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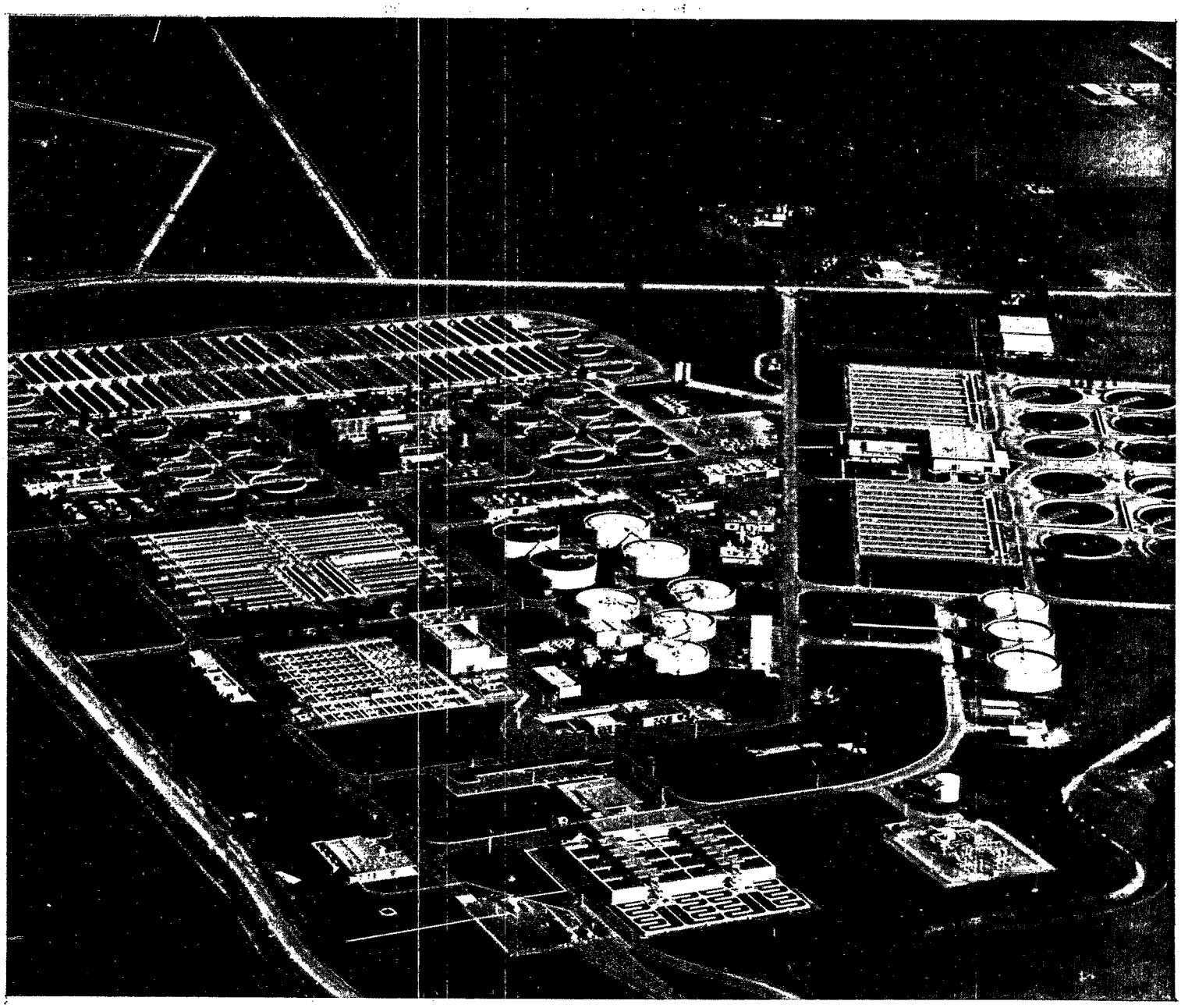
Collecting Household Hazardous Wastes At Wastewater Treatment Plants

Case Studies



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Notice

Collecting Household Hazardous Wastes At Wastewater Treatment Plants

United States
Environmental Protection Agency
401 M Street SW. (WH-546)
Washington DC 20460

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Introduction

The advent of integrated solid waste management programs across the United States has produced a growing need for environmentally sound alternatives for the disposal of Household Hazardous Waste (HHW). HHW includes pesticides, motor oil and automobile batteries, common cleaners, solvents, paint products, and any other household material that may be corrosive, reactive, ignitable, or otherwise damaging to human and environmental health. Recent research has evaluated how household hazardous waste being handled by homeowners affects the quality of domestic sewage discharged to wastewater treatment plants. Studies have found that HHW contributes significantly to injuries, accidents, and environmental contamination. As much as 7.5 percent of municipal treatment plant influent is reportedly comprised of residential organic chemicals; the residential contribution of hazardous metals is reportedly 20 percent of the influent. (USEPA 1986)

Solvents, paint thinners and degreasers, pesticides, gasoline and used motor oil are often disposed in residential wastewaters. Substantial contributions of metals in wastewaters result from disposal of a variety of cleaners and cosmetics along with paint products and hobby supplies. These types of contaminants in wastewater can result in worker injuries, pipe damage and environmental pollution. In addition, air emissions resulting from sludge incineration and ground and surface water contamination from residues in land-disposed sludge increase the environmental liability associated with wastewater treatment. As the population increases and environmental regulations tighten, HHW collection programs present an opportunity to reduce the potential for this type of contamination and improve the public image and understanding of the importance of wastewater treatment and the impact of HHW on wastewater treatment processes.

Hundreds of HHW collection programs are implemented throughout the country each year. These programs include community collection events, door-to-door collection, and permanent collection centers and are sponsored by various organizations such as wastewater treatment facilities, water supply utilities, private industry, recycling centers, and municipal government centers. Community collection events are commonly conducted over a one or two-day period at local municipal centers, e.g., schools, public facilities. These events range in cost from $5,000 to over $100,000 per event dependent on the extent of participation and the types of waste collected. Community events are often successful at removing large quantities of HHW from the municipal waste stream; however, they are typically expensive (in comparison to permanent centers) because of the inability to accurately forecast participation. Community events are also understaffed and ill-equipped to handle certain waste types and volumes. Permanent collection centers offer opportunities for year round HHW collection, and, unlike community events, typically provide adequate areas for collection and storage of all types and volumes of HHW. These facilities, however, are costly to construct, and may require special permitting. Door-to-door or curbside collection events are becoming less common; participation in these events is generally minimal. Excessive personnel liability is associated with this type of collection program.

Wastewater treatment plants can provide ideal facilities for HHW collection. These facilities are often equipped to handle emergency spills and may offer a disposal option for non-hazardous household materials. In addition, HHW collection at wastewater treatment plants creates an opportunity for public education about HHW and wastewater treatment.

The extent of involvement of a wastewater treatment plant in HHW collection can vary. Collection programs or permanent centers can be located at a wastewater treatment facility or sponsored or co-sponsored by the municipal sanitary treatment authority. Five case studies outlining the role of the wastewater treatment plant in HHW collection are presented in the remainder of this report. The studies are intended to provide details on the organization, development and implementation of HHW collection programs related to wastewater treatment plants. This information can be used as a supplement to other EPA publications relating to HHW collection (e.g., "How to Design and Implement a Household Hazardous Waste Collection Program"), available from EPA's Office of Solid Waste and Emergency Response in developing an appropriate HHW collection program.

Key components of the HHW collection programs outlined in this report are summarized in Table 1-1. Daily participation for each collection event averaged 374 participants. The extent of participation varied with the population serviced and the type of collection (events or permanent). Lower daily participation was observed for permanent collection centers.

Funding sources for the events included municipal, state, and public organizations. In each case, municipalities are in the process of identifying and evaluating dedicated future funding sources.

Principle problems and limitations associated with HHW collection

programs identified in this study included inability to accurately forecast public participation which lead to budgeting and logistical problems (e.g., traffic congestion and lack of working space during collection events). Sponsoring agencies also demonstrated a lack of understanding of local and state permitting and liability issues. Permanent centers, for example, were designed and built for containment of hazardous materials, and appeared over-equipped for HHW collection. One-day events relied on contractors that were certified hazardous waste haulers, but were overwhelmed by the extent of public participation and therefore poorly prepared for HHW collection.

Table 1-1

Summary of HHW Collection Programs

Design Characteristics	HHW Programs				
	St. Johns, MI	Orange County, CA	Palo Alto, CA	South Central CT Regional Water Authority	Jefferson County, KY
Program Type	one-day	permanent weekly	regular one-day	permanent seasonal	one-day, multiple sites
Location	Wastewater Treatment Facility	Recycling Center	Wastewater Treatment Plant	Dedicated Collection Facility	Six public parking lots
Local or regional program	local	regional	local	regional	regional
Population served	7,800	2.5 million	65,000	15 participating towns	750,000
Number of participants per day (households)	452	90	526	152	3,900 (total)
Sponsoring agencies	City of St. Johns Water Treatment Facility	Orange County govt. Orange County Fire Dept.	City of Palo Alto Water Treatment Plant	Regional Water Authority 15 participating towns	City of Louisville Jefferson County Govt Metropolitan Sewer District
Operational cost	$10,000	unknown at this time	$50,000	unknown at this time	$320,000
Construction cost	NA	$5,000 per facility	NA	$250,000	NA
Funding source	refuse collection bill	landfill tipping fee	refuse collection bill	town general funds	general city and county funds
State permit required	no	yes	yes	yes	no

NA - not applicable

* preliminary figure that does not include leased storage units

Case Studies— Hosting HHW Collection At The Wastewater Treatment Plant

2.1 Rationale

Principal concerns in siting of HHW collection centers are accessibility to emergency spill equipment and water supplies, and potential for facilities to adequately provide for traffic flow. A number of communities have found that wastewater treatment plants (WWTP) provide the necessary spill control measures, water supplies and vehicular accessibility for HHW collection as well as offer convenience to target populations. Use of the treatment plant for one-day collection events is also advantageous over the use of other public facilities since other events which would conflict with a collection program are not likely hosted by the WWTP (e.g., high school sporting events, social activities). Locating permanent centers at the WWTP also provides continued staffing for screening and storage of HHW.

