

# **(Fanhasso) HASSO GUAM! HOUSEHOLD HAZARDOUS WASTE COLLECTION**

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## **I. BACKGROUND**

Guam's (*Fanhasso*) *Hasso Guam! Household Hazardous Waste Collection Program* was created as part of a larger project to achieve pollution prevention for the island. This larger project includes environmental awareness and waste minimization. The collection program falls within the environmental awareness component. A better understanding of the Program's purpose will provide insight on the importance of the components that are needed to promote self-sufficiency in waste management for the islands.

Waste cannot be eliminated in its entirety, but it can be reduced through pollution prevention incentives. Pollution prevention is not a single endeavor, but rather results from several activities that are interconnected and gain synergy from one another. One component of the pollution prevention equation for Guam is environmental awareness. This component is accomplished primarily by educating the public through long-term outreach programs. These programs in turn must be clearly identified and organized to maximize environmental awareness.

Three target areas were identified to promote environmental awareness. These target groups are:

- Businesses
- Homes
- Schools

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Guam's (*Fanhasso*) *Hasso Guam! Household Hazardous Waste Collection Program* was created to promote environmental awareness in the home. The theme (*Fanhasso*) *Hasso Guam!* translates from the Chamorro phrase of "Think of Guam". Although information is still needed to determine the quantity of household hazardous waste generated on Guam, it is estimated that the average household within the United States produces approximately 13.91 pounds of hazardous waste annually<sup>1</sup>. The Program was inspired by the emergence of similar programs in the United States and developed to address two major concerns:

1. Household hazardous waste is a waste stream that is not regulated under local and federal statutes and regulations. In fact, regulations allow for the disposal of such wastes into a sanitary landfill.
2. Guam's sanitary landfill is a natural depression created before regulatory standards were established and, therefore, without appurtenances to prevent waste migration or groundwater contamination.

## **II. PLANNING AND DEVELOPMENT**

The planning and development of the program has changed since its inception. Over the years, changes in funding, marketing strategies, siting, and implementation were needed to reflect the demands of the community and improve the program. In addition, surveys and debriefings provided the information to tailor the Collection to the needs of the community.

### **A. Funding Sources**

Seed money to begin a new project is always critical and oftentimes difficult to obtain. Since start-up funding was a challenge, proper management, creativity and persistence were all important in supporting the Collection as a long-term project.

### Enforcement and Compliance

The Program began in 1991 through funding from out-of-court settlement negotiations in which Guam EPA was successful in bargaining for community services in lieu of direct cash payments to the Government of Guam's general fund. Guam EPA was successful in directing \$50,000 towards the (*Fanhasso*) *Hasso Guam! Household Hazardous Waste Collection Program*. The company providing the funding made the necessary arrangements with the assistance of an environmental company familiar with the concept. In 1991, Guam held its first Collection for a wide spectrum of household hazardous wastes. The company spent approximately \$32,000 on waste management, disposal, and advertising.

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<sup>1</sup> Steps to Safe Management: Household Hazardous Waste, April 1993, U.S. Environmental Protection Agency, Document Number 530F92031, page 1.

By the second Collection, approximately \$18,000 remained from the original funding. Due to the limited funding, the April 1993 Collection was restricted to batteries and waste oil.

#### Grants & Appropriations

In addition, sporadic funding had been supported through grants from USEPA, Region IX, through the assistance of the Office of Pacific Islands and Native American Program (currently known as Pacific Insular Area Programs), and appropriations from the Guam Legislature. Funding was approximately \$15,000 from each.

#### Contributions From Businesses and Other Government Entities

Following the exhaustion of the initial funding, creating resource management was a necessity. Unitek Environmental Services, Incorporated, approached Guam EPA and expressed their interests in funding the December 1993 Collection in partnership with Guam EPA. Unitek handled the waste collection and removal of the wastes and Guam EPA agreed to handle the marketing. This was the beginning of several partnerships with the community for this public service.

