



- ✧ **Advanced composting**
- ✧ **Renewable energy**
- ✧ **Organic food production**

Operations Update: Advanced Aerated Composting Facility in Prince William County

Metropolitan Washington Council of Governments – Recycling Committee

September 16, 2021



Introduction and Outline

About Us:

Freestate Farms transforms food and yard waste from cities, businesses, and individuals into high-quality compost, renewable energy, and organic produce.

The benefits of Freestate's integrated facilities are increased soil health and productivity, reduced water use and pollution, minimized greenhouse gas emissions, and overall more sustainable communities.

Having completed the first year of operating Phase I of its initial facility, Freestate has begun delivering food waste processing capacity and high quality compost products to Northern Virginia and Metro DC.



Presentation Outline:

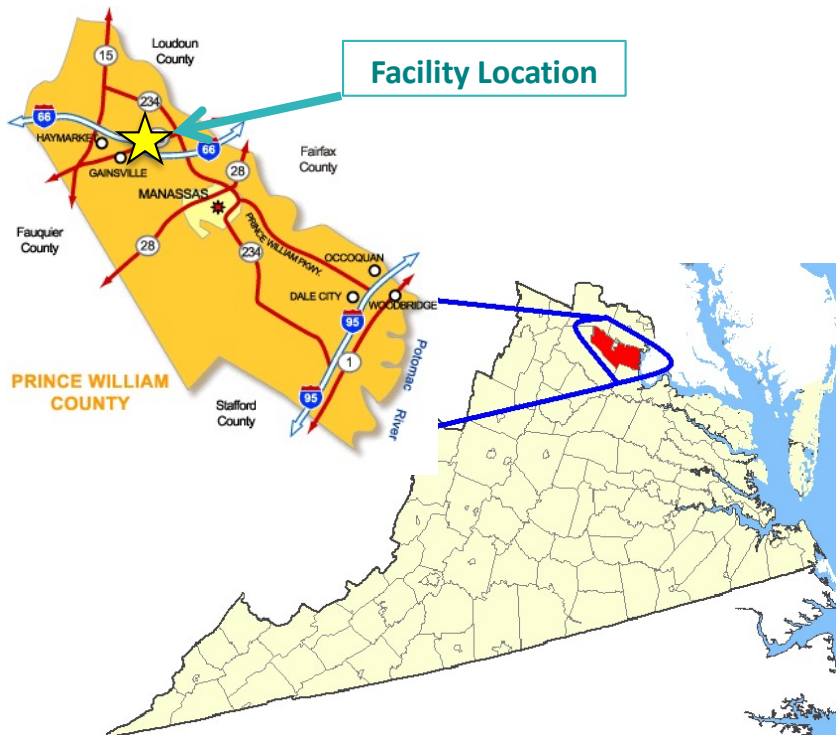
- Public-Private Partnership
 - Pre-Project Background and Key Project Info
 - Review of Upgraded Operation
 - Walk-through of Process
- Operational Highlights and Lessons Learned

Pre-Project Background: Prince William County's Municipal Facility



Background

- Suburban county of $\approx 430,000$ residents ($\approx 150,000$ households, and 8,000 businesses)
- Located ≈ 30 miles from downtown Washington, DC



Balls Ford Road Facility – Legacy Operation

- Began composting leaves and grass on the 30-acre site in 1994
- Residential Convenience Center
- Commercial and residential yard waste and brush tipping
- Original permitted capacity of 50k tons per year; recently handling ≈ 30 k tons per year
- Simple windrow composting – large piles turned every few weeks with an excavator



Freestate — Prince William County P-P-P Key Project Information



<p>Phase 1</p> <p>Yard Waste and Food Scraps</p>	<ul style="list-style-type: none"> ✓ Upgrade project developed, owned, and operated by Freestate ✓ Expansion of throughput capacity from 50,000 tpy of yard and wood waste to 100,000 tpy of food, yard, and wood waste ✓ Capable of handling up to 20,000 tons per year of full spectrum (incl. proteins) pre- / post-consumer food scraps 	<p>35 Miles from The White House</p>
<p>Phase 2</p> <p>Additional Food Scraps, Renewable Energy, and CEA</p>	<ul style="list-style-type: none"> ✓ Expand capacity for an additional 100,000 tons per year of material (including $\geq 40,000$ tpy of food scraps) via additional advanced aerated composting ✓ Installation of ≥ 250 kW of solar panel generation to offset portion of the facility's demand for electricity ✓ Organic food production through controlled environment agriculture (CEA), utilizing electricity generated and heat captured from Ph.II compost system 	

Phase I System Technology Reversing Aerated Static Pile Composting



The foundational strategic element of the Freestate Farms integrated system is advanced aerated composting, and we have partnered with **Engineered Compost Systems** of Seattle, Washington for our facility in Prince William County.

ECS's in-house engineering and design expertise has been well proven at the 35+ sites across the U.S. where its systems are presently in operation, with many more under construction and development.