The cities of St. Johns, Michigan and Palo Alto, California were identified as two municipalities where HHW collection is held at the WWTP. St. Johns provides annual one-day collection events at the WWTP, while Palo Alto, which formerly conducted HHW collection at the recycling center, has recently initiated quarterly HHW collection at the WWTP. Both communities reported enthusiastic public participation. Neither event conflicted with operation of the treatment facility. Each community intends to continue HHW collection at the WWTP.

2.2 Case Study St. Johns, Michigan

Introduction

Since 1988, the City of St. Johns, Michigan has held two, one-day HHW collection events at the local wastewater treatment plant. Both events were organized to increase public awareness of the wastewater treatment process and the importance of proper disposal of HHW. In addition, the HHW collection events aided the local voluntary recycling program by providing a safe disposal alternative for non-recyclables. It also provided an opportunity for local and regional elected officials to view HHW collection and wastewater treatment processes first hand.

Program Design

Location and Schedule

The following is based on the most recent HHW collection event held at the St. Johns Wastewater Treatment Facility (WTF) on Saturday, June 30, 1990 (Figure 2-1). This event was advertised as part of the city's annual Spring Clean Up. During Spring Clean Up the city provides additional waste collection services to discard items not normally handled by the regular refuse hauler (e.g., bulk items, appliances, furniture, etc.). Throughout the two-week Spring Clean Up program, residents were instructed to consolidate HHW and take it to the HHW collection event. Drug and Lab Disposal Inc., a full service HHW collection and disposal contractor was hired to service the event. In addition, the WTF offered a HHW home pick-up service to senior citizens. In the week prior to the collection day senior citizens could call the WTF and arrange for a staff person to pick up HHW. This material was stored at the WTF for disposal by Drug & Lab Disposal, Inc. on the day of the collection event.

The WTF is conveniently located, and is well designed for HHW collection. The driveway is U-shaped and facilitates good vehicular circulation, preventing traffic problems. The public is greeted at the facility gate by a WTF employee who checks identification for proof of St. Johns residency (Figure 2-2). Traffic moves around behind the facility to the collection site where participants are asked to complete a questionnaire relating to the collection program and proceed to the unloading area. The questionnaire is designed to solicit

Figure 2-1
St. Johns HHW Collection Event

Figure 2-2
Verifying St. Johns Residence

information relating to the public perception of the HHW collection program. Citizens are encouraged to remain in their cars while materials are unloaded by staff from the WTF and the contracting company (Figure 2-3). Chemists from the collection company classify the material and prepare it for transport.

The St. Johns WTF, tertiary treatment facility, learned about HHW collection from the State of Michigan Waste Management Division (WMD). WMD administers the Clean Michigan Fund to award grant money to municipal governments for the purpose of developing and implementing HHW collection events. This fund was used for the first HHW collection event in St. Johns (1988); it was not used for the 1990 event since the fund is intended only for program development. Municipalities are charged with maintaining the subsequent collections.

Personnel

The city retained a contractor to sort, store, transport and dispose of HHW collected during the event. WTF staff, however, provided many services including advertising, home pick-up, and organizational and touring responsibilities during the collection event. Advertising and home pick-up involved approximately two employees, part-time, over a three-week period prior to the collection event. During the event three WTF employees were needed to direct traffic, check I.D.'s for residence verification, administer questionnaires, and help the contractor unload HHW from the vehicles. Several other employees were available to give facility tours and answer questions about the facility.

Emergency staff (e.g., police, fire department) were not at the WTF during collection events. However, the local hospital and the fire department was informed of the event.

Contractor

Drug and Lab Disposal, Inc. was hired to complete the collection events that have been held in St. Johns. Rather than using a competitive bid process, the municipality researched local HHW collection contractors and made their decision based on the HHW collection

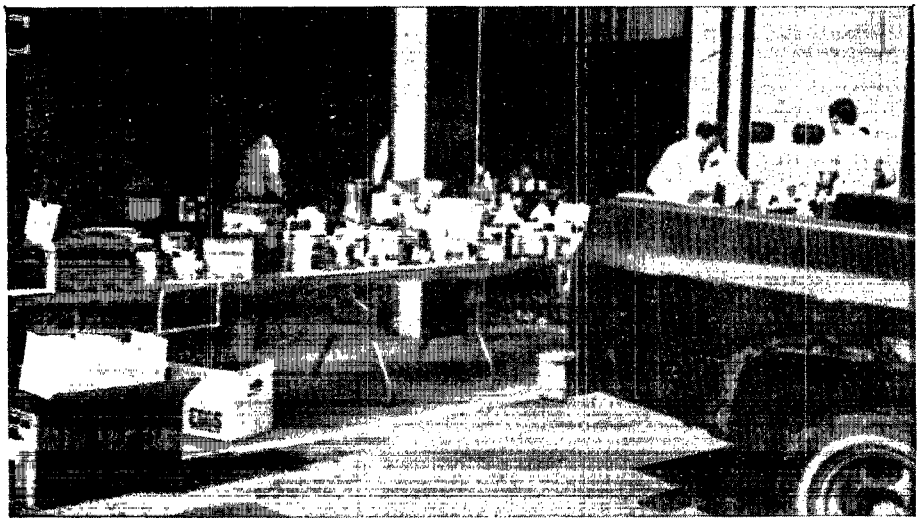

Figure 2-3
Collection and Packaging Area
St. Johns MI

experiences of other municipalities in the area. Drug & Lab Disposal, Inc. is equipped and licensed to haul special industrial and hazardous waste. They operate a certified Toxic Substances Disposal Facility (TSDF) and can therefore expedite the packing process and re-sort materials at their facility.

Administrative Organization

Funding

Costs involved for St. John's HHW collection events include the contractor's services, advertising such as posters, mailings, and press releases, and internal costs for staff on the collection day and days preceding the event for home pick-up for senior citizens.
Internal costs to the municipality for publicity and labor are difficult to quantify; however, they are estimated at approximately $2,500. The budget for contracted services for the first event was set for between $6,000 and $9,000. The actual cost of the hauler's services was $7,800. For the second event, a not-to-exceed $10,000 budget was negotiated with the contractor. The actual value of contractor services at the second event was $28,379; St. Johns, however, was only charged $10,000 because of the not-to-exceed price ceiling. The high cost of the collection was attributed to the large turn-out resulting from coordinating the collection event with the City's Spring Clean Up. The municipality anticipates that the costs for future collection events will be significantly greater because the contractor is now aware of the quantity of HHW that will be collected and will be more conservative in future budget negotiations.

Publicity

The collection event was advertised using direct mailings, newspaper articles, and notices on bulletin boards in grocery stores and laundromats. Copies of newspaper articles are provided in Appendix A (Item 1). HHW brochures from the Water Pollution Control Federation were also mailed to residents along with a detailed notice of the event. The notice stressed that the collection event was free and was provided as a means for residents to recognize the hazardous materials in their households and conveniently dispose of them. In addition, the notice advised senior citizens that door-to-door collection was available at their request.

Regulatory /Liability Requirements

The State of Michigan does not require municipalities to purchase additional insurance or obtain special permits for HHW collection. However, the waste hauler is required to be fully licensed and insured for collection, transportation, and hauling of hazardous materials.

Results

The results of the June 1990 St. Johns HHW collection event are presented in Table 2-1. The event was considered successful on the basis of public participation and positive feedback from the community. The event drew approximately 452 participants from a population of approximately 7,800. This is a high level of participation compared to the turn-out observed at similar one-day collection events held elsewhere in the United States (1% to 2% on average). Municipal staff attribute the success to the coordination of the event with the City's annual Spring Clean Up. Materials collected included 915 gallons of oil based paint, 3,902 pounds of car batteries, 21 gallons of pesticides, 4 cubic feet of asbestos, and 400 gallons of paint thinner and other solvents.

Table 2-1

Household Hazardous Waste Collection
St. Johns, MI
June 30, 1990

Sponsor:	City of St. Johns
Contractor:	Drug and Lab Disposal
Participation:	452 vehicles

Waste Collected	
Unknown Aerosols	452 cans
Oil based Paints	915 gallons
Automobile Batteries	3,902 lbs.
Pesticides	21 gallons
Liquid Solvents	400 gallons
Asbestos	4 cu. ft.

The Citizens of St. Johns were enthusiastic about the collection event and indicated on questionnaires a willingness to pay a greater fee for the service. The WTF received numerous telephone calls after the event from individuals who had missed the opportunity and still wanted to dispose of HHW. The county government is therefore planning a HHW collection event for the near future and is seeking assistance from the City of St. Johns in organizing the event.

Problems and Limitations

The main problem with HHW collection in St. Johns is the financial and manpower commitment required for contractor services. As mentioned earlier, the actual value of the most recent collection event far exceeded the municipality's budget and therefore the

next collection event is anticipated to be much more costly. To reduce costs, the municipality is considering operating future events using trained staff from the WTF to sort, package and transport the material off site. However, this idea is under preliminary investigation and any decision will require full consideration of all aspects of the tasks required for HHW collection.

Contacts

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2.3 Case Study Palo Alto, California

Introduction

The Palo Alto Department of Public Works initiated a HHW collection program in 1983 to minimize toxic chemical contamination of municipal wastewater at the Regional Water Quality Control Plant (RWQCP), protect refuse workers from injuries associated with HHW, and prolong the life and protect the environmental integrity of the City landfill. The City has been cited for a violation by the California Integrated Waste Management Board for disposal of unacceptable materials (paint cans and empty flammable material containers) in the landfill. The HHW collection program is designed to reduce the volume of such materials requiring landfill disposal.

Over the last seven years, 26 HHW collection events have been held at the Palo Alto Recycling Center. These events are held on a quarterly basis and have had greater participation in recent years. As a result, the City decided to relocate the collection events to the RWQCP to minimize traffic problems and provide a more organized collection program.

