



On-site Food Waste Handling Equipment Overview

Food Waste increase in just a decade!



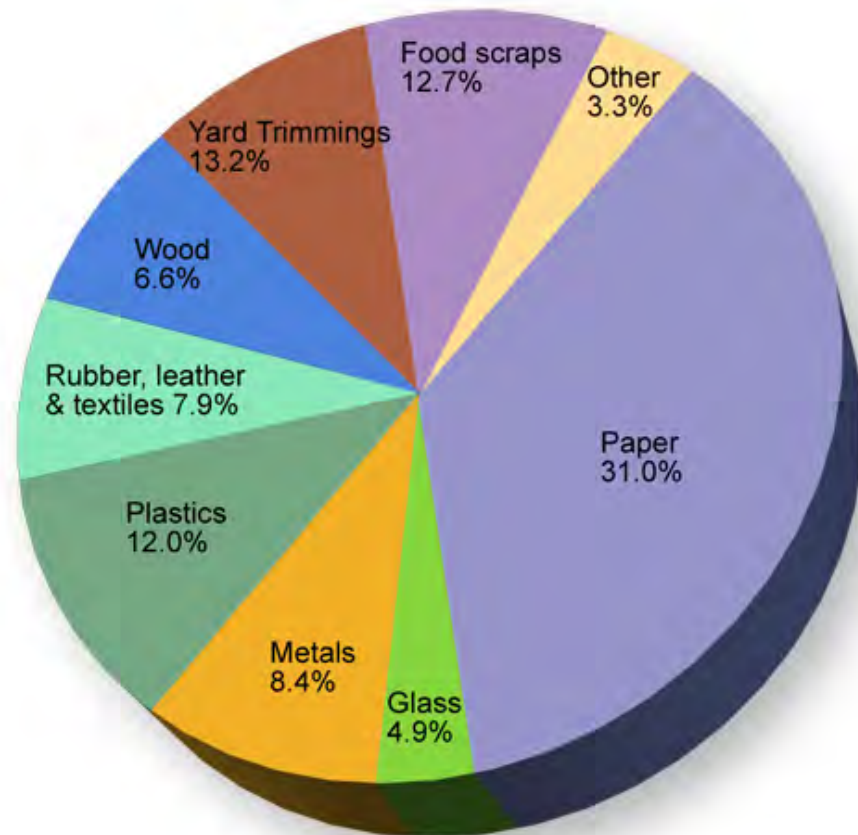
1995	Generated	Recycled	
Food waste	14.1 M tons	3.4%	
Yard waste	30.6 M tons	22.9%	
2010	Generated	Recycled	
Food waste	31.8 M tons	2.5%	-74%
Yard waste	32.9 M tons	64.7%	+283%

MSW makeup (250M tons)

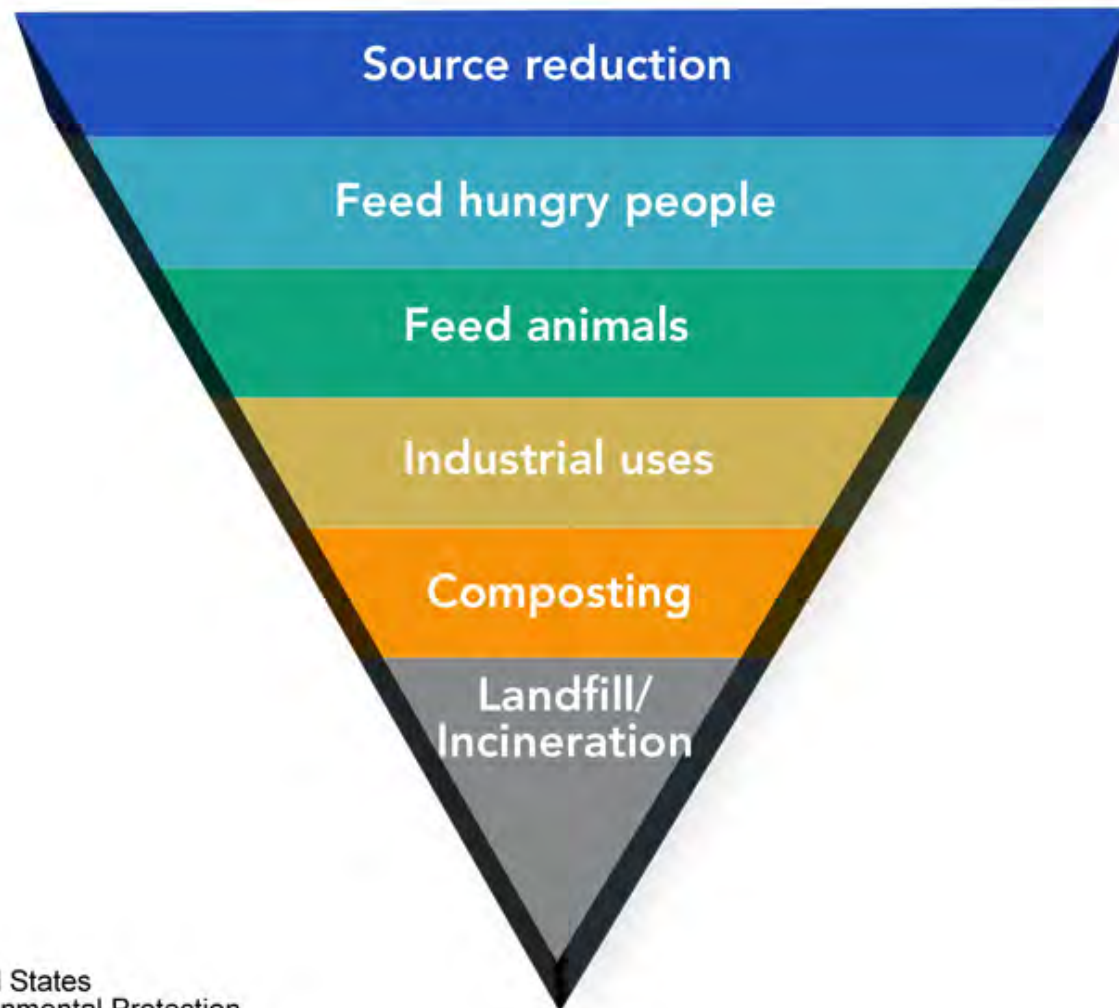


32 Million tons generated
31 Million tons disposed (97.5%)

Paper 31.0%
Yard trimmings 13.2%
Food scraps 12.7%
Plastics 12.0%
Metals 8.4%
Rubber, leather and textiles 7.9%
Wood 6.6%
Glass 4.9%
Other 3.3%



Food recovery hierarchy



Where does it all go?



