



Infrastructure Solutions for the Food Waste Crisis



Los Angeles County

Integrated Waste Management Task Force

November 18, 2021

[forktofeed.com](http://forktofeed.com)

Belluno Organics creates valuable agricultural products from food waste using technology developed and commercialized by Sustainable Alternative Feed Enterprises, Inc.

Our mission is to become a leading solution for the food waste crisis and for reducing the environmental impact of the food processing industry.

## Company History

- Sustainable Alternative Feed Enterprises, Inc. (“SAFE”) was founded in 2013 by a consortium of Bay-Area waste haulers and feed distributors in response to the organics diversion mandates
- Patented process for converting food waste into animal feed and fertilizer\*
- Over the last 8 years, the technology has been deployed to five locations: Santa Clara (2), Santa Cruz, Sunnyvale, and Oxnard
- Three additional projects coming soon: Riverbank/Modesto (2), South Gate/LA
- The only process licensed by the California Department of Food and Agriculture (CDFA) to convert post-consumer food waste into animal feed\*\*
- Evolved from a technology company selling equipment to a provider of food waste processing services
- Projects are developed, financed, owned and operated by Belluno Organics, LLC, the principals of which have decades of experience in environmental infrastructure, sustainable agriculture, and the waste industry

## Background



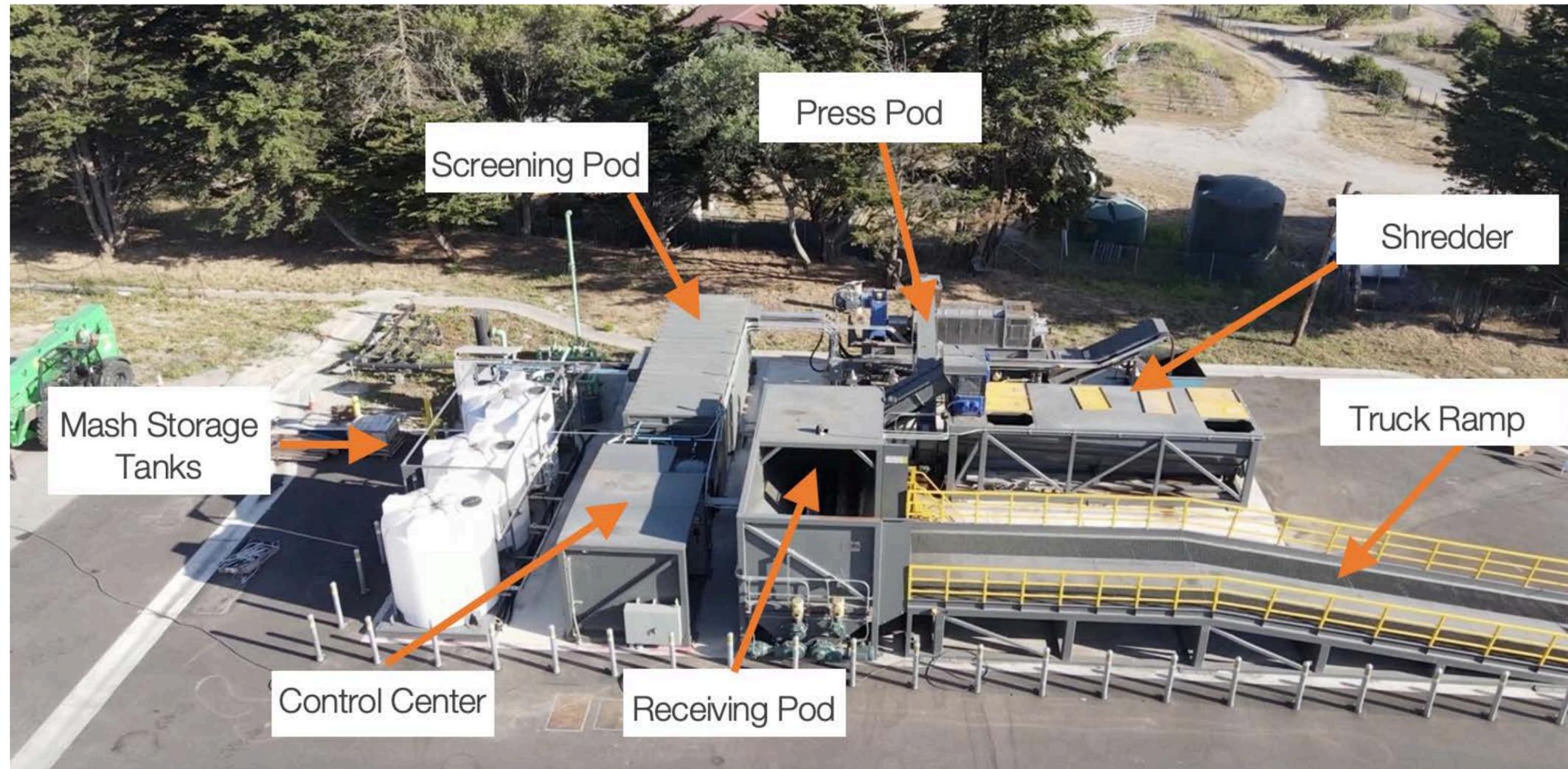
\*US Patent #8,973,491B1 issued March 15, 2017. Other patents pending.