Since that time, the Collection has been supported through funding ranging from \$200 to \$2,000 from companies such as Shell Guam, Incorporated, Mobil Oil Guam, 7-11 Stores, and the Guam Automotive Dealers Association. In-kind services were also received to alleviate costs through companies and organizations. Companies such as Unitek Environmental Services, Incorporated, Pacific Environmental Resources, Incorporated, Energy Recovery Corporation, and Images Advertising provided discounted services to the Collection. Companies such as Island Scrap Yard accepted spent lead acid batteries free of charge or at a reduced rate, and organizations from the U.S. Department of Defense and U.S. Coast Guard provided additional labor in collection assistance or supplied fluorescent bulb crushers for mercury collection.

#### Revolving Funds

Another source for funding has been through the statutory establishment of revolving funds or depositories for litter fines and permitting fees. Although partnerships with the community have been successful, the bulk of the expenses have been paid through these revolving fund sources.

### **B. Marketing Strategy**

The marketing strategy of the Collection began with basic advertisements and public service announcements in the local paper and radio. Simple flyers were created and distributed to schoolchildren to take home to their parents. Much of the freestyle artwork came from staff without assistance of media specialists and was often crude in form. The marketing of the Collection has improved dramatically since those early days.

#### Media

With additional funding, sophisticated advertising via television first aired in 1993. In 1996, advertisements in the local paper were greatly improved through the assistance of an advertisement agency and Guam EPA's newly hired public information officer.

Improvements over the years include road banners, radio interviews, and inserts for the local paper, all which further enhanced the Collection's image. Costs associated with the Collection have increased over the years due to the additional and sophisticated advertising.

#### Partnerships

Part of the marketing strategy included participation by businesses, mayors, and the branches within the Department of Defense. Through these closely coordinated partnerships, the Collection has evolved into a community project.

Since the first partnership with one business, the number of interested businesses has increased dramatically. Moreover, as the Collection's popularity grew, interest from local village mayors also increased. As a result, the Mayor of the particular village hosting a Collection has often served as an effective catalyst to increase participation within their village. At times, the Mayors have been helpful in collecting certain wastes such as batteries by sending staff to pick-up the waste from those who cannot drive to the collection site.

Guam EPA recognizes the participation of these groups by including them in road banners, radio announcements, printed advertisements, certificates of appreciation, and appreciation barbecues.

#### Environmental Education Aids

During the Collection, personalized household hazardous waste educational material is provided to each participant. Thousands of pieces of literature have been distributed over the years. The materials vary so that they may be utilized by the participant or family members with students from grades K-12. These materials have been printed in the local paper and are provided to schools for educators and students as additional to reinforce awareness of hazardous waste at home.

### **C. Waste Management**

Prescreening of wastes was conducted as an additional mechanism to prevent businesses from utilizing this service, to control possible overcrowding during drop-offs, to further notify participants on what can be accepted, and to plan ahead on the necessary equipment for packaging. Over the past three years, prescreening has been discontinued for two primary reasons. First, although prescreening was valuable for planning purposes, it also discouraged participants because they had to make an appointment to deliver their waste at a particular time and place. Secondly, with improvements in the marketing strategy, most participants understood what wastes could be accepted and in what quantities.

To further dissuade businesses from utilizing and impacting the service, the Collection limited the amount of waste that could be brought in per participant. Incidences involving participants exceeding specified quantities were negligible.

The choice of companies employed to perform waste management focused only on those that could provide handling of the waste in the field. Companies with EPA identification numbers were solely utilized. Choices of waste handlers have improved over the years on Guam, but is still limited. During the infancy stages of the Collection, only one active hazardous waste handler was available. Since that time, others have emerged, which has improved the number of collection sites and reduced costs through competition.

