

Feasibility of a Permanent Household Hazardous Waste Facility: Mesa, AZ

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Final Report

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Executive Summary:

The population of Mesa, AZ is continuously increasing. With this growth, there is a need to reconsider the efficiency of city services. One of these services is how to best handle household hazardous waste (HHW). Currently, the City of Mesa has four HHW events per year and is interested in building a permanent facility. The purpose of this study is to assess the feasibility of constructing a permanent HHW facility for the City of Mesa.

This report analyzed several permanent HHW case studies and investigated these three research questions: (1) What process was used to create a permanent HHW facility? (2) What are the pros and cons of permanent HHW facilities? (3) What are the associated costs (capital/fixed, operating, cost/car)?

This report recommends that the City of Mesa build a permanent HHW facility. Additionally, it is suggested that Mesa consider collaboration with surrounding facilities in the region and consider continuing with one-day events, but less frequently than they are currently offered. A permanent facility will provide a valuable service for City of Mesa residents and will create a healthier and safer environment.

Background and Introduction:

The City of Mesa in Arizona currently has a population of 457,587 (2013 estimate), and is part of the greater Phoenix Metropolitan Area. Mesa experienced a dramatic growth rate of 52.2% between 1990 and 2010 and is expecting to continue to increase. In general, these trends are seen across the Phoenix Metropolitan Area. With such potential for growth and development, there is a need to reconsider how they can accommodate a variety of city services to meet the needs of the population. In Mesa, one of the municipal services, collection of Household Hazardous Waste (HHW), is experiencing higher demand with this growth. The City of Mesa would like to re-consider how it has structured this service in order to make it efficient and economical.

According to the US Environmental Protection Agency (EPA), HHW is defined as “leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients.” HHW must be managed for several reasons, including its impact on water quality and the general health of the community. The City of Mesa holds a permit for its stormwater system issued by the Arizona Department of Environmental Quality. To meet the requirements of this permit, the City holds four HHW events per year. These events help divert HHW from landfills and pollutants from the stormwater system.

Though program participation has increased over the years, the percentage of city households reached is still relatively low according to the City of Mesa. Through more convenient and visible programming, there is potential to involve a larger base of residents. It is clear that the Mesa HHW program is growing and there is great opportunity to reassess their program and look into opportunities to save costs, increase participation rates, and provide a more efficient process for city residents.

Purpose and Methodology

The City of Mesa approached ASU's Urban Sustainability Best Practices/ Case Studies course led by Dr. Nalini Chhetri in the School of Sustainability to assist them in exploring the feasibility of a permanent HHW facility, as they believe they are capable of achieving higher diversion rates of HHW. The overarching goal is to document a variety of best practices that the City of Mesa can use to help with their decision- making process. Therefore, this report investigates comparable cities, pros and cons, and associated costs for permanent facilities.

The research analyzes three permanent HHW facilities in Albuquerque, NM, Butte County, CA, and Gilbert, AZ. Similarities and differences between the Mesa HHW program and these programs are referenced throughout the report. In addition, supplemental research was conducted in order to provide a comprehensive analysis. The report investigates the following research questions:

- 1) What process was used to create a permanent HHW facility?
- 2) What are the pros and cons of permanent HHW facilities?
- 3) What are the associated costs (capital/fixed, operating, cost/car)?

Research Results

Question 1: What process was used to create a permanent HHW facility?

The cities researched all have effective HHW programs. Question 1 addresses their decision-making processes and their current structures. This will provide examples for the City of Mesa as they are exploring the possibility of a permanent facility.

The Town of Gilbert is similar to the city of Mesa in terms of location and has a population of 229,973. It is projected to have the same growth trend as Mesa according to the United States Census Bureau. They opened their permanent HHW facility in July of 2008. Prior to its new facility, Gilbert held one HHW event in the spring and one in the fall. One was a full event where it advertised taking all HHW and the other was a BOPA event where it advertised taking Batteries, Oil, Paint and Antifreeze.

