



Depackager Tests

JANUARY 10, 2018 & MARCH 29, 2018

GUNDERSEN-LUTHERAN'S ENVISION DIGESTER

Food scraps loaded here

Food scraps conveyed up this chute and dropped into de-packager

Mechanism that smashes food scraps over screens. Scraps pushed thru screens pumped to digester. Discards carried out.

Discard chute that expels plastic bags and other material not pushed through screens

De-packaging machine



Post digestion solids. This what the material looks like after digestion.

City of Madison material
collected from organics carts
(these piles are from January 2018)





This is a compostable bag. Better than plastic, but still will be discarded in depackager.

Contamination examples: Chip bags, plastic food containers, plastic bags, and other plastic scrap.

More contamination. Notice the blue plastic toy. Also, the tree branch is a problem.





More contamination. Notice the plastic on the sprig of parsley & the sticker on the avocado. Plus there's the plastic bag. There's always plastic bags.



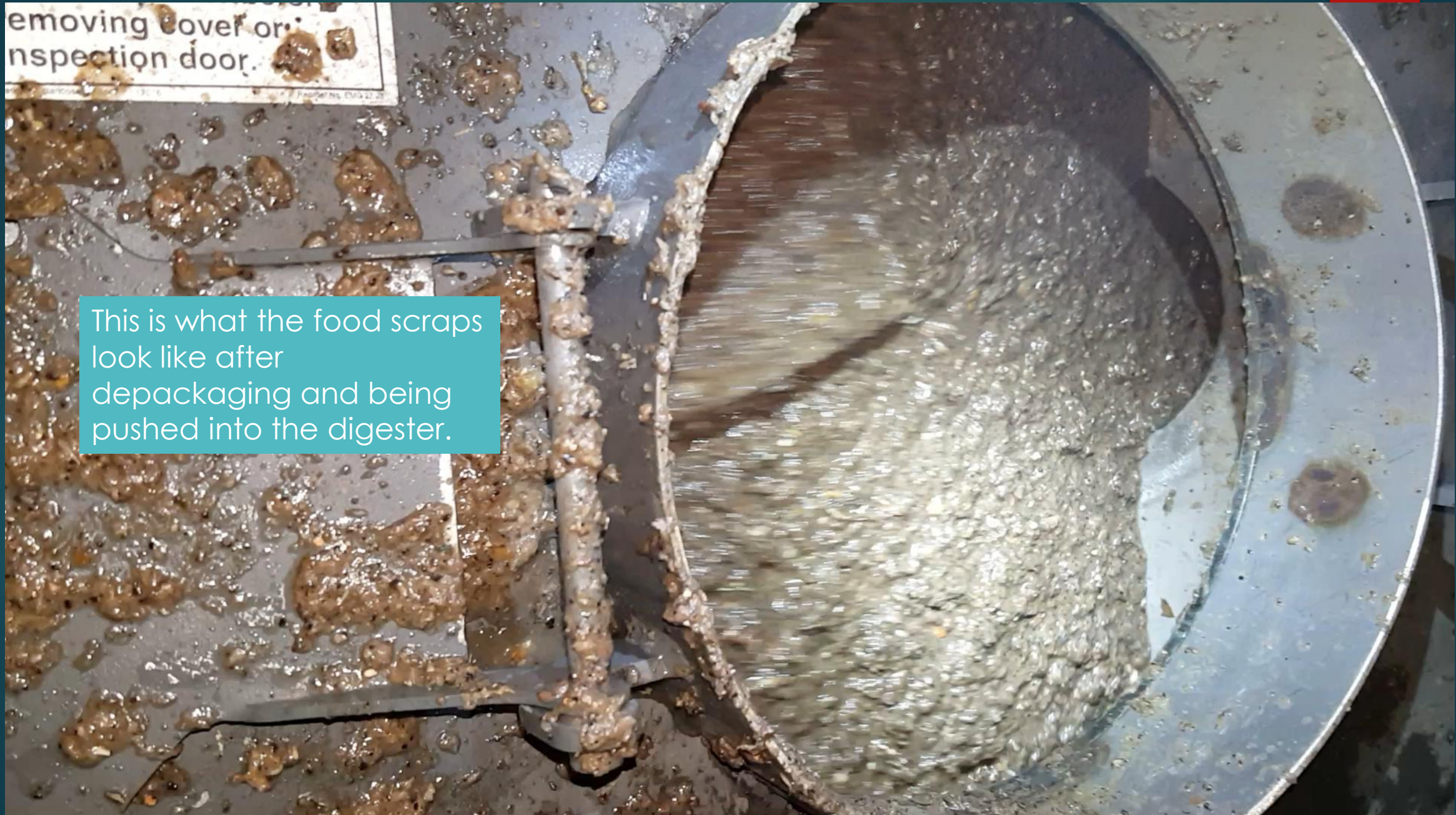
How the depackager is loaded

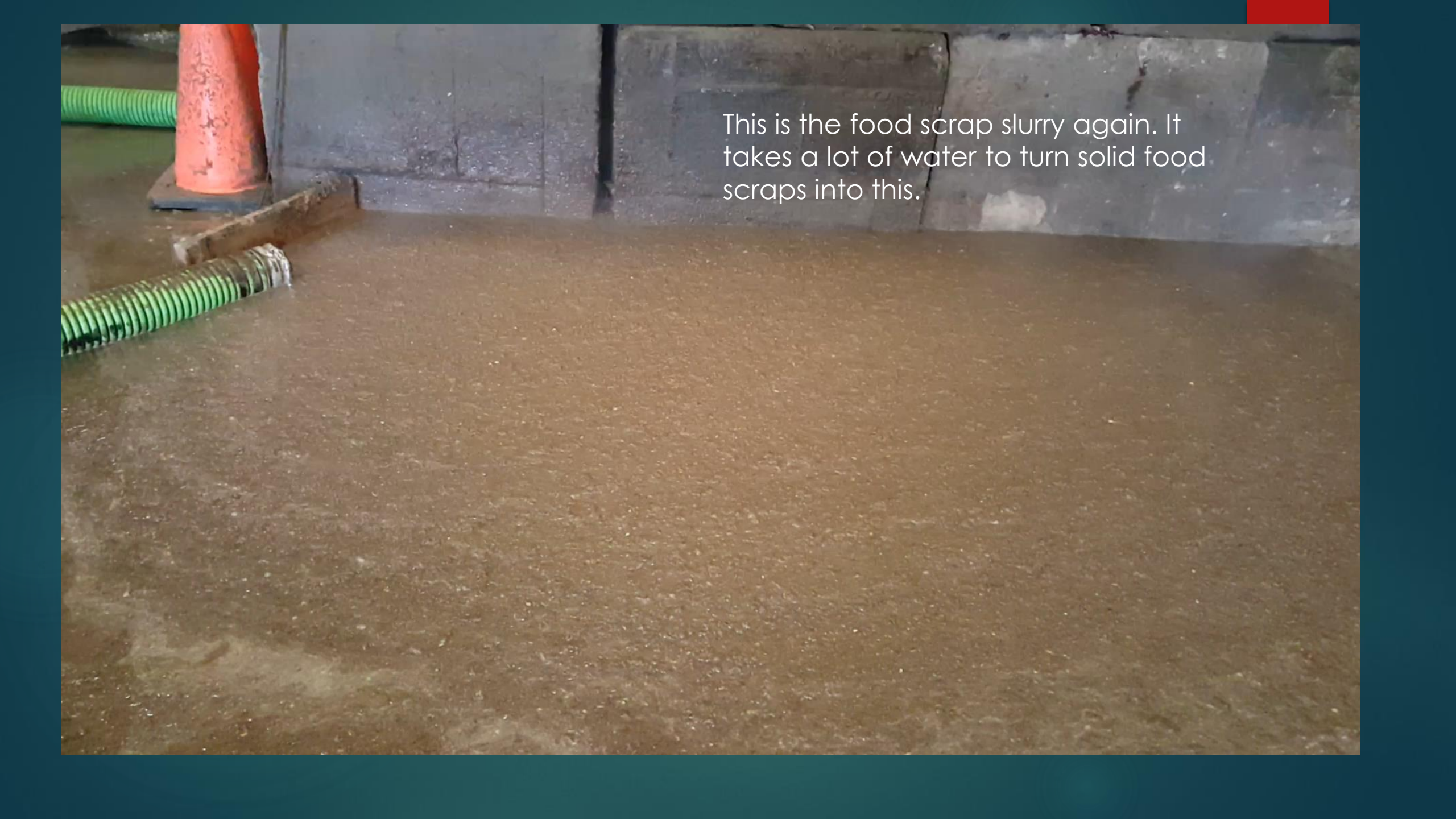




Removing cover or
inspection door.

This is what the food scraps
look like after
depackaging and being
pushed into the digester.





This is the food scrap slurry again. It takes a lot of water to turn solid food scraps into this.

These are pictures of the discards. The first photo on the left is the discard chute. The next two are the discards. The center picture and the one of the far right were taken about an hour apart from each other. The food scraps needed to be processed for 12 plus hours during the first day and more time during a second day.





Lessons learned from trial one

- ▶ Plant manger liked what he saw of the finished product. This is good news.
