



Greening the OR Assessment Results

Chesapeake Regional Medical Center, October 18th, 2012

EXECUTIVE SUMMARY

Waste Baseline

- 20% of RMW contents did not meet the criteria for red bag waste.
 - Potential annual cost savings opportunity estimated to be about \$2,356 annually.
 - Opportunity for increased compliance:
 - Bloody tubing found in regular trash
 - Batteries found in regular trash
 - Gauze and towels that did not meet RMW guidelines found in red bag
 - Reusable supplies found in regular trash
- 26% of Regular Trash could be recycled under current recycling program
 - Potential annual cost savings opportunity estimate to be about \$5,300 annually

Summary of Eco-friendly Supply Changes

Supply Conversion	Annual Environmental Savings				Annual Cost Savings
Eco-Friendly Alternative	Waste	Energy	CO ₂	Chemicals	Item Cost + Env'l Savings
PerfecTemp ⁱ	2,700 lbs	19,100 kWh	14 tons		\$10,310 [‡]
LiquiLoc Packs ⁱⁱ	164 lbs				\$1,050 [‡]
Natural OR Towels ⁱⁱⁱ (sterile, off-the shelf)				36 gallons	(\$368)
Natural OR Towels ⁱⁱⁱ (packs)				105 gallons	Cost Neutral
OR Towel Recycling Program ^{iv}	12,450 lbs				\$2,755
Pigment-Free Plastics: Bedpan, Emesis Basin, Washbasin				1.5 gallons	Cost Neutral
Pigment-Free Patient Plastics				13 gallons	TBD
Total Savings	15,314 lbs (7 tons)	19,100 kWh	14 tons	155 gallons	\$13,747

[‡]Represents annual cost savings over first 3 years. Total 5 year cost savings is \$152,750.

BACKGROUND

Medline's greensmart™ program provides environmental consultation and services to help hospitals meet their sustainability goals. CRMC became a member of the greensmart™ program in July of 2012, with the goal of reducing the environmental impact of CRMC and greening their operating rooms. On October 16th – October 18th Medline conducted a 2-day on-site OR assessment with the following goals:

- ❖ Establish Waste Baseline
- ❖ Reduce Waste in the OR through
 - Changes in OR supplies
 - Changes to current processes
- ❖ Identify Potential Environmental Savings and Cost Savings
- ❖ Use assessment results to determine next steps in CRMC's sustainability program

The goals were achieved through a variety of methods, including: the completion of a walk-through assessments of the OR and Soiled Utility Room; online waste survey; a waste sort of RMW and



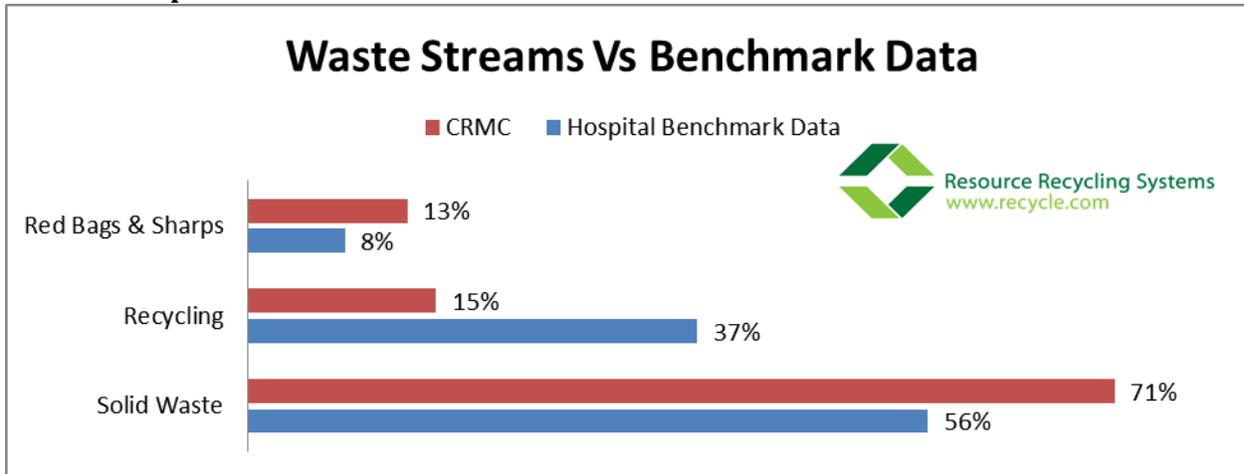
general trash bags from the OR; and interviews with staff. The results are detailed in the section below.