Close coordination with the waste handler is essential. Details of the Collection event are planned in advance and contractor monitoring is conducted by Guam EPA personnel. The final disposition of the wastes varied between contractors. All waste oil (nonhazardous waste) are burned for energy at the power plants on island. Waste car batteries are shipped off-island to either the United States or Asia for reclamation. Oil based paint-related items are disposed in the United States.

#### **D. Siting Considerations**

Initially, the Collection was held at a facility managed by the waste handler. This arrangement was convenient for the handler but not for residents. Over time, the Collection has expanded to include a site for Northern, Central, and Southern residents. Moreover, we have found that siting the Collection within the community in public places such as the Mayor's office, has greatly increased the community's involvement.

### **III. SURVEY RESULTS**

Surveys were first conducted in December 1993 to track the progress of the Collection and provide information to improve its effectiveness. Although the surveys provided good data, it is important to note that conclusions drawn from these surveys have their limitations. First, the outcomes from these surveys reflect only those individuals who actively participated in the event, and may not represent the consensus of the population. Second, some surveys were not always fully completed. Therefore, unanswered questions were not included in the tabulations.

It should be noted that the sudden increase in participation in the first Collection of 1998 was due to an island-wide restoration immediately following the passing of Typhoon Paka on December 16, 1997. Over 1,000 homes were either destroyed or severely impacted by the typhoon which in turn generated an increase in household hazardous waste.

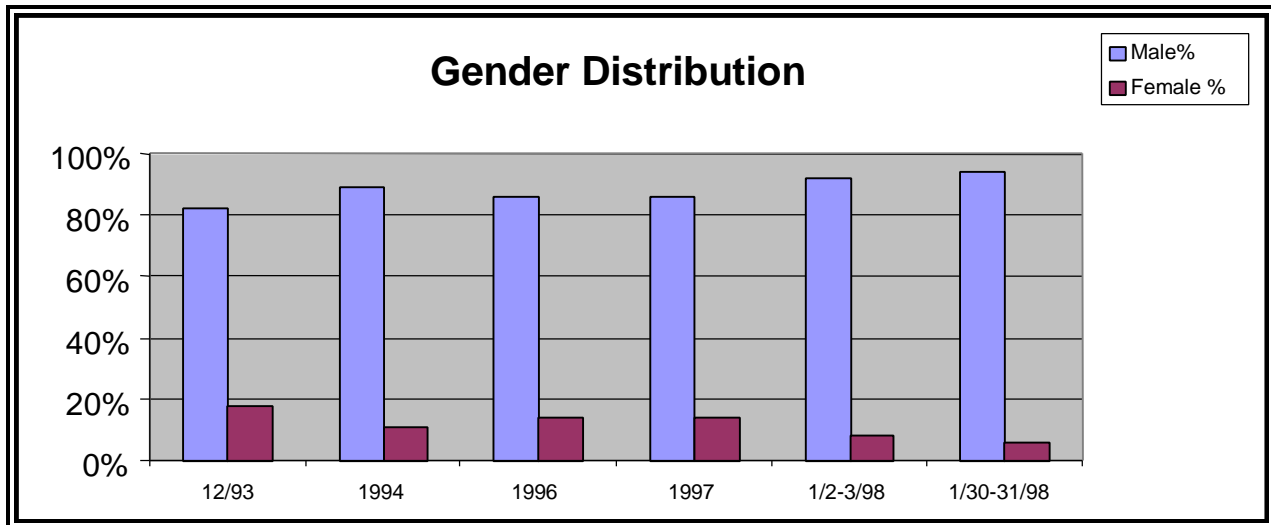
## A. Gender Distribution

Based on data gathered at the field collection sites, approximately 80% of the participants to date have been male. The data is not conclusive and additional information is needed to further evaluate the participation of women in these events, whether direct or indirect. The surveys do not factor in the traditional or cultural aspects of women in the home. Therefore, modifications to the survey are recommended to better understand the awareness and involvement of women in this public service.

