

Facts about the Wilmington Organic Recycling Center (WORC)

“Converting Waste Into a Sustainable Resource”

ABOUT WORC:

- According to the US Composting Council, the WORC is one of the newest, most state-of-the-art, large scale commercial food and yard waste composting facilities in North America.
- Composting is an environmentally friendly alternative over the landfill and incineration for disposing of organic waste.
- The facility sits on 27 acres across from the Port of Wilmington strategically located for waste haulers and generators from DE, MD, NJ & PA.
- The location was formerly a brownfield site that was remediated prior to WORC construction.
- The project was developed by the Peninsula Compost Group, LLC over a three-year period at a cost of \$20 million. Ground was broken in May 2009 and construction was complete in December 2009. EDiS Company managed the construction.
- The three partners in the WORC are Delaware businesses:
 - The Peninsula Compost Group, LLC, an internationally recognized innovative organics solutions company
 - EDiS Company of Wilmington, a regional leader in green construction
 - Port Contractors of New Castle, one of the premiere material handling specialists in the nation
- WORC uses Gore™ Cover System technology supplied by W.L. Gore and Associates of Newark.
- The Peninsula Compost Group (www.peninsula-compost.com) leverages their team's combined 100-plus years of experience in the waste, composting and technology businesses to provide next generation organics recycling solutions as well as consultative support in green environmental infrastructure technology. Peninsula is the authorized distributor of Gore™ Cover System technology for the eastern United States. (See pg. 5 for info. on key management.)
- The facility receives only Source Separated Organic (SSO) waste including food and yard waste from waste generators and haulers such as state, federal and municipal institutions, schools, hospitals, universities, supermarkets, importers, restaurants, food processors and convenience stores as well as landscapers and contractors.
- Current waste generator customer sample: WaWa, Whole Foods, the Kenny Family ShopRites, Delaware Park, University of Pennsylvania, Children's Hospital Philadelphia and Waste Management of NJ.
- WORC converts 160,000 tons of source separated food discards and yard wastes into 100,000 tons of high-value, nutrient rich compost. 40,000 tons of additional organic material is blended into the compost to produce a total of 140,000 tons of compost and soil products per year for use in agriculture, horticulture, landscaping and home use.

The environmental benefits include:

- Greenhouse Gas (GHG) emissions are a major cause of global warming and climate change. Landfills account for 23% of the methane emissions in the US.
- Methane is 72 times more potent than carbon dioxide over a 20-year period or 23 times more potent than carbon dioxide over a 100-year period.

- WORC reduces carbon (methane) by over 100,000 tons of CO₂ equivalent per year.

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Organics in the landfill become anaerobic and create methane. Composting is an aerobic process and does not create methane. Sending food and yard waste to WORC rather than to a landfill results in the avoidance of methane emissions.

- WORC reduces greenhouse gas emissions by the equivalent of removing 8,800 automobiles from area roads per year.
- Approximately 25% of the prepared food in the United States becomes food waste. Roughly 31 million tons of food waste ended up in the trash in 2008.
- 24 billion metric tons of topsoil erodes from croplands worldwide annually of which 1 billion is in the United States.
- Soil erosion is an urgent problem because new soil forms very slowly; 2.5 centimeters (1 inch) of topsoil may take anywhere from 20 to 1200 years to form.
- WORC diverts 120k tons of pre-and post-consumer food waste annually from landfills extending the useful life of the landfill facilities.
- Generates carbon credits.
- Restores and replaces soil nutrients which perpetuates a sustainable closed-loop organic life-cycle.
- Sustainability Partner with the U.S. EPA Mid-Atlantic Region.
- The economic benefits include:
 - Lowers cost of organic waste disposal rates anywhere from 20 – 50% on “tip” fees at WORC vs. surrounding landfills. There are no surcharges (fuel or environmental fees.)
 - Created “green” jobs
 - 100,000 tons / year high-value, nutrient-rich organic compost and soil products produced for use in agriculture, horticulture, landscaping and home use.
- Community Benefits include:
 - Project produced the first Community Benefits Agreement in the state of Delaware with closest community, Southbridge/Neighborhood House Association.
 - State-of-the-art process developed to enable WORC to be considerate of neighbors and the surrounding community.