To the landfill (aka the dump)



Wasted food



3rd largest waste stream

- US EPA

- 32 million tons generated

- 31 million tons disposed

Does not include agricultural and industrial food wastes

- USDA

- Estimated 48 million tons wasted

Likely includes non-msw



Wasted food



The food service industry estimates:

4% to 10% of food purchases become waste before they even reach a guest.

If you spend \$500,000 on food purchases a year, that equals \$ 50,000 thrown away!

Even a small percentage recovered could feed millions

**Let's first Feed People
-not Landfills**



Feeding People



Step #1: **Source reduction**-reducing waste at the source

- Reducing over-ordering & processing waste
- Reducing over preps and plate waste

Step #2: **Feed hungry people**

- Donating wholesome food supplies and prepared foods to food banks, pantries and kitchens

Step #3: **Feed animals**

- Local farmers or zoos use food scraps as animal feed

Feeding People



Step #4: Composting

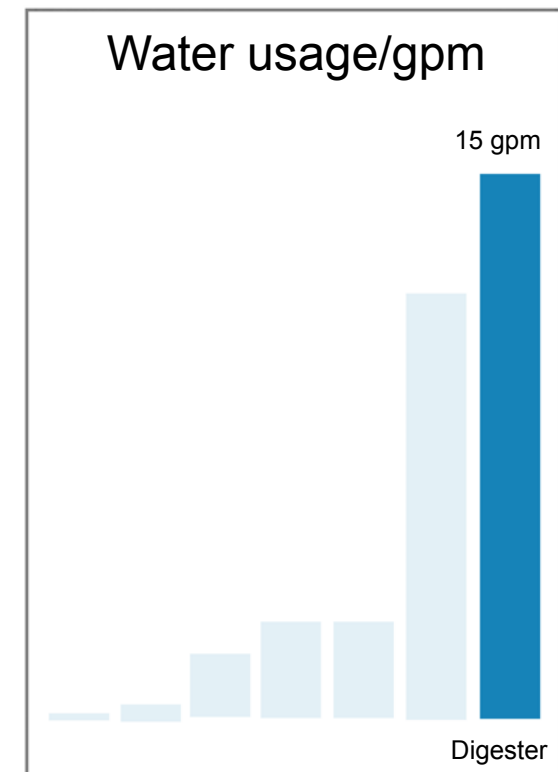
- Fat, oil and grease (FOG's) can be converted into soaps, cosmetics and biodiesel fuels
 - includes anaerobic digestion with digestate being composted

Step #5: Landfill/incineration

- Last resort is disposal
 - includes anaerobic digesters where the digestate is landfilled



Digesters



Digesters-the upside



- Organic food waste
- Micro organism culture “digests” (dissolves) food waste.
- Liquid discharged to sanitary sewer



Digesters-the downside



- Requires media (wood or plastic chip base) and microorganism additives
- Media requires routine replacement
- Handles only organic food waste (no compostable disposables)
- May not be compliant with local codes
- May require large amounts of water to be compliant (solution to pollution is dilution!)

Digesters



IN:

- Organic food waste (no liquids)
- Proprietary and consumable blend of wood or plastic chips
- Large amounts of water
- Heat (generated by the digestion process and electric auxiliary tank heaters)
- Micro organism culture (also proprietary and consumable)