\*\*CDFA Feed License #368110

## Pre-Processing Operations – Removes Contaminants

- Separates inorganic materials, packaging, rigid contaminants
- Produces a liquid mash for subsequent conversion into animal feed / fertilizer

Technology



*SAFE Food Waste Pre-Processing System Serving the City of Santa Cruz*

# Pre-Processing Operations – System Advantages

Technology

- Systems are built buy CP Group - a leading manufacturer of recycling systems

## Design

- ▶ No building required reduces site improvements
- ▶ Individual pods can be configured in multiple ways to accommodate site dimensions
- ▶ 10-20+ tons per hour processing capacity

## Operations

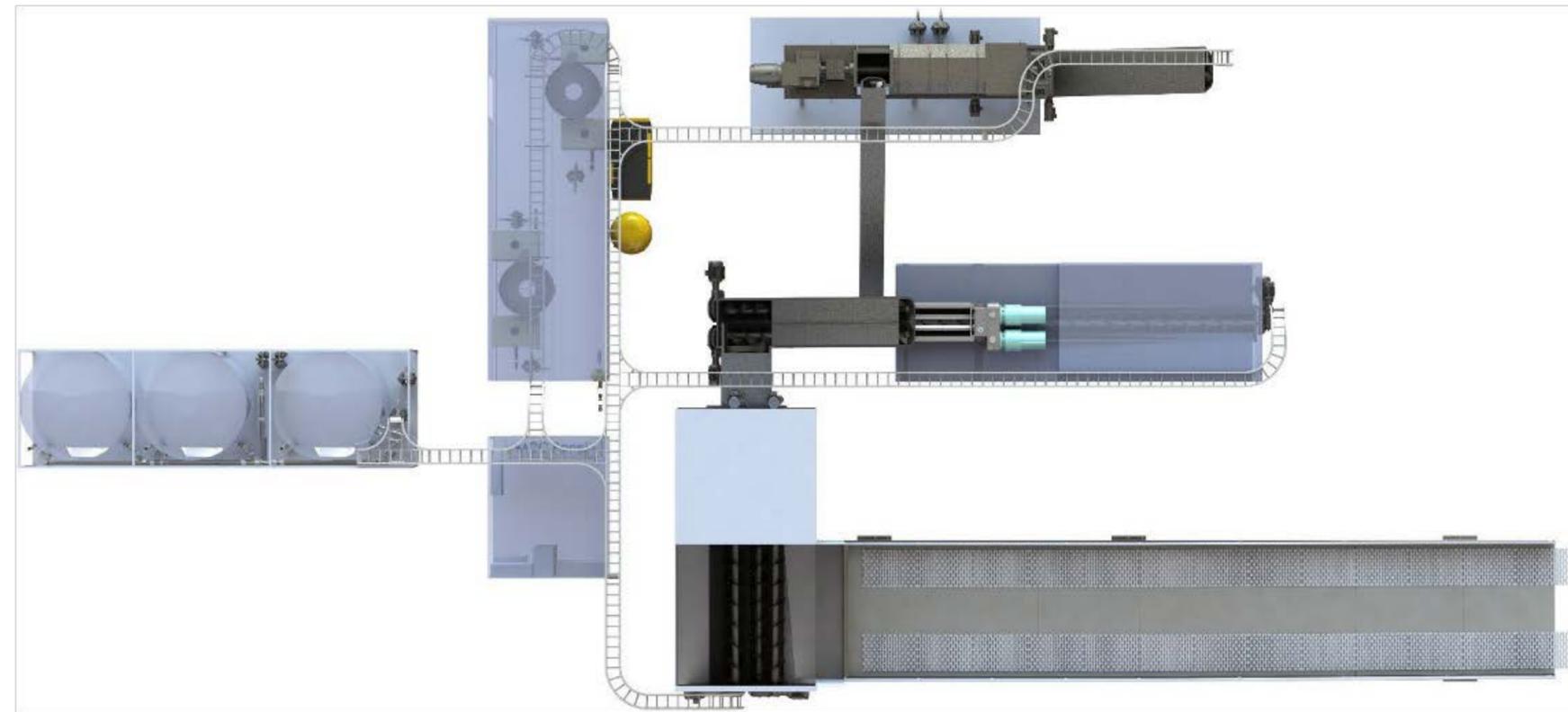
- ▶ Typical unloading time 10-15 minutes
- ▶ Open-end discharge screws don't wrap
- ▶ Dual screw feeding shredder
- ▶ Multiple SWECO's for flexibility and redundancy
- ▶ High efficiency screw compressor to accommodate multiple diaphragm pumps
- ▶ Cleaner "unders" vs depackaging equipment