WASTE BASELINE

Annual Waste Volumes & Benchmark Data

CMRC's hospital-wide waste stream is described in the chart below and compared against benchmark data compiled by Resource Recycling Systems. It showcases that CMRC has taken significant steps in the right direction to deal in managing waste. The hospital still has room to improve in terms of recycling and RMW waste reduction.

Table 1: Hospital Wide Waste Streams vs. Benchmark Data

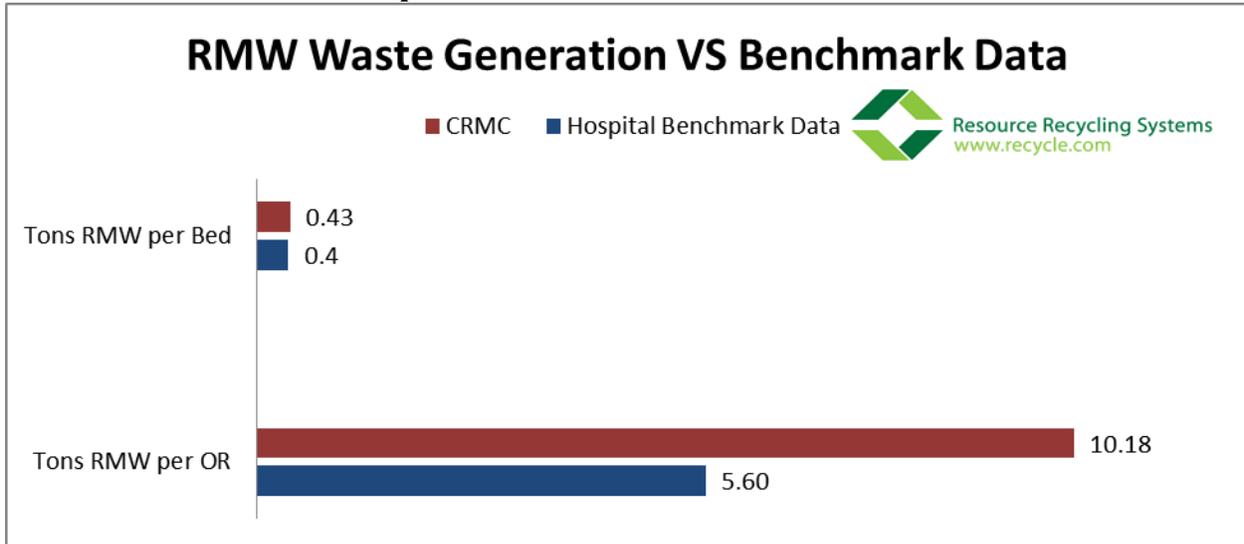


- Benchmark data has been compiled by Resource Recycling Systems and represents hospitals who are not only complying but are setting the green hospital standard.

The following graph tries to normalize hospitalwide RMW benchmarks with a hospital of CMRC's size and operation. The first pair of figures demonstrates that CMRC is well placed with the level of RMW it is generating, coming in at just 0.43 tons a year, per bed annually. The second set of numbers suggests that for the number of ORs (13) the hospital is generating RMW that is higher than the benchmark. This data is conflicting with what Resource Recycling Systems observed in the audit, as the OR's do not seem to be over generating RMW. Resource Recycling Systems recommends a deeper look at other areas of the hospital generating RMW.