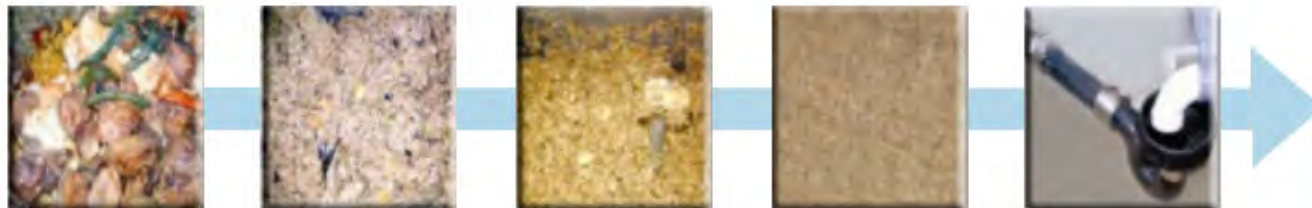


Digesters



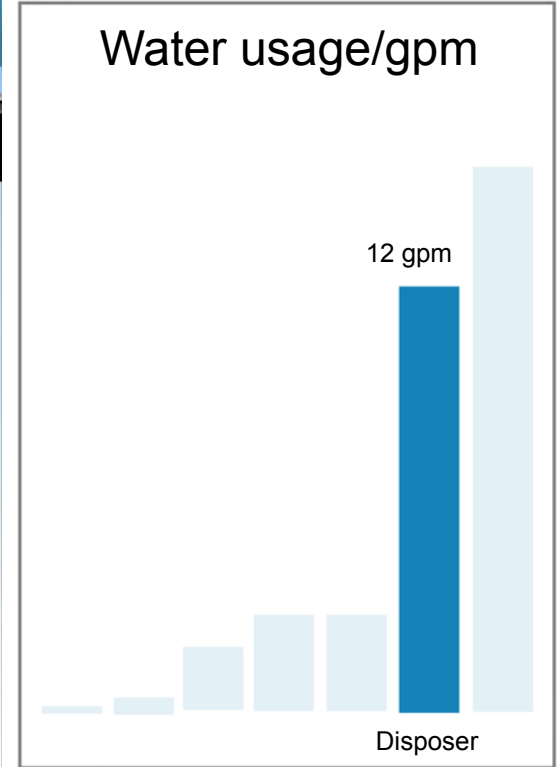
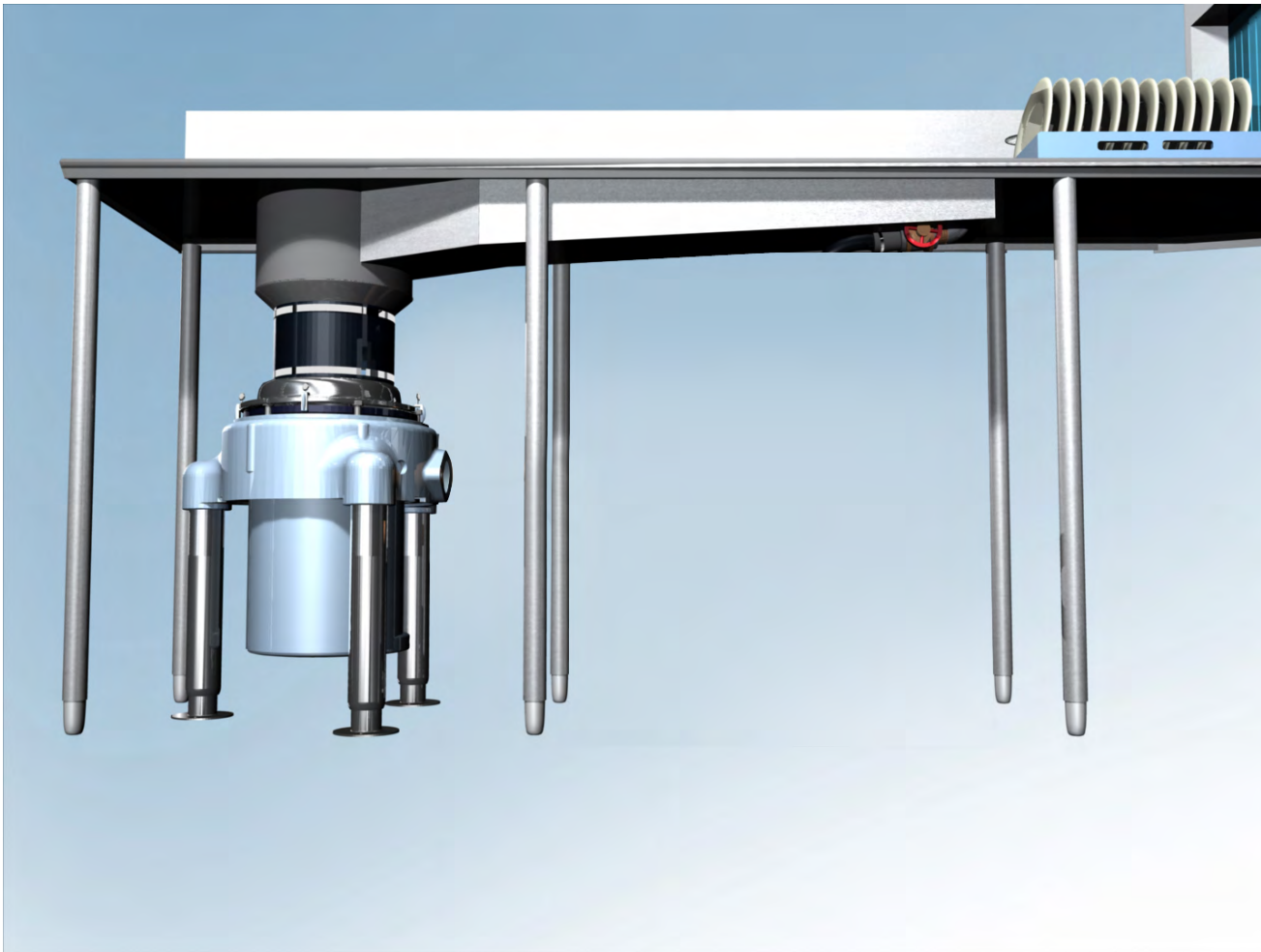
OUT:

- Liquid discharged to sanitary sewer
- All dissolved solids <1/8" (basically everything that went in)
- 300-600 Gallons of slurry a day



