



HUGHES ENERGY

Air, Water, Pfas Statistics

ABOUT OUR COMPANY

Hughes Energy is a US green-tech company providing a low-carbon solution to waste.

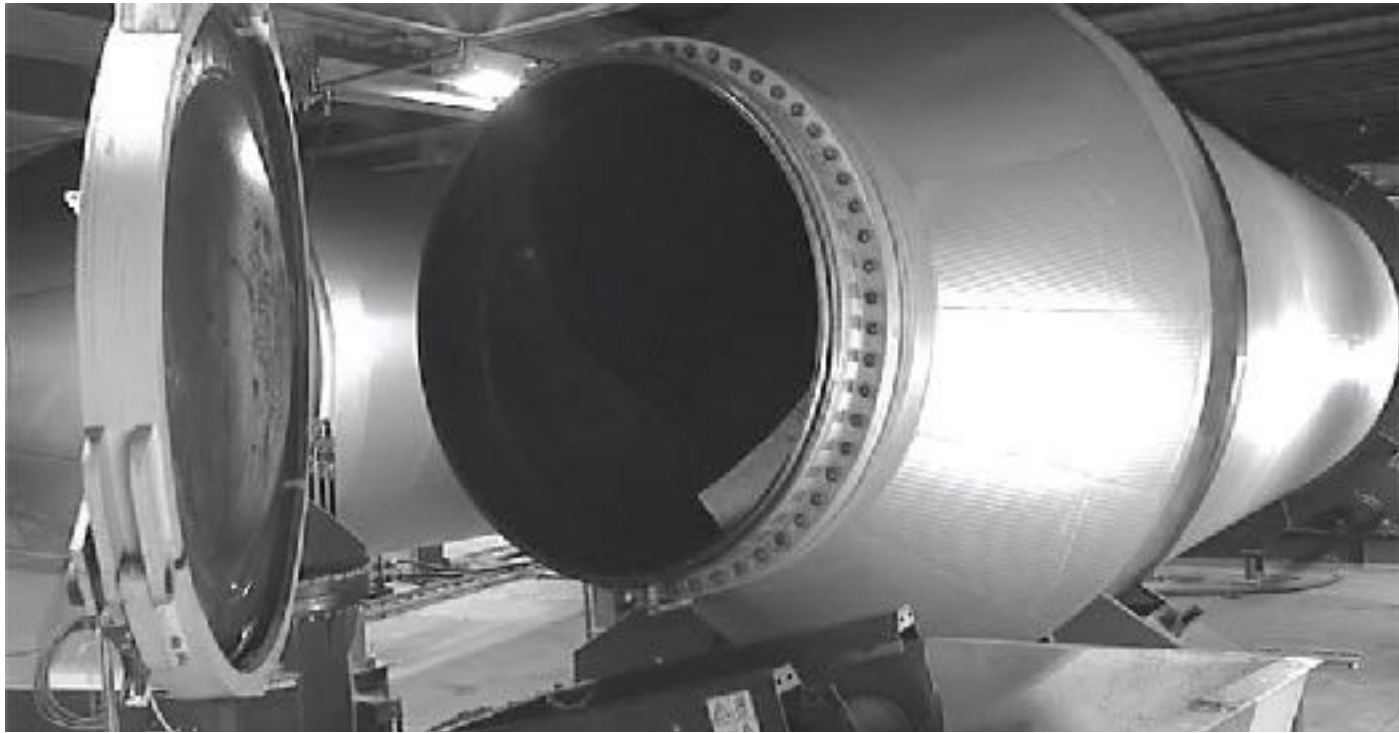
Our autoclave system transforms organic waste (source-separated food waste and contained in municipal solid waste) into a homogenous fiber that can be used to create second generation bio-products and bio-fuels.

The organic waste arrives, is processed and our fiber generally leaves the building the same day (except nights, Sundays and holidays)



We are a fiber production company.

We recycle organic materials to increase clean non-woody fiber supply for recycled paper and cardboard.



- **A completely indoor process**

All activity is conducted indoors, from waste delivery through to shipment of our fiber products

- **Odor does not escape the facility**

The building actually sucks air from outside (“under negative air pressure”), preventing odors from escaping out of the building

- **A closed system process**

The building air emissions are 82% below US thresholds for a Title V air permit.

The technology is a closed system which recycles water and steam, cleaning it for re-use.