THE PARTS OF THE PROCESS:

Scale-house and Customer Management System

- Trucks are weighed both before and after they dump their loads at the facility
- The average trip time through the facility for a truck is less than 15 minutes
- The scale-house operator uses an integrated customer management system to track WORC's customers down to the individual truck level and can provide customized reporting to its customers to better serve their needs.
- At the scale-house, waste is categorized as food waste, yard waste, grass and wood waste

Tip Building

- The heart of the WORC operation is its high tech, specialized receiving building, also called a Tip Building, where the trucks dump their load.
- The Tip Building has a negative air system and a biofilter to keep any odors inside the building and scrubs the air to remove any odors. The building has 4 air exchanges per hour.

- The Tip Building contains a Leachate Collection System to collect and dispose of excess liquids.

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- Once the material is dumped on the floor, a WORC Quality Inspector inspects the materials to ensure it complies with the Acceptable Materials List for the facility. Once the material is inspected and determined to be acceptable the material ownership is transferred to WORC.
- The material is then pre-processed inside the controlled environment of the Tip Building

Air handling system and biofilter

- The tip building contains an air handling system to contain waste odors to the inside of the building in consideration of WORC's neighbors and the surrounding community.
- Two large 75hp fans suck air from the building completing 4 air exchanges per hour.
- The air is piped from the building to a large biofilter which scrubs the air of any odors releasing a fresh forest floor scent.
- The biofilter consists of green waste such as branches and trees mixed with compost. Mother Nature's microbes which are attached to the green waste and compost clean the air as it passes through the filter.

Material Pre-Processing System

- After the quality inspection and the material is accepted by WORC, inside the tip building a front-end loader moves the material to a staging area with similar materials.
- The loader bucket is then used to premix various materials to create the proper 30:1 Carbon Nitrogen ratio needed for composting.
- The front-end loader then dumps the mix into the slow speed shredder where it is sized to minus 4 inches and further mixed. In addition, the slow speed shredder gently rips open any plastic bags which can then be removed at the picking station.
- The material then passes by a high power magnet where any ferrous metals are removed.
- The material then passes through an eddy-current where non-ferrous metals are removed.
- Conveyor belts then move the material through a pick-station where plastics and other remaining contaminants are removed.
- Next, conveyor belts move the material through a shoot outside to a staging area for composting.

Gore Cover System

- The Gore Cover System is a high tech composting solution that speeds Mother Nature's natural process. It does in 8 weeks what Mother Nature, on her own, would do in 1 to 2 years.
- In addition to accelerating the composting process, the Gore Cover System performs two important functions: controls odors and separates leachate from storm water to prevent ground water contamination.
- A sophisticated control system monitors oxygen and temperature within the stack and creates an optimal environment for the microbes by controlling the amount of oxygen in the environment.
- During the composting process, the stacks reach temperatures in excess of 140 -170 degrees Fahrenheit. In order to kill pathogens the stack must reach at least 131 degree Fahrenheit for 3 consecutive days. This is easily accomplished in Phase 1.

- There are three phases in the composting process using the Gore Cover System. The first phase is 4 weeks long, the second phase is 2 weeks long, and the third phase is 2 weeks long.

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- In Phase 1 and 2 the material is covered with the Gore Cover™ blanket to create an “in-vessel” environment required to process food waste. A customized winder is used to control the Gore Cover™ which weighs over two thousand pounds.
- Each day at WORC in Phase 1 a “stack” is built out of the organic material received by front-end loaders. Each stack is 184 ft long, 26 ft wide, and 12 ft tall. There are over 500 tons of Source Separated Organic (SSO) materials in each stack.
- During the composting process the material breaks down and begins to dry out creating a volume reduction. After 4 weeks, two stacks are moved to Phase 2 and combined to create one stack.
- After 2 weeks in Phase 2, the material is moved to Phase 3 for two more weeks. After Phase 3, the composting process is complete and the material is moved to the post processing area.

Post Processing System

- Once the material has been through the 8-week composting process, the material is moved via loader to the Post Processing System for final product preparation.
- First the material is run through a trommel screen where it is sized to market specifications.
- Next a de-stoner removes any rocks, corks, or other small debris from the material.
- An air-separator then removes any final plastics from the product.
- What is left is a valuable, nutrient-rich compost product.
- This compost product is then moved via front-end loader to the Final Product Storage Area.

