



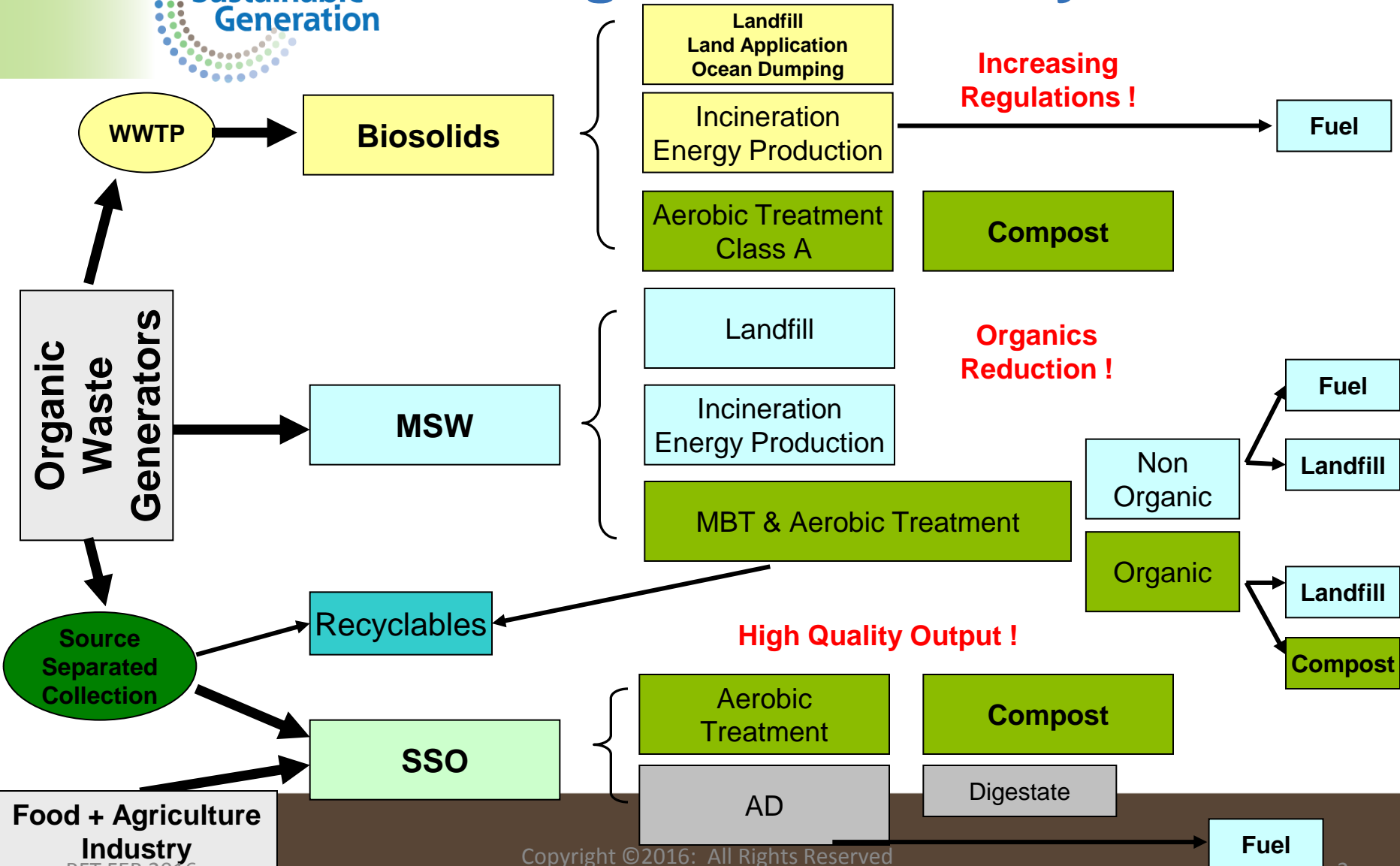
Scalable Waste  
Conversion Solutions

# Scalable Operating Model for Processing Organics

Scott Woods  
Founder and CEO



# Organics Recovery Model



RFT FEB 2016

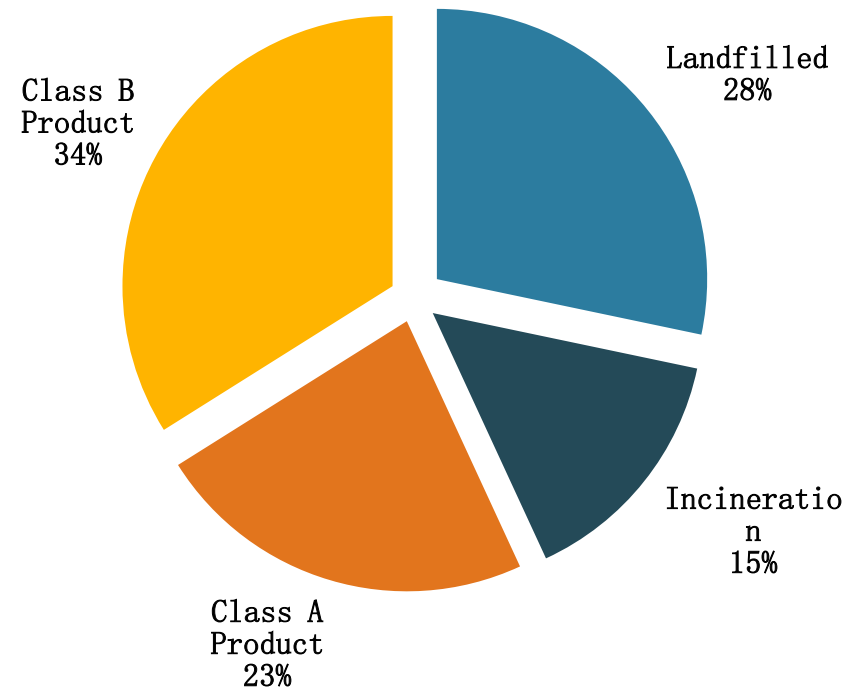


# US BioSolids Market

## Biosolids: Human Waste

- × US produces 7,200,000 dry tons of biosolids annually
- × 45% of total is disposed of by landfilling or incineration

