office of Community and Intergovernmental Relations
ADDRESS: U.S. Environmental Protection Agency, 401 M St., S.W., Washington, D.C.
20460
GRADE LEVEL: K-12th

TITLE: Fine Arts Guide: K-5/San Francisco Unified School District
SUBTITLE: Visual Arts, Music, Drama, and Dance
DATE: February 1988
PUBLISHER: San Francisco Unified School District, Board of Education
ADDRESS: Parkside Center, 2550 - 25th Avenue, San Francisco, CA 94116
GRADE LEVEL: K-5th

TITLE: Follow-Up Activities for Santa Barbara Recycling Education Program
DATE: 1982
PUBLISHER: California State Solid Waste Management Board
GRADE LEVEL: Elementary School

TITLE: Follow-Up Activities for Ventura Recycling Education Program
DATE: 1982
PUBLISHER: California State Solid Waste Management Board
GRADE LEVEL: Elementary School

TITLE: Garbage Reincarnation, Copy 1
SUBTITLE: Interdisciplinary Approach to Materials Conservation and Recycling
DATE: 1977
PUBLISHER: Sonoma County Environmental Center
ADDRESS: P. O. Box 704, Cotati, CA 94928
GRADE LEVEL: Elementary School

TITLE: Hazardous Waste Education Kit
DATE: Not listed.
PUBLISHER: Federation of Ontario Naturalists
ADDRESS: 355 Lesmill Road, Dan Mills, ON, Canada, M3B 2W8
GRADE LEVEL: High School (Adaptable for 7th-9th)

TITLE: Here Today, Here Tomorrow
SUBTITLE: A Curriculum on: Recycling * Energy * Solid Waste
DATE: 1983
PUBLISHER: Conservation and Environmental Studies Center, Inc.
ADDRESS: 20 - 13 Whitesbog Rd., Browns Mills, NJ 08015
GRADE LEVEL: K-12th

TITLE: Household Hazardous Materials: Pollution Solutions Start at Home
DATE: 1989
PUBLISHER: Environmental Health Coalition
ADDRESS: 1844 Third Avenue, San Diego, CA 92101
GRADE LEVEL: Middle School and Junior High School

TITLE: Household Hazardous Waste Learning Stations
DATE: 1990
PUBLISHER: Minnesota Pollution Control Agency, Hazardous Waste Division
ADDRESS: 520 Lafayette Road North, Saint Paul, MN 55155
GRADE LEVEL: 4th-6th

TITLE: Household Hazardous Waste Program Kit
DATE: 1989
PUBLISHER: San Bernardino County Department of Environmental Health Services
~~ADDRESS: 385 N. Arrowhead Avenue, San Bernardino, CA 92415-0160~~
GRADE LEVEL: K-6th

TITLE: Household Toxics
DATE: 1988
PUBLISHER: Environmental Health Coalition
ADDRESS: 1844 Third Ave., San Diego, CA 92101
GRADE LEVEL: Grades 4th-6th

TITLE: I Can Do It Myself
SUBTITLE: An Energy Conservation Coloring Book
PUBLISHER: Pacific Gas and Electric Co.
ADDRESS: 77 Beale St., San Francisco, CA 94106
GRADE LEVEL: Middle School

TITLE: Let's Recycle! Lesson Plans for Grades K - 6 and 7 - 12
DATE: 1980
PUBLISHER: U.S. Environmental Protection Agency
ADDRESS: Office of Water & Waste Management, Washington, D.C. 20460
GRADE LEVEL: K-12th

TITLE: Let's Recycle! Lesson Plans for Grades 7 - 12
DATE: 1980
PUBLISHER: PG&E Educational Activities
ADDRESS: 77 Beale St., San Francisco, CA 94106
GRADE LEVEL: 7th-12th

TITLE: Living with Insects in the Big City
DATE: 1987
PUBLISHER: Citizens for a Better Environment
ADDRESS: 501 Second Street, Suite 305, San Francisco, CA 94107
GRADE LEVEL: K-3rd

TITLE: A Manual for the Household Hazardous Materials Audit
DATE: 1987
PUBLISHER: Alaska Center for the Environment
ADDRESS: 519 W. 8th Ave., Suite 201, Anchorage, AK 99501
GRADE LEVEL: Middle School and older, including adults