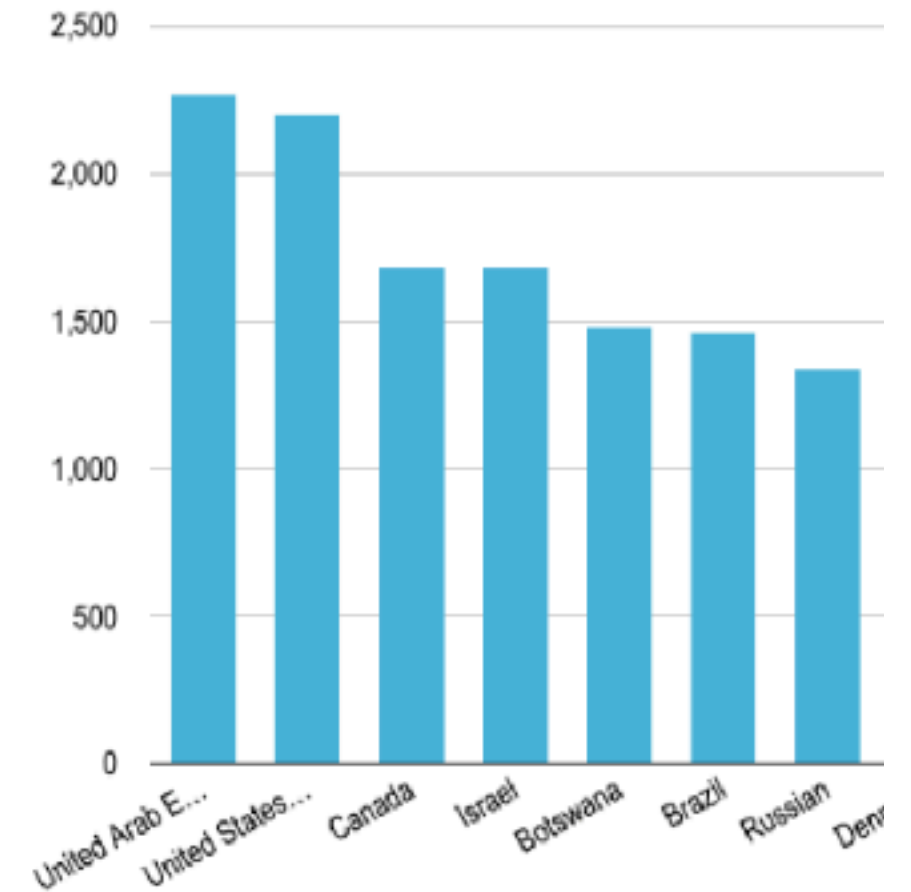
AIR EMISSIONS - COMPLETE PLANT OPERATION

ELEMENT (tons per year)	WILSON PLANT	THRESHOLD (required NYS DEC Air Permit)	THRESHOLD (required Federal Title V Air Permit)
Carbon Dioxide Equivalent (CO2e)	16,300	50,000	100,000
Oxides of Nitrogen	6.89 (included in CO2e)		
Sulfur Dioxide	0.08 (included in CO2e)		
Hazardous Air Pollutants	1.49	5	10
Particulate Matter (PM-2.5, PM-10)	4.99	50	100

*HEG and DEC will monitor and report on air emissions.
Emissions are 65% below the threshold for applying for a NYS Air Permit;
HEG and DEC agree that the plant will apply for a permit to ensure reporting and compliance are maintained.*

WATER USE

- The plant will use up to 22,000 gallons of water per day (what 200 Americans use per day*).
- The water is for the boilers to produce steam
- Water is recycled and cleaned within our system, but some steam evaporates or is absorbed during the process
- The water is cleaned through a proprietary system which includes advanced activated carbon filtration and reverse osmosis
- Waste Water is carried away from the site to the water treatment plant less than a quarter mile away from the site. The water treatment plant has reviewed water emissions and has no concerns with its makeup.



Water "Footprint" Per Person (in Gallons per Day)*

PFOS / PFAS - PEOPLE USE IT THROUGHOUT THEIR HOMES AND FOOD

Common Items with PFAS



FOOD PACKAGING
microwave popcorn bags, sandwich wrappers, takeout containers, fast food wrappers



HOUSEHOLD ITEMS
makeup, floss, waxes, paints, stains



STAIN-RESISTANT
carpets, rugs, and furniture



NONSTICK COOKWARE



OUTDOOR GEAR
with a "durable water repellent" coating



FIREFIGHTING FOAM

- PFAS and PFOS are known as “Forever Chemicals” which have been identified and are of increasing concern globally. These Forever Chemicals are **present throughout the environment** and in our waste
- Within the Wilson Process, PFAS and PFOS are concentrated in the water which is cleaned and recycled in the system.
- A state of the art activated carbon filtration system and reverse osmosis system is used in the Wilson System
- A 2021 University of North Carolina study concluded that activated carbon filtration **removes 97-99%** of PFAS/PFOS in water*, **
- Activated carbon filters in the Wilson System are removed for **safe processing, reactivation and recycling** in a specialized facility
- A 2014 study of wastewater treatment concluded that reverse osmosis systems were the most effective removal of PFAS***

* <https://www.rti.org/publication/longitudinal-assessment-point-use-carbon-filters-removal-and-polyfluoroalkyl-substances>

** <https://www.epa.gov/sciencematters/reducing-pfas-drinking-water-treatment-technologies>

*** <https://www.mendeley.com/catalogue/4ec074d1-a24e-31bd-9b72-3192382246ae/>

Environment & Energy

States Eclipse Feds in Cleaning ‘Forever Chemicals’ in Soil (1)

By Tripp Baltz

Deep Dive

Nov. 10, 2021, 6:00 AM; Updated: Nov. 10, 2021, 1:01 PM

For now, Maine is “pretty far ahead of the federal government,” said Patrick MacRoy, deputy director of the environmental group Defend Our Health in Portland, Maine.

For PFOA/PFOS, the level is 4.4 mg/kg for residential sites and 64 mg/kg for non-residential, while for PFBS the level is 66 mg/kg for residential and 960 mg/kg for non-residential. The standards will take effect in mid-November.

PFOS / PFAS LIMITS - STATES **LEADING THE WAY**

State / Agency**	PFAS Limit (parts per billion)	PFOS Limit (parts per billion)	Wilson Fiber Analysis* (Parts per billion)
PA (soil, residences)	4.4	4.4	<.09
PA (soil, not a residence)	64	64	<.09
ME (use of fiber for products)	2.5	5.2	<.09
US EPA	Not issued	Not issued	<.09

* Source: October 2022 Report from SOCOTEC UK. <https://www.socotec.co.uk/>

** Sources: Maine DEP website, EPA website, PA DEP website.