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WAUPACA COUNTY PLANNING & ZONING COMMITTEE
MEETING MINUTES August 6, 2026

ON-SITE INSPECTIONS: The Committee made on-site inspections of the following properties:

- **Roger W. Schuelke**
- **Gerald E. Ort Jr.**
- **Debra Lynn & Mark L. MacKinnon**
- **John G. & Doreen K. Robertson**

Chair J. Nygaard called the meeting to order at 9:03am with the following members present: Chair J. Nygaard, Vice Chair D. Federwitz, J. Beyer, R. Ertl, and D. Wengelski. A quorum was present.

D. Wengelski moved to approve the agenda as printed.

Chair J. Nygaard suggested moving the meeting to a different time and location to address the proposed ordinance amendments.

D. Wengelski moved and R. Ertl seconded to amend the agenda to remove the Selected Revisions to The Waupaca County Zoning Ordinance, Waupaca County Code of Ordinances, Chapter 34.

Voice vote: 5 ayes, 0 nays.

J. Beyer requested the meeting be moved to a time better-suited for the public to attend.

Voice vote: 5 ayes, 0 nays.

Vice Chair D. Federwitz moved and J. Beyer seconded to approve the July 2, 2026 meeting minutes as printed. The motion carried.

Public Comment (must be in person, is limited to items not on the agenda, and a three (3) minute time limit per person will be imposed):

-Mike Luedtke, N5437 County Road E, Pine River, spoke.

A representative of the Sheriff's Office requested everyone exit.

A motion and a second was made (inaudible) to adjourn the meeting at 9:16am.

Becky Landre
Recording Secretary

cc: County Clerk



WAUPACA COUNTY PLANNING & ZONING OFFICE

811 Harding Street Waupaca, WI 54981
Phone: (715) 258-6255 Fax: (715) 258-6212

2026 ZONING ORDINANCE SUMMARY

LEGEND:

Highlighted Term = Additional language proposed

Highlighted Term - Additional language added after the Town Information Meeting

Red-Font-Strikethrough = Language proposed to be stricken

*All formatting changes, including subsets and internal references, are not shown and will be update accordingly. *

Section 1.7

1.7 Definitions of Words or Phrases

“1.7 Definitions of Words or Phrases The following words, phrases and terms, wherever they occur in the Ordinance, shall be interpreted as herein defined. Definitions for land uses are outlined in Section 6.0.

....

3. Battery Energy Storage System, Accessory: One or more devices capable of storing energy in order to serve the electrical needs of the principal use of the property as an uninterrupted power source, not to supply power primarily to the electric power grid.

4. Battery Energy Storage System, Standalone: One or more devices capable of storing energy in order to supply electrical energy primarily to the power grid.

25. Data Center: A building, buildings, structures or containers which are occupied primarily by computers and/or telecommunications and related equipment where digital information is processed, transferred and/or stored, primarily to and from offsite locations. The use may also include air handlers, power generators, water cooling and storage facilities, utility substations, and other associated utility infrastructure to support operations at the data center. This use shall include cryptocurrency mining, blockchain transaction processing, server farms, etc. This use does not include computers or telecommunications related equipment that is secondary and customarily incidental to an otherwise permitted use on the property, such as servers associated with an office building.

Section 2.2.2.c.

c. **Exceptions:** A Land Use Permit shall not be required for the following:

....

(4) Rooftop and building mounted solar panels used as part of an ~~small~~ Accessory Solar Energy Generating Systems.

Section 2.6.2

1. **Exemptions.** Heights of the following structures may exceed Ordinance limits as identified in Section 4.0 for the zone in which they are to be located: Cooling towers, stacks, lookout towers, silos, windmills, water towers, spires, radio and television aerials, masts, antenna, roof and building mounted solar panels used as part of an Accessory Solar Energy Generating System, and mechanical appurtenances and barns and other buildings designed for the storage of agricultural products.
 - a. Structures that are exempted from the height provisions of this ordinance shall comply with setback regulations of Section 2.8.

Section 2.8.5.i

5. **Setback Exemptions.** The following shall be exempt from all highway, railroad, and lot line setbacks except where necessary to provide visual clearance at highway intersections as described in Section 2.7:

....

- i. Roof and building mounted solar panels used as part of an Accessory Solar Energy Generating System.

Table 5 and 5.1

Amend Table 5 and 5.1 to allow Small Solar Generating Facility to be a Conditional Use permit in PURF, PVRF, AE, AR, AWT, RC-N, RC-G, RI-G, and RI-I.

Amend Table 5 and 5.1 to allow Large Solar Generating Facility to be Permitted in all zoning districts.

Amend Table 5 and 5.1 to allow Battery Energy Storage Systems as a Conditional Use permit in RI-G and RI-I. Add footnote to table 5 and 5.1 to reference Section 6.7.10 for accessory BESS and Section 12 for BESS associated with Alternative Energy Systems.

Amend Table 5 and 5.1 to add Manure Co-Digester Facility as a Conditional Use permit in AR and AE.

Section 6.7.3

- 3. Heavy Industrial:** Land uses which meet one (1) or more of the following criteria: are not conducted entirely within an enclosed building; are potentially associated with nuisances such as odor, noise, heat, vibration, and radiation which are detectable at the property line; and pose a significant safety hazard, such as danger of explosion. Examples of heavy industrial land uses include meat product producers; breweries, micro-breweries, wineries, micro-wineries, distilleries and their accessory sample tasting; paper, pulp or paperboard producers; chemical dealers and/or storage facilities; chemical and allied product producers, except drug producers, but including poison or fertilizer producers; petroleum and coal product producers; asphalt, concrete or cement producers; tanneries; stone, clay or glass product producers; primary metal producers; heavy machinery producers; electrical distribution equipment producers; electrical industrial apparatus producers; transportation vehicle producers; commercial sanitary sewage treatment plants; railroad switching yards; data centers; and recycling facilities not involving the on-site storage of salvage materials.

Section 6.7.10

10. Battery Energy Storage Systems: Land uses that include one or more devices capable of storing and discharging electricity to a building, use, or to the electrical grid. This use includes, but is not limited to the following: battery cells; enclosures, containment vessels, and dedicated-use buildings; thermal, battery, and energy management system components; inverters; access roads; distribution, collection, and feeder lines; wires and cables; conduit; footings; foundations; towers, poles; guy lines and anchors; substations; interconnection or switching facilities; circuit breakers and transformers; overhead and underground control, communications and radio relay systems, and telecommunication equipment; utility lines and installations; and accessory equipment and structures.

- a. Accessory Battery Energy Storage Systems that are accessory to a principal use or building are permitted within all zoning districts.
- b. Battery Energy Storage Systems associated with Alternative Energy Generating Systems are subject to the regulations found in Section 12 of this ordinance.
- c. Standalone Battery Energy Storage Systems are subject to the following requirements:
 - (1) Setbacks for a battery energy storage facility shall be one hundred (100) feet to any lot line including the right way of the road. The battery energy storage facility shall also comply with any Department of Natural Resources or Public Health setback requirements.
 - (2) Separate containment enclosures that include the following:

- i. Enclosure Size Capacity containment of one-hundred and fifty (150 %) percent of the battery energy storage system.
 - ii. Sufficient fireproofing for connecting electronic wires, protecting from one structure to the next and from the battery energy storage system to the substation.
- (3) Battery management protocols including:
 - i. Labeling of battery energy storage system container with a date of first usage via a stamped metal nameplate with serial number.
 - ii. Upon the end of its serviceable life the battery energy storage system container shall be removed from the site and properly recycled at owner/operator's expense.
 - iii. The owner/operator shall provide an operational plan of the proposed facility to the Waupaca County Emergency Management Department including reporting the storage and/or use of any hazardous materials as well as an emergency plan for the facility.
- (4) A decommissioning plan and financial assurance for project decommissioning costs shall be provided with the Conditional Use permit application. A posted form of financial security such as a surety bond, letter of credit, escrow account, reserve fund, parent guarantee, or other suitable financial mechanism, prior to the commencement of construction to include the total cost of decommissioning of the solar generation portion and the battery energy portion of the solar project at the end of its useful life.
- (5) A Standalone Battery Energy Storage System located within the confines of an existing substation is permitted within all districts.
 - i. An existing substation may be expanded for the addition of a Standalone Battery Energy Storage System provided that it is not expanded beyond the original parcel of record.

d. All Battery Energy Storage Systems shall comply with all State, Federal, and County regulations including, but not limited to, the Shoreland Protection Ordinance, Floodplain Ordinance, etc.

Section 6.8.9

9. Small Solar Energy System Generating Facility: See Section 12 for requirements. ~~An energy system with a panel area of fourteen hundred (1,400) square feet or less that converts solar energy to usable thermal, mechanical, chemical, or electrical energy, where such solar energy system is accessory to the principal use of the land, e.g., solar panels providing energy for a residence on the same lot. This use shall meet the following performance standards:~~

- ~~a. Ground-mounted solar energy systems shall comply with the minimum required setbacks for principal structures. Ground-mounted solar energy systems shall comply with the height requirements of Section 2.6.~~

- ~~b. The requirements of Wisconsin Statutes including, but not limited to, Sections 66.0401 and 66.0403, shall apply to all solar energy systems.~~
- ~~c. In the Farmland Preservation Overlay, the Small Solar Energy System must meet the standards set forth in Section 6.10.5 for an Agricultural Accessory Use.~~

Section 6.8.10

10. Large Solar Energy **Generating Facility:** See Section 12 for requirements. **System:** ~~An energy system with a panel area of more than fourteen hundred (1,400) square feet that converts solar energy to usable thermal, mechanical, chemical, or electrical energy, where such solar energy system is typically a principal use of the land and designed primarily to generate energy for commercial sale off site. This use shall meet the following performance standards:~~

- ~~a. Ground-mounted solar energy systems shall comply with the minimum required setbacks for principal structures. Ground-mounted solar energy systems shall comply with the height requirements of Section 2.6.~~
- ~~b. The requirements of Wisconsin Statutes, including, but not limited to, Sections 66.0401 and 66.0403, shall apply to all solar energy systems.~~

Section 6.10.12

12. Manure Co-Digester Facility: An anaerobic manure co-digester facility that produces energy in the form of biogas from materials grown or produced on the farm in conjunction with biodegradable organic feedstock brought to the farm. A co-digester facility shall be permitted through the conditional use permit process in the zoning districts identified in table 5.0 and 5.1 of this ordinance.

a. The applicant shall submit the following as part of the Conditional Use permit application:

1) A narrative description of the proposed facility including:

- i. All operations and performance standards for siting to minimize impacts on neighboring properties which shall include considerations of topography, odor, prevailing wind patterns, proximity to nonagricultural properties, operational noise, buffering and screening, and specific hours of operation.
- ii. The nature of on-site activities and operations, the types of materials stored and used as part of the operation as well as the frequency and duration period of storage of materials and the methods for use and disposal of materials. Evidence shall be provided that the use, handling, and disposal of material will be accomplished in a manner that complies with state and federal regulations.

- iii. Copies of all permits and approvals which are required by governmental agencies for the construction and operation (including final disposal of all byproducts and waste) of a co-digester.
 - iv. The general scale of the operation in terms of its market area, specific space and area requirements for each activity, the total number of employees of each shift, and an overall needed site size.
 - v. An emergency action plan which incorporates appropriate training for the local fire department and emergency management services.
- 2) A site plan providing all proposed structures, driveways, stacking lanes, parking areas, and any other related facilities along with setback distances to any property lines, road right of ways, etc.
- 3) A decommissioning plan for the co-digester and related facilities when the co-digester becomes functionally obsolete or is no longer in use. All tanks or other structures that contained waste or have been contaminated with waste shall be cleaned and the waste processed and disposed of appropriately. Additionally, buildings, tanks, supporting structures and other physical components may be refurbished for continued use, reclaimed or adapted for other farm use, or dismantled and recycled or properly disposed of. The co-digester owner shall notify the Planning and Zoning Department immediately upon cessation or abandonment of the facility and shall be responsible for the removal of the manure and organic food waste from the facility within six (6) weeks from the date operations cease. The co-digester shall be removed and all associated buildings or facilities shall be removed or repurposed as set forth in the decommissioning plan within twelve (12) months from cessation or abandonment of the operation. Prior to a conditional use permit being issued the owner shall supply to the Planning and Zoning Department financial security in the amount required by the Planning and Zoning Committee as part of their consideration of the conditional use permit.
- 4) Written confirmation from the provider of any utility service(s) which is/are required for the operation of a co-digester.
- b. The required parking for the facility shall be one parking space for each employee on the largest work shift at the co-digester facility.
- c. The co-digester shall be accessory to and located on the same parcel as the active farm operation.
- d. In no event shall any human biological byproduct waste or hazardous waste be brought to the farm or utilized as part of the digestion process.
- e. The applicant shall provide sufficiently long stacking lanes on the facility grounds, so that vehicles waiting to be unloaded or loaded will not queue on public roads.

- f. The off-loading and storage of any feedstock brought to the facility shall occur within a fully enclosed receiving building. No outdoor storage of food waste or storage of food waste in open vessels is permitted.
- g. All garbage, trash, and rubbish shall be stored indoors.
- h. All of the manure generated at the subject farm shall be used in the operation of the onsite co-digester and at least fifty-one (51) percent of the manure used in the co-digester shall come from animals housed on the subject farm.
- i. There shall be no onsite commercial or retail sales of digestate or any product or byproduct generated by the co-digester unless expressly permitted by the Conditional Use permit process.
- j. The operator shall be responsible for maintaining a permanent log confirming the source of all feedstock for the co-digester including the date of delivery of the feedstock as well as the name and location of the source of the feedstock and the volume delivered.
- k. The co-digester shall be designed and constructed in compliance with applicable local, state, and federal codes and regulations.
- l. All structures shall comply with the height and setback requirements of all applicable ordinances with the exception that a co-digester that is designed to inflate and deflate in capturing the biogas may exceed the thirty-five (35) foot height restriction provided that the height does not exceed forty-five (45) feet in height when fully inflated.
- m. The owner and operator shall provide direct contact information to the County and shall update their contact information within thirty (30) days of any changes in the contact information.
- n. The operator shall be responsible for testing the co-digestion byproducts for the presence of PFOS, PFAS, heavy metals, and microplastics once every month. Samples shall be collected and testing conducted by a third-party laboratory acceptable to the Planning and Zoning Committee. The operator shall be responsible for notifying the Planning and Zoning Department of the results of the testing within five business days of the receipt of the results.
- o. Any biogas generated from the co-digester must be used on the subject farm or be transported off the subject property via pipeline.

Section 12 *Formatting of Section 12 altered to add Solar Generating Systems*

12.0 ~~Wind Energy Systems~~ Alternative Energy Generating Systems

Section 12.1

12.1 Wind Energy Systems

Section 12.1.4.1

- 1. Battery Energy Storage System.** If battery energy storage systems are included on the same site as wind energy projects, the following considerations shall be made by the owner/operator:

- (1) Setbacks for a battery energy storage facility shall be one hundred (100) feet to any lot line including the right way of the road. The battery energy storage facility shall also comply with any Department of Natural Resources or Public Health setback requirements.

- (2) Separate containment enclosures that include the following:

- i. Enclosure Size Capacity containment of one-hundred and fifty (150 %) percent of the battery energy storage system.
 - ii. Sufficient fireproofing for connecting electronic wires, protecting from one structure to the next and from the battery energy storage system to the substation.

- (3) Battery management protocols including:

- i. Labeling of battery energy storage system container with a date of first usage via a stamped metal nameplate with serial number.
 - ii. Upon the end of its serviceable life the battery energy storage system container shall be removed from the site and properly recycled at owner/operator's expense.
 - iii. The owner/operator shall provide an operational plan of the proposed facility to the Waupaca County Emergency Management Department including reporting the storage and/or use of any hazardous materials as well as an emergency plan for the facility.

Section 12.2

12.2 Solar Energy Generating Facilities

- 1. Authority:** This Section of the Ordinance is adopted pursuant to authority granted by Wis. Stats. Sec. 59.69 and 66.0401. Wis. Stats. 66.401 is adopted and incorporated by reference.
- 2. Purpose:** The purpose of this Section of the Ordinance is to adopt and incorporate the requirements of Wis. Stats. 66.0401 as a local ordinance and to establish local regulations on the installation and use of Energy Generating Facilities that are authorized by and compliant with Wisconsin statutes and that serve to preserve or protect public health or safety, do not significantly increase the cost of the system or significantly decrease the system's efficiency, or allow for an alternative system of comparable cost or efficiency.

The provisions listed under this section are not intended to be a duplication of any federal or state requirement or to exceed authority granted to Wisconsin Counties.

3. Definitions: In this Section of the Ordinance:

- a. **Conditional Use Permit** means a discretionary permit for a listed conditional use per table 5.0 and 5.1 of this ordinance, granted by the Waupaca County Planning and Zoning Committee, under the notice and hearing procedures of Section 14 of this ordinance, upon application by an owner, and to which various conditions of use may be attached and adhered to by the applicant.
- b. **County** means Waupaca County.
- c. **Department** means the Waupaca County Planning and Zoning Department.
- d. **Kilowatt** means a unit of power equal to one thousand (1,000) watts.
- e. **Megawatt** means a unit of power equal to one million (1,000,000) watts, especially as a measure of the output of a power station.
- f. **Permit** means a Land Use Permit issued by the Waupaca County Planning and Zoning Department pursuant to this section.
- g. **Shared Revenue Utility Payment** means payments made to counties and municipalities to off-set tax exempt utility property. Payments are based on state calculations.
- h. **Solar Energy Generating System, Accessory** means a photovoltaic energy system that converts solar energy to usable thermal, mechanical, chemical, or electrical energy, where such solar energy system is accessory to the principal use of the land (e.g., solar panels providing energy for a dwelling on the same lot). Accessory Solar Energy Generating Systems generate less than 1,000 kilowatts (1 megawatt) and are not intended for use as a public utility.
- i. **Solar Energy Generating Facility, Large** means, but is not limited to, connected arrays of photovoltaic panels, their supporting structures and/or mounting systems, the network of necessary electrical wires and conduit (above and below ground), power poles, inverters, transformers, and supporting substations, or a concentrated mirror thermal energy generating facility and its respective components. These facilities are designed for nominal operation at a nameplate capacity of one-hundred (100) megawatts or more. A Certificate of Public Convenience and Necessity issued by the Wisconsin Public Service Commission (PSC) is typically associated with these facilities. This includes facilities which directly convert and transfer or store solar energy into thermal or electrical energy.
- j. **Solar Energy Generating Facility, Small** means, but is not limited to: connected arrays of photovoltaic panels, their supporting structures and mounting systems, the network of necessary electrical wires and conduit (above and below ground), power poles, inverters, transformers and supporting substations. These facilities are designed for nominal operation at a nameplate capacity of less than one hundred (100) megawatts and do not meet the definition of an “accessory solar energy generating system”. This includes facilities which directly convert and transfer or store energy into thermal or electrical energy.
- k. **Land Use Permit** means written approval by the Planning and Zoning Department staff that is required before commencing any development as defined

in this chapter or before establishing, extending, or changing any use on any parcel.

- I. Environmental Analysis** means a detailed localized review of relevant environmental conditions (e.g. wetland delineations, floodplain studies, navigability determinations, etc.)

4. Accessory Solar Energy Generating System

- a. An accessory solar energy generating system is permitted in all zoning districts.
- b. All components of an accessory solar energy system are subject to the setback, height and permit requirements for principal structures found in Section 2 as well as any other applicable ordinances including the Shoreland Protection and Floodplain Ordinances.
- c. In the Farmland Preservation Overlay the Accessory Solar Energy Generating System must meet the standards set forth in 6.10.5 for an Agriculture Accessory Use.

5. Small Solar Energy Generating Facility

a. Conditional Use Permit Requirements

(1) **Permit Requirement.** Small Energy Generating Facilities are subject to Conditional Use approval in the zoning districts identified in table 5.0 and 5.1.

(2) **Application Process.** The application for a Conditional Use Permit shall be processed in accordance with the procedures set forth in Section 14.

(3) **Application Requirements.** The application for a Conditional Use permit shall include the following items as applicable to the project area:

- i. A narrative description of the proposed project, including a description of the subject property by metes and bounds, address(es), parcel numbers, and any unique circumstances within the project area;
- ii. A site plan, which shall include a scalable drawing showing the location of all drives, entrances, easement labels and locations, trails, and signs; panels, inverters, storage systems, and any other planned infrastructure; visual clearance triangles; setbacks; floodplain(s); wetland(s); and shoreland zone boundaries;
- iii. A plan showing an overhead view of all existing and proposed landscaping on the site, including the location, species, size at time of planting, and mature size for all new plantings;
- iv. A decommissioning plan and financial assurance;
- v. Shared Revenue Utility Payment tax projections and estimated property tax reductions to the County, town(s), and school/special district(s);

- vi. Agreements, leases or other documentation with affected landowners and/or communities outlining any site-specific terms or conditions of development and assuring maintenance of land to be owned or used for common purposes, including, but not limited to, joint development agreements and road maintenance agreements;
- vii. Supporting documentation addressing the review criteria in Section 14;
- viii. Copies of all state, federal, and other permits;
- ix. Any other documentation as identified by the Planning and Zoning Director or the Planning and Zoning Committee to demonstrate compliance with county, state, and federal law.
- x. Documentation evidencing environmental analyses done by third parties, and associated permit authorizations as required by law;
- xv. Documentation of planned stray voltage mitigation and response.
- xvi. Planned noise nuisance abatement measures.

(4) Conditional Use Permit Review Criteria. In addition to the criteria set forth in Section 14, the review for a Conditional Use Permit shall address and consider the following:

- i. Setbacks from participating and non-participating property lines, residential structures, unique adjacent land uses, and roadways, assessed on a case-by-case basis for each parcel affected.
 - a. Fifty (50) feet from non-participating property lines.
 - b. Setbacks identified in Table 4.0 from participating property lines.
 - c. All other applicable required structural setbacks.
- ii. Mitigation of impacts to local environmentally sensitive species and habitats by following:
 - a. Best construction practices, such as wildlife permeable fencing to allow smaller wildlife access through facility fences; and,
 - b. Best construction practices to allow larger wildlife access via natural movement around facility fences.

- iii. Best Management Practices and considerations as noted in the Battery Energy Storage System section below for projects utilizing battery storage.
- iv. Environmental resources.
- v. Reasonable construction standards, including:
 - a. Phasing, to limit area of disturbance;
 - b. Hours of construction to limit disruption to residents; and,
 - c. Light pollution mitigation.
- vi. Equipment related sound mitigation measures including but not limited to:
 - a. Equipment relocation further from receptors;
 - b. Noise cancellation using quieter equipment;
 - c. Sound shielding technology;
 - d. Sound filtering technology; and,
 - e. Noise suppression and blocking with building enclosures or barrier walls.
- vii. Operational lighting standards.
- viii. Maintenance and repair of damage to local roads due to project construction, in the form of a Road Maintenance Agreement.
- ix. Mitigation plans for any damaged soil drainage infrastructure.
- x. Mitigation plans for any damage to surface water conveyance infrastructure, such as grassed waterways.
- xi. Fire hazard mitigation plans, including:
 - a. Battery-related fire suppression design and chemical release containment design and;
 - b. Clean-up and monitoring of any fire related chemical releases.
- xii. Replacement of lost property tax revenue, including school and special districts.
- xiii. Financial assurance for construction in the form of a surety bond, letter of credit, escrow account, reserve fund, parent guarantee, or other suitable financial mechanism.
- xiv. Decommissioning plan and financial assurance for project decommissioning costs. A posted form of financial security such as a surety bond, letter of

credit, escrow account, reserve fund, parent guarantee, or other suitable financial mechanism, prior to the commencement of construction to include the total cost of decommissioning of the solar generation portion and the battery energy portion of the solar project at the end of its useful life.

xv. Compliance with county, state, and federal laws, as may be applicable.

xvi. Other community benefits as may be relevant.

b. Land Use Permit Requirements for Small Solar Energy Generating Facility.

(1) **Permit Requirement.** The owner must apply for and receive a Land Use Permit from the Department before installing, constructing, or expanding any Small Solar Energy Generating Facility.

(2) **Application Process.** The application for a Land Use Permit shall be processed in accordance with the procedures set forth in Section 14.

(3) **Permit Fee.** The permit fee shall be in accordance with the adopted fee schedule and be submitted when the application is submitted for review.

(4) **Permit Expiration.** A Land Use Permit shall expire two (2) years from the date of issuance. To the extent allowable under the conditions of the Conditional Use Permit decision of the Planning and Zoning Committee, if in the event that the construction is not yet completed by the expiration date of the Land Use Permit the applicant shall obtain a new land use permit prior to the recommencement of the construction project.

(5) **Application Requirements.** The application for a Land Use Permit shall include the following items applicable to the project area:

- i. A narrative of the proposed project, including a description of the subject property by metes and bounds, addresses, parcel numbers, and any unique circumstances within the project area.
- ii. A site plan, which shall include a scalable drawing showing the location of all drives, entrances, easement labels and locations, trails, and signs; panels, inverters, energy storage systems, and any other planned infrastructure; visual clearance triangles; setbacks; floodplain(s); wetland(s); and shoreland zone boundaries.
- iii. Supporting documentation addressing the review criteria in Section 14, if not already submitted.

c. **Additional Permitting Requirements.** Additional permits and processes may be required under the Waupaca County Code of Ordinances.

- d. **Operator Ownership Change.** Notice shall be provided to the County for any change in ownership of the Small Solar Energy Generating Facility on or before the effective date of the change.
- e. **Other Approvals.** A copy of all necessary state and federal permits and approvals shall be submitted to the Department within ninety (90) days of receiving said authorizations.
- f. **Post Construction Filing Requirement.** Within ninety (90) days of the date a Small Solar Energy Generating Facility commences operation, the owner shall file with the Department an as-built description of the facility, an accurate map of the facility showing the location of all infrastructure, geographic information system information showing the location of said infrastructure, and current information identifying the owner(s) and operator(s), including designated contact(s), of the Small Solar Energy Generating Facility.
- g. **Battery Energy Storage System.** If battery energy storage systems are included on the same site as the solar project, the following considerations shall be made by the owner/operator:
 - (1) Setbacks for a battery energy storage facility shall be one hundred (100) feet to any lot line including the right way of the road. The battery energy storage facility shall also comply with any Department of Natural Resources or Public Health setback requirements.
 - (2) Separate containment enclosures that include the following:
 - i. Enclosure Size Capacity containment of one-hundred and fifty (150 %) percent of the battery energy storage system.
 - ii. Sufficient fireproofing for connecting electronic wires, protecting from one structure to the next and from the battery energy storage system to the substation.
 - (3) Battery management protocols including:
 - iii. Labeling of battery energy storage system container with a date of first usage via a stamped metal nameplate with serial number.
 - iv. Upon the end of its serviceable life the battery energy storage system container shall be removed from the site and properly recycled at owner/operator's expense.
 - v. The owner/operator shall provide an operational plan of the proposed facility to the Waupaca County Emergency Management Department including reporting the storage and/or use of any hazardous materials as well as an emergency plan for the facility.

6. Large Solar Energy Generating Facility

a. Land Use Permit Requirements for Large Solar Energy Generating Facility.

- (1) Permit Requirement.** The owner must apply for and receive a Land Use Permit from the Department before installing, constructing, or expanding any Large Solar Energy Generating Facility.
- (2) Application Process.** The application for a Land Use Permit shall be processed in accordance with the procedures set forth in Section 14.
- (3) Permit Fee.** The permit fee shall be in accordance with the adopted fee schedule and be submitted when the application is submitted for review.
- (4) Permit Expiration.** A Land Use Permit shall expire two (2) years from the date of issuance. In the event that the construction is not yet completed by the expiration date of the Land Use Permit the applicant shall obtain a new land use permit prior to the recommencement of the construction project.
- (5) Standards for Review.** The standards for review of a permit application for Large Solar Energy Generating Facility are consistent with Wis. Stats 66.0401 as well as Wis Stats 59.69 and are not more restrictive than the Public Service Commission approved site plan as part of the Certificate of Public Convenience and Necessity.
- (6) Application Requirements.** The application for a Land Use Permit shall include the following items, as may be applicable:
 - i. A copy of the Public Service Commission authorization, in the form of a Certificate of Public Convenience and Necessity and a copy of the final application packet and documentation submitted to the Public Service Commission for approval.
 - ii. A narrative of the proposed project, including a description of the subject property by metes and bounds, address(es), parcel numbers, and any unique circumstances within the project area, as may have been identified during the Public Service Commission review.
 - iii. A site plan, which shall include a scalable drawing showing the location of all drives, entrances, easement labels and locations, trails, and signs; panels, inverters, energy storage systems, and any other planned infrastructure; visual clearance triangles; setbacks; floodplain(s); wetland(s); and shoreland zone boundaries;
 - iv. Documentation evidencing environmental analyses done by third parties and associated permit authorizations as required by law.

- v. A complete list of neighboring parcels within one (1) mile that have been notified of the project.
 - vi. Shared Revenue Utility Payment tax projections; and estimated property tax reductions to the County, Town(s), and school/special district(s).
 - vii. Any updates submitted to the Public Service Commission as applicable to these requirements. The equipment should have the capability to withstand extreme weather events.
- b. **Additional Permitting Requirements.** Additional permits and processes may be required under the Waupaca County Code of Ordinances.
- c. **Operator Ownership Change.** Notice shall be provided to the County for any change in ownership of the Large Solar Energy Generating Facility on or before the effective date of the change and contact information of the new owner shall be included with the notice.
- d. **Other Approvals.** A copy of all necessary state and federal permits and approvals shall be submitted to the Department within ninety (90) days of receiving said authorization(s).
- e. **Post Construction Filing Requirement.** Within ninety (90) days of the date a Large Solar Energy Generating Facility commences operation, the owner shall file with the Department an as-built description of the facility, an accurate map of the facility showing the location of all infrastructure, geographic information system information showing the location of said infrastructure, and current information identifying the owner(s) and operator(s), including designated contact(s), of the Large Solar Energy Generating Facility.

Section 14.4.2.a Powers of the Board of Adjustment: Administrative Appeals.

a. **Appealable Matters:**

....

- (3) Decisions by the Planning & Zoning Committee that consist of interpretations of the terms of the Waupaca County Zoning Ordinance and which are made in the course of determining whether a permit or approval will be issued by said Committee are appealable to the Board of Adjustment as Administrative Appeals. Planning and Zoning Committee decisions on rezonings and conditional use permits are not appealable to the Board of Adjustments.

Section 14.5.1.a.(5) Duties of the Planning and Zoning Committee

- (4) **Step 5—Notice of Action:** Within ten (10) days of final Planning and Zoning Committee action on the Conditional Use Permit request, the Planning &

Zoning Director shall provide written notice of Committee action, including any required conditions of approval, to both the applicant and the affected town. Approval of a Conditional Use Permit does not eliminate the requirement to obtain the appropriate Sanitary, Building and Land Use Permits. Decisions on any application for a Conditional Use Permit are appealable to the ~~Board of Adjustment pursuant to Section 14.4.~~ circuit court.



WAUPACA COUNTY ZONING ORDINANCE

CHAPTER 34

Waupaca County Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances

Be it known, that the Waupaca County Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances was comprehensively amended and was approved by the Waupaca County Board of Supervisors on May 18, 2010. Published and effective as of June 3, 2010.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on February 19, 2013. Effective upon publication of February 28, 2013.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on June 18, 2013. Effective upon publication of June 27, 2013.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on July 16, 2013. Effective upon publication of July 25, 2013.

Be it known, that the Waupaca County Board of Supervisors enacted an amendment to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on December 17, 2013 (delete Section 12 Telecommunication Towers, Antennas and Related Facilities and create Chapter 48 Mobile Service Facilities and Support Structures as a stand-alone Ordinance). Effective upon publication of December 26, 2013.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on July 15, 2014. Effective upon publication of July 22, 2014.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on May 19, 2015. Effective upon publication of May 28, 2015.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on July 21, 2015. Effective upon publication of July 30, 2015.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on May 17, 2016.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on May 16, 2017.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on May 15, 2018. Effective upon publication of May 24, 2018.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on May 21, 2019. Effective upon publication of May 28, 2019.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on June 16, 2020. Effective upon publication of June 25, 2020.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on May 18, 2021. Effective upon publication of May 27, 2021.

Be it known, that the Waupaca County Board of Supervisors Repealed and created Chapter 34 Waupaca County Zoning Ordinance on September 21, 2021. Published and effective as of September 30, 2021.

Be it known, that the Waupaca County Board of Supervisors Repealed and created Chapter 34 Waupaca County Zoning Ordinance on May 17, 2022. Published and effective as of May 26, 2022.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on June 20, 2023. Effective upon publication of June 29, 2023.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on June 18, 2024. Effective upon publication of July 9, 2024.

Be it known, that the Waupaca County Board of Supervisors enacted amendments to the Waupaca County Comprehensive Zoning Ordinance, Chapter 34 of the Waupaca County General Code of Ordinances on June 17, 2025. Effective upon publication of June 26, 2025.

Published in the Waupaca County Code of Ordinances, Chapter 34.

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1.0 Interpretation and Purposes

1.1 Objectives

To achieve the objectives outlined in Sections 59.69, 59.693, and 87.30, Wis. Stats., implement the Waupaca County Comprehensive Plan, and implement the Waupaca County Towns' Comprehensive Plans, the Board of Supervisors of Waupaca County ordains zoning regulations as follows:

1.2 Short Title

This Ordinance may be known as and may be cited as The Waupaca County Zoning Ordinance.

1.3 Purpose and Intent

This Ordinance is adopted in order to promote and to protect public health, safety, comfort, convenience, prosperity, aesthetics, and other aspects of the general welfare; and, more specifically, to fix reasonable standards to which buildings and structures shall conform, to regulate and restrict buildings in all of the unincorporated areas of the County, to guide the proper distribution and location of various land uses, to promote the safety and efficiency of the streets and highways, to provide for adequate light, air, sanitation and drainage, to conserve natural resources, to provide safety from fire and other hazards, to define the powers and duties to the administrative bodies as provided hereinafter, and to prescribe penalties for the violation of the provisions of this Ordinance or any amendment thereto.

1.4 Application of Overlapping Regulations

This Ordinance shall not repeal, impair, or modify private covenants or other municipal Ordinance, with the exception of Chapters 32 or 36 as stated below.

The Shoreland and Floodplain regulations of this Ordinance and of Chapters 32 and 36 of this Code of Ordinances, when applied within the jurisdictional area as defined in Sections 59.692 and 87.30, Wis. Stats., supplement and take precedence over the less restrictive provisions of the respective zones. Where the provisions of this Ordinance are more restrictive than similar provisions in Chapters 32 or 36, the provisions of this Ordinance shall prevail.

1.5 Enactment of Zoning Ordinance and its Effect

1. This Zoning Ordinance shall become effective per the procedures under Wisconsin Statutes Section 59.69. Each town within which this Zoning Ordinance applies has adopted the Ordinance independently of one another and generally on different dates, as follows:

Town	Date
Bear Creek	June 15, 2010
Caledonia	May 20, 2011
Dayton	April 13, 2011
Farmington	September 22, 2010
Helvetia	June 21, 2011
Iola	October 15, 2010
Larrabee	April 25, 2011
Lebanon	November 30, 2011
Lind	May 11, 2011
Little Wolf	September 29, 2010
Matteson	December 16, 2010
Mukwa	April 15, 2011
Royalton	January 19, 2011
Scandinavia	October 15, 2010
St. Lawrence	September 15, 2011
Union	April 27, 2011
Waupaca	June 7, 2011
Weyauwega	January 27, 2011
Wyoming	January 10, 2011

2. This Zoning Ordinance is a comprehensive revision to the Waupaca County Zoning Ordinance that, in part, carries forward by re-enactment some of the provisions of the regulations governing zoning and related matters, being previously known collectively as the Waupaca County Zoning Ordinance, adopted prior to the effective date of this comprehensive revision to the Zoning Ordinance. While it is the intention of this comprehensively revised Zoning Ordinance to repeal the prior Waupaca County Zoning Ordinance, it is also the intention to re-enact and continue in force such existing provisions so that all rights and liabilities that have accrued there under are preserved and may be enforced, unless explicitly surrendered by specific provisions of this Zoning Ordinance or altered by the Official Zoning Map.
3. All provisions of the Waupaca County Zoning Ordinance which existed prior to May 18, 2010 and which are not re-enacted herein are hereby repealed.
4. The adoption of this Zoning Ordinance shall not adversely affect the County's right to prosecute any violation of the predecessor Zoning Ordinance, provided that such violation occurred while that Zoning Ordinance was in effect.

1.6 General Interpretation

The following rules of construction shall apply to this Ordinance: The particular shall control the general; in case of any difference of meaning or implication between the text of this Ordinance and any caption or illustration, the text shall control; the word "shall" is always mandatory, whereas the word "may" is permissive; words used in the present tense shall include the future, and words used with singular number shall include the plural, and the plural the singular, unless the context clearly indicates the contrary; building or structure includes any part thereof; the phrase "used for" includes arranged for; the person includes an individual, a corporation, a partnership, an incorporated association or any other similar entity, unless the context clearly indicates the contrary. Where a regulation involves two (2) or more items, conditions, provisions or events connected by the conjunction and, or, either...or, the conjunction shall be interpreted as follows; and indicates that all the connected items, conditions, provisions or events shall apply, or indicates that the connected items, conditions or events may apply singly or in any combination; either...or indicates that the connected items, conditions, provisions or events shall apply singly, but not in combination; the masculine gender includes the feminine and the neutral. Words used in this Ordinance shall be defined first by referring to this Ordinance. If this Ordinance does not contain a definition for the word or words, then the word or words shall be as defined in a common English dictionary used by the Planning and Zoning Director.

1.7 Definitions of Words or Phrases

The following words, phrases and terms, wherever they occur in the Ordinance, shall be interpreted as herein defined. Definitions for land uses are outlined in Section 6.0.

1. **Accessory Use:** A use of land or structure or portion thereof customarily incidental and subordinate to the principal use of the land or structure and located on the same parcel with the principal use except for such accessory parking facilities as are specifically authorized to be located elsewhere, as distinguished from a principal use.

2. **Accessory Structure:** A subordinate structure, the use of which is incidental and customary to that of the principal structure, located on the same lot as the principal structure. No accessory structure or part thereof shall be used for living, sleeping, or eating quarters.

3. **Battery Energy Storage System, Accessory:** One or more devices capable of storing energy in order to serve the electrical needs of the principal use of the property as an uninterrupted power source, not to supply power primarily to the electric power grid.

2- 4. **Battery Energy Storage System, Standalone:** One or more devices capable of storing energy in order to supply electrical energy primarily to the power grid.

3-5. **Brew Pub:** A facility for the production of 31,000 gallons or less per year of fermented malt beverages in accordance with Wis. Stats. 125.295 in which a license to operate a restaurant has also been issued under Wis. Stats. 97.30 on the same premises.

4-6. **Brewery:** A facility for the production of fermented malt beverages, as defined in Chapter 125 of the Wis. Stats., that are sold wholesale and /or off premises directly to retailers as authorized by statute.

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~~5-7.~~ **Brewery, Micro:** A facility for the production of 100,000 gallons or less per year of fermented malt beverages, as defined in Chapter 125 of Wis. Stats., that are sold wholesale and/or off premises directly to retailers as authorized by statute.

~~6-8.~~ **Brewery, Nano:** A facility for the production of less than 10,000 gallons of fermented malt beverages per year that may be bottled, packaged, possessed, stored, sold, shipped, transported, delivered and/or consumed on premise in accordance with the provisions of Wis. Stats. 125.29. A nano-brewery may operate a restaurant on the brewery premises as provided in Wis. Stats. 125.29(6).

~~7-9.~~ **Buildable Area:** The specified portion of a lot within the building and setback lines.

~~8-10.~~ **Building:** Any structure which is built for the support, shelter, or enclosure of persons, animals, or property of any kind. Also see Structure.

~~9-11.~~ **Building Area:** The area bounded by the exterior dimensions of the outer walls at the ground line.

~~10-12.~~ **Building Coverage:** The percentage of a lot covered by principal buildings, accessory buildings, and all other structures with a roof.

~~11-13.~~ **Building Envelope:** The three dimensional space within which a structure is built.

~~12-14.~~ **Building, Principal:** The main building on a lot, intended for primary use as permitted by the regulations of the zone in which it is located.

~~13-15.~~ **Building, Public and Semi-Public:** Public and semi-public buildings, in the sense of this Ordinance, are structures principally of an institutional nature and serving a public need such as: churches, hospitals, rest homes, schools, including private academic schools and preschools, libraries, museums, post offices, police and fire stations, public and private utilities, and other public services, but not including the operation of a public bar, restaurant, or recreational facility as commercial enterprise.

~~14-16.~~ **Building, Service:** A structure which may contain a toilet, lavatory, and such other facilities as may be required by this Ordinance. Such structures shall be primarily designed and used for the operation of a manufactured/mobile home park, campgrounds, or camp. This shall include those buildings of a commercial nature which may be permitted by the Planning and Zoning Committee and also the home and/or office of the management.

~~15-17.~~ **Camping Unit:** A recreational vehicle (RV), motor home, pick-up coach, travel trailer, camping trailer, park model, cabin, yurt, or tent not exceeding four hundred (400) square feet.

~~16-18.~~ **Committee:** Waupaca County Planning and Zoning Committee.

~~17-19.~~ **Common Ownership:** Ownership by the same person or persons or by partnerships or corporations that are all wholly owned by the same person or persons. This includes joint tenancy and tenancy in common. Within the Farmland Preservation Overlay, a parcel owned by one member of a married couple is deemed to be owned by the married couple.

~~18-20.~~ **Condominium:** A form of ownership combining individual unit ownership with shared use and ownership of common property or facilities, established in accordance

with Chapter 703 of the Wisconsin Statutes, Condominium Ownership Act. Common areas and facilities are owned by all members of the condominium association on a proportional, undivided basis. A condominium is a legal form of ownership, and not a specific building type or style.

~~19-21.~~ **Contiguous:** Lots or parcels shall be considered contiguous if they share a common boundary. Land that is separated only by a navigable river, stream or creek, section line, public or private road, rail right-of-way, pipeline, transmission line, or other right-of-way or easement shall be considered contiguous. Lots or parcels that only meet at a single point are not considered contiguous.

~~20-22.~~ **County:** Reference to County shall mean Waupaca County including any agency department or committee thereof.

~~21-23.~~ **County Board:** Waupaca County Board of Supervisors.

~~24.~~ **Cul-de-Sac:** The end of a highway with only one (1) outlet and having a turn-around for the safe and convenient reversal of traffic movement.

~~25.~~ **Data Center:** A building, buildings, structures or containers which are occupied primarily by computers and/or telecommunications and related equipment where digital information is processed, transferred and/or stored, primarily to and from offsite locations. The use may also include air handlers, power generators, water cooling and storage facilities, utility substations, and other associated utility infrastructure to support operations at the data center. This use shall include cryptocurrency mining, blockchain transaction processing, server farms, etc. This use does not include computers or telecommunications related equipment that is secondary and customarily incidental to an otherwise permitted use on the property, such as servers associated with an office building.

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~~23-26.~~ **Daylight Hours:** As defined in the current Wisconsin Department of Natural Resources Hunting Regulations, in reference to Shooting Ranges for Firearms.

~~24-27.~~ **Density:** The number of development rights located within a specific land area. Existing residential dwelling units or equivalent principle uses within the parcel are included in this calculation.

~~25-28.~~ **Development Right:** The legally allowed residential or equivalent principle use development potential on a parcel of real property.

~~26-29.~~ **Development Site:** One or more parcels of land unified under common ownership which constitute the entire area of development shown on a site plan or subdivision plat.

~~27-30.~~ **Distillery:** A facility for the production of any beverage, except beer, made by a distillation process from agricultural grains, fruits, and sugars. For example: whiskey, brandy, gin, or rum.

~~28-31.~~ **Dwelling:** A structure designed, intended, or used as living or sleeping quarters for human habitation.

~~29-32.~~ **Dwelling, Unit:** A group of rooms constituting all or part of a dwelling, which are arranged, designed, used, or intended for use exclusively as living quarters for one

family and not more than an aggregate of two (2) roomers, and which include complete kitchen facilities permanently installed.

~~30-33.~~ **Family:** One or more persons related by blood, marriage, or adoption, or a group of not more than five (5) persons not so related, maintaining a common household in a dwelling unit.

~~31-34.~~ **Farm:** Land that is primarily devoted to agricultural use, having produced at least six thousand dollars (\$6,000) in gross farm revenues in the previous year, or at least eighteen thousand dollars (\$18,000) in the preceding three (3) years.

~~32-35.~~ **Farm Residence:** A single-family or duplex residence located on a farm that meets one of the following criteria:

- a. Is the only residential structure on a farm; or
- b. Is occupied by an owner or operator of the farm; or
- c. Is occupied by a parent or child of an owner or operator of the farm; or
- d. Is occupied by an individual who earns more than fifty percent (50%) of his or her gross income from the farm.

~~33-36.~~ **Farm Revenue, Gross:** Gross receipts from agricultural uses, less the cost of other basis of livestock or other agricultural items purchased for resale which are sold or otherwise disposed of during the taxable year and receipts accruing to the renter, but not rent paid to the land owner.

~~34-37.~~ **Floor Area, Gross:** For the purpose of determining requirements for off-street parking and off-street loading, the floor area shall mean the sum of the gross horizontal areas of several floors of the building, or portion thereof, devoted to such use, including accessory storage areas located within selling or working space, such as counters, racks or closets, and any basement floor area devoted to retailing activities to the production or processing of goods, or to business or professional offices.

~~35-38.~~ **Height:** Structure height is the measurement of the vertical line segment starting at the lowest point of any exposed wall and its intersect with the ground to a line horizontal to the highest point of a structure as described in Section 2.6.

~~36-39.~~ **Hobby farm:** A use of the land that is primarily residential in nature but may include the raising of livestock primarily for recreational purposes.

~~37-40.~~ **Junk:** Shall include, but is not limited to, old iron, steel, brass, copper, tin, lead, or other base metals; old cordage, ropes, rags, fibers, or fabrics; old rubber; old bottles or other glass; wastepaper and other waste or discarded material which might be prepared to be used again in some form; and inoperable appliances and machinery; and three (3) or more motor vehicles, no longer used as such, to be used for scrap metal or stripping of parts; but "junk" shall not include materials or objects accumulated by a person as by-products, waste, or scraps from the operation of his own on-going business or materials or objects held and used by a manufacturer as an integral part of his own manufacturing process.

~~38-41.~~ **Kitchen Facilities:** A room or area within a room whose primary purpose is to store, prepare and cook food. A kitchen will have a refrigerator to store food, counter space and a sink to prepare food, and a stove and/or range to cook food.

- 39-42. Livestock:** Bovine animals, equine animals, goats, poultry, sheep, swine, farm-raised deer, farm-raised game birds, camelids, ratites and farm raised fish.
- 40-43. Lot:** A buildable parcel of land represented and identified in a subdivision or minor subdivision as defined in Sections 2.2.48 and 2.2.69 of the Waupaca County Subdivision Ordinance.
- 41-44. Lot Area:** The area of contiguous land bounded by lot lines, exclusive of land provided for public thoroughfares.
- 42-45. Lot Area, Gross:** The area contained within the property lines of an individual parcel of land, including area to the centerline of any adjacent public street or railroad right-of-way or proscriptive easement.
- 43-46. Lot Depth:** The horizontal distance of a straight line drawn from the midpoint of the front property line to the midpoint of the rear property line.
- 44-47. Lot Lines:** A property boundary of any lot held in single or separate ownership; except where any portion of the lot extends into the abutting street or alley, the lot line shall be deemed to be the street or alley right-of-way.
- 45-48. Lot Width:** The horizontal distance between side lot lines measured at right angles to lot depth line at a point midway between the front and rear property lines. If the side property lines are not parallel, the width of the lot shall be the length of a line at right angles to the depth line or the lot at a distance midway from the front and rear property lines.
- 46-49. Navigable Water:** Lake Superior, Lake Michigan, all natural inland lakes within Wisconsin and all streams, ponds, sloughs, flowages and other waters within the territorial limits of this State, including the Wisconsin portion of boundary waters, which are navigable under the laws of this State. Under Wis. Stats. s. 281.31(2)(m), notwithstanding any other provision of law or administrative rule promulgated there under. Shoreland Ordinances required under Wis. Stats. s. 59.692, and ch. NR 115, Wis. Adm. Code, do not apply to lands adjacent to farm drainage ditches if:
- Such lands are not adjacent to a natural navigable stream or river.
 - Those parts of such drainage ditches adjacent to such lands were not navigable streams before ditching; and
 - Such lands are maintained in nonstructural agricultural use.
- 47-50. Nonconforming Use or Structure:** Any structure, land or water, lawfully used, occupied or erected at the time of the effective date of this Ordinance or amendments thereto, which does not conform to the regulations of this Ordinance or amendments thereto.
- 48-51. Nonfarm Residence:** Any residence other than a farm residence.
- 49-52. Ordinary Maintenance:** The work of keeping something in proper condition or upkeep. Ordinary maintenance includes painting, decorating, installation or repair of heating, electricity or plumbing systems; and installation or replacement of paneling, acoustical ceilings, insulation, doors, windows, roof surface materials or siding, provided the replacement is done with materials similar in nature of those being replaced. Structural alterations of any type are not included in ordinary maintenance.

- ~~50-53.~~ **Outlot:** A parcel of land not to be used for building purposes, so designated on a Plat or Certified Survey Map.
- ~~51-54.~~ **Parcel:** A single piece of land separately owned, either publicly or privately, and capable of being conveyed separately.
- ~~52-55.~~ **Patio:** A structure characterized by a flat, open, horizontal surface or platform and usually constructed of materials including, but not limited to, concrete, brick, flagstone, crushed stone, compacted stone, gravel, wood, or other natural or man-made materials, that are not associated with normal driveway or vehicle parking construction.
- ~~53-56.~~ **Person:** Any individual, firm, trust, partnership, public or private association or corporation; or partnership, firm, company, corporation, municipality, County, Town, State, Federal agency, whether tenant, owner, lessee, licensee, or its agent, heir, or assign.
- ~~54-57.~~ **Planning & Zoning Committee:** This Committee of Waupaca County as created by the Waupaca County Board of Supervisors to serve as the County Planning and Zoning agency.
- ~~55-58.~~ **Planning & Zoning Director:** The official appointed to administer this Ordinance and whose duties are outlined in the administration Section of the Ordinance.
- ~~56-59.~~ **Private Sewage Disposal System or Private Onsite Wastewater Treatment System (POWTS):** A sewage disposal system other than a public sewage disposal system, including septic tank, soil absorption systems, privies, holding tanks, and privately owned common sewerage facilities including package treatment plants, lagoons and irrigation systems.
- ~~57-60.~~ **Principal Use:** The primary or predominant use of land or a building, as distinguished from an accessory use.
- ~~58-61.~~ **Public Open Space:** Any publicly owned open area; including, but not limited to, the following: parks, playgrounds, forest preserves, beaches, waterways, parkways and streets.
- ~~59-62.~~ **Public Sewage Disposal System:** Sewers and sewage treatment facilities which are maintained and operated by a municipality or sanitary district.
- ~~60-63.~~ **Reconstruction:** To construct or rebuild again. Reconstruction refers to the replacement or rebuilding of a structure when any exterior portion or support of a structure is included. Reconstruction does not result in a substantial change in use of the subject area.
- ~~61-64.~~ **Recreational Vehicle:** A vehicle that is designed to be towed upon a highway by a motor vehicle; that is equipped and used, or intended to be used, primarily for temporary or recreational human habitation; that has walls of rigid construction; and that does not exceed forty-five (45) feet in length, including Class A, Class B and Class C motor homes, travel trailers, park models, camping trailers, fifth-wheel trailers, truck campers, but excluding tents, utility trailers, livestock trailers, manufactured homes, mobile homes, modular homes, and all other types of vehicles, shelters, and permanent or temporary dwellings. Recreational vehicles shall comply with all adopted standards of the Recreation Vehicle Industry Association (RVIA).

- ~~62-65.~~ **Renovate/ Remodel:** To restore to a former interior, or improve the interior of a structure. Renovating or remodeling does not result in a substantial change in use of the subject area.
- ~~63-66.~~ **Repair:** To restore to sound condition after damage or revitalize.
- ~~64-67.~~ **Seasonal Camp Site:** a site designated in a campground or camping resort that is intended to accommodate a camping unit, for a period of time exceeding thirty (30) days.
- ~~65-68.~~ **Section:** A land unit equal to one (1) square mile (2.59 square kilometers), six hundred forty (640) acres, or 1/36 of a township.
- ~~66-69.~~ **Setback:** The minimum allowable horizontal distance from a given point or line of reference or prospective line to the nearest vertical wall or other vertical element of a building or structure.
- ~~67-70.~~ **Sign:** A name, identification, description, display, or illustration which is affixed to or painted or represented directly or indirectly upon a building or other outdoor surface or piece of land; and which directs attention to an object, product, place, activity, person, institution, organization, or business. However, a sign shall not include any display of official court or public office notices, and it shall not include a sign located completely within an enclosed building unless the context shall be exposed to view from a street. Each display surface of a sign shall be considered to be a separate sign.
- ~~68-71.~~ **Site Area, Gross:** The entire land area located within a development site, including land within all easements, to the centerline of any adjoining roads, and environmentally constrained land, such as floodplains and wetlands, but not including land on the water side of the ordinary high water mark of navigable lakes, ponds, rivers and streams.
- ~~69-72.~~ **Street, Avenue, Place, Road, Terrace, Parkway, Boulevard or Court:** A right-of-way of a required width, which affords a primary means of access to abutting property.
- ~~70-73.~~ **Structural Alteration:** Any changes to an existing layout of space that will result in a change to the dimensions of a structure; involve the reconstruction, replacement or addition of exterior walls, foundation, or structural components; or change the pitch of the existing roof.
- ~~71-74.~~ **Structure:** Anything constructed, erected, or placed on a property that has shape, form and utility and which is temporarily or permanently attached to or resting on or in the ground, riverbed, or lakebed. The term "structure" includes, but is not limited to buildings, mobile homes, vehicles and trailers not in use for transportation purposes, above ground storage tanks, patios, decks, gazebos, above and below ground swimming pools, satellite dishes larger than one (1) meter in diameter, retaining walls, fences, towers. The term does not include filling or grading.
- ~~72-75.~~ **Substantial Evidence:** Facts and information, other than merely personal preferences or speculation, directly pertaining to the requirements and conditions an applicant must meet to obtain a Conditional Use Permit that reasonable persons would accept in support of a conclusion.

- ~~73-76.~~ **Suitable Area or Acreage:** Area of land capable of supporting and maintaining farm animals. Suitable areas do not include wetland areas, buildings, driveways, surface water, right of ways, and the like.
- ~~74-77.~~ **Temporary or Temporary Use:** Any period of time or use not to exceed thirty (30) days during the calendar year.
- ~~75-78.~~ **Transfer of Development Rights:** The ability to transfer development rights to contiguous parcels within the same Township provided that an owner is in common and the zoning district is the same.
- ~~76-79.~~ **Water Line:** The shortest straight line at the waterfront end of a lake or stream lot that lies wholly within the lot, provided that not less than seventy-five percent (75%) of the length of such water line shall be on, or on the landward side of, the high-water mark of such lake or stream.
- ~~77-80.~~ **Water Setback:** The distance which a building shall be required to be setback, placed, located, or erected from the water line.
- ~~78-81.~~ **Wine Pub:** A tavern, cocktail lounge, restaurant, grocery store, liquor store, or other similar retail establishment that includes a facility for the production of 20,000 gallons or less per year of wine as defined by Wis. Stats., that are sold for consumption on premises, or that are sold directly to the consumer as carry out items.
- ~~79-82.~~ **Winery:** A facility for the production of normally fermented juices and/or must of sound, ripe grapes, or other fruits or other agricultural products.
- ~~80-83.~~ **Winery, Micro:** A facility for the production of 25,000 gallons or less per year of normally fermented juices and/or must of sound, ripe grapes, or other fruits or other agricultural products, as defined in Chapter 125 of Wis. Stats., that are sold wholesale and/or off premises directly to retailers as authorized by statute.
- ~~81-84.~~ **Winery, Nano:** A facility for the production of less than 10,000 gallons of wine per year that may be bottled, packaged, possessed, stored, sold, sampled, shipped, transported, delivered and/or consumed on premise in accordance with the provisions of Wis. Stats. Ch 125.53. A nano-winery may also operate a restaurant on the winery premises in accordance with County and State permitting requirements
- ~~82-85.~~ **Yard:** An open space on a lot which is unoccupied and unobstructed from its lowest level to the sky.
- ~~83-86.~~ **Yard, Front:** The portion of the yard on the same lot with the principal building, located between the front line of the building and the front lot line and extending for the full width of the lot. The front yard shall be identified by where the address number providing the main access to the principal structure is located.
- ~~84-87.~~ **Yard, Rear:** The portion of the yard on the same lot with the principal building, located between the rear line of the building and the rear lot line and extending for the full width of the lot. The rear yard shall be opposite the front yard.
- ~~85-88.~~ **Yard, Side:** A yard extending along a lot line between the front and rear yards.



1.8 Severability Clause

If any section, provision, or portion of this Ordinance is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of this Ordinance shall not be affected thereby.

If any application of this Ordinance to a particular structure, land, or water is adjudged unconstitutional or invalid by a court of competent jurisdiction, such judgment shall not be applicable to any other structure, land, or water not specifically included in said judgment.

Zoning regulations adopted by Waupaca County, which incorporate by reference Wisconsin State Statute, also include existing or future amendments. This Ordinance shall be deemed to be in strict conformity, and not contrary to or inconsistent with such chapters or rules as the result of statutory amendments.

2.0 General Provisions

2.1 Compliance

Except as may be otherwise specifically provided, the use, size, height, and location of buildings now existing or hereafter erected, converted, enlarged, or structurally altered, the provisions of open spaces and the use of land shall be in compliance with the regulations established herein for the district in which such land or building is located.

2.2 Permits

1. All uses shall comply with all Zoning Ordinance standards on land use and dimensional requirements. Some uses require permits as a means of assuring compliance. It is a violation of this Ordinance for such a use to occur without a permit, regardless of whether or not the use is in compliance with the land use and dimensional standards of the Ordinance.
2. **Land Use Permit:** Unless exempted under Section 2.3, a Land Use Permit is required to be issued before any of the following may occur:
 - a. Before any building or structure, not excepted below, is erected, moved, or structurally altered; and
 - b. Before any building or structure or any parcel or tract of land is changed as to use.
 - c. **Exceptions:** A Land Use Permit shall not be required for the following:

- (1) Above ground swimming pools that are erected seasonally and do not have accessory decking.
 - (2) Retaining walls located outside the jurisdiction of Chapter 32 Shoreland Protection Ordinance.
 - (3) Signs, however, must comply with applicable regulations.
 - (4) Rooftop and building mounted solar panels used as part of an ~~small~~-Accessory ~~s~~Solar ~~e~~Energy Generating ~~s~~Systems.
 - (5) A five (5) foot by six (6) foot open platform for safe access to an egress/ingress on a principal structure. The allowed platform area:
 - a. May have a roof covering with up to a one (1) foot overhang;
 - b. May not be enclosed.
 - (6) The construction or maintenance of a hunting blind (maximum size limited to thirty-two (32) square feet).
 - (7) Special Events under 200 people.
 - (8) Walkways and sidewalks that are five (5) feet or less in width; and driveways.
 - (9) Trails, pathways, walkways and sidewalks that are designed and intended for public use.
 - (10) Fences, however, must be in accordance with Sec. 2.7(5) and Sec. 2.8(5)(c),
 - (11) Window wells extending five (5) feet or less from the foundation of the structure.
3. **Conditional Use Permit:** When the use being applied for is a conditional use as identified in Sections 5.0 and 6.0, a Conditional Use Permit is required.
 4. **Application Procedure:** The application procedures for Land Use Permits and Conditional Use Permits are outlined in Section 14.3 and 14.5. Site Plans are required for Conditional Uses and may be required for Land Use Permits according to Section 10.0.
 5. **Expiration:** Within two (2) years from issuance of a Land Use Permit for construction, the project shall have progressed at least to the point of the exterior shell being completed. The original permit shall lapse if this state of completion is not accomplished within the two (2)-year period. A new permit shall be required to recommence work on the project.

2.3 Exemptions

The following uses are exempted by this Ordinance and are permitted in any zoning district: poles, wires, cables, conduits, vaults, laterals, pipe mains, valves, or any other similar distributing equipment for telephone or other communications and electric power, gas, water, and sewer lines, and satellite dishes less than one (1) meter in diameter.

2.4 Use Regulations

1. **Restricted Uses:** In any zone no building or land shall be used and no building shall be hereafter erected, structurally altered, or relocated except for one or more of the

uses as hereinafter stated for that zone and in compliance with the regulations hereinafter established for that zone.

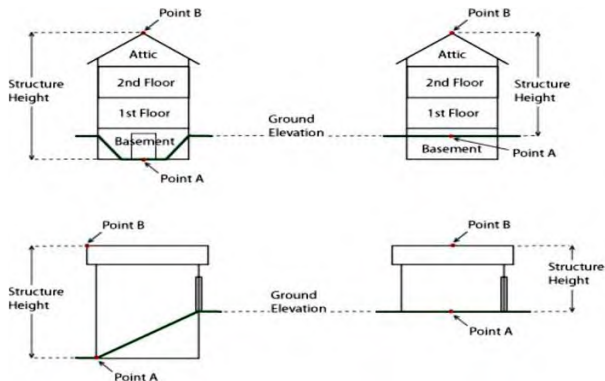
2. **Accessory Uses:** In any zone accessory buildings and uses customarily incidental to the permitted uses in that zone shall be permitted subject to such requirements as may be hereinafter designated for that zone in which they are located.
3. **Change/Expansion in Uses:** If a change/expansion in the use of the property occurs and that use is listed as a permitted use, then a Land Use Permit is required. If the new use is listed as a Conditional Use, then a Conditional Use Permit is required.

2.5 Area Regulations

1. **Lot Reduction:** After adoption of this Ordinance, no lot area shall be so reduced that the dimensional and setback requirements required by this Ordinance cannot be met.
2. **Building Over Lot Lines:** When the same entity owns more than one (1) contiguous lot and wishes to place a new building across lot lines or within minimum required lot line setbacks between lots in the same ownership, the two (2) or more lots shall be legally combined into one (1) lot before a Land Use Permit will be issued.
 - a. No lots shall be combined or created over township lines.

2.6 Height Regulations

1. **Height:** Structural height is the measurement of the vertical line segment starting at the lowest point of any exposed wall and its intersect with the ground (Point A in the following diagram) to a line horizontal to the highest point of a structure (Point B in the following diagram), unless specified under other sections of this code. (Refer to Table 4)



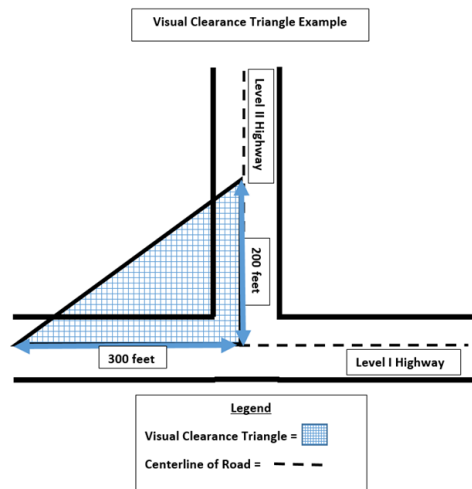
2. **Exemptions.** Heights of the following structures may exceed Ordinance limits as identified in Section 4.0 for the zone in which they are to be located: Cooling towers, stacks, lookout towers, silos, windmills, water towers, spires, radio and television aerials, masts, antenna, roof and building mounted solar panels, used as part of an Accessory Solar Energy Generating System and mechanical appurtenances and barns and other buildings designed for the storage of agricultural products.
 - a. Structures that are exempted from the height provisions of this ordinance shall comply with setback regulations of Section 2.8.

2.7 Visual Clearance

1. All State and Federal Highways in the County are hereby designated Level I Highways.
2. All County Trunk Highways not designated Level I are hereby designated Level II Highways.
3. Town Roads will hereby be designated as a Level III Highway.
4. In each quadrant of every highway intersection there shall be designated a visual clearance triangle bounded by the highway centerlines and a line connecting them.
 - a. The line along a Level I Highway centerline shall be three hundred (300) feet.
 - b. The line along a Level II Highway centerline shall be two hundred (200) feet.
 - c. The line along a Level III Highway centerline shall be one hundred fifty (150) feet.
 - (1) An exception to the dimensional requirements for the visual triangle shall be made in a registered and approved platted area where Level III Highways only

are involved. Here the visual triangle shall be bounded by the highway centerlines and a line connecting them, one hundred twenty-six (126) feet from the intersection.

5. Within the triangle described in par. 4 above, no structure over two (2) feet in height above these highways shall be allowed if it obstructs the view across the triangle.
 - a. Posts or fences a maximum of thirty percent (30%) solid and less than three (3) feet in height, natural vegetation, and agricultural crops are excluded from this provision.
 - b. Structures are allowed within the visual clearance triangle if the structure does not further obstruct the view across the triangle more than existing nonconforming structures and also meets all other applicable setback and height limitations.

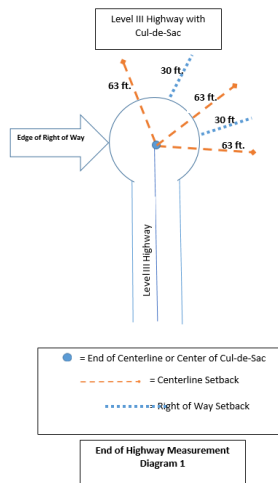


Visual Clearance Diagram 1

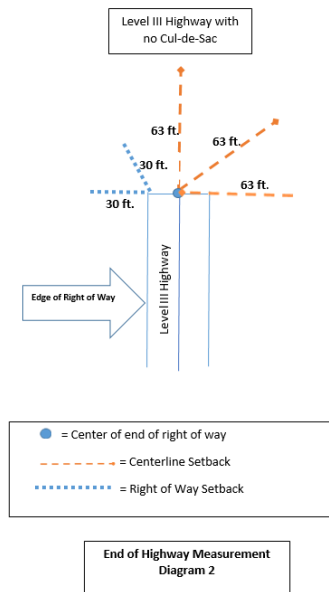
2.8 Setbacks

1. Setbacks are measured to the first vertical wall or post of any structure.
 - a. Roofs, overhangs, or other architectural features in excess of three (3) feet within any setbacks are not permitted.
2. Level I Highway setback shall be fifty (50) feet from the right-of-way line. Level II Highway setback shall be seventy-five (75) feet from the marked centerline of the highway or forty-two (42) feet from the right-of-way line, whichever is greater. Level III Highway setback shall be sixty-three (63) feet from the center of the travelled path or thirty (30) feet from the right-of-way line, whichever is greater.
 - a. Highway Setback Average

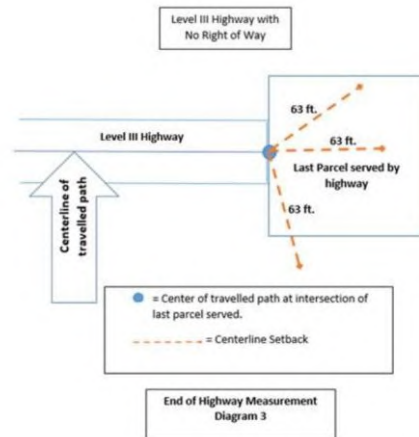
- (1) **Average Setback Determination:** The highway setbacks for Level III Highways found in Section 2.8 may be reduced, as described in par. (2), provided all the following are met:
 - (a) There is an existing structure located on an adjacent lot to the proposed building site on the same side of the highway.
 - (b) The existing structure(s) to be used in the averaging are within two hundred and fifty (250) feet of the proposed building site.
 - (c) The existing structure(s) do not meet the required highway setback.
 - (2) **Average Setback Application:** Where each adjacent lot has a structure closer than the required setback the average setback shall be calculated by averaging the highway setback distances of the existing adjacent structures. Where only one adjacent lot has a structure closer than the required setback, the average shall be calculated by averaging the setback distance of the structure on the adjacent lot with the required setback distance. The following shall also apply:
 - (a) The highway setback may not be reduced to less than twenty (20) feet to the right-of-way or fifty-three (53) feet to the center of the travelled path, whichever setback distance is greater.
 - (b) Where no right-of-way exists, the centerline of the as travelled Level III Highway shall be utilized for the measurement. The highway setback in this case may not be reduced below fifty-three (53) feet from the centerline.
- b. Level III Highway Setback Measurement at End of Highway
- (1) **Platted Cul-de-Sac.** Where the highway terminates in a platted cul-de-sac, the highway setback shall be measured thirty (30) feet from the edge of the right-of-way of the cul-de-sac or sixty-three (63) feet from the end of the centerline of the cul-de-sac identified on the plat, whichever is greater. Where the centerline is not identified on the plat the center point of the cul-de-sac shall be used for the sixty-three (63) foot setback.



- (2) Dead End. Where the highway terminates in a dead end with no cul-de-sac, the highway setback shall be measured thirty (30) feet from the edge of the right-of-way or sixty-three (63) feet from the center of the end of the highway, whichever is greater.



- (3) Where no right-of-way exists for Level III Highways the center of the travelled path shall be deemed to terminate at the parcel line for the last parcel served by the highway. The highway setback shall be measured sixty-three (63) feet from the intersection of the centerline of the travelled path of the highway and the parcel line of the last parcel served by the highway.



3. **Railroad Setbacks:** the minimum allowable horizontal distance from a parcel predominately utilized for railroad purposes to the nearest vertical wall or other vertical element of a building or structure.
 - a. All principal and accessory structures on a parcel abutting a lot used predominately for railroad purposes must meet the lot line setbacks specified in Table 4, except as noted in Section 2.8.5.f.
4. **Lot Line Setbacks**
 - a. All principal and accessory structures must meet the required setbacks as specified in Table 4, unless otherwise specified.
 - b. An accessory structure or use less than two hundred (200) square feet in area and located in a rear yard can be located seven and one-half (7 ½) feet from any lot line; however, highway setbacks shall be met.
5. **Setback Exemptions.** The following shall be exempt from all highway, railroad, and lot line setbacks except where necessary to provide visual clearance at highway intersections as described in Section 2.7:
 - a. Marquees and awnings adjoining the principal building's overhang roof eaves, driveways, ornamental light standards, flag poles, arbors, trellises, shrubs, retaining walls, outdoor fuel dispensing equipment, air conditioning units, and open accessory off-street parking spaces.
 - b. Walkways and sidewalks that are five (5) feet or less in width.

- c. Fences; however, those located within a highway setback shall be greater than seventy percent (70%) open if greater than four (4) feet in height.
 - d. Trails, pathways, walkways, and sidewalks that are designed and intended for public use.
 - e. A five (5) foot by six (6) foot open platform for safe access to an egress/ingress on a principal structure. The allowed platform area:
 - (1) May have a roof covering with up to a one (1) foot overhang;
 - (2) May not be enclosed.
 - f. Structures utilized for the loading and unloading of rail cars are exempted from railroad setbacks.
 - g. Window wells extending five (5) feet or less from the foundation of the structure.
 - h. Recreational vehicles, except that any accessory decking or accessory structures shall be required to meet applicable setbacks and obtain necessary permits.
 - i. Roof and building mounted solar panels used as part of an Accessory Solar Energy Generating System.
6. For the purpose of safety from structure failure in all zoning districts, any building or structure that is allowed to exceed thirty-five (35) feet in height per Table 4.0 and Section 2.6 must be set back from all parcel lines, property lines, and lot lines, a distance equal to the height of the building or structure, excepting amateur radio antennas.
- a. A reduced setback, equal to the designed radius for self-collapsing-type structures, may be authorized. A signed and sealed plan shall be submitted by a registered professional engineer verifying the applicable fall zone.
7. The county reserves the right to require a survey, at owner's expense, prior to issuance of a permit when a proposed structure is located, in the County's judgment, at or near the required setback to a property line.
8. **Reasonable Accommodations:** The Planning and Zoning Director may issue a special Land Use Permit to relax the standards of this ordinance in order to provide reasonable accommodations as required by Federal or State law. Such relaxation shall be the minimum necessary to be consistent with the Federal guidelines for accommodation of persons with disabilities and shall, where practicable, be terminated when the facility is no longer used by the disabled person. A person applying for a Land Use Permit for construction under this section shall establish the nature and extent of the disability and that the relaxation requested is the minimum necessary to provide reasonable use of the facility. A deed restriction or affidavit for the reasonable accommodation shall be filed with the Register of Deeds.

2.9 Setback Exceptions for Essential Service Facilities

Overhead and underground essential service facilities installed as of November 19, 2002, including, but not limited to, sewer and water utilities, electric power, and telecommunications, but not including any buildings, towers, or antennas, may be located within any required setback on the condition that the owner of such facilities within highway

setbacks shall remove all construction, additions, and replacements of these facilities at the owner's expense when necessary for the improvement of the highway.

Essential service facilities that are in place on private property within the highway setback prior to November 19, 2002 shall not be entitled to an exception to the setback requirement of the Zoning Ordinance.

The Waupaca County Highway Commissioner or his designee may grant a waiver to the owner of an essential service facility when the coordination of projects by the utility and the County reveals that no County project exists in the five (5)-year plan for the location where essential services facilities are to be placed or rebuilt or where the County is unable to determine the necessary right-of-way widths needed to avoid conflict with the service facility in the future.