TITLE: A Matter of Waste
DATE: Not listed.
PUBLISHER: Alberta Environment
ADDRESS: 12th Floor, Oxbridge Place, 9820-106 Street, Edmonton, Alberta, Canada TSK 2J6
GRADE LEVEL: 4th-6th

TITLE: Ohio Science Workbook: Litter Prevention & Recycling
DATE: 1987
PUBLISHER: The Ohio Academy of Science
ADDRESS: 445 King Ave., Columbus, OH 43201
GRADE LEVEL: 7th-12th

TITLE: Oscar's Options
DATE: 1986
PUBLISHER: ERIC Document Reproduction Services
ADDRESS: 3900 Wheeler Ave., Alexandria, VA 22304-6409
GRADE LEVEL: 4th-8th

TITLE: An Outline for Teaching Conservation in High Schools
SUBTITLE: U.S. Department of Agriculture Soil Conservation Service
GRADE LEVEL: High School

TITLE: PG&E
SUBTITLE: Educational Service Guide
DATE: 1982
PUBLISHER: Pacific Gas and Electric
ADDRESS: 77 Beale St., San Francisco, CA 94106
GRADE LEVEL: K-12th

TITLE: Professor Smart Meets a Visitor from Mars
SUBTITLE: A Solid Waste, Recycling, and Litter Control Curriculum Package
DATE: June 1985
PUBLISHER: Solid Waste Coordination Staff of the County of Fresno Resources and
Development Department
ADDRESS: 4499 E. Kings Canyon Rd., Fresno, CA 93702
GRADE LEVEL: 3rd-6th

TITLE: Project Wild
SUBTITLE: Elementary Activity Guide
DATE: 1983
PUBLISHER: Western Regional Environmental Education Council
ADDRESS: Project Wild, Salinas Star Route, Boulder, CO 80302
GRADE LEVEL: K-12th

TITLE: Recycling Activities for the Classroom
DATE: April 1978
~~PUBLISHER: ERIC/SMEAC Center for Science, Mathematics, and Environmental Education~~
ADDRESS: 1200 Chambers Rd., 3rd Fl., Columbus, OH 43212
GRADE LEVEL: K-12th

TITLE: Recycling for Children
PUBLISHER: Marin Citizens for Energy Planning
ADDRESS: 24 H St., San Rafael, CA 94901
GRADE LEVEL: K-6th

TITLE: Science Alive (bilingual and multicultural)
DATE: 1988
PUBLISHER: Science Oriented Learning, Project Ocean, Oceanic Society,
San Francisco Bay Chapter
ADDRESS: Fort Mason, Building E, San Francisco, CA 94129
GRADE LEVEL: 4th-6th (Adaptable for grades K-12)

TITLE: SLEUTH: Educational Materials on the Disposal of Household Hazardous Waste
DATE: August 1982
PUBLISHER: METRO Toxicant Program, Water Quality Division HHW Project
ADDRESS: 821 Second Avenue, MS81, Seattle, WA 98104-1598
GRADE LEVEL: 4th-12th

TITLE: Some of the Best of Bay Area Creative Recycling, Copy 1
PUBLISHER: Bay Area Creative Recycle Center/SCRAP
ADDRESS: Pier 3 Fort Mason, San Francisco, CA; (mailing address) c/o 165 Grove St., San
Francisco, CA 94102
GRADE LEVEL: Elementary - Middle School

TITLE: Strategy Six: Winning Programs and Events, Summary
DATE: May 1981
PUBLISHER: California State Solid Waste Management Bureau
ADDRESS: 1020 9th Street, Suite 100, Sacramento, CA 95814
GRADE LEVEL: Elementary

TITLE: Teaching about Hazardous and Toxic Materials
DATE: 1985
PUBLISHER: ERIC Science, Mathematics and Environmental Education Clearinghouse
ADDRESS: Ohio State University, 1200 Chambers Road, 3rd Floor, Columbus, OH 43212
GRADE LEVEL: K-3, 4-6, 7-9, and 10-12

TITLE: Toxics In My Home? You Bet!
SUBTITLE: Curriculum on Household Toxics
DATE: 1984
PUBLISHER: Golden Empire Health Planning Center
ADDRESS: 2100 - 21st St., Sacramento, CA 95818
GRADE LEVEL: K-3rd