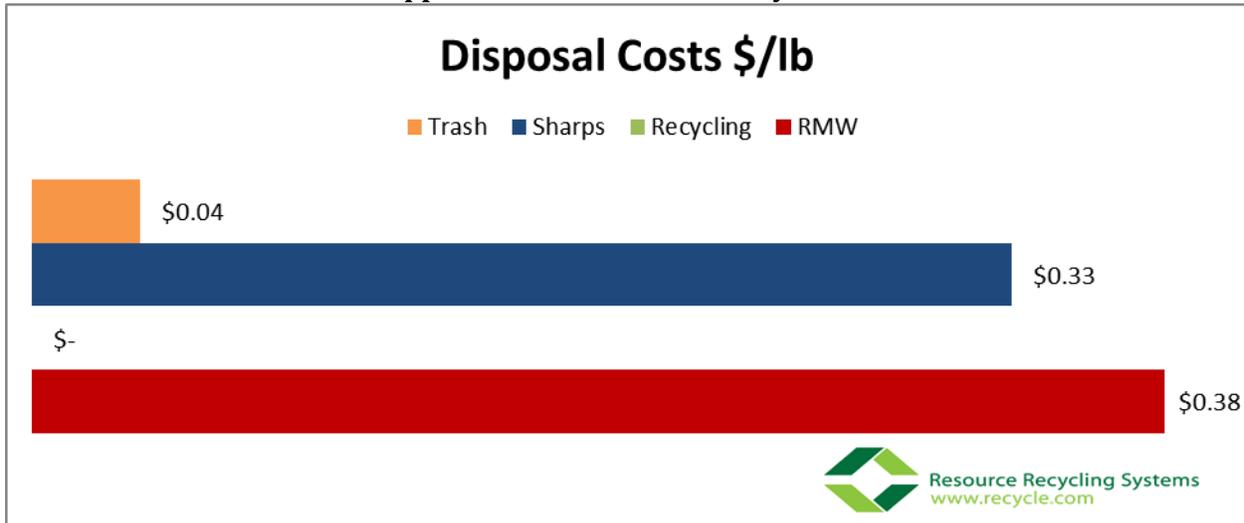


Table 2: Hospital Wide Waste Streams vs. Benchmark Data



- Benchmark data has been compiled by Resource Recycling Systems and represents hospitals who are not only complying but are setting the green hospital standard.

Table 3: Approximate Current Costs by Waste Stream



Based on our knowledge of typical hospital waste costs, the cost for CRMC’s RMW disposal is slightly higher than average and solid waste is slightly lower than average. It is important to point out that by recycling, CRMC saves \$0.04 over disposing in trash and by reducing trash that goes into the red bag, CRMC saves \$0.34 a pound!



Regulated Medical Waste

Two red bags were sorted; below is an overview of the contents.

- **0% Recycling** – commonly recycled materials
 - No recyclables were found in the red bag, but typically, we find a basin or tub as well as blue wrap.
- **20% Trash** – materials cannot be recycled and should be thrown in the trash
 - OR towels that are suited for the trash or eligible for Medline’s towel recycling/rebate program
 - Gauze that were suited for regular trash
- **80% RMW** – materials that meet the criteria for RMW and need to be disposed of as such
 - Mostly saturated OR towels, gauze and solidified suction canisters
 - No sharps or hazardous waste were found in the red bag

Although the red bag was compliant, there are still cost savings that can be achieved. By removing trash volumes from the red bag, CRMC could realize a **20% weight reduction** in red bag waste from the OR, or a total of **\$0.21 per case** or **\$2,356 per year** (based on the average of the two bags we sorted and using 11,000 surgeries per year).