Program Design

Location and Schedule

HHW collections in Palo Alto are held at the RWQCP quarterly, on Saturdays from 10:00 am to 3:00 pm. However, starting in September, 1990, the City began a trial monthly collection program on Saturdays from 9:00 am to 12:00 noon. The Palo Alto Public Works Department sponsors the events. A HHW collection contractor is hired to package and transport and dispose of HHW.

HHW collection events were originally located adjacent to the RWQCP at the Palo Alto Recycling Center, on the grounds of the local landfill. This 2.4 acre site provided adequate space for unloading and sorting materials; however, traffic flow became problematic as attendance at these events increased. Consequently, the City recently moved the HHW collection events to the RWQCP. Unlike the Recycling Center, the RWQCP has a separate entrance and exit, along with ample parking space to allow good traffic flow through the facility. The collection site is situated along the edge of a parking lot. The HHW collection contractor, Safety Specialists, Inc., (SSI) sets up tables and tent areas for sorting and packaging HHW. The contractor also surveys participants to verify city residence, identify first-time attendees and determine the number of households represented by a single carload. All attendees are required to remain in their vehicle while the contracting staff unloads HHW.

Because Palo Alto has had a HHW collection program for so long, the schedule and organization of the events has become somewhat standardized. SSI has always serviced Palo Alto for HHW collection and is familiar with the attendance rates and the city's approach to HHW collection.

Personnel

SSI, the HHW collection contractor, provides complete service for HHW collection events, therefore these events do not involve a large staff of city employees. Most events are staffed by one city employee from the Public Works Department and approximately 24 contracted professionals including 5 people to administer surveys and direct traffic, 15 technicians, 3 chemists and 1 project manager. The city employee is available to answer questions, make any necessary decisions, and oversee the contracted staff.

Contractor

Contractor selection is conducted through a competitive bid process. Every three years the city issues a Request for Proposal (RFP) for the program. The RFP outlines the city's requirements for the contract and specifies the number and qualifications of employees to staff the events, as well as the services (including traffic control, materials handling, site preparation, demobilization and cleanup) that must be provided by the contractor.

SSI has always been awarded the contract for HHW collection. Because SSI is not a full Toxic Substance Disposal Facility, the company must contract with various hazardous waste management facilities to dispose of Palo Alto's HHW appropriately. SSI is fully licensed with the United States Department of Transportation to transport hazardous materials.

SSI attempts to recycle much of the HHW collected at Palo Alto. Motor oil and reusable solvents are separately collected for reuse as fuel; automobile batteries are recycled. Non-recyclable materials are sent either to an incinerator or to a Class I landfill elsewhere in the State of California.

Administrative Organization

Funding

The budget for each event in the 1990-1991 operating year was raised to $55,000 from the 1989-1990 budget of $40,000. Actual costs vary, but the average actual cost per event for 1989-1990 was $50,474. This figure represents only charges for the contractor. Internal costs for program organization and administration are not tracked; however, these tasks, because they have been standardized over the years, require less financial commitment than the original program development.

The HHW collection program is funded through the residents' refuse fee set by the Palo Alto City Council. The council is supportive of HHW collection, consistently approving increases in the program budget. The residents are also supportive of the collection program. Survey results from recent collection events indicate that 78% of the attendees surveyed were willing to pay an additional fee of between $5.00 to $20.00 for the service.

Publicity

Because the residents of Palo Alto consistently support regular HHW collection events, publicity for these events is limited to a utility bill insert one month in advance of the event (Appendix A Item 2) and a notice in the local newspaper one week in advance. The notices identify HHW and provide an explanation of why it should be taken to the collection event. A directional map for the collection site is also printedon the notice, along with a reference to the state transportation regulations limiting the amount of hazardous materials that may betransported.

Regulatory/Liability Requirements

HHW is not exempt from California regulations governing hazardous waste handling. These regulations require permits for any activity that involves the handling of hazardous waste. Therefore, for HHW collection events, municipalities in California must obtain a letter of approval or a variance from the permit requirement from the California Department of Health Services. Permanent facilities that store HHW for up to 90 days are generally not eligible for this variance, and must apply for a full hazardous waste handling permit. California HHW regulations are currently in transition; the Department of Health is moving to a permit-by-rule approach that will allow 7-day storage for one-day events and will require appropriate documentation of plans for emergency response and site operation.

The City of Palo Alto is self-insured; however, the contract with the collection company stipulates that the company maintain a $1,000,000 insurance policy including full workman's compensation, general and comprehensive liability, and sudden or accidental pollution coverage. The contractor must also name the City of Palo Alto as an additional insured party.

Results

Because Palo Alto has sponsored HHW collections for a number of years, they have acquired a large database of information about participation rates, materials collected and costs involved. Results of each collection during the 1989-1990 period are markedly constant (Table 2-2). Of Palo Alto's 65,000 residents, an average of 526 households (approximately 3%) are represented at each event. This level of participation is relatively high for regularly scheduled collections. Table 2-3 summarizes the survey results and volumes of HHW collected from the April 28, 1990 event held at the RWQCP. Over half of the participants had never attended a HHW collection event and most had learned about it from the utility bill insert.

Future events are expected to continue to attract a consistent level of participation. RWQCP managers were attentive to the HHW collection event and its impact on the facility. Although they were not directly involved with this first collection event, the RWQCP managers are working on an education campaign to familiarize the public with wastewater treatment. These collection events provide a forum that could be extremely valuable to this outreach effort.

Problems and Limitations

The biggest problem encountered at events held at the recycling center was traffic control and disruption of the recycling operation. Because the center shares the access road with the local landfill, residents transporting goods to the landfill were inconvenienced by the long lines resulting from HHW collection. Communication became problematic as these individuals were not aware of the reason for the delay.

While these traffic problems were not encountered at the RWQCP, a minor problem was reported for this location. Sensors at the plant used to monitor for chlorine leaks are extremely sensitive and are known to be activated with some frequency. Although these alarms have never indicated a real danger to individuals on site, they can cause concern among the collection participants and staff if they sound during the event. Therefore, precautions must be taken to limit the number of cars entering the facility at any given time to facilitate safe evacuation if it becomes necessary. During an event held on July 28, 1990, the alarm went off; traffic was halted at the entrance and the problem was rectified, preventing any necessary evacuation or disruption of the collection event.

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Table 2-2

Household Hazardous Waste Disposal Program Summary
Palo Alto, CA
Fiscal Year 1989-90

Participation (No.)	July 1989	Oct. 1989	Jan. 1990	Apr. 1990
Vehicles	398	470	423	538
Households represented	463	541*	462	641
Previous participant	175	283	191	233
New Participant	223	187	232	305
Hazardous Waste Collected (No.)				
Drums for disposal	978	253	109	116
Drums for incineration	24	13	16	23
Gallons of latex paint recycled	2,133	180	556	1,262
Vehicle batteries recycled	32	30	36	89
Costs				
Estimated budget	$40,000	40,000	40,000	40,000
Actual expended	$46,675	63,796	43,276	48,148

* Due to heavy rainfall, the survey takers were unable to record full information.
The number of households figure is an estimate based on responses from 231 vehicles.

Table 2-3

Household Hazardous Waste Day,
Palo Alto, CA
April 28, 1990

Number of Vehicles	538	up from 423
Number of Households	641	up from 462
Previous participants	233	43%
New participants	305	57%
How participants heard of program:		
Newspaper ad	118	22%
Utility bill	369	69%
City Offices	18	3%
Word of Mouth	13	2%
Other	32	6%

Council Questions	**Yes**	**No**
Aware program funded by garbage fee	164 - 30%	374 - 70%
Aware of cost to City $100-200 per participant	35 - 6%	503 - 94%
Willingness to pay additional fee*	419 - 78%	119 - 22%
How much		
	$5	246 - 59%
	$5-20	156 - 37%
	+$20	17 - 4%

Hazardous Waste Collected
Drums of hazardous waste packed for disposal
Drums of hazardous waste packed for incineration
Drums of latex paint recycled
Auto batteries recycled through City program

***Comments regarding additional fee:**
Do not support additional fee - deterrent to proper disp
already too many fees.
Support of additional fee - support if users fee only, su
if based on volume produced.

Case Study— Hosting HHW Collection At A Facility Other Than The WWTP, With WWTP Sponsorship

3.1 Rationale

The wastewater treatment facilities of many communities either because of location or type of operation, do not provide adequate facilities for HHW collection. This, however, does not preclude the involvement of municipal wastewater authorities in HHW collection. In these instances, municipal wastewater authorities can provide sponsorship and staffing for HHW collection programs.

The South Central Regional Water Authority of New Haven Connecticut services a number of rural communities with small, simplified wastewater treatment facilities. Larger wastewater treatment facilities of the type required to host an HHW collection do not exist within the Authority's service territory. The Authority has therefore assisted in the development of an HHW collection program which relies on a permanent collection center. Details of the operation of the permanent center follow.

3.2 Case Study South Central Regional Water Authority, New Haven, Connecticut

Introduction

Connecticut's first permanent HHW redemption center is located at the South Central Connecticut Regional Water Authority in New Haven. Previously the area relied on intermittent, one-day collection events sponsored by individual municipalities. However, because these events were costly to implement and participation was limited, the Regional Water Authority committed to building a permanent HHW collection center. The facility is open to residents from the 15 municipalities participating in the project on Saturdays for six months each year (April - October).

Program Design

South Central Connecticut's regional HHW collection facility, Hazwaste Central, is a permanent facility operated seasonally from April through October. The facility is located in the parking lot behind the Regional Water Authority building and is open for service on Saturdays from 9:00 am to 12:00 noon. The Regional Water Authority hired Laidlaw Environmental Services, Inc. (Laidlaw), a private HHW collection company, to operate the facility and transport HHW off site on a monthly basis. Participation is encouraged from all individuals served by the Authority although proof of residence is not required. Each of the 15 participating towns sponsors two collection events a year at Hazwaste Central. These events are referred to as Home Days. Transport and disposal costs along with publicity and volunteers are provided by the town sponsoring the Home Days. Volunteers direct traffic, administer public response surveys and answer participants' questions.