TITLE: Toxics In My Home? You Bet!
SUBTITLE: Curriculum on Household Toxics
DATE: 1984
PUBLISHER: Golden Empire Health Planning Center
ADDRESS: 2100 21st St., Sacramento, CA 95818
GRADE LEVEL: 4th-6th

TITLE: Toxics In My Home? You Bet!
SUBTITLE: Curriculum on Household Toxics
DATE: 1984
PUBLISHER: Golden Empire Health Planning Center
ADDRESS: 2100 - 21st St., Sacramento, CA 95818
GRADE level: 9th-12th

TITLE: Waste in Place
SUBTITLE: A New Sequential Curriculum Covering the Behavioral Aspects of Waste Management
DATE: 1979
PUBLISHER: Keep America Beautiful, Inc.
GRADE LEVEL: K-6th

TITLE: Adopt-A-Beach Curriculum
DATE: 1988
PUBLISHER: Oceanic Society, San Francisco Bay Chapter
ADDRESS: Fort Mason, Bldg. E, San Francisco, CA 94123
GRADE LEVEL: 2nd-8th

TITLE: Household Hazardous Waste Program Kit
DATE: 1989
PUBLISHER: San Bernardino County Department of Environmental Health Services
ADDRESS: 385 N. Arrowhead Avenue, San Bernardino, CA 92415-0160
GRADE LEVEL: K-6th

Other Sources of Educational Materials on Household Hazardous Waste

Arm and Hammer Company
469 North Harrison
Princeton, New Jersey 08540
1-800-524-1328

Educational curricula focusing on safer alternatives to household cleaning products and protection of water resources (Grades 5 & 6)

California IWMB - Public Affairs Office

1020 Ninth Street, Suite 300
Sacramento, CA 95814
(916) 327-9333

California Department of Health Services

Toxic Substances Control program

P. O. Box 942732

Sacramento, CA 94234-0476

Services: Speakers bureau; classroom presentations (K-12); seminar and conference planning;

Public Service Announcements; educator training programs;

Educational Materials: Brochures and handouts; Environmental Education Anthology; youth activity books; computer game

Dana Duxbury and Associates

16 Haverhill St.

Andover, MA 01810

(508) 470-3044

Annotated Bibliography on HHW, 1990

EHMI

P. O. Box 932

Durham, NH 03824

(603) 868-1496

Environmental education conferences; training

EHMI - Re: Source newsletter.

Household Hazardous Waste Project

1031 E. Battlefield Road, Suite 214

Springfield, MO 65807

(417) 889-5000

"Household Hazardous Waste Education for Schools: An Annotated Bibliography", 1990.

Local Government Commission

909 12th Street, Suite 205

Sacramento, CA 95814

(916) 448-1198

San Diego Environmental Health Coalition
1844 Third Avenue
San Diego, CA 92101
(619) 235-0281

Toxinformer Newsletter; household hazardous waste fact sheets; toxics use-reduction information

