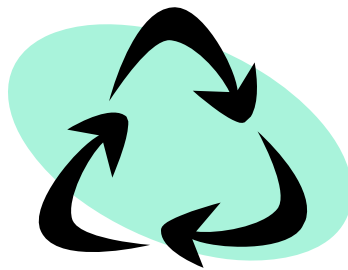


**PLASTIC BOTTLE RECYCLING  
PILOT PROGRAM  
SPRING, 2008**



**MEMORIAL HIGH SCHOOL  
935 ECHO LANE  
HOUSTON, TX 77024**

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**August 15, 2008**

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## I. Introduction / Need for Project

Plastic beverage bottles make up a large part of the waste stream at Memorial High School (MHS) and come from three sources: those sold in the cafeteria at lunch periods, from vending machines, and those brought from home. The reasons for recycling are numerous:

- reducing the waste stream results in dollar savings in garbage pickup and landfill tipping fees
- saving landfill space, petroleum, and natural gas
- energy conservation and environmental stewardship
- possibly generate a modest source of income for the school

MHS is a public high school, grades nine through 12, enrolling approximately 2200 students and employing about 175 teachers and staff.

## II. Lead Coordinators

The team of coordinators at MHS consisted of three parent volunteers: Lisa Lane, Kathleen Johnson, and Sue Harding. These individuals were responsible for initiating the program, securing administrative and PTA approval, negotiating an agreement with the recycling company, recruiting student groups, purchasing the bins and advertising material, and overseeing and monitoring the program. The coordinators must be capable, enthusiastic, and willing to commit time to the project. The estimated time frame, from the initial concept to the implementation for one school semester (Spring, 2008), was from June 2007 to May 2008. An average of 13 hours per month was put forth by each of the three coordinators.

A student group is necessary for successful advertising and promotion. The AP Environmental Science (APES) classes played a vital role since the team believed that any new message brought before the student body would get better reception if delivered by students, rather than a parent or administrator. Twenty-three students volunteered an average of five hours each from mid-November to early January.

## III. Finding a Reliable Recycler

The main criterion for the team was to secure regular pickup of the collected plastic at no cost to the school. After meeting with five recycling companies, we found Reterra Plastics willing to come to the school every other week to pick up the accumulated bottles. Reterra said they may be willing to pay the school for the plastic after a pilot program during which time they would assess the quantity and quality of our collected plastic. Quality is determined by the percentage of contaminants, including trash, liquid, or plastic other than beverage containers.

Most beverage containers are either #1 also known as PET (polyethylene terephthalate) or #2 also known as HDPE (high density polyethylene). The number is found on the bottom of the container inside the chasing arrows recycling symbol. The recycling program at MHS is for #1 and #2 plastic only.

It is worth noting that the recycling business is very unpredictable and prices for recycled materials can fluctuate from month to month, and year to year. With this in mind, we made it clear to all interested school and PTA members that this program's ultimate purpose is to take responsibility for our environment, not to generate an income stream.

Even though no formal contract with Reterra was signed, it is hoped that the company will continue to pick up the collected plastic. If, however, due to external economic factors such as increasing fuel costs, Reterra cannot provide this service to the school, there are alternatives. Drop-off centers such as Vista Fibers, located just 3.6 miles from MHS, accept plastic for recycling. A new strategy for transporting the collected plastic would have to be implemented by the coordinating team and student groups.

#### **IV. Administrative and Custodial Support**

The program would not have happened without the support of Steve Shorter, MHS principal; Lou Ann Farmer, MHS Grade Level Principal and Administrator for Facilities; and Magdaleno Reyes, MHS Custodial Manager. The support and financial backing of the PTA was critical as well.

In addition to communicating with key MHS staff, the team met with Shari Lemley (Sr. Dispatcher – Maintenance Department) who serves as the recycling contact for the Spring Branch Independent School District (SBISD). Shari confirmed that no existing plastic bottle recycling program was in place in any SBISD school and that existing contracts regarding refuse pick-up would not cover plastic bottle pick-up. She encouraged any efforts to begin a recycling program.

