

# PEH ARCHITECTS

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## MEMORANDUM

Date: October 12, 2020

From: Christopher Mirto AIA, LEED AP  
Peter E. Heinz AIA

Re: Boulder County Compost Processing Facility – Development Report/Narrative  
PEH# 2018.08

The purpose of this Special Use Review Application is to obtain approval for the proposed improvements to the former Rainbow Tree Nursery located at 5762 N. 107<sup>th</sup> Street in Longmont. This application focuses on the proposed development of the 39.7-acre site to become the new regional Boulder County Compost Processing Facility.

The property consists of three parcels that are planned to be combined under a separate Subdivision Exemption application. As part of this application, the vast majority of the proposed development will occur on Lot 1 (approximately 21.6A). Most of the remaining Lot 2 (9.2A) and all of Lot 3 (approximately 8.9A) will remain undeveloped. The design team has studied how a future expansion of the proposed compost facility would fit onto the entire site. The site is currently zoned A – Agricultural, which allows a compost facility when submitted under a Special Use Review application.

This proposed development will construct a compost facility that is planned to accept a maximum of 50,000 tons of compost feedstock per year. An operational narrative has been attached to this Development Report/Narrative to better describe the operational details of the facility.

### Site Access

The existing southern access point on US-287 will be closed and a new, safer, centralized access point will provide better access for vehicles of all sizes visiting the site. Immediately upon entering the site, vehicular traffic will be split to direct visitors and residential dropoff/pickup customers to the north to the “public” portion of the site, while commercial (landscaper) and industrial (Western Disposal, etc.) trucks will be directed to the east, where the heart of the compost operations are located.

Commercial and industrial trucks will queue upon entering the site for check-in/weigh-in. Some smaller commercial trucks will drop off at the “Small Volume Drop-Off” area and then turn around to exit the site. Industrial trucks will proceed into the hammerhead, then back into the Tipping Building to drop off their load. Backing operations for large vehicles have been localized to this portion of the process. Once trucks are empty, they will exit the site onto US-287.

Trucks for finished products will follow the same initial movements, but once at the Tipping Building, they will continue on to an access road through the Wood Processing Area and around to the Finished Product Area. Here they will be loaded via a front-end loader, and will then exit the site the same way as empty trucks. No backing movements will be required as part of this loading operation.

The existing northern access point will remain for emergency access to the site, but it will not be open at any time for daily ingress/egress for the site.

## **Landscaping & Views**

As the site of a former nursery, the proposed development has many trees to contend with. The design team has worked extensively with the County Forester and the County Arborist to determine the most environmentally friendly path forward, while still allowing for the necessary site operations.

During the days of the nursery, trees were planted with short-term harvesting in mind (i.e., close spacing in close rows). With the site having been dormant for several years, the trees have continued to grow and have begun to entangle, and in some cases, have affected the health of adjacent trees. This unchecked growth is combined with a significant number of ash trees having been planted with the past intent to harvest and sell. These ash trees are non-native to Boulder County and due to the emerald ash borer, have been identified by the County to be removed on all County-owned properties.

These concerns with the number and species of existing trees are at odds with the County's and design team's shared desire to retain as many trees as possible for screening, air quality, and view preservation reasons. Therefore, the design team has worked with the County Arborist to begin developing a plan to integrate the site planning with a landscape plan that preserves as many trees as possible on the site.

All ash trees on the proposed development portion of the site have been shown to be removed. Existing, healthy deciduous trees are being identified to be retained, while unhealthy and/or closely-spaced trees are planned for selective removal. The remaining, healthy deciduous trees will be retained to improve air quality, and to screen the operations on the site from all directions. The small number of existing coniferous trees in the middle of the site have been identified as healthy and suitable for transplanting.

Additionally, the eastern portion of the site is significantly lacking even in existing trees that would properly screen views from neighboring properties. Therefore, the design team has proposed an uninterrupted collection of new trees and transplanted existing coniferous trees along the entire eastern property line to help preserve the view and screen site operations for neighbors to the east.

## **Traffic**

Fox Tuttle Transportation Group has authored a traffic study that has informed the site ingress/egress design. Based on the number of trips per day (visitors, residential customers, commercial/landscapers, industrial) expected for the site, a non-signalized free turn intersection with US-287 is recommended. Additionally, trip metrics fall below CDOT requirements for deceleration and acceleration lanes.