Final Product Storage Area

- The final product storage area serves several purposes at WORC:
 - Aging of finished compost to allow it to cool down and mature
 - Blending area to mix compost with other materials to manufacture topsoil blends
 - Storage for our retail and commercial sales of products

Leachate Collection System

- Leachate is water that has been in contact with the organic waste and can contaminate the ground water supply if not properly treated.
- There are two components to the WORC leachate collection system. The first is in the Tip Building and the second is an integral component in the Gore Cover System.
- Inside the Tip Building, the floor is sloped to a central drain system. Any excess fluids from the organic waste tipped in the building is either used to add moisture to the material in the premixing process or is discharged through the drain into the sanitary sewer system and is processed at the Wilmington Waste Water Treatment Plant.
- A cast iron and concrete trench system is part of the Gore Cover System design and runs the entire length of each stack. Here, moisture passes through the organic material pile and is collected in the trench and discharged into the sanitary sewer system.

Storm-water Management System

- In order to prevent contamination of groundwater, the active WORC site is built on an impervious surface of concrete and asphalt. Water that does not come in contact with the organic waste is treated as storm-water.

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- The site is sloped such that storm-water on half of the facility flows to the west and the other half flows to the east.
- The storm-water flows into sediment ponds where silt and other matter can settle out before discharging into retention ponds. The sediment ponds are periodically cleaned using a front-end loader to remove any silt.
- Aerators have been installed in the retention ponds which run constantly to purify the water.

Quality Management System

- WORC has implemented a sophisticated Quality Management System to ensure the proper controls are in place to create an environmentally safe process that produces only the highest quality products.
- At the front end of the process WORC has partnered with Waste Management, Republic Services, Central Jersey Waste, Action Carting, Organic Diversion that specialize in setting up for customers Source Separated Organic waste programs to ensure that only Acceptable Materials (see below) enter our process.
- All waste is dumped on the floor and inspected by Quality Inspector for contaminants and must meet our high quality standards before being accepted by the facility. A quality inspection form is completed on each load and periodic feedback is provided to the waste hauler and waste generator on a routine basis.
- Once the material has been pre-processed and a stack formed, the material is sampled and tested internally by our quality control technician. Each stack is given a unique lot number so it can be individually tracked throughout the process.
- The material is further tested and tracked at each stage in the process by the internal quality control technician. Once the final compost product has been screened, it is then tested by an independent, A&L Labs, a nationally recognized soil-testing firm.
- Regulatory data is gathered automatically and sent to DNREC monthly, quarterly and annually.

Acceptable Materials List

GROCERY

- Post date and spoiled items, meat, fish, vegetables, fruits, dairy, all dry goods (pasta, beans, flour, rice, cereal, sugar, coffee, tea, etc.)

PAPER MATERIALS

- Soiled or clean paper, cardboard waxed or plain, egg cartons and fruit trays and/or paper/cardboard products

YARD WASTE

- Brush, leaves, grass, clean wood, clearing debris, Christmas trees, stumps, bushes, flowers

PAPER

- Waxed and plain cardboard, cardboard tubing, tissue, paper towels, paper placemats, napkins

NO METAL, GLASS, PLASTIC OR OTHER NON-BIODEGRADABLES

THE PENINSULA COMPOST GROUP KEY MGMT. BRIEFS

Nelson Widell, Co-Founder – Mr. Widell has over 30 years of experience in the composting industry, is a founding member of the US Composting Council, Co-founded the Bedminster Bioconversion Company and developed and constructed 12 co-composting facilities in the US

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and overseas using the patented Bedminster Bioconversion rotary drum process.

Charles Gifford, Co-Founder – Mr. Gifford has over 20 years of principal-level experience in the waste industry business currently serving as CEO of Waste Options, Inc., Waste Options Atlantic, LLC and Waste Options Nantucket, LLC where he implemented a recycling solution on Nantucket that increased the recycling rate from 17% to 92% diversion; the highest rate of any community in the United States. Additionally, Gifford has practiced law and has over 30 years of experience as a real estate and environmental developer.

Scott Woods, CEO - Woods has over 25 years of leadership experience in building and scaling organizations and processes for growth in the Telecom, IT Services & Government Services industries. Woods' successful track record of leading high performance teams to execute strategies that propel revenue growth, profitability and shareholder value includes Sun Microsystems, Qwest Communications and Adams and Associates.

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