Hazwaste Central is fully permitted by the Connecticut Department of Environmental Protection (DEP) as a solid waste handling facility. The permit allows material to be stored for up to 90 days. The facility was designed according to state regulatory specifications; it includes three ventilated storage bays and three 250-gallon waste oil storage tanks situated on a raised concrete platform within a large paved bermed area. The facility is fenced and equipped with alarm systems designed to detect forced entry, leaks and fires. Drainage, including runoff, is discharged through an oil-water separator; a shower/eyewash station is located at each end of the facility. A large awning that provides shelter from rain is assembled for each event and tables covered with plastic are placed in various locations to sort the material. A telephone and other equipment are housed in a small shed at the corner of the facility.

The staff at the Regional Water Authority was introduced to the concept of HHW collection after a study commissioned by the New Haven Recycling Program identified their facility as an optimal location for a permanent HHW collection center. The Authority is conveniently located adjacent to Interstate 95 in New Haven on a large property with sufficient space to handle traffic. The Water Authority's commitment to this project was followed by efforts to gain the active support of the communities serviced by the Authority. The Water Authority solicits partial funding, advertising, and staff from various community volunteer organizations to assist in operating the collection facility.

Personnel

Staff requirements on the part of the Regional Water Authority have been limited. A full-time consultant was hired for the first two years of Hazwaste Central operation. The consultant worked with the design engineers, DEP, participating towns, and the collection company to build the facility, develop operational protocol, and negotiate permits, contracts, financial contributions, and agreements. Two part-time workers also assist with public outreach and volunteer training. Additional part time help is provided to assist with budget and billing issues.

Laidlaw provides 5 to 16 employees for each weekly collection. These individuals are trained in hazardous materials handling procedures and are the only people responsible for unloading, sorting and packing HHW. Each week, 5 to 10 volunteers from the town sponsoring the collection are available to direct traffic, answer questions and administer surveys. Generally, these individuals are selected from local civic organizations such as the League of Women Voters, the Rotary Club and local garden clubs.

Contractor

Laidlaw, a full service company experienced in HHW collection, was selected by the Water Authority on the basis of competitive bid. Contractor selection was based on a criteria matrix that included cost and level of perience.

Administrative Organization

Funding

Administrators from the South Central Regional Water Authority presented plans for Hazwaste Central to the South Central Regional Council of Governments to raise funds for the project. The Council provided a preliminary forum to present the project to towns serviced by the Authority. Although town representatives to the Council were receptive to the plan, further efforts were necessary to present the project to individual town councils to obtain a three-year funding commitment from each community.

Fiscal requirements for the HHW collection facility include construction costs, operating costs (including transport and disposal), and internal administrative costs. The total budget for constructing the facility, approximately $250,000, is financed over three years by participating towns, the Water Authority, and a grant program offered by the Connecticut State Legislature that provided $100,000 for construction. To defray the costs of building and operating Hazwaste Central, the Water Authority also solicited private contributions from organizations such as Olin Charitable Trust, Browning Ferris Industries, Cestari & Company and the Humphrey Chemical Company, Inc. Contributions totalled approximately $46,000. Some of these contributions were dedicated for development of public service announcements, educational videos, newspaper advertisements and color brochures.

Operating, transport and disposal costs for each collection event are the responsibility of the fifteen participating towns, based on the population and estimated attendance at Hazwaste Central. For the first fiscal year of operation, five percent of the transport and disposal costs are being paid by the DEP from start-up funds available for first-time HHW collection programs. Each town sponsors two events per year which range in cost from approximately $1,800 to $32,000, depending on participation rates (quantity collected).

Publicity

Construction of the permanent facility was highly publicized throughout the area through public service announcements, press releases, newspaper articles and advertisements and informational inserts with the water bills. The collection events continue to be advertised in the press and by organizations. Each town draws volunteer staff from local civic organizations such as the Lions, Rotary, and Garden clubs to assist at Home Days. Advertising and staffing HHW collection events gives these groups visibility and an opportunity for fund raising activities.

Regulatory /Liability Requirements

Regulatory and liability issues are considered the most costly and time-consuming aspect of building the permanent HHW collection facility. Neither the DEP nor the Water Authority's insurance company had experience in permanent HHW collection.

HHW is exempt from Connecticut Hazardous Waste Regulations. Organizations sponsoring HHW collection events or developing permanent facilities are required by the State of Connecticut to obtain a

Municipal Solid Waste Handling Permit, however. The Water Authority's HHW collection facility was the first of its kind to be permitted by the DEP. Because of this precedent, the facility design was regarded as crucial to the appropriate development of future facilities. It was therefore permitted in accordance with guidelines for hazardous material storage facilities. The permitting process was extensive and required significant negotiation of storage and disposal standards.

In addition to permitting, liability issues for the towns and Water Authority were subject to negotiation. The Water Authority spent considerable time educating the insurance companies and participating towns on the HHW collection liability issues. The Water Authority developed a service contract with Laidlaw, under the direction of legal counsel, which specified the services, permits and insurance to be provided by the collection company, as well as provisions to indemnify the Water Authority and Council of Governments against general liability for operation for the facility. Laidlaw was required to demonstrate generator status and document licenses as a transporter of the waste. Laidlaw was also required to provide trained personnel and materials necessary for appropriate response to emergency situations. These requirements were outlined in the RFP.

Results

Although Hazwaste Central is still operating in its first season, the collections held thus far are considered successful. The number of available volunteers and contracted personnel have been sufficient to allow for smooth operation of the facility. An average of 152 households were represented at each collection event, bringing waste oil, used batteries, paint, pesticides, antifreeze and other materials to the facility. Estimates of quantities of HHW collected at these events is not available at this time; however, the Water Authority feels the events have improved public awareness of HHW and its potential impact on water quality. The event also demonstrated the importance of the utility's services to the community.

Problems and Limitations

Obtaining funding and state permits were the two greatest problems encountered in planning and building Hazwaste Central. Both elements were critical to the completion of the project and required a great deal of time and effort on the part of the Regional Water Authority. Problems involved in operating the facility have not yet been assessed.

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Case Studies— Co Sponsoring HHW Collection

4.1 Rationale

Community involvement is HHW collection programs is not limited only to wastewater treatment authorities. A number of municipal agencies can be involved in the development of HHW collection. Two municipalities, Jefferson County, Kentucky and Orange County, California have implemented programs involving sponsorship by wastewater treatment and other municipal entities. The details of these programs follows.

4.2 Case Study Jefferson County, Kentucky

Introduction

A one-day, county-wide HHW collection event was initiated in Jefferson County, Kentucky, on April 21, 1990, in conjunction with Earth Day celebrations. This effort was organized by the City of Louisville in collaboration with the Metropolitan Sewer District (MSD), the Health Department, and county government, with each agency providing either volunteer staff, financial, or organizational support for the collection event. Six HHW collection centers were located throughout the county, and all locations drew a large number of residents throughout the day. Plans are underway to organize future regularly scheduled HHW collection events.

HHW collection in Jefferson County was originally proposed by a task force from the MSD because of concerns about release of hazardous materials in the municipal sewer system. A major explosion caused by a release of hexane from a local industrial facility in the early 1980's destroyed 5 miles of the municipal sewer and raised interest in control of household discharges to sewers. In addition, several accidents in Louisville were attributed to improper disposal of HHW, the most notable of which involved injuries to a sanitation worker burned by muriatic acid in the municipal waste stream. MSD proposed annual collection events as a means to educate the public of the effects of HHW on the sewage treatment processes. As sewage effluent limitations became more stringent and waste minimization a more important issue, the City and the County Health Department became more interested in the benefits of HHW collection programs.

The Household Hazardous Materials Collection Committee (HHMC), a group representing the City of Louisville, Jefferson County, and the MSD was therefore created. This committee organized the 1990 HHW collection project and provided financial support.

The HHMC determined that one-day collection events would be the most effective approach to HHW collection in the county. The HHMC completed the basic tasks that were necessary to organize a collection event including soliciting funds from their respective organizations, establishing a budget, selecting a program design and contractor, developing a publicity campaign, drafting a participation survey or questionnaire, and soliciting the assistance of community services and volunteer groups.

Program Design

The Jefferson County HHW collection event was designed by representatives from the City of Louisville, the Metropolitan Sewer District (MSD) and the Jefferson County government as a regional one-day event servicing the County's population of approximately 700,000. HHW collection was held at six locations, three within Louisville City limits and three outside of the City, in Jefferson County. These locations were selected on the basis of convenience and accessibility to target populations within the county's 300 square mile area.

Sites with two entrances were preferred so as to provide separate ingress and egress, eliminating the need for traffic to cross itself and the potential for congestion. Other factors that were

considered included the availability of the site on the preceding afternoon for set-up activities and accessibility to a water supply and restroom facilities for wash-up and emergency purposes.

The collection and ultimate disposal of HHW was contracted to Laidlaw Environmental Services Inc., (Laidlaw), a licensed hazardous materials transporter that the Jefferson County administrators selected through a competitive bid process. Collection began at 9:00 a.m. and continued until 4:00 p.m. Attendees were greeted at the entrance by volunteers administering questionnaires (Appendix A Item 3). The questionnaire was designed to collect information about the residents' habits and attitudes toward HHW disposal, their home addresses, the types of materials brought to the site, and opinions regarding the location, frequency, and funding of HHW collection events. Volunteers screened materials for regulated hazardous waste and individual disposal of large quantities of material that would identify a possible small quantity generator.

The collection stations, provided and assembled by the contractor, consisted of tables covered with plastic situated under tents to protect the area from inclement weather. Materials were sorted on tables and packaged for transport by the contracted personnel. Volunteers from local chemical and paint companies were available to pre-sort HHW materials. Usable paint, along with motor oil and automobile batteries, was diverted from the collection stream for recycling. Other materials collected included pesticides, solvents, antifreeze and common household cleaners.