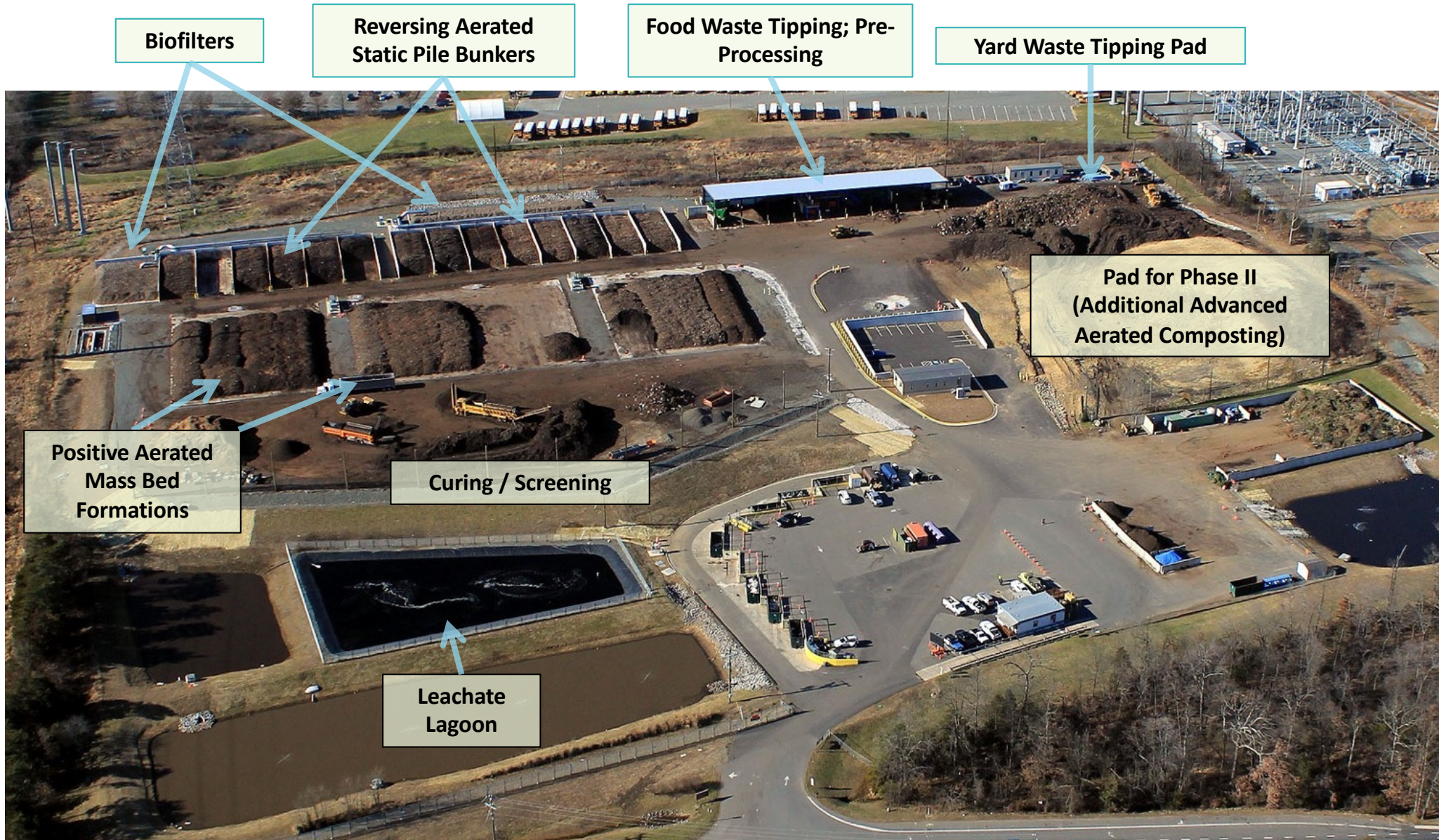


ECS's systems include intelligent process control and reliable environmental protections in the production of top quality compost products that conform to health and safety regulations and also meet the USCC's Seal of Testing Assurance (STA) Standards.

Balls Ford Road Compost Facility: Legacy Operation



Balls Ford Road Compost Facility: Current Status – Phase I System Operational



Phase I Operation – Pre-Processing Equipment



Phase I Operation – Static Pile Bunkers with Reversing Aeration



Phase I Operation – Biofilter, Mass Bed, and Final Screening



Operational Highlights and Lessons Learned



Operational Highlights

- Ramped up operation despite difficulties brought on by COVID restrictions
- Increased year-over-year throughput volumes of both yard waste and food scraps, from both legacy and new tipping partners
- Collaborated with Arlington to facilitate expansion of curbside collection program to include food scraps
- Reduced processing time as expected, from 6-12 months to 2-3 months
- Accepting compostable service ware from a few specific institutional and commercial generators on a trial basis
- Achieved USCC STA product certification
- Bagging product to make more accessible to local full-circle composters and DIY landscapers

Lessons Learned

- Eliminating plastic from incoming tip generates significant improvement in facility operation and final product quality
- Iterative improvements for treating and recycling leachate
- Working with generators to accept and process compostable service ware
 - Industry in early stage of learning curve
 - CMA vs. BPI
- Broader society in very early stages of understanding and appreciating the benefits of composting and using compost
 - Greenhouse gas emissions
 - Stormwater management



Thank You!

Chief Executive
Douglas Ross

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