## Environmental

- ▶ Capture of all liquids
- ▶ Reduced odor issues

## Permitting

- ▶ Lower solid waste permitting threshold



[cpglobalcompanies.com](http://cpglobalcompanies.com)

## Manufacturing Operations – Creates Valuable Agricultural Products

Technology

- After pre-processing, the food waste mash is subsequently converted into animal feed and fertilizer
- Fats, oils and greases (FOG) are removed and sold for use as biodiesel
- Remaining fraction is dried and extruded - all pathogens destroyed
- Process water is clean enough for discharge, but is reused to the extent possible



S A F E



# Manufacturing Operations – Creates Valuable Agricultural Products

## Transport

- Tanker trucks can deliver 25 tons of liquid food waste mash per load
- Can also be transported by rail in standard tank cars



## Receiving

- Material is conveyed to heated storage tanks to maintain temperature and consistency



*Sustainable Organic Solutions, LLC Feed and Fertilizer Manufacturing Facility - Santa Clara, CA*

## Gas Fired Oil Heater

Circulates synthetic heat transfer fluid to maintain consistent product temperature



## Utility Skid & Control Panel

Provides access to mash flow, heating, and drying systems data and controls



## Decanter/Centrifuge

Separates free water and fats, oils & greases (FOG) from solids in the mash



## Dryer

Utilizes a patented process to remove moisture efficiently while preserving the nutritional viability of the product.



## Extruder

Further processes meal while effectively destroying pathogens. USDA certified.



## Dry Product Staging

Enables product throughput management for lot tracking and batch traceability.