## US Biosolids Disposal

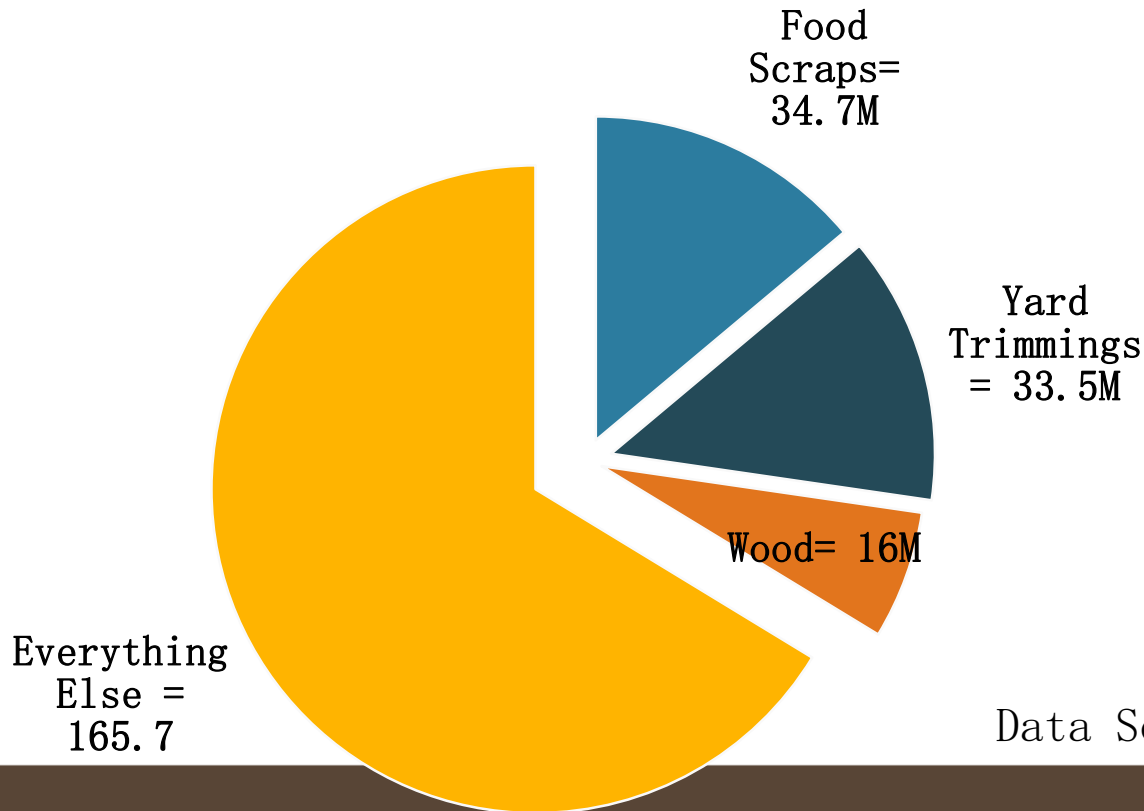


Source: NtlBiosolidsReports



# Source Separated Organic (SSO) in the US

Total MSW Generation 250 (M) Tons



- Today only ~5% of Food Waste is recovered
- Landfilling organics is source of Green House Gases

Data Source: US EPA Reports



# Why Compost?

- **GHG Emission Reduction**
- **Clean Waterways- Eliminate Nutrient Loading**
- **Healthy Soils/Nutrient Value**
- **Water Management**
- **Solid Waste Master Plans**
  - **Recycling Rates**
  - **Diversion Mandates**
- **Extends Landfill Longevity**
- **Business Opportunity \$\$\$**
- **Right Thing to Do**





# SG and GORE® Partnership

**SG is the Authorized GORE® Cover Distributor for North America**



## GORE® Cover Globally:

- 200+ installations
- 20+ countries
- +3.5M tons annual processing capacity

## GORE® Cover North America:

- 20+ Installations
- +1M tons annual processing capacity

*The proven track record of success over time of the GORE® Cover mitigates the composting technology risk for our Clients and their Projects*



# TORC™ Solution

## Total Organic Recycling Center



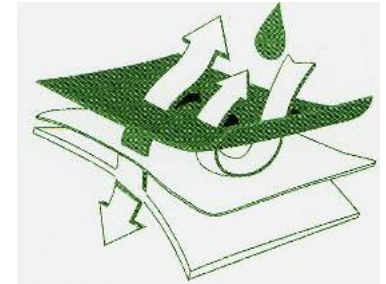
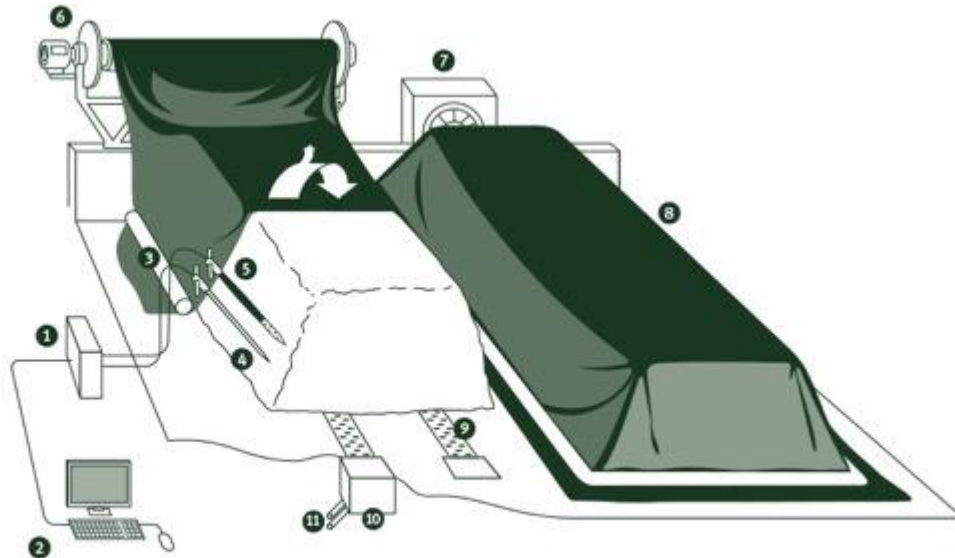
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# SG Compost System with GORE® Cover