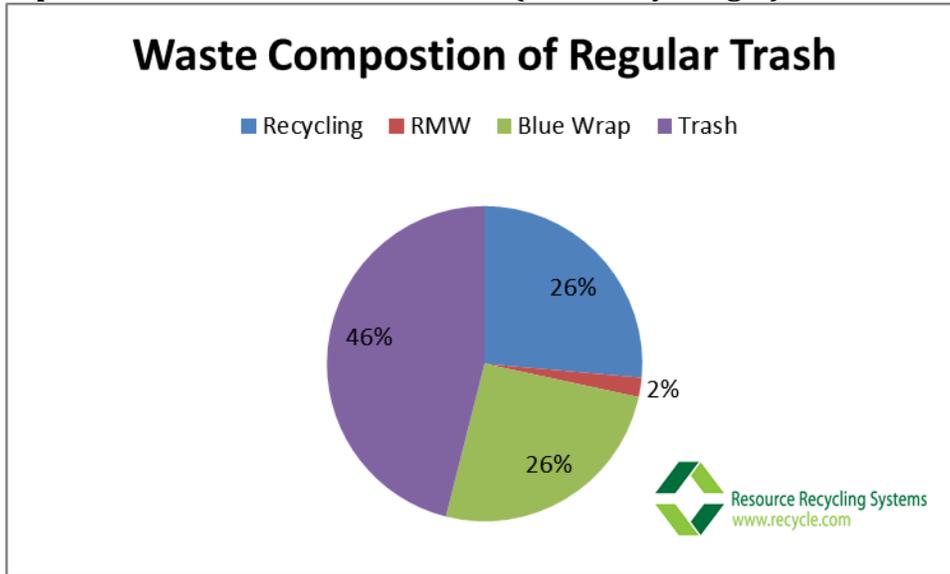
General Trash

Seven regular trash bags, from two separate cases, were sorted. Below is an overview of the contents.

- **26% Recycling** – commonly recycled materials
 - Mostly packaging materials
 - Some rigid plastics (irrigation bottles, tubs and basins)
 - Batteries
- **26% Blue Wrap/Potential Recycling** – technically recyclable, but currently no markets exist for CRMC’s recycler
- **46% Trash** – materials cannot be recycled and should be thrown in the trash
 - Blue OR towels which may be eligible for Medline’s towel rebate program
 - Plastic tubing
 - 1 bulb syringe filled with non-regulated liquid
 - Antibiotics that should be collected with pharmaceutical waste
- **2% RMW** – materials that meet the criteria for RMW and need to be disposed of as such
 - Blood filled tubing
 - Blood soaked stockings and gauze



Table 4: Composition of General Trash in the OR (Percent by Weight)



If the packaging, rigid plastics, and paper were collected in the current single stream recycling program, CRMC could realize a **26% weight reduction** in trash from the OR, or a total of **\$5,302 per year** (based on the two cases we sorted at 11,000 surgeries per year).

If CRMC’s recycler is able to identify a market for blue wrap it could be collected as a separate waste stream and **reduce trash weight by 26%** from the OR. CRMC’s trash hauler has also pointed out that the material does not compact well and could be resulting in very light--low density pulls of the dumpster. This could have significant cost savings for the hospital and should be investigated further

Case 1 – Orthopedic Surgery

The first case to be audited was an orthopedic knee surgery lead by Dr. Romash. The case generated four bags of regular trash and one red bag. The regular trash contained batteries, a reusable tourniquet, blood soaked gauze and tubing.

Table 5: Waste Composition of Case 1



Case # 1 Waste Composition (by lbs)

■ Recycling ■ RMW ■ Potential Recycling ■ Trash

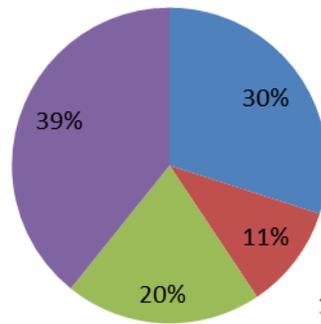
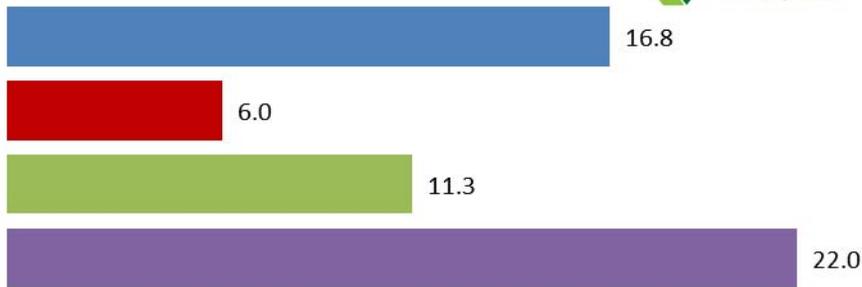


Table 6: Waste Contents by Weight

Case #1 Contents by Weight (lbs)

■ Recycling ■ RMW ■ Potential Recycling ■ Trash





Case 2 –

The second case to be audited was led by Dr. Goss and contained three bags of regular trash and one red bag. The regular trash contained blood soaked tubing and blood soaked gauze that should have been placed in a red bag.