Can dissolve up to 1200 lbs. per 24 hours

Disposers



Food Waster Disposers-The Upside



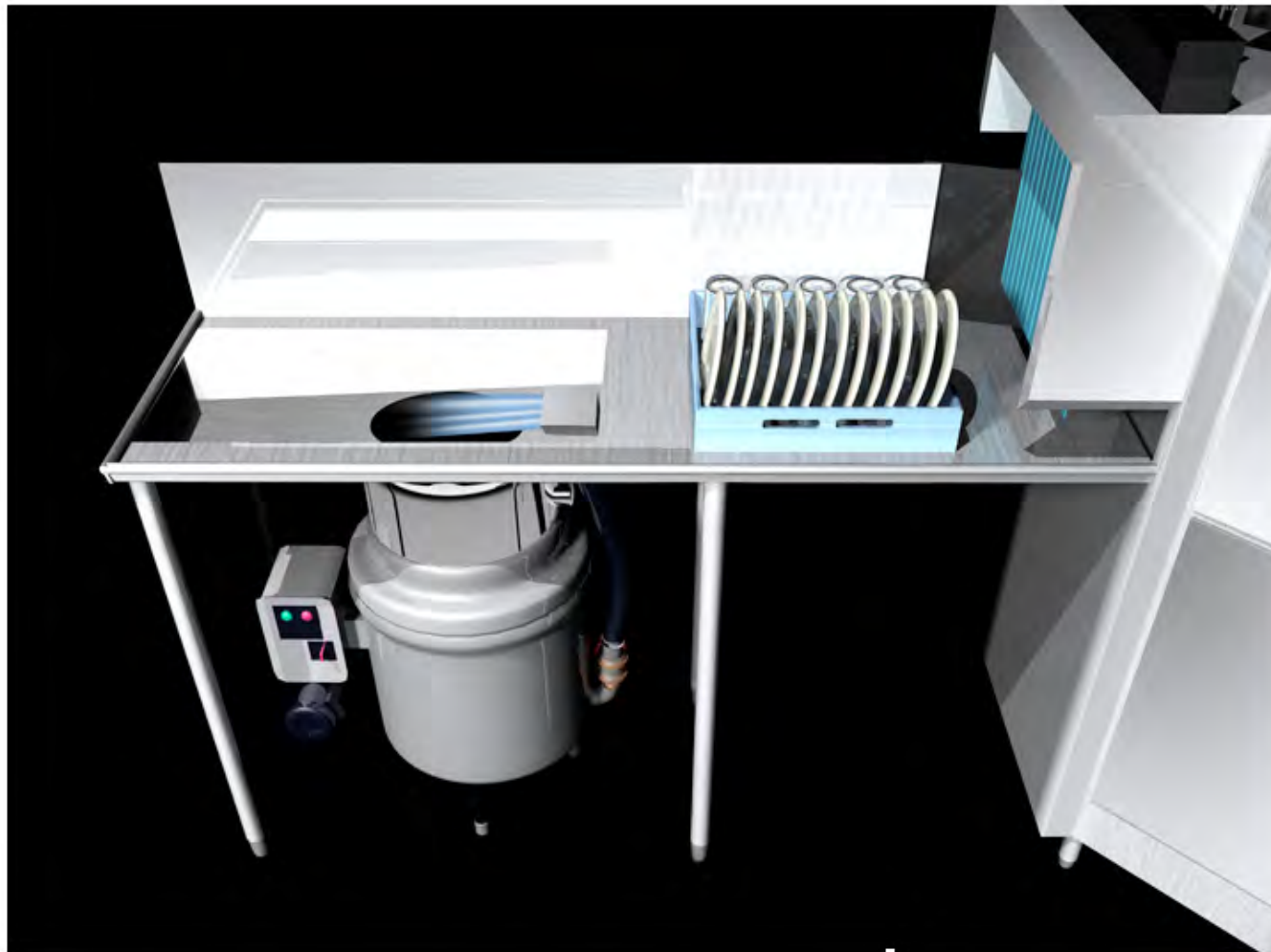
- Food waste disposers utilize existing conveyance system for transporting organics.
- The most convenient and hygienic method of disposing of food waste is using sewer to treatment plant route.
- Food waste is 70% water.
- Biosolids are *sometimes* beneficially reused, although this does require a trip to your local WWTP to verify.
- Some manufacturers have reduced water requirements up to 70%.

Food Waster Disposers-The Downside

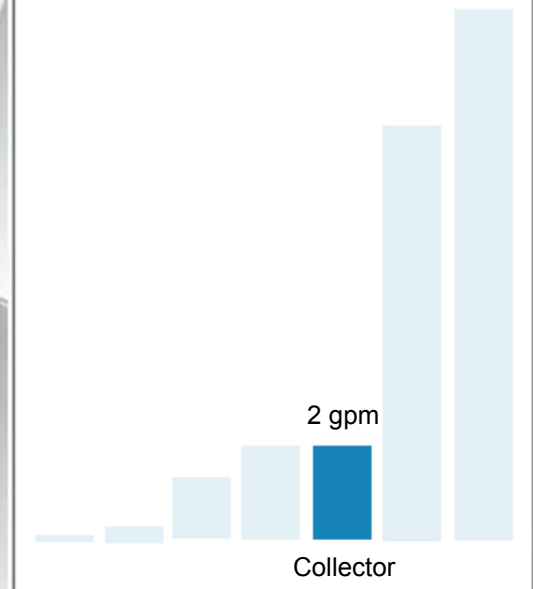


- Banned in many localities
- Can be excessive water consumers up to 15 gallons per minute (gpm).
- Not for compostable disposables
- FOG loads and BOD counts are high, often resulting in surcharges from local municipalities
- Do not function well with grease traps

Collectors



Water usage/gpm



Collectors-The Upside



- Can be used where typical disposers are not permitted
- Multiple stations, single and pan units
- Solubles removed (down the drain), solids collected
- Water recycled for reduced consumption
- Simple, reliable technology

Collectors-The Downside

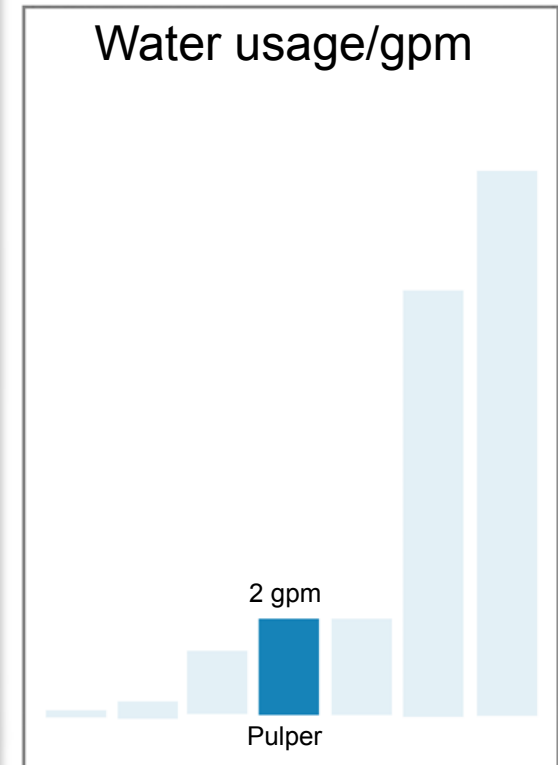


- Recycled water concentrates FOG's
- Solids must be disposed of elsewhere
- Circle is not closed
- Staff complains about lifting basket/strainer
- Only processes food waste