2.10 Principal Residential Structures

Not more than one (1) principal residential structure shall be allowed on a parcel except for:

1. Manufactured/Mobile Home Communities or Parks;
2. A secondary farm residence and,
3. In the case where an existing residence is to be replaced with a new residence, the existing residence may be occupied during the construction of the new residence provided that it is razed or otherwise removed from the property within six (6) months of occupancy of the new residence.

2.11 Nonconforming Uses and Structures

1. **Nonconforming Use:** A nonconforming use is a principal use of land or premises that does not conform to the terms of this Ordinance, but which was lawfully in existence prior to adoption of this Ordinance. Later Zoning Ordinance amendments may also create nonconforming situations.
2. **Nonconforming Structure:** A nonconforming structure is a structure that does not conform to the terms of this Ordinance, but which was lawfully in existence prior to adoption of this Ordinance. Later Zoning Ordinance amendments may also create nonconforming situations.
3. **Premises:** A premise may be nonconforming both as to use and to structure.
4. **Provisions:** Provisions of this Ordinance shall not be construed to prevent the customary and necessary maintenance or repairs of buildings, utilities, and property in legal non-conforming situations.
5. **Legal Rights:** The legal rights of a nonconforming use or structure are defined below.

2.12 Premises Conforming as to Use, but Nonconforming as to Structural or Dimensional Standards

1. **Repair, Maintenance, Renovation, Rebuilding or Remodeling:** A structure that is nonconforming as to structural or dimensional standards may be repaired, maintained,

renovated, rebuilt or remodeled in the same building envelope as the existing nonconforming structure.

- a. Prior to a nonconforming structure being structurally altered or rebuilt, a land use permit shall be obtained that properly documents the building envelope of the nonconforming structure.
 - b. In the event that a nonconforming structure is removed in accordance with par. a. and not replaced prior to the expiration date of the land use permit, the structure will no longer be considered a nonconforming structure and may not be replaced.
2. **Expansion:** A structure that is nonconforming as to structural or dimensional standards may not be expanded or enlarged unless the expansion meets the required setback(s).
 3. **Damage:** Any lawful nonconforming structure damaged or destroyed by violent wind, vandalism, fire, flood, ice, snow, mold or infestation on or after March 2, 2006 may be restored or reconstructed, provided that the structure will be restored to the size, location and use it had immediately before the damage or destruction occurred, except if otherwise necessary to comply with Federal, State or County requirements.
 4. **Moving Structure:** Should such structure be moved, it shall thereafter conform to the regulations of the zone to which it is moved.

2.13 Nonconforming Use of Structures or Premises

1. **Limitations:** A nonconforming use may be expanded or enlarged provided the existing use isn't changed from the original nonconforming use or expanded beyond the original parcel of record.
2. **Discontinuance:** If such use is discontinued for twelve (12) consecutive months, any future use of the structure or premises shall conform to the regulations of the zone in which it is located.

2.14 Substandard Lots

1. No new lot shall be created and no existing lot shall be reduced in dimensions in a manner that does not meet the dimensional requirements of the zoning district in which it is located or as specified by the Waupaca County Subdivision Ordinance, whichever is larger.
2. Any lot or parcel legally created and indicated on a recorded subdivision plat, Certified Survey Map, assessor's plat, or conveyance and recorded in the office of the Register of Deeds for Waupaca County prior to June 3, 2010 may be used as a building site even though such lot or parcel does not conform to one or more minimum dimensional requirements of the district in which it is located, subject to the following conditions:
 - a. The use is permitted in the zoning district in which the lot is located.
 - b. The substandard lot is developed to comply with all other Ordinance requirements.
 - c. The substandard lot has never been developed with one or more of its structures placed partly upon an adjacent lot.

- d. A Land Use Permit is first obtained per Section 2.2.2.
 - e. Any variation to the above standards may only be obtained through a variance granted by the Board of Adjustment.
 - f. For nonfarm residences built within the Farmland Preservation Overlay, a rezone into RR-O or RC-O will be required.
3. Any parcel of land designated as an outlot on a Plat or Certified Survey Map may not be used for building purposes.

2.15 Accessory Uses and Structures

1. Accessory buildings, structures and uses are permitted in all zoning districts, except the Conservancy District, and they shall be compatible with the principal uses on a parcel. Accessory structures and buildings shall meet the following standards:
 - a. No accessory structure or part thereof shall be used for living, sleeping, or eating quarters, unless it is attached to and part of the principal building and complies with all applicable sanitary regulations. For the purpose of this subsection, an accessory structure is considered attached to the principal building if it is connected by a common wall or aboveground-enclosed breezeway, with the connection being at least five (5) feet in width. An enclosed breezeway must have a solid roof, floor, and walls; however, openings are allowed for windows, doors, skylights and similar features.
 - b. No commercial use shall be allowed in an accessory structure unless the property is appropriately zoned for the proposed use or a Land Use Permit for home occupation (see Section 6.5. 8 & 9) has been obtained.
 - c. In residential uses, no sanitary system or plumbing shall be allowed in an accessory structure if it is built prior to the dwelling.
 - d. The structure must be according to the site plan and meet all the required setbacks.
 - e. All other Sections of this Ordinance must be met.
2. **Accessory Use:** see definition in Section 1.7.1 and Section 2.4.2.
3. **Accessory Structure:** Any detached private garage, carport, or utility shed on a lot that primarily accommodates the sheltered parking of a vehicle, the storage of maintenance equipment to serve the same lot or a contiguous lot, or a detached shelter such as a gazebo. It also includes swimming pools, greenhouses, wind and solar energy systems for on-site residential use, and private kennels. Attached garages, attached carports, and decks shall be considered part of the principal building, not an accessory structure for the purpose of determining the required setbacks and the applicable fee for a Land Use Permit.
4. **Non-conforming:** See Sections Section 2.11, 2.12 and 2.13
5. **Campground:** See Section 6.9(5)
6. **Agricultural Accessory Structures:** See Section 6.10(5)
7. Portable Storage Facilities (includes shipping containers, portable on demand storage (PODS), and store and move (SAM) containers), buses, heavy-duty trucks and their

bodies, semi-trailers, freight containers, mobile homes, and similar items which are no longer in use for their designated purpose are prohibited from being used as an accessory structure.

- a. Portable Storage Facilities and freight containers may be used as an accessory structure in the Agriculture and Forestry zoning districts provided that they maintain a one hundred (100) foot setback from any lot line, including the right of way of the road
- b. Portable Storage Facilities and freight containers may be permitted to be used in the Rural Residential (RR) district through the Conditional Use permit process provided that they meet any standards applied through the Conditional Use permit process and also the following standards:
 1. The roof has a minimum pitch of 4/12.
 2. The item shall be sided with residential siding.
 3. The item's doors shall be concealed with or converted to, that of an accessory structure door.
- c. Portable Storage Facilities and freight containers may be permitted to be used in the Hamlet, Commercial, and Industrial Zoning Districts through the Conditional Use permit process provided that they meet any standards applied through the Conditional Use permit process and any required ordinance standards for structures.

8. The parking of a commercial type vehicle on a residential lot is allowed when such vehicle is owned or leased and operated by a person living in the dwelling unit and used on a daily basis for transportation to and from a separate work place. This provision does not apply to the storage of equipment, unless otherwise permitted, such as back-hoes, skid-steers, dump trucks, equipment trailers and other items that are inconsistent with the residential use of the property.

3.0 Zoning Districts and Maps

3.1 Establishment of Base Zoning Districts

1. In order to carry out the purpose and provisions of this Ordinance, the following base zoning districts in Sections 3.2 through 3.18 and their purposes are hereby established, and may be known by the accompanying abbreviations.
2. Regulations for each District including Density, Lot Size, Setbacks, and Building Height are identified for each District in Section 4.0.
3. Permitted and Conditional Uses are identified for each District in Section 5.0 and 5.1. Definitions, additional regulations and parking requirements for each land use are within Section 6.0.
4. The statement, "Please refer to the Waupaca County Density Management Tracking System maintained by the Waupaca County Planning & Zoning Department (811 Harding Street, Waupaca, WI) for current information on available residential development rights on this/these parcels," shall be recorded on each Certified Survey Map, plat, and plat of survey created for parcels within the following zoning districts:

- a. PVRF: Private Recreation and Forestry
- b. AE: Agriculture Enterprise
- c. AR: Agriculture Retention
- d. AWT: Agriculture and Woodland Transition
- e. RR: Rural Residential

3.2 PURF: Public Recreation and Forestry District

Purpose: To accommodate and maintain publicly owned property for the purpose of natural resource management and public outdoor recreation, parks and open space. The PURF zoning district corresponds with the Public Recreation and Forestry Enterprise or Forestry Preferred Land Use Category within the Waupaca County Comprehensive Plan.

3.3 PVRF: Private Recreation and Forestry District

Purpose: To maintain privately owned large tracts of forest and woodland areas that are managed to produce sustainable forest products and to provide quality outdoor recreation experiences. Selective cutting, sustained yield, and other practices of good forestry management shall be encouraged within the district.

Residential development shall be limited and placed on the landscape in a fashion that minimizes the fragmentation of large forest tracts and prevents conflicts between forest management, outdoor recreation, and residential land uses.

The PVRF zoning district corresponds with the Private Recreation and Forestry Enterprise or Forestry Preferred Land Use Category within the Waupaca County Comprehensive Plan.

3.4 AE: Agriculture Enterprise District

Purpose: To preserve and promote a full range of agricultural uses in areas where soil and other conditions are best suited to cultivation and livestock.

Nonfarm development shall be limited and placed on the landscape in a fashion that prevents conflicts between agricultural and residential land uses, and minimizes the loss of prime agricultural soils as identified by the Natural Resource Conservation Service. The AE zoning district corresponds with the Agriculture Enterprise or Agriculture Preferred Land Use Category within the Waupaca County Comprehensive Plan.

3.5 AR: Agriculture Retention District

Purpose: To preserve and promote a full range of agricultural uses in areas where soil and other conditions are best suited to cultivation and livestock.

Nonfarm development shall be limited and placed on the landscape in a fashion that prevents conflicts between agricultural and residential land uses, and minimizes the loss of prime agricultural soils as identified by the Natural Resource Conservation Service. Though still limited, residential densities are generally higher in the AR District than the AE District. The AR zoning district corresponds with the Agriculture Retention or Agriculture Preferred Land Use Category within the Waupaca County Comprehensive Plan.

3.6 AWT: Agriculture and Woodland Transition District

Purpose: To accommodate agricultural uses and woodlands, but also to allow for land use change or “transition” to residential and compatible uses within these areas driven primarily by market forces or land sale trends.

Nonfarm development shall be placed on the landscape in a fashion that prevents conflicts between agricultural, forestry, and residential land uses. The AWT zoning district corresponds with the Agriculture and Woodland Transition or Agriculture Preferred Land Use Category within the Waupaca County Comprehensive Plan.

3.7 CV: Conservancy District

Purpose: The intention of this district is to provide for general agricultural and open-space activities with the prohibition of any structures or buildings. It is intended to be used as a tool to preserve tracts of land that are to remain free from structural development, but can continue to be used for agriculture.

a. Requirements:

- (1) Minimum of five (5) acres, no maximum acreage required
- (2) Consistent with all Forestry (or PVRF (Private Recreation and Forestry) District) and Agriculture (or AE (Agriculture Enterprise) District, AR (Agriculture Retention) District and AWT (Agriculture and Woodland Transition) District) Planning Districts found within the Preferred Land Use Map.
- (3) Requires no development rights. Any existing development rights may exist but cannot be used in this district. They can be transferred in accordance with Sec. 7.6(2) and Sec. 8.7(1)(d).
- (4) Any existing or new structures are prohibited .
- (5) Property owners may rezone into the Conservancy District with approval of a Petition of Zoning Map Amendment and a document recorded detailing the acreage under the Conservancy District.
- (6) Once in the Conservancy District, property owners may adjust the acreage as long as it results in a greater or equal amount of acreage that remains in the Conservancy District. This procedure would also require a Petition for Zoning Map Amendment and a new document recorded detailing the change in acreage.
- (7) This Conservancy District is not the same as Chapter 47 Waupaca County Voluntary Conservation Easement Donation Ordinance which is administered through the Waupaca County Land & Water Conservation Department.

3.8 RR: Rural Residential District

Purpose: To accommodate existing and planned residential development including compatible neighborhood uses that rely on private on-site wastewater treatment systems and private wells in a rural setting.

Residential development shall be placed on the landscape in a fashion that allows the concentration of local services while minimizing the consumption of agricultural land, forested land, and open space. The RR zoning district corresponds with the Rural Residential or Residential Preferred Land Use Category within the Waupaca County Comprehensive Plan.

3.9 RR-O: Rural Residential - Overlay District

Purpose: To accommodate non-farm residential development including compatible neighborhood uses that rely on private on-site wastewater treatment systems and private wells within in a Farmland Preservation area.

Residential development shall be placed on the landscape in a fashion that minimizes the consumption of prime agricultural land, forested land or any existing agricultural operations in accordance with Wis Stats 91.48. The RR-O zoning district is only allowed in areas that are within the Farmland Preservation Eligibility areas in participating towns. This district is not a certified Farmland Preservation zoning district.

3.10 SR: Sewered Residential District

Purpose: To accommodate existing single and two-family residential development including compatible neighborhood uses that are currently served by public sewer. Lots may be as small as 20,000 (twenty thousand) square feet and shall be established in a fashion that maximizes the use of existing infrastructure and allows for the efficient expansion of infrastructure in the future. The SR zoning district corresponds with the Sewered Residential and the Residential Preferred Land Use Categories within the Waupaca County Comprehensive Plan.

3.11 PD: Planned Residential Development District

Purpose: To provide the means whereby land may be planned and developed as a unit for residential uses under standards and conditions which encourage good design and promote a stable, desirable living environment. This district is intended to permit flexibility and variety in development, to encourage the preservation of natural features and open space, and to minimize the present and future burdens upon the community as a whole which result from poor planning. Such developments shall be site designed as a total unit development and may be developed by sub-units in accordance with the approved overall site plan. All rezoning applications must be accompanied by a Site Plan according to Section 10.0. The PD zoning district corresponds with the Sewered Residential and the Residential Preferred Land Use Categories within the Waupaca County Comprehensive Plan.

3.12 H: Hamlet – Mixed Use District

Purpose: To accommodate historic or planned future collections of small-scale commercial, office institutional, residential, and open space uses in which community character is protected through building scale, appearance and signage. This district should be generally mapped at or near road crossings that serve as gathering points for rural communities, which are often referred to as hamlets or unincorporated communities. The district best corresponds with the Rural Crossroads-Mixed Use (RCM) or Hamlet Preferred Land Use Category within the Waupaca County Comprehensive Plan.

3.13 RC-N: Rural Commercial - Neighborhood District

Purpose: To accommodate rural commercial development that is generally neighborhood or locally oriented in areas well-served by the transportation system, does not conflict with adjacent land uses in terms of use or generated traffic, and is properly buffered from residential or other potentially conflicting land uses. The RC-N zoning district corresponds with the Rural Crossroads-Mixed Use and the Rural Commercial/Industrial or Commercial Preferred Land Use Categories within the Waupaca County Comprehensive Plan.

3.14 RC-G: Rural Commercial - General District

Purpose: To accommodate rural commercial development that includes uses that are generally more intensive than allowed in the RC-N District in areas that are well-served by the transportation system, does not conflict with adjacent land uses in terms of use or generated traffic, and is properly buffered from residential or other potentially conflicting land uses. These uses are generally oriented to the greater county and region rather than the neighborhood or community level. The RC-G zoning district corresponds with the Rural Commercial/Industrial or Commercial Preferred Land Use Category within the Waupaca County Comprehensive Plan.

3.15 RC-O: Rural Commercial – Overlay District

Purpose: To accommodate rural commercial development that is agriculturally related and in areas well-served by a transportation system, does not conflict with adjacent land uses in terms of use or generated traffic, and is properly buffered from residential or other potentially conflicting land uses. The RC-O zoning district is only allowed within the Farmland Preservation Eligibility areas in participating towns. An example of an allowable use would be a farm implement dealer/repair shop. This district is not a certified Farmland Preservation zoning district.

3.16 RI-G: Rural Industrial - General District

Purpose: To accommodate rural industrial development with a variety of lot sizes that is generally light intensity, in terms of noise, dirt, smoke, odor, physical appearance, traffic generated, etc., in areas that are well-served by the transportation system, does not conflict with adjacent land uses in terms of use or generated traffic, and is properly buffered from residential or other potentially conflicting land uses. The RI-G zoning district corresponds with the Rural Commercial/Industrial or Industrial Preferred Land Use Category within the Waupaca County Comprehensive Plan.

3.17 RI-I: Rural Industrial - Intensive District

Purpose: To accommodate rural industrial development with a variety of lot sizes that is generally more intensive than the RI-G District in areas that are well-served by the transportation system, does not conflict with adjacent land uses in terms of use or generated traffic, and is properly buffered from residential or other potentially conflicting land uses. The RI-I zoning district corresponds with the Rural Commercial/Industrial or Industrial Preferred Land Use Category within the Waupaca County Comprehensive Plan.

3.18 Incorporation of Maps

The locations and boundaries of the County's zones are shown on the zoning maps of each township, and accompanying detail maps, and referred to by references as the Zoning Map, Waupaca County, Wisconsin.

These maps together with all explanatory matter and regulations thereon are an integral part of this Ordinance. In the event of a conflict between zone boundaries shown on a township map and the County Zoning detail map, the latter shall govern and prevail.

Official copies of the zoning maps, together with a copy of this Ordinance, shall be kept by the Planning & Zoning Director and shall be available for public inspection during official hours. These maps shall be certified by the Chairman of the County Board and attested by the County Clerk. Any changes or amendments affecting zoning boundaries or explanatory matter shall be recorded on the applicable maps. All such changes shall be made in accordance with provisions of this Ordinance and Wisconsin Statutes, Sec. 59.69(5) (c), and as subsequently amended.

3.19 Boundaries of Zones

When uncertainty exists with respect to the boundaries of the various zones as shown on the zoning maps, the following rules shall apply:

1. When the width or lengths of boundaries are not clear, the scale of the map shall determine the approximate dimensions.
2. Zone boundaries are normally lot lines; section and quarter section lines; center lines of streets, highways, railroads or alleys.
3. Base zoning district boundaries shown as following or approximately following the limits of any city, village, town or the County boundary shall be construed as following such limits. Base zoning district boundaries shown as following the centerlines of streams, rivers or other continuously flowing navigable watercourses shall be construed as following the channel centerlines of such watercourses. The zoning district boundary shall be construed as moving with the channel centerline.
4. When uncertainty exists as to the precise location of the floodplain zone boundary line, the floodplain boundary maps shall govern in general and the zoning text shall govern specifically.
5. The Planning & Zoning Director and/or the Planning and Zoning Committee, in accordance with the provisions of this Ordinance, shall hear and decide the precise location of a zone boundary line when such line cannot otherwise be determined.
6. No lot or tax parcel shall be divided into more than one (1) base zoning district, unless that lot or tax parcel is legally divided so that new lot lines and new zoning boundaries coincide.

4.0 Base Zoning District Regulations

Table 4.0

Zoning District	Residential Density	Lot Size		Setbacks	Maximum Building Height
	Baseline ⁶	Minimum Area ⁷	Minimum Width	Highway Setback: Per Section 2.8 Waterfront: Per Shoreland Zoning Minimum Lot Line ⁸	
CV ⁶ Conservancy		5 Acres	100 Ft	None ⁶	None ⁶
PURF Public Recreation and Forestry		1 Acre	-	20 Ft	None
PVRF ⁵ Private Recreation and Forestry	1 unit/ 10 acres	1 Acre	150 Ft	20 Ft	35 Ft
AE ⁵ Agriculture Enterprise	1 unit/ 40 acres	1 Acre	100 Ft	20 Ft	35 Ft
AR ⁵ Agriculture Retention	1 unit/ 10 acres	1 Acre	100 Ft	20 Ft	35 Ft
AWT Agriculture and Woodland Transition	1 unit/ 2 acres	1 Acre	100 Ft	15 Ft	35 Ft
RR Rural Residential	1 unit/1 acre	1 Acre	100 Ft	15 Ft	35 Ft
RR-O Rural Residential - Overlay		2 Acre	100 Ft	15 Ft	35 Ft
SR Sewered Residential		20,000 SF	100 Ft	10 Ft	35 Ft
PD Planned Residential Development			75 Ft	10 Ft	35 - 60 Ft ²
H Hamlet		NONE	50 Ft	10 Ft	35 Ft
RC-N Rural Commercial - Neighborhood		-	50 Ft	10 ft ³	35 - 60 Ft ²
RC-O Rural Commercial - Overlay		2 Acre	50 Ft	10 ft ³	35 - 60 Ft ²
RC-G Rural Commercial - General		10,000 SF	75 Ft	10 ft ³	35 - 60 Ft ²
RI-G Rural Industrial - General		20,000 SF	150 Ft	20 Ft	35 - 60 Ft ²
RI-I Rural Industrial - Intensive		10,000 SF	75 Ft	20 Ft	35 - 60 Ft ²

Notes:

- 1 Lots located within shoreland areas are subject to the minimum lot sizes established in Chapter 32 Waupaca County Shoreland Protection Ordinance.
- 2 See Section 2.8.6
- 3 Minimum lot line setback shall be the same as neighboring lot zoning unless the neighboring lot is zoned RC-N or RC-G.
- 4 Accessory Uses and Structures less than 200 square feet in area in the rear yard can be located 7.5 feet from any property line; however, highway and any other applicable setback, shall be met.
- 5 Base Zoning District Regulations remain the same within the Farmland Preservation Overlay Districts, with the exception of minimum lot size, which is two (2) acres.
- 6 No Structures allowed per Section 6.10
- 7 Minimum Lot Sizes shall be measured exclusive of the road right-of-way, as defined in Sec. 2.0(40) of the Waupaca County Subdivision Ordinance.
- 8 Also see Section 8.0 Zoning District Overlays. Township overlay restrictions may be more restrictive than the baseline standards.

5.0 Zoning District Permitted and Conditional Uses

The following table identifies the Permitted (P), and Conditional uses (C) within the Waupaca County Zoning Districts. Definitions and additional requirements for these land uses are included in Section 6.0. See Table 5.1 for Special Regulations for Districts within Farmland Preservation Overlay.

Table 5.0	Zoning Districts ⁵																														
	CV	Conservancy District ⁴	PURF	Public Recreation and Forestry	PVRF	Private Recreation and Forestry	AE	Agriculture Enterprise	AR	Agriculture Retention	AWT	Agriculture and Woodland Transition	RR	Rural Residential	SR	Sewered Residential	PD	Planned Residential Development	H	Hamlet ¹	RC-N	Rural Commercial - Neighborhood	RC-G	Rural Commercial - General	RI-G	Rural Industrial - General	RI-I	Rural Industrial - Intensive	Land Use Definition and Requirements (Section #)		
Land Uses																															
RESIDENTIAL LAND USES																															
6.5																															
Single Family Residence (Nonfarm)				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P											1	
Dwelling less than 22 feet in Width				C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C											2	
Two Family Residence (Nonfarm)				P	C	P	P	P	P	C	P	P	P	P	P	P	P	P	P											3	
Multiple Family Residence										C	C	C	C	P	P	P	P	P	P											4	
Nonfarm Residential Cluster																														5	
Lot Clustering Density Bonus							C	C	C	C																				6	
Single Family Residence - Accessory to a Principal Commercial Use																			P	C	C									7	
Major Home Occupation				C	C	C	C	C											C												8
Minor Home Occupation				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P												9
Family Day Care Home				C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C												10
Bed and Breakfast Establishment				C	C	C	C	C	C	C	C	C	C	C	C	C	P	P													11
Manufactured/Mobile Home Community or Park																	C														12
Temporary Occupancy of RV (over 30 days)				C	C	C	C	C	C	C								C													13
COMMERCIAL LAND USES																															
6.6																															
Personal or Professional Service																		P	P	P	P	P	P	P	P	P	P	P	P	1	
Indoor Sales and Service																		P	P	P	P	P	P	P	P	P	P	P	P	2	
Medium Indoor Sales and Service																				C	P	P	P	P	P	P	P	P	P	3	
Large Indoor Sales and Service																					C	C	C	C	C	C	C	C	C	4	
Long Term Outdoor Display and Sale																					C	C	C	C	C	C	C	C	C	5	
Indoor Maintenance Service																			P	P	P	P	P	P	P	P	P	P	P	6	
Outdoor Maintenance Service																					C	C	C	C	C	C	C	C	C	7	
In-Vehicle Sales and Service																					C	C	C	C	C	C	C	C	C	8	
Commercial Entertainment																					C	P	P	P	P	P	P	P	P	9	
Indoor Shooting Ranges for Firearms																						C	C	C	C	C	C	C	C	10	
Commercial Indoor Lodging Facility																					C	C	P	P	P	P	P	P	P	11	
Resort Establishment																						C	P	P	P	P	P	P	P	12	
Group Day Care Center Facility																					C	P	P	P	P	P	P	P	P	13	
Group Day Care Center Facility - Accessory to a Principal Use				C	C	C	C	C	C	C	C	C	C	C	C	C	C	P	P	P	P	P	P	P	P	P	P	P	P	14	
Commercial Animal Facility				C	C	C	C	C													C	C	C	C	C	C	C	C	C	15	
Sexually-Oriented Business																						C	C	C	C	C	C	C	C	16	
Personal Storage Facility				C	C	C	C														P	P	P	P	P	P	P	P	P	17	
Indoor Storage or Wholesaling																						C	C	C	C	C	C	C	C	18	
Outdoor Storage or Wholesaling																							C	C	C	C	C	C	C	19	
Indoor Retail Sales Activity as an Accessory to Industrial or Indoor Storage and Wholesaling																								C	C	C	C	C	C	20	
Marinas and Boat Livers																							C	C	C	C	C	C	C	21	
Mobile Service Facilities & Support Structures ²				C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	22	
Commercial Wind Energy Systems				C	C	C	C	C	C													C	C	C	C	C	C	C	C	23	
General Temporary Outdoor Sales																			P	P	P	P	P	P	P	P	P	P	P	24	
Off-Site Commercial Parking				C	C	C	C	C									C	C	C	C	C	C	C	C	C	C	C	C	C	6.4	

Table 5.0 (continued)	Zoning Districts ⁵															
	CV	PURF	PVRF	AE	AR	AWT	RR	SR	PD	H	RC-N	RC-G	RI-G	RI-I	Land Use Definition and Requirements (Section #)	
Land Uses																
INDUSTRIAL LAND USES																6.7
Light Industrial Accessory Activity as an Accessory to Retail Sales or Service												C				1
Light Industrial											C	C	P ¹	P ¹		2
Heavy Industrial													C	C		3
Contractor Shop			C	C	C	C					C	P	P ¹	P ¹		4
Truck, Freight or Bus Terminal															C	5
Mineral Extraction (Non-Metallic)			C	C	C	C							C	C		6
Tow or Impoundment Yard													C	C		7
Salvage or Junk Yard														C		8
Solid or Hazardous Waste Facility														C		9
PUBLIC / INSTITUTIONAL LAND USES																6.8
Community Living Facility - 1 to 8 Residents			C	C	P	P	P	P	C	P						1
Community Living Facility - 9 to 15 Residents			C	C	C	C		C	C	C						2
Community Living Facility - 16 or More Residents			C	C	C	C		C	C							3
Outdoor Institutional			C	C	C	C	C	C	C	C	P ¹	P ¹				4
Airport					C	C							C	C		5
Minor Indoor Institutional		C	C	C	C	C	C	C	C	P ¹	P ¹	P ¹				6
Major Indoor Institutional		C	C	C	C	C	C	C	C		C	C				7
Public Service and Utility			C			C		C	C	C	C	C	C	C		8
Small Solar Energy Systems		P	P	P	P	P	P	P	P	P	P	P	P	P	P	9
Large Solar Energy Systems		C	C	C	C	C					C	C	C	C		10
Standalone Parking Lot											C	C				11
PARK / RECREATION LAND USES																6.9
Outdoor Public Recreation	C ⁴	P	P			P	P	P	P ¹	P	P	P				1
Outdoor-Recreation - Active		C	C			C	C	C	C		C	C				2
Outdoor Shooting Ranges for Firearms		C	C	C	C	C						C				3
Special Events (200 people or less)		P	P	P	P	P	P	P		P	P	P	P	P		4
Special Events (greater than 200 people)		C	C	C	C	C				C	C	C	C	C		4
Campgrounds and Camping Resorts		C	C	C	C				C		C					5
Vehicle Course or Track		C	C	C	C	C						P	P	P		6
OPEN LAND / AGRICULTURE USES																6.10
Agricultural Use	P ⁴		P	P	P	P	C									1
Agriculture - Animal Husbandry ³	P ⁴		P	P	P	P	C									2
Agriculture - Related Use			C	C	C	C					C					3
On-site Agricultural Retail		P	P	P	P											4
Agricultural Accessory Use			P	P	P	P										5
Outdoor Storage of Motor Vehicles, Farm Machinery and Collectibles			C	C	C	C										6
Agriculture Home Occupation			P	P	P	C										7
Farm Residence			P	P	P	P										8
Secondary Farm Residence			P	P	P	P										9
Forestry Management	P ⁴	P	P	P	P	P	P									10
Private Reception Venue			C	C	C	C										11

¹ Permitted use subject to site plan review as outlined in Section 10.0

² Mobile Service Facilities & Support Structures - New Structures and Class 1 Collocations require a Conditional Use Permit and Class 2 Collocations require a Land Use Permit as outlined in Chapter 48 Mobile Service Facilities & Support Structures Ordinance.

³ See Section 6.10.2 for permitted animal units within the PVRF zoning district and non-farm residential lots within the AE, AR, and AWT zoning districts.

⁴ No structures allowed as per Section 6.10.

⁵ Accessory Structures are permitted in all zoning districts, except the Conservancy District, as set forth in Sec. 2.15.

5.1 Special Regulations for Districts within Farmland Preservation Overlay

Table 5.1	Zoning Districts ¹⁰					
	Conservancy District ⁹	Private Recreation and Forestry	Agriculture Enterprise	Agriculture Retention	Rural Residential - Overlay	Rural Commercial - Overlay
Land Uses	CV	PVRF	AE	AR	RR-O	RC-O
RESIDENTIAL LAND USES						
Single Family Residence (Non-Farm)					P	1
Dwelling less than 22 feet in Width		C	C	C	C	2
Two Family Residence (Non-Farm)					P	3
Multiple Family Residence					C	4
Nonfarm Residential Cluster					P	5
Lot Clustering Density Bonus						6
Single Family Residence - Accessory to a Principal Commercial Use						C
Major Home Occupation ⁴		C	C	C	C	8
Minor Home Occupation ⁴		P	P	P	P	9
Family Day Care Home ⁴		C	C	C	C	10
Bed and Breakfast Establishment ⁴					C	P
Manufactured/Mobile Home Community or Park						12
Temporary Occupancy of RV (over 30 days)		C	C	C	C	13
COMMERCIAL LAND USES						
Personal or Professional Service						P ¹
Indoor Sales and Service						P ¹
Medium Indoor Sales and Service						C
Large Indoor Sales and Service						C
Long Term Outdoor Display and Sale						C
Indoor Maintenance Service						P ¹
Outdoor Maintenance Service						
In-Vehicle Sales and Service						C
Commercial Entertainment						P ¹
Indoor Shooting Ranges for Firearms						C
Commercial Indoor Lodging Facility						C
Resort Establishment						C
Group Day Care Center Facility						P ¹
Group Day Care Center Facility - Accessory to a Principal Use						
Commercial Animal Facility		C	C	C		
Sexually-Oriented Business						
Personal Storage Unit		C ⁴	C ⁴	C ⁴		P
Indoor Storage or Wholesaling						C
Outdoor Storage or Wholesaling						
Indoor Retail Sales Activity as an Accessory to Industrial or Indoor Storage and Wholesaling						
Marinas and Boat Liveries						
Mobile Service Facilities & Support Structures ^{2, 4, 8}		C	C	C	C	C
Commercial Wind Energy Systems ⁴		C	C	C	C	C
General Temporary Outdoor Sales						P
Off-Site Commercial Parking						

Table 5.1 (continued)		Zoning Districts ¹⁰						Land Use Definition and Requirements (Section #)
		Conservancy District ⁸	Private Recreation and Forestry	Agriculture Enterprise	Agriculture Retention	Rural Residential - Overlay	Rural Commercial - Overlay	
Land Uses		CV	PVRF	AE	AR	RRO	RCO	
INDUSTRIAL LAND USES								6.7
Light Industrial Accessory Activity as an Accessory to Retail Sales or Service								1
Light Industrial								2
Heavy Industrial								3
Contractor Shop ⁴			C	C	C		C	4
Truck, Freight or Bus Terminal ⁴			C	C	C			5
Mineral Extraction (Non-Metallic) ⁶			C	C	C			6
Tow and Impoundment Yards								7
Salvage or Junk Yard								8
Solid or Hazardous Waste Facility								9
PUBLIC / INSTITUTIONAL LAND USES								6.8
Community Living Facility - 1 to 8 Residents ⁵			C	C	C	P		1
Community Living Facility - 9 to 15 Residents ⁵			C	C	C			2
Community Living Facility - 16 or More Residents ⁵			C	C	C			3
Outdoor Institutional ⁵			C	C	C	C	P ¹	4
Airport ⁵					C			5
Minor Indoor Institutional ⁵			C	C	C	C	P ¹	6
Major Indoor Institutional ⁵			C	C	C	C	C	7
Public Service and Utility ⁸			C				C	8
Small Solar Energy Systems			P	P	P	P	P	9
Large Solar Energy Systems ⁴			C	C	C		C	10
Standalone Parking Lot								11
PARK / RECREATION LAND USES								6.9
Outdoor Public Recreation		C ⁹	P			P	P	1
Outdoor Recreation - Active ⁵			C			C	C	2
Outdoor Shooting Ranges for Firearms			C	C	C			3
Special Events (200 people or less)			P	P	P	P	P	4
Special Events (greater than 200 people)			C	C	C		C	4
Campgrounds and Camping Resorts ⁷			C		C			5
Vehicle Course or Track ⁷			C	C	C			6
OPEN LAND / AGRICULTURE USES								6.10
Agricultural Use		P ⁹	P	P	P	C ³		1
Agriculture - Animal Husbandry		P ⁹	P	P	P	C ³		2
Agriculture - Related Use			C	C	C		C	3
On-site Agricultural Retail			P	P	P			4
Agricultural Accessory Use			P	P	P	C		5
Outdoor Storage of Motor Vehicles, Farm Machinery and Collectibles			C	C	C			6
Agriculture Home Occupation			P	P	P			7
Farm Residences			P	P	P			8
Secondary Farm Residence			P	P	P			9
Forestry Management		P ⁹	P	P	P	P		10
Private Reception Venue			C ¹¹	C ¹¹	C ¹¹		C ¹¹	11

¹ Permitted use subject to site plan review as outlined in Section 10.0

² Mobile Service Facilities & Support Structures - New Structures and Class 1 Collocations require a Conditional Use Permit and Class 2 Collocations require a Land Use Permit as outlined in Chapter 48 Mobile Service Facilities & Support Structures Ordinance.

³ See Section 6.10.2 for permitted animal units within non-farm residential lots

⁴ Conditional use Permit shall be compliant with Wis Stats 91.01(1)

⁵ Conditional use Permit shall be compliant with Wis Stats 91.46(5)

⁶ Conditional use Permit shall be compliant with Wis Stats 91.46(6)

⁷ Open Space Use Only, unless there are permanent structures and for public use then compliant with 91.46(5)

⁸ Conditional Use Permits shall be compliant with Wis. Stats 91.46(4)

⁹ No Structures allowed as per Section 6.10.

¹⁰ Accessory Structures are permitted in all zoning districts, except the Conservancy District, as set forth in Sec. 2.15.

¹¹ Conditional Use Permits shall be compliant with Wis. Stats 91.46(1)

6.0 Land Use Definitions and Requirements

6.1 Land Use Interpretation

Section 5.0 broadly categorizes potential land uses in Waupaca County as Permitted (P), or Conditional Use (C) within the Zoning Districts. Definitions and additional requirements for these land uses are included in Sections 6.5 through 6.10. Any use not identified as Permitted (P) or Conditional (C) within a Zoning District is prohibited.

6.2 Conditional Uses

Certain uses are of such special nature and their effects are dependent upon specific circumstances as to make it impractical to determine in advance of where and when and under what conditions they should be permitted. These Conditional Uses may be appropriate within a specific zone provided conditions can be met as set forth in Section. 14.5. These uses may be authorized upon application to the Planning and Zoning Committee and are subject to the Committee's authorization of a Conditional Use Permit pursuant to Section. 14.5.

6.3 Site Plan Review

Applications for Conditional Uses must be accompanied by a Site Plan outlined under Section 10.0 and must also meet any additional requirements specified under each use. Some Permitted Uses may also require a Site Plan and are identified within Section 5.

6.4 Parking and Loading Requirements

1. Adequate off-street parking facilities shall be provided for all uses which generate vehicular traffic, and all required parking spaces shall have adequate access to a public road or street. Specific parking requirements are identified for the land uses defined in Sections 6.5 through 6.10. When a particular use is not listed, the parking requirement shall be that of the most similar use. When two (2) or more uses are combined, the total parking requirement shall be equal to the sum of the spaces required for each use, unless it is demonstrated by the applicant to the satisfaction of the Planning & Zoning Director that the combined uses result in a reduction of necessary parking spaces.
2. Parking access aisles shall have the following minimum widths:
 - a. Two-way aisles:

(1) Perpendicular parking:	24 feet
(2) Angled or parallel parking:	18 feet
 - b. One-way aisles:

(1) Perpendicular parking:	20 feet
(2) 60° angled parking:	18 feet
(3) 45° angled parking:	13 feet
(4) 30° angled parking:	11 feet
(5) Parallel parking:	12 feet

- c. If the degree of angle of parking provided is not listed, the aisle width required shall be the next largest angle of parking shown above.
- 3. All required parking spaces shall have a minimum area of one hundred sixty-two (162) square feet with a minimum width of nine (9) feet and a minimum length of eighteen (18) feet.
- 4. Parking that meets the number, location, and configuration required by the Americans with Disabilities Act (ADA) Standards for Accessible Design shall also be provided. These spaces count toward the number otherwise required for each use.
- 5. All commercial and industrial uses shall provide sufficient off-street loading space so that no public street, road or alley will be blocked by such activities.
- 6. Off-Site Parking that is identified as a Conditional Use (C) in a Zoning District must be located within the same zoning district as, and within 500 feet (measured nearest lot line to nearest lot line) of, the property being served, and shall be governed by the provisions of Sections 6.2 and 14.5 relating to Conditional Uses.
- 7. Standalone public parking lots are regulated by Sec. 6.8.11.

6.5 Residential Uses

- 1. **Single-Family Residence, Nonfarm:** Land uses consisting of a single detached building containing one (1) dwelling unit.
 - a. Parking required is two (2) spaces per dwelling unit.
 - b. This land use includes modular homes as defined in the Wisconsin Statutes Section 101.71(6) and manufactured homes as defined in the Wisconsin Administrative Code SPS 327. This does not include mobile homes as defined in the Wisconsin Statutes 101.91(10).
 - c. Within the Farmland Preservation Overlay a nonfarm single family residence is a type of “single-family dwelling” that is located on a farm, but does not meet the criteria for a “farm residence” as described in Section 6.10.8. Where located within the Farmland Preservation Overlay, this use shall require a rezone and meet the following performance standards in compliance with Wisconsin Statutes 91.48(1):
 - (1) The land is better suited for a use not allowed in the Farmland Preservation Overlay.
 - (2) The rezoning is consistent with any applicable comprehensive plan.
 - (3) The rezoning is substantially consistent with the Waupaca County Farmland Preservation Plan.
 - (4) The rezoning will not substantially impair or limit current or future agricultural use of surrounding parcels of land that are zoned for or legally restricted to agricultural use.
 - d. Dwellings less than twenty-two (22) feet in width shall be regulated by Sec. 6.5.2.
- 2. **Dwelling Less than Twenty-Two (22) Feet in Width:** Land uses consisting of a dwelling that is less than twenty-two (22) feet in width.

- a. The width measurement of the dwelling shall be measured from the exterior vertical walls of the structures but shall not include any decks, porches, screen rooms, patios, or the like.
 - b. Required parking is two (2) spaces per dwelling unit.
 - c. All residential dwellings under this section shall be skirted and have a proper foundation.
 - d. A contractor trailer may be used as a temporary office by a contractor for a permitted project not to exceed the projects duration without the requirement of a Conditional Use Permit.
 - e. In the Farmland Preservation Overlay, a dwelling less than twenty-two (22) feet in width must meet the standards for a Farm Residence as described in Section 6.10.8.
3. **Two-Family Residence, Nonfarm:** Land uses consisting of a building containing two (2) dwelling units. This includes dwelling units that are enclosed within a building or attached by a common floor or wall. Provisions of Section 6.5.1.a through c. apply. In the event of a proposed multi-family condominium form of ownership, the Condominium Declaration and the associated Plat needs to be reviewed for compliance with all regulations by the Planning and Zoning Office prior to being recorded in the Register of Deeds Office.
4. **Multi-Family Residence:** Land uses consisting of a building holding three (3) or more dwelling units. This includes apartment buildings and other dwelling units that are enclosed within a building or attached by a common floor or wall. Each dwelling unit may be owner-occupied or renter-occupied, with the building, lot, and/or unit in fee simple or condominium ownership. There shall be no more than one (1) structure for human habitation unless there is a Condominium Plat consistent with Wis. Stats. Ch. 703. In the event of a proposed multi-family condominium form of ownership, the Condominium Declaration and the associated Plat needs to be reviewed for compliance with all regulations by the Planning and Zoning Office prior to being recorded in the Register of Deeds Office.
- Required parking is two (2) spaces per dwelling unit.
5. **Nonfarm Residential Cluster, Land Use:** A grouping of more than one (1) nonfarm residence. This use shall meet the following performance standards:
- a. The parcels on which the nonfarm residences are located are contiguous.
 - b. Within a nonfarm residential cluster, each residence shall individually satisfy the requirements for a nonfarm residence as described in Section 65.1.c. The County imposes legal restrictions on the construction of the nonfarm residences so that if all of the nonfarm residences are constructed, each would satisfy the requirements for a “Nonfarm Residence”.
 - c. Any siting standards within the County Comprehensive Plan or applicable town comprehensive plan shall be met.
6. **Lot Clustering Density Bonus:** Clustered residential developments, adhering to the standards set forth in Section 9.0 of this Ordinance, are permitted one (1) additional

lot for every four (4) lots allowable per the base zoning district by approval of a Conditional Use Permit.

7. **Single-Family Residence – Accessory to a Principal Commercial Use:** Land uses consisting of a single-family residence that are accessory to a principal commercial use, for example, shopkeeper or employee. This residence may be attached to the commercial building or freestanding.

Required parking is two (2) spaces per dwelling unit.

8. **Home Occupation, Major:** A home-based family or professional business that is accessory to a principal residential use. The regulations for major home occupations are more flexible than for minor home occupations; as such, major home occupations require the issuance of a Conditional Use Permit.

- a. The business shall meet the following standards:

- (1) Economic activities must be performed within the dwelling or residential accessory structure. When the use is conducted entirely within the confines of the principal structure, it shall occupy no more than fifty percent (50%) of the gross floor area on the floor(s) where the use takes place.
- (2) The use is not potentially associated with nuisances such as odor, noise, heat, vibration, and radiation which are detectable at the property line.
- (3) The use does not pose a significant safety hazard.
- (4) The use shall be clearly incidental and secondary to the use of the property for residential purposes, and the appearance of the structure shall not be altered or the occupation be conducted in a manner that would cause the premises to differ from its residential character either by the use of colors, materials, construction, lighting, signs, or the emission of sounds, or vibrations that carry beyond the premises.
- (5) No more than two (2) persons in addition to those members of the family that are permanent residents of the premises shall be employed by the home occupation.
- (6) Conditional Use Permits granted for major home occupations shall be assigned only to a designated person who resides at the residential address. Such permits do not run with the land, and are not transferrable from person to person or from address to address.
- (7) As part of the process to grant the Conditional Use Permit for a major home occupation, the Planning and Zoning Committee may restrict the number and types of machinery and equipment used on the property, limit hours of operations, or attach other conditions to the approval to meet the standards for granting a Conditional Use Permit in Section 14.5 1.b.
- (8) In the Farmland Preservation Overlay, the major home occupation must meet the standards set forth in Section 6.10.7 for an Agricultural Home Occupation.

- b. The following list describes specific uses and their relation to major home occupations:

- (1) A major home occupation shall not involve the removal of sand, gravel, stone, topsoil, peat or moss for commercial purposes.
 - (2) A major home occupation shall not involve the serving of any beverage or food.
 - (3) A major home occupation shall not include the display, storage, or parking of materials, goods, supplies, or products other than those produced by the major home occupation to fill orders made by customers.
 - (4) A major home occupation shall not involve the onsite sale, resale, salvage, or wrecking of automobiles, trucks, boats, trailers, recreational vehicles, or other motorized vehicles.
 - (5) A major home occupation may not include body repair, other than “touchups”, of automobiles, trucks, boats, trailers, recreational vehicles, or other motorized vehicles.
 - (6) A major home occupation may include the repair and maintenance of automobiles, trucks, boats, trailers, recreational vehicles, or other motorized vehicles; however, the size of the operation shall be limited to a maximum of three (3) vehicle repair bays and no more than ten (10) vehicles total onsite at any time, not including property owner vehicles.
 - (7) A major home occupation may include firearm sales, service, and repair of firearms; however, there shall be no outdoor testing of the firearms. For outdoor shooting ranges, refer to section 6.9(3).
 - (8) A major home occupation may include the on-lot retail or wholesale of goods or materials that are accessory to the business.
9. **Home Occupation, Minor:** A small home-based family or professional business that is accessory to a principal residential use. This business includes economic activities performed within any dwelling that comply with the specified requirements listed below. Examples include, but are not limited to, personal and professional services, home offices, small beauty salons, handicrafts, and small machine repair. This use shall meet the following standards:
- a. These uses shall have limited outward appearance, including limited signage, parking, and customer traffic. The use shall be conducted entirely within the confines of the principal residential structure or accessory residential structures.
 - (1) Signage shall be limited to one (1) sign, the sign face shall not exceed thirty-two (32) square feet, the sign may not be illuminated, and the sign must meet the requirements of Section 11.
 - b. Home occupations shall include the employment of no additional persons other than the resident occupants.
 - c. The use shall not involve the serving of any beverage, food, the wholesale of goods or materials.
 - (1) The on-lot retail of goods or materials incidental and accessory to the Minor Home Occupation is allowed.

- d. The use shall not involve the removal of sand, gravel, stone, topsoil, peat or moss for commercial purposes.
 - e. Any off-street parking area provided shall be maintained reasonably dustless, and adequately screened from adjoining residential properties.
 - f. The use shall not include the outdoor operation of any machinery, power tools or other appliances, or produce excessive noise or odors.
 - g. The use shall not involve more than twenty (20%) percent of the classified floor area of the principal building.
 - h. The use shall not generate vehicular traffic beyond ten (10) trips per day, on an average monthly basis, above those generated by the household's use.
 - i. The display, storage, or parking of materials, goods, supplies, or equipment outside of the dwelling or accessory building is prohibited, except for the parking of a commercial type vehicle allowed in Section 2.15.8.
 - j. Any minor home occupation involving the onsite sale, resale, salvage, or wrecking of automobiles, trucks, boats, trailers, recreational vehicles, or other motorized vehicles shall be prohibited.
 - k. The minor home occupation shall not have more than the weekly delivery of materials to or from the premises.
 - l. In the Farmland Preservation Overlay, the minor home occupation must meet the standards set forth in Section 6.10.7 for an Agricultural Home Occupation.
10. **Family Day Care Home:** Land uses consisting of an occupied residence in which a qualified person or persons provide child care for four (4) to eight (8) children. The care of less than four (4) children is not subject to the regulations of this Ordinance.
- In the Farmland Preservation Overlay, the family day care home must meet the standards set forth in Section 6.10.7 for an Agricultural Home Occupation and the standards set forth in Section 6.8.6 for a Minor Indoor Institutional Use.
11. **Bed and Breakfast Establishment:** Land uses which provide lodging facilities that satisfy all of the following:
- a. Provides eight (8) or fewer rooms for rent to no more than a total of twenty (20) tourists or transients for more than ten (10) nights in a twelve (12) month period.
 - b. Provides no meals other than breakfast and provides the breakfast only to renters of the place.
 - c. Is the owner's personal residence.
 - d. Is occupied by the owner at the time of rental.
 - e. Was originally built and occupied as a single-family residence, or, prior to use as a place of lodging, was converted to use and occupied as a single-family residence.
 - f. One (1) parking space per bedroom is required.

- g. In the Farmland Preservation Overlay, the bed and breakfast establishment must meet the standards set forth in Section 6.10.7 for an Agricultural Home Occupation.

12. Manufactured/Mobile Home Community or Park: Land uses meeting the definitions and requirements of Wisconsin Administrative Code SPS 326.

The following standards shall apply to the design, construction and maintenance of any new manufactured/mobile home community or park and to the enlargement or addition to an existing community or park after the effective date of this Chapter. These standards shall be additional to all State statutes, codes and regulations. Although the following standards are mandatory, nothing herein shall be construed to prevent or limit the submission of unique, innovative designs to the Planning and Zoning Committee.

- a. The minimum size of any manufactured/mobile home park shall be ten (10) acres.

b. Lots

- (1) Dimensions and area shall not be less than as follows:
 - (a) Minimum width: 50 feet
 - (b) Minimum depth: 100 feet
 - (c) Minimum area: 6,500 square feet
- (2) All lots shall abut on a street within the park for at least fifteen (15) feet and shall have unobstructed street access. No lot shall abut on a public street, right-of-way, or property line of the park.
- (3) Corner lots located on the inside of any corner shall be of extra width sufficient to maintain front set back requirements on both streets.
- (4) No more than one (1) manufactured/mobile home shall be placed on a lot.
- (5) No manufactured/mobile home unit shall be parked outside of a designated lot.

- c. The **minimum width** of each manufactured/mobile home shall be a nominal 14 (fourteen) feet.

d. Setbacks applicable to each lot:

- (1) Minimum front yard setback: 20 feet
All yards that abut a street are “front yards.”
- (2) Minimum rear yard setback: 10 feet
- (3) Minimum distance between homes: 20 feet

e. Streets:

- (1) Each street and parking area shall be paved.
- (2) A streetlight shall be placed at each street corner within the park, at each entrance to the park, and at such other places along the street so that the distance between each light does not exceed two hundred twenty-two (225) feet as measured down the centerline of the street.

(3) All streets shall be maintained and plowed by the owner.

f. **Parking:**

- (1) Each lot shall have an off-street parking space having either a minimum width of twenty (20) feet and a minimum depth of twenty-four (24) feet or a minimum width of twelve (12) feet and a minimum depth of forty (40) feet.
- (2) If parking on any street is prohibited within the park, an additional parking area within the park shall be established containing one (1) parking space for every five (5) lots, or fraction thereof, which abuts on a street where parking is prohibited.
- (3) No parking shall be permitted on lot yards.

g. **Walkways** not less than three (3) feet wide and comprised of a hard surface shall be provided from the parking area of each lot up to and including the steps to the front door of each mobile and manufactured home.

h. **Utilities:**

- (1) Water, domestic waste disposal, natural gas (where available) and electrical utilities shall be provided to each lot.
- (2) All utilities, including telephone and cable TV, shall be placed underground.
- (3) Each lot shall be furnished with a minimum two hundred (200) amp electrical service.
- (4) The owner shall install one (1) large water meter contained in a manhole for the entire park. The design and construction of the park water distribution systems, the water meters, and the manhole shall meet such requirements as may be established.

i. **Open Areas:**

- (1) Each park shall have one (1) or more designated open area(s), which shall be easily accessible to all park residents, and which shall not include a street or the park boundary, and which shall be so located as to be free of traffic hazards.
- (2) The total size of such open areas shall be a minimum of five percent (5%) of the total land area of the park.
- (3) For every twenty-five (25) lots in the park, there shall be at least one (1) open area in the park having a minimum size of fifty (50) feet by one hundred (100) feet.

j. **Landscaping:**

- (1) Each lot shall be planted with at least one (1) tree and one (1) shrub. The tree shall be a deciduous tree.
- (2) All lots shall be sodded or planted in grass.
- (3) Trees, grass and landscape material shall be properly maintained and replaced to conform to the approved landscape plans and specifications.

k. Park Boundary/Buffer:

- (1) A thirty (30)-foot wide buffer zone shall be established around the entire perimeter of the park.
- (2) The buffer zone shall not be part of any lot.
- (3) A visual screen of compact hedges, decorative fences, coniferous trees and shrubs and other landscape materials, approved by the Planning and Zoning Committee, shall be installed and maintained in the buffer zone to substantially hide the interior of the park from view from any adjacent street or property.
- (4) The buffer zone shall be maintained by the owner and shall be free of rubbish, debris and weeds.

l. Home Installation:

- (1) Each manufactured/mobile home shall be secured with tie-downs and anchoring equipment.
- (2) All manufactured/mobile home units shall be skirted, or shall have a product which makes the home appear to be built upon a basement or foundation; shall be made of plastic, fiberglass, aluminum, metal or vinyl; and shall be of a permanent color or painted to match the manufactured/mobile home so as to enhance the general appearance thereof.

m. Accessory Structures:

- (1) Only one (1) accessory structure may be placed on each lot.
- (2) The following set back requirements apply to each accessory structure:
 - (a) Minimum front yard setback: 20 feet
 - (b) Minimum rear yard setback: 3 feet
 - (c) Minimum side yard setback: 3 feet
- (3) All accessory structures except for automobile garages, shall be located in the rear one-half (1/2) of the lot.
- (4) No accessory structure shall exceed one (1) story in height or four hundred (400) square feet in area.
 - (a) No structure may be attached or added to any manufactured/mobile home except as follows:
 - i. The proposed design and construction standards shall be submitted to the Planning & Zoning Director before commencement of work on the structure.
 - ii. The Planning & Zoning Director shall review and approve the project only if the structure is designed to architecturally blend with the manufactured/mobile home.

- 13. Temporary Occupancy of Recreational Vehicle:** The occupancy of a recreational vehicle that is equipped and used, or intended to be used, primarily for temporary or recreational human habitation; and that does not exceed forty-five (45) feet in length.

This use does not include tents, utility trailers, livestock trailers, manufactured homes, mobile homes, modular homes, and all other types of vehicles, shelters, and permanent or temporary dwellings. This use shall meet the following performance standards:

- a. The recreational vehicle shall comply with all adopted standards of the Recreation Vehicle Industry Association (RVIA).
- b. Recreational vehicles may be used for temporary parking and living purposes on parcels without an existing dwelling for a period not to exceed thirty (30) days during the calendar year. A Conditional Use Permit shall be obtained if such use is proposed to continue for a period in excess of thirty (30) days during the calendar year and the proposed use is located within a district that allows such use.
- c. The recreational vehicle shall remain “road ready” at all times.
- d. The wheels or any similar transporting devices of any recreational vehicle shall not be removed except for repair, and any such recreational vehicle shall not be otherwise fixed to the ground in any manner that would prevent ready removal.
- e. The parking of one (1) recreational vehicle on an existing residentially developed property is permitted, provided no living quarter shall be maintained in excess of thirty (30) days during the calendar year, and no business is conducted within the recreational vehicle.

6.6 Commercial Uses

1. **Personal or Professional Service:** Land uses that are exclusively indoor whose primary function is the provision of services directly to an individual on a walk-in or on an appointment basis. Examples of such land uses include, but are not limited to, professional services, insurance services, realty offices, financial services, medical offices and clinics, veterinary clinics, barber shops, beauty shops, and related land uses.

Required parking is one (1) parking space per three hundred (300) square feet of gross floor area in the principal building(s).

2. **Indoor Sales and Service:** Land uses which conduct or display sales or rental merchandise or equipment, or non-personal or non-professional services, entirely within an enclosed building with a footprint smaller than twenty thousand (20,000) square feet. This includes general merchandise stores, grocery stores, bait shops, sporting goods stores, antique stores, gift shops, laundromats, artisan and artist studios, bakeries, and the like. Artisan craft production such as consumer ceramics, custom woodworking, or other production activities directly associated with retail sales are regulated as “light industrial activities as an accessory to retail sales or service.”

Required parking is one (1) parking space per three hundred (300) square feet of gross floor area in the principal building(s).

3. **Medium Indoor Sales and Service:** Land uses which conduct or display sales or rental merchandise or equipment, or non-personal or non-professional services,

entirely within an enclosed building with a footprint of twenty thousand (20,000) square feet to less than fifty thousand (50,000) square feet.

Required parking is one (1) parking space per three hundred (300) square feet of gross floor area in the principal building(s).

4. **Large Indoor Sales and Service:** Land uses which conduct or display sales or rental merchandise or equipment, or non-personal or non-professional services, entirely within an enclosed building with a footprint of fifty thousand (50,000) square feet or greater.

Required parking is one (1) parking space per three hundred (300) square feet of gross floor area in the principal building(s).

5. **Long-Term Outdoor Display and Sale:** Land uses which conduct sales or display merchandise or equipment on a long-term basis outside of an enclosed building as a principal accessory use of the lot. Examples of such land uses would include vehicle and equipment sales and rental, used cars sales, manufactured housing sales, monument sales, flea markets, and farmer's markets and garden centers when not meeting the standards for an Agriculture Related Use as described in Section 6.10.3. Such land uses do not include the storage or display of inoperative vehicles or equipment, or other materials typically associated with a junk or salvage yard or other permanent outdoor land uses specifically defined by the Zoning Ordinance.

Required parking includes one (1) space per three hundred (300) square feet of gross floor area in the principal building(s), plus one (1) space per two thousand (2,000) square feet of outdoor sales or display area.

6. **Indoor Maintenance Service:** Land uses which perform maintenance services, including repair, and contain all operations, except loading, entirely within an enclosed building. Examples of such land uses include, but are not limited to, auto body repair, auto repair and equipment repair.

Required parking is one (1) parking space per three hundred (300) square feet of gross floor area in the principal building(s).

7. **Outdoor Maintenance Service:** Land uses which perform maintenance services, including repair, and have all, or any portion of, their operations located outside of an enclosed building. Examples of such land uses include, but are not limited to, auto body repair, auto repair, equipment repair, and towing service. A towing service may not operate a tow yard unless it is properly permitted by Section 6.7.7.

Required parking includes one (1) parking space per three hundred (300) square feet of gross floor area in the principal building(s), plus adequate parking for the storage of vehicles awaiting service or pick-up.

8. **In-Vehicle Sales and Service:** Land uses which perform sales and/or services to persons in vehicles, or to vehicles which may be occupied at the time of such activity. Such land uses often have traffic volumes which exhibit their highest levels concurrent with peak traffic flows on adjacent roads. Examples of such land uses include walk-in, drive-in, drive-up, and drive-through facilities, vehicular fuel stations, food trucks or retail vehicles (greater than thirty (30) calendar days), and all forms of car washes.

Required parking is one (1) parking space per one hundred fifty (150) square feet of gross floor area in the principal building(s).

9. **Commercial Entertainment:** Land uses which provide entertainment services. Such activities often have operating hours that extends significantly later than most other commercial land uses. Examples of such land uses include restaurants, banquet halls, beer gardens, taverns, brew pubs, wine pubs, nano-breweries and nano-wineries provided they have a restaurant or tavern, theaters, health or fitness centers, all forms of training studios (dance, art, martial arts, etc.), bowling alleys, arcades, roller rinks, and pool halls. Such land uses do not include sexually-oriented businesses. See Section 6.6.15 for applicable regulations.

Required parking is one (1) parking space per every three (3) patron seats or one (1) space per three (3) persons at the maximum capacity of the establishment, whichever is greater.

10. **Indoor Shooting Ranges:** Land uses where people may participate in recreation, competition, skill and development training with firearms conducted entirely indoors, provided the following standards are met:
- All safety precautions shall meet or exceed the standards listed in the National Rifle Association Range Source Book, 1999; or successor sourcebook.
 - Prior to operation, the shooting range shall be deemed consistent with the Best Management Practices found in the National Rifle Association Range Source Book, 1999; or successor sourcebook, by the Department of Natural Resources and/or by the National Rifle Association Technical Advisory Team.

11. **Commercial Indoor Lodging Facility:** Land uses which provide overnight housing in individual rooms or suites of rooms, each room or suite having a private bathroom. Such land uses may provide in-room or in-suite kitchens, and may also provide indoor recreational facilities for the exclusive use of their customers. Restaurant, arcades, fitness centers, and other on-site facilities available to non-lodgers are not considered accessory uses and therefore require review as a separate land use.

Required parking is one (1) space per room or suite, plus one (1) space for every employee on the largest working shift.

12. **Resort Establishment:** Land uses which provide overnight housing in individual rooms, suites of rooms, cabins, or cottages. Such land uses may also provide indoor and outdoor recreational facilities for the exclusive use of their customers. Restaurants, arcades, fitness centers, and other on-site facilities available to non-lodgers are considered accessory uses and therefore do not require review as a separate land use.
- Required parking is one (1) space per room, suite, cabin, or cottage, plus one (1) space for every employee on the largest working shift.
 - The maximum number of occupancy units in a resort shall not exceed a density of ten (10) units per acre in any zoning district.
13. **Group Day Care Center Facility:** Land uses in which qualified persons provide child care services for nine (9) or more children. Examples of such land uses include day care centers and preschools. Such land uses shall not be located within a residential building. Such land uses may be operated on a for-profit or a not-for-

profit basis. Such land uses may be operated in conjunction with another principal land use on the same environs, such as a church, school, business, or civic organization, which may require a Conditional Use Permit.

Required parking is one (1) parking space per every six (6)-person capacity of the center, plus one (1) space for each employee on the largest working shift.

14. **Commercial Animal Facility:** Land uses where nonfarm animals six (6) months of age or older are bred by a person providing facilities for breeding and the offspring are sold, or where animals are received for care, training, grooming and boarding for compensation, excluding personal pets. This would include a small animal hospital, clinic, or pet shop. These uses include exercise yards, fields, training areas, and trails.
 - a. Required parking is one (1) parking space per every one thousand (1,000) square feet of gross floor area.
 - b. When located within the Farmland Preservation Overlay and the animals are not livestock, the facility must meet the definition provided in State Statute 91.01(1)d.
15. **Sexually-Oriented Business:** Land uses that include any facility involving the display of sexually-oriented materials such as videos, movies, slides, photos, books, or magazines; or actual persons displaying and/or touching sexually specified areas.
 - a. Required parking is one (1) space per every three hundred (300) square feet of gross floor area in the principal building(s) or one (1) space per person at the maximum capacity of the establishment, whichever is greater.
 - b. The outward appearance of an adult-oriented business shall not detract from the ability of neighboring businesses to attract customers.
 - c. No sexually-oriented business shall be located within a one thousand (1,000) foot radius of any place of worship, park, school, residential zoning district, residential use, or licensed child daycare center, as measured in a straight line, without regard to intervening structures, streets or other barriers from the nearest point of the property line of the school, park, place of worship, residential zoning district, residential use, or licensed child daycare center, to the nearest point of the property line of the sexually-oriented business.
 - d. No sexually-oriented business shall be allowed within a one thousand (1,000) foot radius of another sexually oriented business.
16. **Personal Storage Facility:** Land uses oriented to the indoor and outdoor storage of personal items, e.g. mini-warehouse facilities. Such storage areas shall be available on either a condominium or rental basis. Onsite retail is prohibited, although General Temporary Outdoor Sales is permitted in accordance with Table 5 and Table 5.1.
 - a. When located within the Farmland Preservation Overlay the mini-warehouse must meet the definition provided in State Statute 91.01(1).
 - b. All outdoor storage shall be enclosed with a minimum eight (8) foot tall opaque fencing or berming. All fencing shall also comply with Sec. 2.7(4) and 2.8(5).
17. **Indoor Storage or Wholesaling:** Land uses primarily oriented to the receiving, holding, and shipping of materials for a single business or a single group of businesses. With the exception of loading and parking facilities, such land uses are contained entirely within an enclosed building. Examples of this land use include

conventional warehouse facilities, long-term indoor storage facilities, and joint warehouse and storage facilities, but not uses described in the mini-warehouse land use category.

- a. Retail outlets associated with this principal use shall be considered an accessory use.
- b. Required parking is one (1) parking space per two thousand (2,000) square feet of gross floor area in the principal building(s).

18. **Outdoor Storage or Wholesaling:** Land uses primarily oriented to the receiving, holding, and shipping of materials for a single business or a single group of businesses. Such a land use in which any activity beyond loading and parking is located outdoors is considered an outdoor storage and wholesaling land use. Examples of this land use include equipment yards, lumber yards, coal yards, landscaping materials yard, tank farms, construction materials yards, and shipping materials yards. Such land uses do not include the storage of inoperative vehicles or equipment, or other materials typically associated with a junkyard or salvage yard. Contractors' storage yards are considered accessory in the "contractor shop" land use category.

- a. Retail outlets associated with this principal use shall be considered an accessory use.
- b. Required parking is one (1) parking space for every ten thousand (10,000) square feet of gross storage area, plus one (1) space per each employee on the largest work shift.

19. **Indoor Retail Sales Activity as an Accessory to Industrial or Indoor Storage and Wholesaling:** Land uses that include any retail sales conducted exclusively indoors which are clearly incidental to an industrial facility or indoor storage and wholesaling facility on the same site.

20. **Marinas and Boat Liveries:** Land uses including a dock or basin providing secure moorings for watercraft or the rental of watercraft. This use may also include boat repair, chartering, supply, fueling, boat ramps, and other facilities.

- a. Required parking is one (1) space for every two (2) slips or berths plus one (1) space per each employee on the largest work shift. Facilities that include a boat ramp should provide an additional fifteen (15) parking spaces per launching lane.
- b. Facilities shall be located at least five hundred (500) feet from public bathing beaches, parks and boat access points.
- c. Facilities shall be designed and constructed as to not interfere with adjacent riparian owner's uses of the water for swimming, fishing or boating; and not interfere or obstruct the public's free navigation.
- d. Fueling pumps and tanks shall be located two (2) feet above the normal water elevation, and no fuel hose shall extend beyond a point necessary to fuel boats as the closest proximity to land.
- e. Marinas shall be equipped with facilities for the disposition of domestic waste from boats.

- f. The following standards shall apply to marinas:
 - (1) Minimum lot area in square feet: 43,560 sq. feet (1 acre)
 - (2) Minimum lot width at the building or waterline: 200 feet
 - (3) Maximum building height: 20 feet
 - g. The following standards shall apply to boat liveries:
 - (1) Minimum lot area in square feet: 25,000 sq. feet
 - (2) Minimum lot width at the building or waterline: 125 feet
 - (3) Maximum building height: 20 feet
 - h. If located within the (F-P) Floodplain Zone or (RP) Resource Protection Overlay District, subject to periodic flooding, the provisions of the Waupaca County Floodplain Ordinance, Chapter 36, and Waupaca County Shoreland Protection Ordinance, Chapter 32, shall also apply.
- 21. **Mobile Service Facilities and Support Structures:** For requirements, see the Mobile Service Facilities and Support Structures Ordinance, Chapter 48.
 - 22. **Commercial Wind Energy Systems:** See Section 12.0 for requirements.
 - 23. **General Temporary Outdoor Sales:** The display of any items outside the confines of a building that is not otherwise allowed as a permitted or conditional use. Examples of this land use include, but are not limited to, seasonal garden shops, tent sales, bratwurst stands, and garage sales; however, up to six (6) three (3) day garage sales are exempt from the provision of this Section. This use shall meet the following performance standards:
 - a. Display shall be limited to a maximum of thirty (30) days in any calendar year.
 - b. Display shall not obstruct pedestrian or vehicular circulation, including vehicular sign distances.
 - c. Adequate parking shall be provided.
 - d. If the subject property is located adjacent to a residentially zoned area, sales and display activities shall be limited to daylight hours.

6.7 Industrial Uses

- 1. **Light Industrial Activity as an Accessory to Retail Sales or Service:** Land uses that include any light industrial activity conducted exclusively indoors which is clearly incidental to indoor sales or service on the same site.
- 2. **Light Industrial:** Land uses which operations, with the exception of loading operations, are conducted entirely within an enclosed building and are not potentially associated with nuisances such as odor, noise, heat, vibration, and radiation which are detectable at the property line; do not pose a significant safety hazard; and comply with all of the applicable performance standards. Examples of this use include nano-breweries and nano-wineries.

- a. Light industrial land uses may conduct retail sales activity as an accessory use.
 - b. Required parking is one (1) parking space per each employee on the largest work shift.
3. **Heavy Industrial:** Land uses which meet one (1) or more of the following criteria: are not conducted entirely within an enclosed building; are potentially associated with nuisances such as odor, noise, heat, vibration, and radiation which are detectable at the property line; and pose a significant safety hazard, such as danger of explosion. Examples of heavy industrial land uses include meat product producers; breweries, micro-breweries, wineries, micro-wineries, distilleries and their accessory sample tasting; paper, pulp or paperboard producers; chemical dealers and/or storage facilities; chemical and allied product producers, except drug producers, but including poison or fertilizer producers; petroleum and coal product producers; asphalt, concrete or cement producers; tanneries; stone, clay or glass product producers; primary metal producers; heavy machinery producers; electrical distribution equipment producers; electrical industrial apparatus producers; transportation vehicle producers; commercial sanitary sewage treatment plants; railroad switching yards; data centers; and recycling facilities not involving the on-site storage of salvage materials.

Required parking is one (1) space per each employee on the largest work shift.

4. **Contractor Shop:** Land uses that include businesses engaged in contract services or labor, such as contractors involved with landscaping; building construction or carpentry; and electrical, plumbing, or heating systems. This often involves accessory equipment storage yards and rental of equipment commonly used by contractors.
- a. Retail outlets associated with this principal use shall be considered an accessory use.
 - b. Required parking is one (1) parking space per each employee on the largest work shift.
5. **Truck, Freight or Bus Terminal:** Land and buildings representing either end of one (1) or more truck carrier line(s) that may have some or all of the following facilities: yards, docks, management offices, storage sheds, buildings and/or outdoor storage areas, freight stations, and truck maintenance and repair facilities. Such uses typically serve the trucking needs of several businesses on a contract basis. Buildings also include bus stations and terminals.
- a. Required parking is one (1) space per each employee on the largest work shift.
 - b. All parking, loading and vehicle circulation areas shall be surfaced with a hard surface, all weather material such as pavement or concrete.
 - c. All buildings, trucks and activity areas shall be set back from all residential zoning district boundaries a minimum of one hundred (100) feet.
6. **Mineral Extraction (Non-Metallic):** For requirements see the Waupaca County Non-Metallic Mining Ordinance, Chapter 38.
7. **Tow or Impoundment Yard:** Land uses that include the temporary storage of motor vehicles that have been towed or impounded.

- a. Required parking is one (1) space for every twenty thousand (20,000) square feet of gross storage area, plus one (1) space for each employee on the largest work shift.
 - b. The area on the premises where motor vehicles are kept, other than indoors, shall be enclosed by a wall or fence except for entrances and exits.
 - (1) Entrances and exits shall not be wider or more numerous than reasonable necessary for the conduct of the business.
 - (2) When two (2) or more tow or impoundment yards have a common boundary line, a solid wall or solid fence shall not be required on such common boundary line; provided, however, that a solid wall or solid fence shall enclose the entire combined area devoted to such uses.
 - (3) Fences and walls shall be of uniform height in relation to the ground upon which they stand. They shall be a minimum of eight (8) feet high to screen vehicles from view and shall not exceed twelve (12) feet in height. The fence or wall shall be painted one (1) inconspicuous earth-tone color, and enclose the entire site. The fencing plan shall be approved by the Planning and Zoning Committee.
 - c. All buildings, structures, outdoor storage areas, other facilities and the required fence or wall shall meet the structural setback requirements for a principal structure.
 - d. Noxious weeds shall be controlled.
8. **Salvage or Junk Yard:** Land uses that include any land or structure used for a salvaging operation including, but not limited to, the above-ground outdoor storage, collection, recycling, dismantlement, and/or sale of items listed in Section 6.7.8.b. Licensed recycling facilities involving on-site outdoor storage of salvage materials are not included in this land use.
- a. Required parking is one (1) space for every twenty thousand (20,000) square feet of gross storage area, plus one (1) space for each employee on the largest work shift.
 - b. "Junk" means any of the following:
 - (1) Scrap metal, glass, paper products, metal alloy, wood, perishables, refuse, aluminum, steel, tires, concrete, synthetic material, including but not limited to tanks, barrels, cages, pallets, wire/cable, furniture, culverts, bricks, appliances, electronics, plastics, batteries, hot tubs, bathroom fixtures, plumbing products, or bottles.
 - (2) Three (3) or more junked, ruined, dismantled, wrecked, unlicensed, unregistered or inoperative motor vehicles, including but not limited to buses, vans, trucks, cars, and recreational vehicles and parts thereof.
 - (3) Any junked, ruined dismantled, or wrecked machinery or lawn and garden equipment, including but not limited to farm equipment, construction equipment, campers, snowmobiles, boats, bicycles, trailers, motorcycles and parts thereof.