## **Utilities**

The former tree nursery was served by a combination of municipal and on-site utilities. The proposed development will use and expand on as much of the existing utilities as possible. Below is a summary of utility information for the site, but more detailed information can be found on the grading/drainage/utility plans created by JVA, Inc.

## **Water**

The existing water tap in US-287 and water meter for the Office Building will remain. A new water tap will be installed to provide a loop system on the site for fire and domestic service. Two new water meters will be installed: one for the Tipping Building and Scale Building, and one for the Maintenance Building.

No fire sprinklers are required for any of the buildings, but the loop system on the site will provide service for three new fire hydrants on the site.

Boulder County currently owns shares in the Boulder & White Rock Ditch Company, and in the Northern Colorado Water District. For new and existing landscaping, and for on-site processes related to the compost operation, water from one of these sources could be conveyed to the Leggett Ditch as needed, and/or the on-site pond could be drawn upon for use.

### Sanitary Sewer

There is an existing septic tank/leach field that serves the Office Building. It is in serviceable condition and will remain in use. Two new septic tanks/leach fields will be installed: one for the Scale Building, and one for the Maintenance Building.

### Gas

The former tree nursery was served by multiple propane tanks located north of the Office Building. The design team is currently working with Xcel to determine whether the existing gas line in US-287 may be tapped to provide gas service to the proposed development. If this is not feasible, then propane tanks will be installed to serve the buildings on site.

### Electric

The existing electrical service to the Office Building shall remain. Xcel Energy will furnish a new 208/120V pad-mounted transformer, originating at the nearest Xcel overhead facility along US-287. Power will then be distributed to each of the three new buildings on site.

### **Buildings**

#### Office Building

Visitors and residential dropoff/pickup customers will check in at the 3,225 SF Office Building. This building is a repurposing/rehabilitating of the only existing intact structure on the site, which is a wood-framed building that was previously used as the main check-in and point of sale for the old tree nursery. The Office Building will receive customers/visitors, provide office and meeting space, and will have an indoor retail display area where customers can pick up bags of finished product.

The building will retain its existing foundation and structure, but all other exterior and interior finishes will be new. The building will be brought up to the energy code currently adopted by the County.

#### Scale House

The 485 SF Scale House is the first point of contact for commercial and industrial vehicles accessing the site. Vehicles will check in with the scale operator, get weighed, and continue on to the operations portion of the site.

The building will be conventionally framed and clad with prefinished metal exterior wall and roof panels. The building will comply with the energy code currently adopted by the County.

#### Tipping Building

The 17,590 SF Tipping Building is one of the main components of the compost operations on the site. It is here that feedstock (both food waste and green waste) is brought to be prepared and mixed before transferring to the next step in the operation. This building is a fully enclosed, fully contained component of the operation that will minimize odors, provide visual screening, and prevent any leaching of feedstock liquids into the surrounding soil. The building will have a clear interior vertical distance sufficient to allow large trucks to tip their load within the building.

The building will be a pre-engineered metal building with prefinished metal exterior wall panels and roof panels. The building will comply with the energy code currently adopted by the County.

#### Maintenance Building

The 3,040 SF Maintenance Building will provide support services for the site, including bays for vehicle and equipment maintenance and washing, and a meeting point/break room for operations staff. The building will be a pre-engineered metal building with prefinished metal exterior wall panels and roof panels. The building will comply with the energy code currently adopted by the County.

## Operations

A “Basic Operational Narrative” has been attached to this narrative. This document describes basic components of access, internal traffic patterns, and compost operations on the site.

Generally, the facility is planned to operate Monday through Saturday, from 7am to 6pm. The County is also considering a 5 day (Monday through Friday) schedule.

The facility will implement a “covered aerated static pile” system (CASP) for its primary compost operations, which is the first of its kind in Colorado, but has been successfully applied in other facilities across the country. This system has several key benefits:

- **Odor control.** The CASP bunkers have been shown to reduce odors by 90-95% over conventional open pile windrow systems.
- **Pest control.** The covered condition of the piles will eliminate the ability for pests to access the in-process compost operations. Combined with the fully enclosed Tipping Building, and strict EPA/CDPHE guidelines for pest control on compost sites, the site will offer little to no appeal for off-site pests.
- **Groundwater control.** The Tipping Building and CASP bunkers, which are the only areas that contain potentially harmful raw materials, are fully contained and have no communication with the on-site wastewater treatment systems. Any liquids generated within these components are captured and either recycled back into the system, or trucked off-site to a nearby municipal treatment plant. A groundwater monitoring & testing plan will be implemented for the operation, which consists of multiple monitoring/testing wells installed across the site. These wells will be sampled quarterly per CDPHE regulations, and test results will be logged and reported to CDPHE.
- **Process efficiency.** Conventional windrow (open) composting operations can take up to 6 months to finish. The CASP process produces compost that is fully cured within 8 to 12 weeks.