It was a clear decision for Gilbert to transition to a permanent facility because of the potential for higher diversion rates. According to Jack Minkalis, Environmental Services HHW Supervisor in Gilbert, “we had established a need for such a facility by the popularity of our events and knowing we were not capturing many of the wastes through the events” (J. Minkalis, personal communication, November 14, 2014). Gilbert had an opportunity to incorporate this project into the city’s Capital Improvement Program (CIP). The CIP is the public infrastructure and planning tool for the Town, which demonstrates the financial capacity of completing those infrastructure projects needed (Gilbert, 2014). Gilbert was able to build its new facility in conjunction with the development of their new South Area Service Center, and had the financial capability for the city to be the sole owner and operator (Reference picture 1). The upfront cost of the facility was \$800,000 for a 4,000 square foot stand- alone facility, with an annual budget of \$350,000 for operations.



Picture 1. Gilbert, AZ HHW Facility

www.gilbertaz.gov



Albuquerque, NM

Albuquerque has a population of 556,495. In 1988, Albuquerque, NM began holding HHW collection events. When it began, Albuquerque had two collections per year. The popularity of these events grew over the years, with around 600 participants during its last event in 1992. Due to this growing popularity, Albuquerque decided it needed a more permanent facility to handle the higher demand. They wanted to provide greater convenience for residents that would allow them to drop off HHW materials year round (B. Sisneros, personal communication, November 10, 2014).

Albuquerque put out an RFP for a company to build and operate their HHW facility. According to the RFP, the contract would last for two years with optional one- year extensions. The contract consisted of up to \$1,240,000 for the two years, to cover operating the facility and provide various additional services to the City such as off-site pickup. Additionally, the contract consisted of the option of two one- day events per year run by the contractor. Advanced Chemical Transport (ACT) won the bid and is still the contractor for Albuquerque. While this facility is built for the residents of Albuquerque, residents from surrounding communities, Bernalillo County, and Rio Rancho can also dispose of their HHW at this facility (B. Sisneros, personal communication, November 10, 2014).

Butte County is somewhat of a different case compared to the other facilities in this analysis. As a county facility, it is able to take HHW from the entire county population of 220,263 (2012 estimate), and takes HHW from several municipalities for added convenience and centralization. The facility was built following a California Department of Resources Recycling and Recovery (CalRecycle) grant that was awarded for FY 1994-1995, and was originally contracted out by the City of Chico, CA, where the facility is currently located. NRC Environmental Services currently manages the facility. During this same grant period, Butte County was awarded funds to hold temporary events for county residents. Later on, seeing the need for a countywide permanent facility, after four years of collection, the county took over operations of the Chico facility (S. Rodowick, personal communication, November 13, 2014).

The facility is also part of the larger network of three other HHW facilities, but is the only facility in the immediate area that is able to accept HHW from multiple municipalities. The cities of Paradise and Oroville, both located in Butte County, have their own permanent facilities, only open to their own residents (Butte County, 2013).



Question 2: What are the pros and cons of permanent HHW facilities?

This report analyzes a variety of pros and cons related to permanent HHW facilities (See Table 1 below). A feasibility study completed in 2012 by the Northeast Resource Recovery Association for the state of New Hampshire provided insight into some of these pros and cons (Albanese, 2012). These items are expanded on below.

Pros and Cons of Permanent HHW Facilities

Pros	Cons
Increased participation and greater populations reached	Location dependent and inflexibility
Encourages proper disposal and increased reuse opportunities	Liability of HHW processing and storage
Cleaner water supplies	Complex permitting process
Reduced planning, marketing, and continuous education efforts	Well trained permanent staff required
Increased safety/decreased liability	Public/ political justification required