As participants left the site, volunteers collected questionnaires, answered any questions and distributed HHW informational brochures. MSD did not distribute specific literature about wastewater treatment facilities; however, the general brochure did discuss the effect of HHW on wastewater treatment processes.

Personnel

Laidlaw provided 4 to 6 employees per site; 1 to 3 HHMC members, one of whom was designated Site Manager, were also present at each collection location. Anticipating a large turn-out of residents at each collection location, the HHMC solicited a large staff of volunteers and city and county employees to assist in organizing collection activities. On average, 24 volunteers from local civic and environmental groups, and chemical and paint companies were available at each site throughout the day.

For the most part, HHW handling was limited to the contracted personnel. However, volunteers trained in hazardous materials handling were involved in pre-sorting of materials, particularly for recyclable paint. Other volunteer responsibilities included welcoming cars; distributing explanatory and informational literature, questionnaires and pencils; screening vehicles for types of material; directing traffic; and unloading material from vehicles. Volunteers from the paint and chemical companies sorted used paint for recycling and performed a preliminary pre-sorting of other materials.

Shifts for volunteers were scheduled for four hours, from 8:30 am to 12:30 pm and from 12:00 pm to 4:00 pm. This allowed volunteers one-half hour before the first shift to read the instructions prepared by HHMC and to receive direction from the Site Manager. It also allowed one-half hour overlap between shifts so that the second shift volunteers could read instructions, observe the first shift in action, and ask any questions. Instructions included a training sheet listing "ground rules" of the collection and an explanation of the operation and the function of each volunteer.

To ensure a safe environment, a fire truck, a police officer to direct traffic, and an officer from the local bomb squad to detonate any explosives were present at each site. In addition, staff from the Emergency Medical Service were also present to respond to any medical emergencies.

Contractor

Laidlaw was selected to service the collection centers by the HHMC through the competitive bid process. Requests for Proposals (Appendix A Item 4) were distributed to area contractors as required by City-County purchasing regulations. A committee member obtained and reviewed RFPs that had been issued by other communities and drafted a document that met Jefferson County's needs. The RFP was carefully constructed to elicit quotes that could be easily compared (i.e., requesting specific unit pricing, equipment and labor costs). The RFP outlined bid conditions, including a minimum liability insurance requirement of $15,000,000 (later reduced to $10,000,000), and identified the responsibilities of Jefferson County. The RFP also required the following:

- site set-up plan and on-site equipment list,
- a spill and fire prevention plan,
- a contingency plan for response to spills,

- employee training,
- related project experience, and
- a list of disposal facilities.

Cost proposals were required for the following services and equipment:

- planning and assistance
- mobilization/demobilization equipment
- on-site labor
- transportation/disposal/ supplies
- an option to bulk paints and solvents
- packaging guidelines, and
- disposal options.

In addition, cost breakdowns were requested for disposal of wastes of the following categories: non-halogenated flammables, inorganic poisonous solids, organic poisonous liquids, aerosol containers, corrosives, hazardous waste liquids and waste paints.

The Purchasing Department distributed RFPs to 10 companies and received responses from five. A subcommittee charged with evaluating the proposals rejected two as basically non-responsive. After each vendor met with the subcommittee to review the proposal and resolve remaining questions, the subcommittee awarded the contract to Laidlaw, a full Toxic Substances Disposal Facility (TSDF) with extensive experience in HHW collection. The Laidlaw bid was $150,000.

The HHMC met with Laidlaw before finalizing plans for the event to discuss the budget and other issues relating to HHW collection. Although the company had never serviced a collection event with six collection sites, they did not anticipate any problems with servicing such a large event.

Administrative Organization

Funding

The HHMC developed a budget of $150,000 for the event. The original budget was based on one-day events in other areas serviced by Laidlaw. Each sponsoring group (Jefferson County, the City of Louisville, and the Metropolitan Sewer District) appropriated $50,000 for the program with the expectation that additional funds would be needed. Cash and in-kind contributions were solicited from several related industries. Companies pledged individual contributions ($100 to $2,000) which were targeted to cover incidentals such as explanatory brochures, traffic barricades, T-shirts for volunteers and caps for supervisors. Miscellaneous items such as pencils for the survey, donuts for volunteers and pallets for bulk paint buckets were also donated or loaned by local paint companies and other industries.

The final cost for Jefferson County's first HHW collection event was estimated at $320,000. Laidlaw charges totalled $313,000, twice the original estimate of $150,000. Other internal costs for publicity materials and administrative labor were approximately $7,000.

For future collections, the HHMC is investigating various alternative funding sources. For example a one-time user fee added to the water bill would provide adequate funding. This fee would require the approval of the Board of Supervisors for the MSD, the County Commissioners, and the Board of Alderman for the City of Louisville. However, because this first event was so successful, funding mechanisms such as this are expected to be approved.

Publicity

The success of the Jefferson County HHW collection event is largely the result of the amount of publicity for the event. The MSD designed a large poster and a smaller handbill and distributed them throughout the county. The posters were displayed at government buildings, convenience stores, and gas stations. A notice was included in the water/sewer bills for a large segment of the community and MSD also featured the collection in its quarterly newsletter.

Public service announcements were recorded for broadcast on local radio and television stations. The collection was also featured on the local news and was the topic of several press conferences by the Mayor and County Judge, both of whom also appeared on local radio and televisions programs to publicize the event. In addition, a local farm and garden editor discussed the collection event several times on his radio segments. The local newspaper featured several preliminary items and an in-depth article two days prior to the event.

Regulatory /Liability Requirements

HHW is exempt from Kentucky hazardous waste regulations; however, representatives from the Kentucky Division of Hazardous Waste Management (Department for Environmental Protection) were present at five locations to provide guidance on the acceptability of materials. While this presence was not required, it did provide the HHMC with additional legal support where the acceptability of HHW or the generator status of the transporter came

into question. As the publicity indicated, material from small quantity generators was not accepted as HHW.

Jefferson County was responsible for liability issues concerning the collection event. As a result, the County's risk management and legal representatives' recommended the HHW contractor, Laidlaw, be required to maintain a minimum level of total liability insurance coverage (negotiated to $10,000,000) for the event. Laidlaw was also responsible for all permits relating to collection, transportation and disposal of HHW. Jefferson County was indemnified against general liability during the event as specified in the contract with Laidlaw.

Results

Table 4-1 presents the results of the 1990 Jefferson County HHW collection event. Attendance for the collection was typical for one-day events. However, total attendance was derived from questionnaires collected at each site and is considered an underestimate of the actual number of participants.

Approximately 120 tons of HHW was collected at the event. Paint and flammable liquids, including waste motor oil, dominated the waste stream. A large quantity of this material, along with automobile batteries, was set aside for recycling. Although the motor oil and automobile batteries were sent to a vendor, paint collected during the event is currently stored at the MSD until arrangements can be made for local non-profit organizations such as Habitat for Humanity to reuse the material.

The Jefferson County HHW collection event proved to be successful.

Table 4-1

Household Hazardous Materials Collection
Louisville/Jefferson County, Kentucky
Project Summary

Sponsors:	City of Louisville Jefferson County Metropolitan Sewer District
Date:	April 21, 1990
Sites:	6 (3 in City, 3 in County)
Contractor:	GSX Services Inc. (Now Laidlaw Env. Services Inc.)
Total Population:	695,055
Total Households:	250,245
Households Participating:	3,981, or 1.59%
Number of Zip Codes Served:	32 of 42 residential
Contractor Cost:	$315,487
Cost per Household:	$79.25
Hazardous Waste Collected:	237,800 pounds, or 118.9 tons
Hazardous Waste per Household:	59.73 pounds

Types of Waste Collected (in pounds)

Flammable Liquids	140,250	Compressed Gas:	5,600
Flammable Solids:	95	Oxidizers:	3,350
Hazardous Solids:	2,090	Poisons	16,960
Non-Regulated:*	61,205	Corrosives:	8,215
*(Includes Latex Paint)		Reactives:	35

Materials Recycled:	Waste Motor Oil: 3,000 gallons Automobile Batteries: 739 Paint: 1,105 gallons (221 5-gal pails)
Number of Volunteers:	180

Major Recommendations for Future Collections:

1. Implement a permanent program, beginning with semi-annual collection and moving toward an on-going regular collection.
2. Establish permanent funding mechanism, preferably an annual user fee of $2 attached to residential water billing.
3. Expand public relations/promotional activities to increase public awareness and participation.
4. Focus educational effors on schools and community groups.
5. Develop new methods to divert paint from the disposal stream.

It is difficult to ascertain whether the large quantity of material collected, an average of 60 pounds per household, is due to the large number of homeowners in Jefferson County or if it is simply a product of Earth Day celebrations and the absence of alternate disposal options available for such material. Regardless, the results of this collection event point to the need for more regular, regional HHW collection programs.

Problems and Limitations

There were several problems encountered at the Jefferson County collection event. The large attendance rate presented difficulty in processing the materials in a timely manner. With six locations to staff, the contractor and volunteers were overwhelmed at some locations and were not able to thoroughly separate materials. As a result, some non-hazardous materials were mixed with hazardous materials thereby increasing disposal costs. In addition, available packaging and safety equipment for HHW collection was exhausted at some of the locations requiring purchase of additional material.

Work space was limited at some locations, especially where other unrelated events were being held simultaneously. It also rained lightly at most locations throughout the day and, although the tents set up at the events to provide shelter were large (20' X 20'), the area under them became crowded as more HHW was brought to the site. Finally, organizers agreed that more lead-in and lead-out time is necessary to prepare and clean up each site in an organized fashion.

To avoid these kinds of problems, the HHMC has recommended the following for future collection events:

- Implement a permanent program, beginning with semi-annual collection and moving toward an on-going regular collection;
- Establish a permanent funding mechanism, preferably an annual user fee attached to the residential water bill;
- Expand public relations and promotional activities to increase public awareness and participation;
- Focus educational efforts on schools and community groups;
- Develop new methods to divert paint from the disposal stream.