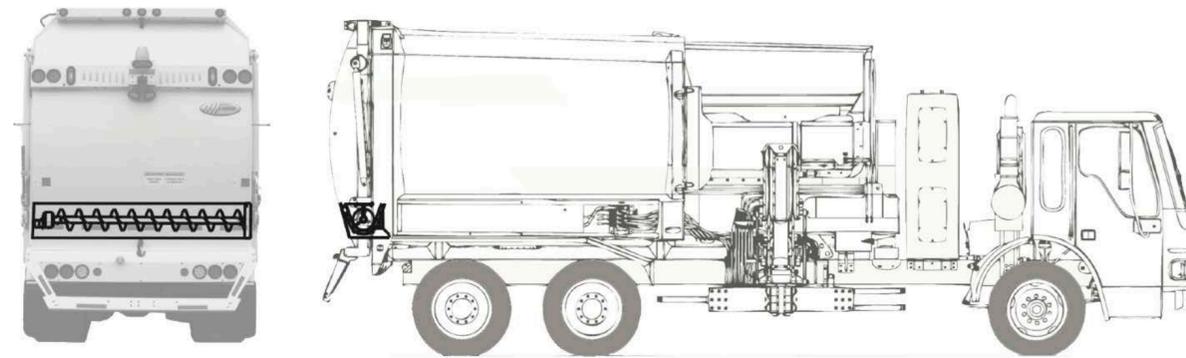


# Truck Retrofits / Split Carts

- Vehicle modifications to specifically handle food waste\*



## RESIDENTIAL/COMMERCIAL TAILGATE RETROFIT

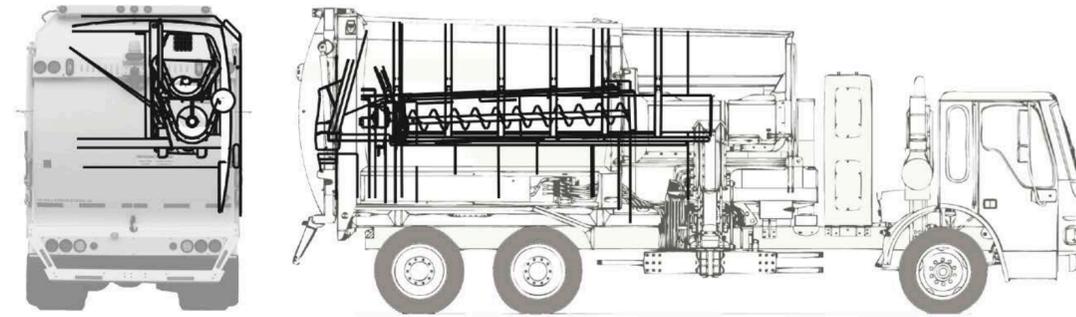


Auger retrofit inserted into tailgate. Allows for dual-use: residential or food waste-only routes.



20 to 96-Gallon Cart.

## RESIDENTIAL - AUTOMATED



Retrofit auger kit to be inserted into an existing automated side loader body. Split hopper allows dual-capacity inside body.

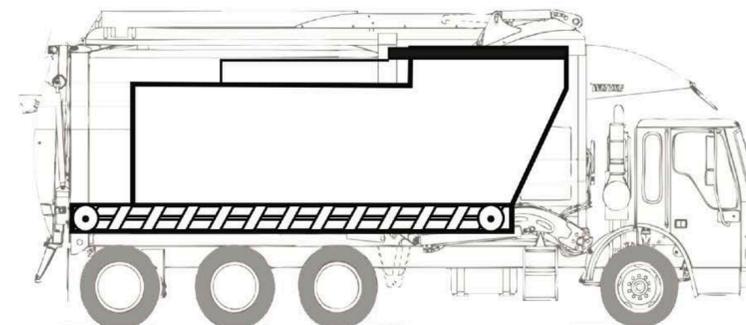


64-Gallon Cart with Insert.

64-Gallon Split Cart.

20 to 96-Gallon Cart.

## COMMERCIAL - FRONT LOADER



Removable auger insert for front loader body.