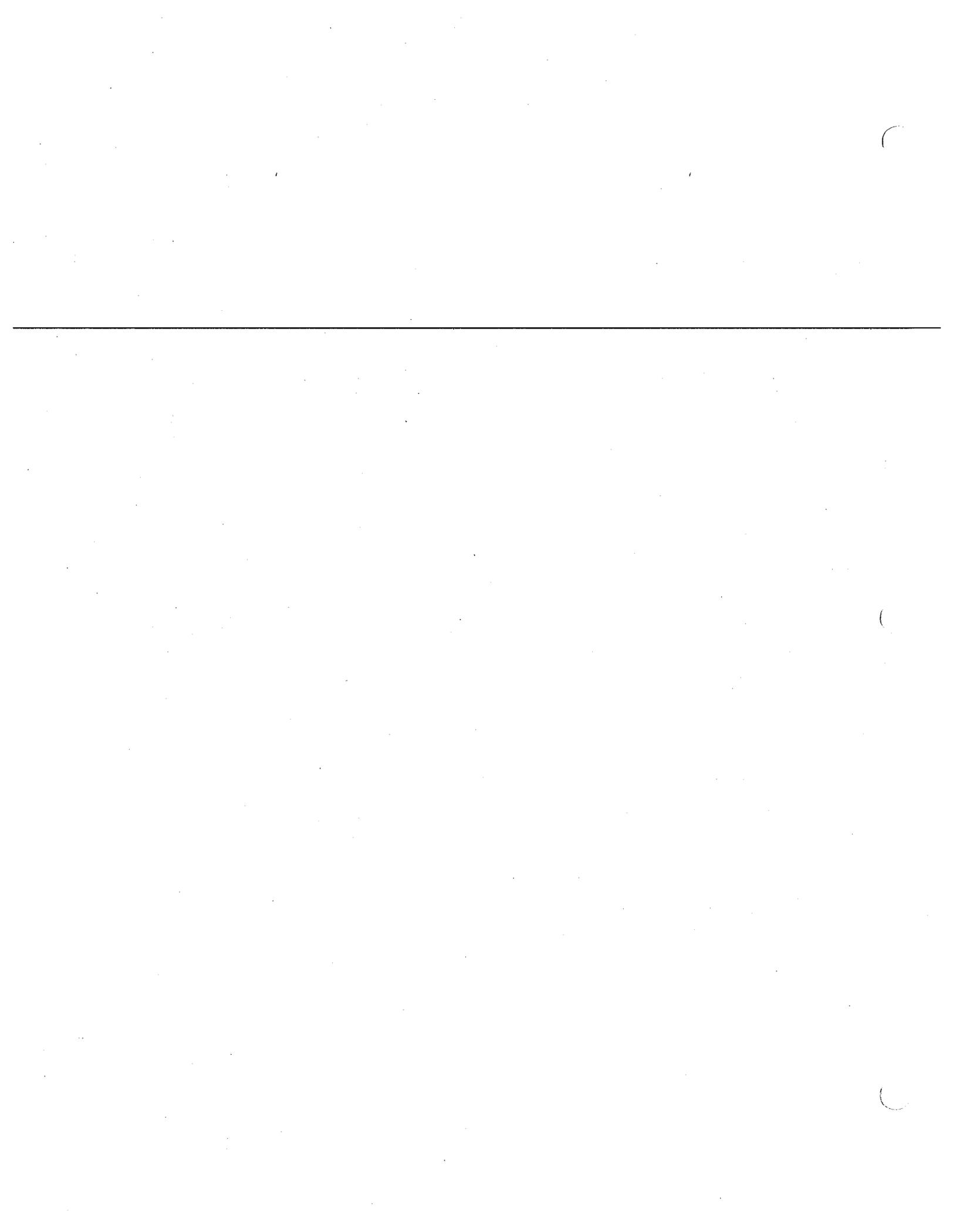
United States Environmental Protection Agency
Office of Solid Waste
401 M. Street, S.W.
Washington, DC 20460

~~(800) 677-9424~~
(202) 382-3000

US EPA
Environmental Education Division
401 M Street, SW
Washington, DC 20460
(202) 382-4361
National environmental education materials clearinghouse

APPENDIX F

**COST ESTIMATE DOCUMENTATION FOR
MULTIJURISDICTIONAL HOUSEHOLD HAZARDOUS WASTE PROGRAMS**



HHW Program Cost Estimate Worksheet

PROGRAM NAME: Periodic Collection Event Program for General HHW¹
PROGRAM TYPE: Multijurisdictional²

<u>CAPITAL COSTS:</u>	<u>ESTIMATE</u>
Site Work/Permit/Start	\$0
Buildings	\$0
Equipment/Materials	<u>\$0</u>
Subtotal	\$0
Design/Engineer @ 7.5%	<u>\$0</u>
Subtotal	\$0
Misc/Contingency @ 20%	<u>\$0</u>
Total	\$0

OPERATING COSTS:

Salaries and Wages	\$84,241
Fringe Benefits	\$20,372
Materials/Supplies	\$23,769
Equipment Replacement	\$0
Recycling/Disposal/Transport	<u>\$144,176</u>
Total	\$272,558

¹ Source: Budget Report, HHW Grant Expenditures. San Mateo County Periodic Collection Program Fiscal Year 1990-1991.

² Cost data for 33 collection events: 22 events were held in four participating jurisdictions, and remaining 11 events were held in three nonparticipating jurisdictions.