- (4) Construction/building materials or all or parts of dismantled buildings or structures, including but not limited to abandoned mobile homes and manufactured homes.
- c. The area on the premises where junk is kept, other than indoors, shall be enclosed by a wall or fence except for entrances and exits.
 - (1) Entrances and exits shall not be wider or more numerous than reasonably necessary for the conduct of the business.
 - (2) When two (2) or more vehicle dismantling yards, junk and salvage yards, and/or vehicle impounding yards have a common boundary line, a solid wall or solid fence shall not be required on such common boundary line; provided, however, that a solid wall or solid fence shall enclose the entire combined area devoted to such uses.
 - (3) Fences and walls shall be of uniform heights in relation to the ground upon which they stand. They shall be a minimum of eight (8) feet high or a height sufficient to screen salvage from view and shall not exceed twelve (12) feet in height. They shall be of wood or metal painted one (1) inconspicuous earth-tone color, and shall enclose the entire site.
 - (4) Junk or salvage materials shall not be piled higher than the height of the fence, and not against the fence.
 - (5) An unobstructed interior firebreak sixteen (16) feet in width shall be maintained adjacent to the fence or wall and shall completely surround the junk or salvage yard.
- d. A vegetated buffer area is required to create additional screening and containment of salvage and to soften the appearance of the fence or wall.
 - (1) The buffer area cannot substitute for a fence or wall, and berms cannot substitute for either.
 - (2) No buildings, structures, outdoor storage areas, or other facilities shall be located in any part of a buffer area.
 - (3) The buffer area must be at least twenty-five (25) feet wide adjacent to the exterior of the fence or wall.
 - (4) The buffer area shall be planted and maintained with a continuous stand of mixed trees and shrubs sufficient to extend above the fence or wall and obscure the majority of it from view within five (5) years.
- e. All buildings, structures, outdoor storage areas, other facilities and the required fence or wall shall be set back at least three hundred (300) feet from public roadways and one hundred (100) feet from rear and side lot lines.
- f. No oil, grease, tires, gasoline, rubber, plastic, asphalt, or similar material shall be burned at any time, and all other burning shall be in accordance with applicable State and local regulations.
- g. All junk and salvage yards shall be maintained so as to avoid creating a public or private nuisance, including, but not limited to, any offensive or noxious sounds or odors and breeding or harboring of rats, flies, mosquitoes, or other vectors.

- h. Drainage facilities shall be established to protect surface and groundwater resources.
 - i. Noxious weeds shall be controlled.
 - j. All materials or wastes which might cause fumes or dust, which constitute a fire hazard, or which may be edible or otherwise attractive to rodents or insects may be stored outdoors only if enclosed in containers which are adequate to eliminate such hazards.
 - k. No materials or wastes shall be deposited on a site so as to allow their transportation off the site by normal natural causes.
 - l. No such facility shall discharge at any point into any public or private sewage disposal system or waterway, or into the ground, any liquid or solid materials except in accordance with the regulations of the Wisconsin Department of Natural Resources and the Wisconsin Department of Public Health.
 - m. Toxic and hazardous materials including, but not limited to, gasoline, oil, antifreeze, brake fluids, freon and transmission oil shall be removed from any scrapped engines, vehicles, appliances, or containers on the premises and shall be recycled or disposed of in compliance with applicable regulations.
9. **Solid or Hazardous Waste Facility:** Land uses that include any area, lot, land, parcel, building, or structure, or part thereof, used for deposit, disposal, processing, or transfer of solid, demolition, or hazardous waste.
- a. The following situations do not need to meet the standards set forth below for a solid or hazardous waste facility:
 - (1) Existing facilities and expansion of existing facilities by adding not more than fifty percent (50%) additional capacity, provided that continuing operations and operations of expanded areas follow basically the same current operating patterns and comply with applicable laws and rules.
 - (2) Transfer, treatment and disposal of farm manure and similar farm animal waste generated from farms in Waupaca County or immediately adjoining lands.
 - (3) Solid or hazardous waste facilities that otherwise would meet the tests of applicability, but that are on the same land where the waste is generated and are conducted as part of the farm or business, other than waste treatment/disposal business on that land.
 - b. Any waste facility to which this Ordinance applies must have advance approval and the issuance of a Conditional Use Permit by Waupaca County before operations may be commenced.
 - c. To approve such a facility, the Planning and Zoning Committee must determine that the facility will not harm the health, safety and welfare of the community and the good order and convenience of the community and the public.
 - d. In making approvals, the Committee is encouraged to impose reasonable requirements on applications in order to avoid nuisance conditions.

e. The intent of this Ordinance is that dumps and waste facilities will be regulated within the process of the Wisconsin Waste Facility Siting Law and that precise application of standards and conditions will be determined within that process.

10. Battery Energy Storage Systems: Land uses that include one or more devices capable of storing and discharging electricity to a building, use, or to the electrical grid. This use includes, but is not limited to the following: battery cells; enclosures, containment vessels, and dedicated-use buildings; thermal, battery, and energy management system components; inverters; access roads; distribution, collection, and feeder lines; wires and cables; conduit; footings; foundations; towers, poles; guy lines and anchors; substations; interconnection or switching facilities; circuit breakers and transformers; overhead and underground control, communications and radio relay systems, and telecommunication equipment; utility lines and installations; and accessory equipment and structures.

a. Accessory Battery Energy Storage Systems that are accessory to a principal use or building are permitted within all zoning districts.

b. Battery Energy Storage Systems associated with Alternative Energy Generating Systems are subject to the regulations found in Section 12 of this ordinance.

c. Standalone Battery Energy Storage Systems are subject to the following requirements:

(1) Setbacks for a battery energy storage facility shall be one hundred (100) feet to any lot line including the right way of the road. The battery energy storage facility shall comply with any Department of Natural Resources or Public Health setback requirements.

(2) Separate containment enclosures that include the following:

i. Enclosure Size Capacity containment of one-hundred and fifty (150 %) percent of the battery energy storage system.

ii. Sufficient fireproofing for connecting electronic wires, protecting from one structure to the next and from the battery energy storage system to the substation.

(3) Battery management protocols including:

i. Labeling of battery energy storage system container with a date of first usage via a stamped metal nameplate with serial number.

ii. Upon the end of its serviceable life the battery energy storage system container shall be removed from the site and properly recycled at owner/operator's expense.

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iii. The owner/operator shall provide an operational plan of the proposed facility to the Waupaca County Emergency Management Department including reporting the storage and/or use of any hazardous materials as well as an emergency plan for the facility.

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(4) A decommissioning plan and financial assurance for project decommissioning costs shall be provided with the Conditional Use permit application. A posted form of financial security such as a surety bond, letter of credit, escrow account, reserve fund, parent guarantee, or other suitable financial mechanism, prior to the commencement of construction to include the total cost of decommissioning of the solar generation portion and the battery energy portion of the solar project at the end of its useful life.

(5) A Standalone Battery Energy Storage System located within the confines of an existing substation is permitted within all districts.

i. An existing substation may be expanded for the addition of a Standalone Battery Energy Storage System provided that it is not expanded beyond the original parcel of record.

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e- d. All Battery Energy Storage Systems shall comply with all State, Federal, and County regulations including, but not limited to, the Shoreland Protection Ordinance, Floodplain Ordinance, etc.

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6.8 Public/Institutional Uses

1. **Community Living Facility – one to eight (1 to 8) Residents:** Land uses which serve the function as a transitional residential setting and which provide guidance, supervision, training, and other assistance to ambulatory or mobile adults with a mild or moderate developmental disability with the goal of eventually moving these persons to more independent living arrangements. Community living arrangements do not include day care centers, nursing homes, general hospitals, special hospitals, prisons, or jails.

Required parking is three (3) total spaces.

2. **Community Living Facility – nine to fifteen (9 to 15) Residents:** See definition for 6.8.1.

Required parking is four (4) total spaces.

3. **Community Living Facility – sixteen (16) or More Residents:** See definition for 6.8.1.

Required parking is five (5) total spaces.

4. **Outdoor Institutional:** Land uses that include cemeteries, religious and historical shrines, outdoor education and interpretive centers, and similar privately held permanently protected open areas. Uses may include buildings supporting the principal outdoor institutional use, such as accessory educational and interpretive facilities and equipment storage sheds.

Required parking includes one (1) parking space per three (3) expected patrons at maximum capacity.

5. **Airport:** Including landing strips, control towers, hangars, aircraft maintenance and refueling facilities, and accommodations for passengers and cargo.

Required parking is one (1) parking space per three (3) expected patrons at maximum capacity.

6. **Minor Indoor Institutional:** Land uses that are generally compatible with residential land uses and that do not exceed the parking or overnight accommodation thresholds that would instead classify such use as a “major institutional use.” Uses include small churches, small elementary or middle schools, small clinics, post offices, libraries, town halls, police stations, fire stations, training centers, nursing homes, funeral homes, and recreational or fraternal facilities such as gyms, swimming pools, museums, clubs and lodges, meeting halls, and community centers, provided that the thresholds are not exceeded.
 - a. Parking requirements must follow standards for Major Indoor Institutional uses.
 - b. Any special events held on the property containing any of the above listed uses shall be permitted.
 - c. If proposed in the Farmland Preservation Overlay, the use shall also meet the following standards:
 - (1) The use and its location are consistent with the purposes of the Farmland Preservation Overlay.
 - (2) The use and its location are reasonable and appropriate, considering alternative locations, or are specifically approved under State or Federal law.
 - (3) The use is reasonably designed to minimize conversion of land at and around the site of the use from agricultural use or open space use.
 - (4) The use does not substantially impair or limit the current or future agricultural use of surrounding parcels of land that are zoned for or legally restricted to agricultural use.
 - (5) Construction damage to land remaining in agricultural use is minimized and repaired, to the extent feasible.
7. **Major Indoor Institutional:** Land uses that include large scale and/or intensive institutional uses that are generally not compatible with residential land uses and that exceed one (1) or both of the following thresholds: required parking exceeds fifty (50) or more motor vehicles, following the parking standards below, or the use is intended to provide overnight accommodations for fifteen (15) or more persons.
 - a. **Parking Required:**
 - (1) **Church:** one (1) space per five (5) seats at the maximum capacity.
 - (2) **Community or Recreation Center:** one (1) space per two hundred fifty (250) square feet of gross floor area or one (1) space per four (4) patrons to the maximum capacity, whichever is greater.

- (3) **Funeral Home:** one (1) space per three (3) patron seats at the maximum capacity.
 - (4) **Hospital or Clinic:** two (2) spaces per three (3) patient beds, plus one (1) space per staff doctor and each other employee on the largest work shift.
 - (5) **Library or Museum:** one (1) space per two hundred fifty (250) square feet of gross floor area or one (1) space per four (4) seats to the maximum capacity, whichever is greater.
 - (6) **Elementary and Middle School:** one (1) space per teacher and per staff member, plus one (1) space per two (2) classrooms.
 - (7) **Senior High School:** one (1) space per teacher and staff member, plus one (1) space per five (5) non-bused students.
 - (8) **College or Trade School:** one (1) space per staff member on the largest work shift, plus one (1) space per two (2) students of the largest class attendance period.
 - (9) **Nursing Home:** one (1) space per six (6) patient beds, plus one (1) space per employee on the largest work shift.
 - (10) **Monastery or Convent:** one (1) space per six (6) residents, plus one (1) space per employee on the largest work shift, plus one (1) space per five (5) chapel seats if the public may attend.
 - (11) **Assisted Living Facility or Retirement Community:** one (1) space per dwelling unit.
 - (12) **Other Elderly or Congregate Residential Facility:** one (1) space per six (6) residents or patient beds, plus one (1) space per employee on the largest work shift.
 - (13) **All other indoor institutional uses,** one (1) space per three (3) expected patrons at maximum capacity.
- b. If proposed in the Farmland Preservation Overlay, use shall also meet the following standards:
- (1) The use and its location are consistent with the purposes of the Farmland Preservation Overlay.
 - (2) The use and its location are reasonable and appropriate, considering alternative locations, or are specifically approved under State or Federal law.
 - (3) The use is reasonably designed to minimize conversion of land at and around the site of the use from agricultural use or open space use.
 - (4) The use does not substantially impair or limit the current or future agricultural use of surrounding parcels of land that are zoned for or legally restricted to agricultural use.
 - (5) Construction damage to land remaining in agricultural use is minimized and repaired, to the extent feasible.
8. **Public Service and Utility:** Land uses that include City, County, State and Federal facilities, except those otherwise defined in this Section, wastewater treatment plants,

public and/or private utility substations, water towers, utility and public service related distribution facilities, and similar land uses. Existing facilities may be improved, expanded, or replaced without the need of a Conditional Use Permit, zone map amendment, or variance provided that the expansion is limited to the existing parcel of record as of the adoption date of this Ordinance and no setback encroachment extends any closer than any legally established existing encroachment.

Required parking is one (1) space per employee on the largest work shift, plus one (1) space per vehicle normally stored or parked on the premises, plus one (1) space per five hundred (500) gross square feet of office area.

~~9. **Small Solar Energy System: Generating Facility:** See Section 12 for requirements. An energy system with a panel area of fourteen hundred (1,400) square feet or less that converts solar energy to usable thermal, mechanical, chemical, or electrical energy, where such solar energy system is accessory to the principal use of the land, e.g., solar panels providing energy for a residence on the same lot. This use shall meet the following performance standards:~~

~~a. Ground-mounted solar energy systems shall comply with the minimum required setbacks for principal structures. Ground-mounted solar energy systems shall comply with the height requirements of Section 2.6.~~

~~b. The requirements of Wisconsin Statutes including, but not limited to, Sections 66.0401 and 66.0403, shall apply to all solar energy systems.~~

~~e. 9. In the Farmland Preservation Overlay, the Small Solar Energy System must meet the standards set forth in Section 6.10.5 for an Agricultural Accessory Use.~~

~~10. **Large Solar Energy System: Generating Facility:** See Section 12 for requirements. An energy system with a panel area of more than fourteen hundred (1,400) square feet that converts solar energy to usable thermal, mechanical, chemical, or electrical energy, where such solar energy system is typically a principal use of the land and designed primarily to generate energy for commercial sale off site. This use shall meet the following performance standards:~~

~~a. Ground-mounted solar energy systems shall comply with the minimum required setbacks for principal structures. Ground-mounted solar energy systems shall comply with the height requirements of Section 2.6.~~

~~b. The requirements of Wisconsin Statutes, including, but not limited to, Sections 66.0401 and 66.0403, shall apply to all solar energy systems.~~

11. **Standalone Parking Lots:** Land uses that involve standalone parking facilities, which include privately owned pay to park facilities and public parking facilities.

- a. All parking spaces shall meet the dimensional requirements of Sec. 6.4 and be located outside of the road right-of-way.
- b. Any structures associated with the use shall meet all required setbacks.
- c. In no instance shall the parking spaces located in a standalone parking lot be used to satisfy the required parking standards found in the remainder of this ordinance unless specifically permitted in accord with Section 6.4.6 "Off Site Parking".
- d. Parking lots shall not include the storage of personal items unless specifically allowed by Sec. 6.6.16 Personal Storage Facility.

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6.9 Park/Recreational Uses

1. **Outdoor Public Recreation:** Outdoor recreational uses located on property owned by the public, owned by a private utility company for public recreational use, or on a public use easement owned by the public or by a non-profit organization. Such land uses may include parks, natural areas, undeveloped natural resources and open space areas per Section 91.44(1) (e) Wisconsin Statutes, wildlife areas, trails, picnic areas, picnic shelter, play courts, play fields, athletic fields, tot lots, outdoor swimming pools, swimming beach areas, fitness courses, playground equipment, boat launches, waterfront access points, or similar land uses. Uses may include building or structures supporting the principal use, such as equipment storage sheds, shelters, restrooms, concession stands, and grandstands. These uses shall meet the following standards:
 - a. Required parking is one (1) space per four (4) expected patrons at maximum capacity. Additional paved, graveled, or grassed area for overflow parking may be provided for occasional outdoor assembly land uses, i.e., special events located on outdoor public recreation sites.
 - b. Waterfront recreational uses shall adhere to the following provisions:
 - (1) The area shall be compatible with adjacent land or water uses.
 - (2) The provisions of the Waupaca County Shoreland Protection Ordinance, Chapter 32, shall apply.
 - (3) Entrances and exits are designed and located as to not interfere with the public's or adjacent landowner's access to public waters.
 - (4) Any lighting facilities are designed as to minimize reflection or glare on or over the water except navigation aids. Maintenance and storage buildings, parking lots and sanitary facilities are effectively screened from the water and adjacent residential properties by vegetative growth.
 - c. All buildings shall be located a minimum of fifty (50) feet from any dwellings.
 - d. No Outdoor Public Recreation use shall be arranged in such a location or manner than inhibits use of nearby agricultural lands for normal farm operations.
 - e. In the Farmland Preservation Overlay, these areas shall remain undeveloped. Any structures associated with this use shall be permitted through a Conditional Use Permit in compliance with State Statute 91.46(5).
2. **Outdoor Recreation - Active:** Land uses that include recreational uses located on public or private property, which involve active recreational activities that are open to the public or to customers, patrons, or members. Uses may include building or structures supporting the principal use, such as equipment storage sheds, shelters, restrooms, concession stands, and grandstands.
 - a. Active uses include playcourts such as tennis courts and basketball courts, playfields such as ball diamonds, football fields, and soccer fields, tot lots, outdoor swimming pools, swimming beach areas, fitness courses, golf courses, archery ranges and similar land uses.
 - b. Provisions of 6.9.1.a. through e. apply.

- c. Waterfront recreational uses that include bleachers, spectator stands, motor driven rides, concession stands and similar uses are effectively screened from the water, if applicable, and adjacent properties by vegetative growth.
3. **Outdoor Shooting Ranges for Firearms:** Shooting ranges require a Conditional Use Permit and shall adhere to the following provisions:
- a. Evaluation. In granting a Conditional Use Permit for gun clubs and shooting ranges, the Planning and Zoning Committee shall evaluate:
 - (1) Potential hazards to adjacent uses
 - (2) Topography and ground cover
 - (3) The Committee cannot regulate noise as per WI. Stats. S. 895.527
 - b. **Firing Limitations.** The firing of rifled arms and shotgun slugs shall not be permitted directly toward or over navigable water; a State DNR designated wetland in excess of two (2) acres in size; or public, private roads or drives. No part of any shooting range may be located within one-half (1/2) mile of any residentially zoned, planned or developed parcel unless owners and occupants of such residences waive this condition in writing.

- c. **In General.** The site shall be equipped with the following:
 - (1) An adequate shotfall or bullet impact area.
 - (2) A defined firing line or firing direction.
 - (3) Adequate target backstops for the firing of rifled arms.
 - (4) No shooting activity between 11:00 p.m. and 6:00 a.m.
 - (5) Shooting ranges shall be clearly identified by signs not less than four (4) square feet in gross area located at intervals not more than twenty-five (25) yards around the perimeter.
 - (6) Range types are subject to the National Rifle Association Range Source Book, 1999; or successor sourcebook.
 - (7) All safety precautions shall meet or exceed the standards listed in the National Rifle Association Range Source Book, 1999; or successor sourcebook.
 - (8) Prior to operation, the shooting range shall be deemed consistent with Best Management Practices found in the National Rifle Association Range Source Book, 1999; or successor sourcebook, by the Department of Natural Resources and/or by the National Rifle Association Technical Advisory Team.
- d. **Setbacks.**
 - (1) No part of any shooting range may be located within one-half (1/2) mile of any residentially zoned, planned or developed parcel unless owners and occupants of such residences waive this condition in writing.
 - (2) Accessory buildings, such as club houses, shall meet the same setbacks as a principal structure in the applicable zoning district.
- e. **Exemptions.**
 - (1) Siting in firearms during the two (2) weeks prior to the nine (9) day gun season during the week of Thanksgiving during daylight hours, as defined in the current Wisconsin Department of Natural Resources Hunting Regulations.
 - (2) Siting in firearms all weekends two (2) months prior to the nine (9) day gun season during the week of Thanksgiving during daylight hours, as defined in the current Wisconsin Department of Natural Resources Hunting Regulations.
- f. For a firing range inside of the Farmland Preservation Overlay, the Conditional Use Permit shall also be consistent with State Statute 91.46(5).
- 4. **Special Events:** Include any organized indoor or outdoor assembly of less than two hundred (200) persons held offsite of an Indoor Institutional as described in Section 6.8(6) and (7). Including auctions, church festivals, large community events, and municipal events open to the public. Also includes weddings, family reunions, anniversaries, or similar family events. These activities shall not be permitted for more than one (1) time in any four (4) week period. Any more than that would require a Conditional Use Permit.
 - a. Adequate parking, drinking water, toilet facilities, and crowd control techniques shall be described in the Conditional Use Permit application, where required for special events and outdoor assemblies with more than two hundred (200)

participants, and shall be implemented for all special events and outdoor assemblies in accordance with applicable laws and industry standards.

- b. If the subject property is located adjacent to a residentially zoned property:
 - (1) Activities shall be limited to daylight hours unless otherwise may be allowed through a Conditional Use Permit or license; and
 - (2) Other conditions addressing impacts such as noise, lighting, trespassing, and parking may be required.
- c. A permit from the government having jurisdiction is generally required for all activities within a dedicated public road right-of-way or on other public lands.
- d. Activities shall not obstruct safe pedestrian or vehicular circulation on the site or on any public road, except where specifically authorized by a permit from the government having jurisdiction over the public road.

5. Campgrounds and Camping Resorts:

- a. Land uses designed, maintained, intended or used for the purpose of providing camping sites for nonpermanent overnight use to accommodate not more than one (1) camping unit per site and one (1) host site per campground. This use also includes facilities for use by campers including restrooms/showers, active and passive recreation areas, office/convenience store buildings, and necessary accessory uses. Any public or private parcel of land containing four (4) or more camping units used for habitation and occupied thirty (30) days or longer shall be deemed a campground or camping resort.
 - (1) Required parking is one and one-half (1 1/2) parking spaces per camping site plus one (1) space per employee on the largest work shift. Each camping unit camping area shall provide sufficient parking and maneuvering space so that the parking, loading or maneuvering of recreational vehicles, incidental to parking shall not necessitate the use of any public street, sidewalk or right-of-way or any private grounds not part of the recreational vehicle parking area.
 - (2) Wisconsin Administrative Code DHS 178 entitled "Campgrounds" shall apply until amended and then shall apply as amended; except the provisions of this Code of Ordinances shall control where more restrictive.
 - (3) Minimum campground/camping resort size: five (5) acres.
 - (4) Minimum camping site space: one thousand two hundred (1,200) square feet per camping site. All allotted individual lot area shall be in one (1) contiguous parcel exclusive of roadways. Each space shall be suitably landscaped, and all areas fronting a park and any buildings or recreational areas shall be suitably landscaped.
 - (5) The density shall not exceed twenty (20) camping sites per acre of gross camp area.
 - (6) Exposed ground surfaces in all parts of every parking area shall be paved, covered with stone screenings or other solid material, or protected with a vegetative growth that is capable of preventing soil erosion and of eliminating objectionable dust.

- (7) Each walkway shall have a minimum width of thirty-six (36) inches. No recreational vehicle lot or space shall ingress or egress directly upon a State, Federal, County, or Town road.
- (8) All structures, including cabins, yurts, decks, and accessory structures, shall meet the setback requirements specified in Sections 2.7 and 2.8.
- (9) Every camp shall be located in a well-drained area not subject to intermittent flooding and properly graded so as to prevent the accumulation of storm or other waters that may create hazards to the property or the health and safety of the occupants.
- (10) There shall be one (1) or more recreational areas which shall be easily accessible to all camp residents. The aggregate size of such recreational areas shall be in an amount equal to, but not less than, two hundred (200) square feet multiplied by the number of camping sites, or two thousand five hundred (2,500) square feet, whichever is greater. The design and placement of such recreation area(s) shall be approved by the Planning and Zoning Committee.
- (11) Proof of ability to install a satisfactory private sewage disposal system, if public sewer and water facilities are not available, shall be presented to the Planning and Zoning Committee at the time of application.
- (12) Convenience establishments of a commercial nature may be permitted in a campgrounds providing that such establishments and their related parking areas shall not occupy more than ten percent (10%) of the total camp area, shall be subordinate to the recreational character of the camp, shall be located, designed and intended to serve the specific needs of the camp occupants, and shall present no visual evidence of commercial character from any portion of any residential district outside the camp. Such convenience establishment building shall adhere to any service building requirements.
 - (a) Recreational vehicle sales and service offices, display areas, or buildings may be permitted on the campground premises by special permission of the Planning and Zoning Committee. In granting such permission, the Committee shall take into consideration the location and appearance of such activities, shall require that display areas not detract from the aesthetic value of the camp, and shall require that all display stock and materials be kept under cover. No repair of service facilities shall be permitted in any case where by reason of excessive noise, odor, unsightliness, etc., would detract from the recreational character of the camping area.
- (13) The camp management shall adopt and include into its leases or camp rules, by reference, such rules and regulations as shall be reasonably required by the Planning and Zoning Committee for the general health, safety and welfare of such campgrounds and of the County of Waupaca, and shall cause the eviction of any tenants of said campgrounds who violate the same.
- (14) The person or organization to whom a permit for a campground is issued shall operate the camp in compliance with this Ordinance and shall provide adequate supervision to maintain the camp, its facilities and equipment in good repair and in a clean and sanitary condition. The camp management

shall notify camp occupants of all applicable provisions of this Ordinance and inform them of their duties and responsibilities under this Ordinance.

- (15) Each campground shall be allowed one host site, which may include facilities exceeding the required allotment for a camping unit. The host site may include a single family residence occupied by an employee of the campground. A dwelling less than twenty-two (22) feet in width may be utilized for a host site without separate conditional use permit approval.
- b. In addition to the above, all campgrounds or camping resorts located in Waupaca County offering seasonal camp sites must abide by the following:
 - (1) Seasonal camp sites are not permanent residences and shall not be occupied more than two hundred ten (210) days per year.
 - (2) If a campground has adequate impervious surface area:
 - (a) Seasonal camp sites may be permitted one (1) accessory structure per site not to exceed ten (10) feet by ten (10) feet, twelve (12) feet in height.
 - (b) Seasonal camp sites may be permitted one (1) deck or patio allowing for safe ingress and egress from the camping unit provided this deck or patio does not exceed one hundred fifty (150) square feet.
 - i. In rare instances, a seasonal camp site owner may request an additional deck or patio area to allow safe ingress or egress to a second door on his/her RV. If this request is approved by the Planning & Zoning Office, then the total square footage of all decks or patios must not exceed one hundred fifty (150) square feet.
 - (3) Seasonal camp sites located within the shoreland or floodplain area are only permitted accessory structures and/or decks or patios when in compliance with all local and State regulations.
 - (4) Prior to the Waupaca County Planning and Zoning Office issuing any permit for an accessory structure, or deck or patio area, the campground owner must first have on file a complete and accurate survey of his/her campground. The survey must accurately detail all lot and shoreland lines, structures, roads, parking areas, green space, and contain the current impervious surface calculations.
 - (5) RVs located on seasonal camp sites may not affix or erect additions of any type, other than those permitted by this Ordinance. This includes porches, room additions, structures designed to cover the RV and protect it from the elements, or any other addition of a similar nature.
 - (6) Seasonal camp sites must retain the ability to be dismantled and removed within twenty-four (24) hours of notice to do so.
 - (7) Other than the permitted accessory structure and deck or patio described above, the placing of materials such as mill felt, indoor-outdoor carpet or other items similar in nature that block or retard growth of natural vegetative cover and create impervious surface in a camp site is prohibited. However, materials such as those listed above are permitted if these materials are those utilized in creating the deck or patio area.

- (8) The person or organization holding the permit for the campground or camping resort shall operate the camp in compliance with this Ordinance. Further, the permit holder shall provide adequate supervision to maintain the camp, its facilities, and equipment in good repair and in a clean and sanitary condition. The camp management shall notify camp occupants of all applicable provisions of this Ordinance and inform them of their duties and responsibilities under this Ordinance.
 - (9) Violations of any provision of this Ordinance shall be the responsibility of the person or organization holding the permit for the campground or camping resort.
 - (10) When located within the Farmland Preservation Overlay, this use shall either be considered an agricultural accessory use consistent with State Statute 91.01(1) or be consistent with State Statute 91.46(5) if new structures are proposed. A campground or camping resort may be allowed as an open space use but no new buildings or structures will be allowed.
6. **Vehicle Course or Track:** Any privately operated track, course, circuit, strip, or loop designed for use by motorized vehicles such as automobiles, trucks, ATVs, motorcycles, motocross bikes, dirt bikes, snowmobiles, go-carts, or boats. Such uses occasionally are operated for recreational purposes for family use. This use shall meet the following standards:
- a. Minimum lot size shall be ten (10) acres.
 - b. If such use abuts any residentially zoned or used property, all track facilities shall be located a minimum of two hundred (200) feet from such property and such use shall not be permitted to have night lighting nor operate between 8 p.m. and 8 a.m.
 - c. Such uses may be subject to enforcement actions under town or County nuisance laws for noise, dust, or other impacts.

6.10 Open Land/Agriculture Uses

- 1. **Agricultural Use:**
 - a. Agriculture use is any of the following activities conducted for the purpose of producing an income or livelihood:
 - (1) Crop or forage production.
 - (2) Keeping livestock, subject to the standards set forth in Section 6.10.2.
 - (3) Beekeeping.
 - (4) Nursery, sod, or Christmas tree production.
 - (5) Floriculture.
 - (6) Aquaculture.
 - (7) Fur farming.
 - (8) Forest management.

- (9) Enrolling land in a Federal agricultural commodity program payment program or a Federal or State agricultural land conservation payment program.
- b. Agriculture in the RR (Rural Residential) District requires a Conditional Use Permit.
 - (1) No Infrastructure would be allowed to be constructed on this property. (i.e. drain tile, agricultural accessory structures, manure storage and the like) except where required or allowed by a Conditional Use Permit.
 - (2) Additional requirements may exist if the property is located within a platted subdivision.
- 2. **Agriculture – Animal Husbandry:** Land uses that include keeping livestock, beekeeping, aquaculture, fur farming, and any other use that the Department of Agriculture, Trade, and Consumer Protection, by rule, identifies as an agricultural use.
 - a. In nonfarm/hobby farm lots within AE, AR, AWT, and PVRF zoning districts, one (1) animal unit per acre of suitable area shall be permitted. Animal units are defined in the Wisconsin Administrative Code Section 243.05(4). A listing of animal units is provided in Appendix B. Any animal units above this limit shall be considered through the Conditional Use Permit process and requires approval by the Waupaca County Land and Water Conservation Department.
 - b. Animal husbandry in nonfarm/hobby farm lots in the Rural Residential and the Rural Residential Overlay Districts is permitted through the Conditional Use Permit process and requires approval by the Waupaca County Land and Water Conservation Department.
 - (1) The raising of chickens in the Rural Residential and the Rural Residential Overlay Districts is permitted without a Conditional Use Permit but with the issuance of a Land Use Permit provided the following standards are met:
 - (a) No more than six (6) chickens are allowed.
 - (b) No roosters are allowed.
 - (c) The chickens must be provided with a fully enclosed shelter which meets the required setback distances for principal structures.
 - (d) Chicken runs are allowed provided they meet the required setbacks for principal structures and are fully enclosed so as not to allow the chickens to escape.
 - (e) Any butchering or slaughtering of chickens shall take place inside an enclosed structure.
 - (f) Onsite commercial sale of eggs is prohibited.
 - c. For horse keeping, a Conditional Use Permit will not be considered by the Planning and Zoning Committee unless the applicant meets the minimum of one (1) suitable acre per horse. An exception to the minimum of one (1) suitable acre per horse may be allowed with a long term lease agreement for additional acreage.
 - (1) A long term lease agreement duration shall be no less than the time that the horses are present on any of the parcels approved through the Conditional Use

Permit. If a long term lease agreement becomes invalid the Conditional Use Permit shall be reviewed by the Planning and Zoning Committee. If sufficient acreage is not available at the time of the review either through ownership or additional long term lease agreement the Planning and Zoning Committee shall revoke the Conditional Use Permit approval.

- d. For horse keeping, property owners must provide a shelter for horses with a minimum of three (3) walls and a roof.
3. **Agriculture-Related Use:** An agricultural equipment dealership, facility providing agricultural supplies, facility for storing, handling, marketing or processing agricultural products, slaughtering livestock, facility for processing agricultural by-products or wastes, and any other use that the Department of Agriculture, Trade, and Consumer Protection, by rule, identifies as an agriculture-related use.
 - a. Examples of such uses include, but are not limited to, agricultural implement sales, storage, and/or repair operations; feed and seed stores; agricultural chemical dealers and/or storage facilities; animal feed storage facilities, except those accessory to an “agricultural use”; commercial dairies; food processing facilities; micro and nano breweries and micro and nano wineries where the farm is the primary source of ingredients, licensed farm auction operations; garden centers and orchard stores; farmer’s markets; canning and other food packaging facilities; agricultural waste and by-product disposal facilities, except those accessory to an “agricultural use”; sawmills; de-barking operations; and chipping facilities. Not included within this land use category are plants intended to convert agricultural products to energy on a large-scale basis.
 - b. Agriculture Related Uses may include incidental long term outdoor display of items offered for sale as part of the approved use.
 - c. Required parking is one (1) space per employee on the largest work shift or one (1) space for every two hundred (200) square feet of product display area, depending on the specific land use type.
 - d. Farm equipment sales, service and repairs shall be conducted on a site of no less than twenty thousand (20,000) square feet. All storage of equipment shall be at least one hundred (100) feet from highways or roads and at least two hundred (200) feet from any residential property. If the Planning and Zoning Committee deems the operations will take on characteristics of a junkyard, it may require a hedge planting of sufficient size to screen the area from the public right-of-way.
4. **On-Site Agricultural Retail:** Land uses that include operations associated with the sale of agricultural products grown exclusively on the site or exclusively by the farm operator. Consolidation of sales from nearby farms and farm operators on a participating farm parcel may be considered as a conditional use. Considerations will at a minimum include the size of the operation, traffic and access, and parking availability.

Packaging and equipment used to store, display, package, or carry products for the convenience of the operation or its customers, such as egg cartons, baskets, containers, and bags, shall be produced off-site.

- a. Required parking is one (1) space per employee on the largest work shift or one (1) space for every two hundred (200) square feet of product display area, depending on the specific land use type.
 - b. Any roadside stand or similar use shall conform to setback, sign and other provisions of this Ordinance, but may be ordered removed by the County Highway Committee, if the Planning and Zoning Committee determines that the use constitutes a traffic hazard or nuisance. Such removal shall be at the landowner's cost if such stand was established after the effective date of this Ordinance. Otherwise the removal cost shall be a consideration of the Highway Committee and the landowner, but the County shall in no way be obligated to pay the cost of removal of such stands.
 - c. In the Farmland Preservation Overlay the use shall meet the standards set forth in Section 6.10.5 for an Agricultural Accessory Use.
5. **Agricultural Accessory Use:** Any of the following land uses on a farm:
- a. A building, structure or improvement that is an integral part of, or incidental to, an agricultural use. This may include, for example:
 - (1) A facility used to store or process raw agricultural commodities, all of which are produced on the farm.
 - (2) A facility used to keep livestock on the farm.
 - (3) A facility used to store or process inputs primarily for agricultural uses on the farm.
 - (4) A facility used to keep or service vehicles or equipment primarily employed in agricultural uses on the farm.
 - (5) A facility used for manure storage or bunker silo. Setbacks for manure storage facilities are measured from the inside liner.
 - (6) A wind turbine or solar energy facility that collects wind or solar energy on the farm, and uses it to provide energy primarily for use on the farm.
 - (7) A manure digester, bio-fuel facility, or other facility that produces energy primarily from materials grown or produced on the farm, primarily for use on the farm.
 - (8) A waste storage or processing facility used to store or process animal waste produced solely from livestock kept on the farm.
 - (9) Farms regularly open for tours, demonstrations, hayrides, corn mazes, farm breakfasts, and other similar events.
 - b. Any activity or business operation that is an integral part of or incidental to, an agricultural use. An example of this land use is a greenhouse:
 - c. A farm residence, including normal residential appurtenances.
 - d. A business, activity, or enterprise, associated with an agricultural use, which meets all of the following requirements:
 - (1) It is conducted on a farm by an owner or operator of that farm.

- (2) It requires no buildings, structures, or improvements other than those described in 6.10.5.a.
 - (3) It employs the equivalent of no more than four (4) full-time employees annually.
 - (4) It does not impair or limit the current or future agricultural use of the farm or other protected farmland.
 - e. Any other use that the Department of Agriculture, Trade, and Consumer Protection, by rule, identifies as an accessory use.
6. **Outdoor Storage of Motor Vehicles, Farm Machinery and Collectibles:** Land uses that include the outdoor storage of disabled or unused motor vehicles, farm machinery, buses, heavy-duty trucks and their bodies, semi-trailers, mobile homes, appliances, collectibles, and similar items.
- a. **Definitions:**
 - (1) Motor Vehicles – Any conveyance that moves on wheels under power whose primary purpose is transportation of persons or commodities.
 - (2) Disabled Motor Vehicle – Any motor vehicle, including its component parts, which is in a dismantled, inoperative, or abandoned condition, or which cannot legally be driven on a public highway.
 - (3) Untitled Motor Vehicle – Any motor vehicle which is not registered with the State Department of Transportation.
 - (4) Disabled/Unusable Agricultural Machinery – Any equipment, including its component parts, originally designed and constructed for agricultural purposes which is in a dismantled, inoperative or abandoned condition.
 - (5) Collectibles – Any vehicle, collector car, bus, heavy duty truck and its body, semi-trailers, mobile home, agricultural machinery, snowmobile, motorcycle, appliance, or similar large item including, its component parts, that is being retained for historic reuse, restoration or other collection purposes.
 - b. Disabled or untitled motor vehicles, disabled/unusable farm machinery, or similar items or collectibles as described above shall be screened from view from public roadways and adjacent properties by opaque fencing of earth-tone colors, walls, earthen berms, coniferous vegetation, or a combination thereof. Adjacent parcels of common ownership shall be considered a single lot. A screening plan, prepared by the landowner, shall meet approval by the Planning and Zoning Committee, Planning & Zoning Director, or his/her designee.
 - c. All lubricants, coolants, and similar substances shall be removed and recycled or disposed of in compliance with applicable State regulations.
 - d. Buses, heavy-duty trucks and their bodies, semi-trailers, freight containers, mobile homes, and similar items which are no longer in use for their designated purpose shall be prohibited under this section.
 - e. No more than two (2) titled motor vehicles may be offered for sale on a lot unless the lot is located in a commercial zoning district.

- f. In addition to the site plan requirements set forth in Section 9.0, the following additional information shall be included on the Conditional Use Permit application and site plan:
 - (1) The size and location of the storage area showing distances to property lines and building on the subject and adjacent properties.
 - (2) Proposed type and dimensions of visual screening.
 - (3) All current uses of the subject and adjacent properties.
- g. The following activities are exempted from the provisions under Section 6.10.6.
 - (1) Storage facilities that meet the requirements of Section 6.7.6, Junk and Salvage Yards.
 - (2) Storage of untitled and disabled motor vehicles at properly zoned motor vehicle sales and repair facilities.
 - (3) Up to two (2) untitled motor vehicles and disabled/unusable farm machinery offered for sale on a lot.
 - (4) A single motor vehicle, piece of farm machinery, or similar item displayed along a public roadway, or a greater number of such items displayed along a private drive as artwork, sculpture, or focal point.
7. **Agricultural Home Occupation:** A business, activity, or enterprise conducted on a farm by an owner or operator of that farm, whether or not associated with an agricultural use, that requires no buildings, structures, or improvements other than those pre-existing on the premises, a farm residence or a building, structure, or improvement that is incidental or integral to an agricultural use, that employs no more than four (4) full time employees annually, and that does not impair or limit the current or future agricultural use of the farm or of other protected farmland. Examples include, but are not limited to, personal and professional services, home offices, handicrafts, and small machine repair. This use shall meet the following performance standards:
 - a. The use shall occupy no more than four hundred (400) square feet of a principal residential structure.
 - b. The use shall be clearly incidental and secondary to the use of the principal residential structure, and the appearance of the structure(s) shall not be altered or the occupation within the structures be conducted in a manner that would cause the premises to differ from its residential character either by the use of colors, materials, construction, lighting, signs, or the emission of sounds, odors, dust, or vibrations that carry beyond the premises.
 - c. Any activity involving the on-site sale, resale, salvage, or wrecking of automobiles, trucks, boats, trailers, recreational vehicles, or other motorized vehicles shall be prohibited.
8. **Farm Residence:** Any of the following structures located on a farm:
 - a. A single family residence that is the only residential structure on a farm.
 - b. A single family residence that is occupied by any of the following:

- (1) An owner or operator of the farm.
 - (2) A parent or child of an owner or operator of the farm.
 - (3) An individual who earns more than fifty percent (50%) of their gross income from the farm.
 - c. Farm residences are subject to the density provisions established in Section 7 and the single family residence provisions in 6.5(1) and (2).
9. **Secondary Farm Residence:**
- a. The property is an active farmstead and the dwelling is to be used as a secondary farm residence.
 - b. The individual residing in the dwelling is one of the following:
 - (1) An owner or operator of the farm.
 - (2) A parent or child of an owner or operator of the farm.
 - (3) An individual who earns more than fifty percent (50%) of their gross income from the farm.
 - c. At the time this dwelling is no longer used as a secondary farm residence, the dwelling must be parceled off via Certified Survey Map and must meet all applicable Subdivision and Zoning Codes at the time of the Conversion.
 - d. Secondary farm residences are subject to the density provisions established in Section 7.
10. **Forestry Management:** Forest production, management and harvesting.
11. **Private Reception Venue:** A location, indoors or outdoors, which is used primarily to host events such as weddings, corporate events, fundraisers, and anniversary celebrations. The term includes event barns. With special standards being:
- a. Minimum size of parcel must be at least five (5) acres.
 - b. Any structure or building to be used must meet all applicable local and state building code regulations for such use.
 - c. Where applicable, licenses or approvals must be obtained from other County departments, including, but not limited to the Health and Sheriff's departments.
 - d. Proper sanitary facilities must be provided and approved by the applicable authority.
 - e. Required parking is one (1) parking space per every three (3) patron seats or one (1) space per three (3) persons at the maximum capacity of the establishment, whichever is greater.
 - f. Private Reception Venues proposed in the Farmland Preservation Overlay are limited to utilizing only existing farm structures, unless rezoned to RC-O.

12. **Manure Co-Digester Facility:** An anaerobic manure co-digester facility that produces energy in the form of biogas from materials grown or produced on the farm

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in conjunction with biodegradable organic feedstock brought to the farm. A co-digester facility shall be permitted through the conditional use permit process in the zoning districts identified in table 5.0 and 5.1 of this ordinance.

a. The applicant shall submit the following as part of the Conditional Use permit application:

1) A narrative description of the proposed facility including:

i. All operations and performance standards for siting to minimize impacts on neighboring properties which shall include considerations of topography, odor, prevailing wind patterns, proximity to nonagricultural properties, operational noise, buffering and screening, and specific hours of operation.

ii. The nature of on-site activities and operations, the types of materials stored and used as part of the operation as well as the frequency and duration period of storage of materials and the methods for use and disposal of materials. Evidence shall be provided that the use, handling, and disposal of material will be accomplished in a manner that complies with state and federal regulations.

iii. Copies of all permits and approvals which are required by governmental agencies for the construction and operation (including final disposal of all byproducts and waste) of a co-digester.

iv. The general scale of the operation in terms of its market area, specific space and area requirements for each activity, the total number of employees of each shift, and an overall needed site size.

v. An emergency action plan which incorporates appropriate training for the local fire department and emergency management services.

2) A site plan providing all proposed structures, driveways, stacking lanes, parking areas, and any other related facilities along with setback distances to any property lines, road right of ways, etc.

3) A decommissioning plan for the co-digester and related facilities when the co-digester becomes functionally obsolete or is no longer in use. All tanks or other structures that contained waste or have been contaminated with waste shall be cleaned and the waste processed and disposed of appropriately. Additionally, buildings, tanks, supporting structures and other physical components may be refurbished for continued use, reclaimed or adapted for other farm use, or dismantled and recycled or properly disposed of. The co-digester owner shall notify the Planning and Zoning Department immediately upon cessation or abandonment of the facility and shall be responsible for the removal of the manure and organic food waste from the facility within six (6) weeks from the date operations cease. The co-digester shall be removed and all associated buildings or facilities shall be removed or repurposed as set

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forth in the decommissioning plan within twelve (12) months from cessation or abandonment of the operation. Prior to a conditional use permit being issued the owner shall supply to the Planning and Zoning Department financial security in the amount required by the Planning and Zoning Committee as part of their consideration of the conditional use permit.

4) Written confirmation from the provider of any utility service(s) which is/are required for the operation of a co-digester.

b. The required parking for the facility shall be one parking space for each employee on the largest work shift at the co-digester facility.

c. The co-digester shall be accessory to and located on the same parcel as the active farm operation.

d. In no event shall any human biological byproduct waste or hazardous waste be brought to the farm or utilized as part of the digestion process.

e. The applicant shall provide sufficiently long stacking lanes on the facility grounds, so that vehicles waiting to be unloaded or loaded will not queue on public roads.

f. The off-loading and storage of any feedstock brought to the facility shall occur within a fully enclosed receiving building. No outdoor storage of food waste or storage of food waste in open vessels is permitted.

g. All garbage, trash, and rubbish shall be stored indoors.

h. All of the manure generated at the subject farm shall be used in the operation of the onsite co-digester and at least fifty-one (51) percent of the manure used in the co-digester shall come from animals housed on the subject farm.

i. There shall be no onsite commercial or retail sales of digestate or any product or byproduct generated by the co-digester unless expressly permitted by the Conditional Use permit process.

j. The operator shall be responsible for maintaining a permanent log confirming the source of all feedstock for the co-digester including the date of delivery of the feedstock as well as the name and location of the source of the feedstock and the volume delivered.

k. The co-digester shall be designed and constructed in compliance with applicable local, state, and federal codes and regulations.

l. All structures shall comply with the height and setback requirements of all applicable ordinances with the exception that a co-digester that is designed to inflate and deflate in capturing the biogas may exceed the thirty-five (35) foot height

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restriction provided that the height does not exceed forty-five (45) feet in height when fully inflated.

m. The owner and operator shall provide direct contact information to the County and shall update their contact information within thirty (30) days of any changes in the contact information.

n. The operator shall be responsible for testing the co-digestion byproducts for the presence of PFOS, PFAS, heavy metals, and microplastics once every month. Samples shall be collected and testing conducted by a third-party laboratory acceptable to the Planning and Zoning Committee. The operator shall be responsible for notifying the Planning and Zoning Department of the results of the testing within five business days of the receipt of the results.

o. Any biogas generated from the co-digester must be used on the subject farm or be transported off the subject property via pipeline.

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7.0 Density Management

7.1 Purpose: The purposes of this section include, but are not limited to:

1. Preserve open space, scenic views, and critical and sensitive areas.
2. Conserve agricultural uses of land.
3. Protect lands, resources and structures of aesthetic, architectural, and historic significance.
4. Conserve and protect water resources and environmentally sensitive lands, water, and other natural resources.
5. Assist in shaping the character and direction of the development of the community.
6. Establish a procedure enabling landowners to voluntarily sever development rights from a sending property.
7. Protect and enhance private property rights by enabling the transfer of development rights.
8. Improve quality of life for residents of Waupaca County.
9. Conserve and promote public health, safety, and general welfare of the County by establishing procedures, methods, and standards for the transfer of development rights within its jurisdiction.

7.2 Applicability:

This section applies only to the following zoning districts; Private Recreation and Forestry (PVRF), Agriculture Enterprise (AE), Agriculture Retention (AR), Agriculture and Woodland Transition (AWT), and Rural Residential (RR).

1. The size and zoning of a parcel limits the maximum number of residential dwellings or equivalent principal use within these zoning districts.
2. Development rights are required for a dwelling or one (1) principal commercial, institutional, recreational, utility, transportation, or industrial land use.
3. Each multi-family dwelling permitted or legally established on the lands following the effective date of this chapter shall be counted as one (1) development right for the purpose of this chapter.
4. All dwellings count towards this density limit, including the original farm dwelling and secondary farm residences.
5. No building, structure or premises shall be erected, occupied or used so as to provide a greater density of population than is allowed by the terms of this ordinance for the district in which such building, structure or premises is located.
6. The availability of a development right does not guarantee that a dwelling or equivalent principal use can be built on a parcel. All evaluation criteria must be met.

7. Accessory structures do not require a development right; however, an accessory structure prior to the principal structure would require a development right. Agricultural Accessory Use does not require a development right.
8. Recreational vehicles that have obtained a Conditional Use Permit to park on property exceeding the thirty (30) days during the calendar year and that have permanent facilities established, such as sheds, septic system, privies, etc., require a development right. If no permanent facilities are established on the property for the recreational vehicle and a porta-potty is utilized, no development right will be required.
9. Campgrounds, camping resorts, resort establishments, mobile home parks, and dormitories and staff housing dedicated to an institutional use do not require the use of a development right.

7.3 Method of Calculation:

1. **Initial:** The following method shall be used to calculate the initial maximum number of residential dwelling units:
 - a. The parcel maps at the time of Township adoption will be the basis of the density determination.
 - b. A quarter-quarter ($\frac{1}{4} \frac{1}{4}$) is deemed to be forty (40) acres regardless of the size of the fractional forty (40).
 - c. Parcels intended to be one-half ($\frac{1}{2}$) of a quarter-quarter ($\frac{1}{4} \frac{1}{4}$) are considered twenty (20) acres regardless of size of the fractional twenty (20) acres.
 - d. In the event of a fractional development right, the development rights are rounded down. No fractional development rights are allowed.
 - e. Easements and parcels intended only for access are neither given a development right, nor counted against the parent parcel.
 - (1) Measure the “gross site area”.
 - (2) Divide the gross site area by the Residential Density and Lot Size Management Overlay as chosen by the applicable Town as described within Section 8.2.
 - (3) The Planning & Zoning Director shall keep track of the total number of development rights on each parcel from the date of adoption of this Zoning Ordinance. All additional dwelling units following that initial date shall conform to the maximum density calculated for the parcel or contiguous common ownership land as such lands were sized and configured on that initial date.
 - f. Where divisions of land are created by the construction of a public right of way that was done solely on the authority of the local government or by divisions of land created by a naturally occurring geographic feature such as a river or stream, a development right is assigned to each parcel created.
2. **Subsequent Assignment:**
 - a. Assignment of development rights will be done in order of recorded Certified Survey Map.

- b. A development right will be considered used when a parcel is split, creating a potentially buildable lot, or when a permit for a dwelling or other principal use is issued for an existing parcel.
- c. For administration of this policy, the development rights remain with the land, not the owner or subsequent owners. It is the responsibility of the owners and potential buyers of the land to check with the County on availability of development rights. Potential buyers are also advised to contact the Waupaca County Planning & Zoning Office to determine if it is in the Limited Development Overlay.
- d. Changes and reconfigurations in ownership do not trigger new allotments of potential future development rights. When land is sold or consolidated after the effective date of the Town adoption, the Planning & Zoning Director will use the following approaches in the order listed to determine how many (if any) potential future development rights were transferred along with the land.
- e. Assignment of development rights will be done at the time of split by all the owners of record of the parent parcel. A document attesting to the assignment of the development rights shall be filed in the Waupaca County Planning and Zoning Office. Signatures of all owners of record must be notarized.
- f. The Planning & Zoning Office will implement a complete and accurate inventory of the development rights that have been used to date and will implement a plan for keeping this inventory up to date.

7.4 Existing Developments:

It is recognized that a number of parcels existed at the time each Town adopted the County Comprehensive Plan which do not meet minimum density requirements.

- 1. One (1) dwelling unit or equivalent principal use may be built on an undeveloped parcel if the parcel existed as of the date of the Town adoption of this Ordinance. For parcels located within the Farmland Preservation Overlay only farm residences will be allowed.
- 2. This “grandfather clause” will allow one (1) dwelling unit without a zone change.
- 3. No further splits of such parcels for development are allowed but may be put in the Limited Development Overlay. [The availability of a development right does not guarantee that a dwelling or equivalent principal use can be built on a parcel. All evaluation criteria must also be met.]
- 4. Each single dwelling unit or equivalent principal use that received a zoning permit or was otherwise legally constructed prior to the effective date of this chapter shall be counted against the maximum number of new dwelling units or equivalent principal uses that may be built.
- 5. Each single dwelling unit or equivalent principal use structure that was legally constructed prior to the effective date of this chapter but does not meet the density requirements of this section shall be allowed to be rebuilt on the lot within a twelve (12) month period. If reconstruction of the dwelling unit or equivalent principal use structure has not started within a twelve (12) month period, then it has to be built in a compliant location.

7.5 Rezoning:

1. Nothing in this Section shall preclude the petitioner from seeking a zoning map amendment to remove lands from the PVRF, AE, AR, or AWT zoning districts unless located in Farmland Preservation in accordance with Section 14.5(2). Rezones in the Farmland Preservation Overlay will not create additional development rights. In the event that such lands are rezoned away from one of these districts, and not rezoned to another one of these districts, the provisions of this Section shall no longer apply.
2. In the event that a property is rezoned into PVRF, AE, AR, AWT or RR zoning districts from a non-applicable zoning district, the assignment of densities will be determined during the rezoning process.

7.6 Transfer of Development Rights (TDR): For Non-Farmland Preservation Properties

(for Farmland Preservation properties see Sec. 8.7).

1. Purpose: To achieve the optimum residential environment while recognizing that rural character of the Town. The density transfer technique is designed to encourage preservation from prime agricultural tillable lands worthy of such preservation.
2. Development rights can be transferred to contiguous parcels within the same Township provided that an owner is in common and the zoning district is the same. A document attesting to the development right transfer shall be filed in the Waupaca County Planning & Zoning Office. Signatures of all owners of record on the sending parcel must be notarized.
 - a. Parcels zoned as Rural Residential (RR) may not send or receive development rights.
3. Once a parcel of land has transferred all of its development rights, it is placed in the Limited Development Overlay District.

8.0 Zoning District Overlays

8.1 Establishment of Zoning District Overlays

1. The purpose of zoning district overlays is to allow the County to establish special land use regulations or procedures in areas with unique land use, site planning, building design, or environmental resource issues. Zoning district overlays are intended to be applied only where special circumstances justify the modification of base zoning district regulations to achieve specific land use and design objectives based on the Waupaca County and local Town Comprehensive Plans and applicable ordinances. Zoning district overlays are established in Sections 8.2 through 8.7.
2. Zoning district overlays are applied through rezoning and only in conjunction with base zoning districts. Letters, numbers, abbreviations, or a combination thereof, shall be combined with other applicable district designations to the property(ies) on which an overlay district is established and shown on the Waupaca County Zoning Map.
3. Except as modified by the zoning district overlay, the provisions of the applicable base zoning district shall apply to all development within the boundary of the

designated area. If regulations conflict, the applicable zoning district overlay regulations shall prevail.

4. Whenever an overlay district is established, any subsequent application to change the base zoning district shall not be construed to be an application to eliminate the overlay district for the property covered by the application. Intent to eliminate the overlay district on a given property or base zoning district shall be expressly stated to be part of the application.

8.2 Residential Density and Lot Size Management Overlays

1. **Purpose:** Provide a range of residential density management, lot size, and lot configuration options to implement the individual Waupaca County Towns' Comprehensive Plans preferred land use policies. Where the base zoning districts implement the base density and lot size, the overlays provide a means to fine tune the base zoning to better match the individual town policies.
2. The Residential Density and Lot Size Management Overlays can be applied to the following base zoning districts:
 - a. PVRF Private Recreation and Forestry Enterprise
 - b. AE Agriculture Enterprise
 - c. AR Agriculture Retention
 - d. AWT Agriculture and Woodland Transition
 - e. RR Rural Residential
3. If utilized, the overlays shall be applied uniformly to entire base zoning districts within individual towns. They cannot be used to modify the zoning requirement of specific properties under the same base zoning district.
4. Overlay designations shall be applied by use of letter or abbreviation and number combination. For each base zoning district listed within Section 8.2.2, not more than one (1) overlay from each of the following categories shall be applied:
 - a. Maximum Residential Density
 - (1) D-2: 1 unit/2 acres
 - (2) D-5: 1 unit/5 acres
 - (3) D-10: 1 unit/10 acres
 - (4) D-20: 1 unit/20 acres or a 1/32 of a section
 - (5) D-40: 1 unit/40 acres or a 1/16 of a section
 - b. Minimum Lot Area
 - (1) MIN-20: 20,000 square feet
 - (2) MIN-1: 1 acre
 - (3) MIN-2: 2 acres
 - (4) MIN-5: 5 acres
 - (5) MIN-10: 10 acres

- c. Maximum Lot Area
 - (1) MAX-0: none
 - (2) MAX-2: 2 acres
 - (3) MAX-3: 3 acres
- d. Lot Clustering Requirements according to the provisions of Section 9.0.
 - (1) C1: All lots created through land divisions must be clustered.
 - (2) C2: All lots created as part of major subdivisions as defined in the Waupaca County Subdivision Ordinance Chapter 37 must be clustered.
 - (3) C3: Lot clustering is optional. If lots are clustered, then one (1) additional lot for every four (4) lots allowable per the base zoning or district overlay is possible by Conditional Use Permit.
- 5. Maximum Residential Density Overlays in Section 8.2.4.a. that are less restrictive than the Base Zoning District shall not be applied.
- 6. Maximum lot areas can be increased up to ten (10) acres in area for the purpose of consolidation of farm structures with Township approval. Site plan, Level 1, review is required.

8.3 Limited Development Overlay

- 1. **Purpose:** To graphically show parcels of land that no longer has any development rights. If, however, a landowner is able to transfer development rights to a parcel in this overlay, the overlay will automatically be modified. This overlay is not a certified Farmland Preservation District.
- 2. For landowners without any development rights, permits will still be issued for any structures that are not principal structures and do not require development rights. (See Section 7.0).

8.4 AUI Agriculture/Urban Interface Overlay

- 1. **Purpose:** To further implementation of a multi-tiered agricultural zoning system in response to Wisconsin Act 235, known as the Livestock Facility Siting Law. This classification will help protect cities, villages, and rural sanitary districts from potential health and safety issues associated with close proximity to large livestock farming operations. This classification will also help protect agricultural operations from the land use conflicts associated with close proximity to urban and suburban growth and development areas.
- 2. This overlay will be utilized to establish an area, (generally within one-half (1/2) mile) surrounding the current boundaries of cities, villages, and rural sanitary districts where new livestock farming operations with fewer than five hundred (500) animal units will be allowed, but new operations with five hundred (500) or more animal units will not be allowed. Animal units are defined by Wisconsin Administrative Code ATCP 51.
- 3. New nonfarm residential structures shall not be allowed within one thousand (1,000) feet of structures, barns, manure storage structures, feed storage structures, etc.

related to livestock operations with five hundred (500) or more animal units. Residential structures for affiliated parties, house for child or farm employees, are exempted from this policy.

8.5 Floodplain Overlay

See the Waupaca County Floodplain Ordinance Chapter 36.

8.6 RP: Resource Protection Overlay District

1. Purpose: To identify, conserve, and protect valued natural and cultural resources that contribute to the County's character, natural environment and history which may include regulatory wetlands and floodplains, wetland buffers, floodplain buffers, surface water buffers, steep slopes, exposed bedrock, wellhead protection areas, woodlots, scenic vistas, wildlife habitat, historic sites, archeological sites, and similar resources. The RP Overlay District corresponds with the Resource Protection Preferred Land Use Category within the Waupaca County Comprehensive Plan.
2. Specific lands within the Resource Protection Overlay District may be removed under one or more of the following circumstances:
 - a. A more detailed study by a qualified, licensed professional reveals that the characteristic(s) which resulted in the property's designation as a Resource Protection Overlay District no longer exist(s), or never existed;
 - b. Approvals from appropriate State or Federal agencies are granted to alter a property so that the characteristic(s) which resulted in its classification as an environmental corridor no longer exist; or
 - c. A mapping error has been identified by the Planning & Zoning Director and/or Planning & Zoning Committee.
3. In the case of the above situations, the property can be zoned in accordance with the adopted Town Comprehensive Plan Preferred Land Use Map without undergoing the formal rezone process, as the circumstances for inclusion within the Resource Protection Overlay District have materially altered. The applicant is responsible for providing an accurate scaled map depicting the revised natural resource boundary. The map shall be prepared by a qualified professional or a land surveyor licensed by the State of Wisconsin.

8.7 FP: Farmland Preservation Overlay

1. **Purpose:** To provide for the preservation of farmland, environmental corridors and open space over areas where it is mapped. This overlay will only be mapped over an underlying base agricultural and forestry zoning district (i.e., Agricultural Retention (AR), Agricultural Enterprise (AE) and Private Recreation and Forestry (PVRF)) to impose regulations in addition to those required by that base agriculture district. This overlay district will be used to represent with the areas identified by participating towns as being consistent with the objective criteria used to define areas to be within Farmland Preservation. During the comprehensive planning process, towns that have a large agricultural contingency created their future land use maps with Farmland Preservation, and more specifically, the Working Lands Initiative in mind. This overlay will in large part be implementing the planning process that have already

occurred at the local and county level. This overlay, once approved, can only be modified by approved rezones (in accordance with Wis Stats 91.48) or by a Comprehensive Plan amendment with a companion amendment to the Farmland Preservation Plan (in accordance with Wis Stats 66.1001 and 91.20).

2. Specific regulations for lands within this overlay:
 - a. No non-farm residential or commercial development will be allowed for lands within this overlay without a rezone out of the underlying district and into Rural Residential – Overlay (RR-O) or Rural Commercial – Overlay (RC-O). All rezones will need to be found compliant with State Statutes 91.48(1) prior to approval. Once approved, this overlay will automatically be adjusted to no longer include RR-O or RC-O zoned property. Note: all properties that receive a rezone will be automatically taken out of the Certified Farmland Preservation zoning district area and will be tracked to provide DATCP an annual audit by March 1 of every year pursuant to State Statute 91.48 (2);
 - b. Rezones in the Farmland Preservation Overlay will not create additional development rights.
 - c. The amount of rezones for non-farm development allowed within this overlay will be regulated by the density requirements determined by the underlying base zoning districts. The density requirements for the base zoning districts will be consistent with the town of jurisdiction's Comprehensive Plan. As soon as density rights are no longer available for an owner, the remaining lands will be placed in a Restricted Development Overlay that will bar any further land divisions. Permits will still be issued for any farm related structures other than principal structures;
 - d. The minimum lot size for non-farm development allowed as a rezone within this overlay will be 2 acres. A lot size larger than the minimum will require additional development rights at the rate of 1:2. For fractional sizes, the necessary development rights will be determined by dividing the proposed lot size by 2 then rounding up to the nearest whole number. For example, for a 9 acre proposed lot, $9/2=4.5$ which rounds up to 5 development rights. Exceptions would include:
 - (1) For the purpose of consolidation of farm structures. The lot area may be increased up to ten (10) acres in area with Township approval. This would only require one (1) development right.
 - (2) For the conveyance of large tracts of land that would consist of one-half ($1/2$) of a quarter-quarter ($1/4$, $1/4$) will be allowed as an exemption of the development right rate of 1:2. A Homeowner Assignment of Density Rights form must be completed for these land divisions as required by Sec. 7.3 2.5.
 - e. The transfer of development rights will be allowed from this overlay into lands outside, but not vice versa. The transfer of development rights will also be allowed if the parcels are zoned differently or if the transfer is between farms, provided that the owner is in common, without regard to contiguity of the parcels, and are all within the Farmland Preservation Overlay. The transfer of development rights will not be allowed to cross any Township boundaries;

- f. Secondary farm residences will be allowed provided that a development right is available and an affidavit is recorded with the Register of Deeds attesting to the following: the residents of the dwelling will be receiving a minimum of 51% of their income from the farm and in the event of the residence being transferred to a non-farm owner, a Certified Survey Map creating a separate parcel in accordance with existing size regulations will be approved and recorded in accordance with all existing regulations governing land divisions.

9.0 Lot Clustering

9.1 Purpose

There are two (2) basic strategies behind residential lot development. The traditional strategy distributes the lots across the development tract, maximizing the size of each lot and leaving little if any undeveloped land. The alternative, “cluster” or “conservation” land divisions, groups the lots together on a portion(s) of the development tract preserving the remainder of the tract in open space for the purpose of maintaining rural character, natural features, agricultural land, or similar features. The cluster or conservation development lots are usually smaller than those of the traditional strategy. The lot clustering requirements of this Section apply to the Lot Clustering Overlays outlined in Section 8.2.4.d.

9.2 Uses and Requirements

All cluster developments shall conform to the allowable permitted and conditional uses, density, lot dimensions, setbacks, height, and other requirements of this Ordinance unless otherwise specified in this Section.

9.3 Lots

1. The minimum residential lot area shall be seventy-five hundredth (0.75) acres.
2. The maximum residential lot area shall be two (2) acres.
3. Lots shall be located so that:
 - a. They are grouped together to form clusters and are surrounded by open space.
 - b. Negative impacts to natural resources and environmentally sensitive areas including wetlands, floodplains, drainageways, woodlands, and slopes over twelve percent (12%) are minimized.
 - c. Negative impacts to historic and cultural resources are minimized.
 - d. Negative impacts to prime agricultural land and large tracts of productive farmland are minimized. The location of lots should avoid interference with normal agricultural practices.
 - e. Views of open space and natural resources are maximized. Lots should be hidden behind woodlands, hedgerows, and topography when possible. Lots should not be located in prominent, visible places like hilltops and ridgelines.

9.4 Open Space

1. The minimum open space required is fifty percent (50%) of the total development tract. Open space includes all land within the tract that is not part of a residential lot, road or road right-of-way.
2. Open space shall:
 - a. Surround clusters of residential lots and provide a buffer between cluster groups.
 - b. Be interconnected to other open space both within the plat and beyond. Open space should not be isolated and disconnected.
 - c. Include natural resources, environmentally sensitive areas, and productive agricultural land, when the intent is to preserve the agricultural use, to the greatest extent possible.
 - d. Include all excess land not used for lots and roads.
 - e. Not be further subdivided for any use other than recreation, conservation or agriculture, except for easements for utilities and septic systems.
3. Ownership of Open Space. Open space shall be dedicated and restricted as such on the Certified Survey Map or Plat and/or a deed restriction shall be placed on the Open Space parcel. Open Space shall be owned by the subdivider, conveyed in common to each of the owners of the lots in the development, or dedicated to the County or Town. The County or Town shall not be required to accept dedication. Lands dedicated to the public must be accepted by appropriate action of the governing body of the accepting unit of government. If the land is to be conveyed to owners of lots in the development, a homeowners association or similar legally constituted body shall be created to maintain the open space land.

9.5 Maintenance and Management of Open Space and Facilities

A plan and narrative for the use, maintenance, and insurance of all common facilities, including provisions for funding, shall be provided to and approved by the Town Board prior to Certified Survey Map or Final Plat approval.

10.0 Site Plan Requirements

10.1 Intent

1. It is the intent of this Ordinance to require Site Plans that will provide sufficient information for the Planning & Zoning Director, County Planning and Zoning Committee, County Board, and other interested parties to make more informed decisions regarding certain land use requests. Site Plans should promote greater understanding of the request and should provide sufficient information to allow informed decisions to be made.

10.2 Applicability

1. A Site Plan is required for all Conditional Uses as identified in Section 5.0, 5.1 and 6.0.

2. A Site Plan is required for certain Permitted Uses where specifically identified in Section 5.0 and 5.1.
3. A Site Plan is required for any development within the PD: Residential Planned Development Zoning District.
4. A Site Plan is also required for the expansion or modification of uses described in Sections 10.2.1, 10.2.2, and 10.2.3 established prior to the adoption of this Ordinance to the extent practical and reasonable. Specifically, only the expansion or modification itself would be considered, and the application of the review criteria may be limited such that the expansion or modification is not required to be substantially out of character with the features of the site that predate this Ordinance. However, this should not be construed to prevent an applicant from willingly making expansions or modifications that are substantial improvements to the character of the site.

10.3 Compliance

All approved Site Plans become part of the official decision record. Failure to comply with all aspects of a Site Plan will constitute a violation of this Ordinance. Any changes to a Site Plan that result from the review process should be clearly indicated in the decision record. Also, any phasing or planned expansion that is intended to be a part of an approved site plan must be clearly identified in the decision record, or such expansion will require a new approval.

10.4 Submittal Requirements

The Site Plan shall be submitted to the Planning & Zoning Director. The Site Plan, whether for Permitted or Conditional Uses, shall contain at a minimum the components identified in the following table and any additional information required in Section 6.0 specific uses.

Site Plan Submittal Requirements	General Site Plan – Level 1	Detailed Site Plan – Level 2	General Architecture Design Plan	Landscaping Plan	Grading and Drainage Plan	Signage and Exterior Lighting Information	Additional Information as Necessary
All Residential Land Uses (Section 6.5) Requiring Site Plan Review	✓						✓
Multi-family Residential, Planned Development (PD), and Manufactured/ Mobile Home Communities	✓	✓		✓	✓	✓	✓
All Commercial, Industrial, and Public/Institutional Land Use (Sections 6.6 to 6.8) Requiring Site Plan Review	✓	✓	✓	✓	✓	✓	✓
All Park/Recreation Land Uses (Section 6.9) Requiring Site Plan Review	✓	✓					✓
Campgrounds and Camping Resorts	✓	✓		✓	✓	✓	✓
All Open Land/Agriculture Land Uses (Section 6.10) Requiring Site Plan Review	✓						✓

10.5 Site Plan Components

The following Site Plan components shall be included as required by specific land use identified in Section 10.4 at an appropriate scale for the subject property and surrounding property, within one hundred (100) feet of the subject property boundary. All components except the ‘General Site Plan – Level 1’ shall be illustrated and identified by a planner, engineer, surveyor, architect, or similar professional:

1. General Site Plan, – Level 1, including:
 - a. North arrow,
 - b. Property boundary,
 - c. Existing and proposed building footprint(s) and dimensions,
 - d. Wells, septic tanks, and drainfields,
 - e. Proposed use(s),

- f. Setback dimensions,
 - g. Driveway location(s),
 - h. Adjacent public roads and rights-of-way,
 - (1) Surface water, floodplain, drainage ditch, and wetland locations.
- 2. Detailed Site Plan, – Level 2, including:
 - a. Drawing scale,
 - b. Location/vicinity map,
 - c. Parking areas, spaces and dimensions,
 - d. Sign locations,
 - e. Exterior light locations,
 - f. Development phasing lines, if applicable,
 - g. Sidewalks, trails, and walkways,
 - h. Easements and dimensions,
 - i. Utility locations,
 - j. Fence locations.
- 3. General Architecture Design Plan including:
 - a. Architectural scale,
 - b. All buildings views/elevations,
 - c. Building height dimensions,
 - d. Exterior building material(s) and color(s),
 - e. Building mounted lighting fixtures,
 - f. Colored rendering or photo simulation, recommended.
- 4. Landscaping Plan including:
 - a. Location of existing and proposed landscaping,
 - b. Size of plantings at installation,
 - c. Species of plantings.
- 5. Grading and Drainage Plan including:
 - a. Existing and proposed contour lines, drainage courses, and fill materials,
 - b. Elevations of proposed building sites,
 - c. Pond/detention basin locations,
 - d. Stormwater and erosion control devices,
 - e. Normal high-water elevation of abutting navigable waters and the proposed waterline.

6. Signage and Exterior Lighting Information including:
 - a. Scaled design drawing of freestanding and/or building signs,
 - b. Sign specifications, lighting, materials, colors, and dimensions,
 - c. Light fixture design detail and specifications.
7. Any additional information deemed necessary by the Planning & Zoning Director or County Planning and Zoning Committee. Either may also exempt a proposed development from submitting any of these detailed plans or their components if it is found that they are not applicable.

10.6 Review Process and Criteria

1. The review of the Site Plan will be incorporated into the review of the permit sought:
 - a. Site Plans for Conditional Uses will be reviewed as a component of the Conditional Use application/permit process as outlined in Section 14.3.5.b.
 - b. Site Plans required for permitted uses will be reviewed as a component of the rezoning process outlined in Section 14.3.5.b. when a rezone and specific development is proposed; otherwise the Site Plan will be reviewed as a component of the Land Use Permit review process outlined in Section 14.3.5.a.
 - c. Site Plans for proposed development within the PD: Planned Residential Development District will be reviewed as a component of the rezoning process.
2. A site plan may be approved, conditionally approved, or denied by the Planning & Zoning Director or Planning and Zoning Committee according to the requirements of this and all other applicable Ordinances and the intent of the County and local Comprehensive Plan policies. Additional considerations include:
 - a. Adherence to the County's Site Plan Components as established in a stand-alone document.
 - b. Relationship to adjacent development in terms of harmonious design, setbacks, maintenance of property values, and potential negative impacts.
 - c. Impacts to the natural resources of the site and adjacent properties.
 - d. Coordination of proposed roads with the existing road network.
 - e. The adequacy of essential services including water, drainage, sewerage facilities, solid waste disposal, and other utilities where necessary to serve residents and/or occupants.

11.0 Signs

11.1 Enactment

1. All signs hereafter located, erected, moved, reconstructed, extended, enlarged, converted, or structurally altered shall be in conformity with the provisions of this Ordinance.

11.2 General Sign Provisions

1. Signs shall be sized appropriately and set back at least ten (10) feet from any road right-of-way as not to dangerously block motorist sight lines. Signs greater than two (2) feet in height, other than official traffic signs shall not be placed within road intersection vision triangles as specified in Sections 2.7.4. and 2.7.5.
2. All signs within the County shall comply with the Electronic Sign Provisions as outlined within Wisconsin Administrative Code Section 201.15.
3. No sign shall dangerously resemble or block official traffic control signs.
4. Signs that do not carry current, fully readable messages and/or signs that are in structural disrepair or are damaged and are left without repair for ninety (90) consecutive days or more shall be removed.
5. Signs on trucks or other vehicles or parts thereof or on cliffs or rocks or the like, regularly placed so as to function as fixed location signs are prohibited.
6. When any sign is externally illuminated, the lights shall be shaded or concealed so that they will not interfere with the vision of motor vehicle operators or shine directly upon adjacent properties.
7. Signs must also comply with any provision under Section 84.30 Wisconsin Statutes.