Table 7: Waste Composition of Case 2

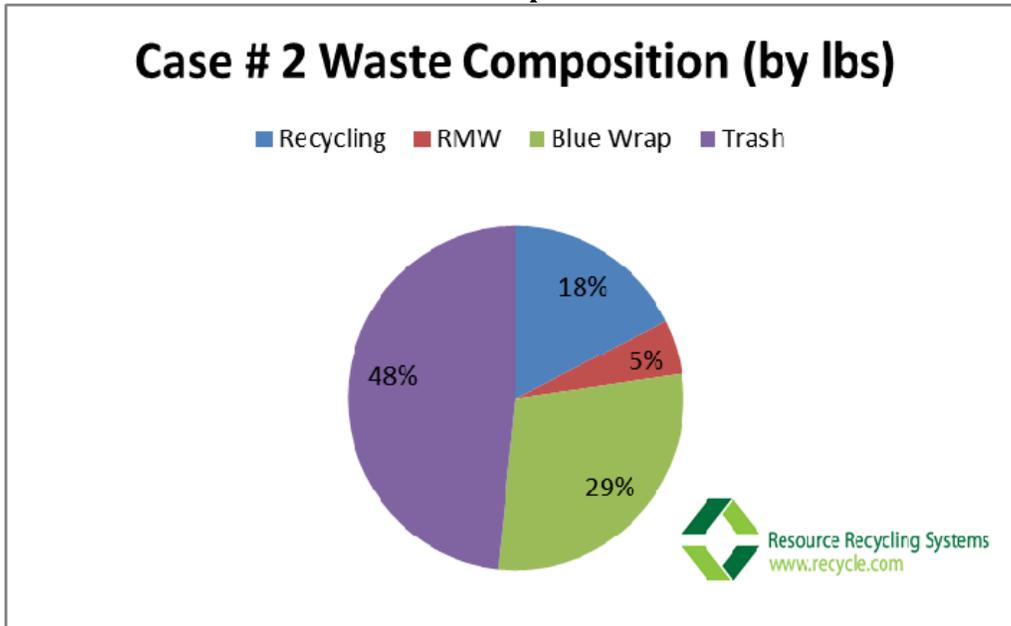
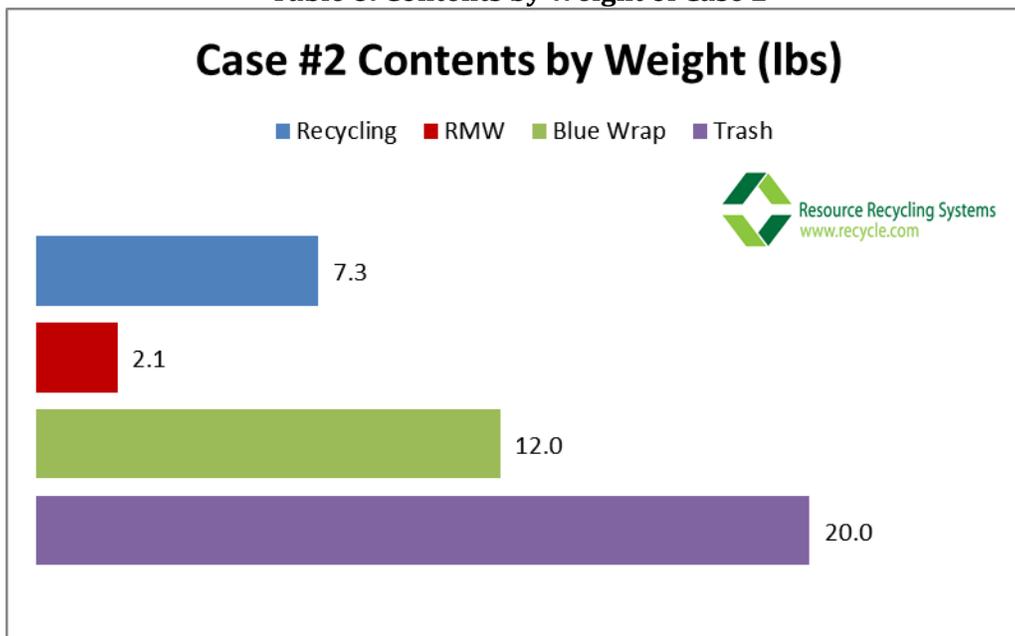