HHW Program Cost Estimate Worksheet

PROGRAM NAME: Vendor Collection Program
 PROGRAM TYPE: Multijurisdictional

CAPITAL COSTS: (1) ESTIMATE

Site Work/Permit/Start	\$0
Buildings	\$0
Equipment/Materials	\$0
Subtotal	\$0
Design/Engineer @ 7.5 %	\$0
Subtotal	\$0
Misc/Contingency @ 20 %	\$0
Total	\$0

OPERATING COSTS: (2)

Labor (3)	\$8,100
Maintenance/Fuel	\$0
Utilities	\$0
Materials/Supplies	\$0
Recycling Equipment Replacement	\$0
Disposal/Transport	\$0
Promotion (4)	\$0
Insurance	\$0
Subtotal	\$8,100
Misc/Contingency @ 20 %	\$1,620
Total	\$9,720

ASSUMPTIONS:

- (1) Assumes no capital costs incurred by participating cities or the unincorporated county.
- (2) Assumes only program administration costs incurred by county and participating cities. HHW collection and recycling operation costs incurred by vendor and passed on to participants.
- (3) Labor costs to participating cities and unincorporated county includes program development and administration, data collection, and reporting; performed by one multijurisdictional coordinator @ 15 % time @ \$45,000/yr., plus 20 % benefits.
- (4) Included in cost estimate for public education and information program.

HHW Program Cost Estimate Worksheet

PROGRAM NAME: Permanent Central Collection/Storage Facility
 PROGRAM TYPE: Multijurisdictional

<u>CAPITAL COSTS:</u>	<u>ESTIMATE</u>
Site Work/Permit/Start (1)	\$50,000
Buildings (2)	\$275,000
Equipment/Materials (3)	\$72,000
Subtotal	\$397,000
Design/Engineer @ 7.5%	\$38,400
Subtotal	\$435,400
Misc/Contingency @ 20%	\$87,080
Total (4)	\$522,480

OPERATING COSTS:

Labor Administrative (4)	\$21,600
Labor Operations (5)	\$162,000
Maintenance/Fuel	\$2,000
Utilities (6)	\$0
Materials/Supplies (7)	\$2,500
Equipment Replacement (8)	\$10,286
Recycling/Disposal/Transport (9)	\$200,000
Promotion (10)	\$0
Insurance (11)	\$0
Subtotal	\$398,386
Misc/Contingency @ 20%	\$79,677
Total	\$478,063
Annual Amortized Capital Cost (@ 11% for 20 years)	\$65,611
Total Annual Costs	\$543,674

ASSUMPTIONS:

- (1) Full site work, including: grading, utility trenching, utilities, paving/curbing, fencing, and landscaping.
- (2) Permanent Facility includes: 1 operations building (2,240 square feet) with all mechanical systems for explosion-proofing and spill drainage; and 1 office building (224 square feet).
- (3) Equipment includes: 1 used oil storage tank, 2 fume hoods, 2 emergency eye wash, misc. processing/handling equipment, drum storage lockers (3 ea.), licensed haz mat truck, utility van.
- (4) One multijurisdictional coordinator 40% time @ \$45,000/yr. plus 20% benefits.
- (5) One HHW operations supervisor 100% time @ \$45,000/yr. plus 20% benefits.
Two technicians 100% time @ \$45,000/yr. plus 20% benefits.
- (6) Included in maintenance/fuel costs above.
- (7) Drum handling & site safety equipment @ \$2,500/yr.
- (8) Replacement of equipment every 7 years.
- (9) \$200,000 for central facility; actual costs will vary significantly depending on HHW generation rate, participation rate, disposal vs. recycling ratios, and methods of disposal and recycling used.
- (10) Included in cost estimate for public education and information program.
- (11) Included in recycling/disposal/transport costs.

HHW Program Cost Estimate Worksheet

PROGRAM NAME: Satellite and Solid Waste Facility HHW Collection Facility (Cost Per Site)
 PROGRAM TYPE: County Operated

<u>CAPITAL COSTS:</u>	<u>ESTIMATE</u>
Site Work/Permit/Start (1)	\$7,500
Buildings (2)	\$10,000
Equipment/Materials (3)	\$1,500
Subtotal	\$19,000
<hr/>	
Design/Engineer @ 7.5%	\$1,425
Subtotal	\$20,425
Misc/Contingency @ 20%	\$4,085
Total	\$24,510