- 1 Control system
- 2 PC
- 3 Rim weight
- 4 Temperature sensor
- 5 Oxygen sensor
- 6 Cover handling device
- 7 Aeration fan
- 8 GORE® Cover
- 9 Aeration and leachate system
- 10 Water trap
- 11 Leachate pipe



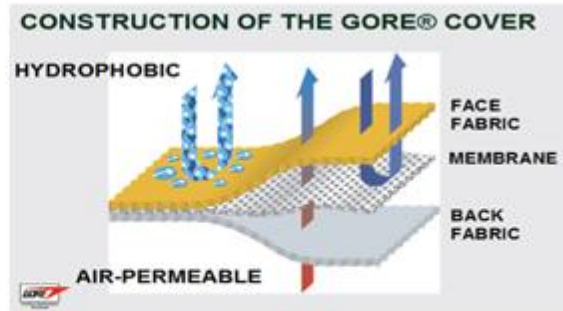
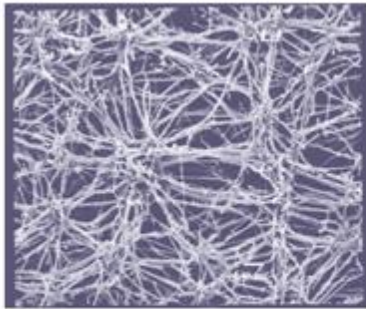
©2012 W. L. Gore & Associates GmbH. GORE® and designare trademarks of W. L. Gore & ASS







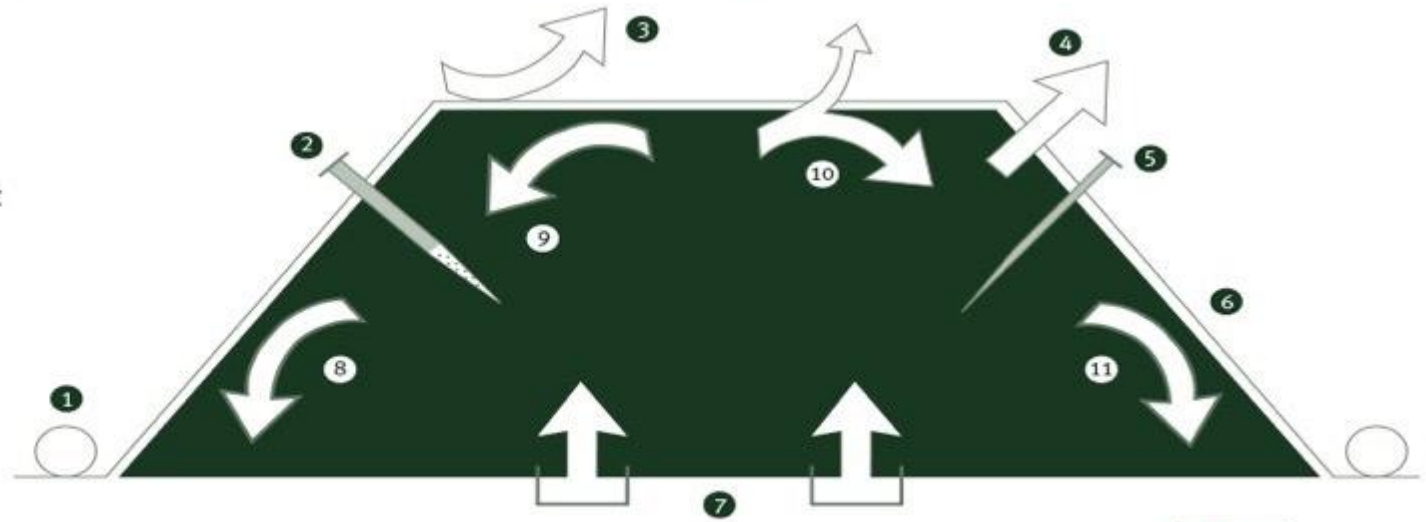
# GORE® Cover in combination with Positive Aeration System



**Encapsulated Process** GORE® Cover delivers In-Vessel performance without the need for buildings or roofed structures

**Each membrane pore is 20,000 times smaller than the smallest water drop.**

- 1 Rim weight
- 2 Oxygen sensor
- 3 Weather resistant impact
- 4 Air
- 5 Temperature sensor
- 6 GORE® Cover
- 7 Positive aeration
- 8 Heat
- 9 Odour
- 10 Moisture retention
- 11 Microorganisms



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# Time Temperature Study US EPA 503 Regulations

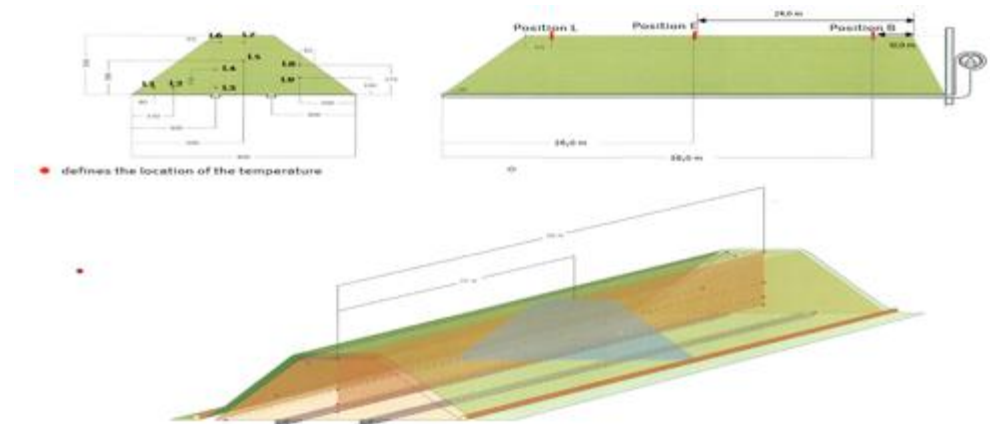
## Biosolids Time Temperature Study

Location: Moncton, NB

Date: August 2008 – April 2009

Source Testing: GMSC, A & L Labs

- EPA has issued a recommendation of national equivalency that the GORE® Cover meets or exceeds requirements for achieving Class A biosolids as described in Alternative 5: Use of PFRP [503.32(a)(7) and (B)(1) of Appendix B].