11.3 Signs on State Controlled Roads

The intent of this Ordinance is to recognize State control of signs along certain State and Federal highways and to defer to State enforcement and administration thereof, with County regulations being supplemental.

12.0 Alternative Wind Energy Systems

12.1 Wind Energy Systems

~~12.1~~ Authority

This Section of the Ordinance is adopted pursuant to authority granted by Wis. Stats. Sec. 59.69 and 66.041

12.2 ~~2.~~ Purpose

The purpose of this Section of the Ordinance is to:

- ~~1.a.~~ Oversee the permitting of wind energy systems.
- ~~2.b.~~ Preserve and protect public health and safety without significantly increasing the cost or decreasing the efficiency of wind energy systems. (Wis. Stats. 66.0401)

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12.3 3. Definitions

In this Section of the Ordinance:

1.a. Administrator: The Waupaca County Planning & Zoning Director and/or his/her designee.

2.b. Meteorological Tower (Met Tower): The tower, base plate, anchors, guy cables and hardware, anemometers (wind speed indicators), wind direction vanes, booms to hold equipment anemometers and vanes, data logger, instrument wiring, and any telemetry devices that are used to monitor or transmit wind speed and wind flow characteristics over a period of time for either instantaneous wind information or to characterize wind resource at a given location.

3.c. Owner: The individual or entity that intends to own and operate the residential wind energy system in accordance with this Section of the Ordinance.

4.d. Rotor Diameter: The cross sectional dimension of the circle swept by the rotating blades.

5.e. Residential Wind Energy System: A wind energy system that:

a.(1) is used to generate electricity;

b.(2) has a nameplate capacity of one hundred (100) kilowatts or less; and

c.(3) has a total height of two hundred (200) feet or less.

6.f. Commercial Wind Energy System: A wind energy system that:

a.(1) is used to generate electricity;

b.(2) has a nameplate capacity of greater than one hundred (100) kilowatts;

c.(3) has a total height of greater than two hundred (200) feet or; and

d.(4) is a wind energy system comprised of two (2) or more residential wind energy systems.

7.g. Total Height: The vertical distance from ground level to the tip of a wind generator blade when the tip is at its highest point.

8.h. Tower: The monopole, freestanding, or guyed structure that supports a wind generator.

9.i. Wind Energy System: Equipment that converts and then stores or transfers energy, as defined by Wis. Stats. 66.0403(1) (m). This equipment includes any base, blade, foundation, generator, nacelle, rotor, tower, transformer, vane, wire, inverter, batteries, or other component used in the system.

10.j. Wind Generator: Blades and associated mechanical and electrical conversion components mounted on top of the tower.

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12.4 4. Standards

Both residential and commercial wind energy systems shall be subject to the following requirements:

4.a. Setbacks: A wind tower for a residential or commercial wind system shall be set back a distance equal to its total height from:

a.(1) any public road right-of-way, unless written permission is granted by the affected utility;

b.(2) any overhead utility lines, unless written permission is granted by the affected utility;

c.(3) all property lines.

4.b. Blade Clearance: The vertical distance from the ground level to the tip of a wind generator blade, with the blade at its lowest point, shall be at least thirty (30) feet.

4.c. Access:

a.(1) All ground mounted electrical and control equipment shall be labeled or secured to prevent unauthorized access.

b.(2) The wind tower shall be designed and installed so as to not provide step bolts or a ladder readily accessible to the public for a minimum height of eight (8) feet above the ground.

4.d. Electrical Wires: All electrical wires associated with a residential or commercial wind energy system, other than wires necessary to connect the wind generator to the tower wiring, the tower wiring to the disconnect junction box, and the grounding wires, shall be located underground.

4.e. Lighting: A wind tower and generator shall not be artificially lighted unless such lighting is required by the Federal Aviation Administration.

4.f. Appearance, Color, and Finish: The wind generator and tower shall remain painted or finished the color or finish that was originally applied by the manufacturer, unless approved in the Land Use Permit.

4.g. Signs: All signs other than the manufacturer's or installer's identification, appropriate warning signs, or owner identification of a wind generator, tower, building, or other structure associated with a residential wind energy system that shall be visible from any public road shall be prohibited.

4.h. Code Compliance: A residential or commercial wind energy system including tower shall comply with all applicable State construction and electrical codes and the National Electrical Code.

4.i. Utility Notification and Interconnection: Residential and commercial wind energy systems that connect to the electric utility shall comply with the Public Service Commission of the Wisconsin's Rule 119, "Rules for Interconnecting Distributed Generation Facilities."

4.j. Met Towers: Shall be permitted under the same standards, permit requirements, restoration requirements, and permit procedures as a residential or commercial wind energy system.

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k. **Maintenance:** Residential and commercial wind energy systems shall be maintained in good, operable condition free from excessive noise.

l. **Battery Energy Storage System:** If battery energy storage systems are included on the same site as wind energy projects, the following considerations shall be made by the owner/operator:

(1) Setbacks for a battery energy storage facility shall be one hundred (100) feet to any lot line including the right way of the road. The battery energy storage facility shall also comply with any Department of Natural Resources or Public Health setback requirements.

(2) Separate containment enclosures that include the following:

i. Enclosure Size Capacity containment of one-hundred and fifty (150 %) percent of the battery energy storage system.

ii. Sufficient fireproofing for connecting electronic wires, protecting from one structure to the next and from the battery energy storage system to the substation.

(3) Battery management protocols including:

i. Labeling of battery energy storage system container with a date of first usage via a stamped metal nameplate with serial number.

ii. Upon the end of its serviceable life the battery energy storage system container shall be removed from the site and properly recycled at owner/operator's expense.

iii. The owner/operator shall provide an operational plan of the proposed facility to the Waupaca County Emergency Management Department including reporting the storage and/or use of any hazardous materials as well as an emergency plan for the facility.

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12.5 5. Permit Requirements

1.a. **Land Use Permit:** A Land Use Permit shall be required for the installation of a residential wind energy system.

2.b. **Conditional Use Permit:** A Conditional Use Permit shall be required for the installation of a commercial wind energy system.

3.c. **Documents:** Both Land Use and Conditional Use Permits shall be accompanied by a plan which includes the following:

a.(1) Property lines and physical dimensions of the property.

b.(2) Location, dimensions, and the types of existing major structures on the property.

c.(3) Location of the proposed wind system tower.

d.(4) The right-of-way of any public road that is contiguous with the property.

e.(5) Any overhead utility lines.

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~~f.~~(6) Wind system specifications, including manufacturer and model, rotor diameter, tower height, and tower type, freestanding or guyed.

~~g.~~(7) Tower foundation blueprints or drawings.

~~h.~~(8) Tower blueprint or drawing.

~~4.d.~~**Critical Communications Study:** The applicant shall submit a critical communications study prepared by a qualified professional engineer which affirmatively demonstrates that the wind energy system will not interfere with critical communication signals.

~~5.e.~~**Fees:** The application for a Land Use or Conditional Use Permit for a residential or commercial wind energy system must be accompanied by the fee required for a permitted principal use.

~~6.f.~~**Expiration:** A permit issued pursuant to this Section of the Ordinance shall expire if:

~~a.~~(1) The residential or commercial wind energy system is not installed and functioning within twenty-four (24) months from the date the permit is issued, or

~~b.~~(2) The residential or commercial wind energy system is out of service or otherwise unused for a continuous twelve (12)-month period.

12.6 6. Abandonment

~~1.a.~~A residential or commercial wind energy system that is out of service for a continuous twelve (12)-month period will be deemed to have been abandoned. The Planning & Zoning Director may issue a Notice of Abandonment to the owner of a residential or commercial wind energy system that has been deemed to have been abandoned. The owner shall have the right to respond to the Notice of Abandonment within thirty (30) days from the Notice receipt date. The Planning & Zoning Director shall withdraw the Notice of Abandonment and notify the owner that the Notice has been withdrawn if the owner provides information that demonstrates the residential or commercial wind energy system has not been abandoned.

~~2.b.~~If the residential or commercial wind energy system is determined to be abandoned, the owner of a residential wind energy system shall remove the wind generator from the tower at the owner's sole expense within three (3) months of the receipt of Notice of Abandonment. If the owner fails to remove the wind generator from the tower, the Planning & Zoning Director may pursue legal action to have the wind generator removed at the owner's expense.

12.7 7. Land Use or Conditional Use Permit Procedure

~~1.a.~~An owner shall submit an application to the Planning & Zoning Director or his/her designee for a Land Use Permit for a residential wind energy system, or Conditional Use Permit for a commercial wind energy system. The application must be on a form approved by the Planning & Zoning Director and must be accompanied by two (2) copies of the plot plan identified in Section 12.5.3. above.

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2.b. The Planning & Zoning Director shall issue a permit or deny the application for a Land Use Permit within one (1) month of the date on which the application is received. The Planning & Zoning Director shall schedule any application for Conditional Use Permit for a hearing once the Planning & Zoning Office receives written recommendation from the Town.

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3.c. The Planning & Zoning Director shall issue a Land Use Permit for a residential or commercial wind energy system if the application materials show that the proposed wind energy system meets the requirements of this Section of the Ordinance.

4.d. If the application is approved, the Planning & Zoning Director will return one (1) signed copy of the application with the permit and retain the other copy with the application.

5.e. If the application is rejected, the Planning & Zoning Director will notify the applicant in writing and provide a written statement of the reasons why the application was rejected. The applicant may appeal the Planning & Zoning Director's decision pursuant to Section 14.4.2. The applicant may reapply if the deficiencies specified by the Planning & Zoning Director are resolved.

6.f. The owner shall conspicuously post the Land Use Permit on the premises so as to be visible to the public at all times until construction or installation of the residential wind energy system is complete.

12.8 8. Violations

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It is unlawful for any person to construct, install, or operate a residential or commercial wind energy system that is not in compliance with this Section of the Ordinance or with any condition contained in a Land Use Permit issued pursuant to this Section of the Ordinance. Residential or commercial wind energy systems installed prior to the adoption of this Section of the Ordinance are exempt.

12.9 9. Administration and Enforcement

- 1.a.** This Section of the Ordinance shall be administered by the Planning & Zoning Director or designee.
- 2.b.** The Planning & Zoning Director may enter any property for which a Land Use Permit has been issued under this Section of the Ordinance to conduct an inspection to determine whether or not the conditions stated in the Permit have been met.
- 3.c.** The Planning & Zoning Director may issue orders to abate any violation of this Section of the Ordinance.
- 4.d.** The Planning & Zoning Director may refer any violation of this Section of the Ordinance to legal counsel for enforcement.
- 5.e.** Disagreements regarding the interpretation of this Section of the Ordinance occurring between the Planning & Zoning Director or designee and the owner are appealable to the Board of Adjustment as an Administrative Appeal.

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12.10 10. Penalties

- 1.a.** Any person who fails to comply with any provision of this Section of the Ordinance or any permit issued pursuant to this Section of the Ordinance shall be subject to enforcement and penalties pursuant to Section 14.7.
- 2.b.** Nothing in this Section shall be construed to prevent the County of Waupaca from using any other lawful means to enforce this Section of the Ordinance.

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12.11 11. Severability

- 1.a.** The provisions of this Section of the Ordinance are severable, and the invalidity of any section, subdivision, paragraph, or other part of this Section of the Ordinance shall not affect the validity or effectiveness of the remainder of the Ordinance.

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12.2 Solar Energy Generating Facilities

- 1. Authority:** This Section of the Ordinance is adopted pursuant to authority granted by Wis. Stats. Sec. 59.69 and 66.0401. Wis. Stats. 66.401 is adopted and incorporated by reference.
- 2. Purpose:** The purpose of this Section of the Ordinance is to adopt and incorporate the requirements of Wis. Stats. 66.0401 as a local ordinance and to establish local regulations on the installation and use of Energy Generating Facilities that are authorized by and compliant with Wisconsin statutes and that serve to preserve or protect public health or safety, do not significantly increase the cost of the system or significantly decrease the system's efficiency, or allow for an alternative system of comparable cost or efficiency.

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The provisions listed under this section are not intended to be a duplication of any federal or state requirement or to exceed authority granted to Wisconsin Counties.

3. Definitions: In this Section of the Ordinance:

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a. **Conditional Use Permit** means a discretionary permit for a listed conditional use per table 5.0 and 5.1 of this ordinance, granted by the Waupaca County Planning and Zoning Committee, under the notice and hearing procedures of Section 14 of this ordinance, upon application by an owner, and to which various conditions of use may be attached and adhered to by the applicant.

b. **County** means Waupaca County.

c. **Department** means the Waupaca County Planning and Zoning Department.

d. **Kilowatt** means a unit of power equal to one thousand (1,000) watts.

e. **Megawatt** means a unit of power equal to one million (1,000,000) watts, especially as a measure of the output of a power station.

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f. **Permit** means a Land Use Permit issued by the Waupaca County Planning and Zoning Department pursuant to this section.

g. **Shared Revenue Utility Payment** means payments made to counties and municipalities to off-set tax exempt utility property. Payments are based on state calculations.

h. **Solar Energy Generating System, Accessory** means a photovoltaic energy system that converts solar energy to usable thermal, mechanical, chemical, or electrical energy, where such solar energy system is accessory to the principal use of the land (e.g., solar panels providing energy for a dwelling on the same lot). Accessory Solar Energy Generating Systems generate less than 1,000 kilowatts (1 megawatt) and are not intended for use as a public utility.

i. **Solar Energy Generating Facility, Large** means, but is not limited to, connected arrays of photovoltaic panels, their supporting structures and/or mounting systems, the network of necessary electrical wires and conduit (above and below ground), power poles, inverters, transformers, and supporting substations, or a concentrated mirror thermal energy generating facility and its respective components. These facilities are designed for nominal operation at a nameplate capacity of one-hundred (100) megawatts or more. A Certificate of Public Convenience and Necessity issued by the Wisconsin Public Service Commission (PSC) is typically associated with these facilities. This includes facilities which directly convert and transfer or store solar energy into thermal or electrical energy.

j. **Solar Energy Generating Facility, Small** means, but is not limited to: connected arrays of photovoltaic panels, their supporting structures and mounting systems, the network of necessary electrical wires and conduit (above and below ground), power poles, inverters, transformers and supporting substations. These facilities are designed for nominal operation at a nameplate capacity of less than one hundred (100) megawatts and do not meet the definition of an “accessory solar energy generating system”. This includes facilities which directly convert and transfer or store energy into thermal or electrical energy.

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k. **Land Use Permit** means written approval by the Planning and Zoning Department staff that is required before commencing any development as defined in this chapter or before establishing, extending, or changing any use on any parcel.

l. **Environmental Analysis** means a detailed localized review of relevant environmental conditions (e.g. wetland delineations, floodplain studies, navigability determinations, etc.)

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4. **Accessory Solar Energy Generating System**

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- a. An accessory solar energy generating system is permitted in all zoning districts.
- b. All components of an accessory solar energy system are subject to the setback, height and permit requirements for principal structures found in Section 2 as well as any other applicable ordinances including the Shoreland Protection and Floodplain Ordinances.
- c. In the Farmland Preservation Overlay the Accessory Solar Energy Generating System must meet the standards set forth in 6.10.5 for an Agriculture Accessory Use.

5. **Small Solar Energy Generating Facility**

a. **Conditional Use Permit Requirements**

- (1) **Permit Requirement.** Small Energy Generating Facilities are subject to Conditional Use approval in the zoning districts identified in table 5.0 and 5.1.
- (2) **Application Process.** The application for a Conditional Use Permit shall be processed in accordance with the procedures set forth in Section 14.
- (3) **Application Requirements.** The application for a Conditional Use permit shall include the following items as applicable to the project area:
 - i. A narrative description of the proposed project, including a description of the subject property by metes and bounds, address(es), parcel numbers, and any unique circumstances within the project area;

- ii. A site plan, which shall include a scalable drawing showing the location of all drives, entrances, easement labels and locations, trails, and signs; panels, inverters, storage systems, and any other planned infrastructure; visual clearance triangles; setbacks; floodplain(s); wetland(s); and shoreland zone boundaries;
- iii. A plan showing an overhead view of all existing and proposed landscaping on the site, including the location, species, size at time of planting, and mature size for all new plantings;
- iv. A decommissioning plan and financial assurance;
- v. Shared Revenue Utility Payment tax projections and estimated property tax reductions to the County, town(s), and school/special district(s);
- vi. Agreements, leases or other documentation with affected landowners and/or communities outlining any site-specific terms or conditions of development and assuring maintenance of land to be owned or used for common purposes, including, but not limited to, joint development agreements and road maintenance agreements;
- vii. Supporting documentation addressing the review criteria in Section 14;
- viii. Copies of all state, federal, and other permits;
- ix. Any other documentation as identified by the Planning and Zoning Director or the Planning and Zoning Committee to demonstrate compliance with county, state, and federal law.
- x. Documentation evidencing environmental analyses done by third parties, and associated permit authorizations as required by law;
- xv. Documentation of planned stray voltage mitigation and response.
- xvi. Planned noise nuisance abatement measures.

(4) Conditional Use Permit Review Criteria. In addition to the criteria set forth in Section 14, the review for a Conditional Use Permit shall address and consider the following:

- i. Setbacks from participating and non-participating property lines, residential structures, unique adjacent land uses, and roadways, assessed on a case-by-case basis for each parcel affected.
 - a. Fifty (50) feet from non-participating property lines.

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- b. Setbacks identified in Table 4.0 from participating property lines.
 - c. All other applicable required structural setbacks.
- ii. Mitigation of impacts to local environmentally sensitive species and habitats by following:
 - a. Best construction practices, such as wildlife permeable fencing to allow smaller wildlife access through facility fences; and,
 - b. Best construction practices to allow larger wildlife access via natural movement around facility fences.
- iii. Best Management Practices and considerations as noted in the Battery Energy Storage System section below for projects utilizing battery storage.
- iv. Environmental resources.
- v. Reasonable construction standards, including:
 - a. Phasing, to limit area of disturbance;
 - b. Hours of construction to limit disruption to residents; and,
 - c. Light pollution mitigation.
- vi. Equipment related sound mitigation measures including but not limited to:
 - a. Equipment relocation further from receptors;
 - b. Noise cancellation using quieter equipment;
 - c. Sound shielding technology;
 - d. Sound filtering technology; and,
 - e. Noise suppression and blocking with building enclosures or barrier walls.
- vii. Operational lighting standards.
- viii. Maintenance and repair of damage to local roads due to project construction, in the form of a Road Maintenance Agreement.
- ix. Mitigation plans for any damaged soil drainage infrastructure.
- x. Mitigation plans for any damage to surface water conveyance infrastructure, such as grassed waterways.

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xi. Fire hazard mitigation plans, including:

a. Battery-related fire suppression design and chemical release containment design and;

b. Clean-up and monitoring of any fire related chemical releases.

xii. Replacement of lost property tax revenue, including school and special districts.

xiii. Financial assurance for construction in the form of a surety bond, letter of credit, escrow account, reserve fund, parent guarantee, or other suitable financial mechanism.

xiv. Decommissioning plan and financial assurance for project decommissioning costs. A posted form of financial security such as a surety bond, letter of credit, escrow account, reserve fund, parent guarantee, or other suitable financial mechanism, prior to the commencement of construction to include the total cost of decommissioning of the solar generation portion and the battery energy portion of the solar project at the end of its useful life.

xv. Compliance with county, state, and federal laws, as may be applicable.

xvi. Other community benefits as may be relevant.

b. Land Use Permit Requirements for Small Solar Energy Generating Facility.

(1) **Permit Requirement.** The owner must apply for and receive a Land Use Permit from the Department before installing, constructing, or expanding any Small Solar Energy Generating Facility.

(2) **Application Process.** The application for a Land Use Permit shall be processed in accordance with the procedures set forth in Section 14.

(3) **Permit Fee.** The permit fee shall be in accordance with the adopted fee schedule and be submitted when the application is submitted for review.

(4) **Permit Expiration.** A Land Use Permit shall expire two (2) years from the date of issuance. To the extent allowable under the conditions of the Conditional Use Permit decision of the Planning and Zoning Committee, if in the event that the construction is not yet completed by the expiration date of the Land Use Permit the applicant shall obtain a new land use permit prior to the recommencement of the construction project.

(5) **Application Requirements.** The application for a Land Use Permit shall include the following items applicable to the project area:

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- i. A narrative of the proposed project, including a description of the subject property by metes and bounds, addresses, parcel numbers, and any unique circumstances within the project area.
 - ii. A site plan, which shall include a scalable drawing showing the location of all drives, entrances, easement labels and locations, trails, and signs; panels, inverters, energy storage systems, and any other planned infrastructure; visual clearance triangles; setbacks; floodplain(s); wetland(s); and shoreland zone boundaries.
 - iii. Supporting documentation addressing the review criteria in Section 14, if not already submitted.
 - c. **Additional Permitting Requirements.** Additional permits and processes may be required under the Waupaca County Code of Ordinances.
 - d. **Operator Ownership Change.** Notice shall be provided to the County for any change in ownership of the Small Solar Energy Generating Facility on or before the effective date of the change.
 - e. **Other Approvals.** A copy of all necessary state and federal permits and approvals shall be submitted to the Department within ninety (90) days of receiving said authorizations.
 - f. **Post Construction Filing Requirement.** Within ninety (90) days of the date a Small Solar Energy Generating Facility commences operation, the owner shall file with the Department an as-built description of the facility, an accurate map of the facility showing the location of all infrastructure, geographic information system information showing the location of said infrastructure, and current information identifying the owner(s) and operator(s), including designated contact(s), of the Small Solar Energy Generating Facility.
 - g. **Battery Energy Storage System.** If battery energy storage systems are included on the same site as the solar project, the following considerations shall be made by the owner/operator:
 - (1) Setbacks for a battery energy storage facility shall be one hundred (100) feet to any lot line including the right way of the road. The battery energy storage facility shall also comply with any Department of Natural Resources or Public Health setback requirements.
 - (2) Separate containment enclosures that include the following:
 - i. Enclosure Size Capacity containment of one-hundred and fifty (150 %) percent of the battery energy storage system.

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- ii. Sufficient fireproofing for connecting electronic wires, protecting from one structure to the next and from the battery energy storage system to the substation.

(3) Battery management protocols including:

- iii. Labeling of battery energy storage system container with a date of first usage via a stamped metal nameplate with serial number.
- iv. Upon the end of its serviceable life the battery energy storage system container shall be removed from the site and properly recycled at owner/operator's expense.
- v. The owner/operator shall provide an operational plan of the proposed facility to the Waupaca County Emergency Management Department including reporting the storage and/or use of any hazardous materials as well as an emergency plan for the facility.

6. Large Solar Energy Generating Facility

a. Land Use Permit Requirements for Large Solar Energy Generating Facility.

- (1) **Permit Requirement.** The owner must apply for and receive a Land Use Permit from the Department before installing, constructing, or expanding any Large Solar Energy Generating Facility.
- (2) **Application Process.** The application for a Land Use Permit shall be processed in accordance with the procedures set forth in Section 14.
- (3) **Permit Fee.** The permit fee shall be in accordance with the adopted fee schedule and be submitted when the application is submitted for review.
- (4) **Permit Expiration.** A Land Use Permit shall expire two (2) years from the date of issuance. In the event that the construction is not yet completed by the expiration date of the Land Use Permit the applicant shall obtain a new land use permit prior to the recommencement of the construction project.
- (5) **Standards for Review.** The standards for review of a permit application for Large Solar Energy Generating Facility are consistent with Wis. Stats 66.0401 as well as Wis Stats 59.69 and are not more restrictive than the Public Service Commission approved site plan as part of the Certificate of Public Convenience and Necessity.
- (6) **Application Requirements.** The application for a Land Use Permit shall include the following items, as may be applicable:

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- i. A copy of the Public Service Commission authorization, in the form of a Certificate of Public Convenience and Necessity and a copy of the final application packet and documentation submitted to the Public Service Commission for approval.
- ii. A narrative of the proposed project, including a description of the subject property by metes and bounds, address(es), parcel numbers, and any unique circumstances within the project area, as may have been identified during the Public Service Commission review.
- iii. A site plan, which shall include a scalable drawing showing the location of all drives, entrances, easement labels and locations, trails, and signs; panels, inverters, energy storage systems, and any other planned infrastructure; visual clearance triangles; setbacks; floodplain(s); wetland(s); and shoreland zone boundaries;
- iv. Documentation evidencing environmental analyses done by third parties and associated permit authorizations as required by law.
- v. A complete list of neighboring parcels within one (1) mile that have been notified of the project.
- vi. Shared Revenue Utility Payment tax projections; and estimated property tax reductions to the County, Town(s), and school/special district(s).
- vii. Any updates submitted to the Public Service Commission as applicable to these requirements. The equipment should have the capability to withstand extreme weather events.

b. **Additional Permitting Requirements.** Additional permits and processes may be required under the Waupaca County Code of Ordinances.

c. **Operator Ownership Change.** Notice shall be provided to the County for any change in ownership of the Large Solar Energy Generating Facility on or before the effective date of the change and contact information of the new owner shall be included with the notice.

d. **Other Approvals.** A copy of all necessary state and federal permits and approvals shall be submitted to the Department within ninety (90) days of receiving said authorization(s).

e. **Post Construction Filing Requirement.** Within ninety (90) days of the date a Large Solar Energy Generating Facility commences operation, the owner shall file with the Department an as-built description of the facility, an accurate map of the facility showing the location of all infrastructure, geographic information system information showing the location of said infrastructure, and current information identifying the owner(s) and operator(s), including designated contact(s), of the Large Solar Energy Generating Facility.

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13.0 Validity

13.1 Conflict

All other ordinances or parts of ordinances in conflict with the provisions of this Ordinance are hereby repealed.

13.2 Court Invalidation

Invalidation by a court of any part of this Ordinance shall not invalidate the rest of the Ordinance.

13.3 Force and Effect

Following passage and publication by the County Board of Supervisors, this Ordinance shall be in full force and effect in each town adopting County Zoning as listed in 1.5(1).

14.0 Administration and Enforcement

14.1 General Provisions

Section 14.0 contains provisions on the administration and enforcement of the requirements of the Waupaca County Land Use Ordinances. The provisions of Section 14.0 apply, as indicated, to all ordinances and are connected by reference to the substantive standards of the zoning, subdivision and sanitary sections of the Waupaca County Land Use Ordinances.

14.2 Agencies and Offices Involved in Ordinance Administration and Enforcement: Definitions of Roles and Responsibilities

1. **Waupaca County Board of Supervisors:** The Waupaca County Board of Supervisors is responsible for the enactment, amendment and repeal of the Waupaca County Land Use Ordinances.
2. **Waupaca County Planning and Zoning Committee:** The Planning and Zoning Committee is a Committee of the County Board, created pursuant to Sec. 59.69(2) of the Wisconsin Statutes, and serves as the County Planning Agency pursuant to Sec. 236.2(3) of the Wisconsin Statutes. The Committee is responsible for overseeing the office of the Planning & Zoning Director and for other functions assigned to it by this Ordinance or by State law.
3. **Waupaca County Board of Adjustment:** The Waupaca County Board of Adjustment is a board created by action of the County Board of Supervisors pursuant to Section 59.694 of the Wisconsin Statutes. The Board of Adjustment is responsible for hearing and deciding Administrative Appeals and Variance applications as provided in this Ordinance.
4. **Waupaca County Planning and Zoning Office:** The Planning and Zoning Office is an administrative unit of the Waupaca County government, created by the Waupaca County Board of Supervisors. The Office is headed by a Planning & Zoning Director. The Office shall consist of such other personnel as shall be provided for the Office. In addition to duties and responsibilities specified elsewhere in this Ordinance, the Planning & Zoning Director shall be responsible for directing the work of the office for making periodic reports as required on the activities of the office, and for training and educational activities to assure that persons connected with ordinance administration are able to keep abreast of developments in the field of County Land Use Ordinances.

14.3 Duties of the Planning & Zoning Director: Records, Inspections, Determinations, Permit Fees:

In addition to the duties specified elsewhere in this Ordinance, the Planning & Zoning Director or his/her designee shall be responsible for the following administrative duties:

1. **Advising Applicants:** The Planning & Zoning Director shall advise applicants for permits and approvals as to the provisions of this Ordinance and shall assist them in preparing applications.
2. **Keeping Records:** The Planning & Zoning Director shall keep records of applications received, committee or board of office actions on such applications, permits issued, inspections made, enforcement actions undertaken and other similar activities.
3. **Making Inspections:** The Planning & Zoning Director shall make such inspections of premises as are required to determine compliance of land use activities with the terms of this Ordinance. Except in case of emergency, such inspections shall be made only at a reasonable hour with consent, unless the inspection is made pursuant to an inspection warrant issued pursuant to Wisconsin Statutes.

4. **Making Determinations:** The Planning & Zoning Director shall make those administrative decisions and determinations as are specifically assigned to the Director by terms of this Ordinance.
5. **Permits, Approvals and Fees:** The Planning & Zoning Director shall receive applications for the following permits and shall process the applications and the fees collected in the following manner:
 - a. **Land Use Permit**
 - (1) **When required:** A Land Use Permit shall be required to be issued in accordance with Section 2.2.
 - (2) Land Use Permits shall be issued only if the parcel is in compliance with the Waupaca County Subdivision Ordinance.
 - (3) **Application and issuance:** Applications for Land Use Permits shall be made on forms furnished by the Planning & Zoning Director. Issuance of a Sanitary Permit is a precondition of issuance of a Land Use Permit whenever applicable. Permits shall be issued if the application and information obtained through field inspections, if any, causes the Planning & Zoning Director to conclude that the proposed use will comply with all applicable regulations.
 - a) An application submitted for review shall expire not less than sixty (60) days after filing if all of the following apply:
 1. The application does not comply with form and content requirements.
 2. Not more than ten (10) working days after filing, the Planning and Zoning Director provided the applicant with written notice of noncompliance. The notice shall specify the nature of the noncompliance and the date on which the application will expire if the noncompliance is not remedied.
 3. The applicant failed to remedy the noncompliance before the date provided in the notice.
 - (4) **Revision:** A revision is allowed to be made to the site plan after the Land Use Permit has been issued and prior to construction only if it contains the same structures as originally applied for and these structures meet all the required setbacks. If this revision contains a different type of structure or any additional structures have been added to the original site plan since the Land Use Permit was issued, another Land Use Permit will be required.
 - (5) Land Use Permits issued on the basis of plans and applications authorize only the use, arrangement, and construction set forth in such approved plans and applications, and no other use, arrangement, or construction. Use, arrangement, or construction without the authorization shall be deemed a violation of this Ordinance.
 - (6) **Setback Verifications:** Setback verifications at the footings stage shall be conducted by the Planning and Zoning Office. It is the property owner's responsibility to contact the Planning and Zoning Office, during normal working hours at least twenty-four hours in advance, to schedule the setback verification. All setback verifications shall occur during normal working hours Monday through Friday.
 - (7) **Fees:** Fees shall be submitted to the Planning & Zoning Director when application is made for a Land Use Permit. Additional fees shall be assessed in accordance with the adopted fee schedule if work is started before the permit is requested or issued, or once the permit has been issued and additional structures are constructed on the parcel without obtaining another permit. Fees may be changed by action of the Planning and Zoning Committee and notification to the County Board. Any such change of fees is effective upon posting of the

new County Fee Schedule in the Planning & Zoning Office after action by the Planning and Zoning Committee and notification to County Board.

b. Applications for Conditional Use Permits, Variances, Administrative Appeals, and Applications for Rezoning

- (1) **Application and Referral:** Applications for Conditional Use Permits, Variances and Administrative Appeals shall be made to the Planning & Zoning Director on forms prepared by the Planning & Zoning Director and approved as to form and content by the Planning and Zoning Committee. Completed applications shall be referred by the Planning & Zoning Director to the appropriate committee or board for processing and disposition.
 - (a) Applications for rezoning requests shall be made to the Planning & Zoning Director, acting for this purpose on behalf of the County Clerk, on forms prepared by the Planning & Zoning Director and approved by the Planning and Zoning Committee. Completed forms shall be referred to the Planning and Zoning Committee for processing and disposition.
 - (b) Application for variance requests shall be accompanied with a site plan prepared by a Professional Land Surveyor containing all pertinent information regarding the request including, but not limited to, verification of properly monumented lot and right-of-way lines.
- (2) **Fees:** Fees shall be submitted to the Planning & Zoning Director when application is made for public hearings. Additional fees shall be assessed in accordance with the adopted fee schedule if work is started before the permit is requested or issued. Fees may be changed by action of the Planning and Zoning Committee and notification to the County Board. Any such change of fees is effective upon posting of the new County Fee Schedule in the Planning and Zoning Office after action by the Planning and Zoning Committee and notification to County Board.
- (3) **Disposition of Fees:** All fees received by the Planning and Zoning Office shall be placed within the County general fund or transmitted to State agencies as required by the County Board or State Statutes. Fees are collected at the time of application and are not refundable if the application is denied.
- (4) **Permits:**
 - (a) Conditional Use Permits issued on the basis of plans and applications authorize only the use, arrangement and construction set forth in such approved plans and applications, and no other use, arrangement or construction. Use, arrangement, or constructions without that authorization shall be deemed a violation of this Ordinance.
 - (b) The Permit card shall be placed in a prominent location on the premises during construction, alteration, or moving.
 - (c) Owner consent: Whenever a permit or approval carries conditions, the permit or approval shall not be effective until the owner of record of the subject parcel personally signs acknowledgment of the conditions.
- (5) No variances for highway setback are needed where the nonconforming structures resulted from a highway reconstruction project commencing after April 17, 1996, if the structures are relocated on the same footprint.

14.4 Duties of the Board of Adjustment: Variances: Administrative Appeal

1. **General Operating Rules for the Board of Adjustment** (hereinafter referred to as the "Board").
 - a. **Appointment and Term:** The Board shall consist of five (5) members and two (2) alternate members who shall be appointed by the Chair of the County Board for staggered three (3) year terms, commencing on July 1. Vacancies shall be filled in like manner for the unexpired term of any member whose term becomes vacant. Members shall all reside in the County and outside incorporated cities and villages, and no two (2) members shall reside in the same town.
 - b. **Operating Process**
 - (1) The Board shall choose its own Chair, Vice-Chair and Secretary.
 - (2) The Board shall meet at the call of the Chair or at such other times as the Board may determine.
 - (3) The Board shall comply with all requirements of the Wisconsin Open Meeting Law in the conduct of the business before it. The nature of the Board's proceedings are quasi-judicial. The Board may, therefore, deliberate in closed session, after a hearing on the matter, provided legal requirements are complied with.
 - (4) To promote effective use of resources, the Planning & Zoning Office will wait for two (2) or more variance applications to come into the office before scheduling, or forty-five (45) days from the receipt of the first application, whichever comes first.
 - (a) At the discretion of the Board of Adjustment Chair, the Board may delay the scheduling of the public hearings for variances/appeals due to seasonal inclement weather that may hinder the Board from properly assessing the site.
 - (5) The Board may conduct on site inspections of premises and surrounding areas which are the subject of matters before the Board, provided that when the Board, as a unit or individual members, are engaged in such site inspections that they shall not allow interested parties to present arguments or advocacy materials. Such arguments and materials shall be received only at hearings before the Board.
 - (6) The Board shall conduct a public hearing on all Administrative Appeals, and variance matters before it, shall cause a Class 2 Notice under Chapter 985 of the Wisconsin Statutes to be published, and shall give due notice of the hearing to all parties in interest. Any party may appear in person or by agent at such hearing. The Chair may administer oaths to parties testifying and may compel attendance of witnesses.
 - (a) Due notice to parties in interest shall mean that the Planning & Zoning Director will mail, by ordinary postage, reasonable advance notice of all hearings and meetings on any pending matter to the applicant, to owners of record of properties which are located within three hundred (300) feet of the parcel involved in the application, to the Clerk of the town where the property is located, to the Clerk of any other town or any property involved in the application, and to other parties who have made known to the office their specific interest in the matter and their request to receive such notices.
 - (b) Failure of the office to accomplish such provision of notice shall not invalidate or prejudice the proceedings, provided the Board concludes that reasonable efforts were made or that the parties who subsequently complain of not having been sent or of not receiving notice did, in fact, know of the proceedings and had reasonable opportunity to attend, to be represented, or to convey their views prior to the Board's decision.

- (7) Notices shall be sent to State agencies when and if required by State law or rule, or as a matter of information at the discretion of the Planning & Zoning Director.
- (8) All testimony before the Board by persons other than Board members and written or documentary evidence or material pertaining to matters before the Board shall be received at the hearings conducted by the Board, provided, however, that the content of relevant ordinances or statutory materials shall be deemed to be before the Board in all cases and need not be entered into the record. All parties in interest shall be afforded reasonable opportunity to comment on all materials or information so received. Board members who are in possession of facts which may have a bearing on the matter before the Board shall enter same into the record of the hearing and opportunity shall be allowed for comment.
- (9) If following the close of a hearing, the Board finds it necessary or desirable to receive additional information, evidence or arguments which may have a bearing upon the Board's decision, it shall reconvene a public hearing, with notice given in the same manner as for the initial hearing.
- (10) The Board shall deliberate on matters before it. The concurring vote of a majority of the Board shall be necessary to approve any appeal or variance before the Board. The vote of each member on each matter decided by the Board shall be recorded in the minutes. If a member is absent or if a member fails to vote, such fact shall similarly be recorded. The minutes of the Board shall show the Board's decisions and votes of members thereon. Each decision of the Board to approve a variance or to grant an appeal shall be accompanied by written statement, shall be signed or acknowledged by the members and shall be entered into the minutes.
- (11) All decisions by the Board shall be made pursuant to the standards of the Ordinance. The Board shall decide all matters before it within a reasonable time.
- (12) The Board shall cause complete records to be kept of its examinations on matters before it, of public hearings, site inspections, decisions and other official actions, which shall be immediately filed in the County Planning & Zoning Office and shall be a public record.
- (13) The Board may adopt procedural rules not in conflict with this Ordinance or State law.

2. Powers of the Board of Adjustment: Administrative Appeals.

a. Appealable Matters:

- (1) Decisions by the Planning & Zoning Director that consist of interpretations of the terms of Waupaca County Land Use Ordinances and which are made in the course of determining whether or not a permit or approval will be issued by said Planning & Zoning Director are appealable to the Board of Adjustment as Administrative Appeals.
- (2) Decisions by the Planning & Zoning Director to issue an enforcement demand or to commence other ordinance enforcement activities, where the Planning & Zoning Director has determined that violation of the Ordinance exists are appealable to the Board of Adjustment as an Administrative Appeals.
- (3) Decisions by the Planning & Zoning Committee that consist of interpretations of the terms of the Waupaca County Zoning Ordinance and which are made in the course of determining whether a permit or approval will be issued by said Committee are appealable to the Board of Adjustment as Administrative Appeals. Planning and Zoning Committee decisions on rezonings and conditional use permits are not appealable to the Board of Adjustments.

b. Procedures for Initiating an Administrative Appeal.

- (1) **Eligible appellants:** Administrative Appeals may be initiated by any person aggrieved by the decision or interpretation being appealed, or by any officer, department, board, or committee of the Waupaca County government.
- (2) **Time for appeals:** An appeal shall be commenced within thirty (30) days after making of the decision or interpretation being appealed.
- (3) **Initiating an appeal:** An appeal shall be commenced by filing with the Planning & Zoning Director a notice of appeal specifying the decision being appealed, the grounds for the requested relief, and the payment of the fee specified by Section 14.3.5.b(2). Upon receipt of such a notice, the Planning & Zoning Director shall immediately notify the Board of Adjustment and shall make available to the Board all papers and files constituting the record of the decision being appealed.
- (4) **Stays:** An appeal of a decision to issue an enforcement demand or to commence other ordinance enforcement proceedings shall cause the permit or approval action to be suspended or shall stay further enforcement prosecution unless the Planning & Zoning Director or Corporation Counsel shall file with the Board of Adjustment a certificate supported by a statement of facts alleging that suspension or stay will cause imminent peril to life or property. If such a certificate is filed, proceedings shall not be stayed except upon a restraining order issued by a court.
- (5) **Decisions by the Board of Adjustment:** Following a public hearing and other investigation, the Board shall decide the matter based upon whether the decision, determination or interpretation being appealed was in error. The Board may reverse or affirm, wholly or partly, or may modify the appealed decision, and may make such decision as ought to have been made, and to that end shall have all powers of the officer from whom the appeal is taken. All decisions by the Board on Administrative Appeals shall be based upon the terms of the Ordinance and evidence as to intent of the County Board.

3. Powers of the Board of Adjustment: Variances

- a. **Nature of Variances:** Variances are waivers in the terms of the Zoning Ordinance. In a variance case, the terms of the Ordinance are not in dispute. An applicant for a variance acknowledges that the Ordinance forbids the development for which approval is sought. Two avenues of relief can be pursued in such a case. One is for the applicant to seek an amendment to the Ordinance. The second possible avenue of relief, one that is available only under strictly defined circumstances, is to seek a variance. Variances are an available form of relief only where the use in question is allowed in the zoning district, but the dimensional standards, setbacks, minimum lot area, building height, etc., block or hinder the proposed form of development. Where dimensional standards create a hardship which can be relieved by modifying the standards for that parcel of land without destroying the basic intent of the Ordinance, a variance procedure allows the impact of general rules to be varied in response to unusual local circumstances without involving the County Board in amendment procedures for each such localized situation.
- b. **Variance Review Process:** Waupaca County's process for each variance request is as follows.
 - (1) **Step 1 — Application:** Applications for variances in the applicable zoning regulations may be filed with the Planning & Zoning Director along with payment of the application fee. If a property has multiple structures requiring a variance, it shall require separate variance applications with separate fees.

- (2) **Step 2—Notice and Analysis:** Upon receipt of a complete application, the Planning & Zoning Director shall direct the scheduling and notice of a Board of Adjustment public hearing per Wisconsin Statutes. Before the hearing, the Planning & Zoning Office staff shall prepare a written analysis of the application against the standards listed in subsection c. As soon as practical following receipt of a complete application, but in no case fewer than ten (10) days prior to the date of the public hearing, the Planning & Zoning Director shall mail to the Chair, and Clerk of the affected town a copy of the notice of the hearing. Such information may be mailed through a single mailing or through separate mailings. The Planning & Zoning Director shall also provide the information assembled during this and the previous step to the Board of Adjustment in advance of the public hearing.
- (3) **Step 3—Board of Adjustment Public Hearing and Action:** The Board of Adjustment shall conduct an on-site inspection of the property involved and a public hearing to hear testimony on the variance application at a date, time, and location specified in the public hearing notice prepared under Step 3. Within forty-five (45) days following the public hearing, the Board of Adjustment shall approve as presented, approve with conditions, or deny the variance request. The Board shall evaluate the request for conformance with the criteria included in 14.4.3.c and may consider all applicable information included in the petition, the Planning & Zoning Director's report, public testimony, or its own investigations. In its action, the Board shall include findings of fact relative to its decision. An application for a variance under this Section may be dismissed by the Board upon notice to the applicant, if one (1) year has passed since the filing of the application or the last scheduled public hearing on said application, whichever is later. Dismissal during this step shall not limit the ability of applicants to reapply.
- (4) **Step 4—Notice of Action:** Within ten (10) days of final Board of Adjustment action on the variance request, the Planning & Zoning Director shall provide written notice of Board action, including any required conditions of approval, to both the applicant and the affected town. Approval of a variance does not eliminate the requirement to obtain the appropriate building, sanitary and land use permits.
- c. **Board Review and Decision:** Following a public hearing and other investigations, the Board shall decide the matter based upon the following standards:
- (1) **Unnecessary hardship:** What constitutes a hardship is to be determined from the facts and circumstances of each individual case. The Board must consider the following court-established principals:
- (a) A property owner bears the burden of proving unnecessary hardship, for an area variance, by demonstrating that strict compliance with the zoning ordinance would unreasonable prevent the property owner from using the property owner's property for a permitted purpose or would render strict conformity with the zoning ordinance unnecessarily burdensome.
 - (b) The hardship must be based on conditions unique to the property, rather than considerations personal to the property owner.
 - (c) Loss of profit or financial hardship is not in and of itself grounds for a variance. The fact that developing in compliance with ordinance requirements may cost considerably more does not constitute a hardship.
 - (d) A self-imposed or self-created hardship does not constitute an unnecessary hardship for which the Board may grant a variance. When conditions giving rise to the need for a

variance were created by the property owner or a former owner, the hardship is self-imposed.

- (2) **Unique property limitation:** Unique physical characteristics of the property, not the desires of, or conditions personal to the applicant, must prevent the applicant from developing in compliance with the Zoning Ordinance.
 - (3) **Protection of the public interest:** Granting of a variance must neither harm the public interest nor undermine the purpose of the Ordinance. In granting a variance, the Board may attach special conditions to ensure that the public welfare will not be damaged. Such conditions must relate reasonable to the purpose and intent of the Ordinance. Also, any variance granted should include only the minimum relief necessary to allow reasonable use of the property.
 - (4) No variance may be granted that would have the effect of allowing, in any district, a use not permitted in that district.
 - (5) No variance may be granted that would have the effect of allowing a use of land or property that would violate State laws or Administrative Code.
 - (6) The burden is upon the appellant to prove the need for a variance.
 - (7) The Board is bound to accept the Zoning Ordinance and official zoning map as being correct.
 - (8) The Board of Adjustment in fulfilling its duties may modify, alter, or place conditions on any application.
 - (9) Subject to the above limitations, variances may be granted where strict enforcement of the terms of the Ordinance results in an unnecessary hardship and where a variance in the standards will allow the spirit of the Ordinance to be observed, substantial justice to be accomplished and the public interest not violated.
- d. **Conditions:** Conditions shall be attached in writing to all approved variances where such conditions will achieve compliance with the standards of this Ordinance.
 - e. **Expiration of Decision:** If a variance is approved, any privilege granted must be exercised within six (6) months of the date of this decision by obtaining the necessary land use permit for the proposed construction. This construction must be completed within two (2) years of the date of issuance of the land use permit. Failure to complete the project by the expiration date of the land use permit shall cause the approval to expire.
 - f. **Effect of Denial of Variance:** No application that has not been enacted under this Section shall be resubmitted for a period of twelve (12) months from the date of final Board of Adjustment action, except on grounds of new evidence or proof of change of factors found valid by the Board of Adjustment.
 - g. **Notice of Right to Appeal:** A decision made by the Board of Adjustment may be appealed by filing an action in certiorari in the circuit court for this county within thirty (30) days after the date of filing of the decision under Wis. Stats. s. 59.694(10). Waupaca County assumes no liability for and makes no warranty as to reliance on this decision if construction is commenced prior to expiration of this 30-day period.

14.5 Duties of the Planning and Zoning Committee

The Waupaca County Planning and Zoning Committee shall have those duties and responsibilities assigned to it by this Ordinance, by other actions of the County Board and by Section 59.69 of the Wisconsin Statutes.

1. **Conditional Use Permit Decisions.** Certain uses are of such special nature that their effects are so dependent upon specific circumstances as to make impractical the determination in advance of where and when and under what conditions they should be permitted. Provision has been made in this Ordinance for the determination of such cases as Conditional Uses (C) in a Zoning District as identified in Sections 5.0, 5.1 and 6.0. A Conditional Use Permit may be granted in a Zoning District only upon approval by the Planning and Zoning Committee.
 - a. **Conditional Use Permit Review Process:** Waupaca County's process for each Conditional Use Permit request is as follows.
 - (1) **Step 1—Application:** Application for a Conditional Use Permit may be filed with the Planning & Zoning Director on forms prepared by the Planning & Zoning Director and approved as to form and content by the Zoning and Land Use Planning Committee.
 - (2) **Step 2—Initial Recommendation from Town:** Following the application for a Conditional Use Permit, the County will forward the complete application to the Clerk of the affected Town, or the Town Chair if that particular Town has designated the Chair as the receiving party, along with a Town Recommendation Form. The consultation process may vary from town to town, and may involve the Town Plan Commission and/or Town Board. The Town shall have forty-five (45) days from the date the application materials and Town Recommendation Form were forwarded by the County to provide the County with a recommendation regarding the potential application. After forty-five (45) days, if the affected town has not provided a recommendation to the County regarding the potential application, and provided the applicant has attempted to meet or has met with representatives of the Town, the County shall schedule the public hearing before the Planning and Zoning Committee. The Planning & Zoning Director may grant an extension to the forty-five (45) days if requested by the Town.
 - (3) **Step 3—Notice and Analysis:** Upon receipt of a complete application and town recommendation, if received in the allotted time period, the Planning & Zoning Director shall direct the scheduling and notice of a Planning and Zoning Committee public hearing per Wisconsin Statutes. Before the hearing, the Planning and Zoning Office staff shall prepare a written analysis of the application against relevant plans, ordinances, criteria, and sound planning and zoning principles. As soon as practical following receipt of a complete application, but in no case fewer than ten (10) days prior to the date of the public hearing, the Planning & Zoning Director shall mail via U. S. regular mail a notice of the hearing to the Town Board Chair and Clerk of the affected Town and to the owners of record of properties which are located within three hundred (300) feet of the parcel involved in the application.
 - (4) **Step 4—Committee Public Hearing and Recommendation:** The Planning and Zoning Committee shall conduct an on-site inspection of the property involved and a public hearing to hear testimony on the Conditional Use Permit application at a date, time, and location specified in the public hearing notice prepared under Step 3. In the event that the scope, range of uses, or geographic area of the request is substantially increased from that noticed or presented at the public hearing, the Committee shall cause to be noticed and conduct an additional public hearing before taking action on the request. As soon as possible following the final public hearing, the Committee shall approve, approve with modification from the

original application or with conditions, or deny the proposed Conditional Use Permit requested through the application. All actions shall be accompanied by reasons based on the criteria for consideration of a Conditional Use Permit included in Section 14.5.1.b. A Conditional Use Permit application may be dismissed by the Planning and Zoning Committee upon notice to the applicant if one (1) year has passed since the filing of the application or the last scheduled public hearing on said application, whichever is later. Dismissal during this step shall not limit the ability of the applicant to file a new application.

- (5) **Step 5—Notice of Action:** Within ten (10) days of final Planning and Zoning Committee action on the Conditional Use Permit request, the Planning & Zoning Director shall provide written notice of Committee action, including any required conditions of approval, to both the applicant and the affected town. Approval of a Conditional Use Permit does not eliminate the requirement to obtain the appropriate Sanitary, Building and Land Use Permits. Decisions on any application for a Conditional Use Permit are appealable to the ~~Board of Adjustment~~ pursuant to Section 14.4 circuit court.

- b. **Conditional Use Permit review criteria:** If an applicant for a Conditional Use Permit meets or agrees to meet all of the requirements and conditions specified in this ordinance and conditions imposed by the Planning and Zoning Committee the Conditional Use Permit shall be granted. It is the applicant's responsibility to demonstrate that the application and all requirements and conditions established by this ordinance and by the Planning and Zoning Committee are or shall be satisfied. In its review and action on each Conditional Use Permit application, the Planning & Zoning Committee shall find that all the following standards are or will be met, unless a particular standard is inapplicable to the proposed conditional use, and shall include such findings in writing as basis for approval:
- (1) The proposed conditional use will be designed, constructed, operated, and maintained so as to be compatible, and be appropriate in appearance with the existing or intended character of the general vicinity, and that such use will not change the essential character of the same area such that the use will substantially impair or diminish the use, value, or enjoyment of existing or future permitted uses in the area.
 - (2) The proposed conditional use will not materially impact the established character and quality of the area, architecture and aesthetics, and is generally compatible with surroundings, traffic impact and circulation, environmental impacts, the demand for related services, the possible hazardous, harmful, noxious, offensive, or nuisance effects resulting from noise, dust, smoke, or odor.
 - (3) The proposed conditional use will be consistent with all relevant aspects of the Town and County Comprehensive Plans.
 - (4) The proposed conditional use will not substantially increase the erosion potential of the site; negatively affect wetlands, floodplains, or water bodies; or otherwise compromise surface or ground water quality based on topography, drainage, slope, soil type, vegetative cover, means of waste disposal and other relevant factors.
 - (5) The proposed conditional use is located in an area that will be adequately served by, and will not impose an undue burden on, any of the improvements, facilities, utilities, or services provided by public agencies.
 - (6) The proposed conditional use is in a location where access to streets and highways is suitable, and ingress and egress is designed to minimize traffic congestion and the potential effect on traffic flow.

- (7) The proposed conditional use will meet all applicable standards of this Zoning Ordinance, particularly any performance standard in Section 6 that is applicable to the particular conditional use being sought.
- c. **Imposition of Conditions:** The Planning and Zoning Committee may impose conditions of, and restrictions on, approval as may, in its discretion, be necessary to effectuate the terms and intent of this Ordinance. Such conditions and restrictions may relate to the establishment, location, construction, maintenance, and operation of the proposed use, off-site impacts and any other impact upon the public's health, safety, or general welfare. Conditions imposed as a part of the Conditional Use Permit shall be achievable, practicable, and to the extent possible, measurable. Any condition imposed must be related to the purpose of the ordinance and be based on substantial evidence. Any condition or restriction imposed under this Chapter shall not lessen a development standard or requirement contained elsewhere in this Ordinance.
- (1) In a case where the Committee has approved a Conditional Use Permit with a condition that it be reviewed within a set amount of time at a later date by the Committee, this review shall be a legally noticed public hearing per Wisconsin Statutes. No fewer than ten (10) days prior to the date of the public hearing, the Planning & Zoning Director shall mail via U.S. regular mail a notice of the hearing to the Town Board Chair and Clerk of the affected Town and to the owners of record of properties which are located within three hundred (300) feet of the parcel involved in the application. An on-site inspection of the property may be conducted only if requested.
- d. **Time Limits Associated With Conditional Uses:**
- (1) If the approved Conditional Use is not initiated by securing a Land Use Permit, or, if more than one (1) permit is necessary, and securing at least one (1) necessary permit within twelve (12) months of the date of the approval is not done, the Conditional Use Permit approval shall expire. The applicant may apply for and the Planning and Zoning Committee may grant a one-time extension, provided that a written request for extension is submitted before the original expiration date. At the Planning and Zoning Committee's discretion, these provisions may be modified.
- (2) If a use or activity associated with a previously approved Conditional Use Permit ceases for twelve (12) months or more after first being established on the property, the property owner or authorized agent must reapply and obtain approval of another Conditional Use Permit before recommencing the use or activity. Unless a specific condition of approval indicates otherwise, or the operation is ceased for the period of time indicated above, each Conditional Use Permit shall run in perpetuity with the underlying land and not with the particular property or business owner who originally obtains the Conditional Use Permit.
- i. Pursuant to Sec. 6.5.8 Conditional Use Permits granted for Major Home Occupations are assigned to a designated person that resides at the residential address. Such permits do not run with the land and are not transferable from person to person or from address to address.
- (3) **Amendments to Conditional Uses:** Any expansion, structural change, or substantial alteration to a grandfathered conditional use shall require a new Conditional Use Permit following the procedures and requirements of this Section. Any substantial change to the nature or intensity of a use for which a Conditional Use Permit was previously granted or to a previously approved plan or required condition of approval shall require a new or amended Conditional Use Permit following the procedures and requirements of this Section.

- (4) **Monitoring and Potential Revocation of a Conditional Use Permit:** The Planning and Zoning Committee or Planning & Zoning Director may require evidence and guarantees as proof that approved plans are being followed, required conditions are being met, and review criteria are being satisfied for conditional uses at all times. If the Planning and Zoning Committee finds that the review criteria of this Section or the conditions attached to the permit are not in compliance, the Planning and Zoning Committee may review the Conditional Use Permit at a public hearing. As part of the review the Committee may amend the conditions of approval or revoke the approval of the Conditional Use Permit. Failure to comply with a condition of approval shall be construed as a violation of this ordinance and is subject to the enforcement provisions of this ordinance.
 - (5) **Effect of Denial of Conditional Use Permit:** No application that has not been enacted under this Section shall be resubmitted for a period of twelve (12) months from the date of final Planning and Zoning Committee action, except on grounds of new evidence or proof of change of factors found valid by the Planning and Zoning Committee.
 - (6) **Owner/Applicant Request to Rescind Conditional Use Permit:** When an owner or applicant requests to rescind their Conditional Use Permit, they must submit a written explanation to the Planning and Zoning Office so it can be placed on the Planning and Zoning Committee's agenda. The Town will be notified.
2. **Rezone Review Process:** Waupaca County's process for each amendment to the Official Zoning Map (rezoning) is as directed by Wisconsin Statutes Section 59.69 and is as follows.
- a. **Step 1—Application:** Application for a rezone may be filed with the Planning & Zoning Director or his/her designee on forms prepared by the Planning & Zoning Director and approved as to form and content by the Planning and Zoning Committee. If a Certified Survey Map is required, it must be received with all applicable fees and be approved by the Planning and Zoning Office prior to the public hearing in front of the Planning and Zoning Committee. If the zone map amendment is approved by the County Board, the CSM will be recorded thereafter as previously approved. Failure to record the CSM as approved will result in the rezone being void.
 - b. **Step 2—Initial Action by Town:** Following receipt of a rezone application, the County will forward the complete application to the clerk of the affected town or the Town Chair if that particular town has designated the Chair as the receiving party, along with a Town Recommendation Form. Prior to scheduling of a Planning and Zoning Committee meeting, the potential applicant, within one (1) month of the application, shall attempt to arrange a consultation with representatives of the affected town. The consultation process may vary from town to town, and may involve the Town Plan Commission and/or Town Board. The Town shall have forty-five (45) days from the date the application materials and Town Recommendation Form were forwarded by the County to provide the County with a recommendation regarding the potential application. After forty-five (45) days, if the affected Town Board has not taken action, and provided the applicant has attempted to meet with representatives of the Town, the County shall schedule the Planning and Zoning Committee meeting to review the rezone application. The Planning & Zoning Director may grant an extension to the forty-five (45) days if requested by the Town.
 - c. **Step 3—Notice and Analysis:** Upon receipt of a complete application and Town recommendation, the Planning & Zoning Director shall direct the scheduling and notice of a Planning and Zoning Committee public hearing, per Wisconsin Statutes. Before the hearing, the Planning and Zoning Office staff shall prepare a written analysis of the application regarding relevant plans, ordinances, criteria and sound planning and zoning principles. As soon as

practical following receipt of a complete application, but in no case fewer than ten (10) days prior to the date of the public hearing, the Planning & Zoning Director shall mail, via U. S. regular mail, to the owners of record of properties which are located within three hundred (300) feet of the parcel involved in the application, and the Town Chair a copy of the notice of the hearing. The Town Clerk shall receive notice of the hearing via certified mail. Such information may be mailed through a single mailing or through separate mailings. If the application would affect an airport area under Wisconsin Statutes Section 62.23(6) (am), the Planning & Zoning Director shall also provide notice to the owner or operator of that airport. The Planning & Zoning Director shall also provide the information assembled during this and previous steps to the County Board Supervisor representing the area and to the Planning and Zoning Committee in advance of the public hearing.

- d. **Step 4—Committee Public Hearing and Recommendation:** Per Wisconsin Statutes, the Planning and Zoning Committee shall conduct an on-site inspection of the property involved and a public hearing to hear testimony on the rezoning application at a date, time, and location specified in the public hearing notice prepared under Step 3. For a Town initiated multiple rezones within the Town, there will be no on-site inspections conducted. In the event that the scope, range of uses, or geographic area of the request is substantially increased from that noticed or presented at the public hearing, the Committee shall cause to be noticed and conduct an additional public hearing before taking action on the request. As soon as possible following the public hearing and the passage of the allowable timeframe for town action in Wisconsin Statutes, the Committee shall recommend whether the County Board should approve, approve with further modification from the original application, or deny the proposed rezoning requested through the application. All recommendations shall be accompanied by reasons based on the criteria for rezoning land included in 14.5.2.h. If the affected town files a certified copy of a resolution indicating its disapproval of the proposed amendment, the Planning and Zoning Committee may not recommend approval of the application without change, but may recommend approval with change, or may recommend denial. A rezoning application may be dismissed by the Planning and Zoning Committee, upon notice to the applicant, if one (1) year has passed since the filing of the application or the last scheduled public hearing on said application, whichever is later. Dismissal during this step shall not limit the ability of the applicant to file a new application.
- e. **Step 5—Formal Town Board Action (OPTIONAL):** If the affected town chooses, it may file a certified copy of a resolution adopted by the Town Board indicating its approval or disapproval of the proposed rezoning at this step as well. The Town's decision shall be based on the Town's adopted Comprehensive Plan. The resolution shall be filed either before the Planning and Zoning Committee public hearing or within ten (10) days following such public hearing.
- f. **Step 6—County Board Action:** Following the recommendation of the Planning and Zoning Committee, the County Board shall act to enact by ordinance, enact by ordinance including modifications from the original application, deny the proposed rezoning requested by the application, or refer said amendment back to the Committee for further consideration. All actions shall be accompanied by reasons based on the criteria for rezoning land included in 14.5.2 and 14.5.2.a. If the County Board approves the rezoning as requested through the original application without further modifications, and the application was not disapproved by the affected Town Board within the required timeframe described under Step 5, it shall become effective upon County Board passage of the associated ordinance.
- g. **Step 7—Possible Final Town Board Action:** If the County Board enacts by ordinance the rezoning including modifications from the original application, or enacts by ordinance the

original rezoning application where the affected Town filed a resolution indicating disapproval of the original rezoning application, the County Clerk, in consultation with the Planning & Zoning Director, shall submit the Ordinance to the Clerk of the affected Town or the Town Chair if that particular Town has designated the chair as the receiving party by certified U.S. mail within seven (7) days of County Board enactment, along with an explanation of the Town's role during this step and another copy of a resolution to signify Town Board action and findings of fact on the request. If the Town Board wishes to disapprove of the rezoning as enacted by the County Board, it shall enact a resolution to that effect and file a certified copy of such resolution with the County Clerk within forty (40) days of the date of County Board enactment. The rezoning, as enacted by the County Board, shall become effective only if and when one (1) of the following occurs: After the passage of the forty (40) days day period, the County Clerk has not received a town board resolution indicating disapproval, or before the end of the forty (40) day period the County Clerk receives a resolution from the affected Town Board indicating approval of the rezoning as enacted by the County Board.

- h. **Step 8—Notice of Action:** Following the effective date of enactment or denial of an ordinance rezoning land, the County Clerk shall provide notice to Town and County officials and to the applicant and shall record such action per Wisconsin Statutes.
- (1) **Rezoning review criteria:** In its review and action on the rezoning application, the Planning and Zoning Committee shall make findings with respect to the following criteria:
- (a) The proposed rezoning is consistent with the overall purpose and intent of this Zoning Ordinance.
 - (b) The proposed rezoning is consistent with the County Comprehensive Plan, as determined by the Planning and Zoning Committee.
 - (c) The proposed rezoning is consistent with the Town Comprehensive Plan. It is the responsibility of the affected town to determine consistency with any Town Comprehensive Plan. In the event that the Town denies a Comprehensive Plan Amendment that a Rezone Application is contingent upon, the Rezone Application is denied and will receive no further consideration.
 - (d) For applications to rezone land to a commercial or industrial zoning district, adequate public infrastructure is or will be available to accommodate the range of commercial or industrial uses that would be allowed in that zoning district.
 - (e) For applications to rezone land to the Planned Residential Development (PD) zoning district, the proposed project shall produce significant benefits in terms of environmental design, and significant alternative approaches to addressing development performance, which relate to and more than compensate for any requested waiver or modification of any normal standard of this Zoning Ordinance.
- (2) Land may be considered for rezoning out of the Farmland Preservation Overlay without certification by the Department of Agriculture, Trade, and Consumer Protection if all of the following apply:
- (a) The County finds all of the following, after public hearing:
 - i. The land is better suited for a use not allowed in the Farmland Preservation Overlay.
 - ii. The rezoning is consistent with the County and local Comprehensive Plans.
 - iii. The rezoning is substantially consistent with the County Certified Farmland Preservation Plan.

- iv. The rezoning will not substantially impair or limit current or future agricultural use of surrounding parcels of land that are zoned for or legally restricted to agricultural use.
- (b) The County shall by March 1 of each year provide all of the following to the Department of Agriculture, Trade and Consumer Protection:
 - i. A report of the number of acres that the County has rezoned out of the Farmland Preservation Overlay during the previous year and a map that clearly shows the location of those acres.

14.6 Town Review

The Waupaca County Planning & Zoning Director or his/her designee shall forward all applications submitted for rezonings and Conditional Use Permits within each town's jurisdiction to the appropriate Town Clerk. Applications for Land Use Permits that do not require a rezoning or Conditional Use Permit, but do require a Site Plan under Sections 5.0, 6.0, and 10.2, will not be forwarded to the Town Clerk unless the Town Board adopts an ordinance requiring site plan review.

1. **Town Recommendation:** The Town Plan Commission and/or Board may review all applications and provide a written recommendation to the Waupaca County Planning & Zoning Director to be forwarded to the appropriate decision-making body.
2. **Timeline:** Towns shall have forty-five (45) days to provide review and recommendation to the Waupaca County Planning & Zoning Director from the date the town receives the application. If the Planning & Zoning Director has not received a written recommendation within forty-five (45) days, the County review process will continue without Town feedback. The Planning & Zoning Director may grant an extension to the forty-five (45) days if requested by the Town.
3. **County Action:** The Waupaca County Planning & Zoning Director, Planning and Zoning Committee, Board of Adjustment, and Board of Supervisors shall consider the Town recommendation per Section 14.6.1 as a component of application review and prior to rendering a decision.

14.7 Enforcement

1. **Declarations of Unlawful Conduct, Activities and Conditions.**
 - a. **Violation of Land Use Ordinances**
 - (1) It shall be unlawful for any building or structure to be erected, constructed, place, moved, or structurally altered, or for any use of land, premises, building, or structure to be established or changed in violation of the provisions of this Ordinance.
 - (2) It shall be unlawful to fail to comply with any standard of this Ordinance or with any condition or qualification placed upon the issuance of a permit or approval or variance granted, in due course, under this Ordinance.
 - (3) It shall be unlawful to fail to apply for and obtain permits and approvals as specified herein.
2. **Liability**
 - a. Owners of lands or properties, occupiers of land or premises, and agents of owners or occupiers including, without limitation because of enumeration, building contractors, surveyors, plumbers, installers, soils technicians, road builders, grading and excavating contractors and their agents, and lending institutions and insurers and their agents are responsible for compliance with all provisions of this Ordinance which bear upon their area of competency and responsibility.

- b. Any such party who violates or aids or abets in a violation shall be liable to prosecution or remedial action.
- c. This Ordinance applies fully to all public governmental and quasi-public and quasi-governmental lands, developments and activities unless specifically exempted by State or Federal law.

3. Investigation of Compliance, Notice of Violations

- a. The Planning & Zoning Director is responsible for inspecting and investigating compliance of land use activities with the terms of this Ordinance. In an effort to verify compliance, a survey map may be required at landowner's expense.
- b. If, upon such inspection or investigations, the Planning & Zoning Director becomes aware of a condition which is or likely to become unlawful, the Planning & Zoning Director shall immediately notify the parties to whom he deems to be responsible and potentially liable of the situation. Such notice shall include:
 - (1) A demand that the condition that is alleged to constitute the present or potential violation be halted, prevented from occurring, or remedied; or
 - (2) A statement that a complaint on the condition and demand for prosecution has been or will be transmitted to the Corporation Counsel and/or to enforcement officials, State agencies, or both.
- c. If an enforcement demand is issued and is not in compliance, the Planning & Zoning Director shall forthwith file a complaint and a demand for prosecution, unless an Administrative Appeal has been commenced and a stay order has been issued.

4. Prosecution; Injunctions and Penalties in Court Proceedings

- a. The responsibilities of the Corporation Counsel include prosecution of violations of this Ordinance.
- b. Nothing in this Section shall be deemed to prevent private prosecutions of violations.
- c. The following forfeitures and penalties are hereby established for violations of this Ordinance:
 - (1) Reference to Chapter 25 – Section 25.04 Penalty Provisions
 - (2) As a substitute for an addition to forfeiture actions, the Corporation Counsel, on behalf of the County, may seek enforcement of any and all parts of this Ordinance by court actions seeking injunctive orders or restraining orders, or remedies may be sought under the County Citations Ordinance.

5. Other Enforcement Provisions

- a. Where a Conditional Use or Variance has been approved subject to specified conditions, and where such conditions are not complied with, the Board of Adjustment or the Planning and Zoning Committee may entertain and conduct a hearing upon a petition to revoke Conditional Use Permit or Variance. Such hearing and action upon a petition shall follow procedures similar to those followed in considering the noncompliance with the conditions originally imposed and shall be grounds for revocation.
- b. Relationship to Deed Restrictions: It is not otherwise intended by this Ordinance to repeal, abrogate, or impair any deed restrictions, easements, or covenants. However, where this Ordinance imposes greater restrictions than are imposed by deed restrictions, easements, or covenants, the provisions of the Ordinance shall prevail.

- c. Relationship to Nuisance Actions: No provision of this Ordinance shall be construed to bar an action to enjoin or abate the use or occupancy of any land or structure as a nuisance under the laws of the State of Wisconsin.

6. Statute of Limitations

- a. An enforcement action may not be commenced against a person who owns a building or structure that is in violation of this ordinance if the building or structure has been in place for more than ten (10) years. The property owner shall bear the burden of proof to prove that the structure has been in place for greater than ten (10) years.
- b. Any structure meeting the statute of limitations as described in par. a. shall not be subject to the allowances pertaining to nonconforming structures as found in Sec. 2.12.

14.8 Process for Receiving Interpretations of Ordinance

Any person may submit to the Planning & Zoning Director or designee, in writing, a request for interpretation of this Ordinance. Any written request submitted shall include the appropriate fee as may be established by the county from time to time. The Planning & Zoning Director or designee, after consulting with Corporation Counsel, shall prepare a written response to any such request within thirty (30) days of receipt of the request and present such response to the Planning & Zoning Committee for approval at its next meeting. The Planning & Zoning Committee shall act on the proposed response by either approving or modifying the response. The Planning & Zoning Committee's response shall be provided to the requesting person and, in addition, if the response relates to the allowable (permitted, conditional or prohibited) use of a parcel, a copy of written response shall be mailed via U.S. Regular Mail to the owners of record of properties within three hundred (300) feet of the parcel involved in the written response. In interpreting this Ordinance, the Planning & Zoning Director or designee shall give effect to the terms of this Ordinance and the intent of the provisions to be interpreted. The Planning & Zoning Director or designee shall maintain a written record of all previous interpretations that remain applicable. All interpretations provided under this section are appealable to the Board of Adjustment pursuant to Sec. 14.4 provided such appeal is commenced within thirty (30) days from the date of mailing of such interpretation.

Appendix A – Residential Density Management System

This Section provides an example of how residential density is managed in Waupaca County within the following zoning districts: Private Recreation and Forestry (PVRF), Agriculture Enterprise (AE), Agriculture Retention (AR), Agriculture and Woodland Transition (AWT), and Rural Residential (RR). This Section applies only to the above listed zoning districts. Furthermore, nothing in this Section shall preclude the petitioner from seeking a zoning map amendment to remove lands from the PVRF, AE, AR, AWT or RR zoning districts. In the event that such lands are rezoned away from one of these districts, and not rezoned to another one of these districts, the provisions of this Section shall no longer apply.

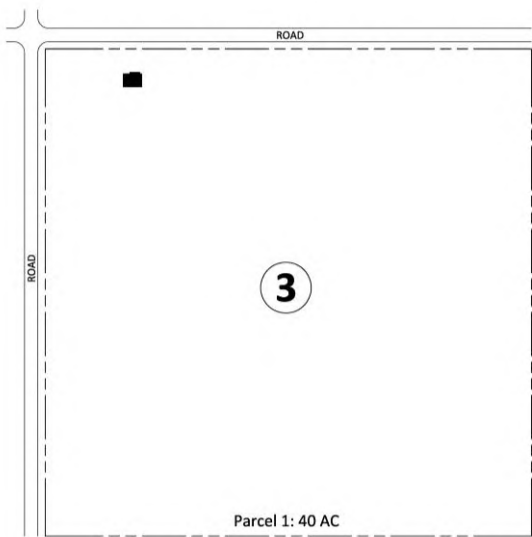
The size and zoning of a parcel limits the maximum number of residential dwelling units within these zoning districts. The numbers of land divisions that can occur are not limited, however, as long as the number of dwelling units does not exceed the maximum residential density.

Method of Calculation: The following method shall be used to calculate the maximum number of residential dwelling units:

Determine the gross site area of the land division. At the property owner's discretion, this can include all lands in common ownership or a single parcel. If the property owner chooses to use all lands in common ownership, the parcels have to be located within the same zoning district and within the same town.

1. Measure the "gross site area."
2. Divide the gross site area by the Residential Density and Lot Size Management Overlay as chosen by the applicable Town and as described within Section 8.2.
3. Contiguous common ownership lands that are less than the minimum established Residential Density as established on the Town zoning map shall be allowed a total of one (1) dwelling unit or one (1) principal commercial, institutional, recreational, utility, transportation, or industrial land use as may be allowed in that zoning district. No further division for development purposes shall be allowed while the properties remain under a PVRF, AE, AR, AWT or RR zoning district.
4. The Planning & Zoning Director shall keep track of the total number of dwelling units on each parcel or set of contiguous common ownership lands from the date of adoption of the this Zoning Ordinance. All additional dwelling units following that initial date shall conform to the maximum density calculated for the parcel or contiguous common ownership land as such lands were sized and configured on that initial date.