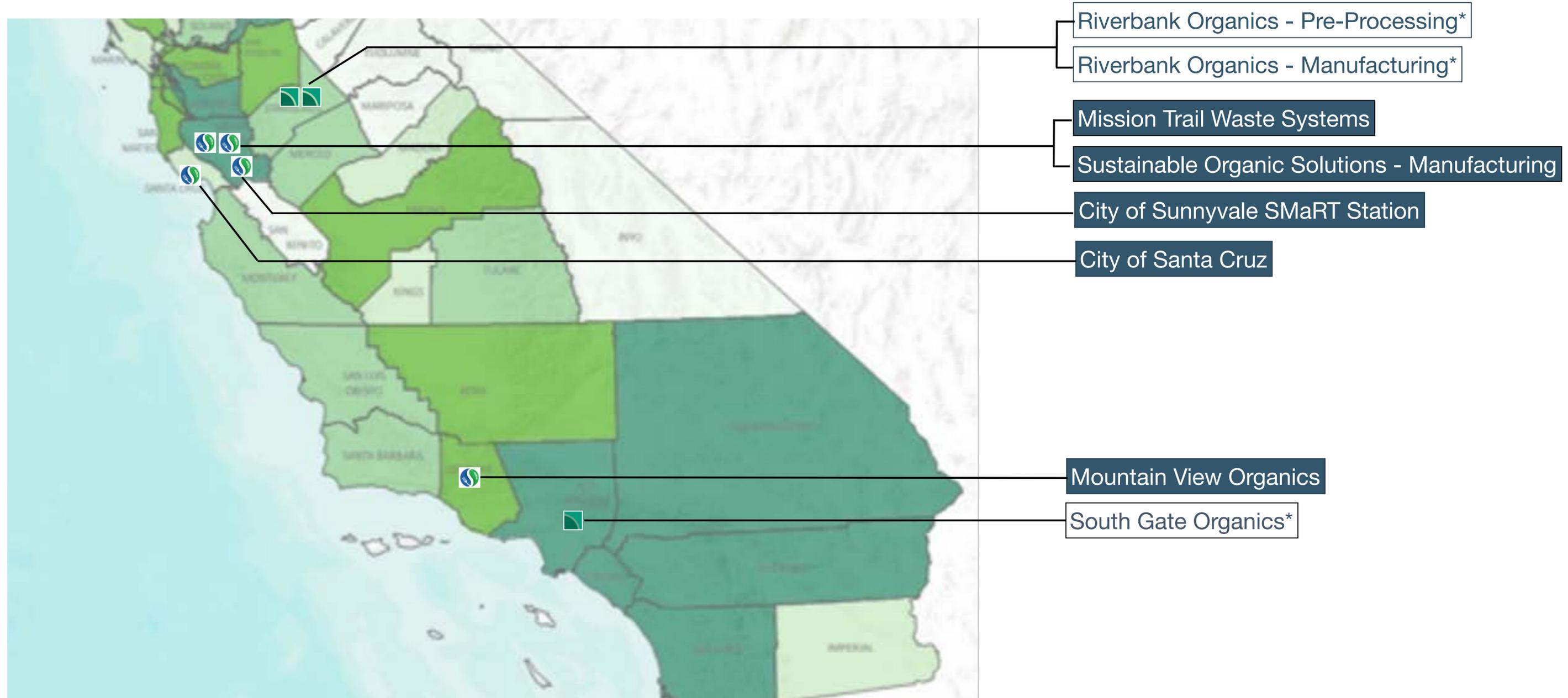


Traditional Bins and/or Carts.

\*US Patent #9,358,746B1 & other patents pending.

# Project Locations

- Five facilities since 2013, three additional in pipeline including in Los Angeles (South Gate)



\* Projects in development

## Mission Trail Waste Systems | Santa Clara, CA

- Franchised hauling company for portions of the City of Santa Clara, and all of the City of Los Altos
- Commissioned June 2015, 70 tons per day capacity
- Processes source-separated organics, post-consumer residential and commercial waste

Projects



[missiontrail.com](http://missiontrail.com)

# Sustainable Organic Solutions | Santa Clara, CA

- Converts processed food waste mash into animal feed and fertilizer
- Commissioned January 2015, 50 tons per day capacity
- Serves Santa Clara, Santa Cruz, Sunnyvale, and Milpitas



[forktofeed.com](http://forktofeed.com)

## Sunnyvale SMaRT Station | Sunnyvale, CA

Projects

- Recycling Center serving Mountain View, Sunnyvale and Palo Alto
- Commenced operations in 2018 - 100 tons/day capacity
- Foodcycle program provides split-carts to all single-family homes, available for multi-family in 2022
- Residents have recycled over 14,000 tons of food scraps since February 2021



[sunnyvale.ca.gov](https://www.sunnyvale.ca.gov)