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4.3 Case Study Orange County, California

Introduction

The government of Orange County, California has recently developed a permanent HHW collection program with redemption facilities located throughout the County. Completion and operation of permanent facilities is organized by the Hazardous Materials Program Office (HMPO) of the Orange County Fire Department which is also responsible for other components of the County's solid and hazardous waste management plans. The first permanent collection center opened in June 1990; two more are also scheduled to open in 1990. Three remaining facilities will be implemented pending state and local agency approval.

The new program is designed to improve upon the series of one-day events that have periodically been held since 1985. These events were cosponsored by the County Sanitation Districts of Orange County (CSDOC) and the League of Women Voters and were implemented to reduce non-industrial point source pollution from wastewater treatment plants and satisfy requirements for a National Pollutant Discharge Elimination System (NPDES) permit. Concurrently individuals on the Board of Supervisors of Orange County were looking for alternate solid waste disposal methods in response to growing concern over ground water contamination at local landfills. These concerns led to a detailed investigation of alternatives for HHW collection and disposal. The investigation concluded that HHW collection would reduce certain contaminant levels in the municipal sewage and help protect the county landfills from further contamination.

Program Design

Location and Schedule

Orange County's first permanent HHW collection facility is operated by Appropriate Technologies, II, Inc. (Aptech), a full service HHW collection contractor. The facility is located in Anaheim, along the edge of a parking lot at a privately owned solid waste transfer station (Figure 4-1). The facility operates from 9:00 am to 3:00 pm, Tuesday through Friday and serves a population of 2.5 million. Construction of additional centers at various locations within the County will also provide service to county residences. Criteria for site selection for the permanent center included:

- adequate space for smooth flow of traffic,
- geographical convenience to target populations, and
- distance from environmentally sensitive areas.

Two county owned landfills and three privately owned properties are under consideration as sites for additional permanent centers.

The Anaheim collection center is enclosed by fencing and consists of a concrete pad with two explosion-relief storage units providing a total capacity of twenty-four, 55-gallon drums (Figure 4-2). The units drain to two split sumps under the floor area that serve as a secondary spill containment system.

Incoming collection center traffic is directed towards the facility via a registration booth where participants are required to sign a form confirming that they are residents of Orange County. At this facility, information pertaining to the quantity and nature of the HHW is solicited. Aptech personnel sort and dispose of HHW according to chemical class and ultimate disposal (Figure 4-3). Acids are contained for ultimate neutralization, oils and latex paint are separately bulked for recycling, organics are mixed for use as fuel, and non-treatables are separated for either

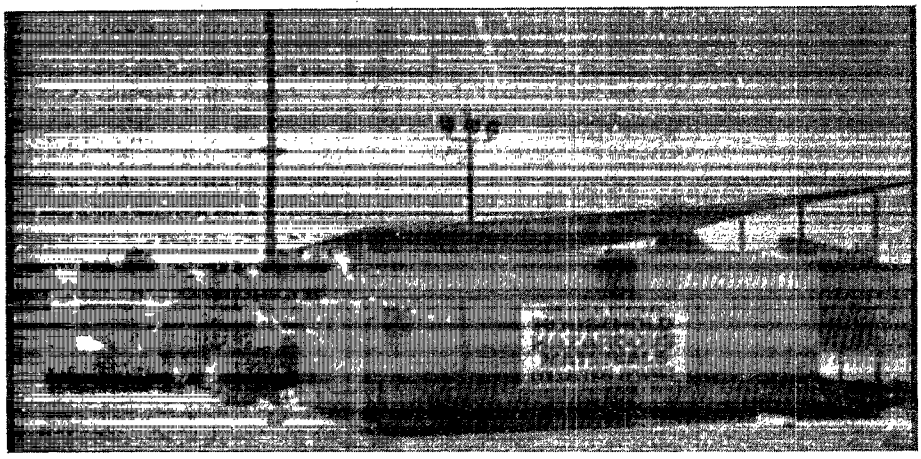
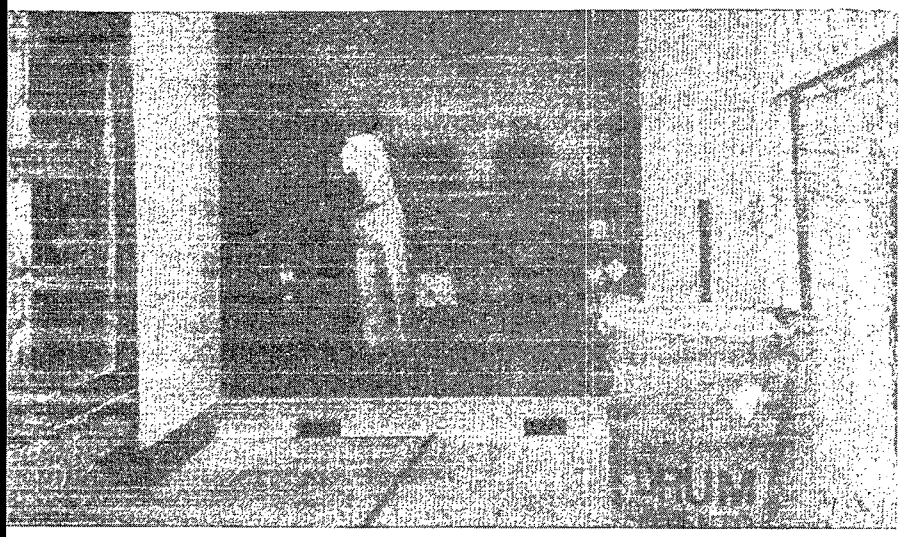


Figure 4-1
Orange County's Permanent HHW Collection Center



igure 4-2
HW Containment at Orange County

igure 4-3
HW Collection an Sorting Area, Orange County

ncineration or, as a last resort, landfill isposal. Eventually, latex paint will be istributed to regional graffiti control rganizations; however, this network has ot yet been organized.

The facility is approved by the state for 90-day storage of HHW; however, the current level of participation has overwhelmed the storage capacity of the facility. Materials must therefore be transported off site daily. The completion of additional collection facilities in the County is expected to alleviate this problem. Packaging and transport of materials off site takes place after the facility is closed to prevent injuries and accidents resulting from consolidation and movement of the HHW.

Personnel

Orange County administrators anticipate that the permanent centers will require a much smaller operating staff than the one-day collection events. The one-day events in Orange County required a staff of 20 to 30 people because of the short turn-around time (72 hours) and the high level of participation (an average of 1200 to 1500 households per event). Individuals were needed at these events to greet the public and administer surveys, direct traffic, and assist off-loading the materials. The permanent facility, however, requires two county employees to register participants and oversee the contractor, one or two security guards to direct traffic, and approximately five contractor personnel to unload, sort and package the HHW.

Contractor

Aptech was hired to staff the Anaheim HHW collection center and will also operate four additional facilities when they are completed. Aptech is a full service hazardous materials management company equipped to sort, haul and dispose of all HHW collected at the Anaheim facilities in accordance with OSHA, DOT and EPA requirements. The HMPO selected Aptech through a competitive bid process under the conditions set forth in the County's Invitation for Bid (IFB). Selection was

based on a review of responsiveness to the IFB, technical merit, and commercial analysis of cost and related factors. Aptech is compensated for their services on the basis of time, materials, and volume and type of waste collected.

Administrative Organization

Funding

Although the costs for the first permanent facility are not yet available, the budget for construction and first year operations of the first 4 permanent centers is estimated at approximately $2,500,000. This budget was derived through an evaluation of the costs associated with the one-day events. The funding mechanism consists of an additional line item surcharge added to the tipping fee for the County landfill ($0.46/ton). The fee, set by the Orange County Board of Supervisors, is applied to commercial and industrial haulers, but is not levied directly against the homeowner.

Because the permanent HHW collection program is still operating as a pilot project, a detailed cost breakdown is not available. The storage units at the Anaheim facility are leased rather than purchased and the operating costs have not been assessed. However, the current budget is based upon one-day collection events that are known to be more costly than operating a permanent facility.

Publicity

Advertising for the permanent HHW collection program includes radio and newspaper public service announcements and flyers distributed to civic organizations, libraries, and schools. The County plans to also distribute informational inserts describing the program with the water bill; however, at this time the high level of participation does not warrant the additional effort.

Regulatory/Liability Requirements

HHW is not exempt from California hazardous waste regulations. The California Department of Health regulates all HHW collection facilities and programs. Permit requirements are currently in transition; however, they are intended to address safety issues involving site operation and emergency response planning. Basic regulatory guidelines require that only trained personnel unload materials from cars and enter the HHW storage area. All packing and transporting of collected HHW is to be completed after the facility is closed.

As a pilot program, Orange County's first facility has been granted interim status (i.e., a variance) from the permitting process normally required for 90-day hazardous waste storage facilities. After one year in operation, this variance will be withdrawn and a permit will be required. Liability issues associated with the HHW collection facility are addressed in Orange County's contract with Aptech. The contract stipulates that the HHW collection contractor must maintain a minimum level of comprehensive and contractual liability insurance of 1,000,000. Orange County is listed as an additional insured party under this policy. In addition, Aptech must also maintain full worker's compensation insurance.

Results

The results of the first month of operation at the Anaheim facility are provided in Table 4-2. Motor oil and paint products make up the largest portion of the waste stream and are the only products for which collection data is available. An average of 90 vehicles per day were received during the first month of operations. The HMPO feels that this level of participation is high compared to attendance observed at permanent facilities in neighboring counties.

Table 4.2

Household Hazardous Materials Collection Project
Orange County, CA
July 1990 Activity Recap

Participation:	
Total Vehicles Received	1,717
Average Vehicles Received per Day	90
Service Area Vehicles	929
Outside Area Vehicles	788
Materials Received:	
Waste Oil	
Volume (gallons)	5,281
per vehicle	3.1
per operating day (19)	278.0
Paint and Paint Related Products	
Containers	14,895
per vehicle	8.7
per operating day (19)	784.0
volume (gallons)	
per vehicle	5.0
per operating day (19)	448.0
Staffing Levels (Contractor only)	
Labor hours	1,445.5
per operating day	76.1

Problems and Limitations

No operational problems have been reported to date for Orange County's first permanent facility. From its experience in permanent and one-day HHW collection, the HMPO has determined that permanent collection centers provide a safer, more organized means of collecting HHW then one-day events. There is more time available to unload and sort material and fewer attendees per hour, thereby reducing the probability of spills and accidents. In addition, the center is built to contain spills and allows for storage of material on site.