Table 1. Gender Distribution

Year	Male%	Female %
12/1993	82%	18%
1994	89%	11%
1996	86%	14%
1997	86%	14%
Jan 2-3, 1998	92%	8%
Jan 30-31, 1998	94%	6%

Figure 1. Gender Distribution



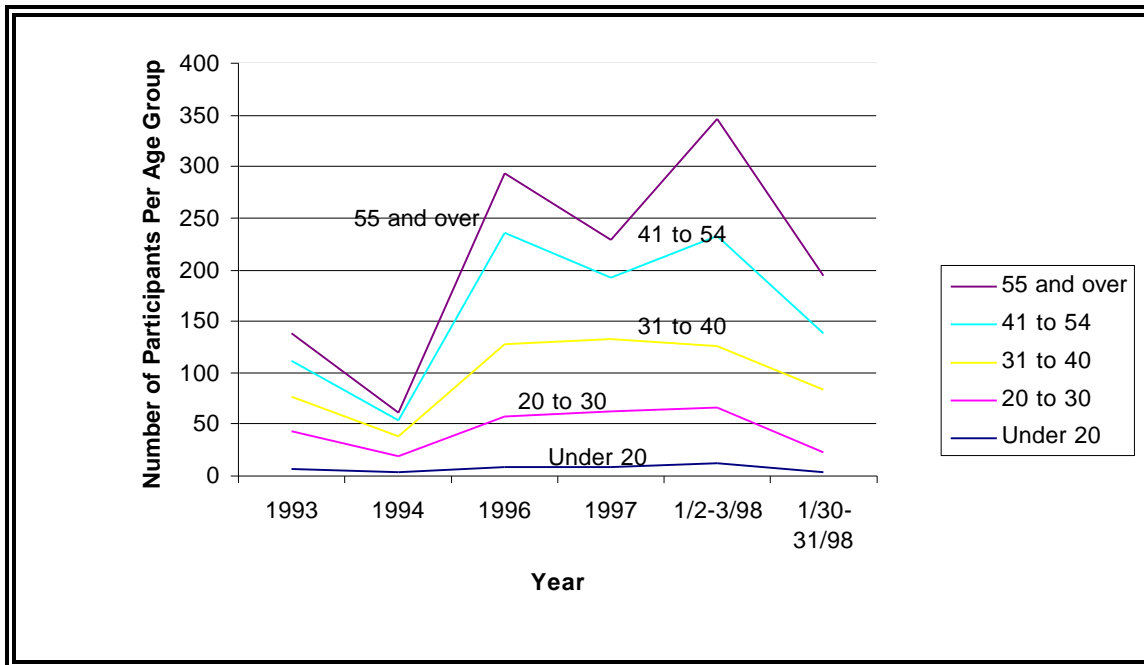
## B. Age Distribution

According to the surveys, the largest participants range from 41 years and over. Issues such as home ownership, work status (i.e. retired) are potential factors for the lower turn out from the age group of 30 and under. However, despite these factors, the results tend to imply that perhaps another outreach project should be considered to increase participation from those in the 20-30 age category.

**Table 2. Age Distribution**

Age Group	Year					
	1993	1994	1996	1997	1/2-3/98	1/30-31/98
Under 20	7	4	9	8	12	4
20 to 30	36	15	49	55	54	18
31 to 40	34	19	70	69	60	61
41 to 54	35	16	108	60	106	55
55 and over	26	7	57	37	114	56