Remote and Closed-Coupled Pulpers



- 600 to 1,200 lbs per hour



Disposers and Pulpers are compatible



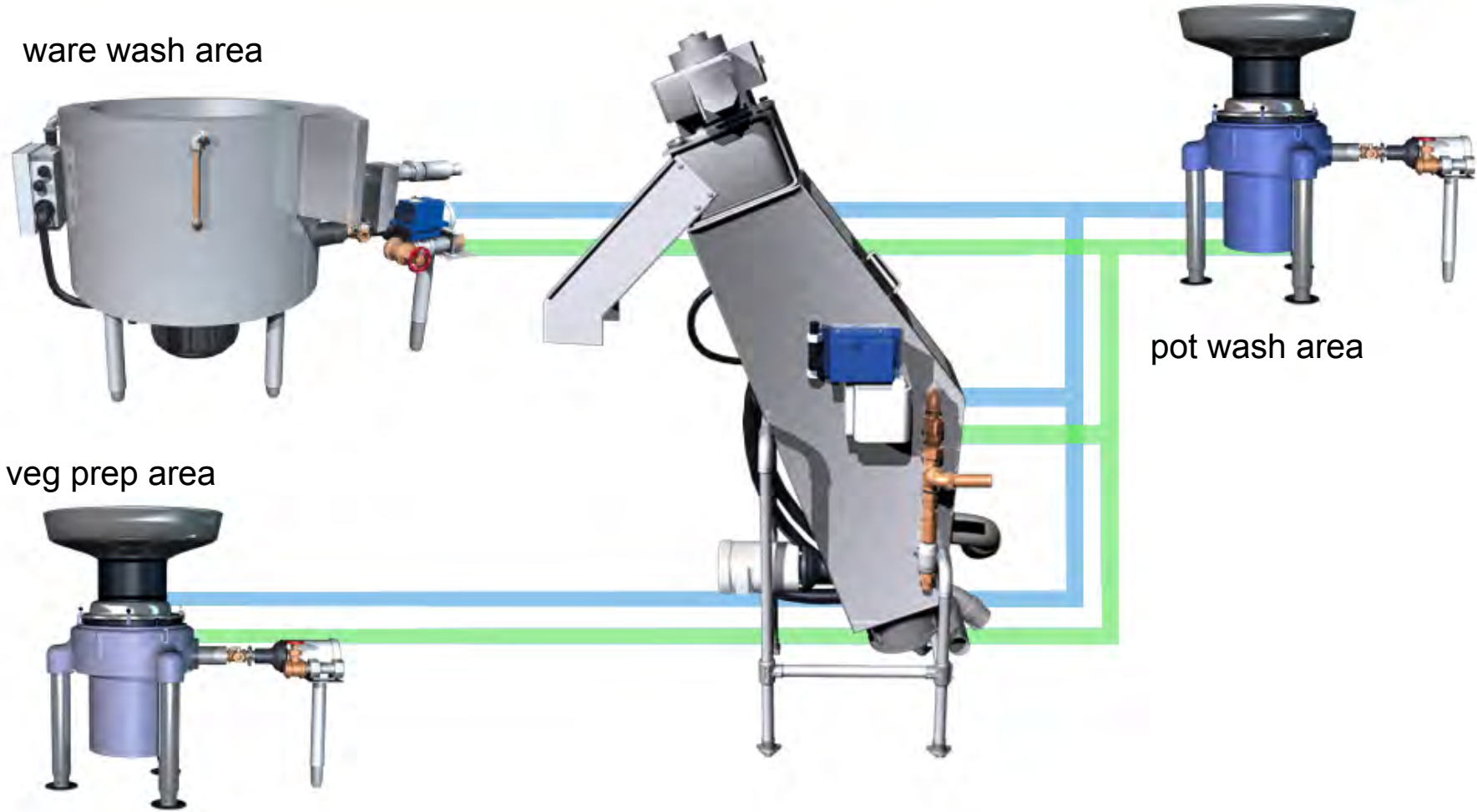
ware wash area



veg prep area



pot wash area



Pulpers-The Upside



- Processes both food waste and disposables
- Water recycled for reduced water consumption
- Reduce volume up to 80%
- Remote extraction available (labor savings and security)
- Can be used in conjunction with garbage disposers
- Excellent pre treatment of food waste prior to composting or dehydrating (maceration and dewatering aid in decomposition).

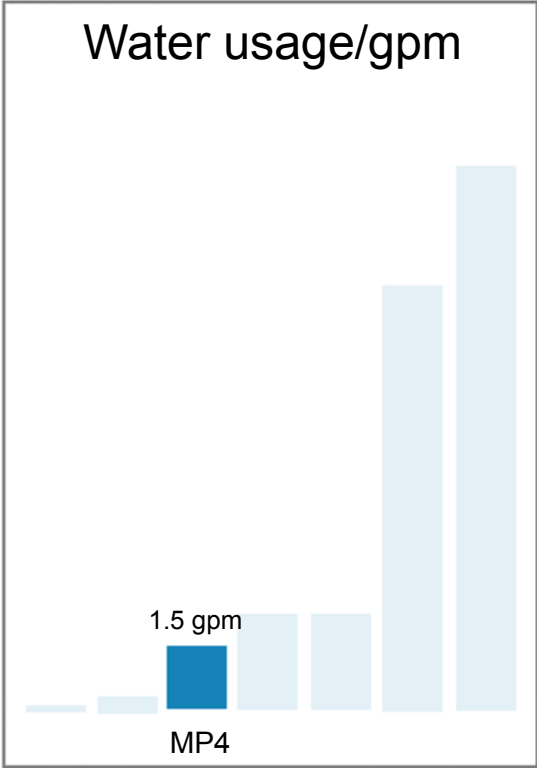


Pulpers-The Downside



- Although water consumption is minimized, pulpers still require some fresh water
- Recycled water concentrates FOG's
- Pulped waste is reduced and dewatered but not ready for soil application.