# City of Santa Cruz Resource Recovery Center | Santa Cruz, CA

Projects

- Commissioned in February 2020
- Processes post-consumer commercial waste
- 100 tons per day capacity
- Pilot program underway for separate bin post-consumer residential food waste

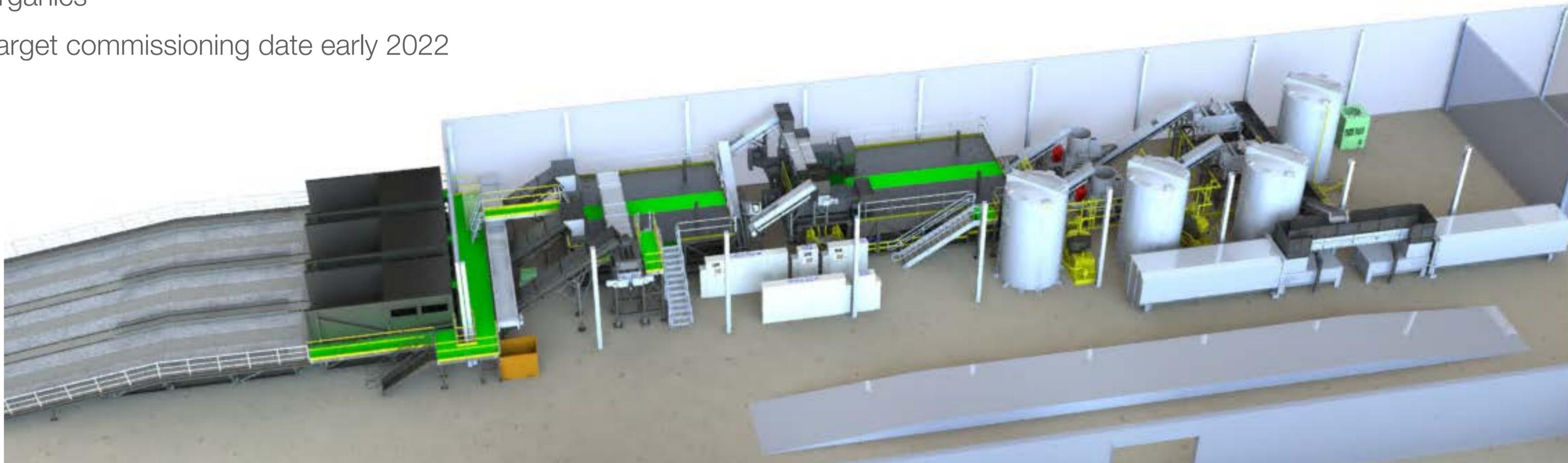


[cityofsantacruz.com](http://cityofsantacruz.com)

## Mountain View Organics | Oxnard, CA

Projects

- Owned and operated by Harrison Industries, a privately-owned, multi-generation waste hauler, and Agromin Corp.
- Serves Ventura County
- Design capacity of 300 tons per day of source-separated organics
- Target commissioning date early 2022