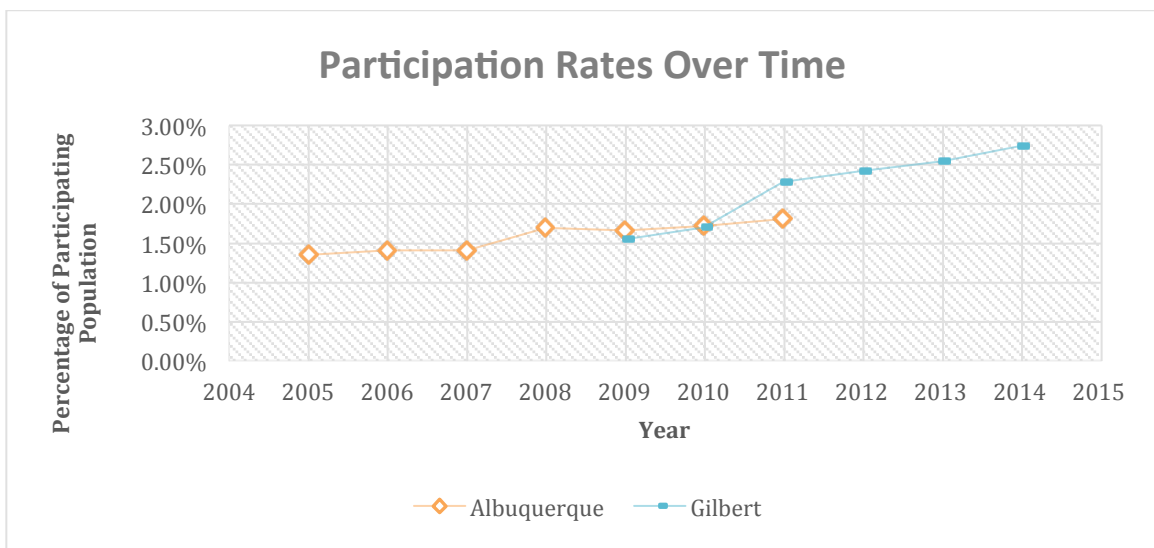
Table 1: Pros and cons for a permanent household hazardous waste facility

Pros of Permanent Facilities

Pro 1: Increased participation and greater populations reached

It is evident that Gilbert, AZ and Albuquerque, NM have seen a steady increase in participation rates (percentage of the population) with their new facilities (reference Graph 1 below). In addition, Butte County has high participation rates. Though the population is around half the size of Mesa, Butte County garners more participants of population by percentage. According to data provided from Mesa, Butte County garners around 3.2% of the population on average versus an average of 0.8% for Mesa.

There is an added dimension of convenience and equity that comes with establishing a permanent facility. A facility that is open several days weekly provides greater access to Mesa's population, versus temporary events only held four times a year on Saturdays.