One of the most important links in assuring a successful recycling program is clarifying which team or individuals are responsible for the daily/weekly emptying of the bins. The custodial manager and staff generously agreed to take on this project since they already regularly handle the waste stream. As will be described fully in a later section, the program had ten indoor bins placed in the cafeteria and 30 bins located throughout the rest of the building. The custodial staff monitors the bins and when they became full, removes the bag, inserts a new clear plastic bag, and transports the full bags to the central storage location on the school property.

Through monitoring done in March, April, and May, we determined that for the 30 bins located throughout the school, on average, eight bins per week needed emptying. The ten bins located in the cafeteria were not monitored for frequency of change out, however, we estimate 17 bags per week were used. Thus 25 bags per week are needed for the indoor bins.

Reterra provided six gaylords (large cardboard containers measuring 4' x 4' x 4') to be used as receptacles for the bagged plastic bottles. The gaylords sit on wooden pallets on a covered patio area outside the main cafeteria. Reterra can access the central storage location by truck. Once every two weeks, Reterra employees pick the bagged bottles out of the gaylords and throw them in their truck to be hauled away. No automation or lift devices are used.

An item of concern voiced by a member of the PTA was the possibility of collected bottles attracting rodents and/or insects. We found that this has not been an issue. Students and teachers have responded to the message to keep trash and food out of the bins and as a result, the contamination rate averages only about 10%.

## **V. Containers and Funding**

### **Indoor Bins**

For the containers, the team did an internet search for products that were specifically used for recycling. We decided on Link-A-Bag containers ([www.linkabag.com](http://www.linkabag.com)). The unique patented design encourages the effectiveness of recycling programs because of the use of clear bags which reinforces that only recyclables should be placed in them. People see that Link-A-Bag is not a trash receptacle and contamination is kept at a minimum.

Forty Link-A-Bag bins (at \$61.95 each + shipping) were ordered once funding was secured (see 'Funding' below). Ten containers were placed in the cafeteria; the remaining 30 bins were scattered throughout the school in the halls, locker rooms, gyms and breezeways. All forty units were placed next to trash bins – this is extremely critical for reducing contamination.

The Link-A-Bag bins are designed to hold 56 gallon clear bags. Each bin comes with 20 bags; additional bags will be purchased with PTA funds. Occasionally the custodial staff will use the SBISD standard-issue 40 gallon bags used for trash bins, however, this size isn't optimal for the recycle bins. The bags tend to pull out of the frame and flop on the floor as they become full. We made inquiries about the possibility of SBISD providing larger bags for our use in the recycle bins but were told that larger bags aren't stocked centrally. The only avenue for acquiring larger bags through the school district is for MHS to make the request and consequently pay for the order. Because the PTA was willing to fund the purchase of bags annually we decided to leave that job in the hands of the PTA Recycling Liaison (see 'Funding' below).

## **Outdoor Bins**

The internet was also used to research and purchase the outdoor bins. We ordered 12 blue, 44 gallon Huskee containers (\$35.00 each) with gray funnel tops (\$32.00 each) from Trash Can Depot ([www.trashcandepot.com](http://www.trashcandepot.com)). Large (12" X12"), waterproof, self-adhesive recycle logos were purchased from Recy-Cal Supply ([www.recy-cal.com](http://www.recy-cal.com)) and affixed to the side of the containers. Plastic signs reading "Plastic Only – NO Trash" were ordered from Link-A-Bag and secured to the wall/fence above each recycle bin. Bins were placed at the tennis courts, track, baseball field, softball field, field house, crossover bridge on Echo Lane and Gaylord school entrance. The 40 gallon bags used by the custodial staff fit the outdoor bins, thus no special sized bags are needed.

## **Funding**

For the funding of both indoor and outdoor containers, the team wrote up a proposal and presented initially to the PTA board and then to the PTA at large at the first general meeting in September 2007. A one-time line item of \$4000.00 was proposed and approved for the purchase of all 52 bins.

An additional annual line item of \$1000.00 was also budgeted for future repair and/or replacement purposes and purchase of bags. Since it is estimated that 25 Link-A-Bag bags are needed per week (950 per year) for the indoor bins, an estimated bag budget per school year is \$370.00 plus an estimated \$120.00 for shipping. (Link-a-Bag sells cases of 120 bags for \$46.00.)