**Figure 2. Age Distribution**



### C. Marketing Strategy Effectiveness

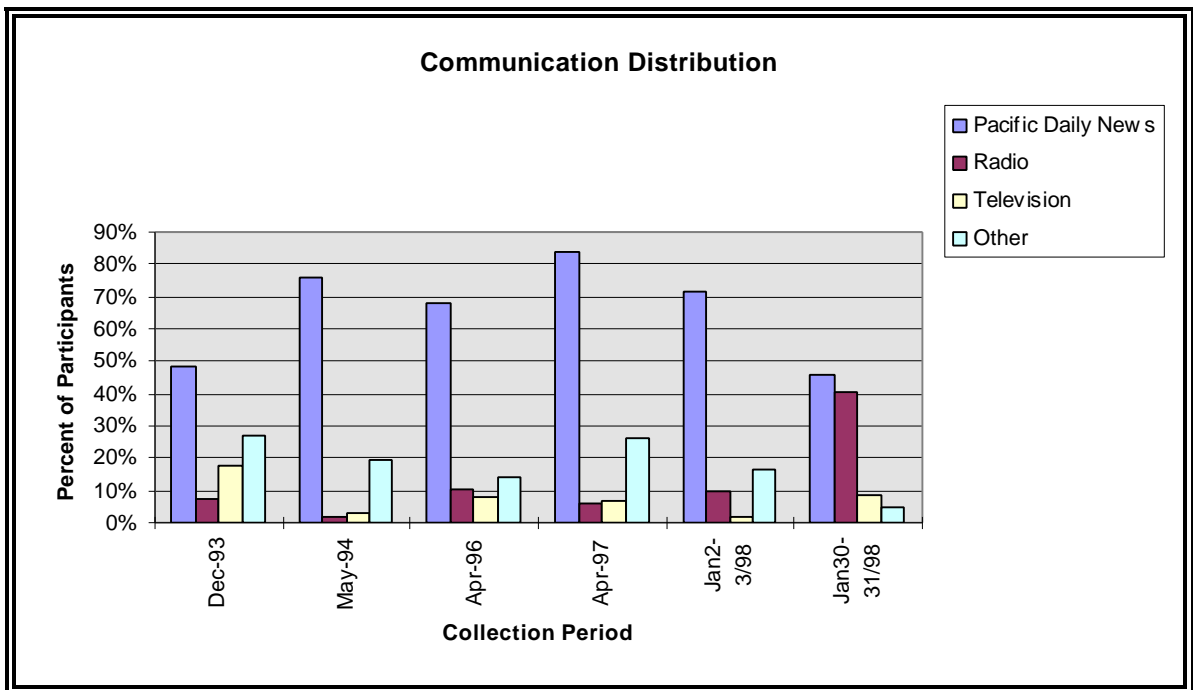
Based on the surveys, over 60% of the participants were reached with Guam’s local paper, the *Pacific Daily News*. Radio and television contributed to a certain extent in public outreach. Radio was very important immediately following Typhoon Paka, since most of the island was without electricity. However, under normal conditions, a larger affect on the population is through other means of communication. These methods primarily include broadcasting via facsimile, advertisements in the Catholic Sunday paper, road banners, and through “word of mouth” (friends, family, mayor, etc).

Additional research is warranted to evaluate the combined effectiveness of all these forms of communication.

**Table 3. Communication Distribution**

Community Outreach	Responses Per Year					
	Dec-93	May-94	Apr-96	Apr-97	Jan2-3/98	Jan30-31/98
<i>Pacific Daily News</i>	49%	76%	68%	84%	71%	46%
Radio	7%	2%	10%	6%	10%	41%
Television	18%	3%	8%	7%	2%	8%
Other	27%	19%	14%	26%	17%	5%

**Figure 3. Communication Distribution**





## D. Waste Profile

In evaluating the surveys and various information (correspondence and invoices) from 1993, the primary household hazardous wastes collected on Guam are spent lead-acid batteries, waste oil, and paints or paint-related wastes. In addition, due to limited funding, Collections were sometimes limited to more common waste streams.