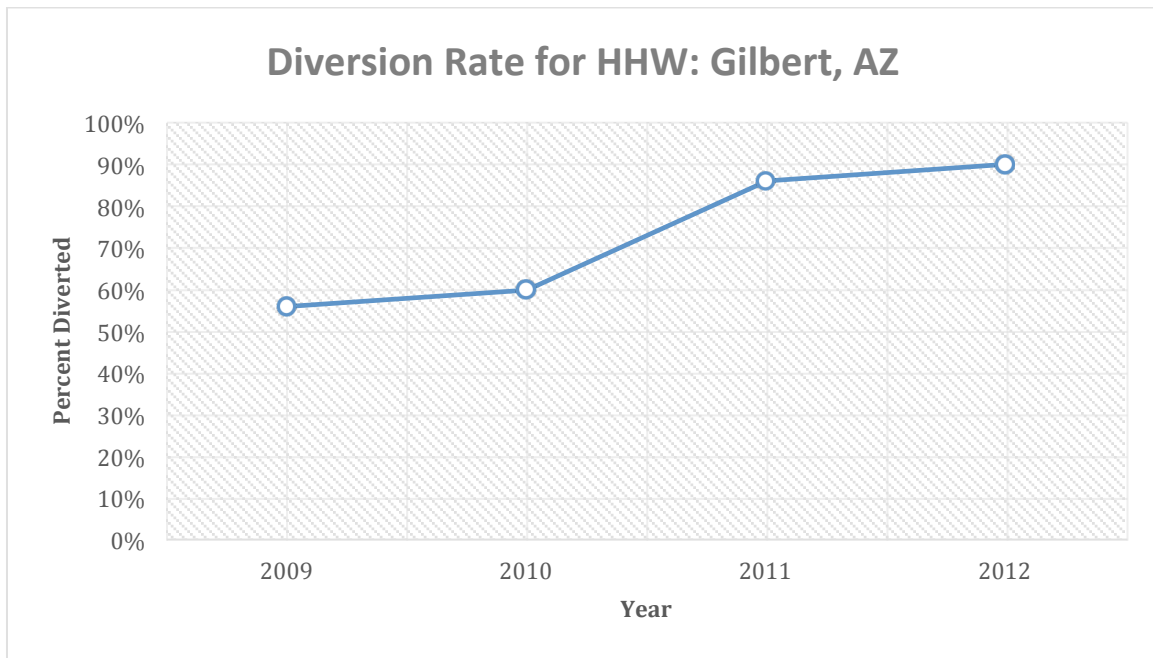


Graph 1: HHW collection participation for Albuquerque, NM and Gilbert, AZ. Data provided by the City of Mesa.

Pro 2: Encourages proper disposal and increased reuse opportunities.

A permanent facility would provide a means for residents to readily dispose of hazardous material rather than waiting for the next collection event or improperly disposing HHW. Therefore, less HHW is sent to the landfill and diversion rates are improved. Graph 2 below demonstrates how the diversion rate has increased in Gilbert since they opened their new facility.

A permanent could also include additional re-use opportunities, especially with items such as paint, that are easy to store and the re-distribute. For example, The City of Gilbert has a Swap Shop at their facility that re-distributes products such as cleaners, detergents, weed killer, bug spray, and a variety of items dropped off at the HHW Facility. They have re-distributed over 37,559 gallons of paint since opening in 2008 (J. Minkalis, personal communication, November 14, 2014).



Graph 2: Diversion rate for Gilbert, AZ HHW facility. Data provided by the City of Mesa.

Pro 3: Cleaner Water Supplies

The introduction of toxins into waterways can occur through the improper disposal of HHW. These toxins not only affect natural waterways, but can also affect public drinking water and can be found in sewers. This creates issues for stormwater management. Through the collection of HHW at a permanent site, the risks associated with introduced toxins are lowered and can be better controlled (Albanese, 2012). Often times, stormwater management policies are the reason for HHW programs to exist, such as the case with the City of Mesa.

Pro 4: Reduced planning, marketing, and continual education efforts

According to the City of Mesa, staff commitment at every HHW event is quite high. Staff is needed to not only concentrate advertising on various platforms, but also to operate events. For Mesa's quarterly collections, two city departments are involved in the planning process,

while police staff is necessary for day-of operations (traffic control and ammunition and prescription drug disposal). There is a high investment of time and effort by the City that would not be necessary for a permanent facility's daily operations. The City of Mesa's current events also entail a high labor cost, with a large number of contractor staff that must be available onsite to staff these events. A permanent facility would not require nearly as many workers or as high a labor cost expended for one period of time (HHW Program Plan, City of Mesa, 2014).

Education efforts for a permanent facility would be restructured in order to provide continual awareness to residents. Education campaigns could be created throughout the year, as staff wouldn't be focused on providing advertising and marketing before each individual event.

Pro 5: Increased safety/ decreased liability

By having a permanent facility, HHW does not have to be moved to another location on the same day it is collected, but is rather handled on site. There is also a longer amount of time to handle the HHW when it comes in compared to a satellite event that is more rushed. Additionally, material can be better screened, as items that are not HHW are not taken. Furthermore, there is a greater ability to package and bulk HHW. A permanent facility better allows for the screening of the individuals who bring the material in so that only residents of the specific area are helped, and not commercial or non- residents (Patrick Engineering, Inc., 2009).

