



TM

advanced composting
renewable energy
organic greenhouses



Prince William County Organic Waste Processing Facility

Metropolitan Washington Council of Government
Recycling Committee Meeting
October 1, 2015



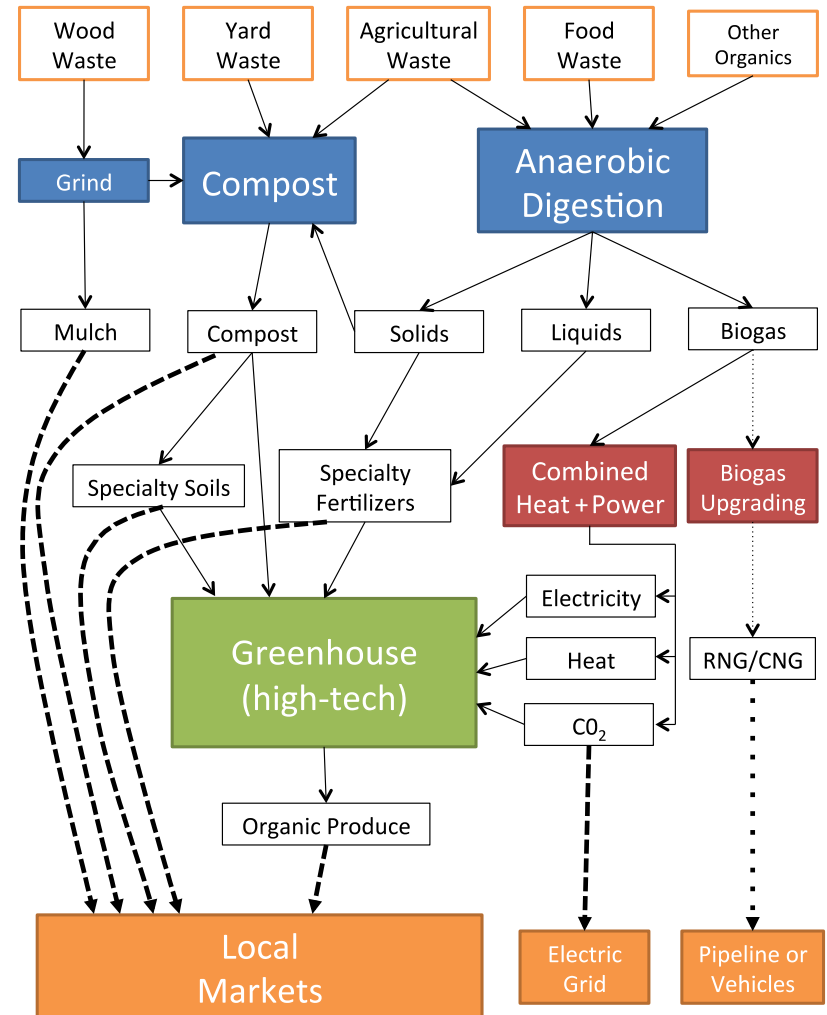
Introduction and Process

Freestate Farms LLC delivers full-cycle sustainable solutions to its local community partners by developing, owning, and operating integrated facilities for advanced composting, anaerobic digestion, renewable energy, and commercial organic greenhouse food production.

Presently developing its first facility through a public-private partnership with Prince William County, Freestate Farms is starting to bring sustainable waste management, baseload renewable energy, nutrient rich compost and natural fertilizer products, and fresh locally-grown organic produce to the Metropolitan DC Region.