Table 8: Contents by Weight of Case 2





If CRMC recycled the recyclables found in the trash stream and applied that to each case, it would translate into over 66 tons of recyclable material per year. By recycling these 66 tons, CRMC would contribute to the following **environmental benefits of recycling in the OR:**

Environmental Benefits of Recycling 66 tons of Recyclables		
Total GHG Emission Savings	176	Metric Tons Carbon Dioxide Equivalent
Total Landfill Volume Savings	264	Cubic Yards
Total Trees Saved	84	Trees

SUPPLY CHANGES

CRMC has already implemented several changes to their supply chain hospital-wide, such as:

- ✦ Cooking oil recycled from the cafeteria
- ✦ Food waste from cafeteria is composted
- ✦ Energy Star Rating of 76
- ✦ Recycling of plastics, aluminum, paper, cardboard, batteries, fluorescent bulbs, ink cartridges, toner
- ✦ Donations of expired, unused or obsolete medical supplies and equipment to organizations such as Physicians for Peace

However, there is still room for improvement. These changes will result in significant cost savings and environmental savings.

Opportunities for Greener Alternatives in OR Supplies

Supply Conversion		Annual Environmental Savings				Annual Cost Savings	
Conventional Item	Eco-Friendly Alternative	Waste	Energy	CO ₂	Chemicals	Env'l Impact	Item Impact
Forced-Air Blankets	PerfecTemp ⁱ	2,700 lbs	19,100 kWh	14 tons		\$2,290	\$8,020 [‡]
Fluid Solidifiers	LiquiLoc Packs ⁱⁱ	164 lbs				\$35	\$1,015
Blue OR Towels (sterile, off-the shelf)	Natural OR Towels ⁱⁱⁱ (sterile, off-the shelf)				36 gallons		(\$368)
Blue OR Towels (packs)	Natural OR Towels ⁱⁱⁱ (packs)				105 gallons		Cost Neutral
No Recycling Program for OR Towels	OR Towel Recycling Program ^{iv}	12,450 lbs				\$2,755	\$0
Plastic Basins (packs)	Pigment-Free Bedpan, Emesis Basin, Washbasin ^v				1.5 gallons		Cost Neutral
Colored Patient Plastics	Pigment-Free Patient Plastics ^{vi}				13 gallons		TBD
Total Savings		15,314 lbs (7 tons)	19,100 kWh	14 tons	155 gallons		\$13,747

[‡]Represents annual cost savings over first 3 years. Total 5 year cost savings is \$152,750.



There are also several additional eco-friendly alternatives that would be worth reviewing down the road on your sustainability journey. They include:

- EcoDrape is Medline’s line of biobased surgical drapes and table covers. By converting only the back table cover and the thyroid T drape, CRMC would replace 610 pounds of plastic with biobased material. By also converting applicable single sterile components, CRMC would replace a total of 5,262 pounds or 2.4 metric tons of plastic with biobased material.
- Green cleaning chemicals that would improve the environmental health of your facility for both patients and staff.
- ThermaHoney, a medical grade raw honey that heals wounds faster and draws out infection – honey has been used for this purpose for centuries.

PROCESS CHANGES

Chesapeake Regional Medical Center has already begun making changes within the hospital to improve their impact on the environment. CRMC has a green team that has been meeting once a month for several months. There are nearly 20 participants on the team from departments across the hospital, including Facilities, Environmental Services, Communications, Materials Management, Warehouse, Surgical Services and Nursing. In addition to the grass roots effort, the CEO of CRMC has also made sustainability a priority. The ultimate goal is to improve CRMC’s environmental footprint, be a responsible community citizen and achieve cost savings. While this is a great start, there is still much opportunity to make achieve environmental and cost savings through process change.