Cons of Permanent Facilities

Con 1: Location dependent and inflexibility

One- day events are not location dependent and are more flexible compared to a permanent facility. Therefore, permanent facilities pose some challenges because they are location dependent and may not be convenient for residents who live farther away from the facility. For example, Butte County is currently assessing the possibility of putting out an additional RFP for a new facility based on the changing needs of the county's population (S. Rodowick., personal communication, November 13, 2014).

Con 2: Liability of processing HHW and storage

A permanent facility will potentially pose liability issues. According to the New Hampshire Feasibility Study "permanent facility storage areas need to meet special parameters, such as specialized concrete floors, decontamination areas, and fire suppressions systems. All regulations are to be followed according to the Full Quantity Generator regulations" (Albanese, 2012, p.29). Compared to a collection event, where all the material is immediately removed from the site, a permanent facility will have to deal with the complexity of temporary storage of HHW materials, and all the potential situations that may arise such as fires, spills, and leaks.

Con 3: Complex permitting process

While HHW does not fall under the definition of hazardous waste under the Resource Conservation and Recovery Act, the EPA suggests that facilities who handle and store HHW still follow the requirements set forth for hazardous waste treatment, storage, and disposal facilities (Environmental Protection Agency, n.d.). Additionally, a permanent facility would require a variety of city approvals and must comply with zoning, building, and fire codes (Environmental Protection Agency, n.d.)

Con 4: Well- trained permanent staff required

In order to have a functional permanent facility there must be full time staff that is properly trained. This can be costly and training just one employee costs, on average, \$5,000 per year (Albanese, 2012). The Town of Gilbert has two full time HHW technicians and one HHW supervisor, compared to the current situation in the City of Mesa that heavily relies on contractors, city employees and volunteers on their collection days.

Con 5: Public/ political justification required

Having public and political buy-in is necessary for building and maintaining a permanent HHW facility. Not-in-my-backyard attitudes can persist if a facility is located too close to residential areas; opposition may occur if the facility is too far away. Additionally, the costs associated with building and maintaining a permanent HHW facility has to be justified to city council (Patrick Engineering, Inc., 2009). If the facility is not a feasible option or there are better alternatives, then the city council may reject the idea. Additionally, if there is strong public opposition, then the council may likewise be hesitant to agree to the construction of the facility.

Question 3: What are the associated costs (capital/fixed, operating, cost/car)?

Financial feasibility is a major component for the decision- making process as it is a prohibitive factor. To provide Mesa with a more comprehensive understanding of the costs associated with permanent facilities, this study assessed the capital/fixed costs, yearly/operational costs, and costs per car for each of the case examples (reference Table 2 below).

There are a variety of ways to finance permanent HHW facilities. Each city researched had a different cost structure, and it can be determined that the financials of these projects are very contextual and depend on several variables including: available land, access to capital improvement money, approval by city officials, etc. However, the data provided will be helpful in the decision-making process as well as the overall analysis.

Associated Costs With Permanent Facilities

Type of cost	City	Permanent HHW Facility Costs (Except Mesa)	Explanation and Timeframe of Costs
Capital/ Fixed Cost (for permanent facility)	Butte County	\$1,200,000	Estimate provided by County Employees
	Albuquerque	N/A	Not available
	Gilbert	\$800,000	\$800,000 upfront for new facility
Yearly/ Operational Costs	Butte County	\$410,287.66	Average yearly cost, 2009-2011
	Albuquerque	\$620,000	This is an estimate per year. The contract is up to \$1,240,000 for two years
	Gilbert	\$350,000	Annual budget
	*Mesa	\$480,000	Annual budget
Costs per car	Butte County	\$59.07	Averaged from 2009-2011
	Albuquerque	\$61.00	Fixed Cost
	Gilbert	\$79.68	Average between 2008-2014
	*Mesa	\$70.87	Current

Table 2: Comparative costs of permanent HHW facilities for Butte County, CA, Albuquerque, NM, and Gilbert, AZ. Source: Mesa and each individual entity provided documentation that was used in compiling this chart.