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Appendix

Appendix A

Example HHW Collection
News Releases
St. Johns Reminder Tuesday, June 5, 1990

City promotes clean environment with household waste disposal

St. Johns residents will be able to safely dispose of household hazardous waste through a collection program, sponsored by the city of St. Johns. Residents should bring waste to the St. Johns Wastewater Treatment Facility, located at 1000 N. US-27, on Saturday, June 30, anytime between 9 a.m. and 4 p.m.

According to Wastewater Treatment Facility Supt. Roy Anklam, the goals of the collection program are to provide a convenient and accessible means for disposal of hazardous household waste, help the public become aware of hazardous waste and the proper disposal of it, and foster the use of alternative products to hazardous materials.

Anklam stresses the fact that the collection day is for residents of the city of St. Johns only, and that the waste must be from St. Johns households only. Persons depositing waste will be required to show a drivers license or some other proof of residency in the city before waste will be accepted.

The collection is free to city residents. As a service to senior citizens, items from seniors will be picked up at their residences. Senior citizens should call 224-7898 between 7 a.m. and 3 p.m. to schedule an appointment for waste collection prior to June 30.

Following is a listing of household hazardous waste items which can be disposed of during the collection day.

Kitchen area: Floor care products, furniture polish, metal polish with solvent, bug sprays.

Garage area: Automatic transmission fluid, battery acid (or battery), brake fluid, car wax with solvent, diesel fuel, fuel oil, gasoline, kerosene, metal polish with solvent, motor oil, other oils.

Workshop area: Cutting oil, glue (solvent based), paint (oil based), paint (auto), paint (model), paint brush cleaner with solvent, paint thinner, paint stripper, primer, turpentine, varnish, wood preservative.

Garden area: Fungicide, herbicide, insecticide, rat poison, weed killer.

Miscellaneous: Ammunition, artists paints, dry cleaning solvents, fiberglass epoxy, gun cleaning solvents, lighter fluid, mercury batteries, moth balls, old fire alarms, photographic chemicals, swimming pool aids.

Persons with questions about the collection day or items that are not included on the list should call the Wastewater Treatment Facility at 224-7898.

Example HHW Collection
News Releases
Clinton County News May 29, 1990

St. Johns hazardous waste collection to be held June 30

The City of St. Johns will again conduct a Household Hazardous Waste Collection Program for the residents of the city, on **JUNE 30, 1990,** Saturday between the hours of 9:00 a.m. and 4:00 p.m. Collection will be at the St. Johns Wastewater Treatment Facility located at 1000 North US-27.

The goals of the collection program are to:

(1) Provide a convenient and accessible means of disposal of hazardous household materials throughout the city limits.

(2) Foster proper disposal of hazardous materials from the household wastes of the residents of St. Johns.

(3) Help the public become aware and recognize the hazardous waste materials in their households and limit the purchase and use of them.

(4) Foster use of alternative products to hazardous materials wherever feasible.

This collection day is for residents of the City of St. Johns only, and the waste must be from St. Johns households only, Drivers License or some other proof of residency in the city must be shown before the household waste will be accepted.

This collection of household hazardous waste is free to the residents. As a service to the **SENIOR CITIZENS** of our city, we will come to your home and pick up your household hazardous waste. Give us a phone call at **224-7898** if you are in need of this service, Please call between the hours of 7:00 a.m. to 3:00 p.m. any day of the week to make an appointment prior to collection day.

HOUSEHOLD HAZARDOUS WASTE COLLECTION DAY
SATURDAY, JUNE 30, 1990
9:00 A.M. to 4:00 P.M.
ST. JOHNS WASTEWATER TREATMENT FACILITY
1000 NORTH US-27 (behind the DPW building)

The following table is a list of the household hazardous wastes that can be disposed of on the collection day:

KITCHEN AREA:

1. Floor Care Products
2. Furniture Polish
3. Metal Polish with Solvent
4. Bug Sprays

GARAGE AREA:

1. Automatic Transmission Fluid
2. Battery Acid (or Battery)
3. Brake Fluid
4. Car Wax with Solvent
5. Diesel Fuel
6. Fuel Oil
7. Gasoline
8. Kerosene
9. Metal Polish with Solvent
10. Motor Oil
11. Other Oils

WORKSHOP AREA:

1. Cutting Oil
2. Glue (Solvent Based)
3. Paint (Oil Based)
4. Paint (Auto)
5. Paint (Model)
6. Paint Brush Cleaner with Solvent
7. Paint Thinner
8. Paint Stripper
9. Primer
10. Turpentine
11. Varnish
12. Wood Preservative

GARDEN AREA:

1. Fungicide
2. Herbicide
3. Insecticide
4. Rat Poison
5. Weed Killer

MISCELLANEOUS:

1. Ammunition
2. Artists' Paints, Mediums
3. Dry Cleaning Solvents
4. Fiberglass Epoxy
5. Gun Cleaning Solvents
6. Lighter Fluid
7. Mercury Batteries
8. Moth Balls
9. Old Fire Alarms
10. Photographic Chemicals
11. Swimming Pool Aids

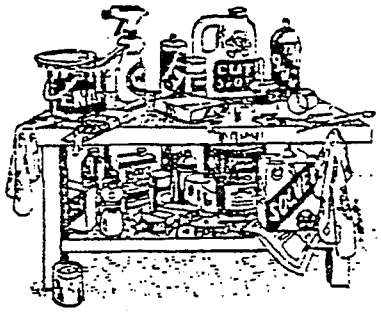
If you have any questions about the Household Hazardous Waste Collection Day or any questions in reference to disposal of any other items you may have concern about that are not on the above list, please phone the Wastewater Treatment facility for assistance at 224-7898.

Appendix B

Example Advertisement
HHW Collection -
Palo Alto

DISPOSE OF HOUSEHOLD HAZARDOUS MATERIALS FREE OF CHARGE

ARE THE FOLLOWING UNUSED PRODUCTS IN YOUR HOME?



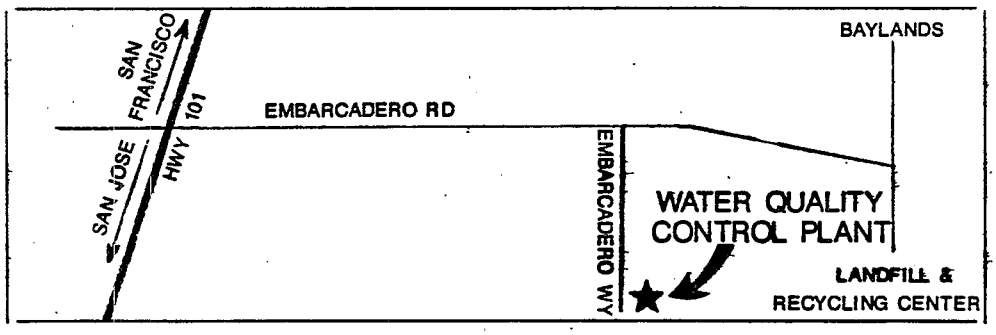
*Household Batteries
*Paint Products
*Solvents
*Chemical Drain Openers
*Household Cleaners
*Pool Chemicals
*Aerosol Cans
*Pesticides
*Insecticides

These are just a few of the items that, if disposed of improperly, could endanger the health and safety of you, your family, refuse workers and wildlife. Improper disposal creates hazardous conditions in the sewer system and landfill. Bring unwanted household products to the next Household Hazardous Waste Day to help protect our environment and make your home safer.

WHEN: SATURDAY, JULY 28, 1990 10:00 AM TO 3:00 PM
EVENT CLOSES PROMPTLY AT 3:00 PM

WHERE: ***NEW LOCATION***
REGIONAL WATER QUALITY CONTROL PLANT
2501 EMBARCADERO WAY

OPEN TO PALO ALTO RESIDENTS ONLY.
PROOF OF RESIDENCY WILL BE REQUIRED.



REMINDER: *STATE LAW PROHIBITS THE TRANSPORTATION OF MORE THAN 5 GALLONS OR 50 POUNDS OF HAZARDOUS WASTE AT A TIME.
*RECYCLE MOTOR OIL AND AUTO BATTERIES AT THE RECYCLING CENTER AT THE PALO ALTO LANDFILL.

CITY OF PALO ALTO PUBLIC WORKS DEPARTMENT

HOUSEHOLD HAZARDOUS MATERIALS COLLECTION DAY SURVEY

1. Which site did you visit today? (Circle one:)
   a. East Government Center
   b. Iroquois High School
   c. Pleasure Ridge High School
   d. Seneca High School
   e. Shawnee High School
   f. Southern High School

2. What zip code do you live in? _____

3. From how many households did you bring items? _____

4. What did you bring in today? (Circle all that apply:)
   a. car battery
   b. drain cleaner
   c. motor oil
   d. paint
   e. solvents
   f. other _____

5. How did you dispose of household hazardous materials before this collection day? (Circle all that apply:)
   a. down the drain
   b. dumped on your property
   c. put in garbage can
   d. stored in basement
   e. stored in garage or shed
   f. other _____

6. How did you hear of this collection day? (Circle all that apply:)
   a. billing insert
   b. newspaper
   c. poster
   d. radio
   e. TV
   f. other _____

7a. Do you think this collection effort should be repeated? Y N
   If yes, please continue: (Circle First Choice For Each:)

   7b. How often should it be repeated?
   a. one time per year
   b. two times per year
   c. four times per year
   d. year-round

   7c. What time of year is best for you?
   a. spring
   b. summer
   c. fall
   d. winter

   7d. Up to how many miles would you be willing to drive next time?
   a. 6 miles
   b. 9 miles
   c. 12 miles
   d. 18 miles

   7e. How do you think future collections should be financed?
   a. general taxes
   b. point-of-purchase fees with free collection days
   c. collection day fees

   7f. If a collection day fee system were adopted, how much would you be willing to pay per pound of disposed material?
   a. $10
   b. $8
   c. $6
   d. $4

Please add your comments and/or suggestions for improvement here:

REQUEST FOR PROPOSALS

HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAM

This is a request for proposals for a contractor to handle collection, transportation and disposal of materials collected through a household hazardous waste collection program. The successful bidder shall be responsible for assisting County Staff in planning and developing of the project collection centers, staffing the collection project sites, and classifying, packaging, transporting and disposing of household hazardous waste collected in Jefferson County, Kentucky.