Figure A-1 shows a forty-acre (40) parcel that limits residential density to one (1) residential unit per ten (10) acres. For example, the Agriculture Retention (AR) zoning district uses this maximum density. A maximum of four (4) residential units (40 acres ÷ 10 acres/unit = 4 units) could be constructed on lots split from the parcel. Since there is already an existing home on the parcel, however, only three (3) residential additional units can be built. This is represented by the “3” shown in the middle of the parcel. The three (3) residential units or “development rights” are tracked by the County for each parcel as part of the County Density Management System.



Maximum Residential Density:
1 unit per 10 acres

Development Rights:
3 remaining

Figure A-1

Figure A-2 shows the same forty-acre (40) parcel depicted in Figure A-1, but split into two (2) parcels along with the construction of another house. As a result, only two (2) development rights remain. In this example, the remaining development rights are divided between the two (2) parcels, meaning each parcel could support one (1) additional housing unit.

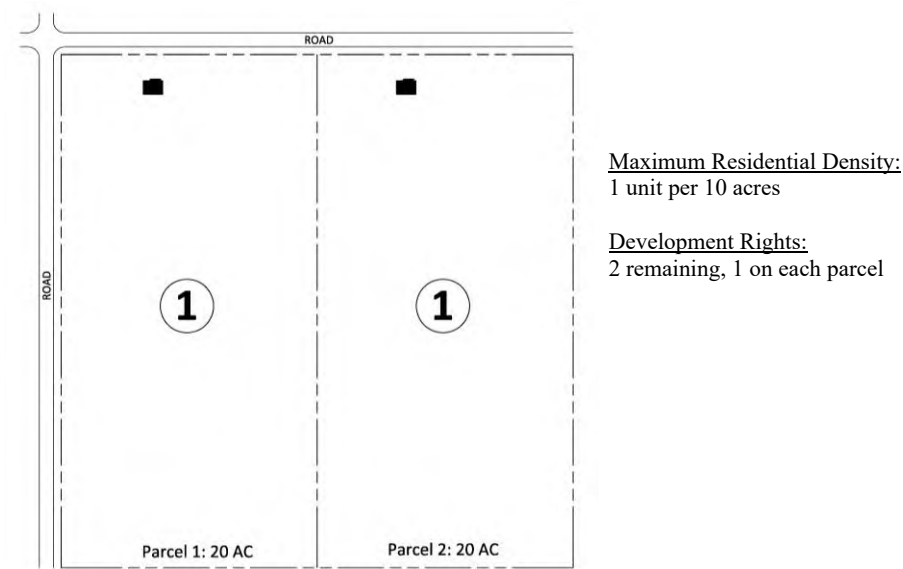


Figure A-2

Figure A-3 shows one (1) more lot with an additional home split from each parcel. This effectively depletes the remaining development rights from the original forty (40)-acre parcel. No additional homes can be built unless property is rezoned to allow a greater residential density.

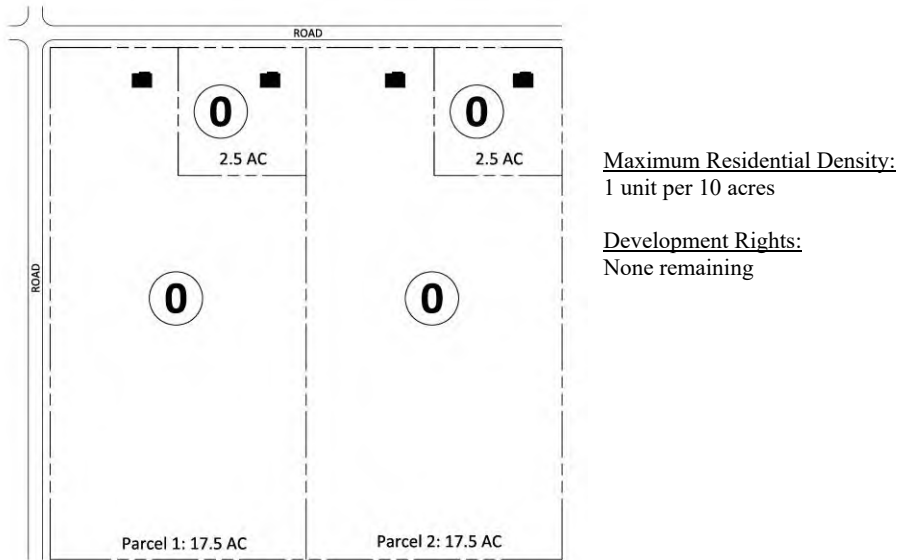


Figure A-3

Figure A-4 shows how development rights would change if the property were rezoned to allow a greater residential density. If Parcel 1 were rezoned to a district that allowed a maximum of one (1) unit per five (5) acres instead of one (1) unit per ten (10) acres, the development rights on that parcel would increase.

The new development rights for Parcel 1 would be calculated as follows: $17.5 \text{ acres} \div 5 \text{ acres/unit} = 3.5 \text{ units}$ which would be rounded down to three (3) units. Since there is already one (1) existing home on the parcel, two (2) development rights would be created.

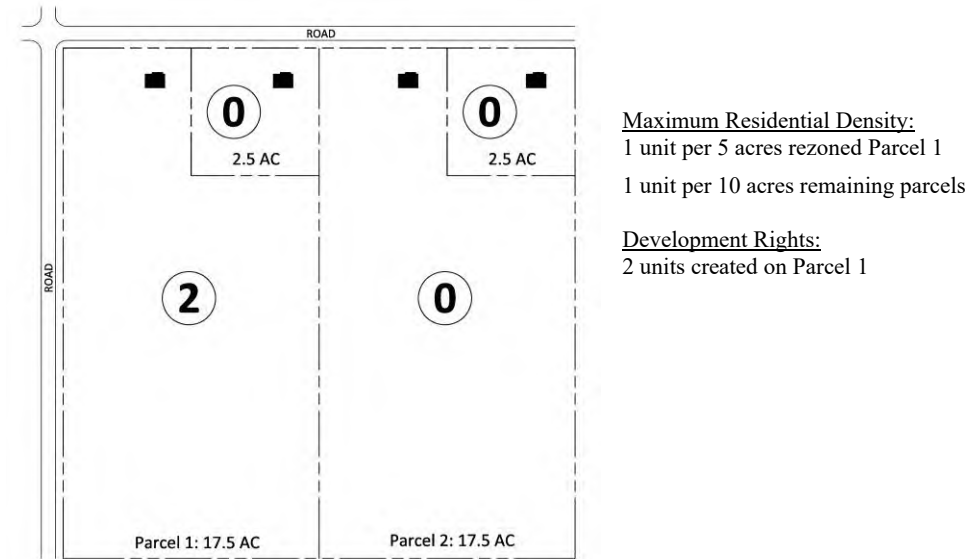


Figure A-4

Figure A-5 shows a different scenario. This is the same original forty (40)-acre parcel depicted in Figure A-1, but with an alternate development approach. In this example, the land divisions and homes are coordinated and clustered together to preserve the maximum amount of contiguous open space. This open space may be agricultural land, woodland, or natural area.

If the zoning allows a maximum residential density of one (1) unit per ten (10) acres, then four (4) total homes are possible, including the home from the original forty (40)-acre parcel. The example here, however, shows a total of five (5) homes. This is possible in certain zoning districts in some towns through the provision of bonus density. Granting bonus density is considered when lots and homes are clustered together with a minimum of fifty percent (50%) open space. See Section 9.0. If a town allows bonus density, it is indicated on local town zoning maps.

The maximum bonus possible is one (1) additional lot and home for every four (4) lots allowable per zoning. See Section 8.2.4.d (3).

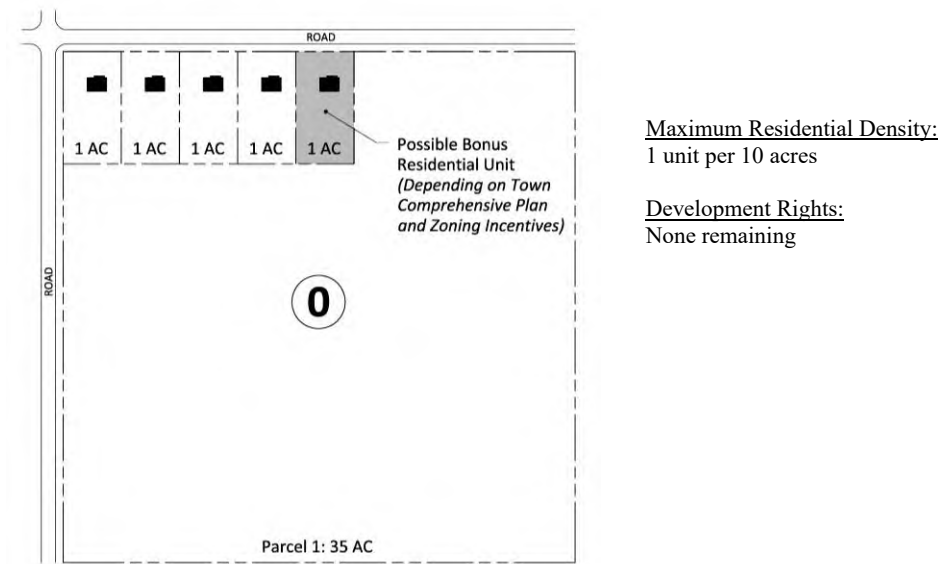


Figure A-5

Figure A-6 shows a scenario where a property owner owns two (2) adjacent forty (40)-acre parcels, eighty (80) acres in total common ownership, situated in the Agriculture Retention Zoning District with a maximum residential density of one (1) dwelling unit per twenty (20) acres and a minimum lot size of two (2) acres. The property owner chose to cluster the lots along an existing right of way to preserve open space and minimize infrastructure cost. No additional lots could be created from the remaining seventy-two (72) acres without a change in the comprehensive plan designation and zoning of the subject property.

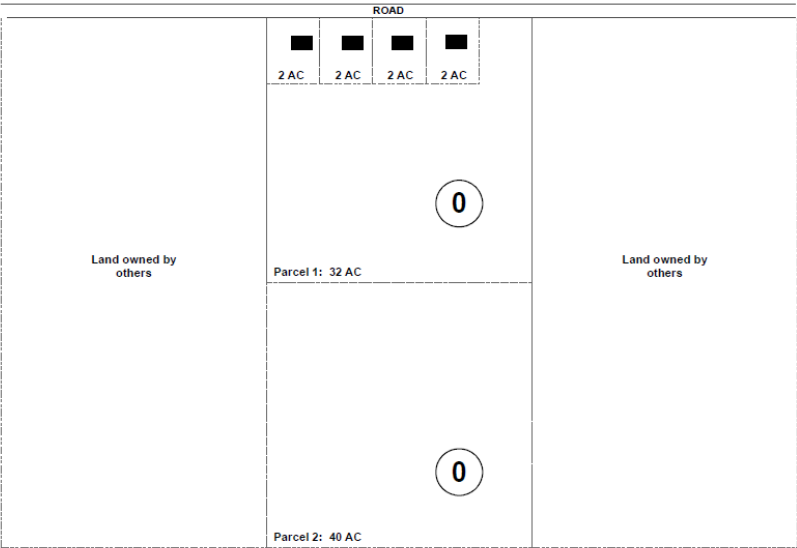


Figure A-6

Appendix B – Animal Density Unit Standards

The following table is based on the Wisconsin Department of Agriculture, Trade and Consumer Protection Agency Animal Density Unit Standards. Any changes to the State standard will be automatically reflected in the table below. Where an animal is not provided on Appendix B; 1,000 pounds of live weight is equivalent to one (1) animal unit.

Waupaca County Zoning Ordinance, Chapter 34				
ANIMAL UNIT DENSITY WORKSHEET				
Parcel Number: _____				
Animal Type	Animal Units			
	b. Equiv. factor	c. Current Animal Units	d. Proposed Animal Units	e. Total Units
Example - Broilers:	0.005 x	150,000		= 750
Dairy/Beef Calves (under 400 lbs)	0.20 x			= 0
Dairy Cattle	Milking & Dry Cows	1.40 x		= 0
	Heifers (800 lbs to 1200 lbs)	1.10 x		= 0
	Heifers (400 lbs to 800 lbs)	0.60 x		= 0
	Beef	Steers or Cows (400 lbs to market)	1.00 x	
	Bulls (each)	1.40 x		= 0
	Veal Calves	0.50 x		= 0
Swine	Pigs (up to 55 lbs)	0.10 x		= 0
	Pigs (55 lbs to market)	0.40 x		= 0
	Sows (each)	0.40 x		= 0
	Boars (each)	0.50 x		= 0
Chickens	Layers (each)	0.01 x		= 0
	Broilers/Pullets (each)	0.01 x		= 0
Buffalo (each)	1.40 x			= 0
Camelids (Camels etc) (each)	1.00 x			= 0
Camelids (Llamas/Alpacas, etc.) (each)	0.20 x			= 0
Deer, Farm Raised (each)	0.20 x			= 0
Donkeys (each)	1.00 x			= 0
Ducks (each)	0.01 x			= 0
Elk (each)	0.70 x			= 0
Ratites/Emu (each)	0.10 x			= 0
Game Birds, Farm Raised (each)	0.01 x			= 0
Goats/Sheep (each)	0.10 x			= 0
Horses (each)	2.00 x			= 0
Ponies/Miniature Horse (each)	0.50 x			= 0
Rabbits (each)	0.01 x			= 0
Turkeys (each)	0.018 x			= 0
Total Animal Units:		Total Animal Units = 0		
		(add all rows above)		
Total Acreage Needed:				

*The above provisions apply ONLY to non-farm use as defined in Section 1.7(48) of the Waupaca County Zoning Ordinance.

Waupaca County, Wisconsin

NOTICE OF A PLANNING AND ZONING COMMITTEE DECISION

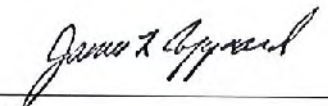
Date: May 7, 2026

**The Waupaca County Zoning Ordinance, Waupaca County Code of Ordinances,
Chapter 34**

The Planning and Zoning Committee has **POSTPONED** any decision on the proposed revisions to The Waupaca County Zoning Ordinance; Waupaca County Code of Ordinances, Chapter 34 until their regularly scheduled August meeting.

APPEAL

NOTICE OF RIGHT TO APPEAL: Decisions by the Planning and Zoning Committee that consist of interpretations of the terms of the Waupaca County Zoning Ordinance and which are made in the course of determining whether a permit or approval will be issued, and all other decisions made by the Planning and Zoning Committee, are appealable to the Board of Adjustment pursuant to Chapter 34, Section 14.4(2)(a)3, within thirty (30) days after the date of filing of the decision.



Chairman

Jason Snyder

From: Jason Snyder
Sent: Thursday, May 14, 2026 8:57 AM
Cc: Kristy Opperman; Ellen Radies; Danielle Taggart; Ryan Brown; Zoning; Angela Boelter
Subject: Chapter 34 Waupaca County Zoning Ordinance proposed amendments extension
Attachments: 2026 ZONING ORDINANCE Ch 34 Summary.pdf

Dear Township Clerks and Chairs,

I hope everyone is enjoying this beautiful day so far! The Planning and Zoning Committee, at their last meeting, granted an extension request to allow townships additional time to review and provide feedback for the proposed amendments to Chapter 34 Waupaca County Zoning Ordinance. I have provided a link on this email to both the Summary and Track Change copies of the proposed amendments below and I have attached a pdf of the Summary to this email. These documents can also be found directly on the Planning and Zoning Office's website.

Website: [Planning and Zoning Office](#)

Summary: [2026 ZONING ORDINANCE Ch 34 Summary.pdf](#)

Track Changes: [Zoning Ordinance Ch 34 \(2026 Track change\).pdf](#)

The Planning and Zoning Committee will hold a public hearing on **August 6, 2026** to consider the proposed amendments to the Zoning Ordinance. Please provide any additional comments or recommendations back to this office prior to the hearing date. You may also attend the hearing to provide comment in person.

If there are any questions regarding these matters please feel free to contact me. Have a great day!

Jason Snyder, Zoning Administrator
Waupaca County Planning and Zoning
811 Harding St.
Waupaca WI 54981
Ph (715)258-6255
Email: Jason.Snyder@co.waupaca.wi.us

Jason Snyder

From: Jason Snyder
Sent: Monday, February 23, 2026 12:44 PM
Cc: Kristy Opperman; Ellen Radies; Danielle Taggart; Ryan Brown; Angela Boelter; Zoning
Subject: RE: Waupaca County proposed ordinance amendments
Attachments: 2026 ZONING ORDINANCE Ch 34 Summary.pdf; 2026 Shoreland Protection Ordinance Ch 32 Summary.pdf

Good afternoon Everyone,

First and foremost a big thank you to everyone who was able to attend both the Town Informational meeting as well as the Town's Association meeting where the proposed ordinance revisions were presented and discussed. Please find attached to this email a summary of the proposed revisions to the Zoning and Shoreland Protection Ordinances. Copies of both the summaries and track change copies will be made available on our website as well. Please place these matters on your next Plan Commission and Board's agenda for review and discussion. After the Town Board has met on the matter please send any comments that the town may have back to our office to be considered by the Planning and Zoning Committee at the public hearing. The Shoreland Protection Ordinance does not require any town approval but if there are any comments or suggestions we are always happy to consider things. The plan is to have the formal public hearing in front of the Planning and Zoning Committee on the ordinance amendments in **early May** so please forward your comments to us in time to be considered at the hearing.

You will note in the summary for the Zoning Ordinance that some terms are highlighted light blue. These changes were added based on the input received at the informational meetings. The definition of a data center was added based on a suggestion from the County Planning Director's Association and a more stringent deadline was added for submittal of testing results for the operation of a Manure Co-Digester Facility based on comments from the Town Informational meeting.

If there are any questions regarding these matters please feel free to contact me.

We look forward to receiving any input that your town may have. Have a great day!

Jason Snyder, Zoning Administrator
Waupaca County Planning and Zoning
811 Harding St.
Waupaca WI 54981
Ph (715)258-6255
Email: Jason.Snyder@co.waupaca.wi.us

NOTE: As of January 1, 2026, the Planning and Zoning Fee Schedule is increasing. See the County website for more information. The septic maintenance fee is increasing to \$10/year and is visible on the property tax bill.

MAR 13 2026

the signage and the DOT is fine with the current placement and size of the signage. Waupaca County has explained the parking lot requirements.

Recommendations and conditions: Upkeep of the lawn, mowing and garbage removal.

Motion by Tammy to approve the CUP for Ben Cate. Seconded by Marilyn. All in favor. Motion carried (6-0)

To	litlwolf@wolfnet.net
Cc	 Person
Bcc	 Person
Subject	Comp Planning Minutes 03/04/26

New business: Comprehensive Planning Commission reviewed the 2026 Shoreland Protection Ordinance Chapter 32 revisions sent by Waupaca County Planning & Zoning Office with no questions or concerns.

2026 Zoning Ordinance Summary was also reviewed. No comments/concerns from the Planning Commission at this time. If any questions, concerns and/or comments would arise between now and March 9th, the commission will let the Chair Jackie Beyer know and these concerns will be directed to the Town Board on March 10th.

Motion to adjourn by Rod, seconded by Marilyn. All in favor. Motion carried. (6-0) Adjourned at 5:57:pm.

Respectfully submitted, Rhonda J Wilz- Secretary

MAR 13 2026

Town of Little Wolf
Meeting Proceeding
Tuesday, March 10, 2026
Little Wolf Town Hall

Chairman Moede called the regular monthly meeting to Order at 6:00 pm with the Open Meeting statement. Roll call showed Moede, R. Beyer, T. Niemuth, Wilz and Beyer present. One resident present.

Beyer/Niemuth to approve the Agenda. Motion Carried 3-0.

Moede/Niemuth to approve the February 10, 2026 Minutes as printed. Motion Carried 3-0.

Treasurer's Report: Wilz gave the fund balances. Total cash on hand, as of 3/5/2026, was \$483,973.37. The Clerk and the Treasurer reconciled to the bank statement. Moede/Niemuth to approve the Treasurers report. Carried 3-0.

Business:

Update on the Millpond Restoration. The Dam Committee met on Monday, March 9th. The Committee Chair is Jim Roenz, and the Vice-chair is Todd Niemuth. The list of 'needs' and 'wants' for a new Dam was discussed. Also discussed was the question of 'what is allowed' by landowners adjacent to the Mill Pond, in regards to any work they'd like to do with shoreline and such. The best bet is to contact the DNR, and to look at the City and Towns' website to get the correct contact information. Cedar Corp has not yet gotten a quote to the City for the H&H study, as they were asked to do in December. Roenz will be following up on that issue, as it is very important for moving forward with the whole process. The next meeting of the Dam Committee will be on Monday, March 9, 2026 at 6:00 PM at the Little Wolf Town Hall.

Land Use Permits/ UDC Permits: Land Use Permit – Manawa Storage, LLC. Cutting Permits: James Thiel.

Action of Cate CUP: the unanimous recommendation from the Planning Commission to approve the CUP for Ben Cate, for outside Display/Storage at the former 'Gunner's Garage' site, and with no further recommendations or conditions by the Town Board, a motion from Beyer, second by Niemuth was brought forth. Carried by 3-0 voice vote.

The proposed amendments to the County's Zoning Ordinances was discussed. The changes are, in the Board's opinion, reasonable and protective of the Town and the landowner's. In the CUP process, the Town's ability to place conditions are extremely important, to preserve local control. Changes this Board feels necessary are to the timing of notification when an agent or contact person are changed. Also important to tighten is the reporting of test results by a lab, and the results should be sent to the County and the Town on the same day as they are sent to the operator. The Clerk will convey the comments to the County Zoning Department.

Fire/Ambulance report from December meeting: Fire Department- Classes for Driver/Operator are going well. Officer classes are being taken as well. Hosted Wildland training with about 20+ people attending. 3 members going to Indianapolis in April for training. 20 calls for 2026, 11 of those in January. Ambulance Department: One EMR student stopped their classes due to health reasons. Josh Luebke will be taking class for new equipment. 31 runs for January reported. Next meeting is on March 17, 2026 at 5:00 PM at the Manawa Municipal Building. It is open to the Public.

Building Use: All is well as of this meeting.

Roads: Tree trimming was completed and board is very satisfied with the work done by MidState Tree Service. Beyer had some pot holes on N. Water Drive and Mouse Creek filled. The ditching done in last season all seems to be working as it should, with the recent rains. The Spring Road Inspection will be done on Saturday, April 18, 2026 starting at 7:00 am. Clerk asked to RSVP to the Highway department for 3 supervisors to attend the Annual County Meeting at the Highway Shop. Resolution 2026-3-10 was discussed. It basically shows the Town of Little Wolf urges the Governor and the State Legislature to enact a sustainable transportation funding solution, to encourage prudent use of General Purpose Revenue and bonding and other mechanisms to support state and local road reconstruction and preservation. Beyer/Moede to support. Carried 3-0. The Clerk was asked to send signed copy to the Wisconsin Towns Association.

Correspondence was reviewed. Moede/Beyer to approve payment of bills with checks 4545-4571. Carried 3-0.

Niemuth/Beyer to adjourn. Meeting was adjourned at 7:17 pm. April meeting starts at 7:00 PM, with the Spring/Summer hours. Annual Meeting will be on Tuesday, April 21, 2026 at 7:00 PM. These Minutes are subject to Board approval.

Respectfully submitted, Jackie Beyer, Clerk

Jason Snyder

From: litlwolf@wolfnet.net
Sent: Tuesday, March 17, 2026 2:57 PM
To: Ryan Brown; Jason Snyder
Cc: Alan Moede
Subject: input re: proposed Amendments

CAUTION: This email originated from outside of the organization.

DO NOT reply, forward, click links, or open attachments unless you recognize the sender and know the content is safe. If this email appears suspicious, or is asking you to provide sensitive information, contact the IT HELP DESK for further guidance.

Hello,

The Town of Little Wolf would like to go on record with the following comments to the proposed amendments to the Zoning Ordinance:

On page 7, the following deadlines need to be stricter: M) contact information for owner and operator shall be provided within 10 days of any changes in the contact information. and N) owner and operator shall be responsible for notifying the P&Z Dept of the results of the testing as it is received, suggesting the lab or testing facility copy the P&Z and the Town Clerk with the original test results, at the same time as the owner or operator.

As always, the Town would like their control over these operations to remain with the Town. If a proposed business should be transferred into a different zoning district or more appropriate district, than that is what they should be required to apply for.

Thank you for the opportunity to send our comments.

Make it a great day!
Jackie Beyer, Clerk
Town of Little Wolf

Jason Snyder

From: Kathy Nickel <kathy.nickel.lindchair@gmail.com>
Sent: Thursday, March 19, 2026 8:00 AM
To: Ryan Brown; Jason Snyder
Cc: Tim Stearns; Cindy Hardy; Kathy Nickel; Colleen McCoy
Subject: Delay in Zoning Ordinance Amendments Feedback

CAUTION: This email originated from outside of the organization.

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The Town of Lind Board is **officialing requesting an additional 90 day delay in the timeline** for feedback to your department in regards to the 2026 Zoning Ordinance proposed amendments (due August 1, 2026). We feel that the 60 days allowed (due by May 1) is not sufficient for us to have a proper review done. It also sets the timeline for it to go to the Waupaca County Planning Commission and County Board of Supervisors potentially by May 2026.

With the election on April 7, there is potential for at least 5, or more, new County Supervisors to be elected into office. We all have been new at one time and realize that new Committee and Board members are never up and running and knowledgeable about the processes for several months. We feel that it is putting the municipalities and the new County Supervisors at a disadvantage with this tight timeline. We have extremely limited time to contact and have direct conversations with the newly elected persons regarding our inputs to these proposed changes.

We are also contacting other County municipalities to make the same request.

Sincerely,
Kathy Nickel
Town of Lind Chairman

Jason Snyder

From: Jeff <chairman@town-dayton.com>
Sent: Friday, March 20, 2026 8:30 AM
To: Ryan Brown; Jason Snyder
Cc: Town Clerk; Brett; Susan
Subject: Requesting a 90 day Extension

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Ryan and Jason,

The Town of Dayton is **requesting a 90 day extension** (to August 1, 2026) to the deadline of needing feedback from the municipalities on the proposed Zoning Ordinance amendments. There is a great deal of concern with solar farms, data centers, digesters, etc.... and some of what is in the proposed amendments and some of what is lacking.

The primary reason for this request is due to the April 7th election that will result in at least 5 new County Board Supervisors due to uncontested open positions. This number could actually be higher because a couple of the positions are being contested. We all know what it is like to be new to a Board or Commission. It can take several months to get your feet planted and start to have a thorough understanding of how the processes work and what issues are before you for consideration. It also extremely limits our timeline for having conversations with these new Board Supervisors on where they stand and our inputs on these proposals.

Jeff Barlow, Town of Dayton Chairman

Jason Snyder

From: Brett <supervisor@town-dayton.com>
Sent: Friday, March 20, 2026 9:13 AM
To: Ryan Brown; Jason Snyder
Subject: Re: Proposed Zoning Amendments

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Mr. Snyder and Mr. Brown,

I am writing to respectfully request that the County leaders grant a 90-day extension related to the consideration of the 2026 Proposed Zoning Ordinance Amendments.

This request is prompted by the April 7 election, which will result in at least five new County Board Supervisors due to uncontested open positions. That number may increase further depending on the outcome of contested races. As you are both aware, transitioning into service as a County Supervisor involves a significant learning curve, and it often takes several months for new members to become fully familiar with established procedures, ongoing initiatives, and the issues brought before the Board for deliberation.

The anticipated level of turnover necessarily limits the available timeframe for meaningful discussion with incoming Supervisors regarding these proposals, including the opportunity to understand their perspectives and provide thoughtful input. Allowing additional time would support a more informed and deliberate process and ensure that all Supervisors—new and returning alike—have adequate opportunity to engage fully in the discussion.

For these reasons, I respectfully request the Board's consideration of a 90-day extension. We believe this additional time would strengthen the decision-making process and serve the best interests of the Towns and the County.

Thank you for your time, service, and consideration of this request.

Respectfully submitted,

Brett Grams, Town of Dayton Supervisor

Jason Snyder

From: Waupaca Chair <chair@tn.waupaca.wi.gov>
Sent: Friday, March 20, 2026 9:36 AM
To: Jason Snyder
Subject: Extension

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Jason, The Town of Waupaca would like to see to the deadline for feedback from the municipalities on the proposed Zoning Ordinance amendments moved to August 1, 2026.

Evan Abrahamson
Chair Town of Waupaca

Jason Snyder

V. Big Falls pres

From: Chris Wargin <chris.wargin@perfectpatterns.com>
Sent: Friday, March 20, 2026 11:18 AM
To: Jason Snyder
Subject: 90 Day extention please

CAUTION: This email originated from outside of the organization.

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To the deadline of needing feedback from the municipalities on the proposed Zoning Ordinance amendments.

Jason Snyder

From: lawrence@wolfnet.net
Sent: Friday, March 20, 2026 2:34 PM
To: Ryan Brown; Jason Snyder
Subject: Proposed Zoning Ordinance Amendments

CAUTION: This email originated from outside of the organization.

DO NOT reply, forward, click links, or open attachments unless you recognize the sender and know the content is safe. If this email appears suspicious, or is asking you to provide sensitive information, contact the IT HELP DESK for further guidance.

I am writing on behalf of the St. Lawrence Town Board regarding the zoning amendments that are being proposed.

It is our request that Waupaca County consider granting a 90 day extension to the current deadline. We would like to more thoroughly examine the important issues/changes being proposed. Specifically solar farms, data centers and digesters. We feel more discussion is warranted as these amendments could significantly impact our local community for years to come.

Kindly consider granting this additional time so that the areas lacking transparency can be addressed and discussed at the local level. Something as important as future land use demands thorough consideration of potential hazards as well as benefits to all involved.

Regards,

Heidi L. Ohren

Heidi Ohren
Clerk, Town of St Lawrence
Town phone: 920-244-7431
cell: 920-988-0971

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Heidi Ohren
Clerk, Town of St Lawrence
Town phone: 920-244-7431
cell: 920-988-0971

Jason Snyder

From: Caledonia Chairperson <caledoniachairperson@gmail.com>
Sent: Friday, March 20, 2026 4:24 PM
To: Jason Snyder; Caledonia Clerk; Caledonia Supervisor1; H Adams;
caledoniapcchair@gmail.com
Subject: 90 day extension

CAUTION: This email originated from outside of the organization.

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Jason, the Town of Caledonia supports the request to extend the review period for the proposed ordinance changes so further review can occur at the Town level

--

Bill Abba, Chairperson

Town of Caledonia
920-667-4953
caledoniachairperson@gmail.com

Jason Snyder

Harrison Clerk

From: Carrie Powell <carriepowell2015@gmail.com>
Sent: Tuesday, March 24, 2026 10:50 AM
To: Jason Snyder
Subject: Extension

CAUTION: This email originated from outside of the organization.

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I am requesting a 90 day extension (to August 1, 2026) to the deadline of needing feedback from the municipalities on the proposed Zoning Ordinance amendments.

Jason Snyder

From: Pat Grunwald <clerk@townfremontwi.gov>
Sent: Friday, March 27, 2026 11:37 AM
To: Ryan Brown; Jason Snyder
Subject: Request for 90-Day Extension from the Town of Fremont

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The town clerk is requesting, on behalf of the town board for the Town of Fremont, that a 90-day extension be approved regarding the deadline for feedback from municipalities on the proposed Zoning Ordinance amendments.

Thank you for your consideration.

Pat Grunwald
Clerk/Treasurer - Town of Fremont
clerk@townfremontwi.gov
920-446-2777

--

Pat Grunwald
Clerk/Treasurer - Town of Fremont
clerk@townfremontwi.gov
920-446-2777

Jason Snyder

From: Nicki Scott <presidentsscott@villageoffremontwi.gov>
Sent: Monday, March 30, 2026 6:49 AM
To: Ryan Brown; Jason Snyder
Subject: Extension to municipal feedback request

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Hello Ryan and Jason,

This is Nicki Scott, President of Village of Fremont, requesting a 90-day extension (to August 1, 2026) to the deadline of needing feedback from the municipalities on the proposed Zoning Ordinance amendments. I will not be able to attend this week's meeting, so I wanted to send my request in advance in support of the extension.

Thank you,

NICKI SCOTT

Board President | **Village of Fremont**

(208) 559-0777

presidentsscott@villageoffremontwi.gov | villageoffremontwi.gov

Population = 685



Jason Snyder

From: Judy Doud, Town Clerk <royaltonwisclerk@yahoo.com>
Sent: Monday, March 30, 2026 10:55 AM
To: Ryan Brown; Jason Snyder
Subject: Extension for deadline

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With the upcoming election on April 7th, 2026, there will be new positions filled on the County Board of Supervisors. As many will be new to the process of handling important issues for their districts, I would ask for a 90 day extension (to August 1, 2026) on needing feedback from municipalities on proposed Zoning Ordinance amendments. This allows new members to be able to best serve their districts. Thank you for your consideration with this request.

Judy Doud, Clerk
Town of Royalton

Jason Snyder

From: Anjela Hamm <clerk@farmingtonwaup.gov>
Sent: Monday, March 30, 2026 1:54 PM
To: Ryan Brown; Jason Snyder
Subject: Feedback in Minutes
Attachments: DRAFT Plan Comm Minutes for 3-4-2026.pdf

CAUTION: This email originated from outside of the organization.

DO NOT reply, forward, click links, or open attachments unless you recognize the sender and know the content is safe. If this email appears suspicious, or is asking you to provide sensitive information, contact the IT HELP DESK for further guidance.

Hi Ryan and Jason,

Just sending over the minutes from our plan commission meeting earlier this month regarding the County changes.

There wasn't anything significant, but if you wanted to read that part over.

Haven't had time to complete the minutes until now, sorry for the delay.

Thank you!

Anjela Hamm - Town Clerk
Town of Farmington
Waupaca County



Office Phone: (715) 258-2779

Hours: Monday - Friday | 8:00am to 12:00pm

<https://farmingtonwaup.gov/>

Town of Farmington Plan Commission Minutes
Wednesday, March 4, 2026, at 9:00am
E913 Prairie View Ln
www.farmingtonwaup.gov

*The Town of Farmington will **never** contact property owners requesting a wire transfer fee for any Plan Commission meeting. All official communications from the Town will come from a .gov email address.*

Call to Order: Meeting was called to order at 9:01am. Plan Commission Chair Robert Karpinski presided. The opening statement was given. Notices were properly published and posted.

Open Meeting Statement: This meeting and all meetings of this Town Plan Commission are open to the public. Proper notice has been posted and given to the press, in accordance with Wisconsin Statutes, so the citizens may be aware of the time, place, and agenda of this meeting.

Roll Call: Robert Karpinski, Chair; Craig Nelson, Town Board; Thomas Hanson, Commission Member; Dennis Trinrud, Commission Member; Steve Rawson, Commission Member; Anjela Hamm, Commission Secretary.

Richard Kasza, Vice Chair was absent.
Alison Dunham, Commission Member was absent.

Approve Agenda: A motion by Thomas Hansen, seconded by Craig Nelson, to approve the agenda. Motion carried unanimously by a voice vote.

Approve Minutes from February 4, 2026, Plan Commission Meeting: A motion by Craig Nelson, seconded by Dennis Trinrud, to approve the Minutes from February 4, 2026, Plan Commission Meeting. Motion carried unanimously by a voice vote.

New Business:

1. **Review and approve Resolution No. 2026-1 Approving an Amendment to the Comprehensive Plan.** Clerk explained that this item was incorrectly denied at previous meeting. The commission clarified that comprehensive plan amendments require an accompanying resolution, while zoning amendments do not. The item was presented to correct the prior procedural error. A motion by Steve Rawson, seconded by Thomas Hansen, to approve Resolution No. 2026-1 Approving an Amendment to the Comprehensive Plan. Motion carried unanimously by a voice vote.

2. Review and provide feedback on the proposed revisions to the County Planning and Zoning Ordinances.

The chairperson explained the item was informational only, as the commission has no authority over county ordinance revisions. Any feedback will be submitted through the meeting minutes. Commissioners reviewed the ordinance updates highlighted in blue, which reflected changes made after a joint meeting with the highway department. Notable updates included a new definition for data centers and a requirement for digester operators to notify the county within five business days of testing.

Discussion focused on large-scale solar projects, with commissioners expressing concern over limited town control, as these projects only require county approval.

Questions were raised about long-term cleanup and who would be responsible after the lifespan of the installations. Commissioners also discussed a large solar project near Plover, noting concerns about the loss of agricultural use, including the capping of irrigation wells and uncertainty around future well permitting once panels are removed. Additional concerns included traffic impacts from solar developments and the potential need to designate routes to limit disruption to residential areas. The discussion also touched on agrovoltatics and the challenges of operating farm equipment around solar arrays. While commissioners acknowledged the financial incentives for landowners, they expressed ongoing concerns about the long-term impact on farmland and the environment. No specific feedback was identified beyond the concerns discussed.

3. New Business from the Floor. None.

Adjournment: A motion by Craig Nelson, seconded by Dennis Trinrud, to adjourn the meeting at 9:18am. Motion carried unanimously by a voice vote.

Submitted by,
Anjela Hamm – Town Clerk

Jason Snyder

From: John Neuman <supervisor2@townofweyauwega-wi.gov>
Sent: Monday, March 30, 2026 4:41 PM
To: Ryan Brown; Jason Snyder
Subject: Extension Request

CAUTION: This email originated from outside of the organization.

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Ryan and Jason,

Please consider extending the deadline for the proposed Zoning Ordinance amendments for 90 days, so that we can get past the election and let things settle down. Thank you for considering our Town's request.

John Neuman

supervisor2@townofweyauwega-wi.gov

Supervisor
Town of Weyauwega

Jason Snyder

From: clerk@tn.larrabee.wi.gov
Sent: Tuesday, March 31, 2026 7:54 PM
To: Ryan Brown; Jason Snyder
Subject: FW: Urgently Need your Requests Submitted by Tuesday March 31st!

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We are requesting a 90 day extension (to August 1, 2026) to the deadline of needing feedback from the municipalities on the proposed Zoning Ordinance amendments.

The primary reason for this request is due to the April 7th election that will result in at least 5 new County Board Supervisors due to uncontested open positions. This number could actually be higher because a couple of the positions are being contested. We all know what it is like to be new to a Board or Commission. It can take several months to get your feet planted and start to have a thorough understanding of how the processes work and what issues are before you for consideration. It also extremely limits our timeline for having conversations with these new Board Supervisors on where they stand and our inputs on these proposals.

Thank you,
Sharon Pingel – Clerk
Town of Larrabee
715.304.8929
www.tn.larrabee.wi.gov

Jason Snyder

From: Caledonia Chairperson <caledoniachairperson@gmail.com>
Sent: Monday, April 27, 2026 12:48 PM
To: Ryan Brown; Jason Snyder
Cc: H Adams; caledoniapcchair@gmail.com; Caledonia Supervisor2; Caledonia Supervisor1; Caledonia Clerk
Subject: Zoning Ordinance Change Delay

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Ryan and Jason, I am requesting that the Waupaca County Zoning Committee delay making decisions on the proposed Waupaca County zoning changes for 90 days to allow for further discussion on the merits and issues of the proposed changes. Further, I am asking the Committee to ensure that local communities continue to be actively engaged and involved in the decision making process for zoning changes in the future, ensuring that local input is always obtained and considered prior to any zoning changes being made within their authority area. Currently, there are a number of impactful and potentially concerning changes being proposed that would set precedence for future decisions, like digester and solar farm siting, and it is important that local involvement and opinion are considered in making these decisions. While I understand the urgency to pass changes and move on, I also understand the importance of ensuring all opinions are heard and considered prior to making these decisions. As a result, I respectfully ask the Committee to slow down the process and ensure we are all heard and sufficient time and discussion is provided before proceeding. Please read this input into the Committee's meeting record at the appropriate meeting.

--

Bill Abba, Chairperson

Town of Caledonia
920-667-4953
caledoniachairperson@gmail.com

Dr. Bob & Sandee Peterson

Residents of Waupaca County since 1975

N3677 Oak Ridge Road Waupaca, WI 54981-8707

Dr. Bob 715-281-2818 Sandee 715-281-8121 e-mail randrock@gmail.com

May 6, 2026

Waupaca County Planning and Zoning Committee

Input via letter for:

The Public Hearing scheduled for May 7, 2026 regarding The Waupaca County Zoning Ordinance, Waupaca County Code of Ordinances, Chapter 34, proposal for section 6.10.12, Manure Co-Digester Facility

Dear Waupaca County Planning and Zoning Committee members:

Our purpose is not to speak to the general idea of having a co-digester in Waupaca County, because we are aware there are pros and cons related to these facilities, just as there are pros and cons to some of the alternatives such as landfills and manure-only digesters.

Our purpose, instead, is to address specific deficiencies in the proposed ordinance 6.10.12.

The proposed ordinance goes into detail about the physical site, right down to the minimum number of parking spaces, and the operational mechanics and procedures. But it almost seems to be an afterthought that any safeguards about the presence of PFOS, PFAS, heavy metals, and microplastics is the next-to-last item:

"n. The operator shall be responsible for testing the co-digestion byproducts for the presence of PFOS, PFAS, heavy metals, and microplastics once every month. Samples shall be collected and testing conducted by a third-party laboratory acceptable to the Planning and Zoning Committee. The operator shall be responsible for notifying the Planning and Zoning Department of the results of the testing within five business days of the receipt of the results."

That paragraph provides no restrictions on the importation of such PFOS, PFAS, heavy metals, or microplastics and thus their introduction into the process

Nor does it address what happens when/if the "results of the testing" show such forever substances.

At the very least, it seems to us that the ordinance should include in this section:

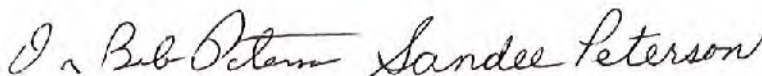
- (a) all organic biodegradable feedstuffs accepted for the co-digester must test free of these substances and
- (b) no co-digestion byproduct shall be released until the testing for that entire batch shows that it is free of such substances, and
- (c) there should be a plan as to how to dispose of the entire batch safely if it does test positive – including how it is to be transported and to what kind of facility it can be disposed (such as a special landfill that will prevent these substances from leaching out).

It might be beyond the scope of this ordinance, but please keep in mind that -- while a given batch of the co-digestion byproduct might not exceed the acceptable limits of these substances -- repeated applications of these low-level substances, for example as fertilizer, will be additive and over time the total could exceed the limit of safety.

Unless these safeguards are put into the ordinance, it should not be approved.

Thank you for considering our input to this conversation.

Sincerely,



Dr. Bob and Sandee Peterson

Jason Snyder

From: john morrison <jsmkarloff@gmail.com>
Sent: Sunday, May 3, 2026 12:20 PM
To: Jason Snyder
Subject: Testimony for May 6, 2016 for public record
Attachments: Waupauce County Planning and Zoning letter John Morrison.docx

CAUTION: This email originated from outside of the organization.

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Please have my testimony read aloud and entered into the public record regarding zoning for digesters in Waupaca county.

Thank you,
John Morrison
6128 S Maple Island Rd
Fremont, MI 49412

To Whom It May Concern on the Waupauca County Planning and Zoning, I would like my comment to be read into the official record.

Firstly, I'd like to say, JUST SAY NO. Biogas digesters are a green-washing scam that would not exist without massive subsidies. Like they did in my hometown, they ruined the quality of life for many residents with excessive and persistent odors that topped anything I had ever smelled in the decades that I have farmed our 161 year old family farm. We have no air conditioning and we could not close the windows fast enough when the wind switched directions and brought the odor a mile away to our farm. We sell our fruit and sweet corn roadside and it was just awful for our direct sales business. No one wants to stop to buy produce when it stinks to high heaven. We have a rental house next to our farmhouse, and the tenants were not happy with the assault on their senses from the outrageous stench. The majority of the time when we and other community members both out near the lagoons or digester, called and reported the stench to the digester staff, the odor was blamed on other sources like a nearby turkey farm or dairy. It was laughable because as farm folk, we clearly know the difference between one farm odor and the next. Yet management from the company, had the gall to come to our yard and tell us the odors were negligible. I believe he would have tried to convince us that the sky was green if it would turn a profit for their company. Good looking, friendly, but slick like a snake oil salesman, as seems often the case with what we have now learned, the biogas industry PR machine is rife with misinformation, outright lies and deception as they spew out the latest bull crap.

Mismanagement and lack of transparency seems to be common in the industry, as we watched digestate being spread in ways that lacked proper field investigation before spread and running dragline hoses across fields and through culverts with obvious leakage. Attached are photos of what happened when they spread on a field with historic, known tile problems. The go to number in such cases, is the Michigan EGLE PEAS hot-line, which any farmer worth their salt knows should be called to report and get professional assistance in mitigating the damage from any type of unintended chemical, fertilizer, or other types of spills, runoff, discharges. Instead Generate's third party hire to spread the digestate never called it in, and tried to take unsuccessful steps to keep it contained. Instead it was coming out of the drains ½ mile away and flowing on to neighboring properties, creating a lake of digestate in one man's yard and then running off into the drains and culvert and on into our White River and Muskegon River watersheds. The lack of care was astounding and the lack of taking full ownership of having mucked up, showed their true colors. (photos attached – please share with the audience if possible).

The US is just not ahead of the game with having any truly protective regulations to keep the biogas industry's potential to pollute at bay. The cart is before the horse on this one. The ones who will pay, will not be the biogas industry execs and their investors and stockholders, it will be the small rural communities that pay. It will be the misled landowners that pay who allow digestate that is not tested adequately that end up with heavy metals, Pfas and microplastics on their land. It will be nearby residents on shallower wells that eventually have those same toxins entering their drinking water supply. Rural communities are not industrial waste water treatment facilities and the biogas industry should not be making our farmland their landfill.

Please put an end to digesters before it is too late for your community.

John Morrison
Fremont, Michigan

Jason Snyder

From: Town Clerk <clerk@townofdaytonwcwi.gov>
Sent: Monday, May 4, 2026 8:28 PM
To: Jason Snyder; Ryan Brown
Cc: Rebecca Landre
Subject: Town of Dayton Ordinance Recommendations
Attachments: 2026 04 Board Meeting Minutes.pdf; 2026 04 Planning Commission Minutes with Zoning Ordinance Recommendations..pdf

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Hello!

Attached please find the Town of Dayton's Planning Commission and Town Board recommendations for the proposed Chapter 34 and Chapter 32 ordinance changes.

Let me know if you have any questions.

Thanks!

Wanda Hiltgen
Town of Dayton Clerk
Phone 715-258-0930
N1755 Patrick Lane.
Waupaca, WI 54981
clerk@townofdaytonwcwi.gov
www.townofdaytonwcwi.gov

TOWN OF DAYTON MONTHLY BOARD MEETING MINUTES

Tuesday April 21st, 2026 – Immediately Following the 2026 Annual Meeting

DAYTON TOWN HALL – N2285 Highway 22

THIS MEETING WILL TAKE PLACE IN PERSON AT THE DAYTON TOWN HALL.

1. Call to order: 6:27pm by Chairman Barlow.
2. Open Meeting Statement: This meeting and all meetings of this board are open to the public. Proper notice has been posted and given to the press in accordance with Wisconsin Statutes so that the citizens may be aware of the date, time and agenda of this meeting.
3. Pledge of Allegiance
4. Roll Call: Sue Popham, Brett Grams, Jeff Barlow, Wanda Hiltgen, Brenda Hewitt.
5. Approve or Amend Agenda (motion): Barlow made a motion to approve the agenda with an amendment to change Akron Road to Akron Avenue under "New Business" item "G." Grams seconded. Motion carried unanimously by voice vote.
6. Treasurer's report approval & transfers and monthly ledger review & approval. (motions): Received Transportation Aids, Landfill annual annuity payment and RE Tax Lottery Credit. No transfers needed. Barlow made a motion to approve the Treasurer's Report and monthly ledger as presented. Popham seconded. Motion carried unanimously by voice vote.
7. Public Comments: None.
8. Approve or Amend Previous Meeting Minutes (motion): Popham made a motion to approve the previous Meeting Minutes as presented. Grams seconded. Motion carried unanimously by voice vote.
9. Oral reports of meetings attended from Board Members. Barlow: Met with AIT regarding email backups. Waupaca Area Fire District: Call increase due to the recent ice storm. "What 3 Words" app: Free location finding app. Used for search & rescue. County Hwy Dept: DOT updated local road work 2026. WI Emergency Mgmt: How to apply for disaster aid & qualifications. Helped Jeff Henneman at clear brush around wells at the landfill. Roundtable Discussion: Kathy Nickel organized a roundtable discussion in regards to proposed County Zoning ordinance updates. Review proposed zoning changes. Sue: County Hwy Dept appreciation night. Roundtable Discussion regarding County Zoning ordinance proposed changes. Grams: Research on sign tracking software. County Hwy Dept appreciation night. Roundtable discussion in regards to County Zoning ordinance proposed changes. WI Lakes & Rivers 3-day conference. Hiltgen: 2027 Spring Election, County Hwy appreciation night. Roundtable discussion in regards to County Zoning ordinance proposed changes. Brenda: Filed annual room tax report. County Hwy appreciation night.
10. New Business
 - A. Review and possibly amend Ordinance #04-15-25(2025)(1) Ordinance To appoint Alternates to the Board of Review. – Board. No action required. Same alternates.
 - B. Planning Commission member appointments. – Board.
 - 1) Appoint Sue Popham as Planning Commission Chair for remaining term ending April 2027: Grams made a motion to appoint Sue Popham as Planning Commission Chair for her remaining term ending April 2027. Barlow seconded. Motion carried unanimously by voice vote.
 - 2) Appoint Neil Young and Wanda Hiltgen to 3-year terms ending April 2029: Grams made a motion to appoint Neil Young and Wanda Hiltgen to 3-year terms ending April 2029. Barlow seconded. Motion carried unanimously by voice vote.
 - C. Request by Chain Skiers to extend ski hours on Columbia Lake on Thursday July 23rd, 2026 from 7pm to 8pm for a Show Ski Exhibition. – Board. No complaints received in 2025. Barlow made a motion to approve extending ski hours on Columbia Lake on Thursday July 23rd, 2026 from 7pm to 8pm. Grams seconded. Motion carried unanimously by voice vote. Barlow requested the Chain O'Lakes District & Association send an email to their members about the event. Fred Silloway said he would make sure that happened.
 - D. Town Board to make a recommendation to Waupaca County Zoning regarding a proposed amendment to Zoning Ordinance Ch 34. – Board. - Kathy Nickel provided minutes from the roundtable discussion regarding

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the proposed changes. Barlow would like to see the Town of Dayton impose a \$100mil Bond for each CUP issued for large solar farms, data centers, digestors. Barlow made a motion to submit the Planning Commission recommendation (attached) plus the requirement of additional bonding to Waupaca County Zoning as Dayton's recommendation. Popham seconded. Motion carried unanimously by voice vote.

- E. Request from resident at N286 Park Court to turn Park Court into a Private Road. – Board. Currently all one parcel. Originally platted as 4 separate lots. Barlow: there is deeded right of way. If the board feels it is in the public's interest, not board's interest, to make the road private, then possible consideration. Property has issues of disturbances. Road would need to be vacated, but we would still own right of way. Board chose to take no action at this time.
- F. Approve hiring Dan Schultz to assist Jeff Henneman with Town maintenance work. – Board. Barlow made a motion to approve hiring Dan Schultz with the condition of an approved application. Grams seconded. Motion carried unanimously by voice vote.
- G. Akron Road Avenue 2026 work order. – Board. Dayton portion to be done. Popham made a motion to approve \$103,600 work order with Waupaca County. Barlow seconded. Motion carried unanimously by voice vote.

11. Old Business

- A. Knight Lane Landing update. – Grams. Working on DNR grant. Also working on Room Tax grant.

Adjourn: 7:32pm. Popham made a motion to adjourn. Grams seconded. Motion carried unanimously by voice vote.

Respectfully submitted by Wanda Hiltgen, Town Clerk.

RULES FOR TOWN BOARD MEETING

- Public Comments will be limited to 2 minutes per person. Be respectful of the time limit.
- Public comment period will be allowed for a maximum of 15 minutes. Once public comment is closed there will no longer be comments allowed from the audience unless addressed by a board member.
- A board member may ask for clarification from someone in the audience.
- The Town Board may conduct a roll call vote, a voice vote or otherwise decide to approve, reject, table or modify any item in this agenda.
- Residents of the Town of Dayton are encouraged to contact any elected official via email and/or phone regarding any concerns or issues they may have at any time. Contact information is on the town website

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TOWN OF DAYTON MONTHLY PLAN COMMISSION-MINUTES

Dayton Town Hall, N2285 State Highway 22

Date: Tuesday, April 14th, 2026 – 6:00 pm

1. Call to Order
2. Pledge of Allegiance
3. Open Meeting Statement: This meeting and all meetings of this board are open to the public. Proper notice has been posted and given to the press in accordance with Wisconsin Statutes so that the citizens may be aware of the date, time and agenda of this meeting.
4. Roll Call: Steve Suhs, Sue Popham, Fred Silloway, Neil Young, Wanda Hiltgen, John Hoftiezer.
Excused: Brian Feest.
5. Approve or amend agenda. Silloway made a motion to approve the agenda as presented. Suhs seconded. Motion carried unanimously by voice vote.
6. Approve or amend minutes from previous meeting. Popham made a motion to approve the previous meeting minutes as presented. Hoftiezer seconded. Motion carried unanimously by voice vote.
7. New Business
 - A. Discussion and review of the changes proposed by Waupaca County Zoning to certain sections of their Zoning Ordinance Chapter 34 and Shoreland Protection Ordinance Chapter 32. The Planning Commission will prepare a recommendation on the proposed changes for the Dayton Town Board to consider: Lengthy discussion between Planning Commission members. All of the Roundtable discussion minutes submitted by Kathy Nickel were agreed upon by the Planning Commission. Hiltgen made a motion to submit a summary of the roundtable discussion minutes, held on 4/9/2026, as a recommendation to the town board. Silloway seconded. Motion carried unanimously by voice vote. (See attached summary)

B. Public Comment.

8. Old Business: NONE

Adjourn: 7:30pm

Respectfully submitted by Wanda Hiltgen, Town Clerk & Planning Commission Member.

(1) Adapted from *Model Rules of Governance for Town Plan Commissions*. Southeastern Wisconsin Regional Planning Commission

The Order of Business at hearings shall be substantially as follows:

1. Introduction by the Chairperson.
2. Explanation by the planning or zoning staff or Chairperson.
3. Hearing of the applicant or agent.
4. Report and recommendation by the planning or zoning staff.
5. Hearing of interested property owners or citizens.
6. Response of the applicant or agent.
7. Response of any opposition.

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TOWN OF DAYTON PLANNING COMMISSION RECOMMENDATION

2026 SHORELAND PROTECTION ORDINANCE: CHAPTER 32

- Agree with all suggested revisions.

2026 ZONING ORDINANCE: GENERAL

- Wording and terminology should be more consistent throughout each section of the ordinance.
- Monitoring language needs to be specific for each section. Who can perform monitoring and testing? Credentials? Who will be policing/enforcing? Will there be monetary fine or disciplinary action for non-compliance? Neutral party testing. If there's a problem, what is the time line to fix it? Shut down? The Towns should get a copy of all monitoring/testing.
- Monitoring must be proactive not reactive.
- Waupaca County Supervisors to author and pass an ordinance similar to the ordinance passed in Port Washington, WI giving the residents a voice and vote for any development/project which utilizes any tax incentive. Potentially a project cost baseline of any project/development costing \$10million or more.
- Facility decommissioning needs a consistent definition. Also, a timeline for determining when a site is "functionally obsolete."
- Financial bonding/security to the municipality needs to be in place for the decommissioning, cleanup, restoration of failed and/or non-active sites. Including but not limited to solar, battery storage, data centers, digesters, co-digesters, etc.
 - If the bonding is a condition of a CUP, the bonding should stay in place if the CUP is pulled.
 - Who holds the bond? Who puts up the bond?
- Municipalities need to be informed of any inquiries *PRIOR* to applications being submitted and signed. Notification to all addresses within a 10mile radius of a proposed site.

SOLAR

- Amending Table 5 and 5.1:
Small solar would be a Conditional Use Permit in PURF, PVRF, AE, AR, AWT, RC-N, RC-G, RI-G, and RI-I. (Currently they would be permitted with no CUP).
Large solar would be permitted in *all* zoning districts with no CUP. (Currently need a CUP for some districts and are not allowed in RR, SR, PD, H.)
 - Why does small solar need a CUP but large solar does not.

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- Any farmland can be taken and used for solar farms? Need to protect the land and natural resources.
- Acreage disturbed should be considered along with the wattage.
- Should solar farms be regulated by Public Service Commission?

MANURE CO-DIGESTERS

- A better description of a Co-Digester.
- Digester size limit. Without size limits the farm becomes an accessory to the digester. The digester must remain an accessory of the farm.
- Co-digesters should only be allowed in Industrial zoning. The DNR defines food waste products being brought to the digester as "industrial waste." Definitions should be consistent.
- Need a timeframe for when a digester is considered non-functioning and the decommissioning process must begin.
- RANDOM & UNANNOUNCED testing of all intake and output and stages of the processing for contamination. Testing must be done by a qualified neutral party.
- Section 6.10.12 (12)(h) amount of manure present in total volume of digester composition should be clarified, currently only percentage of manure from farm operating digester is specified.
- Section 6.10.12 (12)(i) what regulates the sale of methane gas and putting it into the pipeline? Federal regulations?
- Section 6.10.12 (12)(n) The municipality shall also receive a copy of the testing results within 5 business days. Testing should be done more frequently than monthly. Weekly? Need to determine a protocol of action for a test that is out of normal range.
- What happens to the digesterate that is in excess of what can be used on the farm?
- How do we minimize the effect on neighbors: property values, landscape and views, traffic congestion, noise, smells etc.
- Many aspects of the digesters are not able to be monitored appropriately and guidelines cannot be enforced.

The attendees of the Roundtable discussion held on April 9th, 2026 agreed that solar farms, data centers, digesters and battery storage facilities need to be addressed sooner than later. All would like to have the opportunity to work alongside the Planning & Zoning Department to help make the revisions of the ordinances acceptable to all parties.

Cont.

MAY 05 2026

TOWN OF DAYTON TOWN BOARD ADDITIONAL RECOMMENDATION

- \$100million Bond to be held by the Town for each CUP issued for a digester, solar farm or data center.

MAY 05 2026

May 5, 2026

Subject: Concerns Zoning Change Allowance for Anaerobic Co-Digesters in Waupaca County

Dear Citizens of Waupaca County

I am writing to provide a testimonial regarding zoning change to allow development and construction of anaerobic co-digesters to treat waste from industrial agribusiness and commingling organic waste from other industrial operations. As a holder of a master's degree in environmental engineering, I feel compelled to express my concerns, as it seems to suggest a willingness to overlook the potential negative impacts on our environment and community.

From my involvement in the permit review for the construction of the \$65M Brown County Anaerobic Digester in Holland Township, these co-digesters strikes me as fundamentally flawed. It appears to be a mechanism for industrialists to bury their own waste under the guise of "clean energy" while ignoring their responsibility to manage their own waste sustainably. The use of manure in this context does little to mitigate the underlying issues; instead, it serves to conceal the environmental ramifications of industrial practices from remote locations.

Farmers play a crucial role in maintaining healthy soil and clean water through responsible practices such as aerobic composting. Farmers recycle nutrients back into the soil rather than attempting to profit from waste disposal to atmosphere, a concept that deviates from their core purpose of sustainable food production. As noted by Gabe Brown of Regenerative Agriculture, there seems to be a lack of evidence demonstrating that these digesters enhance water quality and prevent violations.

The change of zoning that permits co-digesters without stipulating regulations perpetuates a narrative that prioritizes industrial profit over environmental stewardship, and I believe we must reconsider our approach to waste management. It is imperative that we uphold the integrity of our agricultural practices and resist efforts that threaten to undermine the health of our soil and water.

Thank you for considering my perspective on this important issue. I hope we can engage in a meaningful dialogue to challenge these practices and advocate for more sustainable solutions.

Sincerely,

Tom Cretney
BS/MS Engineering
tomcretney@icloud.com
920-362-1313

Jason Snyder

From: Tom Cretney <tomcretney@icloud.com>
Sent: Tuesday, May 5, 2026 11:51 AM
To: Jason Snyder
Subject: Waupaca Cty Co-Digester Zoning Change
Attachments: Waupaca zoning co-digester.pdf

CAUTION: This email originated from outside of the organization.

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Hi Jason, Sarah D asked me to submit a writeup regards to zoning change for co-digester installations in Waupaca Cty. Sorry, having problems with word processor, so unable to send as attachment.

May 5, 2026

Subject: Concerns Zoning Change Allowance for Anaerobic Co-Digesters in Waupaca County

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Sincerely,

Tom Cretney
BS/MS Engineering
tomcretney@icloud.com
920-362-1313

Jason Snyder

From: Sarah D'Onofrio <sarah.e.donofrio@gmail.com>
Sent: Tuesday, May 5, 2026 1:34 PM
To: Jason Snyder
Subject: Letter for 5/7 Planning & Zoning Meeting
Attachments: Waupaca Letter.pdf

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Hello,

I'm submitting a letter that I would like to be read aloud during the Waupaca County Planning and Zoning meeting and also to make it a part of the official record. Please email me if there are any issues.

Thank you so much.

Dr. Sarah D'Onofrio

--

Sarah D'Onofrio, Ph.D.
Rural Sociologist, Community Organizer, and Anaerobic Digester Expert
She, Her, Hers

May 5, 2026

Subject: Concerns Zoning Change Allowance for Anaerobic Co-Digesters in Waupaca County

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Sincerely,

Tom Cretney
BS/MS Engineering
tomcretney@icloud.com
920-362-1313

Date: 2/18/2019

John Morrison

6128 S MAPLE ISLAND RD

FREMONT 49412

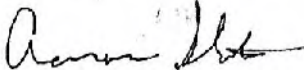
Subject: Organic Fertilizer Application Notification

Slater Custom Farming, LLC is preparing to apply organic fertilizer on land located in Holton Township (see attached plat map), owned by Slater Estates. This organic fertilizer will replace commercial fertilizer and/or manure and has the potential to improve soil fertility and several other soil properties important for plant growth.

The organic fertilizer is generated by the Fremont Regional Digester: Anaerobic Digestion (AD) is the naturally occurring process of decomposition in the absence of oxygen. This system is a holistic organic waste treatment solution which recycles "food waste" materials into renewable energy and crop fertilizers. The AD process results in a stabilized liquid fertilizer that contains nutrients required for crop growth as well as organic matter which conditions the soil. This liquid fertilizer contains Organic Nitrogen, Phosphorus, and Potassium. It is analyzed regularly for nutrient levels and to ensure that there are no contaminants in the material going into the AD system or onto crop fields. The liquid fertilizer also contains additional nutrients that crops need.

This notice is provided on behalf of Fremont Regional Digester, for more information about the benefits of AD or organic fertilizer please feel free to contact the digester management staff anytime.

Respectfully,



Slater Custom Farming LLC



Dan Meccariello, GM
Fremont Regional Digester

Road accident involving digestate hauling on busy M-120 near Holton, MI





To Whom It May Concern on the Waupauca County Planning and Zoning, I would like my comment to be read into the official record for the

Part One – Fooling Farmers

I am a West Michigan farmer who lived 6 miles from a now temporarily closed “food waste” digester. I am about 1 mile from where the two ten million gallon lagoons held the digester waste water – also known as “digestate”. The digestate was used by area farmers and spread on thousands of acres of farmland. As issues of odors and concern over the content of the digestate grew, some of the digestate was hauled about 45 miles away to farmland. The digestate was promoted as quote, “organic” fertilizer. The company that operated the digester sent notification to farmers about the benefits of this so called “organic” fertilizer. My farm received one such letter. (Attached letter copy). The letter was 9 sentences long but they used the word “organic” 8 times in that short note. This raised red flags because as an organic gardener, I know the cost of certified organic fertilizer and unlike Generate’s digester wastewater, certified organic fertilizer is quite expensive. Like the bulk of US digesters, energy companies give the digestate away for free to unsuspecting farmers. The NPK values for the wastewater is disclosed, but not the levels of heavy metals, PFAS, or plastics that can harm crops, farmland, and the surrounding surface and well water. As a farmer, I was furious as I learned that this is pretty much standard in the biogas digester world – mislead and deceive farmers into taking it off their hands, regardless of the consequences to that farmland down the road. During the time when Generate was telling the community and the community council that I sat on for them, that the digestate had been tested in 2019 for PFAS and Generate management claimed none was detected. Fast forward to 2024, and records I obtained showed the tests in 2019 did indeed contain PFAS. I pushed the Michigan state environmental agency, EGLE, to retest the digestate in the lagoons and they found many more PFAS compounds by then and at levels high enough for EGLE to inform Generate that these levels could harm nearby waters. (This letter to Generate from EGLE is attached for reference). Often the digestate contained alarmingly high levels of Aluminum, Sodium, and certain heavy metals that the state began to have concern over. The permit for the facility went with the sale of the digester from its first owner, Novi Energy, to Generate, in 2017, the nature of the materials being fed the digester changed significantly and the state came to realize the special Agricultural Use Agreement Permit was not appropriate given the far more liquid nature of the wastewater, and the high levels of certain analytes that could threaten land, surface water and well water.

Part 2 – Oooh, That Smell. Can’t You Smell that Smell?

During the 6 years that the digester was in operation, our community suffered not only from the spread of digestate with its concerning levels of certain analytes which had the potential to harm land, surface and wells water, but also suffered greatly from the horrific odors that came from the digester itself (just next to a residential area and across from Fremont Lake which is a recreational hot spot) and terrible odors from the digestate storage lagoons and spread. I am a farmer and raised chickens and sheep. We have a dairy CAFO within ½ mile and a turkey CAFO housing tens of thousands of turkeys about 1 mile away. My rural community knows the smells associated with farm operations, both small and big. The smell of the digestate lagoons and spread was off the charts in terms of odor. It was like smelling the most putrid fecal material you can image, mixed with a strange chemical overtone. The smell was so potent that it woke my family at night. Manure spread from other farms never had this effect. I was a mile from the lagoons – those living on adjacent properties suffered greatly. Holton Public Schools is about 2 miles from the lagoons and with no air conditioning had to suffer through extreme odors when it traveled on the breeze to the schools.

Part 3 – This Is Not a One Off

My story is long and it was a grueling 6 years of research, reporting to EGLE, reporting to Generate, fighting to get some measure of justice for my community. No one should have to do this in what should be my golden years. From odors to run-off, road accidents (photos) to EGLE finding their offenses to be so egregious that they needed to be placed under a Consent Order to continue operating, (photo), the headaches to local communities is just not worth the trade off. My local concern turned out not to be a one off. As I delved into this huge problem, it connected me to other communities around the US, Canada, and the UK and Ireland with similar stories. In fact, one man whose heating and cooling business sits next to a mammoth digester in Rhode Island, stopped me when I shared my story and told me that everything I was sharing was exactly the same horror story his community was experiencing. The energy company there was not Generate. Folks in Pennsylvania that I connected with were provided a PR pamphlet on a proposed Vanguard Renewable digester there. It stated Vanguard tested for PFAS, yet when community members asked for testing data, none was ever provided. (photo) At \$500 or more a test, few if any companies will spend that weekly, much less daily, to test the digestate as it leave the facility. Garbage in- garbage out. And the “food waste” misnomer is a huge problem. The biogas industry shows photos of veggie and fruit scraps and talks of the reuse of expired grocery store items and brewery waste, when in reality much more goes into these food waste or codigesters – biofuel production waste, cellulose insulation manufacturing waste, slaughterhouse waste, pharmaceutical production byproducts, and a plethora of other non food waste streams. The concept of biogas digesters looks like a dream on paper. In reality, it is a Trojan Horse with a lack of adequate oversight and suffers from what seems to be a culture of corporate greed that disregards local community concerns, quality of life, and concern for land and water.

For the sake of your community, place a moratorium on biogas digesters until it is certain that the guardrails are in place that will protect area land, surface and well water. Better yet, protect your community residents and the precious farmland and water ways and wells and disallow them altogether in your county.

Kathleen Morrison
Fremont, Michigan
ftbrunswick@gmail.com

Jason Snyder

From: Town Clerk <clerk@townofdaytonwcwi.gov>
Sent: Monday, May 4, 2026 8:28 PM
To: Jason Snyder; Ryan Brown
Cc: Rebecca Landre
Subject: Town of Dayton Ordinance Recommendations
Attachments: 2026 04 Board Meeting Minutes.pdf; 2026 04 Planning Commission Minutes with Zoning Ordinance Recommendations..pdf

CAUTION: This email originated from outside of the organization.

DO NOT reply, forward, click links, or open attachments unless you recognize the sender and know the content is safe. If this email appears suspicious, or is asking you to provide sensitive information, contact the IT HELP DESK for further guidance.

Hello!

Attached please find the Town of Dayton's Planning Commission and Town Board recommendations for the proposed Chapter 34 and Chapter 32 ordinance changes.

Let me know if you have any questions.

Thanks!

Wanda Hiltgen
Town of Dayton Clerk
Phone 715-258-0930
N1755 Patrick Lane.
Waupaca, WI 54981
clerk@townofdaytonwcwi.gov
www.townofdaytonwcwi.gov

TOWN OF DAYTON MONTHLY BOARD MEETING MINUTES

Tuesday April 21st, 2026 – Immediately Following the 2026 Annual Meeting

DAYTON TOWN HALL – N2285 Highway 22

THIS MEETING WILL TAKE PLACE IN PERSON AT THE DAYTON TOWN HALL.

1. Call to order: 6:27pm by Chairman Barlow.
2. Open Meeting Statement: This meeting and all meetings of this board are open to the public. Proper notice has been posted and given to the press in accordance with Wisconsin Statutes so that the citizens may be aware of the date, time and agenda of this meeting.
3. Pledge of Allegiance
4. Roll Call: Sue Popham, Brett Grams, Jeff Barlow, Wanda Hiltgen, Brenda Hewitt.
5. Approve or Amend Agenda (motion): Barlow made a motion to approve the agenda with an amendment to change Akron Road to Akron Avenue under "New Business" item "G." Grams seconded. Motion carried unanimously by voice vote.
6. Treasurer's report approval & transfers and monthly ledger review & approval. (motions): Received Transportation Aids, Landfill annual annuity payment and RE Tax Lottery Credit. No transfers needed. Barlow made a motion to approve the Treasurer's Report and monthly ledger as presented. Popham seconded. Motion carried unanimously by voice vote.
7. Public Comments: None.
8. Approve or Amend Previous Meeting Minutes (motion): Popham made a motion to approve the previous Meeting Minutes as presented. Grams seconded. Motion carried unanimously by voice vote.
9. Oral reports of meetings attended from Board Members. Barlow: Met with AIT regarding email backups. Waupaca Area Fire District: Call increase due to the recent ice storm. "What 3 Words" app: Free location finding app. Used for search & rescue. County Hwy Dept: DOT updated local road work 2026. WI Emergency Mgmt: How to apply for disaster aid & qualifications. Helped Jeff Henneman at clear brush around wells at the landfill. Roundtable Discussion: Kathy Nickel organized a roundtable discussion in regards to proposed County Zoning ordinance updates. Review proposed zoning changes. Sue: County Hwy Dept appreciation night. Roundtable Discussion regarding County Zoning ordinance proposed changes. Grams: Research on sign tracking software. County Hwy Dept appreciation night. Roundtable discussion in regards to County Zoning ordinance proposed changes. WI Lakes & Rivers 3-day conference. Hiltgen: 2027 Spring Election, County Hwy appreciation night. Roundtable discussion in regards to County Zoning ordinance proposed changes. Brenda: Filed annual room tax report. County Hwy appreciation night.
10. New Business
 - A. Review and possibly amend Ordinance #04-15-25(2025)(1) Ordinance To appoint Alternates to the Board of Review. – Board. No action required. Same alternates.
 - B. Planning Commission member appointments. – Board.
 - 1) Appoint Sue Popham as Planning Commission Chair for remaining term ending April 2027: Grams made a motion to appoint Sue Popham as Planning Commission Chair for her remaining term ending April 2027. Barlow seconded. Motion carried unanimously by voice vote.
 - 2) Appoint Neil Young and Wanda Hiltgen to 3-year terms ending April 2029: Grams made a motion to appoint Neil Young and Wanda Hiltgen to 3-year terms ending April 2029. Barlow seconded. Motion carried unanimously by voice vote.
 - C. Request by Chain Skiers to extend ski hours on Columbia Lake on Thursday July 23rd, 2026 from 7pm to 8pm for a Show Ski Exhibition. – Board. No complaints received in 2025. Barlow made a motion to approve extending ski hours on Columbia Lake on Thursday July 23rd, 2026 from 7pm to 8pm. Grams seconded. Motion carried unanimously by voice vote. Barlow requested the Chain O'Lakes District & Association send an email to their members about the event. Fred Silloway said he would make sure that happened.
 - D. Town Board to make a recommendation to Waupaca County Zoning regarding a proposed amendment to Zoning Ordinance Ch 34. – Board. - Kathy Nickel provided minutes from the roundtable discussion regarding

the proposed changes. Barlow would like to see the Town of Dayton impose a \$100mil Bond for each CUP issued for large solar farms, data centers, digestors. Barlow made a motion to submit the Planning Commission recommendation (attached) plus the requirement of additional bonding to Waupaca County Zoning as Dayton's recommendation. Popham seconded. Motion carried unanimously by voice vote.