Recommendations

The following are recommendations based off the research presented in this analysis. Overall, based on the successes of the case examples, as well as several important general benefits, the City of Mesa should pursue building a permanent facility. As the Mesa one-day events are increasing in participation, and are already at capacity, a permanent facility will accommodate for this increased participation, while spreading the intake of materials from one day to all year.

Recommendation 1

Based off of Butte County and Albuquerque, it is recommended for Mesa to consider collaboration with other cities in the Phoenix Metro area. Both the cities of Tempe and Gilbert have facilities and there might be opportunities to explore regional reuse and disposal programs. Supplementary research suggests that multijurisdictional models can be helpful in managing collections and in increasing participation (Cabaniss, 2008).

Recommendation 2

Based on the pros and cons described in section 2, it would be best to pursue a permanent facility with certain considerations in mind. A permanent facility is more accessible and convenient to residents, and provides a better service platform compared to temporary events.

Besides cost, which is addressed in the third research question, the cons describe the inflexibility of a permanent facility, as well as issues of liability and public opinion. One possible solution to this would be to continue hosting events offsite that would serve to reach more of the city's population, while also serving as demonstration sites for the public. These would serve the same practical function as events currently do in the City of Mesa, but would provide an increased awareness to the public about disposal options the city provides. At maximum, two events per year could serve this function. Such events could be built into a contract to construct the facility with the vendor the City chooses. This model has been successful in Albuquerque and has potential to increase participation rates.

Additionally, Mesa should consider including a reuse section in their permanent facility. As they already have a program in place for reuse, continuing these efforts in the context of a permanent facility will help increase diversion of HHW. They can look to the City of Gilbert Swap Shop as a successful example.

Recommendation 3

Recommendation 3: Based on cost, savings can be realized in building a permanent facility. However, a high capital cost can be problematic in terms of decision-making. The economies of scale concept is relevant in that increased participation as well as the availability of a facility to process this waste both lead to greater efficiency overall. Evidence for this can be seen in the results the Town of Gilbert realized upon building a facility. Though initial capital costs can be daunting, there is the potential to save more in a unit analysis sense, per participant. Operationally speaking, the City of Mesa spends close to the same amount every year funding temporary events as other jurisdictions do financing a permanent facility. Therefore, cost savings per year is not necessarily realized in building a permanent facility. However, since a permanent facility can lead to increased participation rates, the cost per pound of collected waste ultimately will decrease (Cabaniss, 2008).

A permanent facility makes the service that a city provides to its population cheaper and more efficient. This is because cities can save money on packaging and shipping costs, and have the ability to store collected wastes at a lower volume. If a facility is constructed, more City of Mesa residents will be served on a similar operational budget as the temporary events. The value of this service is something that might be difficult to quantify in terms of the overall health benefits it provides the community. Adverse risk, health effects, and decreased water quality all impose an external cost on the community. A facility would better mitigate all of these problems, and is implicitly reducing these external costs. Therefore, despite the short-term capital cost, in the long run, a permanent facility creates a much more efficient service for both residents and the municipality itself.

Conclusion

There has been a definite trend in the past few years for cities to build HHW permanent facilities (Cabaniss, 2008). This is something that not only increases efficiency, but also provides an invaluable service to a municipality's residents because it incentivizes proper disposal and environmentally responsible behavior. This is important for the City of Mesa with their high growth rates.

The facilities examined in this report show two different own and operate models. Albuquerque and Butte County have an outside contractor that owns and operates the facility. Gilbert owns and operates their own facility. It will take additional research to show which model works best for Mesa.

Though a permanent facility is initially costly, the benefits that such a service would provide would be profound. The City of Mesa would follow a precedent set by many other urban areas around the nation in transitioning from temporary events.

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