A recycling liaison position on the PTA board was established to oversee the approved funding. This board member will interface with the school staff or APES class once a group for surveillance of the program is established for the coming school years. That person will also purchase bags for the indoor bins when needed.

## **VI. Program Kick-off**

In November 2007, the team approached the APES teacher who embraced having one of our team speak to the class about the plastic recycling program. This class is an AP level science class whose students are required to do a set number of environmental service hours each semester. Our intent was to solicit recruits to form a committee to introduce the recycling program, make signs and help place containers. Involved students would be credited for service hours.

Twenty-three students signed on, and these students met with us after school in the cafeteria for four, two-hour sessions in the two weeks leading up to the first day of collection (January 8). We made a point of encouraging the sessions to be student led, and used their ideas for themes and marketing techniques.

Three informational points were critical to the campaign message:

**Only Plastic labeled 1 and 2** can be recycled – look for the chasing arrows on the bottom of bottles.

**No Trash, No Liquids** for purposes of eliminating contamination from the recycle container bags.

**Caps On** to keep any remaining liquid in bottles contained – Reterra recycles caps.

The following ideas were put into action by the students:

- A skit was designed and broadcast several times over the televised student announcement system.
- An interview with one member of our team was conducted and used in said televised announcement.
- Weekly audio announcements were made during the first critical month and approximately once a month after that.
- Posters were designed, painted and hung at critical designated spots around campus. These posters were hung ahead of the scheduled collection date in order to get the student body informed of the upcoming event.
- An article was written for *The Anvil*, the school newspaper, by one of its staff writers.
- Students worked on the day prior to the first day of collection to assemble and distribute the containers around campus and place signs where necessary.

## VII. Monitoring and Lessons Learned

The parent team began the collection period by monitoring the first few lunch periods to see how the containers were used and to be available for questions and guidance. Follow up was done on a weekly basis, as needed, to check the bins for usage, contamination, and success in proper placement location. A few ad hoc meetings were held with the Custodial Manager director to exchange feedback on the program.

At the end of the semester, we requested a feedback email from teachers and staff in order to field complaints and gain suggestions to be used in the upcoming school year. To date no responses were received.

We found it very important to be very specific to the maintenance staff about the increased or altered workload that the collection of plastic waste entailed. While the trash volume basically remains unchanged, there is added work in distributing the plastics to another location. We suggested to the maintenance staff that the recycling container bags be left until full (as opposed to changed out every lunch period or every day) to save on their workload and to save on usage of the special Link-A-Bag bags.

We still haven't resolved how to handle the emptying of the outdoor containers. During the Spring Semester they were emptied on an ad hoc basis, either by maintenance staff, coaches, parents or, most of the time, by the Lead Coordinators. Consequently, the containers became overfull at times. For the Fall semester, we hope to get students (hopefully from the APES class) involved with the outdoor bin maintenance. Stay tuned....

Also, despite appropriate signage, we found that the containers at the baseball and softball concessions stands were routinely contaminated with food waste and paper cups. We speculate is that these areas are frequented by families who are not aware of the campus recycling program. After a semester of finding too much trash in these recycle bins the team moved them to the tennis courts and track where contamination is minimal and usage is high.

Two unfortunate issues should be mentioned. One indoor bin went missing; it is not known whether it was theft or accidental breakage. On several occasions, the attached signs on the indoor bins were snapped off. This occurred most often with bins in the breezeways where strong winds most probably knocked the bin over.

## **VIII. Results**

During the Spring Semester (93 days) at Memorial High School, an average of 4000 bottles per week (a total of 75,000 bottles) were collected and recycled by Reterra. Our contaminants remained low at about 10%. Approximately 80% of our collected plastic was #1 (PET) and 10% was #2 plastic (HDPE).

Reterra generally picked up our plastic every other week on a Saturday. Our six gaylords were usually piled high with bags of plastic bottles by then!

