

**Ship Repair Company
Waste Reduction Recommendation Report**

Prepared by Solana Recyclers, Inc.
Sponsored by Region IX of the US EPA
3/12/99

I Summary

XXXXXXXXXX Inc. operates a full service ship repair facility on approximately 14 acres of land and 18 acres of water. The facility includes 350,625 square feet of office, warehouse, and manufacturing building area. The facility is mainly designed for pier-side repair and maintenance for most types of deep draft, U.S. Naval, and commercial vessels. The company has over 375 employees and maintains an office paper recycling program. One of the company s objectives is to maintain and preserve the quality of the environment. Accordingly the facility complies with local, State, and Federal environmental laws, rules, and regulations.

On February 17, 199, a waste assessment was performed at the facility. Waste was characterized based on volume measurements and estimations. The 40 yard roll off containers, administrative areas, and cafeteria were assessed.

Background Information

Address	XXXXXXXXXXXXXXXXXXXXXXXXXXXX
Contact	XXXXXXXXXXXX
Phone	XXXXXXXX

Waste Characterization Methodology

In order to obtain a representative waste sampling, waste from full 3 yd. bins and 40 yd. roll off containers was analyzed. Individual waste materials were categorized and amounts were estimated based on the overall volume of each identified material.

Waste Characterization

Paper*	53%	corrugated cardboard (OCC) mixed paper (packing)	50% 3%
Plastics	8%	PET bottles (1) LDPE (4) Polypropylene (5) - scrap Polystyrene (6)	1% 2% 2% 3%
Glass	1%	CRV and other glass	1%
Metals	3%	#10 tin coated steel and aluminum cans other metal	2% 1%
Wood	15%	Damaged and functional wood pallets (48' x 40)	15%
Yard Trimmings	5%	green waste	5%
Other Organics	4%	compostable food waste	4%
Other Waste	11%	All types (textiles, dry wall, packing material)	11%
Total	100%		100%

Waste Characterization Discussion

This waste characterization is based on an analysis of the two 40 yard roll off containers in front of shipping and receiving and the 3 and 5 yd. containers staged throughout the facility. Note that one of the roll offs was completely full, one was 30% full and all 3 yard containers were overflowing.

Waste Reduction Recommendations

I Implement a Cardboard Recycling Program

As is mentioned in the waste characterization, Old Corrugated Cardboard represents over 50% of the waste stream. This is due to the fact that there is a significant amount of this material represented in the waste stream. In addition, most of the cardboard is unflattened--expanding its total volume. Due to the unflattened nature of the cardboard the facility is paying quite a bit for air space in addition to the weight of the material. Listed below are the waste reduction recommendations and the resulting cost savings;

1. Stage a 40 yd. Roll off for cardboard only and reduce the disposal costs.
2. Reduce the number of service days for three and five yd. bins from twice to once a week.
3. Implement an assertive employee education program which will manifest in compliance.

Current Disposal Service Fees Without Cardboard Recycling

Container Type	Monthly Fees	Annual Fees (est.)
40 yd. roll offs 8 pulls/month (avg)	\$87/pull	\$8,352
3 yd. bins four bins serviced twice a week	\$445.17	\$5,342
5 yd. container one bin serviced twice a week	\$168.70	\$2,024
Subtotal		\$15,718

Projected Disposal Service Fees With a 40 Yard Cardboard Recycling Roll Off

Container Type	Monthly Fees	Annual Fees (est.)
40 yd. roll offs serviced 4 times per month	\$87/pull	\$4,176
40 yd. recycling roll off serviced 4 times per month	\$0.00	\$0.00
3 yd. containers four bins serviced once a week	\$222.58	\$2,760.96
5 yd. container one bin serviced once a week	\$84.38	\$1,012.56
Subtotal		\$7,858.48

Projected Savings in Disposal Service Fees

Current Service Fees (est) \$15,718.00	Projected Service Fees \$7,859.52	Annual Savings \$7,858.48
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II Recycle All Functional and Damaged Pallets

On the day that the waste assessment was performed, there were nine pallets in the roll off containers analyzed. Several were undamaged and the others were missing between one and four top boards. Listed below are the waste reduction recommendations and resulting cost savings:

1. Inform various departments that all pallets, regardless of condition, are to be staged next to the refuse container in their area.
2. Collect pallets from staging areas with a forklift and store in a central location (pallet recycling bin or outside on the south side of the warehouse).
3. Arrange for pallet pick-up and payment with one of the resources listed below.
4. Place identifiable signs which designate appropriate areas to stage pallets. Monitor refuse containers to ensure employee participation.