- ▶ Took entirely too long to process and material had a considerable amount of contamination.
 - ▶ City delivered approximately 7 tons of food scraps, that's around a week's worth of material from the carts.
 - ▶ Took 12 plus hours one day and additional hours on the following day to get the material into the depackager.
 - ▶ Material was hard to feed into the depackager and it operated very slowly.
 - ▶ Contamination bogged down the machine, clogging the screens and tangling the paddles that process the material.

Lessons learned from trial one

- ▶ Contamination concern is serious
 - ▶ Plant reported nearly 1 ton of contamination from the 7 tons delivered
 - ▶ However, a lot of that weight was water added to the machine to process the material. Not very likely it was a full ton of contamination prior to processing
 - ▶ Contamination can damage the machinery
 - ▶ Chopsticks block screens; dirt clogs pipes; plastic bags and cloth tangle up the depackaging mechanism
- ▶ Water use also serious
 - ▶ Unsure the number of gallons of water needed to process material

Second Test Load

- ▶ A second test load was taken to digester on 3/29/18.
- ▶ Material looked cleaner, and process went smoother
 - ▶ Less plastic junk
 - ▶ Water use still a concern
 - ▶ Still labor intensive and slow
- ▶ Tip fee for second test higher
 - ▶ Test 1: \$50/ton
 - ▶ Test 2: \$100/ton



Questions remain

- ▶ Cost certainty
 - ▶ Unclear how much it will cost if test two proves successful
 - ▶ Unclear if cost is worth shouldering if a food scrap processing facility of some kind is not in the future
- ▶ Capacity
 - ▶ Assuming cost is resolved and acceptable, the time it takes to process food scraps is lengthy. Limits the ability to expand.
 - ▶ Also assuming cost is resolved, dumping location for food scraps is challenging to access for vehicles and space is limited