- E. Request from resident at N286 Park Court to turn Park Court into a Private Road. – Board. Currently all one parcel. Originally platted as 4 separate lots. Barlow: there is deeded right of way. If the board feels it is in the public's Interest, not board's interest, to make the road private, then possible consideration. Property has issues of disturbances. Road would need to be vacated, but we would still own right of way. Board chose to take no action at this time.
- F. Approve hiring Dan Schultz to assist Jeff Henneman with Town maintenance work. – Board. Barlow made a motion to approve hiring Dan Schultz with the condition of an approved application. Grams seconded. Motion carried unanimously by voice vote.
- G. Akron Road Avenue 2026 work order. – Board. Dayton portion to be done. Popham made a motion to approve \$103,600 work order with Waupaca County. Barlow seconded. Motion carried unanimously by voice vote.

11. Old Business

- A. Knight Lane Landing update. – Grams. Working on DNR grant. Also working on Room Tax grant.

Adjourn: 7:32pm. Popham made a motion to adjourn. Grams seconded. Motion carried unanimously by voice vote.

Respectfully submitted by Wanda Hiltgen, Town Clerk.

RULES FOR TOWN BOARD MEETING

- Public Comments will be limited to 2 minutes per person. Be respectful of the time limit.
- Public comment period will be allowed for a maximum of 15 minutes. Once public comment is closed there will no longer be comments allowed from the audience unless addressed by a board member.
- A board member may ask for clarification from someone in the audience.
- The Town Board may conduct a roll call vote, a voice vote or otherwise decide to approve, reject, table or modify any item in this agenda.
- Residents of the Town of Dayton are encouraged to contact any elected official via email and/or phone regarding any concerns or issues they may have at any time. Contact Information is on the town website

TOWN OF DAYTON MONTHLY PLAN COMMISSION-MINUTES

Dayton Town Hall, N2285 State Highway 22

Date: Tuesday, April 14th, 2026 – 6:00 pm

1. Call to Order
2. Pledge of Allegiance
3. Open Meeting Statement: This meeting and all meetings of this board are open to the public. Proper notice has been posted and given to the press in accordance with Wisconsin Statutes so that the citizens may be aware of the date, time and agenda of this meeting.
4. Roll Call: Steve Suhs, Sue Popham, Fred Silloway, Neil Young, Wanda Hiltgen, John Hoftiezer.
Excused: Brian Feest.
5. Approve or amend agenda. Silloway made a motion to approve the agenda as presented. Suhs seconded. Motion carried unanimously by voice vote.
6. Approve or amend minutes from previous meeting. Popham made a motion to approve the previous meeting minutes as presented. Hoftiezer seconded. Motion carried unanimously by voice vote.
7. New Business
 - A. Discussion and review of the changes proposed by Waupaca County Zoning to certain sections of their Zoning Ordinance Chapter 34 and Shoreland Protection Ordinance Chapter 32. The Planning Commission will prepare a recommendation on the proposed changes for the Dayton Town Board to consider: Lengthy discussion between Planning Commission members. All of the Roundtable discussion minutes submitted by Kathy Nickel were agreed upon by the Planning Commission. Hiltgen made a motion to submit a summary of the roundtable discussion minutes, held on 4/9/2026, as a recommendation to the town board. Silloway seconded. Motion carried unanimously by voice vote. (See attached summary)

B. Public Comment.

8. Old Business: NONE

Adjourn: 7:30pm

Respectfully submitted by Wanda Hiltgen, Town Clerk & Planning Commission Member.

(1) Adapted from *Model Rules of Governance for Town Plan Commissions*. Southeastern Wisconsin Regional Planning Commission

The Order of Business at hearings shall be substantially as follows:

1. Introduction by the Chairperson.
2. Explanation by the planning or zoning staff or Chairperson.
3. Hearing of the applicant or agent.
4. Report and recommendation by the planning or zoning staff.
5. Hearing of interested property owners or citizens.
6. Response of the applicant or agent.
7. Response of any opposition.

TOWN OF DAYTON PLANNING COMMISSION RECOMMENDATION

2026 SHORELAND PROTECTION ORDINANCE: CHAPTER 32

- Agree with all suggested revisions.

2026 ZONING ORDINANCE: GENERAL

- Wording and terminology should be more consistent throughout each section of the ordinance.
- Monitoring language needs to be specific for each section. Who can perform monitoring and testing? Credentials? Who will be policing/enforcing? Will there be monetary fine or disciplinary action for non-compliance? Neutral party testing. If there's a problem, what is the time line to fix it? Shut down? The Towns should get a copy of all monitoring/testing.
- Monitoring must be proactive not reactive.
- Waupaca County Supervisors to author and pass an ordinance similar to the ordinance passed in Port Washington, WI giving the residents a voice and vote for any development/project which utilizes any tax incentive. Potentially a project cost baseline of any project/development costing \$10million or more.
- Facility decommissioning needs a consistent definition. Also, a timeline for determining when a site is "functionally obsolete."
- Financial bonding/security to the municipality needs to be in place for the decommissioning, cleanup, restoration of failed and/or non-active sites. Including but not limited to solar, battery storage, data centers, digesters, co-digesters, etc.
 - If the bonding is a condition of a CUP, the bonding should stay in place if the CUP is pulled.
 - Who holds the bond? Who puts up the bond?
- Municipalities need to be informed of any inquiries *PRIOR* to applications being submitted and signed. Notification to all addresses within a 10mile radius of a proposed site.

SOLAR

- Amending Table 5 and 5.1:
Small solar would be a Conditional Use Permit in PURF, PVRF, AE, AR, AWT, RC-N, RC-G, RI-G, and RI-I. (Currently they would be permitted with no CUP).
Large solar would be permitted in *all* zoning districts with no CUP. (Currently need a CUP for some districts and are not allowed in RR, SR, PD, H.)
 - Why does small solar need a CUP but large solar does not.

- Any farmland can be taken and used for solar farms? Need to protect the land and natural resources.
- Acreage disturbed should be considered along with the wattage.
- Should solar farms be regulated by Public Service Commission?

MANURE CO-DIGESTERS

- A better description of a Co-Digester.
- Digester size limit. Without size limits the farm becomes an accessory to the digester. The digester must remain an accessory of the farm.
- Co-digesters should only be allowed in Industrial zoning. The DNR defines food waste products being brought to the digester as "industrial waste." Definitions should be consistent.
- Need a timeframe for when a digester is considered non-functioning and the decommissioning process must begin.
- RANDOM & UNANNOUNCED testing of all intake and output and stages of the processing for contamination. Testing must be done by a qualified neutral party.
- Section 6.10.12 (12)(h) amount of manure present in total volume of digester composition should be clarified, currently only percentage of manure from farm operating digester is specified.
- Section 6.10.12 (12)(i) what regulates the sale of methane gas and putting it into the pipeline? Federal regulations?
- Section 6.10.12 (12)(n) The municipality shall also receive a copy of the testing results within 5 business days. Testing should be done more frequently than monthly. Weekly? Need to determine a protocol of action for a test that is out of normal range.
- What happens to the digesterate that is in excess of what can be used on the farm?
- How do we minimize the effect on neighbors: property values, landscape and views, traffic congestion, noise, smells etc.
- Many aspects of the digesters are not able to be monitored appropriately and guidelines cannot be enforced.

The attendees of the Roundtable discussion held on April 9th, 2026 agreed that solar farms, data centers, digesters and battery storage facilities need to be addressed sooner than later. All would like to have the opportunity to work alongside the Planning & Zoning Department to help make the revisions of the ordinances acceptable to all parties.

Cont.

TOWN OF DAYTON TOWN BOARD ADDITIONAL RECOMMENDATION

- \$100million Bond to be held by the Town for each CUP issued for a digester, solar farm or data center.



Sloppy farming at best, but truly an environmental disaster of frmin in truth. Additionally wehave documentation of dragline hoses being fred through Cedar Creek – emails that show that Generate management knew full well that the creek was being used and were unconcerned that a leak/spill could occur. The creek feeds many people in this area wit fish.



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
MATERIALS MANAGEMENT DIVISION

EGLE

PHILLIP D. ROOS
DIRECTOR

December 16, 2024

Logan Randles
Generate Fremont Digester, LLC
1634 Locust Street
Fremont, Michigan 49412

Dear Logan Randles:

SUBJECT: Land Application of Digestate Containing PFAS; Generate Fremont; 1634 Locust Street; Fremont; Newaygo County; Waste Data System Number 493259

On November 22, 2024, staff from the Department of Environment, Great Lakes, and Energy (EGLE), collected samples of the digestate that Generate Fremont Digester, LLC (Generate) land applies via Agricultural Use Approval (AUA) 17-AUA-001 and submitted the samples for laboratory analysis of per – and polyfluoroalkyl substances (PFAS). The samples were collected from the digestate stored in Generate's two lagoons near Holton, Michigan. EGLE received laboratory analysis which indicated that the digestate contained PFAS compounds on December 9, 2024. The laboratory analysis is attached for reference.

EGLE appreciates the steps Generate took to voluntarily and immediately cease land application of the digestate while EGLE analyzed and considered the laboratory data. Eleven different PFAS compounds were detected in the samples, and two PFAS compounds, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), were present at levels that exceed maximum contaminant levels (MCLs) for drinking water under the Safe Drinking Water Act, MCL 325.1001 *et seq.*, and groundwater cleanup criteria under Part 201 of the Natural Resources and Environmental Protection Act (NREPA), MCL 324.20101 *et seq.*

EGLE understands the time constraints facing Generate as the seasonal window for land application of the digestate will close later this month. However, additional evaluation of the data and the characteristics of the digestate is required to fully understand the risk posed to soil and groundwater from its land application. Even with additional evaluation, it may not be possible to determine with any certainty, the nature and extent of the impacts to soil and groundwater. Given these unknowns, EGLE strongly recommends that Generate cease land application of the digestate. EGLE has determined that land application of this material may constitute a violation of the AUA as follows:

From a pamphlet provided to the people of Caernarvon Township, PA regarding a proposed digester on the Kurtz dairy farm – which incidentally, had only a few hundred acres of spreadable farmland yet the digester would have created enough digestate for thousands of acres. The farmer would have been left with the burden of finding willing farmers to take the rest.

Q: 2. Does Vanguard Test for PFAS?

A: Vanguard Renewables is committed to being good neighbors and works tirelessly to ensure the safety and wellbeing of our staff, our farm partners, and the communities where we operate. Vanguard Renewables voluntarily tests the soil before land application of the liquid digestate to get a baseline reading and then routinely tests the soil and the digestate before application. If there are any elevated levels of these chemicals the digestate will be remediated or not used.



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
LANSING

EGLE

LIESL EICHLER CLARK
DIRECTOR

June 12, 2019

CERTIFIED MAIL

Mr. Dan Meccariello, General Manager
Generate Fremont Digester, LLC
1634 Locust Street
Fremont, Michigan 49412

Dear Mr. Meccariello:

SUBJECT: Consent Order, Generate Fremont Digester, LLC (Generate Fremont);
WDS 493259

Enclosed please find a fully executed original of the Consent Order, MMD Order No. 115-03-2019 (Consent Order), between Generate Fremont and the Department of Environment, Great Lakes, and Energy (EGLE). The Consent Order became effective on June 10, 2019, the date it was signed by the Director of the Materials Management Division (MMD). Payment of the settlement amount identified in the Order was initiated by Generate Fremont on June 4, 2019.

Thank you for your cooperation in resolving this matter. If you have any questions regarding the Consent Order, please contact Mr. Tim Unseld at 616-356-0229; unseldt@michigan.gov; or Grand Rapids District Office, MMD, EGLE, 350 Ottawa Avenue NW, Unit 10, Grand Rapids, Michigan 49503-2341.

Sincerely,

Alexandra Clark, Manager
Enforcement Section
Materials Management Division
248-752-2740

Enclosure

cc: Ms. Laura LaMore, Michigan Department of Attorney General
Mr. Jack Schinderle, EGLE
Mr. Lonnie Lee, EGLE
Ms. Rhonda Oyer, EGLE
Mr. Fred L. Sellers, EGLE
cc/enc: Mr. Duane Roskoskey, EGLE
Mr. Tim Unseld, EGLE

Jason Snyder

From: KM <ftbrunswick@gmail.com>
Sent: Sunday, May 3, 2026 12:16 PM
To: Jason Snyder
Subject: Testimony for public record re: May 6, 2026 Digester Zoning
Attachments: To the Waupauca County Planning and Zoning Board Kathleen Morrison.docx

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Attached is my testimony which I would like to have read aloud at the May 6th zoning hearing and made part of the public record. Thank you,
Kathleen Morrison
6128 S Maple Island Rd
Fremont, MI 49412

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Comparing Regulations for Land Spreading Across Industries with Anaerobic Digesters in Wisconsin

Compiled by Dr. Sarah D'Onofrio

	On-Farm Animal Feeding Operations Regulations	Landfill Solid Waste Regulations	Wastewater Domestic Sewage Sludge Management Regulations
<u>Sampling Reqs</u>	Manure, process wastewater and soil on fields used for land application shall be sampled by the permittee in accordance with this chapter and WPDES permit conditions. Manure or process wastewater shall be analyzed on at least an annual basis for nitrogen, phosphorus and percent solids in years when the manure or process wastewater is applied. The department may require more frequent monitoring and monitoring for other parameters as part of a WPDES permit where necessary to provide representative samples of manure and process wastewater. Manure and soil samples shall be analyzed by a laboratory certified under s. ATCP 50.50. Samples of process wastewater that are not mixed with manure shall be analyzed using applicable methods specified in ch. NR 219. The department may specify alternative methods for sampling in the WPDES permit. The permittee shall submit appropriate quality control information for sampling and analysis upon written request of the department. Note: NRCS Standard 590 requires soil testing once every 4 years.	Analysis of the waste material for the following parameters. The limit of detection and the limit of quantitation shall be reported with the sample results. If a substance is detected below the limit of quantitation, the detected value with the appropriate qualifier shall be reported. 1. pH 2. Nutrient content including Kjeldahl-nitrogen, ammonia-nitrogen, nitrate and nitrate-nitrogen, phosphorous and potassium 3. Salt content including chloride, fluoride and sulfate. 4. Biological populations including total coliform, fecal coliform and any virus present in the waste material. 5. Metals content including aluminum, barium, boron, calcium, copper, iron, manganese, magnesium, sodium, strontium and zinc. 6. A bulk chemical analysis for additional analytes may be required by the department based on the information provided in pars. (a) to (c).	A representative sample of the sludge shall be analyzed by the permittee as specified in the permit, for any or all of the following parameters, depending on the treatment facility size, processes used for treatment, methods of beneficial use or disposal, and characteristics of industrial discharges to the treatment facility: 1. Characteristics such as the percentage of total solids, volatile solids, pH and specific oxygen uptake rate (SOUR). 2. Nitrogen, phosphorus and potassium. 3. Arsenic, beryllium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium and zinc. 4. Fecal coliform, salmonella, enteric viruses and viable helminth ova. 5. Selected phenolics, pesticides, toxic substances and persistent organics. 6. Priority pollutant scan. 7. Toxicity characteristics leaching procedure (TCLP) test if landfilling. 8. Paint filter test if landfilling. 9. Any other parameters which the department determines may be present in the sludge and which may result in detrimental effects to public health or the environment.

**FINDINGS, CONCLUSIONS, AND DECISION
OF THE ZONING BOARD OF ADJUSTMENT
ST. CROIX COUNTY, WISCONSIN**

File Number:	CUP-2018-003
Applicant:	Bruce Moll
Agent:	Raymond Davy
Complete Application Received:	November 30, 2018
Hearing Notice Publications:	January 10 and 17, 2019; April 11 and 18, 2019; and August 8 and 15, 2019
Hearing Dates:	January 24, April 25 and August 22, 2019

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Having heard all the testimony, considered the entire record herein, and visited the site, the Board of Adjustment makes the following Findings of Fact and Conclusions of Law pertinent to the applicant's Conditional Use requests:

1. The applicant and property owner is Bruce Moll. The agent is Raymond Davy.
2. The site is located at 1768 County Road Z in part of SW ¼ SE ¼, SE ¼ SE ¼, Sec. 4 T28N R17W, Town of Pleasant Valley.
3. The site is zoned as AG-2 Agricultural District.
4. The Conditional Use request is to operate a Manure Processing Facility, as an Agricultural Related Use, pursuant to Section 17.145 C.3.g. of the St. Croix Zoning Ordinance.
5. Conditional uses shall only be granted subject to the following provisions, pursuant to Section 17.70 (7)(a):
 - a. No grant of a conditional use shall violate the spirit or general intent of this chapter. *Wis. Stat. 59.69 Purpose. It is the purpose of this section to promote the public health, safety and convenience and general welfare...To encourage uses of land and other natural resources which are in accordance with their character and adaptability...to encourage the protection of groundwater resources...to conserve soil water and forest resources.*
 - b. No conditional use shall be allowed which would be contrary to the public health, safety, or general welfare or which would be substantially adverse to property values in the neighborhood affected.
 - c. No use shall be permitted by conditional use that would constitute a nuisance by reasons of noise dust, smoke, odor or other similar factors.
 - d. The board shall also apply standards set forth in other sections of this chapter which apply to particular classes of conditional uses.

6. Granting of the Conditional Use will be substantially adverse to property values in the neighborhood affected for the following reasons:

- a. According to an experienced local real estate agent the proposed site in his professional opinion would create concern for prospective home buyer that would both negatively affect a home seller's marketability and a buyer's perceived value of a home ultimately resulting in a lower sale price (Exhibit 53).
- b. A resident was informed by his realtor that if the digester was in his back yard, it would be harder to sell his property and it would be worth less money (August 22, 2019).
- c. Real estate professionals located in Le Seur, MN, site of a similar bio digester, indicated that the siting of a manure digester would most likely negatively affect property values.
- d. Real estate professionals located in St. Croix County, WI, indicated that the siting of a manure digester would most likely negatively affect property values.
- e. The Steigerwaldt appraisal report Method 1, recognized that viewshed, odor, noise, traffic and safety are factors that can impact property value; and the actions of buyers and sellers ultimately determine value. The report found that odor is a primary impact driver and that poultry (turkey) contains the highest smell factor. Therefore with turkey litter being approximately 70% of the manure sent to the digester in covered, not sealed, trucks averaging between 11 to 15 trucks per day, there is likely a negative impact range from 0 to 13 percent from odor.
- f. Lots near an existing turkey farm in a New Richmond, WI, residential subdivision sell for \$5,000 to \$10,000 less than lots further away from the existing turkey farm.

DECISION

On the basis of the above Findings of Fact, Conclusions of Law, and the record herein, the Board denied the applicant's Conditional Use request.

The following vote was taken to deny the request: Chairperson Malick, (No); Vice Chairman Peterson, (Yes); Nelson, (No); Niccum, (Yes); Miller (Yes). Motion carries.

APPEAL RIGHTS

Any person aggrieved by this decision may file an appeal in St. Croix County circuit court within 30 days after the filing date shown below, pursuant to Sec. 59.694(10), Wisconsin Statutes. St. Croix County assumes no responsibility for action taken in reliance on this decision prior to the expiration of the appeal period. St. Croix County does not certify that the identity of all persons legally entitled to notice of the Board of Adjustment proceedings, which resulted in this decision, was provided to the County.

EUROPEAN TESTING REQUIREMENTS FOR DIGESTATE: Separated Liquid and Solid Digestate	TESTING SAMPLES REQUIRED: PER EACH BATCH	WISCONSIN'S TESTING REQUIREMENTS FOR DIGESTATE	Frequency of Testing: Testing is required every 4 years under WI NMP plans
NUTRIENTS: Total Nitrogen (N) Total Phosphorus (P) Ammoniacal Nitrogen (NH4-N) Total Potassium (K) Loss of Ignition (also referred to as "volatile solids") PH Level HEAVY METALS: Arsenic (As) Cadmium (Cd) Chromium (Cr) Copper (Cu) Mercury (Hg) Nickel (Ni) Lead (Pb) Zinc (Zn)	3 "most recent samples" not to exceed the corresponding upper limit established 3 "most recent samples" not to exceed the corresponding upper limit established	NUTRIENTS: According to NMP Requirements Nitrogen (N) Phosphorus (P) Potassium (K) Organic Matter: plant and animal residue, microbial biomass Humus PH Level Some Heavy Metals: Specific Metals Not Specified	
PATHOGENS: Human and Animal E. Coli: Potential to cause severe gastrointestinal illness Salmonella spp.: Potential to cause foodborne illness Listeria Monocytogenes: Causing Listeria which is dangerous to pregnant women and immunocompromised individuals Campylobacter spp.: Pathogen associated with food borne illnesses PLASTICS AND PHYSICAL CONTAMINANTS: Plastics and Microplastics Man-made physical contaminants, glass, metal, stone, and non-stone PFAS/PFOS: FOREVER CHEMICALS Compliance testing for PFAS in digestate is becoming more standardized throughout Europe	5 Samples need to be tested for human/animal pathogens not to exceed the corresponding upper limits established 3 Samples need to be tested not to exceed the corresponding upper limits established	Some Pathogens: Specific Pathogens Not Specified PFAS/PFOS: Forever Chemicals	Testing Varies and Not Widely Mandated
SOURCES: PAS 110:2014 Specification for whole digestate, separated liquor, and separated fibre derived from the anaerobic digestion of source-segregated biodegradable materials Anaerobic Digestate Resource Framework: Oct. 2025 Revised PAS 110:2014 as the core quality standard Set out a clear End of Waste (EoW) test when digestate stops being waste Introduced new plastics limits and updated waste codes	Links: https://www.wrap.ngo/resources/guide/bi-pas-110-producing-quality-anaerobic-digestate https://www.gov.uk/guidance/anaerobic-digestate-resource-framework		

Jason Snyder

From: Kim Dupre <duprekk@gmail.com>
Sent: Monday, May 4, 2026 3:23 PM
To: DuWayne Federwitz; Laurie Vollrath; Darrell R. Hansen; Dennis Wengelski; Lee Much; Barry Bartz; Ricky Ertl; Lila Malvik Shower; James Nygaard; Kevin Will; Lee Trainor; Scott Purchatzke; Ted Johnson External; Kraeger Allen; Don Holtebeck; Judy Suhs; Larry Eisentraut; Jackie Beyer; Jack Spierings; Joel Bartel; Peter Bosquez; Kenneth Jaeger; David Morack; Fred Zaug; Darla Meshke; Robert Ferg; Jeromy Schuelke
Cc: Brian Haase; Jason Snyder; Kristy Opperman; PublicHealth
Subject: Waupaca County Code of Ordinances - Chapter 34
Attachments: WaupacaCounty_MayLtr.docx; DigestateSamplingRegComparison-r.JPG; FINAL Decision CUP-signed copy.docx; Europe vs USA Digestate Testing Regs.jpeg

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County Board Supervisors and staff,

Please see attached prior to the May 7th Planning & Zoning Committee meeting.

Thank you for your service.....and consideration of this letter.

Kim Dupre, Sustain Rural Wisconsin Network (SRWN)

Danny Akenson, Grassroots Organizing Western Wisconsin (GROWW)

Sue Curtis, St. Croix Citizens Uniting for Responsible Environmental Stewardship (CURES)

To Whom It May Concern on the Waupauca County Planning and Zoning, I would like my comment to be read into the official record for the

Part One – Fooling Farmers

I am a West Michigan farmer who lived 6 miles from a now temporarily closed “food waste” digester. I am about 1 mile from where the two ten million gallon lagoons held the digester waste water – also known as “digestate”. The digestate was used by area farmers and spread on thousands of acres of farmland. As issues of odors and concern over the content of the digestate grew, some of the digestate was hauled about 45 miles away to farmland. The digestate was promoted as quote, “organic” fertilizer. The company that operated the digester sent notification to farmers about the benefits of this so called “organic” fertilizer. My farm received one such letter. (Attached letter copy). The letter was 9 sentences long but they used the word “organic” 8 times in that short note. This raised red flags because as an organic gardener, I know the cost of certified organic fertilizer and unlike Generate’s digester wastewater, certified organic fertilizer is quite expensive. Like the bulk of US digesters, energy companies give the digestate away for free to unsuspecting farmers. The NPK values for the wastewater is disclosed, but not the levels of heavy metals, PFAS, or plastics that can harm crops, farmland, and the surrounding surface and well water. As a farmer, I was furious as I learned that this is pretty much standard in the biogas digester world – mislead and deceive farmers into taking it off their hands, regardless of the consequences to that farmland down the road. During the time when Generate was telling the community and the community council that I sat on for them, that the digestate had been tested in 2019 for PFAS and Generate management claimed none was detected. Fast forward to 2024, and records I obtained showed the tests in 2019 did indeed contain PFAS. I pushed the Michigan state environmental agency, EGLE, to retest the digestate in the lagoons and they found many more PFAS compounds by then and at levels high enough for EGLE to inform Generate that these levels could harm nearby waters. (This letter to Generate from EGLE is attached for reference). Often the digestate contained alarmingly high levels of Aluminum, Sodium, and certain heavy metals that the state began to have concern over. The permit for the facility went with the sale of the digester from it first owner, Novi Energy, to Generate, in 2017, the nature of the materials being fed the digester changed significantly and the state came to realize the special Agricultural Use Agreement Permit was not appropriate given the far more liquid nature of the wastewater, and the high levels of certain analytes that could threaten land, surface water and well water.

Part 2 – Oooh, That Smell. Can’t You Smell that Smell?

During the 6 years that the digester was in operation, our community suffered not only from the spread of digestate with its concerning levels of certain analytes which had the potential to harm land, surface and wells water, but also suffered greatly from the horrific odors that came from the digester itself (just next to a residential area and across from Fremont Lake which is a recreational hot spot) and terrible odors from the digestate storage lagoons and spread. I am a farmer and raised chickens and sheep. We have a dairy CAFO within ½ mile and a turkey CAFO housing tens of thousands of turkeys about 1 mile away. My rural community knows the smells associated with farm operations, bot small and big. The smell of the digestate lagoons and spread was off the charts in terms of odor. It was like smelling the most putrid fecal material you can image, mixed with a strange chemical overtone. The smell was so potent that it woke my family at night. Manure spread from other farms never had this effect. I was a mile from the lagoons – those living on adjacent properties suffered greatly. Holton Public Schools is about 2 miles from the lagoons and with no air conditioning had to suffer through extreme odors when it traveled on the breeze to the schools.

Part 3 – This Is Not a One Off

My story is long and it was a grueling 6 years of research, reporting to EGLE, reporting to Generate, fighting to get some measure of justice for my community. No one should have to do this in what should be my golden years. From odors to run-off, road accidents (photos) to EGLE finding their offenses to be so egregious that they needed to be placed under a Consent Order to continue operating, (photo), the headaches to local communities is just not worth the trade off. My local concern turned out not to be a one off. As I delved into this huge problem, it connected me to other communities around the US, Canada, and the UK and Ireland with similar stories. In fact, one man whose heating and cooling business sits next to a mammoth digester in Rhode Island, stopped me when I shared my story and told me that everything I was sharing was exactly the same horror story his community was experiencing. The energy company there was not Generate. Folks in Pennsylvania that I connected with were provided a PR pamphlet on a proposed Vanguard Renewable digester there. It stated Vanguard tested for PFAS, yet when community members asked for testing data, none was ever provided. (photo) At \$500 or more a test, few if any companies will spend that weekly, much less daily, to test the digestate as it leave the facility. Garbage in- garbage out. And the “food waste” misnomer is a huge problem. The biogas industry shows photos of veggie and fruit scraps and talks of the reuse of expired grocery store items and brewery waste, when in reality much more goes into these food waste or codigesters – biofuel production waste, cellulose insulation manufacturing waste, slaughterhouse waste, pharmaceutical production byproducts, and a plethora of other non food waste streams. The concept of biogas digesters looks like a dream on paper. In reality, it is a Trojan Horse with a lack of adequate oversight and suffers from what seems to be a culture of corporate greed that disregards local community concerns, quality of life, and concern for land and water.

For the sake of your community, place a moratorium on biogas digesters until it is certain that the guardrails are in place that will protect area land, surface and well water. Better yet, protect your community residents and the precious farmland and water ways and wells and disallow them altogether in your county.

Kathleen Morrison
Fremont, Michigan
ftbrunswick@gmail.com

Jason Snyder

From: Cory Parker <cparker09@gmail.com>
Sent: Wednesday, May 6, 2026 9:30 PM
To: Jason Snyder
Subject: 5/7 Planning and Zoning Meeting
Attachments: Parker Waupaca Letter.pdf

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Hello Jason,

I have attached a letter that I would like to be read aloud during the 5/7 Planning and Zoning Meeting. It should be made part of the official record of the meeting.

Thank you,

Cory Parker, PhD

May 6, 2026

Waupaca County Supervisors
Waupaca County Government Center
811 Harding St.
Waupaca, WI 54981

Dear County Board Supervisors,

In the State of Wisconsin, the Department of Natural Resources defines solid waste as, "any material no longer used for its originally intended purpose, that will be discarded, treated to reclaim its original properties or processed to be used for an alternative purpose."¹ Co-digesters take manure and food waste and use them to create biofuel and soil amendments which are processed products used for an alternative purpose. In fact, one of the main inputs for co-digesters is source separated compostable material (SSCM), "a regulatory term used in solid waste code regulations that refers to all the wastes that can be composted under a solid waste compost facility license. It includes food waste, plant waste (including crops and aquatic plants), fruit and vegetable food processing waste, fish processing waste, yard waste, manure and animal bedding from herbivorous (non-meat-eating) animals that are not deer or elk, clean chipped wood and sawdust, non-recyclable compostable paper and certified compostable plastics."² The highlighted inputs are also used in anaerobic co-digesters.

Anaerobic digesters fall within a gap in WI regulations because compost is aerobic (requires oxygen) and digester facilities are anaerobic (requires no oxygen). Composting facilities also operate at higher temperatures and require testing and monitoring. However, the spirit of the regulation clearly places anaerobic digesters into the solid waste category because of the inputs they use in daily operations. Regardless of whether oxygen is present, they still produce a solid waste. This change to the zoning ordinance deepens that gap by eliminating the need for any determination of risk to public health, safety, or the surrounding environment. Making co-digesters a conditional use on agricultural land is simply exploiting a problematic loop-hole in Wisconsin law that deregulates solid waste facilities and creates unnecessary risks for the environment, public health, and safety and should not be enacted.

Sincerely,

Cory Parker, PhD

¹ <https://docs.legis.wisconsin.gov/statutes/statutes/289/i/01/33>

² <https://apps.dnr.wi.gov/doclink/waext/WA2046.pdf>

Date: 2/18/2019

John Morrison

6128 S MAPLE ISLAND RD

FREMONT 49412

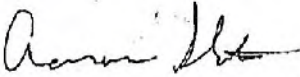
Subject: Organic Fertilizer Application Notification

Slater Custom Farming, LLC is preparing to apply organic fertilizer on land located in Holton Township (see attached plat map), owned by Slater Estates. This organic fertilizer will replace commercial fertilizer and/or manure and has the potential to improve soil fertility and several other soil properties important for plant growth.

The organic fertilizer is generated by the Fremont Regional Digester: Anaerobic Digestion (AD) is the naturally occurring process of decomposition in the absence of oxygen. This system is a holistic organic waste treatment solution which recycles "food waste" materials into renewable energy and crop fertilizers. The AD process results in a stabilized liquid fertilizer that contains nutrients required for crop growth as well as organic matter which conditions the soil. This liquid fertilizer contains Organic Nitrogen, Phosphorus, and Potassium. It is analyzed regularly for nutrient levels and to ensure that there are no contaminants in the material going into the AD system or onto crop fields. The liquid fertilizer also contains additional nutrients that crops need.

This notice is provided on behalf of Fremont Regional Digester, for more information about the benefits of AD or organic fertilizer please feel free to contact the digester management staff anytime.

Respectfully,



Slater Custom Farming LLC



Dan Meccariello, GM
Fremont Regional Digester

Road accident involving digestate hauling on busy M-120 near Holton, MI







GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
MATERIALS MANAGEMENT DIVISION



PHILLIP D. ROOS
DIRECTOR

December 16, 2024

Logan Randles
Generate Fremont Digester, LLC
1634 Locust Street
Fremont, Michigan 49412

Dear Logan Randles:

SUBJECT: Land Application of Digestate Containing PFAS; Generate Fremont; 1634 Locust Street; Fremont; Newaygo County; Waste Data System Number 493259

On November 22, 2024, staff from the Department of Environment, Great Lakes, and Energy (EGLE), collected samples of the digestate that Generate Fremont Digester, LLC (Generate) land applies via Agricultural Use Approval (AUA) 17-AUA-001 and submitted the samples for laboratory analysis of per – and polyfluoroalkyl substances (PFAS). The samples were collected from the digestate stored in Generate's two lagoons near Holton, Michigan. EGLE received laboratory analysis which indicated that the digestate contained PFAS compounds on December 9, 2024. The laboratory analysis is attached for reference.

EGLE appreciates the steps Generate took to voluntarily and immediately cease land application of the digestate while EGLE analyzed and considered the laboratory data. Eleven different PFAS compounds were detected in the samples, and two PFAS compounds, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), were present at levels that exceed maximum contaminant levels (MCLs) for drinking water under the Safe Drinking Water Act, MCL 325.1001 *et seq.*, and groundwater cleanup criteria under Part 201 of the Natural Resources and Environmental Protection Act (NREPA), MCL 324.20101 *et seq.*

EGLE understands the time constraints facing Generate as the seasonal window for land application of the digestate will close later this month. However, additional evaluation of the data and the characteristics of the digestate is required to fully understand the risk posed to soil and groundwater from its land application. Even with additional evaluation, it may not be possible to determine with any certainty, the nature and extent of the impacts to soil and groundwater. Given these unknowns, EGLE strongly recommends that Generate cease land application of the digestate. EGLE has determined that land application of this material may constitute a violation of the AUA as follows:

From a pamphlet provided to the people of Caernarvon Township, PA regarding a proposed digester on the Kurtz dairy farm – which incidentally, had only a few hundred acres of spreadable farmland yet the digester would have created enough digestate for thousands of acres. The farmer would have been left with the burden of finding willing farmers to take the rest.

Q: 2. Does Vanguard Test for PFAS?

A: Vanguard Renewables is committed to being good neighbors and works tirelessly to ensure the safety and wellbeing of our staff, our farm partners, and the communities where we operate. Vanguard Renewables voluntarily tests the soil before land application of the liquid digestate to get a baseline reading and then routinely tests the soil and the digestate before application. If there are any elevated levels of these chemicals the digestate will be remediated or not used.



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
LANSING

EGLE

LIESL EICHLER CLARK
DIRECTOR

June 12, 2019

CERTIFIED MAIL

Mr. Dan Meccariello, General Manager
Generate Fremont Digester, LLC
1634 Locust Street
Fremont, Michigan 49412

Dear Mr. Meccariello:

SUBJECT: Consent Order, Generate Fremont Digester, LLC (Generate Fremont);
WDS 493259

Enclosed please find a fully executed original of the Consent Order, MMD Order No. 115-03-2019 (Consent Order), between Generate Fremont and the Department of Environment, Great Lakes, and Energy (EGLE). The Consent Order became effective on June 10, 2019, the date it was signed by the Director of the Materials Management Division (MMD). Payment of the settlement amount identified in the Order was initiated by Generate Fremont on June 4, 2019.

Thank you for your cooperation in resolving this matter. If you have any questions regarding the Consent Order, please contact Mr. Tim Unseld at 616-356-0229; unseldt@michigan.gov; or Grand Rapids District Office, MMD, EGLE, 350 Ottawa Avenue NW, Unit 10, Grand Rapids, Michigan 49503-2341.

Sincerely,

Alexandra Clark, Manager
Enforcement Section
Materials Management Division
248-752-2740

Enclosure

cc: Ms. Laura LaMore, Michigan Department of Attorney General
Mr. Jack Schinderle, EGLE
Mr. Lonnie Lee, EGLE
Ms. Rhonda Oyer, EGLE
Mr. Fred L. Sellers, EGLE
cc/enc: Mr. Duane Roskoskey, EGLE
Mr. Tim Unseld, EGLE

Jason Snyder

From: KM <ftbrunswick@gmail.com>
Sent: Sunday, May 3, 2026 12:16 PM
To: Jason Snyder
Subject: Testimony for public record re: May 6, 2026 Digester Zoning
Attachments: To the Waupauca County Planning and Zoning Board Kathleen Morrison.docx

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Attached is my testimony which I would like to have read aloud at the May 6th zoning hearing and made part of the public record. Thank you,
Kathleen Morrison
6128 S Maple Island Rd
Fremont, MI 49412

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Town of Mukwa Planning Commission Meeting Minutes
April 8, 2026 6:00 p.m.

Planning Commission Meeting Chairman Lee Shaw called the meeting to order at 6:00 p.m.

Pledge of Allegiance was recited.

Roll Call of members: Lee Shaw (p), Craig George (p), Mike Jensen (p), Pete Popke (p)

Mike Moore (a), Bill Schmidt (a), Adam Dorn (p)

Also present: Mukwa Town Chair Cody Simonis, Mukwa Town Supervisor Matt Manske

Minutes of November 19, 2025 meeting were read, there being no changes, motion by

Craig George, second by Mike Jensen. Motion approved and carried 5-0

New Business:

Read and reviewed Waupaca County Planning and Zoning recommendations of proposed changes for 2026.

Town of Mukwa Planning Commission would like to see a change in Section 6.10.12 n

Start with: The Operator/Owner shall be-----

Then near the end: results of the testing; MUST be sent to operator / owner, Township, and Planning and Zoning, IMMEDIATELY.

If it is a poor test result, Planning and Zoning should IMMEDIATELY electronically and

by mail to residents within a 1/2 mile radius of farm at the owners expense.

Information was presented of the Round Table Discussion on Thursday April 9th at 6:00p.m.

at the Waupaca Co. Hwy. Dept facility at 2670 Co. Hwy A, Waupaca, Wi

Next meeting date: To be determined.

There being no further business, Motion to adjourn made by Craig George 2nd by Mike Jensen.

Motion carried. 6:55 p.m.

Minutes submitted by: Lee M. Shaw acting secretary





Jason Snyder

From: Cheryl Ruble <car.cpfresearch@gmail.com>
Sent: Wednesday, May 6, 2026 2:32 PM
To: Jason Snyder
Subject: Written Comment for Chapter 34: Manure Co-Digester Ordinance Hearing
Attachments: Written Comment (Ruble) for Chapter 24_Waupaca County Manure Co-Digester Ordinance Hearing.pdf

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To Whom It May Concern,

Please see the attached "Written Comment for Chapter 34: Manure Co-Digester Ordinance Hearing."

Thank you,

Cheryl Ruble, MD
Director of Research & Evidence Analysis
Cell: 734.478.1242



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PROTECTION
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With a monthly gift of just \$17, you'll be a vital lifeline of educational advocacy and efforts that benefit the environment, protect animals, and expose greenwashing and humane washing efforts. Please join us now; it'll take 17 seconds. I AM IN.



Written Comment for Chapter 34: Waupaca County Manure Co-Digester Ordinance Hearing

May 7, 2026

My name is Cheryl Ruble. I am a physician from Michigan who has spent several years challenging the industry narrative that portrays anaerobic digestion as a supposed environmental, waste-management, and energy solution—all rolled into a single “fix-all” technology. I am particularly concerned about partnerships between intensive livestock operations and waste conglomerates such as Vanguard Renewables, investor-owned utilities, national and multinational oil and gas companies, and other biogas interests seeking to produce so-called Renewable Natural Gas (RNG) for commercial sale and distribution. Importantly, I am not contesting farm-scale biogas production used on-site to heat and power farm operations and residences.

In addition to my position as Director of Research and Evidence Analysis with Consumer Protection Foundation, Inc., I serve as a volunteer member and leader with several organizations and collaborate with numerous Michigan-based and national groups opposing the widespread adoption of anaerobic digestion and the suite of financial incentives that drive biogas production. I am part of a community advocacy group that successfully challenged a proposed dairy manure co-digester project by Vanguard Renewables in Freedom Township, Michigan, a testament to the power of an engaged and informed community.

We closely follow the Wisconsin biogas scene. Wisconsin is our neighbor, and we share Lake Michigan. What happens in Wisconsin affects Michigan, and vice versa, ultimately affecting the broader Midwest. I write in solidarity with Wisconsinites and their allies who have worked tirelessly and intelligently to oppose what would, in reality, be an industrial-scale methane-production plant.

My written comment will dissect the deeply flawed proposed Waupaca County Zoning Ordinance. In addition to the numerous negative environmental and rural community impacts, I am, as a physician, deeply concerned about the myriad public health risks associated with industrial-scale rural co-digesters.

Biodegradable and organic don't mean what you think they mean

Let's unpack “biodegradable organic feedstock brought to the farm,” starting with “biodegradable.” The EPA defines “biodegradable” as “The ability of a substance to be broken down physically and/or chemically by microorganisms.”¹ According to the EPA, “Biodegradability does not guarantee low toxicity. Chemicals known to be rapidly biodegradable have also been identified as carcinogens, mutagens or reproductive toxicants.”² In other words, just because something is biodegradable does not mean it is safe for land application or use as a fertilizer for food and feed crops.

Let's move on to the word “organic,” which biogas proponents freely toss around. Co-digesters that process non-manure industrial carbon-based waste streams of biological origin, which the biogas industry refers to as “organics,” are very concerning from a public health standpoint.

“Organics,” in the context of digester feedstock and digestate, does not mean certified organic under any rigorous food or farm standard. An almost-pretty photo on Vanguard's website showing colorful, overripe,

early-stage-rotting fruits and vegetables is the kind of “food waste” they would have you believe is fed into the digester. But the typical commercial co-digester diet—composed of industrial pre-consumer food waste—amounts to far more than expired items on grocery store shelves. We’re talking about industrial pre-consumer food-processing waste streams such as milking parlor wash water, food-animal processing waste like DAF scum—the greasy byproduct of meat and dairy wastewater treatment—and slaughterhouse and rendering waste. Even plant-based industrial pre-consumer food waste, like brewery waste, isn’t benign.

Such industrial pre-consumer food waste streams used as co-digester feedstock—and consequently, the waste byproduct, co-digestate—can contain a host of harmful substances, including microplastics and nanoplastics from depackaged food waste, which pose an emerging threat to public health and aquatic, soil, and terrestrial ecosystems; plasticizers; PFAS and PFOS compounds; food stabilizers and other chemical additives; heavy metals; antibiotic residues and resistance genes; hormones and other endocrine disruptors; pharmaceuticals; and more.

These industrial pre-consumer food waste streams can contain high levels of cleaning agents and sanitizers. Proprietary digester additives are another concern. Additionally, many of these waste streams are high in biological oxygen demand (BOD) and salts. Runoff of high-BOD waste into surface waters can deplete dissolved oxygen, impair aquatic life, and contribute to fish kills, while elevated salt levels can increase salinity and disrupt freshwater and soil ecosystems.

Anaerobic digestion, as typically implemented at mesophilic temperatures, does not meet EPA Process to Reduce Pathogens (PRP) or Process to Significantly Reduce Pathogens (PSRP) standards required of Class B and Class A biosolids, respectively, for land application.³ While certain high-temperature (thermophilic) or additional treatment processes may be capable of meeting those standards under controlled conditions, such outcomes must be specifically validated and should not be assumed. Co-digestate derived from livestock manure and the gut contents and processing waste of slaughtered animals contains pathogens of concern to human health. The overuse and misuse of antibiotics in the industrial animal agriculture sector contributes substantially to the spread and emergence of superbugs, pathogens resistant to multiple antibiotics.⁴

According to U.S. Department of Agriculture National Organic Program regulations, animal and plant materials used as fertilizers or soil amendments must not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances.⁵

In 2016, Cenergy USA, a biogas company and manufacturer of Magic Dirt™, a horticultural digestate product, petitioned the National Organic Standards Board (NOSB) to amend federal regulations to allow digestate derived from manure and food waste, including industrial pre-consumer food-processing waste, to be used in organic production without restrictions.⁶

In 2017, the NOSB formally rejected the petition, citing potential risks to human health from pathogens and the unproven safety of digestate, including concerns about synthetic additives used in anaerobic digester systems, feedstock contaminants, and harm to soil health and biodiversity.^{7, 8} The concerns identified during the NOSB review remain directly relevant to the safety of digestate-derived soil amendments today.

Digestate is the Achilles' heel of anaerobic digestion

Aside from the serious contamination issue, anaerobic digestion does not significantly reduce the total volume of waste or its nutrient content. The nitrogen- and phosphorus-containing compounds in digestate are more water-soluble and therefore more mobile, elevating the risk of leaching into groundwater and runoff into surface waters.⁹ Co-digesters typically process approximately 20 to 25% manure and 75 to 80% outside industrial waste. That translates into a substantially greater nitrogen and phosphorus burden applied to area farm fields. Watersheds can only assimilate so many nutrients. Nutrients repeatedly applied in excess of plant needs become pollutants.

“Brought to the farm:” the on-farm advantage

If digestate derived from non-manure industrial carbon-based waste streams of biological origin is so great, why go to the trouble of trucking massive amounts of outside waste to rural areas?

Why not set up an industrial-scale methane production complex on or adjacent to a landfill site? While manure contains methanogens, specialized bacteria that break down carbon-based waste streams of biological origin, releasing methane, those organisms are ubiquitous in nature. Manure is not a mandatory feedstock component. Here's why the biogas industry is keen on farms. It's what I call the on-farm advantage. Commercial biogas producers gain significant advantages by partnering with Animal Feeding Operations (AFOs) or their larger subset, Concentrated Animal Feeding Operations (CAFOs), including:

1. operating under less stringent agricultural regulatory frameworks than comparable industrial waste-processing operations,
2. benefiting from subsidies and financial tools intended for farms,
3. securing access to farmland for digestate disposal,
4. offloading responsibility for digestate management onto livestock producers, and
5. saddling rural communities with the consequences of disposing of excess and contaminated waste on farmland, a form of cost externalization.

Additionally, methane derived from manure fetches higher carbon-market value even though, pound for pound, manure yields less methane than other carbon-based waste streams of biological origin. Why is manure, a lower-methane-potential feedstock, more valuable? Because methane emissions from intensive livestock operations are far less stringently regulated than those from other industrial sectors. Biogas producers maximize profit by co-digesting higher-value manure with higher-yielding industrial waste streams, leveraging favorable incentives tied to manure while boosting gas output with imported waste.

Commercial “on-farm” digester facilities function as methane-production plants that consist not only of the anaerobic digester itself (often multiple units depending on the size of the farm and amount of imported feedstock accepted) but also digestate storage lagoons and, in many cases, onsite refineries that “upgrade” biogas to RNG. Additionally, co-digester sites may include a depackaging system used to separate food waste from plastic packaging, which can introduce harmful microplastics into the digestate. The digester complex footprint often encompasses several acres. Such facilities can significantly alter rural landscapes and be highly visible from neighboring properties. While anaerobic digestion may partially mitigate manure odor, co-digestate odors can be particularly offensive; the adjectives putrid and rancid are commonly used to describe co-digester feedstock and co-digestate. I have smelled it up close and personal, and believe me, it's wretched.

The recycling and landfill diversion bait and switch

Recycling and landfill diversion are essential components of any sound waste management approach, but these concepts are being co-opted. Biogas interests, including waste management companies like Vanguard Renewables, are angling to move anaerobic digestion higher on the waste management hierarchy by reclassifying it as a form of “recycling,” claiming that applying digestate derived from imported industrial waste streams to farmland returns nutrients to the soil. However, they dismiss the increased nutrient loading and potential contaminants from that waste.

Diversion has a role, but source reduction is key. Turning waste streams into revenue streams encourages more waste and more upstream methane emissions. Why reduce when you can digest and turn a profit? **Applying contaminated co-digestate to farmland is relocation, not recycling; it's dumping, not diversion.**

If waste conglomerates are so concerned about sustainability, why not compost source-separated organics—a process that generates relatively little methane when properly managed? I'll tell you why. Methane pays; compost doesn't. And irresponsibly managed digestate pays even more.

United Kingdom and “End-of-Waste” status

Anaerobic digestion is primarily a methane capture process designed to produce fuel, and in commercial settings, to generate methane for sale and distribution. The large volumes of digestate left behind are problematic. The industry tries to turn a liability into a plus. What goes into a digester must come out of a digester. Anaerobic digestion proponents would have us believe in alchemy. Digesters don't magically transform contaminated carbon-based industrial waste streams into harmless, beneficial by-products, any more than lead can be turned into gold. This isn't about environmental protection or public health—it's about the bottom line.

Biogas proponents tout the widespread adoption of anaerobic digestion in other developed countries like the United Kingdom (UK). However, they fail to mention that digestate is strictly regulated in those countries. For example, in the UK, where regulators have long recognized the risks associated with land application, **digestate is considered waste until proven otherwise**. Under the UK's PAS 110:2014 and the Anaerobic Digestate Resource Framework (ADRF), attaining “End-of-Waste” status through extensive validation and testing is required before digestate can be land-applied.^{10, 11} By contrast, in the United States, the biogas industry is pushing to deregulate digestate disposal. **Out of regulatory sight, out of mind, but not out of your soil, water, and food.**

Monthly testing provision: no regulatory teeth

The proposed zoning ordinance acknowledges the contamination risk by including a provision for the monthly testing of co-digestate for PFOS, PFAS, heavy metals, and microplastics. This provision is inadequate and offers no meaningful assurance. It is incomplete in its coverage of potential contaminants and lacks specificity regarding which compounds are to be tested, the analytical methods to be used, whether testing must be performed by certified laboratories, and the contaminant thresholds that would trigger corrective action. As written, it is unenforceable and amounts to no more than a paper tiger. Compared with the United Kingdom's rigorous digestate testing requirements, this provision is, quite frankly, a joke.

The 51% subject-farm manure loophole

The proposed ordinance stipulates that “at least 51% of the manure used in the co-digester shall come from animals housed on the subject farm.” Importantly, this requirement applies only to the manure fraction, not to the total volume of feedstock processed by the co-digester. As a result, massive volumes of outside industrial waste can still be imported under an “agricultural” label, exploiting the on-farm advantage.

Conditional use permit: constrained local control

Under the proposed zoning ordinance, “a co-digester facility shall be permitted through the conditional use permit process.” In practice, if an application meets the ordinance’s stated criteria, local officials have little room to deny it. This process lends the appearance of oversight but, in actuality, severely constrains local control over the siting of industrial methane-production plants on agricultural land.

Rather than serving the farm, the farm serves the digester

The proposed zoning ordinance stipulates, “The co-digester shall be accessory to and located on the same parcel as the active farm operation.” Typical industrial-scale “on-farm” co-digesters that produce RNG for commercial sale and distribution process one part manure to four to five parts imported waste.

Under Wisconsin Statute § 91.01 and general zoning principles, an accessory use must be incidental to and subordinate to the principal use. A co-digester facility in which 75–80% of the feedstock consists of imported industrial waste functions primarily as a waste-processing operation rather than a farm-support structure. By processing substantially more off-site material than on-site manure, the operation shifts the property’s primary use away from agriculture. **The farm’s agricultural activity becomes subordinate to the co-digester.**

Such facilities require high-volume truck traffic, specialized staffing, “adequate parking,” and “sufficiently long stacking lanes,” along with significant infrastructure, including digester tanks, waste staging areas, depackaging systems, and gas upgrading equipment. These characteristics are consistent with an industrial-scale waste-processing and methane-production facility, not a subordinate agricultural accessory.

In effect, the relationship between the farm and the co-digester is inverted: rather than serving the farm, the farm serves the digester. The project’s economic drivers—tipping fees for imported waste and revenue from the sale of lucrative environmental attributes—further reinforce that the primary purpose is to support a commercial waste-to-energy enterprise rather than the agricultural operation itself.

The Fremont Regional Digester: A cautionary tale

Michigan’s Fremont Regional Digester debacle should serve as a cautionary tale. It highlights much of what can go wrong—and did. After the owner/operator, Generate Upcycle, began accepting larger volumes and new sources of digester feedstock, including industrial pre-consumer food-processing waste, neighbors reported unbearable odors and widespread pollution from the land application of digestate.

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) cited the facility for violations of its Organics Residuals Exemption/Agricultural Use Approval (AUA), issued under Part 115 of PA 451 of 1994 (Michigan’s Solid Waste Law). Regulatory oversight eventually transferred to

the agency's Hazardous Waste/Liquid Industrial Waste regulatory program under Part 31 of PA 451 of 1994 (Water Resources Protection). EGLE determined that the contaminated, highly liquid digestate posed serious risks to groundwater and surface waters and required the facility to obtain a groundwater discharge permit.

A weak draft permit drew fierce community opposition, and in March 2025, after a packed public hearing, Generate Upcycle withdrew its application. The digester subsequently shuttered.

The save the farm fallacy

On-farm anaerobic digesters are touted as an economic lifeline for farmers and rural communities. Don't buy it. While relatively few livestock operations benefit financially by entering into binding contractual arrangements with corporate entities like Vanguard Renewables, co-digesters are a losing proposition for rural communities as a whole.

Make no mistake: biogas production is about harvesting a crop of financial rewards under the guise of sustainability, not helping family farms survive and thrive independently. RNG costs far more to produce than fossil gas. Why then the push for digesters? As they say, follow the money. Biogas producers reap lucrative state and federal carbon credits along with federal tax credits. Vanguard wants to invest in a cash cow, not in your community.

The Town of Lind and many Waupaca County residents have made it clear. They don't want co-digester blight or co-digestate with its nutrient load and contaminants. I urge the Waupaca County Planning Committee to reject the proposed zoning ordinance, which favors special interests and corporations over communities.

Respectfully submitted,

Cheryl Ruble, MD
Montague, Michigan

Director of Research and Evidence Analysis
Consumer Protection Foundation, Inc.

¹

https://sor.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossariesandkeywordlists/search.do?details=&vocabName=Environmental%20Issues%20Glossary&filterTerm=biodegradable&checkedAcronym=false&checkedTerm=false&hasDefinitions=false&filterTerm=biodegradable&filterMatchCriteria=Contains

² <https://www.epa.gov/pesticide-labels/criteria-biodegradability-claims-products-registered-under-fifra>

³ <https://www.epa.gov/biosolids/basic-information-pathogen-equivalency-committee>

⁴ <https://pmc.ncbi.nlm.nih.gov/articles/PMC11540112/>

⁵ <https://www.ecfr.gov/current/title-7/subtitle-B/chapter-I/subchapter-M/part-205?toc=1>

⁶ <https://www.ams.usda.gov/sites/default/files/media/Cenergy%20NOSB%20Petition%204-5-16.pdf>

⁷ <https://www.ams.usda.gov/sites/default/files/media/CSAnaerobicDigestateFinalRec.pdf>

⁸ <https://www.ams.usda.gov/sites/default/files/media/AnaerobicDigestateTR5152017.pdf>

⁹ <https://www.nrcs.usda.gov/sites/default/files/2023-04/366-NHCP-CPS-Anaerobic-Digester-2023.pdf>

¹⁰ https://www.wrap.ngo/sites/default/files/2021-03/PAS110_2014.pdf

¹¹ <https://www.gov.uk/guidance/anaerobic-digestate-resource-framework>

May 5, 2026

Subject: Concerns Zoning Change Allowance for Anaerobic Co-Digesters in Waupaca County

Dear Citizens of Waupaca County

I am writing to provide a testimonial regarding zoning change to allow development and construction of anaerobic co-digesters to treat waste from industrial agribusiness and commingling organic waste from other industrial operations. As a holder of a master's degree in environmental engineering, I feel compelled to express my concerns, as it seems to suggest a willingness to overlook the potential negative impacts on our environment and community.

From my involvement in the permit review for the construction of the \$65M Brown County Anaerobic Digester in Holland Township, these co-digesters strikes me as fundamentally flawed. It appears to be a mechanism for industrialists to bury their own waste under the guise of "clean energy" while ignoring their responsibility to manage their own waste sustainably. The use of manure in this context does little to mitigate the underlying issues; instead, it serves to conceal the environmental ramifications of industrial practices from remote locations.

Farmers play a crucial role in maintaining healthy soil and clean water through responsible practices such as aerobic composting. Farmers recycle nutrients back into the soil rather than attempting to profit from waste disposal to the atmosphere, a concept that deviates from their core purpose of sustainable food production. As noted by Gabe Brown of Regenerative Agriculture, there seems to be a lack of evidence demonstrating that these digesters enhance water quality and prevent violations. The change of zoning that permits co-digesters without stipulating regulations perpetuates a narrative that prioritizes industrial profit over environmental stewardship, and I believe we must reconsider our approach to waste management. It is imperative that we uphold the integrity of our agricultural practices and resist efforts that threaten to undermine the health of our soil and water.

Thank you for considering my perspective on this important issue. I hope we can engage in a meaningful dialogue to challenge these practices and advocate for more sustainable solutions.

Sincerely,
Tom Cretney
BS/MS Engineering
tomcretney@ic

To Whom It May Concern on the Waupauca County Planning and Zoning, I would like my comment to be read into the official record.

Firstly, I'd like to say, JUST SAY NO. Biogas digesters are a green-washing scam that would not exist without massive subsidies. Like they did in my hometown, they ruined the quality of life for many residents with excessive and persistent odors that topped anything I had ever smelled in the decades that I have farmed our 161 year old family farm. We have no air conditioning and we could not close the windows fast enough when the wind switched directions and brought the odor a mile away to our farm. We sell our fruit and sweet corn roadside and it was just awful for our direct sales business. No one wants to stop to buy produce when it stinks to high heaven. We have a rental house next to our farmhouse, and the tenants were not happy with the assault on their senses from the outrageous stench. The majority of the time when we and other community members both out near the lagoons or digester, called and reported the stench to the digester staff, the odor was blamed on other sources like a nearby turkey farm or dairy. It was laughable because as farm folk, we clearly know the difference between one farm odor and the next. Yet management from the company, had the gall to come to our yard and tell us the odors were negligible. I believe he would have tried to convince us that the sky was green if it would turn a profit for their company. Good looking, friendly, but slick like a snake oil salesman, as seems often the case with what we have now learned, the biogas industry PR machine is rife with misinformation, outright lies and deception as they spew out the latest bull crap.

Mismanagement and lack of transparency seems to be common in the industry, as we watched digestate being spread in ways that lacked proper field investigation before spread and running dragline hoses across fields and through culverts with obvious leakage. Attached are photos of what happened when they spread on a field with historic, known tile problems. The go to number in such cases, is the Michigan EGLE PEAS hot-line, which any farmer worth their salt knows should be called to report and get professional assistance in mitigating the damage from any type of unintended chemical, fertilizer, or other types of spills, runoff, discharges. Instead Generate's third party hire to spread the digestate never called it in, and tried to take unsuccessful steps to keep it contained. Instead it was coming out of the drains ½ mile away and flowing on to neighboring properties, creating a lake of digestate in one man's yard and then running off into the drains and culvert and on into our White River and Muskegon River watersheds. The lack of care was astounding and the lack of taking full ownership of having mucked up, showed their true colors. (photos attached – please share with the audience if possible).

The US is just not ahead of the game with having any truly protective regulations to keep the biogas industry's potential to pollute at bay. The cart is before the horse on this one. The ones who will pay, will not be the biogas industry execs and their investors and stockholders, it will be the small rural communities that pay. It will be the misled landowners that pay who allow digestate that is not tested adequately that end up with heavy metals, Pfas and microplastics on their land. It will be nearby residents on shallower wells that eventually have those same toxins entering their drinking water supply. Rural communities are not industrial waste water treatment facilities and the biogas industry should not be making our farmland their landfill.

Please put an end to digesters before it is too late for your community.

John Morris
Fremont, N



Sloppy
farming
best, but

at



truly an

environmental disaster of frmin in truth. Additionally wehave documentation of dragline hoses being fred through Cedar Creek – emails that show that Generate management knew full well that the creek was being used and were unconcerned that a leak/spill could occur. The creek feeds many people in this area wit fish.

To Whom It May Concern on the Waupauca County Planning and Zoning, I would like my comment to be read into the official record for the

Part One – Fooling Farmers

I am a West Michigan farmer who lived 6 miles from a now temporarily closed “food waste” digester. I am about 1 mile from where the two ten million gallon lagoons held the digester waste water – also known as “digestate”. The digestate was used by area farmers and spread on thousands of acres of farmland. As issues of odors and concern over the content of the digestate grew, some of the digestate was hauled about 45 miles away to farmland. The digestate was promoted as quote, “organic” fertilizer. The company that operated the digester sent notification to farmers about the benefits of this so called “organic” fertilizer. My farm received one such letter. (Attached letter copy). The letter was 9 sentences long but they used the word “organic” 8 times in that short note. This raised red flags because as an organic gardener, I know the cost of certified organic fertilizer and unlike Generate’s digester wastewater, certified organic fertilizer is quite expensive. Like the bulk of US digesters, energy companies give the digestate away for free to unsuspecting farmers. The NPK values for the wastewater is disclosed, but not the levels of heavy metals, PFAS, or plastics that can harm crops, farmland, and the surrounding surface and well water. As a farmer, I was furious as I learned that this is pretty much standard in the biogas digester world – mislead and deceive farmers into taking it off their hands, regardless of the consequences to that farmland down the road. During the time when Generate was telling the community and the community council that I sat on for them, that the digestate had been tested in 2019 for PFAS and Generate management claimed none was detected. Fast forward to 2024, and records I obtained showed the tests in 2019 did indeed contain PFAS. I pushed the Michigan state environmental agency, EGLE, to retest the digestate in the lagoons and they found many more PFAS compounds by then and at levels high enough for EGLE to inform Generate that these levels could harm nearby waters. (This letter to Generate from EGLE is attached for reference). Often the digestate contained alarmingly high levels of Aluminum, Sodium, and certain heavy metals that the state began to have concern over. The permit for the facility went with the sale of the digester from its first owner, Novi Energy, to Generate, in 2017, the nature of the materials being fed the digester changed significantly and the state came to realize the special Agricultural Use Agreement Permit was not appropriate given the far more liquid nature of the wastewater, and the high levels of certain analytes that could threaten land, surface water and well water.

Part 2 – Oooh, That Smell. Can’t You Smell that Smell?

During the 6 years that the digester was in operation, our community suffered not only from the spread of digestate with its concerning levels of certain analytes which had the potential to harm land, surface and wells water, but also suffered greatly from the horrific odors that came from the digester itself (just next to a residential area and across from Fremont Lake which is a recreational hot spot) and terrible odors from the digestate storage lagoons and spread. I am a farmer and raised chickens and sheep. We have a dairy CAFO within ½ mile and a turkey CAFO housing tens of thousands of turkeys about 1 mile away. My rural community knows the smells associated with farm operations, both small and big. The smell of the digestate lagoons and spread was off the charts in terms of odor. It was like smelling the most putrid fecal material you can image, mixed with a strange chemical overtone. The smell was so potent that it woke my family at night. Manure spread from other farms never had this effect. I was a mile from the lagoons – those living on adjacent properties suffered greatly.

Holton Public Schools is about 2 miles from the lagoons and with no air conditioning had to suffer through extreme odors when it traveled on the breeze to the schools.

Part 3 – This Is Not a One Off

My story is long and it was a grueling 6 years of research, reporting to EGLE, reporting to Generate, fighting to get some measure of justice for my community. No one should have to do this in what should be my golden years. From odors to run-off, road accidents (photos) to EGLE finding their offenses to be so egregious that they needed to be placed under a Consent Order to continue operating, (photo), the headaches to local communities is just not worth the trade off. My local concern turned out not to be a one off. As I delved into this huge problem, it connected me to other communities around the US, Canada, and the UK and Ireland with similar stories. In fact, one man whose heating and cooling business sits next to a mammoth digester in Rhode Island, stopped me when I shared my story and told me that everything I was sharing was exactly the same horror story his community was experiencing. The energy company there was not Generate. Folks in Pennsylvania that I connected with were provided a PR pamphlet on a proposed Vanguard Renewable digester there. It stated Vanguard tested for PFAS, yet when community members asked for testing data, none was ever provided. (photo)

At \$500 or more a test, few if any companies will spend that weekly, much less daily, to test the digestate as it leave the facility. Garbage in- garbage out. And the “food waste” misnomer is a huge problem. The biogas industry shows photos of veggie and fruit scraps and talks of the reuse of expired grocery store items and brewery waste, when in reality much more goes into these food waste or codigesters – biofuel production waste, cellulose insulation manufacturing waste, slaughterhouse waste, pharmaceutical production byproducts, and a plethora of other non food waste streams. The concept of biogas digesters looks like a dream on paper. In reality, it is a Trojan Horse with a lack of adequate oversight and suffers from what seems to be a culture of corporate greed that disregards local community concerns, quality of life, and concern for land and water.

For the sake of your community, place a moratorium on biogas digesters until it is certain that the guardrails are in place that will protect area land, surface and well water. Better yet, protect your community residents and the precious farmland and water ways and wells and disallow them altogether in your county.

Kathleen Morrison
Fremont, Michigan
ftbrunswick@gmail.com

From a pamphlet provided to the people of Caernarvon Township, PA regarding a proposed digester on the Kurtz dairy farm – which incidentally, had only a few hundred acres of spreadable farmland yet the digester would have created enough digestate for thousands of acres. The farmer would have been left with the burden of finding willing farmers to take the rest.

Q: 2. Does Vanguard Test for PFAS?

A: Vanguard Renewables is committed to being good neighbors and works tirelessly to ensure the safety and wellbeing of our staff, our farm partners, and the communities where we operate. Vanguard Renewables voluntarily tests the soil before land application of the liquid digestate to get a baseline reading and then routinely tests the soil and the digestate before application. If there are any elevated levels of these chemicals the digestate will be remediated or not used.



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
MATERIALS MANAGEMENT DIVISION



PHILLIP D. ROOS
DIRECTOR

December 16, 2024

Logan Randles
Generate Fremont Digester, LLC
1634 Locust Street
Fremont, Michigan 49412

Dear Logan Randles:

SUBJECT: Land Application of Digestate Containing PFAS; Generate Fremont; 1634
Locust Street; Fremont; Newaygo County; Waste Data System Number
493259

On November 22, 2024, staff from the Department of Environment, Great Lakes, and Energy (EGLE), collected samples of the digestate that Generate Fremont Digester, LLC (Generate) land applies via Agricultural Use Approval (AUA) 17-AUA-001 and submitted the samples for laboratory analysis of per – and polyfluoroalkyl substances (PFAS). The samples were collected from the digestate stored in Generate's two lagoons near Holton, Michigan. EGLE received laboratory analysis which indicated that the digestate contained PFAS compounds on December 9, 2024. The laboratory analysis is attached for reference.

EGLE appreciates the steps Generate took to voluntarily and immediately cease land application of the digestate while EGLE analyzed and considered the laboratory data. Eleven different PFAS compounds were detected in the samples, and two PFAS compounds, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), were present at levels that exceed maximum contaminant levels (MCLs) for drinking water under the Safe Drinking Water Act, MCL 325.1001 *et seq.*, and groundwater cleanup criteria under Part 201 of the Natural Resources and Environmental Protection Act (NREPA), MCL 324.20101 *et seq.*

EGLE understands the time constraints facing Generate as the seasonal window for land application of the digestate will close later this month. However, additional evaluation of the data and the characteristics of the digestate is required to fully understand the risk posed to soil and groundwater from its land application. Even with additional evaluation, it may not be possible to determine with any certainty, the nature and extent of the impacts to soil and groundwater. Given these unknowns, EGLE strongly recommends that Generate cease land application of the digestate. EGLE has determined that land application of this material may constitute a violation of the AUA as follows:



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

LANSING



LIESL EICHLER CLARK
DIRECTOR

June 12, 2019

CERTIFIED MAIL

Mr. Dan Meccariello, General Manager
Generate Fremont Digester, LLC
1634 Locust Street
Fremont, Michigan 49412

Dear Mr. Meccariello:

SUBJECT: Consent Order, Generate Fremont Digester, LLC (Generate Fremont):
WDS 493259

Enclosed please find a fully executed original of the Consent Order, MMD Order No. 115-03-2019 (Consent Order), between Generate Fremont and the Department of Environment, Great Lakes, and Energy (EGLE). The Consent Order became effective on June 10, 2019, the date it was signed by the Director of the Materials Management Division (MMD). Payment of the settlement amount identified in the Order was initiated by Generate Fremont on June 4, 2019.

Thank you for your cooperation in resolving this matter. If you have any questions regarding the Consent Order, please contact Mr. Tim Unseld at 616-356-0229; unseldt@michigan.gov; or Grand Rapids District Office, MMD, EGLE, 350 Ottawa Avenue NW, Unit 10, Grand Rapids, Michigan 49503-2341.

Sincerely,

Alexandra Clark, Manager
Enforcement Section
Materials Management Division
248-752-2740

Enclosure

cc: Ms. Laura LaMore, Michigan Department of Attorney General
Mr. Jack Schinderle, EGLE
Mr. Lonnie Lee, EGLE
Ms. Rhonda Oyer, EGLE
Mr. Fred L. Sellers, EGLE
cc/enc: Mr. Duane Roskoskey, EGLE
Mr. Tim Unseld, EGLE



Date: 2/18/2019

John Morrison

6128 S MAPLE ISLAND RD

FREMONT 49412

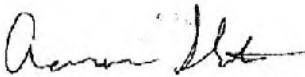
Subject: Organic Fertilizer Application Notification

Slater Custom Farming, LLC is preparing to apply organic fertilizer on land located in Holton Township (see attached plat map), owned by Slater Estates. This organic fertilizer will replace commercial fertilizer and/or manure and has the potential to improve soil fertility and several other soil properties important for plant growth.

The organic fertilizer is generated by the Fremont Regional Digester. Anaerobic Digestion (AD) is the naturally occurring process of decomposition in the absence of oxygen. This system is a holistic organic waste treatment solution which recycles "food waste" materials into renewable energy and crop fertilizers. The AD process results in a stabilized liquid fertilizer that contains nutrients required for crop growth as well as organic matter which conditions the soil. This liquid fertilizer contains Organic Nitrogen, Phosphorus, and Potassium. It is analyzed regularly for nutrient levels and to ensure that there are no contaminants in the material going into the AD system or onto crop fields. The liquid fertilizer also contains additional nutrients that crops need.

This notice is provided on behalf of Fremont Regional Digester, for more information about the benefits of AD or organic fertilizer please feel free to contact the digester management staff anytime.

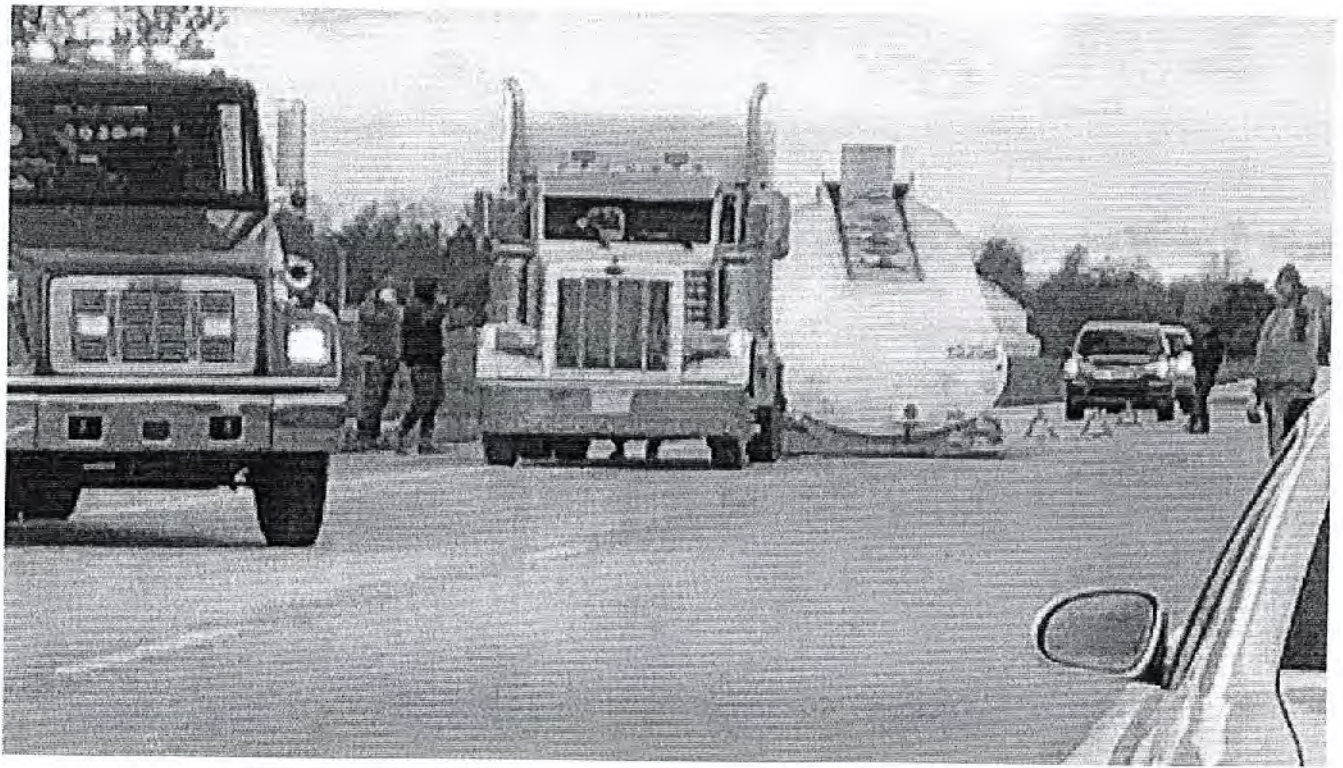
Respectfully,



Slater Custom Farming LLC



Dan Meccariello, GM
Fremont Regional Digester



May 4, 2026



Waupaca County Supervisors
Waupaca County Government Center
811 Harding St.
Waupaca, WI 54981

RE: Planning & Zoning May 7th Committee Meeting – Waupaca County Code of Ordinances, Chapter 34

Dear County Board Supervisors,

Greetings from Western Wisconsin where a coalition of groups have been working to revive rural America.