The results have been rewarding and feedback has been very encouraging. Based on the preliminary success of the MHS program, Westchester Academy for International Studies initiated a similar program. Three other schools have also made inquiries after learning of the success at MHS. We hope other schools, especially in the Spring Branch School District, will also show interest in adopting a plastic recycling program.

## Photos of Outdoor and Indoor Bins



**Cost Breakdown of Recycle Bins  
MHS  
December 2007**

Indoor Containers (40 bins)

The containers (provided by Link-a-Bag Systems in New York) are a unique design consisting of a sturdy *blue* frame that holds 56 gallon clear bags. The visual effect of a clear bag reinforces that only plastic bottles should be placed in them and that it is not a trash receptacle. Contamination is thus easier to eliminate.

Bins	\$61.95 ea. x 40	\$ 2478.00
Shipping		461.33
Total		\$ 2939.33

Outdoor Containers (12 bins)

Outdoor bins (provided by Trash Can Depot, Utah) are heavy-duty *blue* 44 gallon round bins made of engineered resins. Each bin has a funnel top designed to accept bottles only. The bins have handles that will allow them to be chained to fences, if necessary.

Bins	\$35.00 ea. x 12	\$ 420.00
Funnel Lids	32.00 ea. x 12	384.00
Shipping		95.00
Total		\$ 899.00

**Grand Total** **\$ 3838.33**

## Balance Sheet Showing Allocation of PTA Funds

Date	Payee/Payer		Debit	Credit	Balance
9/01/2007	MHS PTA	Funding of pilot bottle recycling		\$4,000.00	\$4,000.00
10/17/2007	Recy-Cal Supply Co.	10, 12"x12" recycle logos	\$23.50		\$3,976.50
11/01/2007	Link-A-Bag	40 indoor recycling bins	\$2,961.22		\$1,015.28
11/15/2007	Link-A-Bag	Outdoor bin signs	\$83.36		\$931.92
11/15/2007	Trash Can Depot	12 outdoor recycling bins	\$896.22		\$35.70
11/28/2007	The Learning Spot	Blue paper, posters	\$26.62		\$9.08
11/28/2007	Texas Art Supply	Paints, brushes	\$16.52		(\$7.44)
12/20/2007	Lowe's	Chains, lettering	\$36.49		(\$43.93)
12/27/2007	Recy-Cal Supply Co.	14, 12"x12" recycle logos	\$32.79		(\$76.72)
12/31/2007	Lowe's	Black/White letters for signs	\$10.72		(\$87.44)
12/31/2007	Texas Art Supply	2 corrugated blue boards	\$17.67		(\$105.11)

## MHS Plastic Bottle Recycling Data Provided by Reterra Spring 2008

Pick-up Date	Total LBS	% Other contaminants	%HDPE	% PET	Net HDPE lbs	Net PET lbs	HDPE bottles saved from Landfill	PET bottles saved from Landfill	# of days collected	# of PET/HDPE bottles recycled weekly
01/23/08	289	10%	12%	78%	35	225	659	4283	10	2471
02/01/08	298	9%	11%	80%	33	238	623	4530	7	3680
02/09/08	401	8%	11%	81%	44	325	838	6171	6	5841
02/23/08	420	9%	13%	78%	55	328	1037	6224	10	3631
03/01/08	198	10%	11%	79%	22	156	414	2972	5	3386
03/15/08	482	9%	13%	78%	63	376	1191	7143	10	4167
03/29/08	380	12%	10%	78%	38	296	722	5632	5	6354
04/12/08	351	14%	17%	69%	60	242	1134	4602	10	2868
04/26/08	521	8%	9%	83%	47	432	891	8216	10	4553
05/11/08	516	10%	11%	79%	57	408	1078	7745	10	4412
05/27/08	525	9%	12%	79%	63	415	1197	7880	10	4539
<b>Totals</b>					<b>515</b>	<b>3,442</b>	<b>9784</b>	<b>65,398</b>	<b>93</b>	<b>4,042</b>

## Contacts

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- Outdoor Bins: Trash Can Depot  
[www.trashcandepot.com](http://www.trashcandepot.com)
- Recycle Stickers: Recy-Cal Supply  
[www.recy-cal.com](http://www.recy-cal.com)