# California VOC Emissions Compliant

San Joaquin Valley Air Pollution Control District has issued an assessment that the Gore® Cover System is capable of meeting and/ or exceeding the emission requirements for Rule 4565, Rule 4565 and BACT when installed, operated and maintained per GORE® Cover specifications...

December 15, 2011

**BACT (Best Available Control Technology)**

–Co-composting operations

**Rule 4565**

–Biosolids, Animal Manure, Poultry Litter

**Rule 4566**

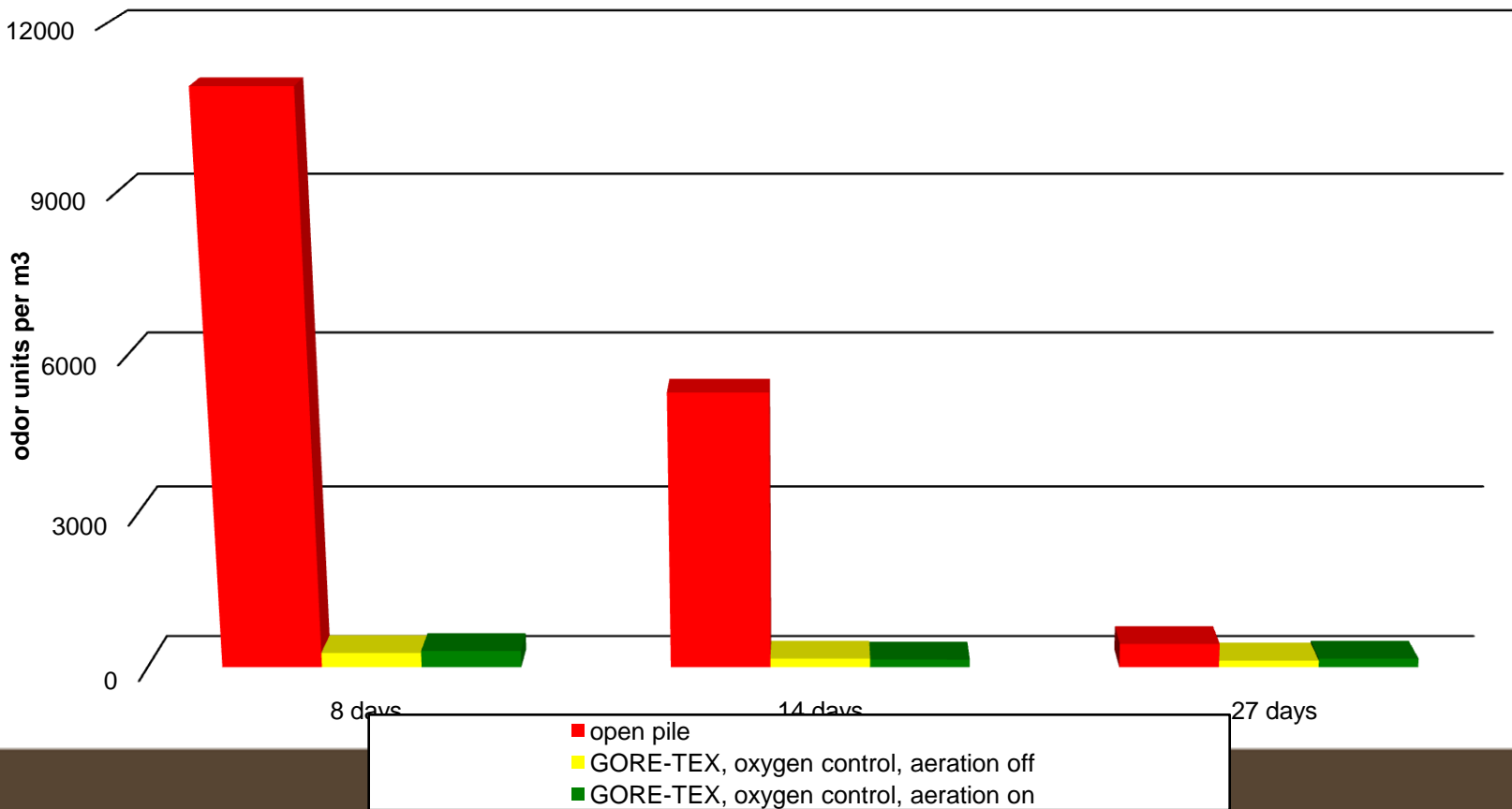
–Organic Material





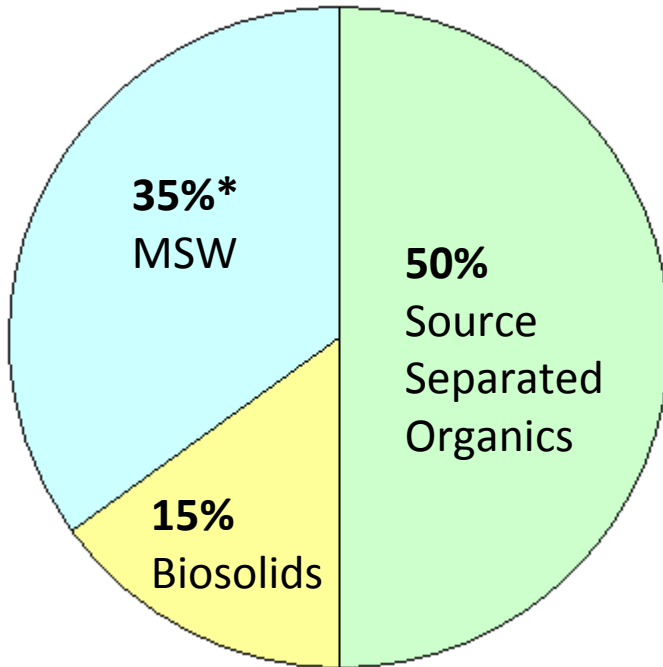
# GORE® Cover provides Odor Reduction

## Comparison of Odor Emissions





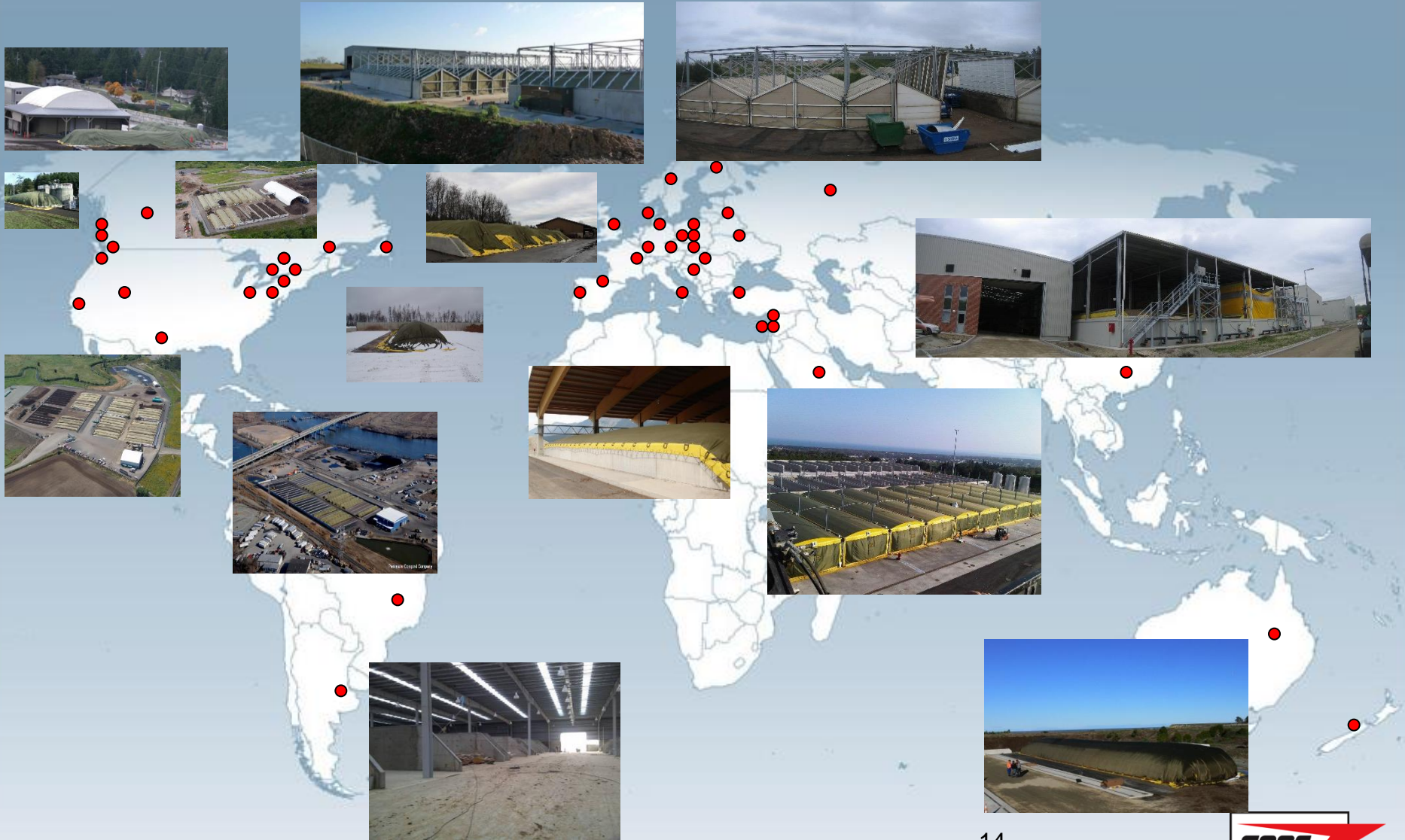
# GORE® Cover Experience in Feedstocks



\*EU: Stabilization, Bio-drying & CLO



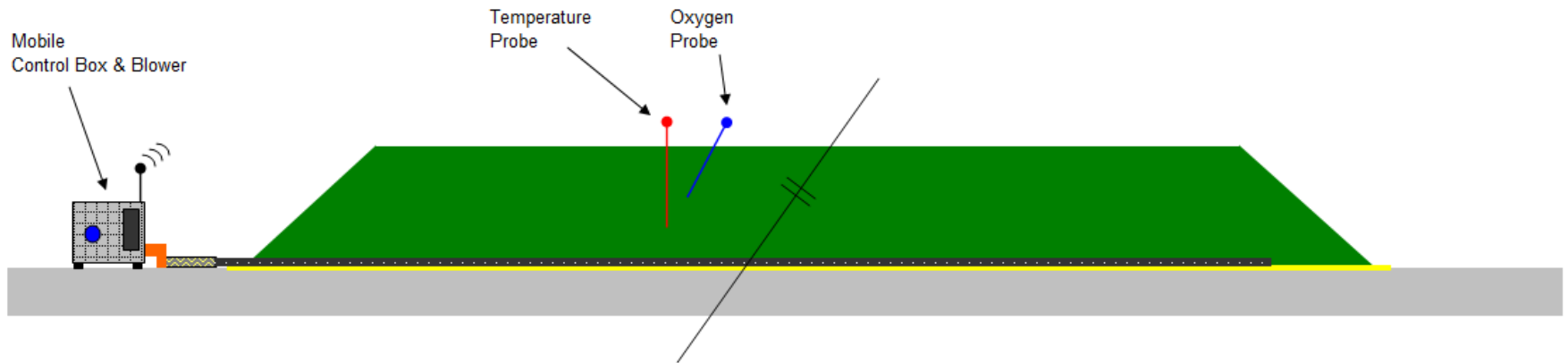
# Global Organic Waste Experience Worldwide: 200 + Installations 3.5 + million tons per year organic waste