Along the St. Croix and Mississippi Rivers, we've been engaging citizens on a local level by building community and networks to create markets for non-industrial producers. While doing this, we have also challenged large energy and agribusiness titans and continue to build the communities local citizens want rather than what out-of-state investors desire. This is the positive vision of building regional food networks like the St. Croix Valley Food Alliance, keeping dollars in our communities and protecting our way of life and property values.

We, too, faced the proposals of big energy & agribusiness (expansion of CAFO herds, biogas co-digesters, data centers, etc.) We have lived experience and have partnered together to make sure our voices are heard at every level of government. We wish to share what we've learned, especially about the biogas co-digesters.

First, local officials in St. Croix County have turned away three different regional biogas co-digester proposals since 2019. Local officials expressed concern over being a "dumping ground" for waste since much of the waste was being trucked in from outside the county yet all digestate spreading would occur in St. Croix County rather than being trucked back to the place of origin. A County study by real estate professionals showed "concern for prospective home buyers that would both negatively affect a home seller's marketability and a buyer's perceived value of a home ultimately resulting in a lower sale price." Concerns for public health & safety and nuisance of noise, dust, smoke, odor and other factors were documented in their September 2019 decision to deny the co-digester permit.

Second, while compost in Wisconsin is regulated, bio-gas digestate is not regulated. Besides nutrients being made more mobile and can more easily threaten ground and surface waters, there is also potential for contaminants such as "forever chemicals," heavy

metals, pesticides, antibiotic resistant pathogens and microplastics to be applied on land and filter into ground and surface waters as well as infiltrate our food supply. Do you have a recourse for those landowners who allow spreading or businesses who could be potentially affected by these contaminants? E.coli outbreaks in our area have caused illness, even for children. Regular operational oversight is critical for co-digesters, and should be similar to wastewater treatment plants and landfills. This oversight is not provided by DNR nor DATCP, even when these facilities reside on agricultural land.

Third, we wanted to make you aware of the financial challenges and viability of bio-gas co-digesters. USDA has extended their “pause” on any funding of biogas digesters through all Rural Business & Cooperative Service programs including controlled environment agriculture (biogas digesters) until Dec. 31, 2026. *They stated, “A recent snapshot of the portfolio shows Controlled Environmental Agriculture projects have a 40 percent delinquency rate and biodigesters have a 28 percent delinquency rate. This is on top of realized losses. Continuing to guarantee high risk projects—particularly those underwritten by lenders’ lacking expertise— threatens the long-term stability of the program and its capacity to fulfill its mission.”* Public records show there is currently over \$230 million in biogas delinquencies, defaults and bankruptcies in Wisconsin alone!

There are obviously concerns over local control for your townships. What about your farmers who choose more regenerative or low-cost methods of producing milk or protein such as pasture-based systems? Is there similar support for them? Concentration of support for only the most expensive operations historically hasn’t shown growth for rural economies in general. Concentrated operations also lead to concentrated risks. Are you prepared for those risks? Does your fire department have capacity to deal with a facility of this nature?

We would urge a much longer conversation over all the risks that a biogas facility would present to your communities and put safeguards in place for public health and safety. Making concrete efforts to bolster your non-industrial producers by creating space for them will enhance your local rural economy, protect public health and safety, along with property values.

Respectfully,

Kim Dupre, Sustain Rural Wisconsin Network (SRWN)

Danny Akenson, Grassroots Organizing Western Wisconsin (GROWW)

Sue Curtis, St. Croix Citizens Uniting for Responsible Environmental Stewardship (CURES)

Enc.

May 4, 2026

Waupaca County Supervisors
Waupaca County Government Center
811 Harding St.
Waupaca, WI 54981

Dear County Board Supervisors,

My name is Dr. Sarah D'Onofrio. I am a rural sociologist and political economist that studies the impacts of biogas and renewable natural gas operations, including manure and food waste co-digesters, on agricultural land and rural communities. In every community I have been invited to work with, one of the biggest themes is dishonesty on the part of the company seeking to implement the project. In economic terms, these companies hold all of the cards. The company gets comparatively cheap land with weak regulatory oversight, a place to store the millions of tons of waste the digester produces, and a farmer to manage all of it, while they sit back and sell the gas.

As leaders in your community, I deeply understand your desire for economic development. But in this case, you all need to ask this: what kind of business does Waupaca County want to be associated with? Co-digesters act as industry hubs not for the agricultural industry, but for the waste and recycling industry and the renewable fuel industry. According to their own project applications in other states and Wisconsin, the leading co-digester company in the US, Vanguard Renewables, calls their co-digesters "advanced organics recycling facilities." Ironically, the basic definition of heavy industry in Waupaca County includes recycling industries.

Companies like Vanguard Renewables are using these legal grey areas to avoid paying the costs to comply with regulations and shift their costs onto local governments like Waupaca County. Co-digesters also depend on infrastructure paid for by local, state, and federal governments and pass the cost of doing business onto the people living in these spaces and pocketing the money for themselves. For example, these facilities need to bring in tons of food waste every day using heavy tanker trucks, thus relying on roads in addition to routine traffic without taking on the burden of paying for them. Excess waste could necessitate the use of local wastewater treatment plants. Co-digesters need access to water services to operate as well. However, tanker trucks are not suited for rural roads and cause significant amounts of damage every year. The contaminants in the waste from the co-digester are too complex to be directed towards aging wastewater treatment plants which were not designed to handle fats, greases, and other substances from industrial food production, a common input in co-digesters. According to the local wastewater treatment plant (WWTP) manager in Chatsworth, Georgia, even though their WWTP was upgraded in 2022, they would still need to add \$20-25 million in upgrades to

process the waste safely.¹ How much money is the county prepared to spend on the idea of development when these projects only create a handful of jobs? What else could the money used to fix the damage inherent to co-digester projects be used for in ways that would make people want to not only stay, but move to Waupaca County?

In comparative historical sociology, there is a term called a critical juncture. These junctures are turning points where one important decision can impact the entire trajectory of the future. Once a decision is made and that path is taken, there is no turning back. Co-digesters that accept food waste are at risk for PFAS contamination and according to the EPA there is no safe level of PFAS for human health. Still, the main form of disposal for these projects is land application despite the lack of regulation that currently exists around PFAS. PFAS is extremely water soluble, seeking out water in the soil. Lind already has high levels of nitrates in their water from agricultural runoff. Increasing the amount of waste farms have to manage is going backwards, not forward, in terms of finding a solution for farmers to manage runoff and protect local water sources. Additionally, PFAS testing as well as PFAS removal are still under development within the scientific community as new types of PFAS are introduced into the environment every year. Once you allow this type of industry onto farmland, there is no going back.

Please consider the long-term impacts of allowing industrial development on agricultural land for current and future generations before capitulating to an industry that is developing quicker than its impacts can be studied.

Best,
Dr. Sarah D'Onofrio

¹ https://drive.google.com/file/d/1GYIzfse1Xsd2ItI7BFFBADyI9ukajVa_/view

Town of Mukwa Planning Commission Meeting Minutes
April 8, 2026 6:00 p.m.

Planning Commission Meeting Chairman Lee Shaw called the meeting to order at 6:00 p.m.

Pledge of Allegiance was recited.

Roll Call of members: Lee Shaw (p), Craig George (p), Mike Jensen (p), Pete Popke (p)

Mike Moore (a), Bill Schmidt (a), Adam Dorn (p)

Also present: Mukwa Town Chair Cody Simonis, Mukwa Town Supervisor Matt Manske

Minutes of November 19, 2025 meeting were read, there being no changes, motion by

Craig George, second by Mike Jensen. Motion approved and carried 5-0

New Business:

Read and reviewed Waupaca County Planning and Zoning recommendations of proposed changes for 2026.

Town of Mukwa Planning Commission would like to see a change in Section 6.10.12 n

Start with: The Operator/Owner shall be-----

Then near the end: results of the testing; MUST be sent to operator / owner, Township, and Planning and Zoning, IMMEDIATELY.

If it is a poor test result, Planning and Zoning should IMMEDIATELY electronically and

by mail to residents within a ? mile radius of farm at the owners expense.

Information was presented of the Round Table Discussion on Thursday April 9th at 6:00p.m.

at the Waupaca Co. Hwy. Dept facility at 2670 Co. Hwy A, Waupaca, Wi

Next meeting date: To be determined.

There being no further business, Motion to adjourn made by Craig George 2nd by Mike Jensen.

Motion carried. 6:55 p.m.

Minutes submitted by: Lee M. Shaw acting secretary

Jason Snyder

From: Cory Parker <cparker09@gmail.com>
Sent: Wednesday, May 6, 2026 9:30 PM
To: Jason Snyder
Subject: 5/7 Planning and Zoning Meeting
Attachments: Parker Waupaca Letter.pdf

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Hello Jason,

I have attached a letter that I would like to be read aloud during the 5/7 Planning and Zoning Meeting. It should be made part of the official record of the meeting.

Thank you,

Cory Parker, PhD

May 6, 2026

Waupaca County Supervisors
Waupaca County Government Center
811 Harding St.
Waupaca, WI 54981

Dear County Board Supervisors,

In the State of Wisconsin, the Department of Natural Resources defines solid waste as, “any material no longer used for its originally intended purpose, that will be discarded, treated to reclaim its original properties or processed to be used for an alternative purpose.”¹ Co-digesters take manure and food waste and use them to create biofuel and soil amendments which are processed products used for an alternative purpose. In fact, one of the main inputs for co-digesters is source separated compostable material (SSCM), “a regulatory term used in solid waste code regulations that refers to all the wastes that can be composted under a solid waste compost facility license. It includes food waste, plant waste (including crops and aquatic plants), fruit and vegetable food processing waste, fish processing waste, yard waste, manure and animal bedding from herbivorous (non-meat-eating) animals that are not deer or elk, clean chipped wood and sawdust, non-recyclable compostable paper and certified compostable plastics.”² The highlighted inputs are also used in anaerobic co-digesters.

Anaerobic digesters fall within a gap in WI regulations because compost is aerobic (requires oxygen) and digester facilities are anaerobic (requires no oxygen). Composting facilities also operate at higher temperatures and require testing and monitoring. However, the spirit of the regulation clearly places anaerobic digesters into the solid waste category because of the inputs they use in daily operations. Regardless of whether oxygen is present, they still produce a solid waste. This change to the zoning ordinance deepens that gap by eliminating the need for any determination of risk to public health, safety, or the surrounding environment. Making co-digesters a conditional use on agricultural land is simply exploiting a problematic loop-hole in Wisconsin law that deregulates solid waste facilities and creates unnecessary risks for the environment, public health, and safety and should not be enacted.

Sincerely,

Cory Parker, PhD

¹ <https://docs.legis.wisconsin.gov/statutes/statutes/289/i/01/33>

² <https://apps.dnr.wi.gov/doclink/waext/WA2046.pdf>

Rebecca Landre

From: Nicolaus, Kelly - DOT <Kelly.Nicolaus@dot.wi.gov>
Sent: Wednesday, May 6, 2026 2:18 PM
To: Rebecca Landre
Cc: Meurett, David - DOT; Nicolaus, Kelly - DOT
Subject: RE: Notice of Public Hearing-May 7, 2026

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Hi Becky,

We have no concerns with this.

Thanks.

*Kelly Nicolaus
Access Management Coordinator
North Central Region - Wisconsin Rapids
Wisconsin Department of Transportation
1681 Second Avenue South
Wisconsin Rapids, WI 54495*

*715-421-8051 Office
kelly.nicolaus@dot.wi.gov*

My hours are Monday - Thursday 6:15 am to 3:15 pm, Friday 6:15 am - 9:45 am

From: Rebecca Landre <Rebecca.Landre@co.waupaca.wi.us>
Sent: Thursday, April 16, 2026 2:31 PM
To: Nicolaus, Kelly - DOT <Kelly.Nicolaus@dot.wi.gov>
Cc: Meurett, David - DOT <David.Meurett@dot.wi.gov>
Subject: Notice of Public Hearing-May 7, 2026

CAUTION: This email originated from outside the organization.
Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon,

Attached please find a Notice of Public Hearing for the upcoming Planning and Zoning Committee meeting. Please let me know if you have any questions. Thank you!

Becky Landre

Waupaca County
Planning & Zoning
811 Harding Street
Waupaca, WI 54981
715-258-6255
715-258-6347 direct

This message and any included attachments are from Waupaca County and are intended for use of the addressee(s) only and may contain privileged, confidential, or proprietary information that is exempt from disclosure under law. Unauthorized forwarding, printing, copying, distribution or use of such information is strictly prohibited and may be unlawful. If you have received this email in error, or have reason to believe you are not authorized to receive it, please promptly delete this message and notify the sender by email.

Rebecca Landre

From: Nicolaus, Kelly - DOT <Kelly.Nicolaus@dot.wi.gov>
Sent: Monday, April 27, 2026 3:09 PM
To: Rebecca Landre
Cc: Meurett, David - DOT; Nicolaus, Kelly - DOT
Subject: RE: Notice of Public Hearing-May 7, 2026

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Hi Becky,

We have no concerns.

Thanks!

*Kelly Nicolaus
Access Management Coordinator
North Central Region - Wisconsin Rapids
Wisconsin Department of Transportation
1681 Second Avenue South
Wisconsin Rapids, WI 54495*

*715-421-8051 Office
kelly.nicolaus@dot.wi.gov*

My hours are Monday - Thursday 6:15 am to 3:15 pm, Friday 6:15 am - 9:45 am

From: Rebecca Landre <Rebecca.Landre@co.waupaca.wi.us>
Sent: Wednesday, April 22, 2026 1:38 PM
To: Nicolaus, Kelly - DOT <Kelly.Nicolaus@dot.wi.gov>
Cc: Meurett, David - DOT <David.Meurett@dot.wi.gov>
Subject: Notice of Public Hearing-May 7, 2026

CAUTION: This email originated from outside the organization.
Do not click links or open attachments unless you recognize the sender and know the content is safe.

Jason Snyder

From: Kathy Nickel <kathy.nickel.lindchair@gmail.com>
Sent: Wednesday, April 29, 2026 8:18 PM
To: Jason Snyder; Ryan Brown
Subject: Town of Lind feedback to Proposed Ordinance Amendments 2026
Attachments: Town of Lind feedback on 2026 proposed amendments.pdf

CAUTION: This email originated from outside of the organization.

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Jason and Ryan,

Attached is the feedback from Town of Lind on the 2026 proposed ordinance amendments. We would like this read into the minutes of the Committee meeting and/or Public Hearing on these amendments, as is appropriate.

Thank you,

Kathy Nickel
Town of Lind Chairman

Town of Lind's response to 2026 Proposed Amendments to Waupaca County Shoreland and Zoning Ordinances.

To Waupaca County Planning and Zoning Dept. and Committee:

The Town of Lind Board and Planning Committee respectfully submits the following response to the proposed 2026 amendments to the Shoreland Ordinance and the Zoning Ordinance:

Shoreland Ordinance: We agree with the proposed amendments to the Shoreland Ordinance with no recommendations for adjustments.

Zoning Ordinance: We have several concerns with the proposed amendments to the Zoning Ordinance. (Please note that we hosted a roundtable discussion with all municipalities of Waupaca County invited on April 9th and 8 municipalities were represented. We were all in agreement with these concerns with the proposed amendments.)

Going through the proposed amendments as presented by the Planning and Zoning summary document, these are the items we have concerns about and we do **not** want the proposed amendments approved as presented based on the following:

- Wording is not consistent or formatted the same under each section—solar, battery storage, digesters, data centers.
- Need more specific wording on who monitors solar, battery storage, digesters, etc. Needs to be trained personnel to do any required testing and have authority to enforce any reporting to other entities and fines, clean-up, etc. Who is qualified to “police” these entities? We know it is already difficult for P & Z to do follow-ups and monitoring of properties and CUPS with current staff levels, and to enforce the rules. Who will “police” these facilities and their actions? And monitoring needs to be proactive; not reactive. Monitoring or testing of these facilities also needs to be on a random schedule, and unannounced. No forewarning to the operators/staff of the facilities as to date/time that testing will be done.
- When a bond is placed as part of a CUP for the purpose of decommissioning, what happens to the bond if a CUP is pulled? Who puts up the bond and how is it kept. Municipalities need to have input on the amount of the bond.

- A timeline needs to be set for decommissioning of these facilities. Define “decommissioning” and “functionally obsolete” and a timeline for “not in use”. Owner could say it just needs repair, but how long do we let the facilities sit idle before labeling them non-functioning or obsolete?
- Municipalities need to be informed of any inquiries *prior* to applications being submitted/signed.

Solar:

- Amending Table 5 and 5.1:
Small solar would be a Conditional Use Permit in PURF, PVRF, AE, AR, AWT, RC-N, RC-G, RI-G, and RI-I. (Currently they would be permitted with no CUP).
Large solar would be permitted in *all* zoning districts with no CUP. (Currently need a CUP for some districts and are not allowed in RR, SR, PD, H.)
- Why does small solar need a CUP but large solar does not?
- Any farmland can be taken and used for solar farms? Need to protect the land.
- Need specifics on surface area and acreage used versus just the wattage
- Should solar farms be regulated by Public Service Commission?

Manure Co-Digesters:

- How can Waupaca County not list these co-digesters as Industrial zoning when even the DNR and EPA defines the food waste products being brought into the digesters as “industrial waste”? If it is industrial waste going in, any end product of the process is still considered industrial waste, per DNR and EPA definitions.
- These are processing facilities that function as a waste treatment facility
- A previous application for a co-digester listed the digester as a “waste treatment facility” and it required a zoning change to industrial and comprehensive plan amendment; how can you suddenly say it is different and no longer needs these applications for change?
- Zoning exists to balance property rights with community impacts. Removing discretionary by allowing the co-digesters in new zoning districts strips local governments of all oversight. Not good politics or public relations.
- Need a better definition of co-digester; more clarification. There is also no limit on size of digester (this needs to be amended for manure digester section also)
- The farm actually becomes the accessory to the digester. Not the digester being a farm accessory; could possibly be considered an accessory to the farm if the farm owner and immediate family staff, operate, and maintain the facility with no

outside sources. But when a company is leasing the land from the farm owner, staffing the facility, and in charge of all operations it is **not** a farm accessory!

- Again, no time frame specified for when it's considered non-functioning, or decommissioning needs to begin. Is it broke down and waiting for repairs or is it non-functioning or abandoned?
- Want outside, qualified staff for RANDOM & UNANNOUNCED testing of all intakes, outputs and stages of the processing for contamination. Operations cease immediately if levels are out of normal, acceptable range.
- Wording in letter "h" needs clarification regarding the manure used in the digester. If the mix going into the digester is 90% food waste and 10% manure, is it only 51% of that 10% that needs to come from the host farm?
- Wording in letter "l"—what is needed for the selling of the methane gas and putting it into the pipeline; is that federal regulations?
- Letter "n" – result of testing will also be sent to municipalities within 5 business days and we want testing done more frequently than every month. And we want parameters on standard of action for a test that is out of the normal range.
- What happens to the digestate that is in excess of what can be used on the farm? If they sell this off to other farms, this becomes a retail fertilizer business; -again, not a farm accessory unit!
- Need to limit range of areas that industrial waste can be brought in from—and how is that monitored? An example: It was once stated that all feedstock needed to come from within 100 miles of the digester. Green Bay is within that range and how could it possibly be monitored that a ship from overseas does not drop a load of infected cattle at the stockyard there and then those infected cattle carcasses and waste are sent to the local digester?
- How do we minimize the effect on neighbors: property values, landscape and views, traffic congestion, noise, smells, etc....
- We feel so many aspects of the digesters are not able to be monitored appropriately and guidelines cannot be enforced.

We agree that we need to address these solar farms, data centers, digesters, and battery storage facilities as these are up and coming in our State and County. The County municipalities would love the opportunity to work together with the Planning and Zoning Dept to revise these amendments to make them doable for all parties. We have to protect our farmland and natural resources, but we need to consider all aspects and how this affects all citizens.

We would also like to have the opportunity to network on a quarterly basis and we can keep each other abreast of what is happening in our municipalities; perhaps by using a timeslot during the quarterly WTA meetings?

During our roundtable discussion that Lind hosted on April 9, 2026, these were the top 3 things we all agreed were priority:

1. No amendment to tables 5 and 5.1 to add manure co-digester facility as a Conditional Use Permit to AR and AE. And no changing their classification from heavy industrial to ag accessory.
2. We would like the Waupaca County Board of Supervisors to develop an ordinance, like that of Port Washington, WI, giving the public a voice and a vote for development that includes any type of tax incentive; maybe set a value that if project is a cost of \$10 million or higher. We would also like to explore a Sunset Ordinance/law that states any CUP and zoning change reverts back to the original zoning classification when a CUP is pulled, expires, or property is sold.
3. We need a lot more financial protection and guarantee for the municipalities for the decommissioning, cleanup, restoration of the sites of failed or non-active solar, battery storage, data centers, digesters, etc. And we have no resources or plans of who and how these facilities will be monitored and regulated.

Respectfully,
Kathy Nickel, Lind Chair

**WHAT THEY DIDN'T KNOW WE WISH THEY HAD KNOWN PRIOR TO
GIVING ADVISORY APPROVAL ON SEPTEMBER 5TH**

**What was disclosed to the Town Planning Commission prior to the
September 5th, 2023 Meeting:**

- Copy of the Comprehensive Plan Amendment Application
- Copy of the Zoning Map Amendment Application
- Copy of Conditional Use Permit Application for Solid/Hazardous Waste Facility/Anaerobic Digester
- Copy of Conditional Use Permit Application for Manure Lagoon

**What was not disclosed to the Town Planning Commission prior to the
September 5, 2023 Meeting but information that was received when
concerned citizens did open records request to the WI DNR.**

WASTE WATER DISCHARGE:

2022.08.16 Joseph Carlson, Braun intertec, sends email to Heidi schmitt Marquez WI DNR stating that **"the facility (biodigester) will not have any regulated wastewater discharges.**

2022.11.08 Heidi Schmitt Marquez, WI DNR, in email to Joseph Carlson, Braun Intertec states that the **Brooks CAFO permit will be modified to add an industrial wastewater outfall/discharge**

Industrial Food Waste:

2022.10.06 Heidi Schmitt Marquez, WI DNR, in an email to Joseph Carlson, Braun Intertec, requests clarification re: the source of food waste that will be used in the biodigester.

2022.11.08 Joseph Carlson, Braun Intertec, in an email to Heidi Schmitt Marquez, WI DNR, clarifies the sources of food waste that will be used in the biodigester: **"the majority of these food wastes will be sources from industrial food processing and food manufacturing facilities."**

Waste Water Discharge:

2022.08.16 Joseph Carlson (Braun Intertec), send email to Heidi Schmitt Marquez (WI DNR) stating **"the facility (biodigester) will not have any regulated wastewater discharges."**

2022.11.08 Heidi Schmitt Marques (WI DNR), in email to Joseph Carlson (Braun Intertec) states that the **"Brooks CAFO permit will be modified to add an industrial wastewater outfall/discharge."**

Industrial Food Waste:

2022.10.06 Heidi Schmitt Marquez (WI DNR), in an email to Joseph Carlson (Braun Intertec), requests clarification re: the source of food waste that will be used in the digester

2022.11.08 Joseph Carlson (Braun Intertec), in an email to Heidi Schmitt Marquez (WI DNR), clarifies the sources of food waste that will be used in the biodigester, **"the majority of these food wastes will be sources from industrial food processing and food manufacturing facilities."**

New Point Source Pollution Discharge:

2022.12.13 Joe Baeten (WI DNR), in an email to Any Skwor (MSA) copying in Jenise Anderson (MSA), Libby McDonald, Alexander Wrocklage and Sofia de la Puente (Vanguard Renewables staff) and Bethani Chambers (WI DNR) states that **"the Brooks Cafo and digester are in the Upper Fox/Wolf impaired waterway with EPA imposed total maximum daily limits. He goes on to state, "since this (digester) is a NEW POINT SOURCE DISCHARGE; the farm will need to either conduct Water Quality Trading or request reserve capacity."**

2023.06.15 WI DNR conducts **evaluation of an Unnamed Tributary to Walla Walla Creek that will be the "receiving waters" for the biodigester's recurring industrial wastewater discharge.**

2023.03 MSA Professional Services Report entitled "Vanguard Renewables Waupaca AD1" submitted to the WI DNR states **"the daily amount of food waste received is anticipated to be approximately 225 tons per day... which correlates to approximately 15,000,000 gallons annually of offsite waste. All of the application documents state 225 tons per day.**

NEW POINT SOURCE DISCHARGE:

2022.12.13 Joe Baeten, WI DNR, in an email to Andy Skwor (MSA) copying in Jenise Anderson, (MSA), Libby McDonald, Alexander Wrocklage and Sofia de la Puente (all from Vanguard Renewables) and Bethani Chambers (WI DNR) states that the **Brooks CAFO and biodigester are in the Upper Fox/Wolf Impaired Waterway/TMDL**. He goes on to state, "Since this (digester) is a **NEW POINT SOURCE DISCHARGE**; the farm will need to either conduct Water Quality trading or request reserve capacity."

2023.06.15 WI DNR conducts **evaluation of an Unnamed Tributary to Walla Walla Creek that will be the 'receiving waters' for the biodigester's industrial wastewater discharge.**

2023.08.08 and 2023.08.14 Waupaca County Planning and Zoning receives Brooks'/Vanguard's Conditional Use Permit and Zoning Map Amendments that **DO NOT mention the point source/industrial wastewater discharge by the Brooks/Vanguard biodigester**, instead they state "low nutrient water to be used for irrigation on the Brooks farm."

2023.08.14 Joe Baeten sends a memorandum to David Bolha, WNDR Water Quality Biologist with results of the 6/15 water quality evaluation of Walla Walla Creek. The evaluation found that **"total nitrogen was high, relative to the concentration typically found in an unimpacted surface water."** The total nitrogen was 8.7 mg/L (per EPA, recommended levels are between 2 mg/L and 6 mg/L) in the Unnamed Tributary directly adjacent to the biodigester and will be receiving "an average, recurring discharge of 41,000 gallons per day" of industrial wastewater.

MAY 20 2026

2023.08.08 and 2023.08.14 Waupaca County Planning and Zoning receives Brooks/Vanguard's Conditional Use Permits, Comprehensive Plan Amendment Application and Zoning Map Amendment Applications that **DO NOT mention the point source/industrial wastewater discharge by the Brooks/Vanguard biodigester**, instead they state "low nutrient water to be used for irrigation on the Brooks farm."

2023.08.14 Joe Baeten, (WI DNR) sends memorandum to David Bolha, WI DNR Water Quality Biologist with results of the 6/15/2023 water quality evaluation of Walla Walla Creek. The evaluation found that **"total nitrogen was high, relative to concentration typically found in an unimpacted surface water."** The total nitrogen was 8.7 mg/L (per EPA, recommended levels are between 2mg/L and 6mg/L) in the unnamed Tributary directly adjacent to the biodigester and will be receiving "an average, recurring discharge of 41,000 gallons per day" of industrial waste water.

Nutrient Management Plan:

2023.03 MSA Executive Summary for Vanguard Renewables Waupaca AD 1 Brooks Farms Dairy, LLC Waupaca County to WI DNR states, **"the farm is aware that the nutrients brought into their permit (digestate by-products) will exceed what their acreage can currently have applied.**

Who Will Manage the Digesters?:

2023.03 MSA report referenced above uses contradictory language. Page 13 states, "Vanguard personnel are required to operate, manage, and maintain all facilities of the transfer system, **anaerobic digesters**, and digester recirculation." However, page i states: **"the digesters will be managed by a third party."**

MAY 20 2026

PFOS AND PFAS IN EFFLUENT:

2024.01.14 Planning Water Quality-Based Effluent Limitations for Brooks Farms Dairy LLC WPDES Permit No. WI-0066885 email from Benjamin Hartenbower - WCR Eau Claire to Bethani Chambers, NE CAFO staff: "The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Since the anaerobic digestion system is expected to take in both manure and food waste, PFOS or PFOA may be present in the effluent ('digestate'). **Therefore, PFOS and PFAS monitoring is recommended once every two months.**

TAX TREATMENT WASTE TREATMENT FACILITY:

2024.01.19 Planning Water Quality-Based Effluent Limitations for Brooks Farms Dairy LLC WPDES Permit No. WI-0066885 email from Benjamin Hartenbower - WCR Eau Claire to Bethani Chambers, NE CAFO staff: "Tangible personal property, that becomes part of a waste treatment of pollution abatement plan or equipment, may be exempt from sales tax under s. 77.45(26), Wis Stats. Similarly, property purchased or constructed as a waste treatment facility and used for industrial waste treatment may be exempt from general property taxes under s. 70.11(21) Wis Stats. A prerequisite to exemption is filing a statement on prescribed forms.

EUROPEAN TESTING REQUIREMENTS FOR DIGESTATE:
Separated Liquid and Solid Digestate

TESTING SAMPLES REQUIRED: PER EACH BATCH

WISCONSIN'S TESTING REQUIREMENTS FOR DIGESTATE

Frequency of Testing:
Testing is required every 4 years under
WI NMP plans

NUTRIENTS:

Total Nitrogen (N)

Total Phosphorus (P)

Ammoniacal Nitrogen (NH₄-N)

Total Potassium (K)

Loss of Ignition (also referred to as "volatile solids")

PH Level

3 "most recent samples" not to exceed the
corresponding upper limit established

NUTRIENTS: According to NMP Requirements

Nitrogen (N)

Phosphorus (P)

Potassium (K)

Organic Matter: plant and animal residue, microbial biomass

Humus

PH Level

HEAVY METALS:

Arsenic (As)

Cadmium (Cd)

Chromium (Cr)

Copper (Cu)

Mercury (Hg)

Nickel (Ni)

Lead (Pb)

Zinc (Zn)

3 "most recent samples" not to exceed the
corresponding upper limit established

Some Heavy Metals: Specific Metals Not Specified

PATHOGENS: Human and Animal

5 Samples need to be tested for human/animal pathogens
not to exceed the corresponding upper limits established

Some Pathogens: Specific Pathogens Not Specified

E. Coli: Potential to cause severe gastrointestinal illness
Salmonella spp.: Potential to cause foodborne illness.
Listeria Monocytogenes: Causing Listeria which is dangerous
to pregnant women and immunocomprised individuals
Campylobacter spp.: Pathogen associated with food borne
illnesses

PLASTICS AND PHYSICAL CONTAMINANTS:

Plastics and Microplastics

Man-made physical contaminants, glass, metal,
stone, and non-stone

3 Samples need to be tested not to exceed the
corresponding upper limits established

PFAS/PFOs: FOREVER CHEMICALS
Compliance testing for PFAS in digestate is becoming
more standardized throughout Europe

PFAS/PFOs: Forever Chemicals

Testing Varies and Not Widely Mandated

SOURCES:

PAS 110:2014 Specification for whole digestate, separated
liquor, and separated fibre derived from the anaerobic
digestion of source-segregated biodegradable
materials

Links:

<https://www.wrap.ngo/resources/guide/bst-pas-110-producing-quality-anaerobic-digestate>

Anaerobic Digestate Resource Framework: Oct. 2025
Revised PAS 110:2014 as the core quality standard

<https://www.gov.uk/guidance/anaerobic-digestate-resource-framework>

Sell out a clear End of Waste (EoW) test when digestate stops being waste
Introduced new plastics limits and updated waste codes

MAY 20 2026

Manure Only Digester Inputs	Contaminants
Liquid Manure	Microplastics, pathogens (Campylobacter, Escherichia coli O157:H7, Salmonella, Listeria, Cryptosporidium, and Giardia), hormones, high concentration of salt, dietary supplements, and antibiotics
Process Wastewater	Sanitizers, disinfectants, heavy metals
Co-Digester Inputs	Contaminants
Liquid Manure	Microplastics, pathogens (Campylobacter, Escherichia coli O157:H7, Salmonella, Listeria, Cryptosporidium, and Giardia), hormones, high concentration of salt, dietary supplements, and antibiotics, hormones, pesticides
Process Wastewater	Sanitizers, disinfectants, heavy metals, manure, urine,
Industrial Food Waste	Microplastics, Per- and polyfluoroalkyl substances (PFAS & PFOs), Polycyclic aromatic hydrocarbons (PAHs), pesticides, Polychlorinated biphenyl (PCBs), heavy metals, mycotoxins, bacteria, mold, heavy metals,(BOD), biogenic amines, endocrine disrupting chemicals, pharmaceutical residuals, antibiotic resistant bacteria, coagulants and flocculants; creates high biological oxygen demand (BOD)
Agricultural By-Products/ Crop Residues	Mycotoxins, herbicides, pesticides, heavy metals, VOCs, pathogenic microorganisms
FOG (Fats, Oils, and Greases)	Mycotoxins, pesticides, heavy metals, PFAS
Slaughterhouse Waste	Paunch, fat, lard, blood, urine, hooves, feathers, manure, bones, sanitizers, disinfectants, bones, antibiotics (doxycycline, chlortetracycline, and sulfadiazine), cationic and anionic surfactants, pathogenic bacteria (Salmonella spp., Listeria sp., E. coli, Shigella sp., and Staphylococcus sp.)
Brewery Waste	Acidic and alkaline solution residue, coloring agents, process water additives , pfas; create high biological oxygen demand (BOD)
Milkhouse Wastewater	Sodium hydroxide (caustic soda), trisodium phosphate, nitric acid, phosphoric acid, chlorine dioxide, antifoaming agents

MAY 20 2026

Landspreading of Industrial Wastes, Landspreading of Industrial Sludge point Source Dischargers; Landspreading of By-product Solids.

According to WI DNR emails sent to citizens in the Town of Lind, the food waste to be brought in from a 100 mile radius was not simply peas and tator tots. Representatives from the digester company eventually told the WI DNR that the food waste would include industrial food manufacturing and food processing waste. Citizens were told that when any type or amount of industrial waste is mixed with manure the entire mixture is considered industrial waste and that any output from the digester would be considered Industrial wastewater and industrial waste sludge. A review of permits on the WI DNR website following the denial of the codigester project in Lind, citizens found that permits for **Landspreading of Industrial Liquid Wastes (WI-0055867-1)**; **Landspreading of Industrial Sludge Point Source Dischargers (WI-0057657-07-0)**; and **Landspreading of By-Product Solids (WI-0057665-7)** were withdrawn.

Because the WI DNR considers byproducts coming from a co-digester as industrial waste, this committee's desire to classify a codigester as an ag accessory is an extremely dangerous precedent to be setting and opens the county up for future lawsuits.

MAY 20 2026

Section 6.7.3

3. Heavy Industrial: Land uses which meet one (1) or more of the following criteria:

- Are not conducted entirely within an enclosed building;
- Are potentially associated with nuisances such as odor, noise, heat, vibration, and radiation which are detectable at the property line;
- Pose a significant safety hazard such as danger of explosion.

Examples: Meat Product Producers, Breweries, micro-breweries, wineries, micro-wineries, distilleries and their accessory sample tasting, paper, pulp, or paperboard producers; chemical dealers and/or storage facilities; chemical and allied product producers; except drug producers; but including poison or fertilizer producers; petroleum and coal product producers; asphalt, concrete, or cement producers; tanneries, stone, clay or glass product producers; primary metal producers; heavy machinery producers; electrical distribution equipment producers; electrical industrial apparatus producers; transportation vehicle producers; commercial sanitary sewage treatment plants; railroad switching yards; data centers; and recycling facilities not involving the storage of salvage materials.

According to Penn State: The danger of fire and explosion is especially significant near digesters and gas reservoirs (Majolaine, 2020). Explosions can occur in the digester if air mixes with the methane that a digester produces, air can seep into the digester during maintenance and tank draining.

<https://extension.psu.edu/safety-around-anaerobic-digesters>

Methane, the main gas of interest in biogas, has an explosive range of between 5 % and 15 % vol. in air. Within biogas, methane accounts for between 50 % and 70 % of the overall gas mixture. Thus, the generated methane has the potential to be within its explosive range at various times during the process, not only during intentional gas generation activities such as the digestion process but also at times when presence of methane is not essential e.g., in the feedstock reception area/holding tanks, or when storage tanks are being accessed for maintenance purposes.

<https://www.icheme.org/media/25595/hazards-33-paper-cc-bergin.pdf>

WI/MI/Iowa Examples of explosions/gas leaks at digester sites:

Waunakee, WI: August 6, 2014

A 1.25-million gallon manure digester near Waunakee won't resume operations until authorities determine the cause of an explosion and fire that destroyed its outer roof early Wednesday, sending up a plume of smoke visible for miles.

https://agupdate.com/news/local/environment/article_56b6030d-5b7c-54a9-8f3e-2adb0a93b4ed.html

Lowell, Michigan: Nov. 2016

Lowell Energy AD digester exploded due to a buildup of methane gas, resulted in a ruptured tank cover, a lingering odor and spilled waste.

<https://www.waste360.com/safety/michigan-biodigester-explodes-methane-gas-buildup>

Stockton, Iowa: June 8, 2021

Bob Baenziger Jr., 54, died while performing a dive to repair a broken cable at the bottom of a million-gallon anaerobic digester tank at Sievers Family.

<https://cedarrapidsgazette-ia-app.newsmemory.com/?publink=6d2b236be>

Denmark, WI: August 2023

The EPA performed a monitoring inspection on the NLC Energy LLC Denmark, WI facility in August of 2023 which identified gas leaks in the facility envelope.

https://apps.dnr.wi.gov/warp_ext/Am_PermiTTrackingSearch.aspx

Wrightstown, WI Air Emission Summary for 2024:

A full year of production took place in 2024.

2023 was a partial year of production along with the start up. A lot of flare time this year with production issues. The biogas project, owned by BC Organics, LLC, emitted 4,921 metric tons of methane in 2024, at least in part due to a leak at the facility, according to its 2025 filing with the Wisconsin Air Management program. The facility also reported more than 26,000 metric tons of CO2 emissions in 2024.

<https://www.thenewlede.org/2026/03/manure-digester-methane-emissions-dairy-cafos/>

State Center Iowa, February 22, 2025:

The Iowa OSHA is investigating a central Iowa biogas digester, located at Marshall Ridge Dairy, after a whistleblower alleged a 2023 fire injured two employees and that the site has ongoing natural gas leaks that endanger workers.

<https://thegazette.com/>

River Falls, WI: December 12, 2025

River Falls Fire Department was dispatched at 10:17 a.m. Dec. 12 to the Vanguard Renewables biodigester facility at W10247 County Road FF for a reported gas leak from the onsite biodome where the membrane on the anaerobic digester separated from the digester tank structure.

<https://www.piercecountyjournal.news/stories/rf-fire-called-to-new-biodigester-for-gas-leak.170354>

Jason Snyder

From: Victoria Gehrke <gctorie@yahoo.com>
Sent: Monday, April 27, 2026 5:12 PM
To: Jason Snyder
Subject: Additional Information for the Large Packet already submitted
Attachments: Citizen Summary Updated.pdf; VG River Falls no self report on gas leak.jpg; RE_ River Falls AD1_64806852A-ROPB_Deviation Notification.eml; RiverFalls_Biogas Release Notification_Jan 2026 - signed.pdf; River Falls biodigester press release_122825.pdf; River Falls codigester.jpeg; River Falls codigester after gas leak.jpg; RF Fire called to new biodigester for gas leak - Pierce County Journal.html; usda-rd-ul-continued-pause-CEA-biodigester-projects.pdf; Biodigester Boondoggles_ Four Financially Delinquent and Bankrupt On-Farm Biodigesters in Wisconsin (1).pdf; BC Organics MOU-Conditional-Use.PDF

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Jason,

Thanks for taking the time to speak with me this morning. Because time is so short, I am emailing you a number of documents that I am requesting be placed into the original large packet that I submitted back in December 2025.

1. An Updated Citizen Summary that includes the new title attachments 21 and 22.
2. Updated information for Attachment 15: Recent Fire and Explosions for Dairy Digesters: This information is specific to the River Falls Co-digester incident from December 2025.
3. Attachment 21: Notice of USDA 90-day and year long pause on loans for digesters and reasons why these loans are so problematic (appendix 1) with a 28% delinquency rate, lack of oversight on complex projects, payment plans based on tax credits without considering operational viability; insufficient analysis of working capital needs, excessive debt for projects with thin operating margins, and overly optimistic projections and lack of stress testing to name a few.
4. Attachment 22: 4 NE WI digesters in default or bankruptcy

Respectfully submitted,
Victoria Gehrke

Citizen Summary and Conclusion

There are many “experts” and biogas and agricultural industry leaders who sing the praises of these industrial biowaste processing and methane gas producing facilities, also referred to as anaerobic manure and industrial food waste co-digesters. For everyone of these “experts” and industry leaders, there are just as many experts, scientific research articles, and everyday stories of the dangers of these types of facilities. As citizens who are opposed to these Industrial food waste depackaging/industrial food waste/manure processing and methane gas producing facilities being sited on agricultural land and being considered an ag accessory, our goal is provide this committee with information that refutes these industry claims.

Conclusion: This Citizen Summary with all the attachments is a testament to the Citizens of Waupaca County who stepped up and did the homework required to make an informed decision about on-farm manure and industrial food waste co-digesters. This is just a small sample of the materials that have been gathered and deciphered during the past two+ years. Hours and hours have been spent researching, visiting other co-digester facilities, and speaking and meeting with individuals from other communities with personal experience with these co-digesters. As a result of all of these efforts, our conclusion is that manure and industrial food waste co-digesters do not belong on agricultural land, nor should they be considered an ag accessory, nor should they be removed from the solid or hazardous waste category under Section 6.7.9.

Recommendations: We respectfully request that you deny the proposed county-wide manure codigester facility ordinance. We also strongly urge this Committee to uphold and continue to support local control and local governance.

Attachment 1: The Town of Lind Experience - Background Information and Denial;

Attachment A1A:Town of Lind Attorney's Letter

Attachment 2: What was NOT Disclosed to the Town of Lind Prior Decisions Made By the Planning Commission at the September 5, 2023 meeting

Attachment 3: Environmental Violations from Co-digesters Owned by Vanguard Renewables

Attachment 4: Denials of Vanguard Renewables Co-digester Permit Applications from a similar proposal submitted to the Pennsylvania Department of Environmental Protection

Attachment 5: Information on the Two Farms with Digesters - one a newly constructed co-digester on a 275 dairy cow farm accepting up to 500 tons of industrial food waste per day. The second, a manure Only digester on a 4,400 dairy cow farm that received \$28 million

Taxpayer funded grants and loans.

- Attachment 6: Digesting the Facts: Digestate and Risks to Rural Communities. Toxic Air Emissions from Digesters Significant Impact Area 2 Miles
- Attachment 7: Contaminants in Manure Only Digester Inputs Versus Co-digester. Current and Emerging Contaminants of High Concern
- Attachment 8: Fremont, MI's Experience with forever chemicals found in the Digestate Spread on their Fields from a Manure and Food Waste Co-digester; Fatal Fertilizer: PFAS Contamination of Farmland; Phosphorus Losses to Surface Runoff Waters After Application of Digestate
- Attachment 9: Emerging Issues of Persistent Chemical Contaminants and Microplastic Contaminants in Food Waste Ending up in Digestate
- Attachment 10: Microbial Community and Antibiotic Resistant Gene Distribution in Food Waste, Anaerobic Digestate and Digestate from Agricultural Biogas Plants as a Reservoir for Antimicrobials and Antibiotic Resistance Genes - Implications for the Environment
- Attachment 11: Organic Micropollutants, Heavy Metals, and Pathogens in Anaerobic Digestate Based on Food Waste
- Attachment 12: Co-digesters Destabilize Nutrients found in Manure and Food Water Nitrate, Make them More Water Soluble, and Prone to Runoff. We Already have Nitrate and PFAS Contaminants in Our Drinking Water
- Attachment 13: A Small Wisconsin Town Bet Big on a Biodigester. Now the Project is Defaulting on Its Loans
- Attachment 14: Financial Incentives Analysis for Biodigester Projects
- Attachment 15: Recent Fires and Explosions at Dairy Digesters in US
- Attachment 16: Insuring Biogas Operations : Risk Exposures that most Standard Insurers exclude from their coverage
- Attachment 17: Impact of Biogas Plants On Rural Resident Property Values
- Attachment 18: Reasons Why Townships Should Continue to have Local Control Over On-Farm Co-digesters
- Attachment 19: U.S. Congressional Representative, Majorie Taylor Greene's Letter in Support of Murray County, GA's Opposition to a Co-digester
- Attachment 20: The Misbegotten Promise of Anaerobic Digesters; The Deceptive Promise of Manure Biogas as a Methane Solution, Hard to Digest: Greenwashing Manure Into Renewable Energy; And More
- Attachment 21: USDA 90-day and now yearlong pause on loans for digesters
- Attachment 22: 4 NE WI digesters in default or bankruptcy. Why a well written ordinance Protects better than a CUP and/or MOU in safeguarding our communities and environment.

Submitted on Behalf of Citizens Protecting Rural Waupaca County by Victoria Gehrke

Fwd: River Falls, WI co-digester exploded dome

Inbox

Kim Dupre

To: me - Mon, Dec 29, 2025 at 9:52 PM ✓

Here's the press release and pics in River Falls co-digester, along with other info I've been sharing....

The Peterson Dairy farm as a small producer with about 300 cows is NOT a CAFO — so Jeff Jackson at DNR doesn't work with them (per my email from him) and he said if I wanted info on the Nutrient Management Plan - I should contact the County Conservationist at Pierce County. [REDACTED]

The only permit from DNR that was needed was an air permit - signed off by Alexander Torres-Negron at alexander.torresnegron@wisconsin.gov / phone 608-609-0001. He was unaware of the incident and was forwarding my info to Randy Matty (Regional Air Mgmt Supervisor) and Alyssa Eggert (Air Compliance Inspector) and they will be investigating (I was told). [REDACTED]

Co-digester
Facility DIED
NOT NOTIFY
WI DNR —
A CITIZEN
DID!

Kim

5 attachments

Download all



Distance to Hom... JPG
JPG • 1459 KB



Fire_NRNNews_12... JPG
JPG • 834 KB



RiverFallsCoDige... jpeg
JPEG • 29 MB



RiverFallsCoDige... jpeg
JPEG • 25 MB



River Falls blodig... .pdf
PDF • 1447 KB



Reply

Forward

Jason Snyder

From: john morrison <jsmkarloff@gmail.com>
Sent: Sunday, May 3, 2026 12:20 PM
To: Jason Snyder
Subject: Testimony for May 6, 2016 for public record
Attachments: Waupauce County Planning and Zoning letter John Morrison.docx

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Please have my testimony read aloud and entered into the public record regarding zoning for digesters in Waupaca county.

Thank you,

John Morrison

6128 S Maple Island Rd

Fremont, MI 49412

Jason Snyder

From: Ryan Brown
Sent: Wednesday, March 18, 2026 4:20 PM
To: Jason Snyder
Subject: FW: input re: proposed Amendments

FYI

From: litlwolf@wolfnet.net <litlwolf@wolfnet.net>
Sent: Wednesday, March 18, 2026 3:04 PM
To: Ryan Brown <Ryan.Brown@co.waupaca.wi.us>
Subject: Re: input re: proposed Amendments

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Ryan,

Sorry for the need to clarify.

The Town's preference is to require a CUP, consistent with the proposals.

Thank you,

Jackie

On 2026-03-18 13:27, Ryan Brown wrote:

Jackie,

Just to clarify the Town's position; would the town prefer to keep the ordinance as is, meaning requiring a rezone or does the town prefer requiring a CUP, consistent with the proposal?

Feedback received on the deadlines, thank you.

Ryan

From: litlwolf@wolfnet.net <litlwolf@wolfnet.net>

Sent: Tuesday, March 17, 2026 2:57 PM

To: Ryan Brown <Ryan.Brown@co.waupaca.wi.us>; Jason Snyder <Jason.Snyder@co.waupaca.wi.us>

Cc: Alan Moede <greensuzu1@gmail.com>

Subject: input re: proposed Amendments

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Hello,

The Town of Little Wolf would like to go on record with the following comments to the proposed amendments to the Zoning Ordinance:

On page 7, the following deadlines need to be stricter: M) contact information for owner and operator shall be provided within 10 days of any changes in the contact information. and N) owner and operator shall be responsible for notifying the P&Z Dept of the results of the testing as it is received, suggesting the lab or testing facility copy the P&Z and the Town Clerk with the original test results, at the same time as the owner or operator.

As always, the Town would like their control over these operations to remain with the Town. If a proposed business should be transferred into a different zoning district or more appropriate district, than that is what they should be required to apply for.

Thank you for the opportunity to send our comments.

Make it a great day!
Jackie Beyer, Clerk
Town of Little Wolf

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Jason Snyder

From: Jeff <chairman@town-dayton.com>
Sent: Friday, March 20, 2026 8:30 AM
To: Ryan Brown; Jason Snyder
Cc: Town Clerk; Brett; Susan
Subject: Requesting a 90 day Extension

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Ryan and Jason,

The Town of Dayton is **requesting a 90 day extension** (to August 1, 2026) to the deadline of needing feedback from the municipalities on the proposed Zoning Ordinance amendments. There is a great deal of concern with solar farms, data centers, digesters, etc.... and some of what is in the proposed amendments and some of what is lacking.

The primary reason for this request is due to the April 7th election that will result in at least 5 new County Board Supervisors due to uncontested open positions. This number could actually be higher because a couple of the positions are being contested. We all know what it is like to be new to a Board or Commission. It can take several months to get your feet planted and start to have a thorough understanding of how the processes work and what issues are before you for consideration. It also extremely limits our timeline for having conversations with these new Board Supervisors on where they stand and our inputs on these proposals.

Jeff Barlow, Town of Dayton Chairman

Jason Snyder

From: Brett <supervisor@town-dayton.com>
Sent: Friday, March 20, 2026 9:13 AM
To: Ryan Brown; Jason Snyder
Subject: Re: Proposed Zoning Amendments

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Mr. Snyder and Mr. Brown,

I am writing to respectfully request that the County leaders grant a 90-day extension related to the consideration of the 2026 Proposed Zoning Ordinance Amendments.

This request is prompted by the April 7 election, which will result in at least five new County Board Supervisors due to uncontested open positions. That number may increase further depending on the outcome of contested races. As you are both aware, transitioning into service as a County Supervisor involves a significant learning curve, and it often takes several months for new members to become fully familiar with established procedures, ongoing initiatives, and the issues brought before the Board for deliberation.

The anticipated level of turnover necessarily limits the available timeframe for meaningful discussion with incoming Supervisors regarding these proposals, including the opportunity to understand their perspectives and provide thoughtful input. Allowing additional time would support a more informed and deliberate process and ensure that all Supervisors—new and returning alike—have adequate opportunity to engage fully in the discussion.

For these reasons, I respectfully request the Board's consideration of a 90-day extension. We believe this additional time would strengthen the decision-making process and serve the best interests of the Towns and the County.

Thank you for your time, service, and consideration of this request.

Respectfully submitted,

Brett Grams, Town of Dayton Supervisor

Jason Snyder

From: Chris Wargin <chris.wargin@perfectpatterns.com>
Sent: Friday, March 20, 2026 11:18 AM
To: Jason Snyder
Subject: 90 Day extention please

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To the deadline of needing feedback from the municipalities on the proposed Zoning Ordinance amendments.

Jason Snyder

From: Carrie Powell <carriepowell2015@gmail.com>
Sent: Tuesday, March 24, 2026 10:50 AM
To: Jason Snyder
Subject: Extension

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I am requesting a 90 day extension (to August 1, 2026) to the deadline of needing feedback from the municipalities on the proposed Zoning Ordinance amendments.

Jason Snyder

From: Nicki Scott <presidentscott@villageoffremontwi.gov>
Sent: Monday, March 30, 2026 6:49 AM
To: Ryan Brown; Jason Snyder
Subject: Extension to municipal feedback request

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Hello Ryan and Jason,

This is Nicki Scott, President of Village of Fremont, requesting a 90-day extension (to August 1, 2026) to the deadline of needing feedback from the municipalities on the proposed Zoning Ordinance amendments. I will not be able to attend this week's meeting, so I wanted to send my request in advance in support of the extension.

Thank you,

NICKI SCOTT

Board President | Village of Fremont

(208) 559-0777

presidentscott@villageoffremontwi.gov | villageoffremontwi.gov

Population = 685



Jason Snyder

From: Anjela Hamm <clerk@farmingtonwaup.gov>
Sent: Monday, March 30, 2026 1:54 PM
To: Ryan Brown; Jason Snyder
Subject: Feedback in Minutes
Attachments: DRAFT Plan Comm Minutes for 3-4-2026.pdf

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Hi Ryan and Jason,

Just sending over the minutes from our plan commission meeting earlier this month regarding the County changes.

There wasn't anything significant, but if you wanted to read that part over.

Haven't had time to complete the minutes until now, sorry for the delay.

Thank you!

Anjela Hamm - Town Clerk
Town of Farmington
Waupaca County



Office Phone: (715) 258-2779
Hours: Monday - Friday | 8:00am to 12:00pm
<https://farmingtonwaup.gov/>

Town of Farmington Plan Commission Minutes

Wednesday, March 4, 2026, at 9:00am

E913 Prairie View Ln

www.farmingtonwaup.gov

*The Town of Farmington will **never** contact property owners requesting a wire transfer fee for any Plan Commission meeting. All official communications from the Town will come from a .gov email address.*

Call to Order: Meeting was called to order at 9:01am. Plan Commission Chair Robert Karpinski presided. The opening statement was given. Notices were properly published and posted.

Open Meeting Statement: This meeting and all meetings of this Town Plan Commission are open to the public. Proper notice has been posted and given to the press, in accordance with Wisconsin Statutes, so the citizens may be aware of the time, place, and agenda of this meeting.

Roll Call: Robert Karpinski, Chair; Craig Nelson, Town Board; Thomas Hanson, Commission Member; Dennis Trinrud, Commission Member; Steve Rawson, Commission Member; Anjela Hamm, Commission Secretary.

Richard Kasza, Vice Chair was absent.

Alison Dunham, Commission Member was absent.

Approve Agenda: A motion by Thomas Hansen, seconded by Craig Nelson, to approve the agenda. Motion carried unanimously by a voice vote.

Approve Minutes from February 4, 2026, Plan Commission Meeting: A motion by Craig Nelson, seconded by Dennis Trinrud, to approve the Minutes from February 4, 2026, Plan Commission Meeting. Motion carried unanimously by a voice vote.

New Business:

- 1. Review and approve Resolution No. 2026-1 Approving an Amendment to the Comprehensive Plan.** Clerk explained that this item was incorrectly denied at previous meeting. The commission clarified that comprehensive plan amendments require an accompanying resolution, while zoning amendments do not. The item was presented to correct the prior procedural error. A motion by Steve Rawson, seconded by Thomas Hansen, to approve Resolution No. 2026-1 Approving an Amendment to the Comprehensive Plan. Motion carried unanimously by a voice vote.

2. **Review and provide feedback on the proposed revisions to the County Planning and Zoning Ordinances.** The chairperson explained the item was informational only, as the commission has no authority over county ordinance revisions. Any feedback will be submitted through the meeting minutes. Commissioners reviewed the ordinance updates highlighted in blue, which reflected changes made after a joint meeting with the highway department. Notable updates included a new definition for data centers and a requirement for digester operators to notify the county within five business days of testing.

Discussion focused on large-scale solar projects, with commissioners expressing concern over limited town control, as these projects only require county approval.

Questions were raised about long-term cleanup and who would be responsible after the lifespan of the installations. Commissioners also discussed a large solar project near Plover, noting concerns about the loss of agricultural use, including the capping of irrigation wells and uncertainty around future well permitting once panels are removed. Additional concerns included traffic impacts from solar developments and the potential need to designate routes to limit disruption to residential areas. The discussion also touched on agrovoltatics and the challenges of operating farm equipment around solar arrays. While commissioners acknowledged the financial incentives for landowners, they expressed ongoing concerns about the long-term impact on farmland and the environment. No specific feedback was identified beyond the concerns discussed.

3. **New Business from the Floor.** None.

Adjournment: A motion by Craig Nelson, seconded by Dennis Trinrud, to adjourn the meeting at 9:18am. Motion carried unanimously by a voice vote.

Submitted by,
Anjela Hamm – Town Clerk

Rebecca Landre

From: Jason Snyder
Sent: Wednesday, April 29, 2026 8:29 AM
To: Rebecca Landre
Subject: FW: Additional Information for the Large Packet already submitted
Attachments: Citizen Summary Updated.pdf; VG River Falls no self report on gas leak.jpg; RE_ River Falls AD1_64806852A-ROPB_Deviation Notification.eml; RiverFalls_Biogas Release Notification_Jan 2026 - signed.pdf; River Falls biodigester press release_122825.pdf; River Falls codigester.jpeg; River Falls codigester after gas leak.jpg; RF Fire called to new biodigester for gas leak - Pierce County Journal.html; usda-rd-ul-continued-pause-CEA-biodigester-projects.pdf; Biodigester Boondoggles_ Four Financially Delinquent and Bankrupt On-Farm Biodigesters in Wisconsin (1).pdf; BC Organics MOU-Conditional-Use.PDF

More info for committee packets. See attached and below.

-----Original Message-----

From: Victoria Gehrke <gctorie@yahoo.com>
Sent: Monday, April 27, 2026 5:12 PM
To: Jason Snyder <Jason.Snyder@co.waupaca.wi.us>
Subject: Additional Information for the Large Packet already submitted

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Jason,

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4. Attachment 22: 4 NE WI digesters in default or bankruptcy

Respectfully submitted,
Victoria Gehrke

Citizen Summary and Conclusion

There are many “experts” and biogas and agricultural industry leaders who sing the praises of these industrial biowaste processing and methane gas producing facilities, also referred to as anaerobic manure and industrial food waste co-digesters. For everyone of these “experts” and industry leaders, there are just as many experts, scientific research articles, and everyday stories of the dangers of these types of facilities. As citizens who are opposed to these Industrial food waste depackaging/industrial food waste/manure processing and methane gas producing facilities being sited on agricultural land and being considered an ag accessory, our goal is provide this committee with information that refutes these industry claims.

Conclusion: This Citizen Summary with all the attachments is a testament to the Citizens of Waupaca County who stepped up and did the homework required to make an informed decision about on-farm manure and industrial food waste co-digesters. This is just a small sample of the materials that have been gathered and deciphered during the past two+ years. Hours and hours have been spent researching, visiting other co-digester facilities, and speaking and meeting with individuals from other communities with personal experience with these co-digesters. As a result of all of these efforts, our conclusion is that manure and industrial food waste co-digesters do not belong on agricultural land, nor should they be considered an ag accessory, nor should they be removed from the solid or hazardous waste category under Section 6.7.9.

Recommendations: We respectfully request that you deny the proposed county-wide manure codigester facility ordinance. We also strongly urge this Committee to uphold and continue to support local control and local governance.

- Attachment 1: The Town of Lind Experience - Background Information and Denial;
- Attachment A1A: Town of Lind Attorney's Letter
- Attachment 2: What was NOT Disclosed to the Town of Lind Prior Decisions Made By the Planning Commission at the September 5, 2023 meeting
- Attachment 3: Environmental Violations from Co-digesters Owned by Vanguard Renewables
- Attachment 4: Denials of Vanguard Renewables Co-digester Permit Applications from a similar proposal submitted to the Pennsylvania Department of Environmental Protection
- Attachment 5: Information on the Two Farms with Digesters - one a newly constructed co-digester on a 275 dairy cow farm accepting up to 500 tons of industrial food waste per day. The second, a manure Only digester on a 4,400 dairy cow farm that received \$28 million

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- Taxpayer funded grants and loans.
- Attachment 6: Digesting the Facts: Digestate and Risks to Rural Communities. Toxic Air Emissions from Digesters Significant Impact Area 2 Miles
- Attachment 7: Contaminants in Manure Only Digester Inputs Versus Co-digester. Current and Emerging Contaminants of High Concern
- Attachment 8: Fremont, MI's Experience with forever chemicals found in the Digestate Spread on their Fields from a Manure and Food Waste Co-digester; Fatal Fertilizer: PFAS Contamination of Farmland; Phosphorus Losses to Surface Runoff Waters After Application of Digestate
- Attachment 9: Emerging Issues of Persistent Chemical Contaminants and Microplastic Contaminants in Food Waste Ending up in Digestate
- Attachment 10: Microbial Community and Antibiotic Resistant Gene Distribution in Food Waste, Anaerobic Digestate and Digestate from Agricultural Biogas Plants as a Reservoir for Antimicrobials and Antibiotic Resistance Genes - Implications for the Environment
- Attachment 11: Organic Micropollutants, Heavy Metals, and Pathogens in Anaerobic Digestate Based on Food Waste
- Attachment 12: Co-digesters Destabilize Nutrients found in Manure and Food Water Nitrate, Make then More Water Soluble, and Prone to Runoff. We Already have Nitrate and and PFAS Contaminants in Our Drinking Water
- Attachment 13: A Small Wisconsin Town Bet Big on a Biodigester. Now the Project is Defaulting on Its Loans
- Attachment 14: Financial Incentives Analysis for Biodigester Projects
- Attachment 15: Recent Fires and Explosions at Dairy Digesters in US
- Attachment 16: Insuring Biogas Operations : Risk Exposures that most Standard Insurers exclude from their coverage
- Attachment 17: Impact of Biogas Plants On Rural Resident Property Values
- Attachment 18: Reasons Why Townships Should Continue to have Local Control Over On-Farm Co-digesters
- Attachment 19: U.S. Congressional Representative, Majorie Taylor Greene's Letter in Support of Murray County, GA's Opposition to a Co-digester
- Attachment 20: The Misbegotten Promise of Anaerobic Digesters; The Deceptive Promise of Manure Biogas as a Methane Solution, Hard to Digest: Greenwashing Manure Into Renewable Energy; And More
- Attachment 21: USDA 90-day and now yearlong pause on loans for digesters
- Attachment 22: 4 NE WI digesters in default or bankruptcy. Why a well written ordinance Protects better than a CUP and/or MOU in safeguarding our communities and environment.

Submitted on Behalf of Citizens Protecting Rural Waupaca County by Victoria Gehrke

APR 29 2026

Fwd: River Falls, WI co-digester exploded dome

Inbox

Kim Dupro

To: me · Mon, Dec 29, 2025 at 9:52 PM ✓

Here's the press release and pics in River Falls co-digester.....along with other info I've been sharing....

The Peterson Dairy farm as a small producer with about 300 cows is NOT a CAFO -- so Jeff Jackson at DNR doesn't work with them (per my email from him) and he said if I wanted info on the Nutrient Management Plan - I should contact the County Conservationist at Pierce County.

The only permit from DNR that was needed was an air permit - signed off by Alexander Torres-Negron at alexander.torresnegron@wisconsin.gov / phone 608-609-0001. He was unaware of the incident and was forwarding my info to Randy Matty (Regional Air Mgmt Supervisor) and Alyssa Eggert (Air Compliance Inspector) and they will be investigating (I was told).

Co-digester
Facility DID
NOT NOTIFY
WI DNR -
A CITIZEN
DID!

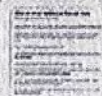
Kim

5 attachments

Download all



Distance to Hom... .JPG
JPG · 146.9 KB



Fire_NRNews_12... .JPG
JPG · 68.4 KB



RiverFallsCoDige... .jpeg
JPEG · 2.9 MB



RiverFallsCoDigo... .jpeg
JPEG · 2.5 MB



River Falls blodg... .pdf
PDF · 144.7 KB



Reply

Forward

APR 29 2026

Rebecca Landre

From: Kyle Grau <kgrau@vanguardrenewables.com>
Sent: Thursday, January 29, 2026 10:08 AM
To: Eggert, Alyssa L - DNR
Cc: Charles Vincent; Maggie Milton; Michael Routledge; Colin Edge; WI Operations
Subject: RE: River Falls AD1_64806852A-ROPB_Deviation Notification
Attachments: RiverFalls_Biogas Release Notification_Jan 2026 - signed.pdf

**CAUTION: This email originated from outside the organization.
Do not click links or open attachments unless you recognize the sender and know the content is safe.**

Hi Alyssa,

I hope this email finds you well and thank you for your patience.

Attached, please find our letter that includes refined emission estimates, a summary of the mechanical and environmental causal factors, and the corrective actions being implemented to ensure future cold weather resilience.

Should WDNR require additional information or further reporting following this investigation submittal, please don't hesitate to reach out.

Best,

Kyle Grau, REM, CESSWI
Environmental Compliance Manager
HSE

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✉ kgrau@vanguardrenewables.com

📞 [828.808.8274](tel:828.808.8274)

📍 133 Boston Post Rd
Weston, MA 02493

🌐 vanguardrenewables.com

From: Eggert, Alyssa L - DNR <alyssa.eggert@wisconsin.gov>
Sent: Thursday, January 22, 2026 1:10 PM
To: Kyle Grau <kgrau@vanguardrenewables.com>
Cc: Charles Vincent <cvincent@vanguardrenewables.com>; Maggie Milton <mmilton@vanguardrenewables.com>; Michael Routledge <mroutledge@vanguardrenewables.com>; Colin Edge <cedge@vanguardrenewables.com>; WI Operations <wioperations@vanguardrenewables.com>
Subject: RE: River Falls AD1_64806852A-ROPB_Deviation Notification

Hi Kyle,

Thank you for the update.

Thanks,

Alyssa Eggert

Phone: (920) 309-0477

alyssa.eggert@wisconsin.gov

Our core values include professionalism, integrity, and customer service.

Please visit our [survey](#) to provide feedback on your experience interacting with any DNR employee.

From: Kyle Grau <kgrau@vanguardrenewables.com>

Sent: Thursday, January 22, 2026 6:00 AM

To: Eggert, Alyssa L - DNR <alyssa.eggert@wisconsin.gov>

Cc: Charles Vincent <cvincent@vanguardrenewables.com>; Maggie Milton <mmilton@vanguardrenewables.com>;

Michael Routledge <mroutledge@vanguardrenewables.com>; Colin Edge <cedge@vanguardrenewables.com>; WI

Operations <wioptions@vanguardrenewables.com>

Subject: RE: River Falls AD1_64806852A-ROPB_Deviation Notification

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Good Morning Alyssa,

Just wanted to provide you with an update on the topics within the email chain below. We sent a signed copy of the deviation letter via certified mail on 1/16 as we are still setting up Michael's Switchboard account. Per the mail's tracking number, it was slated to arrive at the Webster St. address Wednesday, January 21st by EOB.

Furthermore, we are in the final stages of our event RCA and corrective action effort. I will send over your requested information by email as soon as it is finalized. As of now, we intend to have the final report compiled by Friday 1/23. I will let you know if our schedule changes.

Thank you!

Best,

Kyle Grau, REM, CESSWI

Environmental Compliance Manager

HSE

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✉ kgrau@vanguardrenewables.com

📞 828.808.8274

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Weston, MA 02493

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From: Eggert, Alyssa L - DNR <alyssa.eggert@wisconsin.gov>
Sent: Wednesday, January 7, 2026 11:47 AM
To: Kyle Grau <kgrau@vanguardrenewables.com>
Cc: Charles Vincent <cvincent@vanguardrenewables.com>; Maggie Milton <mmilton@vanguardrenewables.com>; Michael Routledge <mroutledge@vanguardrenewables.com>; Colin Edge <cedge@vanguardrenewables.com>; Victoria Lepore <vlepore@vanguardrenewables.com>; WI Operations <wioptions@vanguardrenewables.com>
Subject: RE: River Falls AD1_64806852A-ROPB_Deviation Notification

Thanks Kyle,

The additional information can be sent via email.

Thank you,

Alyssa Eggert

Phone: (920) 309-0477

alyssa.eggert@wisconsin.gov

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From: Kyle Grau <kgrau@vanguardrenewables.com>
Sent: Wednesday, January 7, 2026 10:15 AM
To: Eggert, Alyssa L - DNR <alyssa.eggert@wisconsin.gov>
Cc: Charles Vincent <cvincent@vanguardrenewables.com>; Maggie Milton <mmilton@vanguardrenewables.com>; Michael Routledge <mroutledge@vanguardrenewables.com>; Colin Edge <cedge@vanguardrenewables.com>; Victoria Lepore <vlepore@vanguardrenewables.com>; WI Operations <wioptions@vanguardrenewables.com>
Subject: RE: River Falls AD1_64806852A-ROPB_Deviation Notification

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Hi Alyssa,

Received, we will begin working on providing an e-signature through the Switchboard. For the highlighted portion below, do you prefer this subsequent information be submitted by letter in the Switchboard or via email?

Thanks!

Best,

Kyle Grau, REM, CESSWI

Environmental Compliance Manager

HSE

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📞 828.808.8274

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 133 Boston Post Rd
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From: Eggert, Alyssa L - DNR <alyssa.eggert@wisconsin.gov>

Sent: Tuesday, January 6, 2026 4:57 PM

To: Kyle Grau <kgrau@vanguardrenewables.com>

Cc: Charles Vincent <cvincent@vanguardrenewables.com>; Maggie Milton <mmilton@vanguardrenewables.com>; Michael Routledge <mroutledge@vanguardrenewables.com>; Colin Edge <cedge@vanguardrenewables.com>; Victoria Lepore <vlapore@vanguardrenewables.com>; WI Operations <wioptions@vanguardrenewables.com>

Subject: RE: River Falls AD1_64806852A-ROPB_Deviation Notification

Some people who received this message don't often get email from alyssa.eggert@wisconsin.gov. [Learn why this is important](#)

Thanks Kyle,

The department has received this deviation notification. Please complete the submittal by either having the responsible official complete the e-signature through the Switchboard or by mailing in the wet ink signature page to the address in my signature below. E-signature instructions can be found starting at the bottom of page 2 at this link:

<https://widnr.widen.net/view/pdf/vpoxiv62xz/AM591.pdf?t.download=true>

Ensure that any emissions resulting from this event are accounted for in the facility's annual emission inventory report and all deviations are listed in the facility's annual compliance certification/monitoring report. Additionally, when the investigation of the membrane rupture is complete, provide the total estimate of emissions from the event, duration of the event, an explanation of the cause and any corrective actions taken to prevent future recurrence.

If you have any questions, please let me know.

Thank you,

Alyssa Eggert

Air Management Engineer

Wisconsin Department of Natural Resources

101 S Webster St, PO Box 7921

Madison, WI 53707-7921

Phone: (920) 309-0477

alyssa.eggert@wisconsin.gov



dnr.wi.gov

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From: Kyle Grau <kgrau@vanguardrenewables.com>

Sent: Friday, December 19, 2025 6:01 PM

To: Eggert, Alyssa L - DNR <alyssa.eggert@wisconsin.gov>

Cc: Charles Vincent <cvincent@vanguardrenewables.com>; Maggie Milton <mmilton@vanguardrenewables.com>;

Michael Routledge <mroutledge@vanguardrenewables.com>; Colin Edge <cedge@vanguardrenewables.com>; Victoria Lepore <vlapore@vanguardrenewables.com>; WI Operations <wioptions@vanguardrenewables.com>

Subject: River Falls AD1_64806852A-ROPB_Deviation Notification

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Good Evening Alyssa,

Attached please find a deviation notification for our River Falls AD1 facility, submitted for your awareness. The event involved a departure from normal operations and is currently being investigated. Based on current information, the deviation did not result in an exceedance of federal release thresholds.

Should WDNR require additional information or further reporting following the investigation, we will provide it promptly.

Please feel free to contact me directly with any questions.

We appreciate your consideration.

Best,

Kyle Grau, REM, CESSWI
Environmental Compliance Manager
HSE

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Riverfalls AD 1, LLC

Anaerobic Digestion of Source Separated Organics at Peterson Family Dairy, Riverfalls, WI

DEC Contact: State of Wisconsin
Department of Natural Resources
Bureau of Air Management
Madison, WI 53707-7921

Permit No: 64806852A-ROPB

Subject: Follow-up to Deviation Notification: River Falls AD1 Biogas Release

Date: January 28, 2026

To the Wisconsin Department of Natural Resources (WDNR),

Pursuant to NR 439.03(4)(am), this letter serves as a formal update to the deviation notification for the above-referenced facility involving a low-pressure release of biomethane gas into the atmosphere. Specifically, this submission provides refined emission estimates, a summary of the mechanical and environmental causal factors, and the corrective actions currently being implemented to ensure future cold weather resilience.

Event Description:

On December 12, 2025, at 10:09 am CST, River Falls AD1 experienced a loss of containment (LOC) involving the digester gasholder membrane. The event was triggered by an overpressure condition in the digester headspace. No injuries, casualties, or off-site property damage were reported. As a precaution, site personnel followed established safety and emergency response protocols, including notification to LEPC and mobilization of the local fire department.

Initial Release:

5675 lbs of biomethane and 7.98 lbs of hydrogen sulfide.

Total Aggregated Release (inclusive of initial release):

13625 lbs of biomethane and 19.27 lbs of hydrogen sulfide. Biomethane generation and residual emissions were determined to have ceased by December 21, 2025 due to the temperature of the digestate falling below 68 deg. F.

Cause Analysis:

The investigation concluded that the rupture was the result of synchronized mechanical stress on the inner and outer membranes. This was caused by a gradual pressure accumulation that

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exceeded the Maximum Allowable Operating Pressure (MAOP) due to the concurrent unavailability of gas handling equipment during extreme winter conditions:

- The mechanical Pressure and Vacuum Relief Valves (PVRV), while commissioned to design specifications, failed to actuate. Physical evidence suggests that moisture within the valve seats froze, preventing the dead weights from lifting at the calibrated pressure setpoint (2.7 inWC).
- The emergency flare shut down due to ice/condensate accumulation in the air compressor lines, which occurred downstream of the moisture trap.
- The biogas upgrader faulted following the freezing of a dry cooler.
- Sustained subzero temperatures reduced elasticity in the gasholder fabric, making the membrane more susceptible to stress during the overpressure event.