**Table 4. Waste Profile**

Period	Household Hazardous Waste		
	Car Batteries	Used Oil	Paint
Apr-93	244	236	NWC
Dec-93	430	ICD	ICD
May-94	686	330	NWC
Apr-96	313	178	118
Dec-96	806	454	185
Apr-97	1454	437	143
Sep-97	1384	825	440
Jan-98	1890	2320	1100
Jan-98	1120	910	990

NWC = No Waste Collected During This Period

ICD = Inconclusive Data

**Figure 4. Waste Profile - Used Oil**

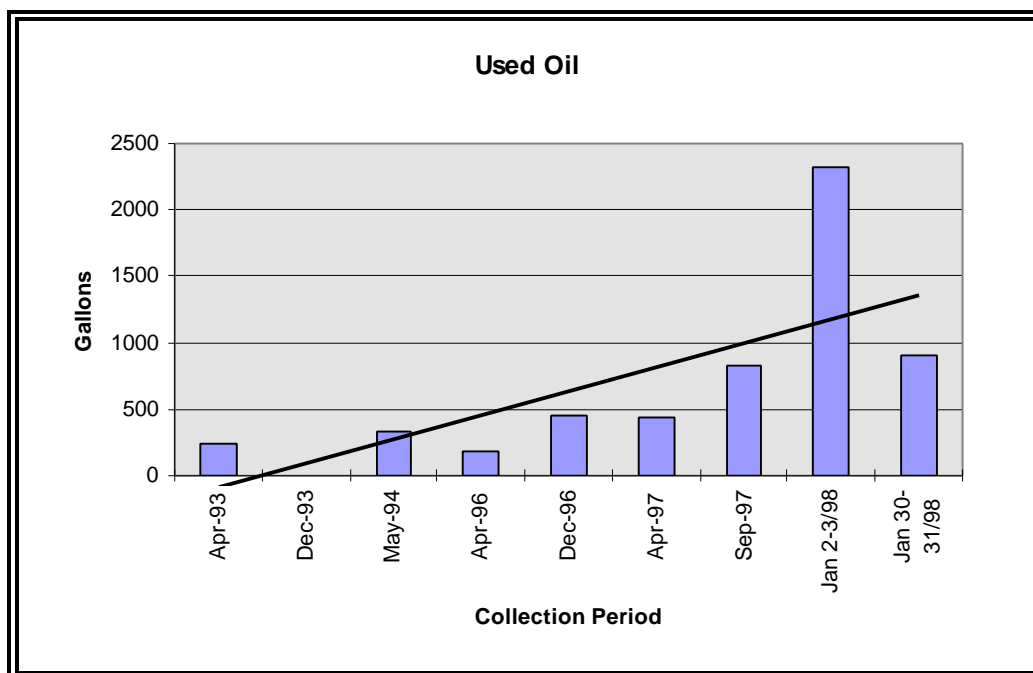


Figure 5. Waste Profile - Lead Acid Batteries

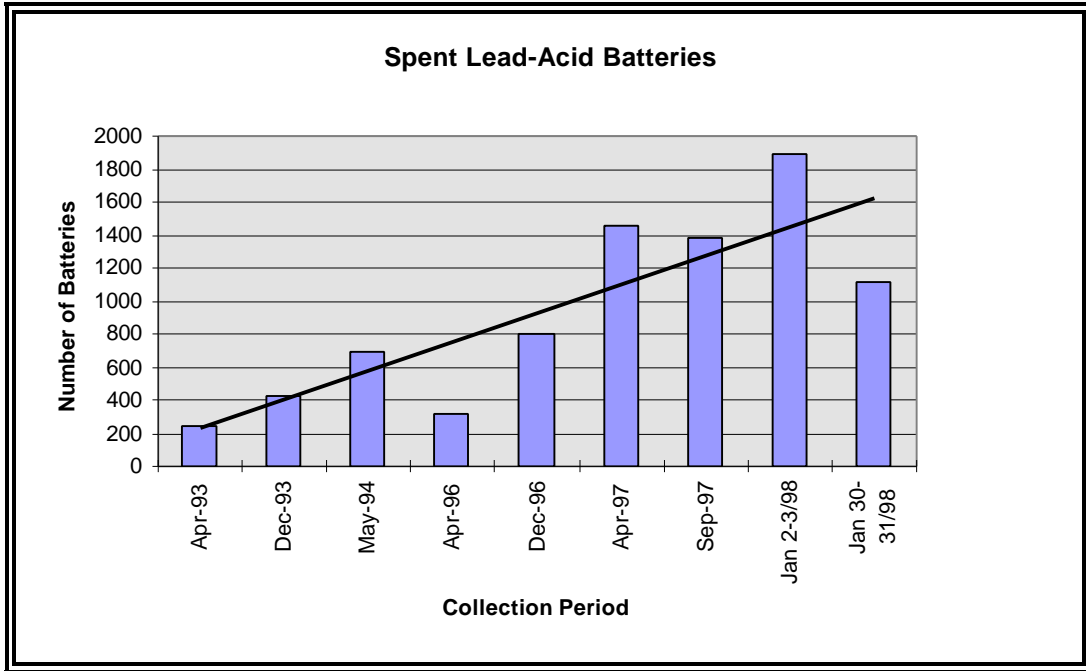
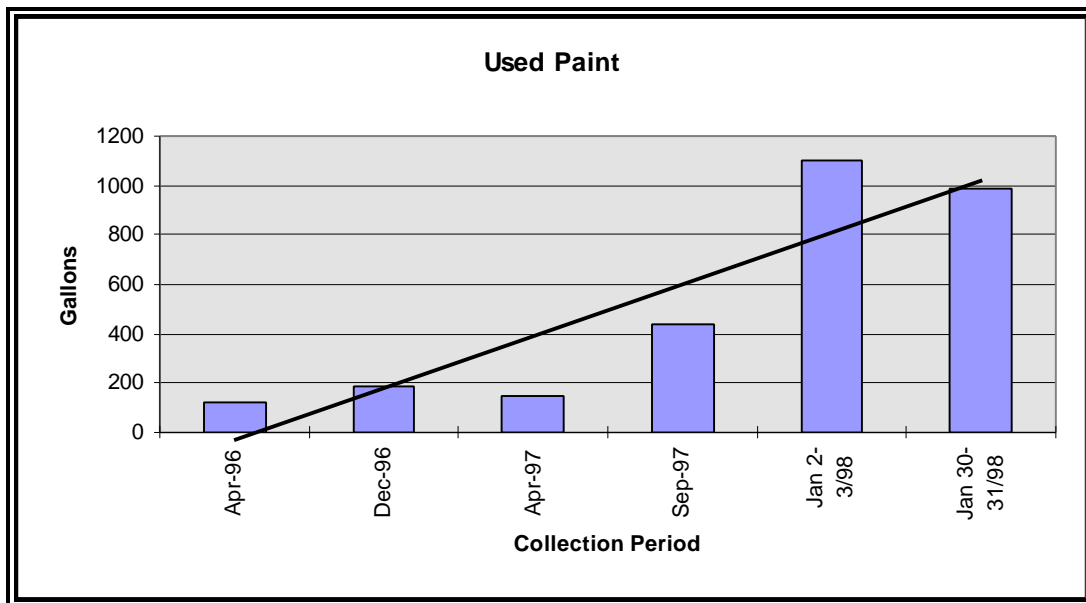