# SG Mobile™ System

## On Floor Aeration – Portable/Demonstration/Pilot





# Pilot Demonstration

## Southern California: Food Waste Study





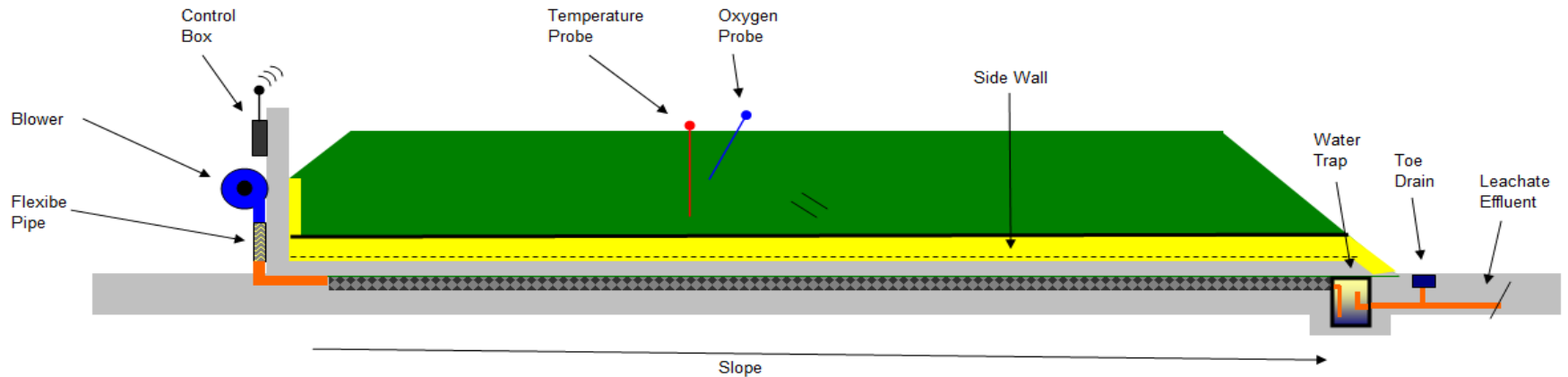




# SG Mega™ System

## Bunker Design

In Floor Trench w/ water trap – Toe Drain – Push & Side Walls





# Full Scale Operation 100 TPD





# Composting Facility 200 TPD SSO





# Green and Food Waste: Washington, USA 180K TPY





# Biosolids Demo



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Sustainable Generation LLC



# Biosolids Example- Oregon

**Waste Water Treatment Plant  
post processing change needed.**

**Regulations restrictions increasing over  
time for Class B Land Application.**

**Consultant hired to evaluate options.**

**Desire to create Class A product.**

**SG Mobile™ System using GORE® Cover  
chosen on Triple Bottom Line  
evaluation and Track Record of  
Success over time.**

**Evaluation of Technology for Full-Scale  
Facility feasibility.**





# Mix Recipe



**Biosolids + Wood Waste = Mix Recipe**





# Mix by Weight



Critical to Quality

- C:N
- Porosity
- Moisture



# Mix by Volume





# Applying the Technology





# 8 Weeks to Compost



**1 Heap = 250 Tons**



# Mid Process Turn



**4 Weeks**



# Pre-Screened Compost



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**8 Weeks**



# Finished Biosolids Compost



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# Next Steps

**Demo Project Case Study to be Published in Q1 CY2016**

**Business Case Evaluation for Full Scale Facility**





# Source Separated Organics Maryland

## Food Waste Composting Pilot Project Example



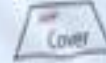
# Prince George's County Food Waste Composting Pilot Project

Operated by



MARYLAND  
ENVIRONMENTAL  
SERVICE

GORE® Cover Technology Provided By Sustainable Generation



[www.sustainable-generation.com](http://www.sustainable-generation.com)

- Existing Yard Waste Composter
- New Feedstock (Food)
- New Technology (GORE® Cover)