Opportunities to Achieve Goals through Process Change

Goal	Recommendation
1. Expand Staff Engagement	<ul style="list-style-type: none"> o Empower staff by congratulating them on their successes thus far, particularly contributing to RMW rates comparable with the greenest hospitals in the country o Engage anesthesia staff on green team o Create incentives for staff and continue to update them on their progress toward their goals. o November recycling day: <ul style="list-style-type: none"> a. Report results of waste assessment b. Take suggestions from staff on how CRMC can be a greener facility c. Have a sign-up sheet for nurses to participate on green team (currently under-represented)
2. Provide On-going Education	<ul style="list-style-type: none"> o What does NOT need to be placed in red bag and can be recycled o Cost of trash and RMW disposal o Create signage, posters to communicate progress o Utilize education offered by TFC
3. Increase recycling	<ul style="list-style-type: none"> o Place recycling container in ORs o Until TFC can find a recycling market for the blue sterilization wrap, identify means of reuse, such as local animal shelters, painting companies and moving companies o Place recycling bins everywhere and make them prominent – including hallways, near elevators and in lobbies. Post easy to understand signage



	that uses pictures more than words.
4. Promote Your Success	<ul style="list-style-type: none"> ○ Consensus is that “Week in the ‘Peake” is not effective because staff have too many other issues to cover in the “huddle”. Find other ways to update staff on green initiatives. Ideas include: <ul style="list-style-type: none"> - Electronic updates on intranet - Posters & banners - Green product fair ○ Promote success within community so that CRMC can be recognized for green initiatives: <ul style="list-style-type: none"> - Website - Ongoing green events after November recycling event - Promote community events, such as pharmaceutical recycling day as part of CRMC’s overall green strategy - Sustainability brochure / report

Compliance Observations from Resource Recycling Systems

Area	Observations	Recommendations
OR Room	<ul style="list-style-type: none"> ➤ Lacking proper waste signage ➤ No recycling cans available ➤ No waste management violations or concerns observed 	
Central Sterile Processing and Soiled Utility Room	<ul style="list-style-type: none"> ➤ All bags tied off properly ➤ No signage above accumulation areas ➤ Clean, tidy SUR ➤ Recycling program for boxboard, film plastic/tyvek and blue wrap could be established ➤ No waste management violations or concerns observed 	
Regular Trash	<ul style="list-style-type: none"> ➤ Patient information found in regular trash ➤ Regulated medical waste found in regular trash ➤ Medication found in regular trash ➤ 	
Sharps	<ul style="list-style-type: none"> ➤ Sharps container contained significant amounts of packaging and unnecessary trash 	

Next Steps

- 1. Set and Prioritize Goals**
- 2. Implement Green Changes**
- 3. Track and Report Progress**
- 4. Promote Your Success**

Now that we have completed the on-site waste assessment, and established a baseline, it is time discuss next steps. During our final presentation we will discuss how CRMC would like to proceed and, based on the decisions made, Medline will draft CRMC’s first Sustainability Action Plan.



Contact Information:

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ⁱ Environmental savings associated with PerfectTemp is based on 11,000 surgeries per year conducted in 13 ORs, with cost of RMW disposal assumed to be \$.382 and regular trash to be \$0.04. It is assumed that 50% of forced air blankets are disposed of as RMW, and the other 50% as regular trash. Cost per kilowatt hour is \$0.09. Forced air blankets including packaging weigh approximately .33 pounds. Total cost savings is a result of approximately \$1,715 in reduced electricity usage and \$572 in reduced waste disposal. Cost savings associated with PerfectTemp is based on the same assumptions, as well as the following: cost of Bair Huggers of \$6.50 each. Cost savings is annual for the first three years, with a total 5-year cost savings of \$152,750.

ⁱⁱ Environmental savings for LiquiLoc is based on weight of current solidifier packaging. Assumed that 50% of solidifiers are thrown in trash and other 50% thrown in RMW. \$0.04, \$0.38 cost per pound for general trash / RMW respectively.

ⁱⁱⁱ Towels savings for packs is based on 113,184 towels used per year. Single sterile towel savings is based on 38,520 towels used per year.

^{iv} Environmental savings for the OR towel recycling program assumes that 30% of OR towels that are disposed of in the OR are not used or are minimally soiled. Assumed that 50% of these are thrown in trash and other 50% thrown in RMW. \$0.04, \$0.38 cost per pound for general trash / RMW respectively. Cost savings also assume 3 pick-ups of 1000 lbs of towels at a rate of 70 cents per pound.

^v Pigment-free savings based on conversion of 13 plastic SKUs converted to their pigment-free equivalent.

^{vi} Patient plastic savings based on annual usage of 324 cases of bedpans, 133 cases of emesis basins and 592 cases of washbasins used per year.