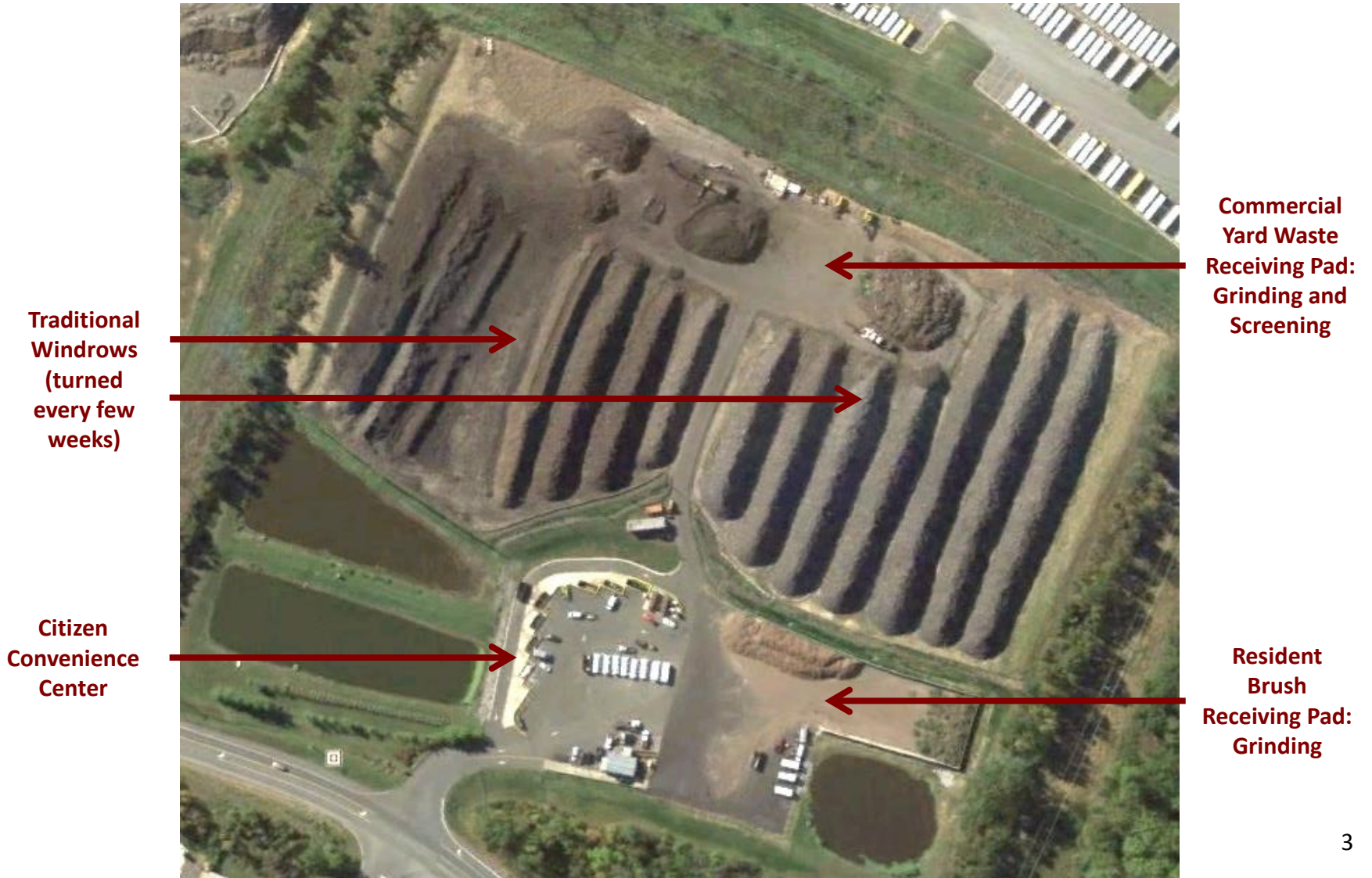
Anaerobic Digestion 101

- Anaerobic digestion (i.e., the controlled decomposition of organic waste) is a proven and economically-viable sustainable technology, with a decades-long track record of successful project development and operation
- Inside a large airtight tank kept between 100-140°F (depending on type of AD system), naturally occurring anaerobic microbes consume organic waste feedstocks and in turn generate both a methane-rich biogas and a very low odor, very low pathogen, nutrient-rich organic slurry