Mini Pulping Systems



Mini Pulpers-the upside



- 80% volume reduction
- Recycles grey water
- Small footprint
- Finer screen catches more waste solids
- Can retrofit to existing disposers

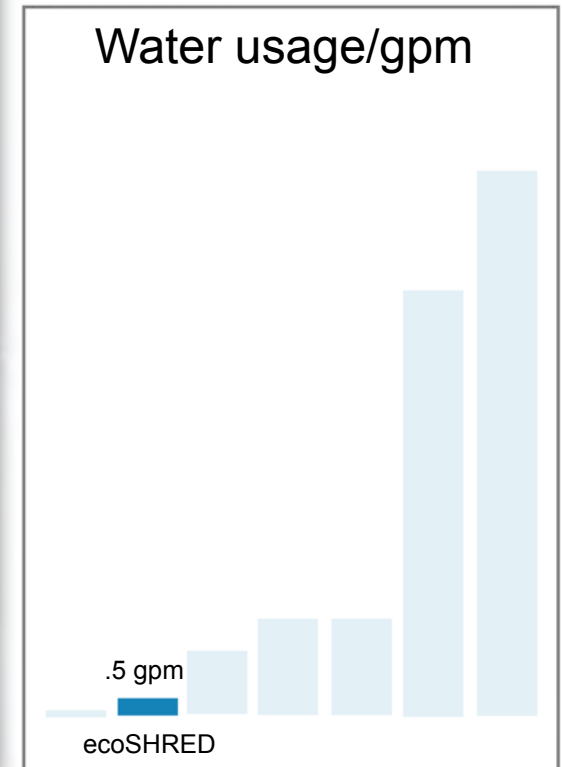


Mini Pulpers-the downside



- Smaller waste capacity than standard pulpers
- Only handles food waste scraps
- Needs water supply to operate

Compostable Waste Shredder



Shredders-The Upside

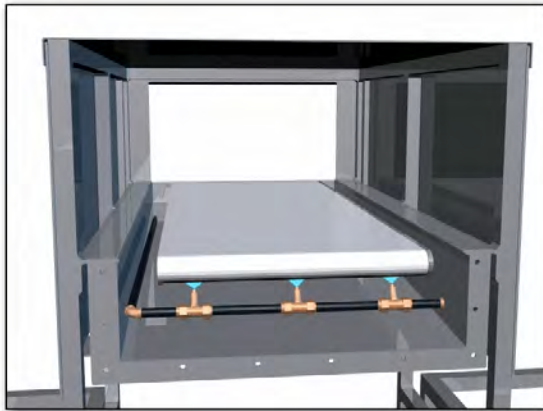


- 80% volume reduction
- No water consumption except for clean-up
- Applicable with “disposable only” operations or operations with “heavy disposable” usage.
- Energy consumption is 65% of pulper (no pumping water back and forth)
- Lower noise level than comparable pulper
- Less sanitary discharge issues because of drastically reduced water consumption

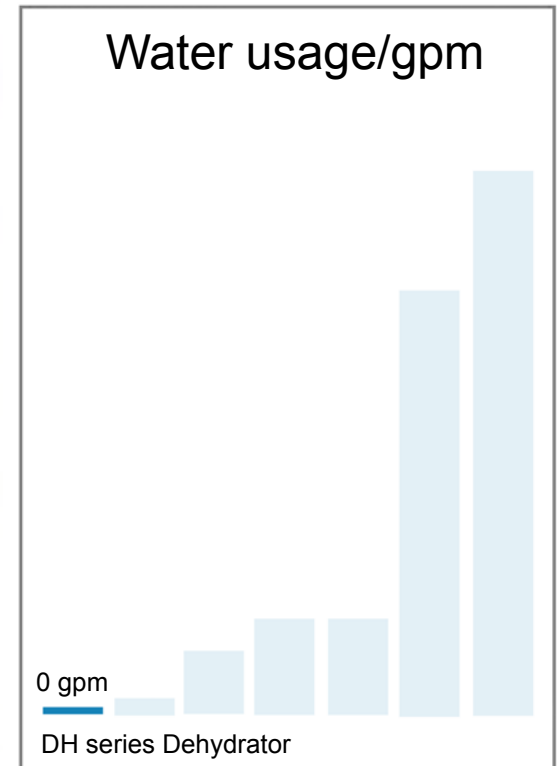
Shredders-The Downside



- Most applicable to “total disposable” self bussing operations
- Size currently limited to 1200 lbs per hour
- Cost more than a comparable sized pulper (approx 10K)



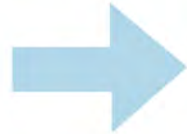
Food Waste Dehydrator



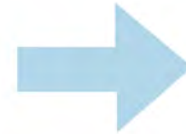
Treatment process inside a dehydrator



Food waste



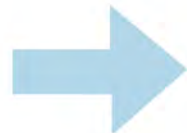
Insert the waste



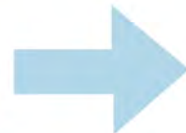
10 minutes later



1 hour later



Dehydrating...



Job completed

Dehydrator-the upside



- 90% reduction in weight and volume
- No water usage
- No impact on sewer or grease traps
- Can be used with food waste and disposables
- End product can be used as soil amendment
- New UL listed controls incorporate “dryness sensing” technology
- 180 degree processing temp achieves pathogen kill
- End product can be stored for long periods of time, dramatically decreasing hauling costs and need for refrigeration

Dehydrator-The Downside



- End product nutrient value (nitrogen level) depends on what you put in it
- End product is dehydrated food waste and compost cycle is not completed
- Electrical costs about \$40 per ton to process (\$5 per day on DH100)
- Processing time (batch process) is 15 to 20 hours

Pulpers increase dehydrator capacity greatly and
produce better quality end product



Best practices for effective food waste diversion



- Staff and patron involvement
- Disciplined sorting techniques
- Effective PR to promote awareness
- Compostable disposables (BPI certified)
- Reduce and dewater prior to compost
- Know the entire process-involve your local composter in your planning processes

Compostable Disposables

What you can tell your clients that the sales folks for these products may not!