The purpose of the project is to provide county residents with a safe and approved method of disposing of accumulated household chemicals as well as educate them in the proper safe use, storage and disposal of those chemicals. The public will be informed of the project through publicity in the local newspapers, radio and television stations, schools, flyers and posters.

The project will take place at four sites in Jefferson County on Saturday, April 21, 1990. Household chemicals will be transported to the collection sites by individual residents. The collection project will use a drive-up system. Citizens with chemicals to dispose of will transport them in their vehicles to the collection sites. They will be directed to sorting tables under tents to unload the chemicals. The contractor will be responsible for accepting the waste, pre-sorting it and moving it to processing areas. The project collection sites will be at locations with large paved areas for queueing automobiles off public roadways.

There are two parts to this request for proposals. Part one is a technical proposal and part two is a financial proposal. Jefferson County will award this contract based on bidders' response to the technical and financial sections as well as any other requirements as stated throughout this proposal.

BID EVALUATION CRITERIA

Technical Proposal.....40%
Cost Proposal.....40%
Liability Protection.....20%

INSURANCE REQUIREMENTS

The following types of insurance and coverage amounts must be certified.

General liability - $15,000,000

Personal
Fire
Medical Expense

Automotive Liability - $15,000,000

CSL
Bodily Injury
Property Damage

Pollution Control Liability - $6,000,000

Workmen's Compensation - Statutory Amount

BID CONDITIONS

1. The preferred method of waste disposal is RCRA Incineration. The contractor must guarantee RCRA incineration of all materials received that are incinerable. Some paints contain PCB's. Any bulked paints found to contain PCB's must be incinerated at a TSCA incinerator. The disposal facility permitted to incinerate the TSCA paints material must also be permitted to incinerate the RCRA portion of the paint waste. Treatment (neutralization ,etc.) of waste is permissible only for corrosive wastes, cyanides and some inorganics.

2. If the bidder proposes fuel blending of materials as a disposal method, the bidder should provide a detailed description of the procedure to be followed in utilizing this option, the types of materials that will be fuel blended and the name, address, and phone number of the facility that will be the end recipient of the materials to be blended.

3. All lab-pack wastes (those in containers of five gallons or less) must be removed from the collection sites within 48 hours of the close of business on the day of collection.

4. Lab-pack wastes must not be re-packaged, treated or combined in any way after the household hazardous waste project is completed. Lab-pack wastes, upon arrival at the ultimate disposal facility, must be directly disposed/treated with the exception of lab-pack flammable solvents which may be bulked prior to RCRA incineration.

JEFFERSON COUNTY RESPONSIBILITIES

Jefferson County will assume the following responsibilities:

1. Coordination of a contingency plan with local emergency response agencies.
2. Suitable site locations.
3. Crowd control.
4. Providing waste containers for the disposal of non-hazardous waste accumulated at the collection sites.
5. Providing volunteers to move the chemicals from the automobiles of the public to the contractor's receiving tables.
6. Security for the sites should the contractor have to remain at the site overnight.
7. Tables and chairs in the receipt area.
8. Representative to sign the transportation manifest.
9. Bulking area if required.
10. Arrangements for the disposal of waste motor oil and lead acid batteries.

I. **TECHNICAL PROPOSAL**

In order for Jefferson County to qualify a contractor the following information must be submitted.

A. Site Set-Up Bidders are requested to submit a diagram of the their proposed project collection site layout for the household hazardous waste collection project. The diagram should include traffic flow, positioning of tent, fire and spill control equipment, other related safety equipment, processing equipment and vehicles and approximate square footage needed for operation. A detailed description of the activity that will take place on the site, including receipt, segregation, testing, packaging, loading, etc., should be attached to the diagram.

B. On-Site Equipment List Bidders should provide a list of all equipment to be provided and used by contractor at the collection site including fire prevention, safety, spill control, personal protective equipment and any other equipment deemed necessary by the contractor.

The County will arrange for personnel and equipment from the local fire protection agency to be present at each collection site.

C. Contingency Plan Bidders are requested to provide a format for a contingency plan for handling notification to participants and evacuation in the event of on-site emergencies.

E. Spill & Fire Prevention Plan Bidders are required to provide spill prevention and fire prevention plans tailored to the on-site activities proposed at the collection site. Bidders may be required to modify their fire, spill or safety plan to meet site-specific requirements of the local fire protection agency.

F. Employee Training Bidders are required to provide the names of employees to be used for this project and a detailed description of their training, including any degrees. This description should differentiate between chemists, technicians, laborers etc. Bidders also should submit a description of employees' experience, including a listing of hours of field experience in this field.

G. Related Project Experience Bidders should provide references of at least five (5) projects of a similar nature that they have successfully completed. This list should include names of the public or private entities for whom the service was performed, contact name, phone number, and address.

H. Transportation & Disposal Facility List Bidders should provide a complete listing of storage, transfer, transportation and disposal facilities which may be utilized throughout the course of this project.

The transportation and disposal facilities should list the location, contact, phone, and Federal I. D. Number of each facility. Copies of permits for these facilities should be attached.

Companies which can internalize all labor, packaging, transportation and disposal services will be highly favored in the bid evaluation process.

II. COST PROPOSAL

Scope of Bid

A. Planning and Assistance The contractor will be required to provide, at the request of the County, experienced staff to attend meetings with the County to review proposed collection site procedures, or otherwise assist in the implementation of this project.

B. Mobilization, Demobilization and On-Site Equipment Cost quote in this section should include:

1. Movement of a minimum of a four person team per site plus supplies and equipment to and from the collection sites

2. Set-up and decommissioning of the collection site

3. Per Diem

4. Truck and related equipment costs

5. Personal protective equipment

6. Tents

7. Administrative costs

8. Safety equipment

Bidder should bid a price per collection facility. This price should include and detail any other associated costs for set-up of the collection sites that the bidder deems appropriate.

C. On-Site Labor Contractors should provide a price for all on-site labor on a cost per hour basis. (One chemist and three technicians minimum are required per site.)

D. Transportation, Disposal and Supplies Contractor should provide a price in this section based on the following costs:

1. Transportation of materials to disposal facility

2. Disposal of wastes at an EPA approved disposal facility

3. Drum costs

4. Absorbent costs

5. Labels

6. Manifests

7. Permitting: To perform this project the contractor must have a Hazardous Waste I. D. Number issued by the Ky. Natural Resources & Environmental Protection Cabinet, Div. of Waste Management. In addition, to haul hazardous waste in Kentucky, the contractor is required, by the Kentucky Dept. of Transportation, to have a Hazardous Materials Permit and to file FORM E (Uniform Motor Carrier Bodily Injury and Property Damage Liability Certificate of Insurance). Contractor must have all required permits to perform hazardous waste activities in any other state in which he may plan to transport or dispose of the materials collected.

E. Bulking of Paints and Solvents Jefferson County will consider the options of the contractor bulking paints and solvents at a pre-determined location within the county as well at the collection sites. The contractor should provide a price per gallon to bulk paints or solvents and indicate if the proposal is to bulk at central location or at the collection sites. Alternatives to this request can be expressed and will be evaluated.

Jefferson County is planning to utilize volunteers to sort and mix usable paint at the collection centers for later distribution to non-profit and social service agencies. Paints containing lead, and those determined otherwise unusable will be turned over to the contractor at the site for disposal as waste.

F. Packaging Guidelines Bidders are required to provide on a separate sheet, attached to the price proposal, the packaging guidelines for each waste type and container to be used as identified in the cost proposal.

G. Disposal Options Each waste type has at least one disposal option listed. Bidder shall provide a bid price for one or all options listed. Contractors are encouraged to supply alternative options, where they deem advantageous. Where disposal options are presented, the County will notify the contractor of the option selected prior to the collection. Keep in mind that RCRA incineration is the preferred disposal option and will receive favorable review. Where RCRA and TSCA disposal are required, the contractor must furnish this disposal at a single incinerator permitted under both TSCA and RCRA. Bidders are rquested to indicate wastes that are unacceptable at the collection project.

III. COST PROPOSAL QUOTATIONS

ITEM	UNIT	COST
1. Planning and assistance	Lump Sum	_____
2. Mobilization/Demob. On-Site Equipment	Per Site	_____
3. On-Site Labor		
Chemist	Per Hour	_____
Technician	"	_____
other (optional) (specify)	"	_____
4. Transportation/Disposal Supplies		
A. Non-halogenated Flammables	Per Gallon	
1) Bulked, incinerated liquid	"	_____
2) Bulked, fuel blended	"	_____
3) Bulked, incinerated sludge	"	_____
4) Lab-Pak, incinerated	"	_____
B. Inorganic Poisonous Solids (arsenical pesticides, etc)		
1) Lab-Pak Landfill	Per Gallon	_____

Bidder's Company Name: _____

C. Organic Poisonous Liquid
(Halogenated solvents & Pesticides)

1) Lab-Pak, Incinerated Per Gallon _____

D. Aerosol Containers

1) Lab-Pak, Incinerated Per Gallon _____

E. Corrosives

1) Lab-Pak, Incinerated Per Gallon _____

2) Lab-Pak, Treatment " _____

F. Hazardous Waste Liquid or Solid N. O. S.

1) Lab-Pak, Incinerated Per Gallon _____

2) Lab-Pak, Landfill " _____

G. Waste Paints bulked, Incinerated Per Gallon _____

Bidder's Company Name: _____