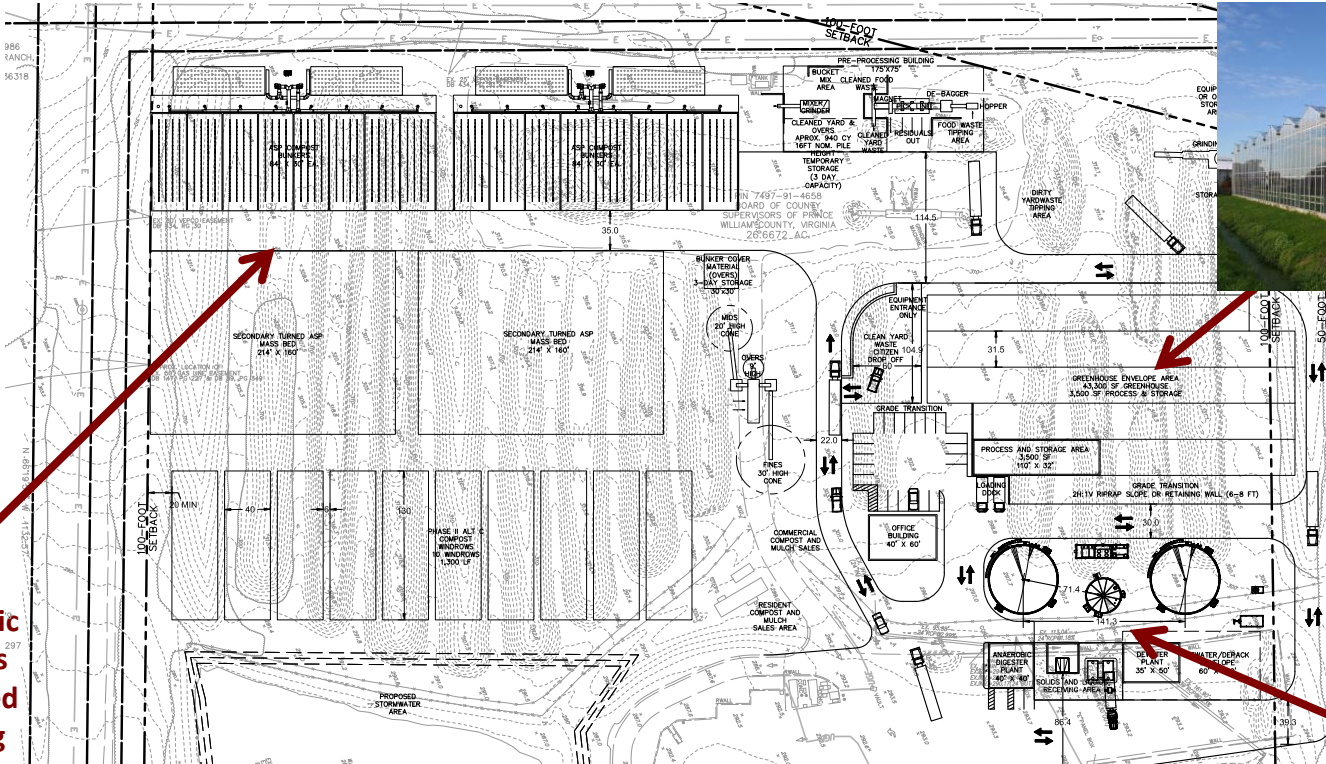


Balls Ford Road Site – Present





Freestate Site Layout – Phase 2



Commercial Organic Greenhouse

Aerated Static Pile Bunkers and Mass Bed Composting

AD System





Aerated Static Pile Composting



The foundational strategic element of the Freestate Farms system is advanced composting, and we have chosen to partner with **Engineered Compost Systems** of Seattle, Washington for our initial project in Prince William County.