- (1) Biodegradable does NOT mean compostable
- (2) Many claims of “compostability” are not accurate (unregulated)
- (3) Products must meet ASTM 6400-04 to be accepted at compost facilities
- (4) Products need to be certified to ASTM spec by an independent testing lab
- (5) Biodegradable Products Institute (BPI) certification is best
- (6) Most of these products still come from overseas
- (7) Shelf life can be an issue
- (8) Cost is still an issue

What types of Food and Soiled Paper can be composted?

- Foods and Food Serviceware
 - Meat, fish, poultry, bones
 - Dairy products (yogurt, cottage cheese, etc.)
 - Vegetable and fruit trimmings
 - Grains (baked goods: breads, pasta, cereals)
 - Egg shells, coffee grounds, tea leaves
 - Table scraps & Solid food leftovers
 - Soiled paper towels, napkins, paper plates & cups
 - Certified (BPI) Biodegradable food serviceware
 - Greasy pizza delivery boxes

Best practices for patron education

Hello there!

Here's some food for thought...



Take a good look at what's on your tray. Fork, bowl, clam shell for salad ...and of course, food.



Nearly everywhere else, these food Service items are made from high-priced petroleum that chokes our landfills.



Green Water Bottles are compostable; *made from plants...not oil.*

Please place these bottles in the compost bin,
not the receptacle for
other recyclable bottles.



deposit your
compostable
bottles here



In the House, all the utensils and clear food containers are made from corn. That's right. Corn.



And here is the best part.
They are 100% biodegradable and
can even be used to grow new food.



So when you toss your corn-based fork, clear container and food scraps do they eventually turn into tomatoes? Maybe!



So how can your trash turn into treasure?
When you throw away your utensils and
food scraps, you are actually beginning a
90 day process that
turns everything into
high-quality topsoil!



All of the cafeteria's waste is put through a pulping machine that grinds it and removes most of the water.



This turns the waste into damp confetti, and reduces it to a tenth of its original size.



A hauler then takes the composted waste to a composting facility in nearby Maryland.



After three months,
the pulp breaks down and becomes
nutrient-rich soil.

90
Days

There's another chapter to the composting story. The topsoil that is made with your waste is sold to landscapers and gardeners who use it to nourish their plants.



It's even used to help buffer and
Protect our streams from runoff.



In our cafeteria,
we literally turn trash into topsoil.
And we're very proud of it.



Food Waste Into Electricity

A case study from the kitchen of





TONIGHT: MOSTLY CLOUDY - SCT'D SHOWERS. LOW: 56 6:46 AM 55°



Extractor – solid/liquid separation.



Excess water overflows to transfer tank.



Waste deposits into receptacle for hauling.



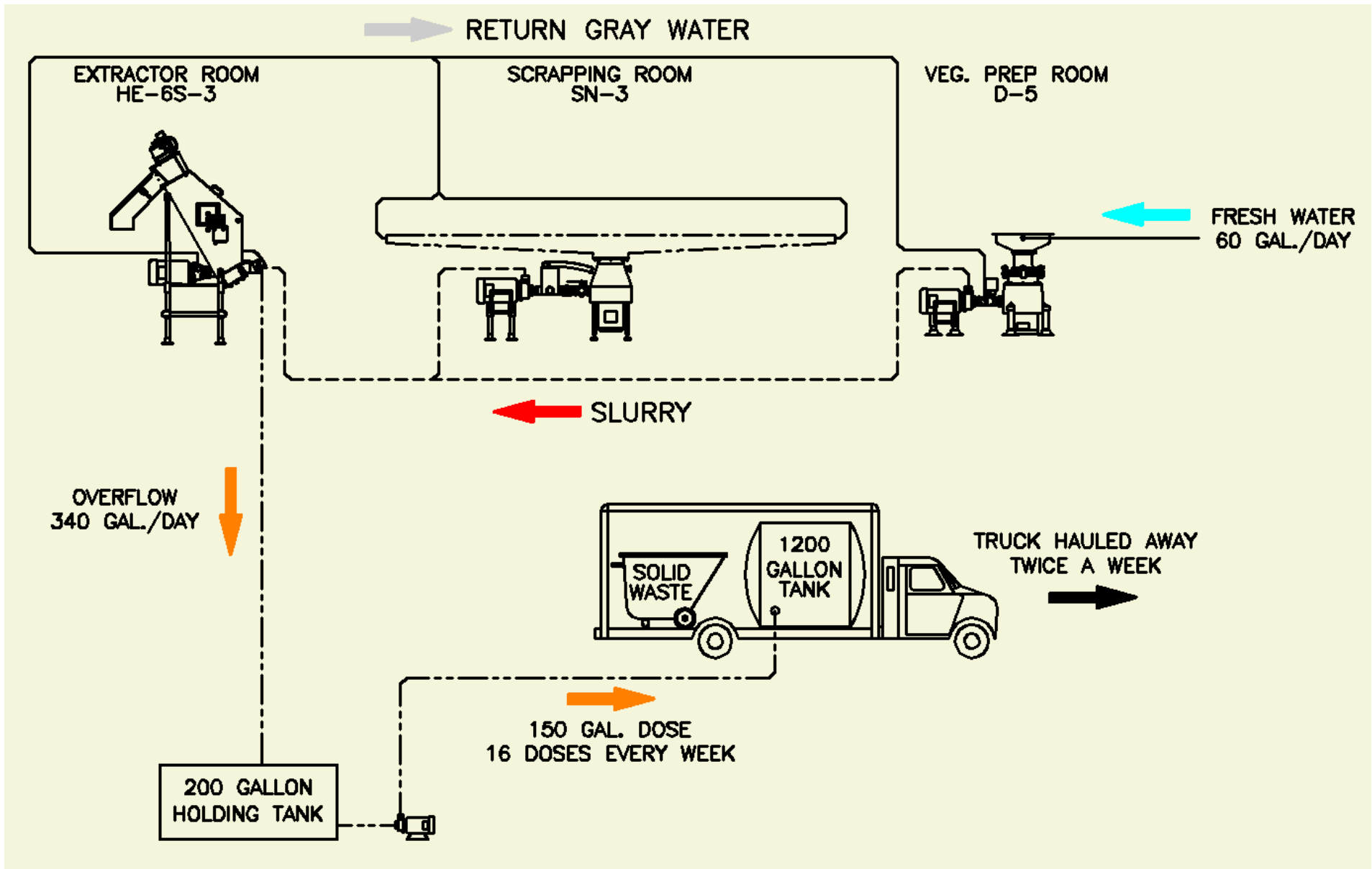
200gl transfer tank (original purpose was grease collection)