This proposed development will be the next step in moving toward Boulder County’s published goal of “zero waste or darn near” by 2025. Several entries in Boulder County’s “Zero Waste Action Plan” point toward supporting composting operations, supporting bans on yard material & food scraps going to landfills, and promoting markets for county-generated recyclables and compost. This facility will help accomplish all of those goals, in addition to significantly reducing the current 50 mile one-way trip required to truck compostable materials generated within Boulder County to outside of the County.

END OF MEMO

# **Boulder County Composting/Organic Recycling Facility**

## **Basic Operational Narrative**

### **Acceptable Feedstocks**

The County will accept Type 3 feedstocks (including vegetative waste, animal manure, source-separated organics, food residuals and food processing vegetative waste, and biosolids), as approved for receipt by CDPHE. Clean material, free of physical contamination, will be accepted from entities within the region. Feedstocks will arrive on various size transport equipment (e.g., trucks, pickups, utility trailers, cars) during operational hours.

### **Receiving Guidelines**

Commercial vehicles will be directed to the Scale House, where they will be weighed. Residential vehicles will be directed to the residential drop-off location. Material volumes and types will be documented in accordance with the facility's approved Waste Characterization Plan.

Commercial vehicles with vegetative waste (e.g., limbs, grass, leaves, clean dimensional lumber) will be directed to the Wood Processing Area. Vegetative waste will be processed through a shredder or grinder. The ground material will be directed to one of the following uses:

- Stockpiled and then moved into the Tipping Building to be used in the composting process, on an as-needed basis.
- Mechanically screened to create products for sale of varying material sizes.
- Transferred off site for recycling at other locations.

Commercial vehicles with non-vegetative waste (e.g., animal manure, source-separated organics, food residuals and food processing vegetative waste, and biosolids) will be directed to the Tipping Building for unloading.

Material received at the residential drop-off location will be transported by facility equipment to the proper processing area (e.g., Tipping Building or Wood Processing Area).

### **Mixing and Filling of Compost Bunkers**

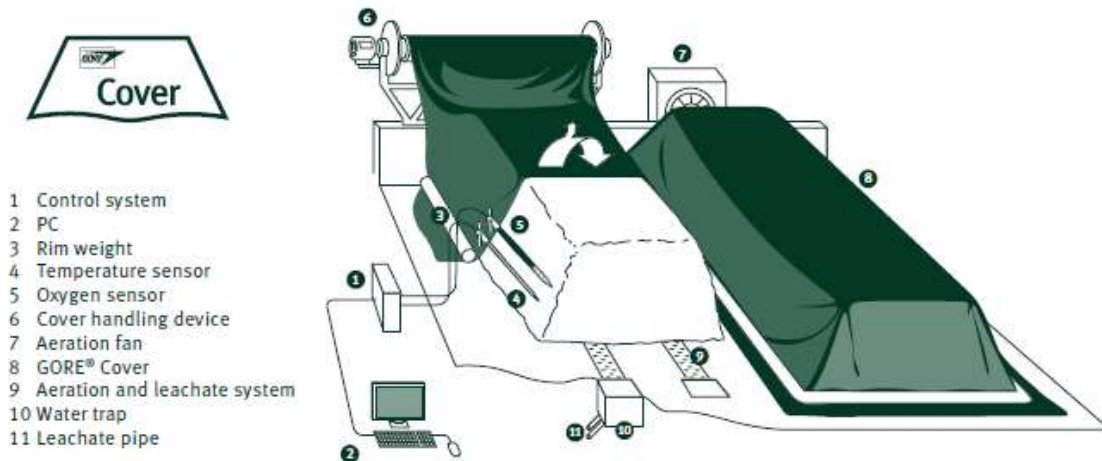
Within the Tipping Building, vegetative waste will be mixed with non-vegetative waste to create a mixture for placement in the compost bunkers. Non-vegetative waste will be shredded and then blended with ground vegetative waste plus recycled process water in a concrete depression (i.e., mixing basin) in the Tipping Building. Operators will blend the materials to target the following characteristics, as required for effective composting:

- Target Mix Bulk Density: ~800 to 1000 lbs./y<sup>3</sup>
- Target Mix Moisture Content: 50-65%
- C:N ratio: 25:1 to 35:1
- Porosity: ~35 - 50%

The blended mixture will be transported by front end loader to a designated compost bunker. Once the bunker is full of blended material, the operator will cover the bunker with a geomembrane cover. The cover will be secured to the side walls of the bunker, and oxygen and temperature sensors will be inserted in the probe port inlets on top of the geomembrane cover.

### Compost Process

A schematic of the geomembrane cover, as represented by the GORE® Cover System, is provided below.

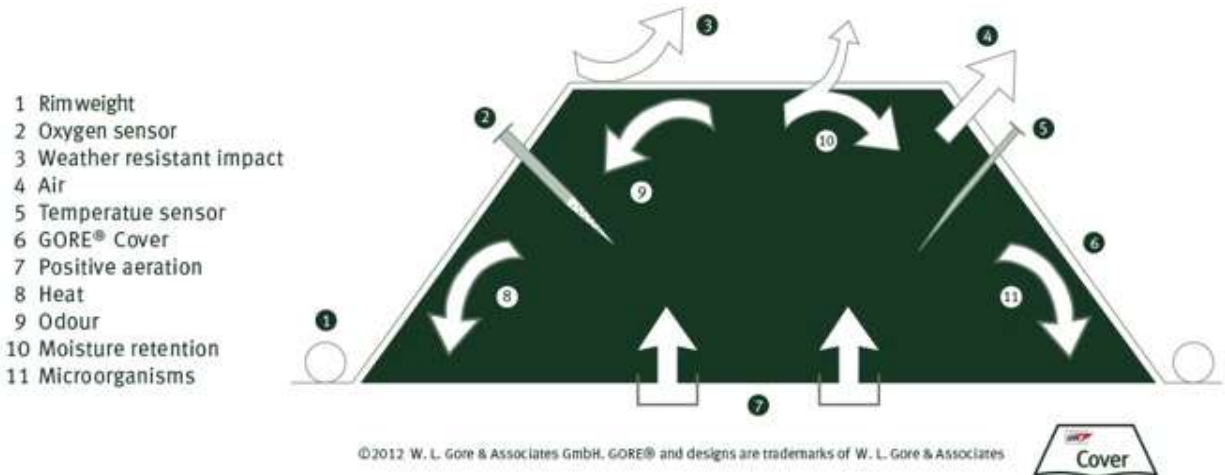


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The composting process takes 8 weeks, as follows:

- **Phase 1: High Rate Active Composting (28 Days):** Once a bunker is filled, it is covered, the temperature and oxygen probes installed, and the control system turned on, which then controls the rate of aeration.
- **Phase 2: Maturation Curing Composting (14 Days):** After Phase 1, the cover is removed from the windrow and the compost is moved by front-end loader to another bunker. Once the bunker is filled, it is covered, the temperature and oxygen probes are re-installed and the control system is turned on.
- **Phase 3: Finishing (14 Days):** After Phase 2, the cover is removed from the windrow and the compost is moved by front-end loader to another bunker. Once a windrow is filled, it is left uncovered, the temperature and oxygen probes are installed and the control system is turned on.

The GORE® Cover has unique physical properties in regard to air permeability, which is selectively designed into the membrane and allows evenly-distributed air and pressure within a bunker. The GORE® Cover is tied down to the side walls (sealed), creating a complete in-vessel enclosure for the entire pile, which can then be pressurized ensuring an even distribution of air throughout the pile.



## Screening

After 8 weeks in the bunker system, the finished compost will be transported by front end loader to the finished product processing area.

At the finished product processing area, the compost will be screened to a selected particle size. Finished compost of defined particle size will be sold as is or blended with other materials and sold to retail, agricultural, and commercial markets.

Oversized materials from the screening process will be directed through a system to remove plastics, stone, glass, etc. from the oversized materials. Oversized woody material will be recycled to the Tipping Building for re-blending. Debris will be shipped to a permitted landfill for proper disposal.