Disposal Service Fee and Tonnage Savings / Revenue Generation (Estimated)

40 Yard Roll Off Service	Annual Savings
4 Less Pulls Per Year @ \$87.00/pull	\$348
Tons Diverted	
6 tons per year	\$270
Revenue	
72 pallets/month (avg. \$1.00 each)	\$864
Pallet Pick-Up Service Fee	\$0.00
Total Projected Cost Savings	\$1,482/year
Natural Resources Conserved	102 trees/year

Discussion

The number of 72 pallets per month was calculated based upon the fact that nine pallets were found in the waste stream at the time of the assessment. This figure was multiplied time the average number of pulls in a month. A reduction of four less pulls per year was projected based upon a volume estimation that 864 pallets saved per year represents a savings of approximately 120 cubic yards when unstacked in dumpsters. Revenue was calculated based on a \$1.00 per pallet revenue recovery. Depending on condition and dimensions, damaged pallets can garner anywhere from \$0.50 to \$1.50 per pallet. Thus the average figure of \$1.00/pallet was used. Most pallet recyclers require a minimum of between 75 to 100 pallets in order to make a pick-up.

Recommended Pallet Recyclers

San Diego Pallets	619/ 426-1441
Atlas Pallets	619/232-4134
AACO Pallets	760/737-0300

Savings in Disposal Tonnage Fees

It is estimated that cardboard recycling will reduce the overall disposal by 197 cubic yards per month. The EPA's low estimate for the weight of one cubic yard of unflattened cardboard is 50 lbs. Accordingly, cardboard recycling will save approximately 4.9 tons per month. This will result in the following savings:

Cubic Yards Diverted	Weight	Annual Cost
Savings		
197 Cubic yards	4.9 tons/month	\$2,646

Revenue

In addition to saving capital in the forms of disposal service fees and landfill tonnage fees, cardboard recycling will also generate limited revenue. Smurfit Recycling Inc., a cardboard and paper recycler, will provide the recycling service free of charge and pay \$7/ton for unballed cardboard and \$25/ton for balled cardboard. A revenue projection is listed below:

Monthly Generation	Revenue	Annual Total
4.9 tons/month	\$7/ton	\$411.60

Cardboard Recycling Total Cost Savings (including revenue)	\$10,916.08
Annual Natural Resources Saved (17 trees/ton)	1,004 trees/year

Discussion

Implementing a cardboard recycling program will result in substantial cost savings in disposal service and tonnage fees. Above figures were based on the estimation that recycling cardboard, if implemented properly can reduce trash volume and associated costs by 50%. In order for this program to work effectively however, all employees must be educated about the need to recycle cardboard. The 40 yard cardboard recycling roll off can be placed next to the existing refuse roll off at the shipping and receiving area or wherever deemed appropriate. Since the facility is large, it is recommended that there be cardboard staging areas with bold signage next to all three and five cubic yard bins. In addition, it is suggested that the 40 yd. cardboard recycling container contain clear signage reminding employees that the roll off is for cardboard only.

Once the recycling program is in place, continual monitoring is required to ensure employee participation. Rewards and incentives can be created for departments that are performing well. An employee *Green Team* can also be established where each member of the committee monitors recycling for a different time interval responding to questions and concerns when they arise. The team members can also speak at the facility's weekly production meetings.

Local Cardboard Recycling Resources

Smurfit Recycling Company	619/268-3533
Summit Corrugated	619/271-9956
Allan Company	619/231-9666
IMS Recycling Services	619/231-2521