Connection from transfer to hauling vehicle.



Digesting tank for methane production/collection



Three case studies showing “end of life” options for foodwaste

Pulp to Compost

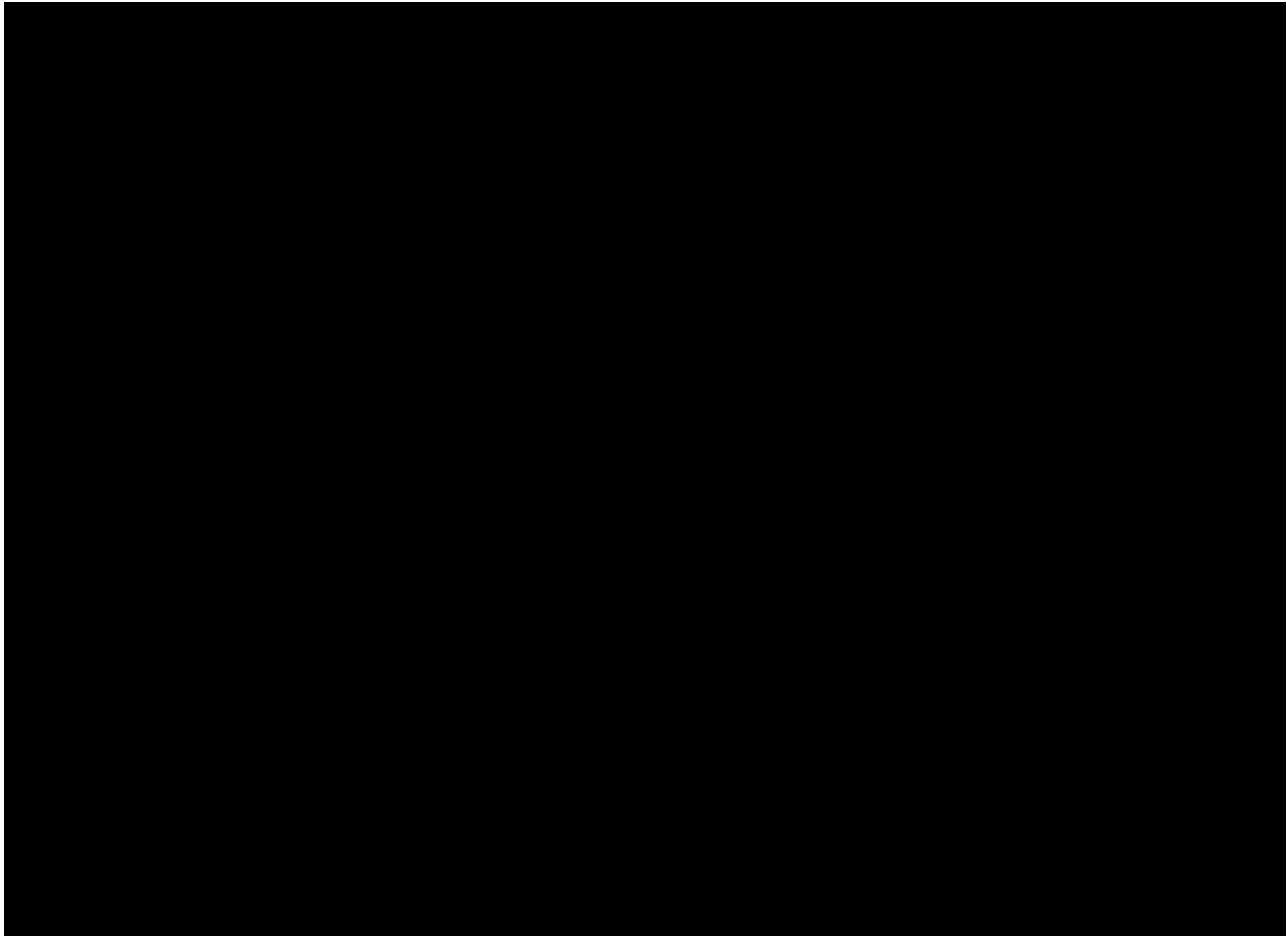
Pulp to Dehydrate to Compost

Pulp to Dehydrate to soil

Pulp to Compost



Pulp to dehydrate to compost



Pulp to Dehydrate to Soil Amendment

U of Maryland rooftop gardens







GREASE TRAPS

-Must I route my disposer or pulper through them?

-On disposers UPC says “no”.....IPC still says “maybe”

And neither are specific on pulpers

What to do??

- Local code enforcers usually rule the day regardless of UPC or IPC

When grease traps are required for pulper effluent here is a better solution than the infamous “honey dipper”



LeBonheur Hospital

Secondary filtration application

Secondary press filtering pulper overflow



One-third of a day's volume; secondary press produces about one third of the solids the primary press does. Bottom line is that it has been one year since startup and no pumping!



Resources



www.somatcompany.com *search LEED*

www.findacomposter.com

www.bpiworld.org

www.compostingcouncil.com

www.epa.gov *search "food waste"*

www.leanpath.com

Thank you!