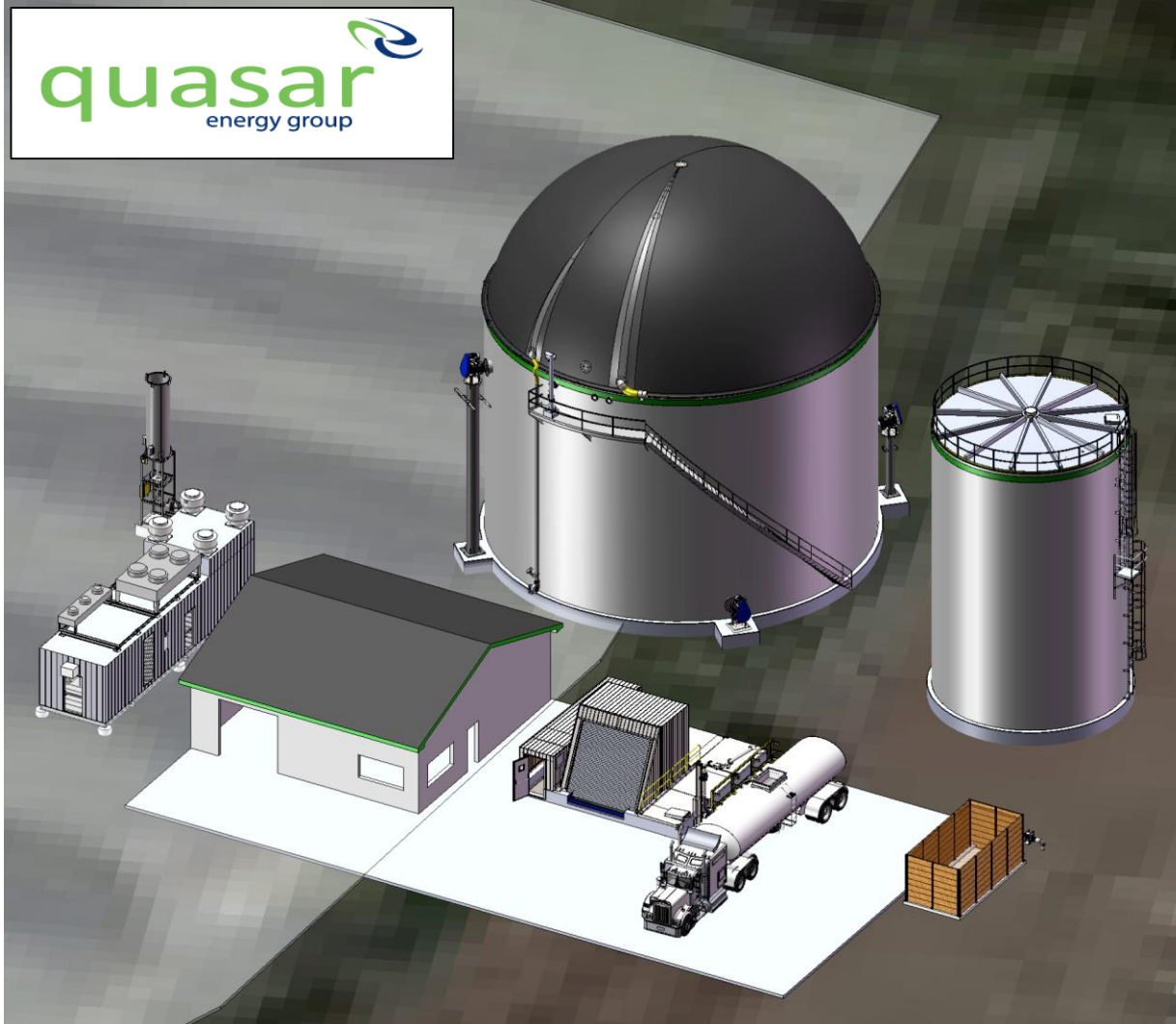
ECS's in-house engineering and design expertise has been well proven at the 30+ sites across the U.S. where its systems are presently in operation, with many more under construction and development.

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 U.S. Composting Council's Seal of Testing Assurance (STA) Standards.





Anaerobic Digestion and CHP



The core strategic element of the Freestate Farms system is the anaerobic digester, and we have chosen to partner with *quasar energy group* of Cleveland, Ohio for our initial project in Prince William County.

Capitalizing on its proven digester design, in-house engineering, and construction capabilities, *quasar* has successfully constructed 13 facilities presently operating in the United States and has more than 10 other facilities under construction and development.

quasar specializes scalable and replicable complete mix stirred tank anaerobic digester systems that are designed to meet all applicable environmental regulations.



Balls Ford Road – Project Specs

The Prince William County Board of Supervisors approved its Development Services Agreement with Freestate in early 2015 for the purpose of granting Freestate the right to develop, own, and operate its proposed organic waste processing and integrated greenhouse facility at the County’s existing composting facility on Balls Ford Road.

The Agreement includes a 20-year term dated from the commencement of new operations, as well as two five-year extension terms (upon mutual agreement).



Organic Waste Capacity

Biogas Use

Greenhouse

Phase 1

Process ≈ 45,000 tons per year of source-separated food waste via anaerobic digestion, and ≈ 40,000 tons per year of yard and wood waste via aerated composting and traditional mulching

Use a 1 MW combined heat and power (CHP) generator to provide electricity and heat for the facility’s elements, with excess electricity sold to the grid

Approx. 1.25 acres of controlled environment agriculture (CEA), with CO₂ injection for increased yields

Phase 2

Process ≈ 90,000 tons per year of source-separated food waste via anaerobic digestion (with depackaging capabilities), and ≈ 80,000 tons per year of yard and wood waste via aerated composting and traditional mulching

Either (a) clean biogas to pipeline quality for injection into the natural gas grid or (b) clean and compress biogas for use in local trucks, cars, and buses



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Thank you

Douglas Ross, CEO

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