# Source Separated Organics

Ideal World: Food Waste has no contaminants





# Food Waste Delivery

## Food Waste Delivery

- #1 of 20 Loads
- 50 Tons Total





# What's in this pile?



- Food
- Moisture
- Plastics
- Contaminates
- ODOR



# Mixing



## Critical to Quality

- C:N
- Porosity
- Moisture



# Heap Construction



- 3 Heaps
- 250 Tons / Heap
- 750 Tons Total



# Applying the Technology

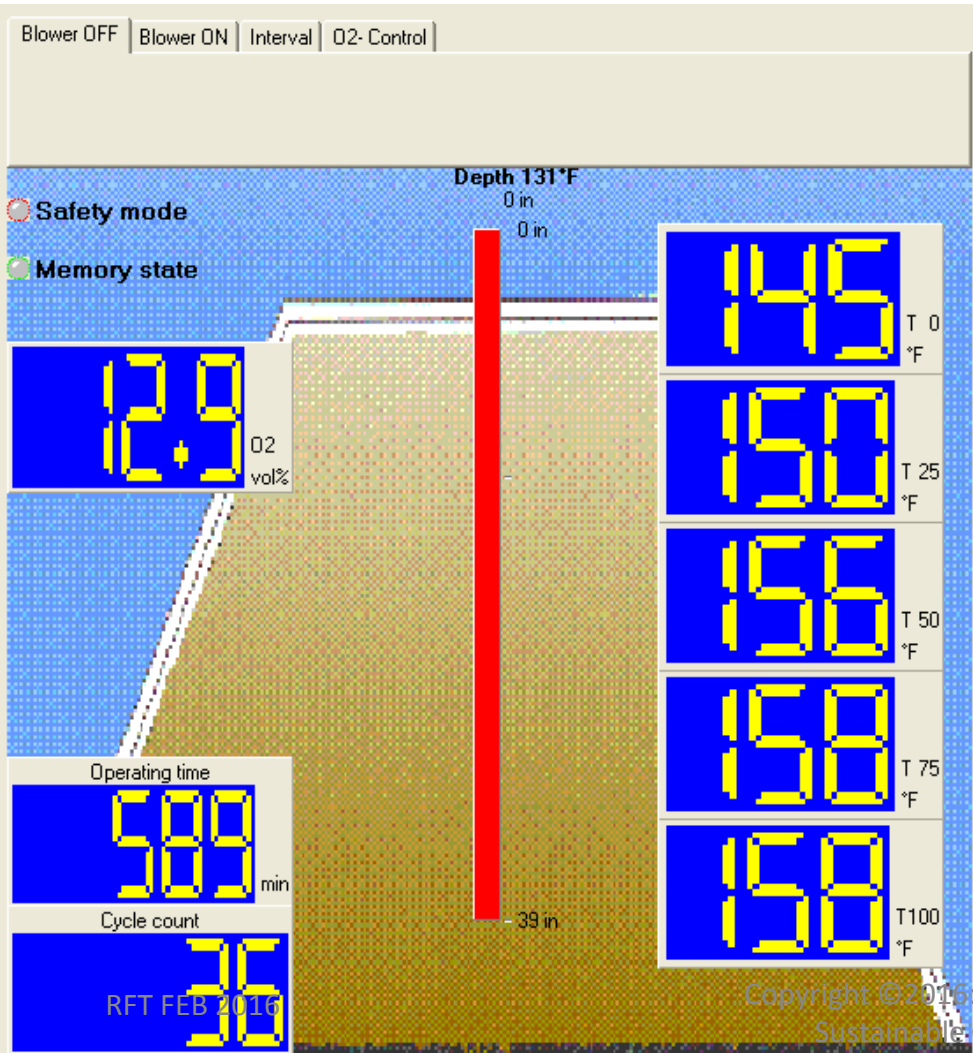


- GORE® Cover System
- Cover
- Temp Probe
- O2 Probe





# Control Monitoring



KOMPMASTER protocol

Company :  
\* Text \*  
\* Text \*

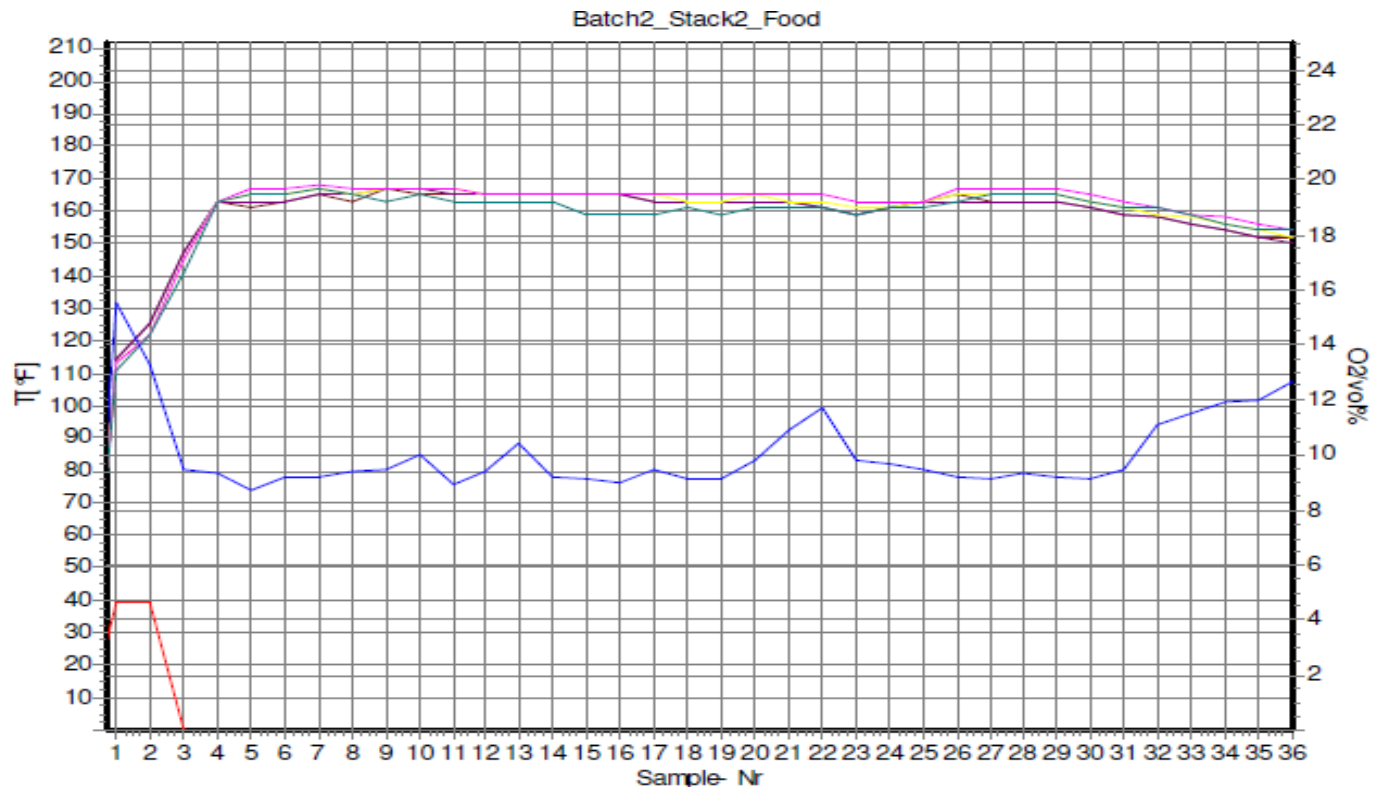
Stack- name : Batch4\_Stack1\_Green  
File- name : C:\Users\SG-DEMO-UNIT\Desktop\Data\Batch4\_Stack1\_Green\_12-3-2013.CSV  
Greenwaste 1:1.5 leaves to grass + 8000 gallons H2O  
First data download at: 12/3/2013