Figure 6. Waste Profile - Used Paint



## **E. Measurement of Success**

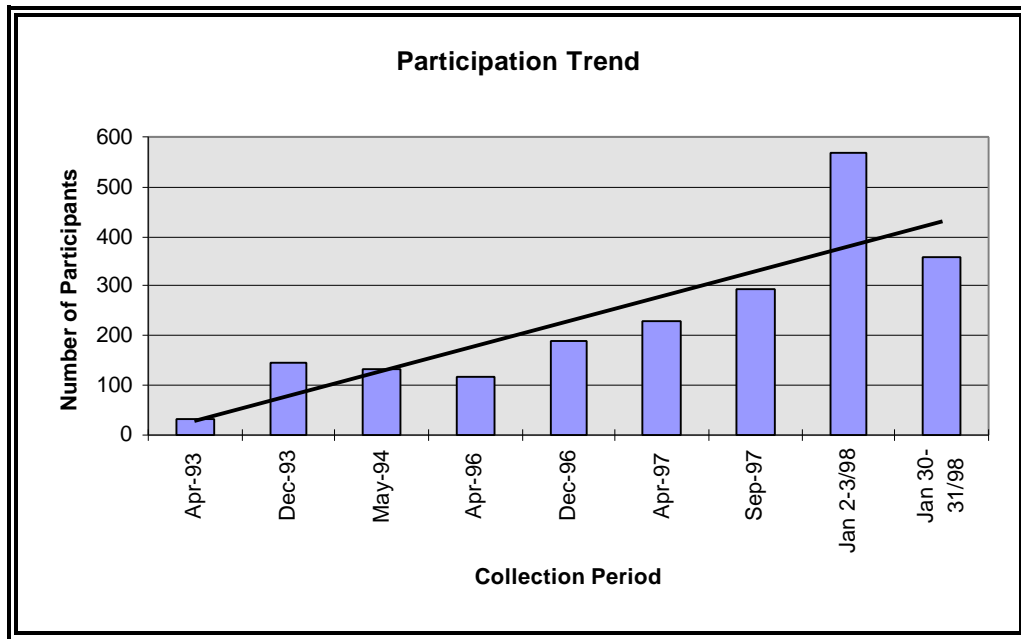
Based on the increasing trend on the number of household hazardous waste collected, the project is successful in that this waste stream is kept from being either disposed at the landfill or abandoned. However, since environmental awareness or education is a major component of the Collection, a good measure of success also lies within the number of participants. That is, the more people who are made aware of household hazardous waste, the more they will participate in the responsible disposal of those wastes. During its initial stages, the Collection attracted at least 30 people and continued on this trend even during the second Collection. It was understood that considerable effort would be needed to convince residents to be more aware of the household hazardous wastes in their home and its potential harm to human health and the environment.

Based on the surveys, there has been a dramatic increase in the number of participants.

**Table 5. Number of Participants**

<b>Period</b>	<b>Number of Participants</b>
Apr-93	34
Dec-93	145
May-94	132
Apr-96	115
Dec-96	188
Apr-97	229
Sep-97	294
Jan 2-3/98	566
Jan 30-31/98	360

Figure 7. Participation Trend



#### IV. CONCLUSION

It is clear that it will take some time before we evolve to the point where there will be an equal number of government officials and “environmentally friendly” citizens per pollution-prone individual. Thus, we have come to the conclusion that merely enforcing the regulations does not prevent pollution.

Incentive programs such as Guam’s *(Fanhasso) Hasso Guam! Household Hazardous Waste Collection* is important in its contribution towards preventing pollution to the island’s natural resources. However, an even more significant achievement is this program’s growing effect on the environmental mindset of the island’s community. As the Collection continues, it has attracted an increasing number of participants utilizing the service. In addition, the Collection has seen an increase in those participants volunteering their services and funding to maintain this event. Therefore, a shift from a government-driven project to a community-based form of environmental protection is developing.

Numerous accolades from the public through comments in the surveys, or through references in meetings and the local paper continue to fuel growing interest on this project. As a result, stable funding must be sought to meet the demands and expectations of the community. As more residents participate in the Collection, an increase in cost may be seen due to a rise in waste quantities. The frequency of Collections has also increased from an annual basis to quarterly. Therefore, the cost to continue the Collection also increases with frequency.

There are several possible solutions to the challenge of funding. Although community involvement provides some funding, the bulk of the funding must be attained from a stable source. Tipping fees, tariffs, and user fees are some possible choices to fund this project.

Even though many challenges lie ahead in continuing the Collection and expanding its impact, *(Fanhasso) Hasso Guam!* must continue to be an integral part of the pollution prevention and education process that has begun.