<u>OPERATING COSTS:</u>	
Labor (4) Administrative	\$1,350
Labor (5) Operations	\$48,600
Maintenance/Fuel	\$500
Utilities (6)	\$0
Materials/Supplies (7)	\$1,000
Equipment Replacement (8)	\$429
Recycling/Disposal/Transport (9)	\$90,000
Promotion (10)	\$0
Insurance (11)	\$0
Subtotal	\$101,450
Misc/Contingency @ 20%	\$26,290
Total	\$121,740
 Annual Amortized Capital Cost (@ 11% for 20 years)	 \$3,078
Total Annual Costs	\$124,818

ASSUMPTIONS:

- (1) Site work includes: grading, paving/curbing, fencing, and landscaping.
- (2) Hazardous materials storage buildings.
- (3) Equipment includes: emergency eye wash/shower stations, misc. processing/handling equip.
- (4) One multijurisdictional coordinator 2.5% time @ \$45,000/yr., plus 20% benefits.
- (5) One HHW operations supervisor 15% time @ \$45,000/yr., plus 20% benefits. Three technicians 25% time @ \$45,000/yr., plus 20% benefits.
- (6) N/A
- (7) Site safety equipment, drums, etc.
- (8) Replacement of equipment every 7 years.
- (9) Actual costs will vary significantly depending on HHW generation rate, participation rate, disposal vs. recycling ratios, and methods of disposal and recycling used.
- (10) Included in cost estimate for public education and information program.
- (11) Included in recycling/disposal/transport costs.

HHW Program Cost Estimate Worksheet

PROGRAM NAME: Mobile Collection Event Program
 PROGRAM TYPE: Multijurisdictional

<u>CAPITAL COSTS:</u>	<u>ESTIMATE</u>
Site Work/Permit/Start (1)	\$0
Buildings (2)	\$0
Equipment/Materials (3)	<u>\$0</u>
Subtotal	\$0
Design/Engineer @ 7.5%	<u>\$0</u>
Subtotal	\$0
Misc/Contingency @ 20%	<u>\$0</u>
Total	\$0

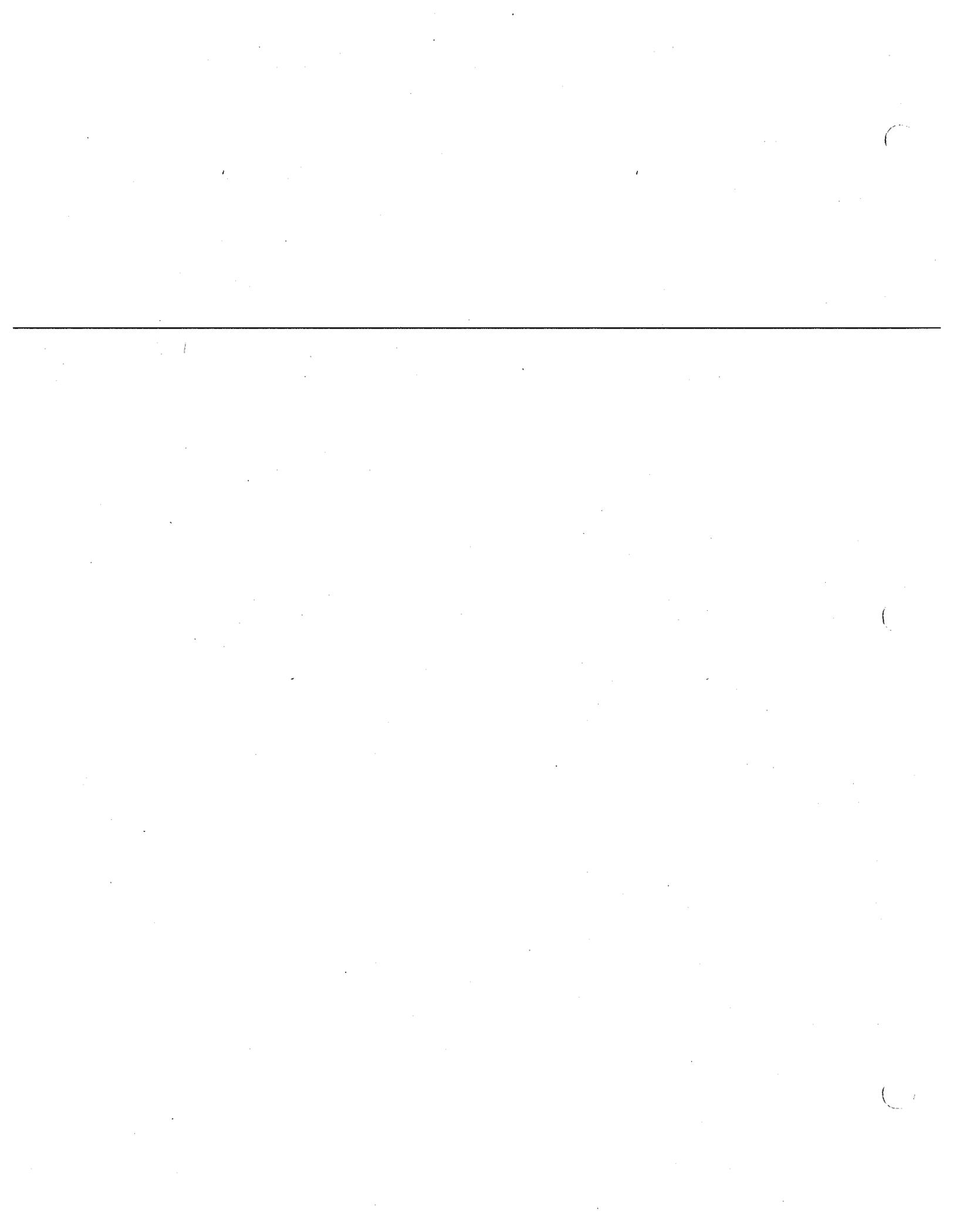
OPERATING COSTS:

Labor (4) Administrative	\$13,500
Labor (5) Operations	\$43,200
Maintenance/Fuel (6)	\$0
Utilities (7)	\$0
Materials/Supplies (8)	\$15,000
Recycling Equipment Replacement (9)	\$0
Disposal/Transport (10)	\$150,000
Promotion (11)	\$0
Insurance (12)	<u>\$0</u>
Subtotal	\$221,700
Misc/Contingency @ 20%	<u>\$44,340</u>
Total	\$266,040

ASSUMPTIONS:

Cost estimate assumes operation of ten three-day collection events held in outlying areas of the county. Collection services provided by contractor.

- (1) No site work required; permit procurement costs included in labor costs below.
- (2) No buildings are required.
- (3) N/A - all equipment provided by contractor.
- (4) One multijurisdictional coordinator 25% time @ \$45,000/yr., plus 20% benefits.
- (5) Three technicians 20% time @ \$45,000/yr., plus 20% benefits. One HHW operations supervisor 20% time @ \$45,000/yr., plus 20% benefits.
- (6) N/A - included in materials/supplies cost.
- (7) N/A - included in materials/supplies cost.
- (8) Materials/supplies includes contract services other than labor; \$1,500/site.
- (9) N/A - equipment provided by contractor.
- (10) \$15,000/event; actual costs will vary significantly depending on HHW generation rate, participation rate, disposal vs. recycling ratios, and methods of disposal and recycling.
- (11) Included in cost estimate for public education and information program.
- (12) Included in disposal/transport costs.



APPENDIX G

**EXCERPTS FROM THE OX MOUNTAIN
LANDFILL LOAD CHECKING PROGRAM**

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APPENDIX G

EXCERPTS FROM THE OX MOUNTAIN LANDFILL LOAD CHECKING PROGRAM

IV. PROCEDURES FOR HANDLING IDENTIFIED HAZARDOUS WASTES

If hazardous or other unacceptable wastes are detected, the Operator's site personnel will immediately cordon off the designated area from the general public and site personnel not involved in the incident. The Operator will immediately notify their immediate supervisor and if needed the San Mateo County Hazardous Material Unit by activating 911 which will be responsible for assessment, directing and cleanup. Transport and disposal of the wastes will be done utilizing IT Corporation or a safety specialist. The incident and response will be recorded in the site records.

If the producer of the waste is known, the producer will be immediately contacted and notified of the incident and the action taken. The producer will be billed for all additional costs incurred in the proper cleanup, transport, and disposal of the waste. If the producer of the waste is not known, the hauler will be responsible for all costs.

Throughout the waste handling process, the Operator's site personnel will follow the proper safety procedures for worker protection from hazardous materials.

The California Regional Water Quality Control Board (CRWQCB) San Francisco Bay Region, California Waste Management Board and San Mateo County Environmental Health and any other appropriate agencies will be notified by BFI of any significant incidents and responses taken. See EXHIBIT 2 for Notification Responsibility Index.