Nr.:	Date/time	Temperature					O2[vol%]	Blower		Depth s 131°F[In]
		T1[°F]	T2[°F]	T3[°F]	T4[°F]	T5[°F]		On-time/min	Cycles	
1	12/3/2013 23:59	116	125	116	102	102	9.9	174	16	39
2	12/4/2013 23:59	131	123	123	125	127	9.7	516	39	39
3	12/5/2013 23:59	159	156	149	149	149	1.1	599	52	0
4	12/6/2013 23:59	170	168	167	165	161	3.4	225	40	0
5	12/7/2013 23:59	177	179	179	177	176	2.9	209	41	0
6	12/8/2013 23:59	179	183	183	181	179	3.6	205	41	0
7	12/9/2013 23:59	179	183	185	183	181	5.9	267	30	0
8	12/10/2013 23:59	177	181	183	181	179	6.0	237	20	0
9	12/11/2013 23:59	176	179	181	179	177	7.8	226	21	0
10	12/12/2013 23:59	174	177	179	177	174	7.7	198	31	0
11	12/13/2013 23:59	172	176	176	176	172	6.8	206	41	0
12	12/14/2013 23:59	170	174	176	174	170	6.6	208	42	0
13	12/15/2013 23:59	170	174	176	174	170	7.6	205	41	0
14	12/16/2013 23:59	170	174	176	174	170	7.6	224	40	0





# Time and Temperature Results



C:\Users\SG-DEMO-UNIT\Desktop\Data\Batch2\_Stack1\_Food\_7-15-2013.CSV



# Pre-Screened Compost



**8 Weeks**



# Mid Process Turn



**4 Weeks**



**Tropical Storm Andrea - July 2013  
+1 Foot Rain Event**



**Polar Inversion – January 2014  
-10 Degree F**

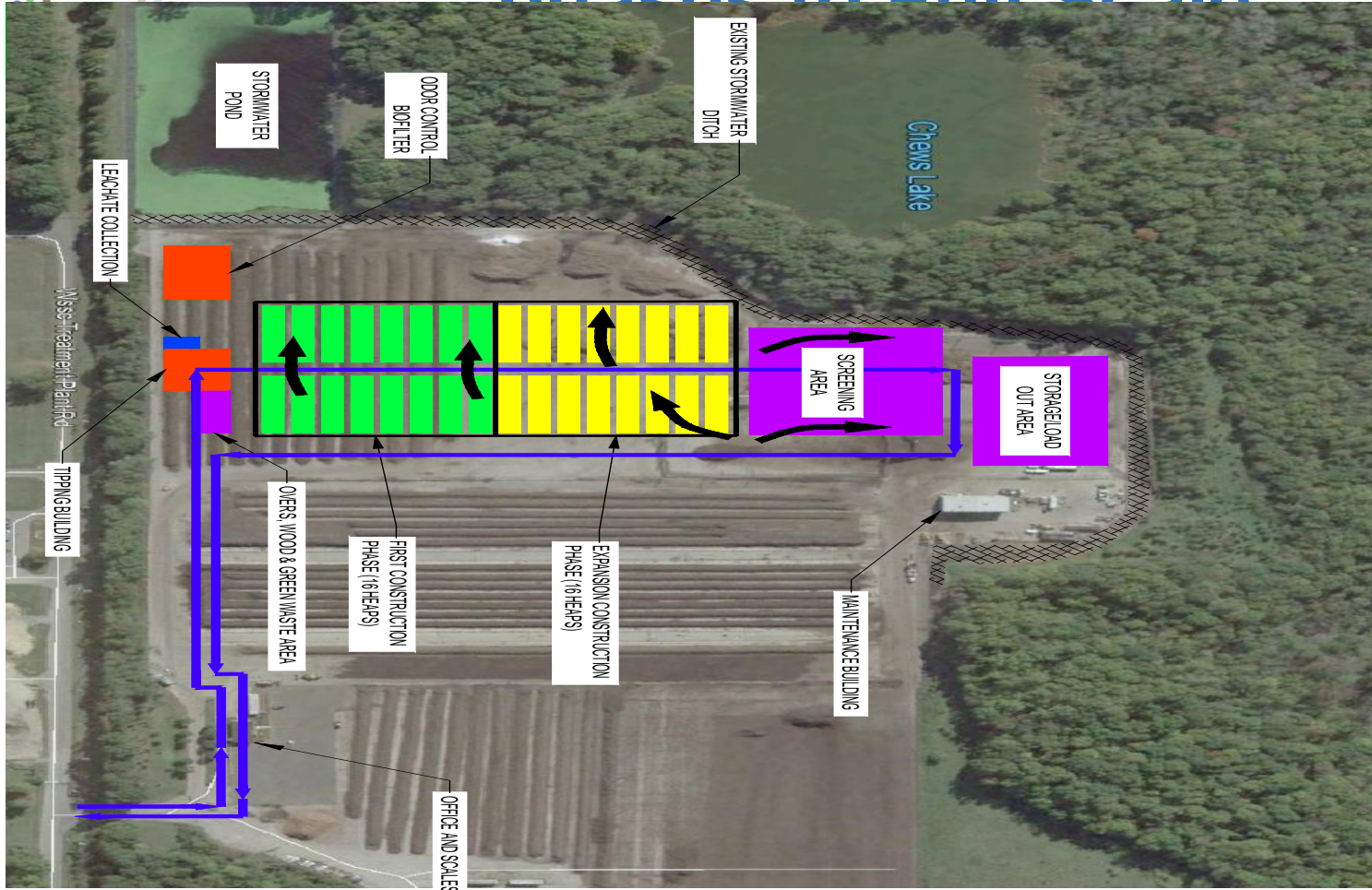


# Finished Food Waste Product



- PFRP Compliant
- VOC Compliant
- Quality Spec'd
- Mature
- Marketable

# Next Step: Expansion of Pilot in phases to Full Scale



**LEGEND:**

- SOLID MATERIAL FLOW (TRUCK ROUTE)
- EXISTING GRADE (STORMWATER LEACHATE SLOPE)
- FIRST CONSTRUCTION PHASE COMPOST HEAP
- EXPANSION CONSTRUCTION PHASE COMPOST HEAP
- EXISTING STORMWATER DITCH

MARKLAND ENVIRONMENTAL SERVICES  
 WEST BRANCH COMPOSTING FACILITY  
 CONCEPTUAL PLAN  
 Kennedy/Jacobs Consulting  
 PROJECT CONCEIVED  
 RFT FEB 2016  
 SITE PLAN  
 KJ 1478XXX  
 FEBRUARY 21, 2016  
 FIGURE



# Contact Info

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