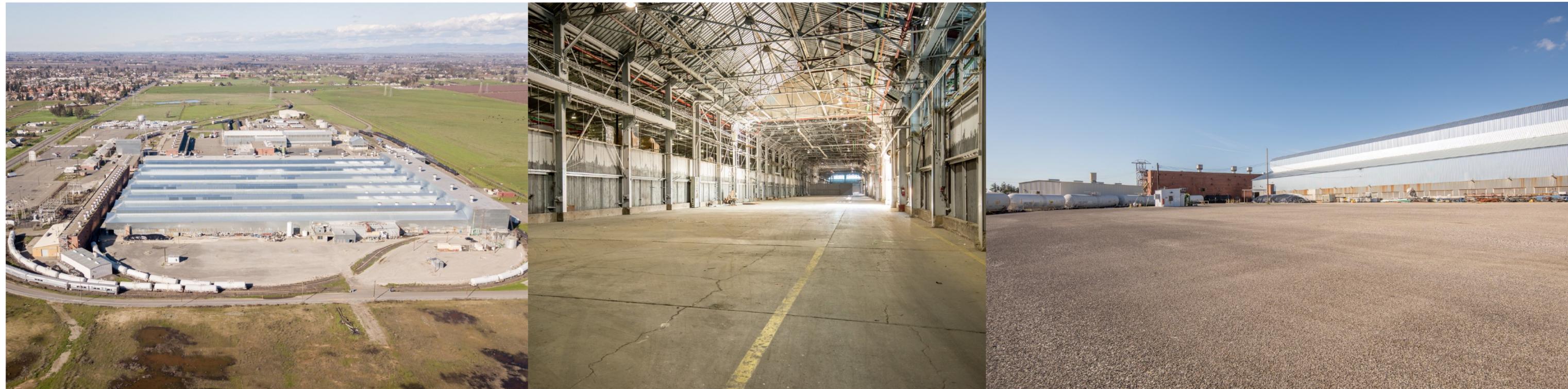


[ejharrison.com](http://ejharrison.com) [agromin.com](http://agromin.com)

## Coming Soon: Riverbank Organics | Modesto, CA

Projects

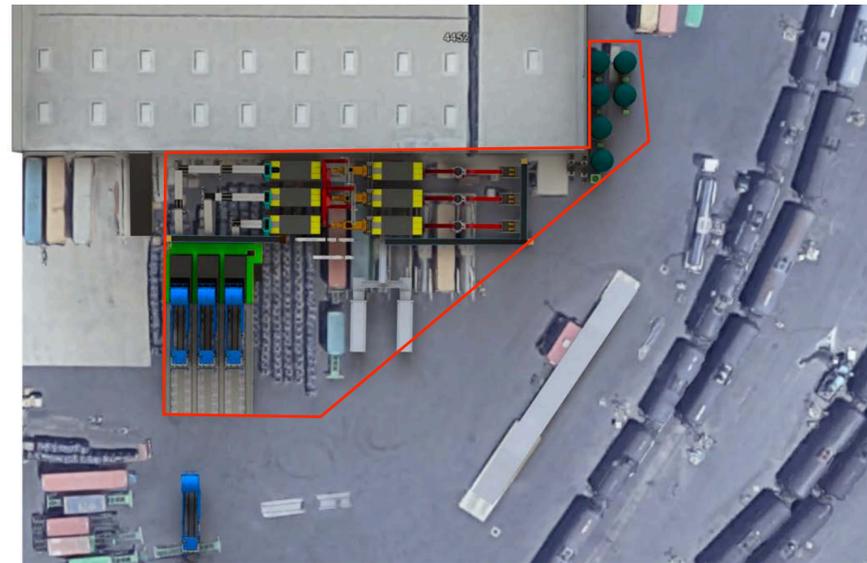
- Combined pre-processing and feed/fertilizer manufacturing facility
- Site is a former army munitions plant - low occupancy costs
- 100,000 square foot facility located on 173 acre site
- Rail served, will be able to accept food waste mash locally and from across the state
- Central Valley location facilitates distribution directly to agricultural markets, reducing truck miles
- CalRecycle Solid Waste Facility Permit issued February 9, 2021\*



[calrecycle.ca.gov](http://calrecycle.ca.gov)

# Coming Soon: South Gate Organics | South Gate, CA

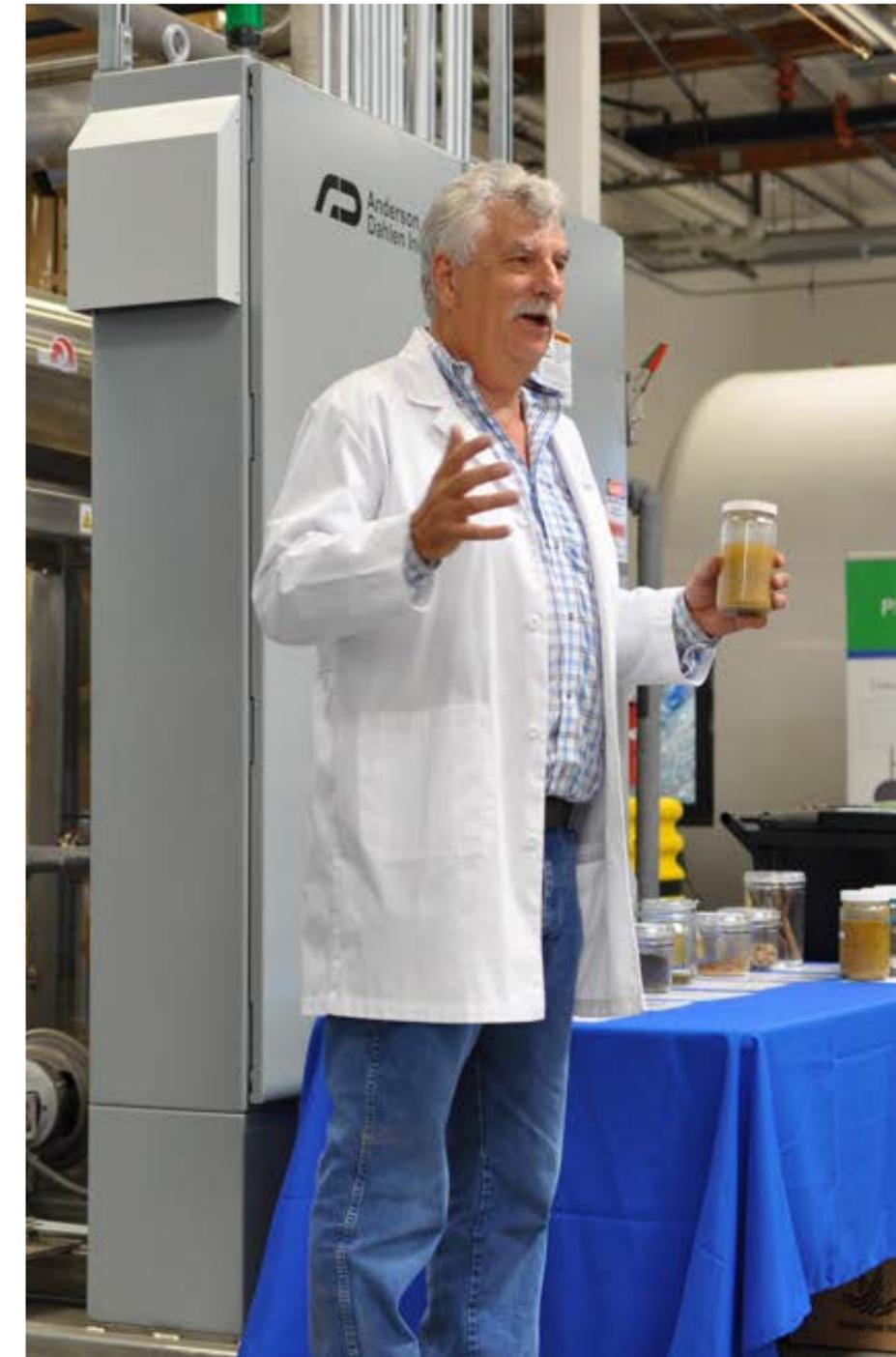
- Planned 300 tons per day of pre-processing capacity
- Site owner and operations partner is Titan Terminal & Transport, Inc., a leading California transload facility
- Ideal location to serve greater Los Angeles Area
- 24 acre site, zoned Heavy Industrial
- Small equipment footprint - Approx. 15,000 sq. ft.
- Food waste mash to be processed at Riverbank Organics facility into animal feed & fertilizer
- Rail served by both Union Pacific and BNSF
- Each rail car load takes 4-5 tanker trucks off the road - reduced truck traffic and carbon emissions



[titanterminal.com](http://titanterminal.com)

## A Special Thanks to Louie Pellegrini, Jr.

- His vision, industry experience and ingenuity made SAFE possible
- ▶ Lifelong waste industry veteran and innovator (third generation)
- ▶ Over 40 years' experience in the solid waste and recycling industries
- ▶ Part of the management and ownership teams of several California Bay Area companies:
  - Mission Trail Waste Systems
  - Peninsula Sanitary Service
  - ACI
  - Garden City Sanitation
- ▶ Active in shaping legislation in California on food waste recovery policy





Infrastructure Solutions for the Food Waste Crisis

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