Corrective Actions:

In response to this event, the following modifications and process improvements are being implemented to ensure plant resilience to extreme weather conditions:

- Implementing additional winterization safeguards (e.g. heat trace and insulation) on all safety critical systems, including but not limited to: biogas upgrader, flare, PVRVs, and three-way selector valves.
- Completing functional testing of our alarms, setpoints, interlocks, and SCADA push-notifications.
- Retrofitting the flare with enhanced desiccants and heated dryers downstream of the air compressors to eliminate the risk of frozen condensate.
- Evaluating the addition of audible control room alarms to ensure immediate detection of abnormal process conditions.
- Revision of Standard Operating Procedures (SOPs) and operator training to include specific checklists and operator interventions for extreme winter conditions.

Should WDNR require additional information or further reporting following the investigation, we will provide it promptly. Please feel free to contact Kyle Grau, Environmental Compliance Manager at kgrau@vanguardrenewables.com with any questions.

We appreciate your attention to this matter and remain committed to maintaining compliance and environmental stewardship.

Certification Statement pursuant to NR 439.03(10):

Based on information and belief formed after reasonable inquiry, the statements and information in the passage above are true, accurate and complete:

Responsible Official Name, Title: Michael Routledge, Vice President

Responsible Official Signature: 

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Best Regards,

Riverfalls AD 1, LLC

Attn: Kyle Grau

133 Boston Post Rd. Bldg. 15, Fl. 2

Weston, MA 02493

wioperations@vanguardrenewables.com

781-232-7597

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RiverFalls_Biogas Release Notification_Jan 2026

Final Audit Report

2026-01-29

Created:	2026-01-29
By:	Charles Vincent (cvincent@vanguardrenewables.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAaIQpFbolUuCXG4OWTWS0swyVF9gSLojR

"RiverFalls_Biogas Release Notification_Jan 2026" History

-  Document created by Charles Vincent (cvincent@vanguardrenewables.com)
2026-01-29 - 12:22:47 PM GMT
-  Document emailed to Michael Routledge (mroutledge@vanguardrenewables.com) for signature
2026-01-29 - 12:23:23 PM GMT
-  Email viewed by Michael Routledge (mroutledge@vanguardrenewables.com)
2026-01-29 - 12:45:48 PM GMT
-  Document e-signed by Michael Routledge (mroutledge@vanguardrenewables.com)
Signature Date: 2026-01-29 - 12:46:19 PM GMT - Time Source: server
-  Agreement completed.
2026-01-29 - 12:46:19 PM GMT

FOR IMMEDIATE RELEASE
December 28, 2025

For more information, contact:
Kim Dupre
Sustain Rural Wisconsin Network
duprekk@gmail.com

River Falls Gas Leak Confirms Rural Biodigester Fears

River Falls, WI – Sustain Rural Wisconsin Network (SRWN) says a gas leak at the brand-new Vanguard Renewables biodigester near River Falls, just days after its highly promoted opening, validates long-standing concerns from rural residents about the safety and oversight of large biogas projects.

According to local reporting, the River Falls Fire Department was dispatched on December 12 to the Peterson Family Dairy biodigester for a reported gas leak from the biodome, where the membrane separated from the digester tank structure. Fire crews used gas meters to check the facility and surrounding area, found no dangerous readings, and cleared the scene after about an hour with no injuries or evacuations reported. This breakdown came almost immediately after announcements touting the facility's ability to process hundreds of tons of food and beverage waste per day and generate large volumes of "renewable natural gas" for corporate buyers.

"This incident proves what neighbors have been saying all along: biodigesters come with real hazards—gas leaks, equipment failures, and emergency calls—that our communities are being forced to live with. This facility is less than one mile from inhabited areas in the city of River Falls," said SRWN member Kim Dupre.

Rural communities across the political spectrum are already fighting to protect their health and property from massive new livestock expansions. These operations house thousands of cows, pigs and turkeys or millions of chickens. They spread millions of gallons of raw feces, urine and cleaning fluids on thousands of acres. There is political support from both sides of the aisle for these operations and current laws don't address community concerns about biogas, air pollution, road damage, fire risk, carcass disposal and more.

The August 31, 2025, article "Winter Impact on Biogas Production and Solutions," published by Rutherford Renewables, explains that winter conditions can significantly reduce biogas production by slowing the microbial activity that drives anaerobic digestion. It notes that unmodified systems in cold climates can see **production drop by 50% to 70% in winter** and warns that without serious insulation, heating, and gas-handling measures, facilities face increased stress on equipment and higher risk of operational problems during cold weather. These production issues occur not just in the coldest part of winter, but when temperatures are below 68° F! Gas yields are minimal when temps are below 59° F.

This data underscores the need to maintain warm, stable temperatures inside digesters for reliable operation. Poorly winterized systems become less productive and more vulnerable to

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breakdowns when temperatures drop. That combination—cold stress, high gas volumes, and rural siting—makes local fears about leaks and emergencies both reasonable and urgent.

“Rural Wisconsinites are not anti-innovation—they are anti-sacrifice zone,” Dupre said. “People are speaking out at town halls, county meetings, and state hearings because they understand these hazards better than anyone. No corporation and no agency should be able to dismiss that lived experience.”

Sustain Rural Wisconsin Network is calling on state and local officials to listen to rural residents and act on their warnings by:

- Pausing approvals of new biodigesters until safety, winterization, and emergency response standards are significantly strengthened.
- Requiring independent engineering review of all existing and proposed biodigesters’ winter performance and gas-handling systems, with findings made public.
- Ensuring towns and counties have clear authority to adopt local protections, including zoning, road agreements, and emergency planning requirements for high-risk livestock and biogas projects.

If decision-makers are serious about respecting rural communities, they must start by hearing—and acting on—the voices of the people who are already living with the hazards of big biogas and factory farms.

-----END-----

Photo caption: A bird’s eye view of the digester shows its proximity — less than one mile — to a nearby housing development.

About Sustain Rural Wisconsin Network

Sustain Rural Wisconsin Network (SRWN) is a grassroots coalition of rural residents, farmers, health professionals, and advocates working to protect Wisconsin’s land, water, and communities from the harms of factory farming and unaccountable industrial development. SRWN supports local organizing, policy reforms, and community-driven solutions that keep rural Wisconsin healthy, vibrant, and resilient.

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Wednesday, December 17, 2025

Red Wing - Red Wing Regional Airport



28° F

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Wednesday, December 17, 2025



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RF Fire called to new biodigester for gas leak

 River Falls Fire Department responded to Vanguard Renewables biodigester facility on the Peterson Family Dairy farm Friday, Dec. 12 for a reported gas leak.

River Falls Fire Department responded to Vanguard Renewables biodigester facility on the Peterson Family Dairy farm Friday, Dec. 12 for a reported gas leak.

Contributed photo

Posted Wednesday, December 17, 2025 10:51 am

By Sarah Nigbor

TOWN OF RIVER FALLS – The cause of a gas leak at a local biodigester facility last Friday has not been determined and no one reported injuries, according to River Falls Fire Chief Justin Wilson.

River Falls Fire Department was dispatched at 10:17 a.m. Dec. 12 to the Vanguard Renewables biodigester facility at W10247 County Road FF for a reported gas leak from the onsite biodome where the membrane on the anaerobic digester separated from the digester tank structure.

Wilson said RFFD arrived about 10 minutes after being dispatched and conducted an investigation of the facility and surrounding areas using gas detection meters.

“There was no fire, no concerning readings on the meters and the areas checked were determined to be safe,” Wilson said. “No evacuations of the surrounding areas were required, and there were no reported injuries to employees or fire personnel.”

Assisting agencies included Allina Ambulance and the Pierce County Sheriff’s Department. Fire crews remained on scene for just over one hour, with all units clearing and returning to service at 11:28 a.m.

Wilson said the response went smoothly without any mishaps or significant challenges. The National Weather Service estimated wind speeds at that time to be about 3 mph.

In a news release dated Dec. 10, 2025, Vanguard Renewables, a national leader in organics recycling and renewable energy production, celebrated the opening of its new anaerobic digestion and advanced depackaging facility in River Falls at the Peterson Family Dairy, a fourth-generation farm. The site provides food and beverage manufacturers, retailers, and processors across the Minneapolis-St. Paul region with a sustainable way to recycle food waste while reducing risk and improving efficiency.

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“Food and beverage companies in Wisconsin and Minnesota face growing regulatory pressure to manage organics responsibly and recover packaging materials. Both states are advancing policies such as Extended Producer Responsibility (EPR) for packaging and commercial organics diversion requirements, driving demand for solutions that ensure compliance and advance sustainability goals,” the news release states.

“Vanguard Renewables gives food and beverage companies a turnkey solution to simplify organics recycling and reduce risk,” said Kent Bartley, President of Organic Solutions. “We combine deep industry expertise with full-service capabilities, from managing logistics with our own fleet to providing real-time data for compliance and reporting. Our approach makes organics recycling simple and reliable.”

The River Falls facility can process up to 275 tons of food and beverage waste per day and will generate 289,000 MMBtu of renewable natural gas (RNG) annually—enough to power 53,000 homes and businesses each year. The project is part of Vanguard Renewables’ joint venture with TotalEnergies to accelerate the development of renewable energy infrastructure across the U.S. The RNG will help power AstraZeneca’s U.S. research and manufacturing facilities, supporting the company’s commitment to reducing emissions and advancing sustainability, their website states.

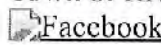
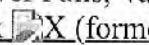
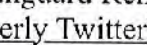
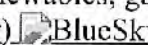
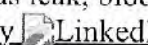
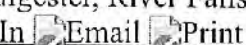
“Unlike other disposal methods, the facility uses anaerobic digestion to turn food waste into renewable energy—giving it a second life and creating a circular solution for businesses and the environment,” the news release states. “The River Falls facility features advanced depackaging technology to handle both bulk and packaged food and beverage products and is already processing more than 50 waste streams from over 30 customers in the region.”

This is Vanguard Renewables’ second location in Wisconsin, joining its operational site in Eden serving the Milwaukee area.

Vanguard Renewables is a leading U.S. environmental services company and producer of biomethane from organic waste. Headquartered in Weston, Mass., the company builds, owns, and operates on-farm anaerobic digesters that convert food, beverage, and agricultural waste into pipeline-ready renewable natural gas.

Keywords

Town of River Falls, Vanguard Renewables, gas leak, biodigester, River Falls Fire Department

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United States Department of Agriculture

Rural Development

Office of the Administrator

Rural Business–Cooperative
Service
1400 Independence Ave, SW
Room 5803-S
Washington, D.C. 20250

TO: All National Office and Business Programs Staff
Rural Business–Cooperative Service (RBCS)
Rural Development

FROM: J.R. Clacys
Administrator
Rural Business–Cooperative Service

Digitally signed by J.R.
Clacys
Date: 2026.04.02
14:57:29 -04'00'

SUBJECT: Extension of the Temporary Administrative Pause on Biodigester
and Controlled Environment Agriculture Applications Pending
Continued Portfolio Performance Review

Purpose

The purpose of this Unnumbered Letter (UL) is to extend the temporary administrative pause—originally established for 90-days—on the acceptance, processing, and awarding of loan note guarantees across Rural Business–Cooperative Service (RBCS) programs for projects involving biodigesters and controlled environment agriculture (CEA), including vertical farming, hydroponics, aeroponics, and aquaponics.

Based on the continuing and significant risks identified during the initial review period, this UL formally extends the pause from April 14, 2026, through December 31, 2026. This extension is necessary to reduce the speed at which these projects are entering the portfolio, complete the comprehensive portfolio performance review as projects under construction come online, assess lender underwriting capability, and strengthen program safeguards before considering future applications involving these technologies, all of which will help protect RBCS's interests and provide oversight by identifying common risk factors and strengthening our approach to guaranteeing loans in the future.

This UL does not establish new eligibility requirements and does not reflect a judgment on any specific applicant or technology.

Continuing to guarantee high risk projects—particularly those underwritten by lenders lacking expertise—threatens the long-term stability of the program and its capacity to fulfill its mission.

EXPIRATION DATE:
December 31, 2026

FILING INSTRUCTIONS:
Community/Business
Programs

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Background

During the original 90 day review period, RBCS identified several persistent and escalating concerns requiring additional- time to address:

- Rapid expansion of biodigester and CEA projects in the portfolio.
- Insufficient lender underwriting expertise for these specialized and volatile sectors, leading to recurring weaknesses not observed in more conventional industries supported by RBCS.
- Twelve biodigesters remain in the construction phase and five applications are pending, representing substantial exposure to construction, commissioning, and operational ramp-up risk.
- Beyond the high delinquency rates already documented, additional projects are now drawing on loss payment reserves, demonstrating deteriorating cash flow and financial instability.
- One-third of the projects involve lenders currently paused or undergoing audits by the Agency, adding additional uncertainty regarding servicing quality and underwriting reliability.

Unlike other sectors where liquidation and corporate guarantees mitigate losses, biodigester and CEA projects are showing erosion of collateral, lower recovery values, and higher loss severity.

A recent snapshot shows Controlled Environmental Agriculture projects have a 40 percent delinquency rate inside the portfolio. Biodigesters have a 28 percent delinquency rate inside the portfolio. This is on top of realized losses.

Budgetary and Programmatic Impacts

The financial effects of these performance issues are immediate and substantial:

- The present subsidy rate of 1.09% requires an appropriation of \$19,750,000 to maintain current lending authority.
- The projected FY 2027 subsidy rate of 2.95% will require \$51,625,000, more than doubling the cost to taxpayers for the same level of lending authority.
- High fees will remain a barrier for many worthy projects as the alternative to appropriation is increased fees to lenders that are often passed on to borrowers. The current fee is 3% at issuance and 0.55% annually.

If unaddressed, these trends will lead to:

- Reduced capital available for deployment to rural America.
- A shift from rolling applications to application windows, delaying project development.
- Competitive scoring environments that may exclude viable and beneficial rural projects.
- Reduced program flexibility and diminished ability to respond to emerging rural business needs.

Need for Continued Pause

Given the data collected, the severity of emerging risks, and the lack of sector specific underwriting and servicing expertise across the lender base, it is clear that biodigester and CEA projects must be paused throughout the remainder of calendar year 2026.

This extended pause supports:

- Development of sector specific underwriting guidance;
- Assessment of lender eligibility, expertise, and oversight requirements;
- Strengthening collateral evaluation and loss mitigation expectations;
- Ensuring that future approvals reflect a sustainable and fiscally responsible approach.

The choice is clear: We can continue approving projects we have reason to believe will fail, or we can preserve capital for job creating rural projects we have strong confidence will succeed. This extension ensures that the latter prevails.

Implementation

Effective immediately:

1. The administrative pause on accepting, processing, or issuing loan note guarantees for biodigester and CEA projects is extended from April 14, 2026, through December 31, 2026, or until further guidance is issued.
2. State Program Directors shall continue monitoring their portfolios for sector specific risks, report recurring themes to the National Office, and prepare recommendations for potential updates to underwriting, servicing, and lender oversight procedures.
3. Business program staff are required to withdraw applications and notify the lender if they are paused due to this (or the preceding) UL.
4. Additional guidance relating to lender participation, underwriting expectations, collateral standards, and risk mitigation requirements will be issued upon completion of the extended review period.

This UL is effective upon issuance and remains in force until rescinded or superseded. Questions should be directed to:

Dominick Lombardi, Special Assistant to the Administrator
dominick.lombardi@usda.gov

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Appendix 1: FAQs: Administrative Pause on Biodigesters and Controlled Environment Agriculture (CEA) Applications

Following are Frequently Asked Questions regarding pausing the approval of CEA and Digester projects. The original UL can be found [here](#).

Why is the Agency pausing approval of Controlled Environment Agriculture (CEA) and biodigester projects?

Rural Development (RD) is reviewing historical losses and poor-performing loans in these two industries. RD has seen a substantial increase in delinquencies. This pause allows us to protect RD's interests and provide oversight by identifying common risk factors and strengthening our approach to guaranteeing loans in the future.

What is the Agency's definition of a biodigester?

A biodigester is a type of anaerobic digester that breaks down organic waste—such as food scraps, animal manure, agricultural residues, and municipal waste in the absence of oxygen. This process produces biogas (often used to power generators for electricity) and digestate, a nutrient-rich material that can be used as fertilizer.

What is the Agency's definition of Controlled Environment Agriculture (CEA)?

CEA refers to growing crops in a controlled environment to optimize plant growth and resource efficiency. Instead of relying on outdoor conditions, CEA uses technology to manage temperature, humidity, light, CO₂ levels, and water/nutrient delivery. These projects typically involve crops historically grown outdoors. For the purposes of the UL, CEA does not include certain well-established industries and practices, identified below. Examples of paused CEA projects include vertical farming, hydroponics, aeroponics, and aquaponics.

Are there areas of concern with these types of projects already identified by the Agency?

Yes. Common concerns include:

- Lack of construction oversight on complex projects. See 7 CFR 5001.205(e).
- Incomplete engineering design, including lack of process design, leading to inoperative facilities unless additional loans are provided. See 7 CFR 5001.202(b)(5)(iv).
- No offtake agreements/contracts for product sales or offtake agreements without fixed volumes, prices, or term to service the debt. See 7 CFR 5001.202(b)(5)(ii).
- Repayment plans based on tax credits without considering operational viability. See 7 CFR 5001.202(b)(2).
- No feedstock agreements and failure to account for price fluctuations. See 7 CFR 5001.202(b)(5)(i).

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- In cases where there are multiple feedstock agreements, inadequate analysis of financial viability of the feedstock providers or availability of substitutes. See Anaerobic Digester Project/Biogas requirements for technical merit in 7 CFR Appendix E to Subpart D of Part 5001, at Section C(6).
- Insufficient analysis of working capital needs. See 7 CFR 5001.202(b)(2)(i).
- Excessive debt for projects with thin operating margins. See 7 CFR 5001.202(b)(2)(ii).
- Overly optimistic projections and lack of stress testing. See 7 CFR 5001.202(b)(6)(iv).

Are mushroom-growing operations included in the pause?

No. Mushrooms have historically been produced indoors, and the industry is well established. To the extent there are any outdoor mushroom operations, they would not count as CEA.

Are nurseries and traditional growing operations using greenhouses included in the pause?

No. The pause focuses on newer, emerging, and underdeveloped CEA projects. Traditional greenhouses used to reduce temperature risk are not included.

Is renewable natural gas from landfills included in the pause?

No. Landfill gas (and sewage treatment gas) projects are not paused because the gas is already present and only needs to be concentrated and processed. These projects remain eligible and are encouraged.

Does this pause affect applications already submitted?

Yes. Applications for CEA and biodigester projects will not be approved during the pause. Other OneRD applications, not involving CEA and biodigesters, are unaffected.

What happens after the pause?

Prior to re-starting approval of these projects, the Agency will issue updated guidance and risk mitigation measures before resuming approvals. Our goal is to ensure stronger underwriting standards and reduce risk for both lenders and borrowers.

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Biodigester Boondoggles: Four Financially Delinquent and Bankrupt On-Farm Biodigesters in Wisconsin

In late-January 2026, the US Department of Agriculture (USDA) issued a 90-day directive to freeze funding for on-farm biodigester projects due to the high number of delinquent loan payments and project failures. Biodigesters, which turn organic waste such as manure into biogas and renewable natural gas (RNG), have a disproportionately high rate of loan delinquency compared to other projects, with over a quarter (28 percent) of projects failing to pay back their loans totaling \$102.6 million. RNG, sold as a source of “green energy” and “economic development” for rural communities, has not lived up to the market hype. Producing pipeline quality RNG in practice is much more complicated and costly than initial projections, yet federal and state governments continue to fund them.

Because of the continuing and significant risks identified during the initial 90-day review period, the USDA extended the temporary administrative pause on the acceptance, processing, and awarding of loan note guarantees across Rural Business Cooperative Service (RBCS) programs for projects involving biodigesters and controlled environment agriculture (CEA). The pause extends from April 14, 2026 through December 31, 2026. According to the Administrator of the Rural Business Cooperative Service the extension is necessary to

- Reduce the speed at which these projects are entering the portfolio
- Complete the comprehensive portfolio performance review as projects under construction come online
- Assess lender underwriting capability, and
- Strengthen program safeguards before considering further applications

During the initial review period, the USDA found high delinquency rates, projects drawing on loss payment reserves with deteriorating cash flow and financial instability. Biodigesters projects are showing erosion of collateral, lower recovery values, and higher loss severity with delinquency rates at 28%.

Common concerns identified for biogas projects include:

- Lack of construction oversight on complex projects
- Incomplete engineering designs, including lack of process design, leading to inoperative facilities unless additional loans are provided
- No offtake agreements/contracts for sales to service the debt
- Repayment plans based on tax credits without considering operation viability
- No feedstock agreements and failure to account for price fluctuations
- Insufficient analysis of working capital needs
- Excessive debt for projects with thin operating margins
- Overly optimistic projections and lack of stress testing

The state of Wisconsin is becoming a hot spot for failing agricultural biogesters with 4 projects facing bankruptcy or loan delinquency totalling close to \$230 million. In all of these cases, the project failed to produce enough RNG to recover the cost of the project itself.

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The projects include:

- 1) **BC Organics (Greenleaf, WI)**- When it began operations in 2023, this facility was touted to be one of the largest manure to energy projects in the U.S. BC Organics currently has 16 biodigesters that process 900 million gallons of manure from 11 different dairy farms totalling 30,000 cows. Currently **180-360 days delinquent on two USDA loans for biodigester programs totalling \$100,976,245 million dollars.** Project funding came from a grant for \$15 million from Wisconsin's Focus on Energy program, two USDA loans totaling \$100.4 million, taxable subordinate bonds from their parent company, Dynamic BC Holdings, Inc, and investment tax credits. An estimated 90% of their post-construction income was supposed to come from the CA Low Carbon Fuel Standard (LCFS) program (70%) and the federal Renewable Fuel Standard program (20%), but no documentation could be found to prove they received them. In 2024, BC Organic's facility emitted large quantities of greenhouse gas emissions, including nearly 5,000 metric tons of methane and 26,000 metric tons of carbon dioxide.
- 2) **NLC Energy-Denmark (Denmark, WI)** is a manure and food waste to RNG biodigester located in Denmark, WI owned by NLC Energy. Manure is hauled daily from 12 farms (6 CAFOs) with herd sizes totaling approximately 14,500 dairy cows. NLC Energy Denmark has \$76 million in secured debt with assets valued at between \$10.3-\$17.7 million. One of the project funders was the Board of Regents for the University of California (UCal) which signed a 20-year contract in 2017 to purchase RNG carbon credits to offset natural gas emissions without actually reducing natural gas use on UCal's campus. UCal determined that these biogas carbon credits were much less expensive than those available in California. During the same period they also bought two biodigester projects- one in Iowa and one in Nebraska. Both facilities leaked pollutants into local air and waterways, accruing millions of dollars in fines and lawsuits. The facility in Denmark, WI underperformed and could not produce enough RNG to meet the UCal contract, tried renegotiating an upward price for RNG, but UCal determined that a price increase was detrimental to California citizens. As part of NLC Energy's Bankruptcy, they plan to reject the UCal contract due to ongoing production issues and financial disputes. From 2022-2025, between 73% and 83% of income earned by NLC Energy Denmark was exclusively from government incentives, while RNG sales represented less than a quarter of their revenue for each of those years. During this same timeframe, NLC Energy-Denmark had 6 (six) spills including two where tanker trucks full of digestate tipped over into ditches, in one instance spilling 5,998 gallons of digestate. In 2024, biogas leaks from the facility envelope were identified during an EPA monitoring inspection.
- 3) **Door County Environmental Energy LLC (Sturgeon Bay WI):** Door County Environmental Energy LLC (DCEE) is a biodigester that converts manure to RNG at S&S Jerseyland Dairy. The current herd size is 8,800 cows, making it a CAFO. Despite filing for Chapter 11 Bankruptcy, S&S is asking the WI DNR to increase their herd size to 14,711, a 60% increase. DCEE filed Chapter 11 Bankruptcy on December 14, 2024 with **\$12,041,377 in debt** against liquid assets valued at \$2.1 million. A lawsuit for \$520,837.52 for failure to pay for goods and services by Foxland Inc. against DCEE and

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S&S Jerseyland plus weak RNG sales ultimately led to bankruptcy. The biodigester project associated with S&S Dairy had several different investors and developers before their bankruptcy in 2024. This project began in 2009 with a different digester developer, DVO. Initial funding for this project came, in part, from a Section 1603 Treasury Grant and a WI Focus on Energy Grant. Through the first bankruptcy proceeding, which happened in 2017, US Gains/Venture purchased the biodigester in 2019. During this period, they obtained certification to sell RNG credits to CA LCFS; Oregon's Clean Fuels Program, and Federal RINs credits. According to the California's Air Resources Board Low Carbon Fuel Standard Tier 2 Pathway application, "RNG is compressed and transported to one of two pipeline injection sites in Hilbert or Madison, WI for injection into common carrier pipeline RNG delivery to CNG vehicle refueling stations in CA using indirect (book and claim) accounting. Bankruptcy documents (pg 64) that **expenses from digester operations exceeded revenue from the sale of RNG** in 2002 through 2024, leading to the request to expand herd size for increased manure production for use in the digester.

- 4) **WI RNG HUB NORTH (Gillet, WI):** is a biodigester project that processes manure from an 11,500 cow dairy CAFO at Zahn's Farms LLC. The tax-exempt municipal bonds to fund this \$41,588,000 project were sold through an Australian finance giant, MacQuarie Capital. The municipal bonds for the project were sponsored by Town of Gillet, but the debt is 100% owned by institutional investors and backed solely by the credit of the WI RNG project. The WI RNG Hub North defaulted on their \$1.7 million principal payment due in early June and again in December on the tax-exempt bonds. While no reason was given for the defaults on principal payments it appears that **RNG production and sale of RNG could not meet financial obligations**.

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MEMORANDUM OF UNDERSTANDING CONDITIONAL USE

This Memorandum of Understanding (this "MOU") is entered into this ____ day of _____, 2020, between the TOWN OF WRIGHTSTOWN, a Wisconsin municipality (the "Town") and BCO Organics LLC, a Wisconsin limited liability company ("BCO"). The Town and BCO may be individually referred to as a "Party" and collectively as the "Parties."

RECITALS

A. On May 29, 2019, BCO filed an application for a conditional use permit (the "CUP") to construct and operate a communal digester (the "Project") on land identified for tax purposes as Tax Parcel No. W-382 (the "Site").

B. The Project provides for the construction and operation of a covered anaerobic system, constituting a communal digester system that will process cow manure, as the only input, from neighboring and area farms, treating the waste water and converting the manure into natural gas, a soil amendment product and a liquid fertilizer product, which will involve the conveyance of materials and products to and from the communal digester from offsite.

C. The Site is zoned Agricultural Farmland Preservation. Article XXVIII D (2) (b) 10 of the Town's zoning code lists as a conditional use ethanol plant, bio-diesel plant, communal digester, pelletizing plant or other facility that processes raw agricultural commodities, agricultural by-product or agricultural wastes (received directly from farms) to produce bulk fuel or other bulk products.

D. The Town followed the procedures of § 60.61(4c), Wis. Stats. and Article XVIII Section K of the Town's Code of Ordinances, and determined substantial evidence supported the grant of the CUP subject to the conditions listed in the Planning Commission Findings and Recommendations and supporting documents that are attached and incorporated as Exhibit A (the "Recommendations").

E. The use permitted in the CUP is described in the application and accompanying documents listed in the Documents of Record on file with the Town Clerk, which are described in the attached Exhibit B. The Town relied and will continue to rely on the truth of the representations made in the Documents of Record when the Town granted the CUP.

F. The Parties desire to reiterate the conditions imposed in the Recommendations and outline the operation of those conditions to ensure the Parties' understanding of the terms of the CUP, the expectations of the Parties and to facilitate the smooth operation of the Project at the Site.

G. The execution and delivery of this MOU is a condition of the Town's issuance of the CUP.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are acknowledged, the Parties agree as follows:

I. GENERAL OPERATING CONDITIONS OF PROJECT

- A. Compliance with Documents of Record, Recommendations and Plans. The Project shall be constructed and operated in substantial compliance with the materials presented and listed in the Documents of Record, the conditions imposed by the Recommendations and the final construction and site plans that will be subject to Town review as provided in this MOU.
- B. Compliance with Laws. The construction and operation of the Project shall be in full compliance with all applicable state, federal and local laws.
- C. Cow Manure Only. The Project shall not process any material other than cow manure. No substrates or commercial, organic or non-organic wastes of any kind shall be introduced into the process.
- D. Estimated Limits. When completed, the Project will process approximately 800,000 gallons of manure per day, resulting in approximately 400,000 gallons of effluent. The manure shall be processed into a semi-dry fertilizer that will be returned to the contributors and marketed. The resulting gas (up to 4,000 gallons of methane per day at the Site) and 1,800 MMBtu/day Methane will leave the Site by pipeline to a connection station. From 55 to 70 percent of the manure will be pumped to the Site; the remaining manure will be brought to the Site by truck. Before manure may be delivered to the Site, the trucking company shall provide a document to the Town, disclosing the contributing locations/source of the manure, their approximate load, and the route to be taken to and from the site. The amounts stated in this paragraph are averages estimated over a one-month period. The amounts are estimates and daily amounts are anticipated to fluctuate, however if the average exceeds the estimates for more than three months the Parties shall schedule a public meeting within one month of the exceedance, to review the impact of the increases on the public interest and determine whether additional conditions are required.
- E. Footprint. At the Site there will be 16 stainless steel digesters, a series of screw presses, two storage tanks, and several outbuildings as shown in the Documents of Record. The footprint for all operations required by the Project is approximately 20 acres. If it is necessary to increase the size of that footprint the Town will be notified and if the Town reasonably deems the increase or any change in use accompanying the increase, a significant change in the use permitted by the CUP, the Town may commence the process for amending a CUP.
- F. Noise. The system shall operate at 75 decibels or less as measured at the

operations site line, except in emergency situations where repairs or other exigency may require machinery that is louder. BCO shall promptly report any such emergency or exigency to the Town.

II. ADDITIONAL CONDITIONS OF CONSTRUCTION AND OPERATION

A. Pre-construction conditions. The following conditions shall be fulfilled to the satisfaction of the Town, before any construction activities related to the Project may begin:

1. State and local permits and approvals. BCO shall gain approval of and provide a copy of each of the following permits, which, when delivered to the Town, shall be retained in a separate file specifically designated for such permits:
 - a. Wisconsin Pollution Discharge Elimination System permit;
 - b. Wisconsin Department of Natural Resources ("WDNR") air quality permit;
 - c. WDNR storm water permit;
 - d. WDNR erosion control permit;
 - e. WDNR Chapter 30 permit;
 - f. Brown County shore land permit;
 - g. State of Wisconsin building approval and permit; and
 - h. Town Building Permit.
2. Site Plan. A copy of final construction and site plans (collectively, the "Site Plan"), which shall include a detailed site plan describing landscaping, lighting security measures, signage, pipeline routing and location of structures and substantial conformity with those already provided with the application. The Town shall review the Site Plan to determine consistency with the Documents of Record, Recommendations and the Town's building code. The Town may condition its approval of the Site Plan upon reasonable conditions. Approval of the Site Plan is a condition of issuance of the Town building permit.
3. Right to Site. BCO shall provide the Town with proof of BCO's permission from the Owner to use the Site in the manner described in the CUP application.
4. Focus on Energy Grant. The Public Service Commission for the State of Wisconsin shall award to BCO a Focus on Energy program grant to finance

a minimum of \$15,000,000 of the estimated \$60,000,000 cost of the Project, as updated, which will be subject to an Incentive Agreement requiring, among other things, that the Project must be complete before 80% of the funds will be released, and that the remaining 20% will be released upon capacity and reliability verification by independent evaluators selected by the Focus on Energy project.

B. Construction Conditions. The following conditions shall be met at all times during construction of the Project:

1. Notice of obstruction of Right of Way. BCO shall provide such notices as required by law as to all rights of way affected by construction of the Project;
2. Right to inspect. During construction the Town's Zoning Administrator and engineers shall be permitted to inspect the Site at any time upon 24 hours-notice and may inspect without such notice in case of emergencies, as determined by the Town in its sole discretion; and
3. Compliance with approved plans and permits. All construction activities shall be conducted in strict compliance with the approved Site Plan and the permits.

C. Public Health Conditions. Before commencement of operations of the Project (commencement of operations of the Project shall be deemed to have commenced when the Project has reached 80% of capacity of the estimated daily manure over a 30-day consecutive period), the Town shall have received satisfactory evidence of the following:

1. Certain Permits and Approvals. Proof of issuance of the following permits and approvals:

- a. Public Service Commission of Wisconsin pipeline approval and permit;
- b. WDNR high capacity well permit (if necessary);
- c. Brown County Private Onsite Wastewater Treatment Systems permit; and
- d. ATCP Scale Permit.

2. Spill Protection.

- a. BCO shall comply with the spill prevention and emergency response

plans approved by the State of Wisconsin;

- b. BCO shall construct a passive containment system designed to catch and retain 110% of the largest single tank capacity, unless a higher requirement is made by a reviewing entity;
 - c. BCO shall install and maintain in good operating condition alarms to monitor the digester levels and any spills on a 24-hour basis;
 - d. BCO shall submit to the Town for its review a protocol addressing the steps to be taken to address any spill at the digester through the pipeline;
 - e. BCO shall nominate a person (the "Emergency Contact"), who shall have authority to supervise emergency response on behalf of BCO and who shall be at the Site or on-call 24 hours a day. Such person's identity and contact information, as the same may change from time to time, shall be provided to the Town Chair and Town Zoning Administrator.
3. Natural Gas Extraction System. In the interests of public safety and welfare to limit the possibility of explosion at the site, pipelines and connection station and to provide for a procedure to address any odor or other concerns, BCO shall fulfill all of the following conditions:
- a. The Natural Gas Extraction System shall be limited to gas extracted from the manure in the digesters and no other source.
 - b. Gas pressures at the site shall be monitored on a 24-hour basis and an internal flare system shall be used to lower any gas pressure and minimize the chance of odor escaping from the gas process.
 - c. Gas pipelines will be monitored 24 hours a day and will have tracers to facilitate prompt response to any breach or leak from the system.
 - d. The connection point shall likewise be monitored and shall be kept and maintained as required by the Public Service Commission of Wisconsin permit.
 - e. BCO shall submit to the Town for its review and approval a protocol addressing the steps to be taken to address any leak or other breach of the gas extraction system from the extraction point at the digester through the pipeline and connection point.
 - f. BCO shall communicate with the Town through the Emergency Contact as to any leak or other breach of the gas extraction system.
4. Manure Delivery/Return Pipelines. To provide for proper oversight of the delivery system and address any spills or leaks in the system that could

cause or contribute to pollution in the area, BCO shall comply with the following conditions:

- a. All pipelines delivering manure to the Site and transporting brown water or effluent off the Site shall be located within county utility easement right of ways, within Town right of way or in private easements. BCO shall provide the Town with documentation showing the right to use each such right of ways as required under this MOU;
 - b. BCO shall have obtained a permit from the Town for the use of those portions of the Mill Road utility easement for the gas and manure pipelines under the terms of this MOU;
 - c. The manure pipelines shall be monitored and shall have tracers located on them to assist in discovering any spill location;
 - d. Any brown water produced at the Site to be returned to a contributor shall be transported in the same manner as deliveries of the same are required under this MOU; and
 - e. BCO shall submit to the Town for its review a protocol addressing the steps to be taken to address any leak or other breach of the manure delivery/return pipelines from the digester to its destination. BCO shall communicate with the Town through the Emergency Contact as to any leak or other breach of the gas extraction system.
5. Water Quality and Volume. In the interest of protecting the East River watershed and hatchery near the Site and to diminish the possibility of pollution at or around the Site and to provide for procedures to address any matters that may relate to those concerns, the following conditions shall be fulfilled:
- a. BCO shall monitor all effluent discharged into the East River Watershed for quality and quantity according to WPDES requirements.
 - b. The results of all such monitoring required by WDNR to be sent to a certified laboratory shall be forwarded to the Town on a monthly basis for review by the Town's consultant(s).
 - c. BCO shall deliver to the Town for the Town's approval a protocol addressing contingencies if effluent discharge to the watershed exceeds the WPDES limits.
6. High Capacity Well. To protect the water source of adjoining property owners, the following conditions shall be met:

- a. Before BCO drills any high capacity well on the Site, BCO shall provide the Town with a cone of influence study, produced by a licensed engineer acceptable to the Town, to determine the draw effect on adjacent property owners, including the Town.
- b. No high capacity well shall be constructed until the Town is satisfied no remediation is necessary or that any necessary remediation has been adequately addressed.
- c. BCO shall have paid the actual cost of any necessary remediation.

III. SITE SECURITY

- A. Security at Site. To address the Town's interest in protecting property and ensuring an operation dealing with high volumes of waste is secure and any vandalism deterred, the following conditions shall be met to the reasonable satisfaction of the Town:
 - I. The Site Plan shall depict the location of the following security measures, all of which shall be in place or constructed prior to operation commencing:
 - a. There shall be security fencing completely surrounding the Project.
 - b. There shall be securely locked gates and the Site shall have posted "No Trespassing" signs.
 - c. There shall be one entrance for ingress and egress to the Site.
 - d. The Site shall be monitored by camera surveillance.
 - e. The entrance to and all roadways on the Site shall be of an impervious surface.

IV. TRAFFIC AND ROUTING

- A. Traffic Plan. To control the amount of truck traffic, the transportation of waste production and materials on the roadways and the volume and constituency of the waste at the Site, and to the preserve Town roads and control, the following conditions shall be fulfilled:
 - I. BCO shall submit to the Town for review and approval a plan showing the routing for manure traffic on Town roads (the "Traffic Plan"). The Traffic Plan shall designate all contributors to the operation and indicate the routes and number of daily trips. Truck traffic shall be in strict compliance with the Traffic Plan and will be limited to the number and origin of trucks referenced in the Traffic Plan (currently 55 to 59 semi-truck round trips per day). Although the Town anticipates and encourages the use of the communal digester by area farms as provided in the Traffic Plan and

recognizes that the number of truck trips may fluctuate, the Traffic Plan may not be amended without the prior review and approval of the Town which approval will not be unreasonably withheld.

B. Regulation of Trucks.

1. All truckers delivering and removing materials from the Site shall be on contracts directly with BCO or with BCO's contractors in a manner that allows BCO to direct and control the truck operators.
 - a. All truckers shall refrain from engine braking while hauling manure and while empty or transporting other materials back to the location from which they came.
 - b. All trucks carrying dried fiber from the Site will be covered.
 - c. All other trucks carrying materials to or from the Site will be closed tankers.
2. BCO shall be responsible for the cost of any spill and clean-up of waste or fiber during transport to or from the Site or when transporting fiber to locations outside the Town.
3. BCO shall provide to the Town for its review and approval a protocol for addressing spill clean-up and other complaints regarding the truck traffic.

- C. Road Use Agreement. Prior to commencement of operations, the Town and BCO shall enter into a Road Use Agreement in the form as attached hereto as Exhibit D.

V. **COMMUNITY RELATIONS AND CITIZEN COMPLAINTS AND CONCERNS**

Citizen Input. To provide for oversight of compliance with the CUP, provide for citizen input and clarify the parameters of the CUP, BCO shall participate in annual public meetings to discuss BCO's operations, the impact of the Project on the community and BCO's record of compliance with the CUP and the terms of this MOU. The Town may also require a meeting upon receipt of allegations of a material breach of the conditions of the CUP.

VI. **ACCESS/INSPECTION BY TOWN**

- A. Inspection of Site and Project. BCO will permit and shall cause the owner of the Property to permit the Town and the Town's construction consultant or inspector, at all reasonable times to inspect the Site, the Project and all matters relating to the same. The Town assumes no obligation to BCO for the sufficiency or adequacy of such inspections, such inspections being made for the sole and separate benefit of the Town. The fact the Town may make such inspections shall in no way relieve BCO from its duty to independently ascertain that the construction of the Project is being completed in accordance with the approved Site Plan.

- B. Access to Effect Cure. To the extent the Town elects to exercise its remedy to cure any failure by BCO to promptly remedy any emergency situation, BCO shall not interfere with the Town and its designated contractors and consultants from coming upon the Site to accomplish such cure, but shall, instead, fully cooperate in such cure efforts by the Town.
- C. Notice. Town officials, including the fire department, zoning administrator and building inspector shall be permitted to enter the Site for inspection purposes upon 24-hour notice, except in case of an emergency, as may be determined by the Town in its sole discretion, in which case, the Town shall endeavor to give notice to BCO and the owner of the Property, but no notice shall be required. At the request of the Town, the inspectors shall be accompanied by employees of BCO during any non-emergency inspection.

VII. PILOT AND ADMINISTRATIVE COSTS AND FEES

- A. Payment of PILOT. The costs of processing the required permits and overseeing the operation of the Project in the interest of the public health, welfare and safety are attributable solely to the Project and are not intended to be paid by the general tax levy; the Project is intended to be exempt from taxes pursuant to § 70.11(21) and 70.111(18) Wis. Stats. Each year, BCO shall pay the Town a payment in lieu of taxes (PILOT) equal to the amount otherwise attributable to the Town (estimated at \$177,000 for tax year 2019), based on an equalized value of not less than \$60,000,000, as such value may fluctuate during the term of this MOU. The PILOT payments shall commence October 31, 2021 and shall be due on the same date annually thereafter. Payments shall be made in a single installment and the Town shall provide notice to BCO of the projected mil rate for the next year not less than 30 days before the due date.
- B. Initial Administrative Fee Payment. In addition to any PILOT, BCO has paid to the Town the sum of \$43,181.64, in one payment to reimburse the Town or provide funds for the Town to pay all administrative costs incurred by the Town in processing the conditional use application, including actual attorneys' and engineer fees expended, actual costs of publication, and any other costs actually incurred by the Town in processing the CUP.
- C. Annual Administrative Fee Payments. In addition to any PILOT and the initial administrative fee payment, BCO shall pay up to \$24,000 per year toward costs incurred by the Town in administering the CUP, including, specifically, costs of engineering, review and professional advice and services. The obligation to make annual administrative fee payments shall commence at the commencement of operations. Payments shall be made in a single installment within 60 days of notice to BCO from the Town of the administrative fees being requested.

VIII. FIRE SAFETY

BCO shall strictly comply with the conditions of the Greenleaf Fire Department, which are attached hereto as Exhibit C, as such conditions may be amended from time to time and shall maintain in good operating condition all of the equipment listed on Exhibit C and all replacements of such equipment.

IX. REPRESENTATIONS AND WARRANTIES

Representations and Warranties of BCO. BCO represents and warrants to the Town as follows, which representations and warranties shall survive termination of this MOU, that:

- A. Organization and Good Standing. BCO is a limited liability company, duly formed and validly existing under the laws of the State of Wisconsin, has filed all necessary filings with the State of Wisconsin Department of Financial Institutions, has not filed articles of dissolution, and has the power and all necessary licenses, permits and franchises to own its assets and properties and to carry on its business.
- B. Due Authorization. The execution, delivery and performance of this MOU and all other agreements requested to be executed and delivered by BCO hereunder have been duly authorized by all necessary corporate action of BCO and constitute valid and binding obligations of BCO, in accordance with their terms.
- C. No Conflict. The execution, delivery, and performance of BCO's obligations pursuant to this MOU will not violate or conflict with BCO's Articles of Organization or Operating Agreement or any indenture, instrument or material agreement by which BCO is bound, nor will the execution, delivery, or performance of BCO's obligations pursuant to this MOU violate or conflict with any law applicable to BCO.
- D. No Litigation. There is no litigation or proceeding pending or threatened against or affecting BCO or the Project or, to the best of BCO's knowledge, the Site that would adversely affect the Project, BCO or the enforcement of this MOU according to its terms, the ability of BCO to complete the Project or to perform its obligations under this MOU.
- E. Certification of Facts. No statement of fact by BCO contained in this MOU and no statement of fact furnished or to be furnished by BCO to the Town pursuant to this MOU contains or will contain any untrue statement of a material fact or omits or will omit to state a material fact necessary to make any such statement not misleading.
- F. Compliance with Laws and Codes. The Project, when completed, will conform and comply in all respects with all applicable laws, rules, regulations and ordinances, including without limitation, all building codes and ordinances of the Town. BCO will at all times comply with, and will cause the Project to be in compliance with all applicable federal, state, local and other laws, rules, regulations and ordinances, including without limitation, all environmental laws, rules, regulations and ordinances.

- G. No Material Change. All copies of documents, contracts and agreements BCO has furnished to the Town or its agents are complete and accurate as of delivery and remain so as of the date of this MOU.
- H. Correction of Defects. Upon demand of Town, BCO shall correct any material defect, structural or otherwise, in the Project, or any departure from the approved Site Plan.
- I. Right to Occupy. BCO shall provide proof to the reasonable satisfaction of the Town that it has the right to occupy and use the Site in the manner provided in the CUP and this MOU.

X. INSURANCE

- A. Liability Insurance. BCO shall provide and maintain with reputable insurance companies licensed to do business in the State of Wisconsin: (a) a general liability policy for \$3,000,000 in standard insurance industry form; and (b) a pollution insurance policy in the amount of \$3,000,000 and to pay the cost and environmental remediation, bodily injury and property damage and cleanup costs resulting from the operation of the Project, including, without limitation, occurrences involving any of the pipelines referenced in the application. The Town shall be named as an additional insured in all such policies. No such policy shall be terminable, except upon 30 days' notice to the Town.
- B. Casualty Insurance. BCO shall provide and maintain property and casualty insurance with insurance companies meeting the criteria in section A immediately above in amounts sufficient to replace all of the equipment and infrastructure required for the operation of the Project as proposed in the conditional use application.
- C. Workers Compensation Insurance. BCO shall maintain workers' compensation insurance in amounts required by the State of Wisconsin.
- D. Proof of Insurance. BCO shall provide to the Town a certificate or certificates of insurance demonstrating compliance with this section X.

XI. INDEMNIFICATION

- A. Indemnification Obligations. BCO, for itself, its owners, directors, officers, members, employees, contractors, agents, insurers and attorneys (each an "Indemnifying Party," and together, the "Indemnifying Parties") shall indemnify, hold harmless and defend the Town, its board members, directors, officers, employees, contractors, agents, insurers and attorneys (each an "Indemnified Party," and, together, the "Indemnified Parties") of and from any and all demands, damages, costs and fees, including, without limitation attorney fees and costs, judgments, awards and all other sums due or claimed to be due and arising out of BCO's breach of any of the terms of

this MOU and any negligence or intentional wrongdoing relating to the ownership or operation of the Project.

B. Indemnification Procedures.

1. In the case of claims made by a third party (a "Third Party Claim") with respect to which indemnification is sought, the Indemnified Party shall give prompt notice to any Indemnifying Party of any such Third Party Claim made upon it. If the Indemnified Party fails to give such notice, such failure shall not preclude the Indemnified Party from obtaining such indemnification but its right to indemnification may be reduced to the extent such delay materially prejudiced the defense of the Third Party Claim or increased the amount of liability or cost of defense.
2. Assumption of Defense. The Indemnifying Party shall have the right, unless (i) the Indemnifying Party(ies) is also a party to such Third Party Claim and the Indemnified Party determines that joint representation would be inappropriate, or (ii) the Indemnifying Party(ies) fails to provide reasonable assurance to the Indemnified Party of the Indemnifying Party's financial capacity to defend such Third Party Claim and provide indemnification with respect to such Third Party Claim), by notice to the Indemnified Party given not later than ten (10) days after receipt of the notice to assume the control of the defense, compromise or settlement of the Third Party Claim, provided that such assumption shall, by its terms, be without cost to the Indemnified Party and provided the Indemnifying Party(ies) acknowledges in writing its obligation to (i) not settle any Third Party Claim where such settlement of the Third Party Claim would have a material adverse effect on the Indemnified Party without the prior written consent of the Indemnified Party, which consent shall not be unreasonably withheld and (ii) indemnify the Indemnified Party in accordance with the terms contained in this section in respect of the Third Party Claim.
3. Pursuit of Defense/Cooperation/Legal Fees. Upon the assumption of control of any Third Party Claim by the Indemnifying Party(ies) as set out in subsection 2 above, the Indemnifying Party(ies) shall diligently proceed with the defense, compromise or settlement of the Third Party Claim at its or their sole expense, including if necessary, employment of counsel reasonably satisfactory to the Indemnified Party and, in connection therewith, the Indemnified Party shall cooperate fully, but at the expense of the Indemnifying Party(ies) with respect to any out-of-pocket expenses incurred, to make available to the Indemnifying Party(ies) all pertinent information and witnesses under the Indemnified Party's control, make such assignments and take such other steps as in the opinion of counsel for the Indemnifying Party(ies) are reasonably necessary to enable the Indemnifying Party(ies) to conduct such defense. The Indemnified Party shall also have the right to participate in the negotiation, settlement or defense of any Third Party Claim at its own expense. The Indemnified Party

shall not settle any Third Party Claim without the prior written consent of the Indemnifying Party(ies), such consent not to be unreasonably withheld.

4. Failure of Indemnifying Party to Assume Defense. If the Indemnifying Party(ies) does not assume control of a Third Party Claim as permitted in subsection 2 above, the Indemnified Party shall be entitled to make such settlement of the Third Party Claim as in its sole discretion may appear advisable, and such settlement or any other final determination of the Third Party Claim shall be binding upon the Indemnifying Party(ies).

XII. CLOSURE SECURITY

Before BCO commences digester operations at the Site, BCO shall provide the landowner with bonds or other security satisfactory to the Town sufficient in type and amount to assure resources will be available to pay for the proper and sanitary closure of the Site and remediation of the Site if digester operations discontinue.

XIII. TERM

This MOU shall commence on _____, 2020 and, unless sooner terminated as permitted in this MOU, shall continue for a period of 20 years from such date. The foregoing notwithstanding, the CUP shall be subject to review every 5 years from the anniversary date of first operation of the Project or upon material change of the permitted use as reasonably determined by the Town.

XIV. DEFAULT AND REMEDIES

A. Default by BCO. The following shall constitute defaults on the part of BCO:

1. Failure to Pay. BCO fails to timely and fully pay any sums due and owing to the Town;
2. Failure to Abide by Other Terms. BCO fails to perform any of its other obligations to the Town under this MOU and such failure continues for a period of 30 days from the date of notice from the Town;
3. Insolvency Event. BCO becomes the subject of an involuntary bankruptcy petition, an involuntary assignment for the benefit of creditors, receivership, or other involuntary proceeding designed for the benefit of creditors that is not dismissed within 180 days of the date of filing (each, an "Insolvency Event");
4. Misrepresentation. Any representation or warranty of BCO in this MOU or otherwise made in writing to the Town is false in any material respect when made;
5. Cessation of Business Operations. Except because of conditions beyond the control of BCO, BCO fails to actively engage in business operations for a

period of 60 consecutive days or for 90 days during any 12-month period;
or

6. Other Contracts. There exists any material, uncured, default in any other agreement between the Town and BCO or the Town.

B. Cure Rights and Events of Default. BCO shall have the right to cure their defaults as set forth in this section. If BCO fails to cure its default(s), an Event of Default shall occur, in which case, the Town may exercise any or all of the remedies provided below. The Cure rights are:

1. Cure of Payment Default. BCO shall have 10 days from notice from the Town to cure any payment default;
2. Cure of Certain Other Defaults. Except as set forth below, for any default, other than a payment default, BCO shall have 30 days from the date of notice from the Town to cure the default; provided, however, if cure of any such default cannot practicably be achieved within the 30 days allowed, then BCO shall have a reasonable period of time, not to exceed an additional 60 days (a total cure period of 90 days), to cure the default, provided BCO has commenced cure within the initial 30 days and diligently pursues cure thereafter.
3. Cure Period Exceptions. Subparagraph 2 immediately above notwithstanding and irrespective of BCO's obligation to suspend operations as set forth in Subsection 5 below, if the default is:
 - a. a failure to maintain insurance as required, the cure period shall be five business days;
 - b. an attempt to assign or an assignment of this MOU without the Town's consent, the cure shall be rescission of the assignment, with proof of the same being given to the Town no later than seven days after notice from the Town;
 - c. Upon the occurrence of an Insolvency Event, the cure period will be 180 days for BCO to obtain dismissal of the date of filing;
 - d. an intentional, material misrepresentation, in which case, there shall be no cure period;
 - e. a condition that threatens immediate harm to human health or significant property damage, in which case the cure period shall be shortest period of time in which to rectify such condition to the reasonable satisfaction of the Town;

- f. a default under any other agreement between the Town and BCO that provides for a different cure period, in which case the other cure period shall control, whether the same is more or less liberal as to the cure period; or
- g. a default of the same provision of this MOU that occurs more than three times in any six-month period the cure, in which case the cure period shall be one-half of the period of time otherwise allowed to cure such default.

C. Remedies.

1. General Remedies. Upon the occurrence of an Event of Default, the Town may: (a) revoke the CUP and terminate this MOU upon 10 days' notice to BCO; (b) effect cure of the default and charge all costs thereof to the defaulting Party, which shall be due and payable in full within 10 days of demand; (c) seek injunctive relief as to any default for which injunctive relief is an appropriate remedy; (d) obtain specific performance; and/or (e) exercise any and all rights and remedies available under law or equity with respect to the default.
2. Self Help. Subsection 1 immediately above notwithstanding, as to the following defaults:
 - a. Failure to keep roadways free of waste products,
 - b. Failure to repair gas, brown, manure or water lines,
 - c. Failure to clean up a spill or debris on any right of way caused by BCO or its agents, or
 - d. Noise violations.

If there exists, in the determination of the Town, an immediate need to remedy any such default, the Town may cure the default of BCO and charge to BCO all costs incurred by the Town in relation to such default and the cure, which costs shall be paid by BCO no later than 10 days after demand by the Town. If BCO fails to make payment as required, the Town may levy a tax against the Site.

3. Discretionary Exercise of Remedies; Remedies Cumulative. The Town need not exercise any of the foregoing remedies, but all remedies are cumulative, i.e, exercise of any one or more of the foregoing remedies shall not preclude exercise of any other remedies.

4. Due Process. Any of the foregoing sections notwithstanding, the Town shall not revoke the CUP without affording the defaulting party an opportunity to be heard. Except in the case of defaults for which no cure period is afforded, to the extent such opportunity to be heard does not occur before the expiration of the applicable cure period, such cure period, as to such default only, shall be extended by the number of days afforded in the applicable cure period, commencing on the day the Town issues its determination that the default exists.
5. Suspension of CUP. The CUP shall be suspended and BCO shall immediately suspend operations upon failure to cure the following defaults:
 - a. Lapse of any insurance coverage required by this MOU continuing beyond the cure period;
 - b. Lapse of any permit required in Section II of this MOU;
 - c. A condition that threatens immediate harm to human health or significant property damage;
 - d. The occurrence of any catastrophic event caused by the operation of the Project that renders the operation of the Project unsafe or causes damage to adjacent properties in the Town; or
 - e. Operation in violation of any local, state or federal law.

The suspension shall remain in effect until, in the reasonable determination of the Town, the lapse is cured, satisfactory arrangements have been made to pay any damages caused by the breach and BCO has made sufficient modifications to the Project to satisfy the Town the event giving rise to the default will not recur. If the cure has not been performed within a reasonable time as determined by the Town, in its reasonable discretion, the Town may revoke the CUP and exercise any and all remedies available to it. Suspension shall not extend any cure period that may apply to the defaults listed immediately above.

- E. Interest. Interest shall accrue on any amounts that are not paid by BCO to the Town when and as due at the rate of 12% per annum from the due date until paid in full.
- F. Attorney Fees. If either Party elects to hire legal counsel to pursue any remedy afforded to it in this MOU and that Party is determined by a court or arbitrator to be the prevailing Party in such pursuit, the other Party shall be liable to pay to prevailing Party an amount equal to the prevailing Party's reasonable attorney fees and costs relating to such pursuit, whether such fees and costs were incurred before or during any formal legal proceeding or arbitration.

- G. Limitation of Damages. Anything in this MOU notwithstanding, under no circumstances shall any Party to this MOU be liable to any other Party for any consequential or other indirect damages. The Town reserves all rights of immunity and damage limitations afforded to it by statute, including, but not limited to §893.80 of the Wisconsin Statutes.
- H. Waiver. Failure of the Town to enforce any provision contained herein shall not be deemed a waiver of the Town's rights to enforce such provision or any other provision in the event of a subsequent default. All waivers shall be in writing and shall specify the particular requirement being waived. No waiver given shall constitute a waiver of any provision not specifically waived or of any future violation of the provision specifically waived, unless a written waiver so indicates.

XIV. MISCELLANEOUS PROVISIONS

- A. Assignment.
Except for collateral assignments in favor of BCOs lender(s) or assignment to a wholly owned subsidiary of BCO, any assignment of this agreement shall be subject to the review and consent of the Town, which consent will not be unreasonably withheld. In the case of any assignment of the Digester, or any part thereof to another party, the party to whom the interest is being conveyed will be required by written agreement to assume BCOs responsibilities under the terms of this agreement. It shall not be unreasonable for the Town to withhold consent if the proposed assignee lacks financial or industry ability to operate the Project in conformance with the terms of this MOU and the CUP.
- B. Financial Interest Prohibited. No member of the governing body or other official of the Town shall have any financial interest, direct or indirect, in this MOU, the Project, the Site, or any contract, agreement, or other transaction contemplated to occur or be undertaken hereunder or with respect thereto, nor shall any such member of the governing body or other such official participate in any decision relating to this MOU that affects his/her personal interest or the interests of any corporation, partnership, or association in which he/she is directly or indirectly interested. No member, official, or employee of the Town shall be personally liable to the Town in the event of any default or breach by BCO or any successor to BCO on any obligation of BCO under this MOU.
- C. Non-waiver of Approvals. Nothing herein shall be construed or interpreted in any way to waive any requirement of BCO to obtain all necessary approvals, licenses, and permits from the Town in accordance with the Town's usual practices and procedures, nor limit or affect in any way the right and authority of the Town to approve or disapprove any plans and specifications or protocols, or any part thereof, or to impose limitations, restrictions, and requirements on the development, construction, and/or use of the Site as a condition of any such approval, license, or permit, including without limitation, requiring any and all other and further development and similar agreements. The Town will act diligently and in good

faith to review all necessary approvals, licenses, and permits duly requested by BCO.

- D. Limitation on Personal Liability. In carrying out any of the provisions of this MOU or in exercising any power or authority granted to them thereby, there shall be no personal liability of the Town's officers, agents, employees, or representatives, as, in such matters they act as agents and representatives of the Town.
- E. No Partnership. This MOU specifically does not create any partnership or joint venture between the Parties, or render any Party liable for any debts or obligations of the other Party.
- F. Delivery of Notices. Any notice required hereunder shall be given in writing, signed by the Party giving notice, personally delivered or mailed by certified or registered mail, return receipt requested, to the parties' respective addresses as follows:

To the Town:

Town of Wrightstown
Attn: Town Chair
1527 Day Street
P.O. Box 175
Greenleaf, WI 54126

With a Copy to:

Davis & Kuelthau, s.c.
Attn: James M. Kalny
318 S Washington Street, Suite 300
Green Bay, WI 54301

To BCO:

Dynamic Concepts LLC
Attn: Managing Member
W175N11117 Stonewood Drive, Suite 209
Germantown, WI 53022-6506

With a Copy to:

Thiel Law Office
Attn: John E. Thiel
P.O. Box 7560
Appleton, WI 54912-7075

Notice shall be deemed delivered (a) in the case of personal delivery, on the date when personally delivered; or (b) in the case of certified or registered mail, on the date when deposited in the United States mail with sufficient postage to affect such

delivery.

- G. Headings. Descriptive headings are for convenience only and shall not control or affect the meaning or construction of any provision of this MOU.
- H. Entire Agreement. This MOU, including the recitals above, which are integral parts of this MOU, and all other documents and agreements expressly referred to herein contain the entire understanding between BCO and the Town with respect to the matters set forth herein.
- I. Amendments. No amendment or other modification of this MOU shall be enforceable unless it is in a writing signed by appropriate representatives of each Party and with the actual authority of each Party.
- J. Law Applicable. This MOU is entered into under and shall be construed in accordance with the internal laws of the State of Wisconsin.
- K. Construction. The terms and conditions of this MOU shall be read in the light most favorable to the Town. Before they executed this MOU, each Party had sufficient opportunity to have the document reviewed by legal counsel, and legal counsel for each Party participated in the negotiation and drafting of this MOU. Accordingly, nothing in this MOU shall be construed more strictly for or against a Party on the basis that such Party's attorney drafted this MOU or any portion thereof or attachment hereto.
- L. Severance. If a provision of this MOU, or the application of this MOU is deemed invalid or unenforceable to any extent by a court of competent jurisdiction, then, unless sufficient proof is given that deprives the Party adversely affected by the elimination of such provision of the essential benefits of this MOU, the remainder of this MOU or the application of such provision shall be valid and enforceable to the fullest extent permitted by law.
- M. Recording of Agreement. The Town may record this MOU or a memorandum of this MOU as an encumbrance upon the Site. Upon request of the Town, BCO shall execute and deliver any such memorandum or other document in connection with such recording.
- N. Agreement Binding. This MOU shall be binding upon and inure to the benefit of the parties hereto and their respective representatives, successors, and assigns.
- O. Third Parties. This MOU is made for the exclusive benefit of the Parties and is not for the benefit of any other persons, as third party beneficiaries or otherwise, and this MOU shall not be deemed to have conferred any rights, expressed or implied, upon any other person.
- P. Originals and Counterparts. This MOU may be executed in any number of counterparts, each of which shall be deemed to be an original. Facsimile and photocopies of this MOU shall have the same effect as originals.

APR 29 2026

[Signature page and exhibits follow.]

APR 29 2026

IN WITNESS WHEREOF, the Parties have caused this Memorandum of Understanding to be executed as of the day and year first written above.

BCO:
BC Organics LLC

By: _____
Its: _____

TOWN:
TOWN OF WRIGHTSTOWN

By: _____
Its: _____

By: _____
Its: _____

**EXHIBIT A
RECOMMENDATIONS**

EXHIBIT B
DOCUMENTS OF RECORD

EXHIBIT C
FIRE DEPARTMENT CONDITION REQUIREMENTS

EXHIBIT D
ROAD USE AGREEMENT

Attachment 1:

The Town of Lind Experience and the Board Denial

The Town of Lind Experience

In August 2023, Vanguard Renewables, owned by BlackRock Real Assets, in a contractual agreement with Brooks Farms Dairy, LCC, proposed to **construct, own, and operate** two anaerobic co-digesters on a portion of the Brooks Farms Property. The property involved was part of a living trust, with Zoey Brooks Nelson as the beneficiary. The proposal called for creating a separate 7.851 acre parcel for the co-digester. The newly created parcel would be leased to Vanguard Renewables under a twenty (20) year lease with four five (5) year renewal options. This land was in the Farmland Preservation Program and part of an Agricultural Enterprise zone.

Vanguard Renewables digester "inputs/feedstock" were estimated to be 111 tons of manure produced on the Brooks Farm and an estimated 225 tons of off-site industrial food waste per day. The daily off-site food waste inputs in this proposal were estimated to be over two times as much as the on-site manure inputs. The food waste was to arrive via approximately 20 trucks per day and would be delivered Monday - Saturday.

The proposal stated that the off-site industrial food waste was necessary because the manure stream produced on the farm was not sufficient to effectively and economically operate the co-digester. Initially, township leaders were told that this food waste was simply "tator tots and peas." that later turned out to be food waste from industrial food manufacturing and food processing facilities. (It should also be noted that research shows that manure increases the methane gas production in a co-digester more so than just using industrial food waste).

The manure and industrial food waste would be placed into the anaerobic digester tanks and would capture the methane gas produced. The methane gas would be cleaned, compressed, and then injected in existing natural gas pipelines. The by-products of the digestion process would be separated into solid and liquid digestate. The solid digestate could be used as animal bedding or as fertilizer and the liquid digester would be used as a liquid fertilizer or for irrigation purposes.

A new 12.9 million gallon uncovered lagoon along with the existing 8 million gallon (approximate) manure pit would hold the liquid digestate until it could be used. Solid digestate would be stored in an open air building.

The Waupaca County Planning and Zoning Office determined that the Vanguard-Brooks proposal was not permitted as an ag accessory use/accessory structure under the zoning regulations for an Agricultural Enterprise zone. It also determined that the digester would fall under a solid waste facility (Section 6.7.9). To approve the

Vanguard-Brooks co-digester, the Town of Lind would need to vote to approve a Comprehensive Plan Amendment and Zoning Map Amendment changing the zoning for this parcel to Rural Industrial-Intensive. Additionally, the township would have to vote to approve removing this parcel from the Farmland Preservation Program.

The Vanguard/Brooks proposal was heard at a public hearing held by the Town of Lind Board on February 28, 2024. The Town of Lind Board denied approval for a Comprehensive Plan Amendment, a Zoning Map Amendment, as well as the request to remove the parcel from the Farmland Preservation Program.

ATTACHMENT 1A:

Town of Lind Attorney's Letter

**REVIEW AND ANALYSIS OF PROPOSED WAUPACA
COUNTY ZONING ORDINANCE TEXT AMENDMENT TO
ADD ANEROBIC DIGESTERS USING OFF-FARM FOOD
WASTE AS A NON-DISCRETIONARY PERMITTED
AGRICULTURAL ACCESSORY USE IN AGRICULTURAL
DISTRICTS**

BACKGROUND. The Waupaca County Dairy Farmers Alliance proposed zoning text amendment is in response to the Vanguard/Brooks Farms failure to obtain discretionary approval of a Comprehensive Plan amendment and Zoning Map amendment for an anaerobic digester requiring an estimated 111 tons of manure per day and an estimated 225 tons of off-farm food waste per day in the Town of Lind. The proposed text amendment would make this digester a non-discretionary accessory use, permitted as a matter of right, without any review or approval requirement by either the County or Towns.

In August 2023, Brooks Farms in the Town of Lind and Vanguard, a Massachusetts company (Waupaca AD1, LLC), proposed to construct and operate an anaerobic digester on a portion of the Brooks Farms property at N1757 CTH A. (Attachment A1). The proposal involved creating a separate 7.851 acre parcel by CSM for the digester. (Attachment A2). The newly created parcel would be leased to Vanguard under a 20 year lease with four five year option extensions. (*Id.*)

Vanguard would build, own and operate the anaerobic digester. (Attachment A3). There would be 10-12 permanent Vanguard employees operating the digester on-site Monday through Friday and on call 24/7. (*Id.*)

The anaerobic digester "inputs" are estimated to be 111 tons per day of manure produced on Brooks Farms and an estimated 225 tons of off-site food waste per day. The food waste would be delivered by approximately 20 trucks per day. (*Id.*) Food waste deliveries would be made Monday through Saturday. (*Id.*)

The food waste was necessary because the manure stream produced at Brooks Farm was insufficient to effectively operate the digester. The food waste will be obtained from grocery stores, food manufacturers, restaurants, breweries and the like. (Attachment A1).

The organic manure and food waste is converted to methane gas that is captured and sold to a gas utility. (*Id.*) The remaining liquid is sent through a press where fibrous solids are removed which can be used as a soil amendment or animal bedding. The liquid would then be sent through a filtration system and separated into a thicker nutrient rich fertilizer and a low nutrient water usable for irrigation. (Attachment 1). A 12.9 million gallon storage lagoon would hold the low nutrient water. (Attachment A3).

EXISTING COUNTY ZONING REGULATIONS. The Brooks Farms is currently zoned Agricultural Enterprise District. Farming and animal husbandry are permitted "principal" uses. Relevant permitted "accessory" uses include the following (Section 6.10.5, Attachment B1):

a. A building, structure or improvement that is an integral part of or incidental to an agricultural use.

(5) A facility used for manure storage or bunker silo.

(7) A manure digester, biofuel facility, or other facility that produces energy primarily from materials grown or produced on the farm, primarily for use on the farm.

(8) A waste storage or processing facility used to store or process animal waste produced solely from livestock kept on the farm.

d. A business, activity, or enterprise, associated with an agricultural use which meets all of the following requirements:

(1) It is conducted on a farm by an owner or operator of that farm.

(2) It requires no buildings or structures, or improvements other than those described in 6.10.5a.

(3) It employs the equivalent of no more than four (4) full time employees annually.

(4) It does not impair or limit the current or future agricultural use of the farm or other protected farmland.

The County Ordinance defines "Accessory Use" as follows (Section 1.7, 1) (Attachment B2):

A use of land or structure or portion thereof customarily incidental and subordinate to the principal use of the land or structure and located on the same parcel with the principal use. . .

"Accessory Structure" is defined as follows (Section 1.7, 2) (Attachment B2):

A subordinate structure, the use of which is incidental and customary to that of the principal structure, located on the same lot as the principal structure.

The County Ordinance definitions of an accessory use and an accessory structure follow common zoning practice throughout Wisconsin and the U.S. at large. "Zoning" throughout the country was promoted by the U.S. Department of Commerce by its 1927 "Standard Zoning Enabling Act" adopted by Wisconsin and other states. A model zoning ordinance was also developed. Zoning court cases from other states are informative.

In a New York case it was determined that an accessory use that is too large for an applicant's own proven needs ceases to be naturally and normally incidental to the main use. *Ames v. Palma*, 52 A.D. 2d 1078, 384 N.Y. 2d 587 (1976). In a Michigan case, *Groveland Tp. v. Jennings*,

106 Mich. App. 504, 308 N.W.2d 259 (1981), a corporation proposed to construct and operate, as an accessory use, a treatment plant to process waste and to utilize the finished product as fill for mined cavities on the property. Mining and reclamation was a permitted principal use. The issue was whether the corporation was processing waste to reclaim the land or whether it was reclaiming the land to be allowed to operate a waste processing plant. The court concluded that the dominant purpose was to process waste and reclamation was incidental to that use.

The Waupaca Zoning Ordinance currently sets forth conditions and limitations for a digester to be permissible as an incidental and subordinate accessory use and accessory structure. As for the Vanguard/Brooks proposal, the County Planning and Zoning office determined that the proposal did not meet Ordinance conditions and limitations as an accessory use and accessory structure incidental and subordinate to farming.

In addition, the Vanguard/Brooks proposal fits within the definition of a "Solid or Hazardous Waste Facility" in section 6.7.9 of the County Ordinance. (Attachment B2) The definition is as follows:

Land uses that include any area, lot, land, parcel, building or structure, or part thereof, used for deposit, disposal, processing, or transfer of solid, demolition, or hazardous waste.

Exceptions for "disposal of farm manure and similar farm animal waste generated from farms" (3) and "waste facilities that are on the same land where the waste is generated" (3) do not apply to the Vanguard/Brooks proposal. (Attachment B3)

A DIGESTER IS ALREADY A PERMITTED ACCESSORY USE BUT THE VANGUARD/BROOKS PROPOSAL, BECAUSE OF ITS SCALE AND OPERATION DESIGN, WAS DETERMINED BY THE COUNTY TO BE A SOLID WASTE FACILITY REQUIRING A DISCRETIONARY COMPREHENSIVE PLAN AMENDMENT, AND ZONING MAP AMENDMENT FROM AGRICULTURAL ENTERPRISE TO RURAL INDUSTRY INTENSIVE.

The Vanguard/Brooks Farm proposal involved:

1. Creating a parcel by Certified Survey Map for the construction, ownership and operation of the digester by Vanguard that is separate and apart from the Brooks Farm

the principal structure

3. The Vanguard digester, using an estimated 111 tons per day of on-site Brooks Farm manure and 225 tons per day of off-site food waste does not comply with Section 6.10.5a(7) which requires that a bio-fuel facility produce energy primarily from materials grown or produced on the farm, primarily for use on the farm.
4. The Vanguard digester facility designed to require off-site food waste inputs over two times as much as on-site manure waste inputs does not comply with Section 6.10.5a(8) which requires use of animal waste solely from livestock kept on the farm. (Attachment B2).
5. The Vanguard digester operation, owned and operated by Vanguard, will not comply with Section 6.10.5d., (1) which requires that any business or enterprise associated with agricultural be conducted on a farm by an owner operator.
6. The Vanguard digester proposal is a solid waste facility which is not a permissible use in the Agricultural Enterprise District.
7. The Vanguard digester will have 10-12 permanent employees on-site Monday-Friday and on call 24-7 which does not comply with Section 10.5d(2) which prohibits the employment of more than four (4) full time employees.

Not surprisingly, the Waupaca County Planning and Zoning Office determined that the Vanguard/Brooks proposal was neither an accessory use nor an accessory structure. The Waupaca County Planning and Zoning Office determined that the Vanguard/Brooks proposed digester was a solid waste facility that was not a permitted principal or accessory use or structure and needed a Comprehensive Plan Amendment and Zoning Map Amendment from Agricultural Enterprise to Rural Industrial-Intensive.

**THE TOWN BOARD OF THE TOWN OF LIND DENIED
APPROVAL OF A COMPREHENSIVE PLAN
AMENDMENT/ZONING DISTRICT CHANGE (MAP
AMENDMENT).**

A Comprehensive Plan Amendment is a discretionary decision of the Town. A Zoning Map Amendment is a discretionary decision of the Town. Both require public notice and a public hearing.

The Vanguard/Brooks Farm proposal was heard by the Town Board on February 28, 2024. It was controversial. The public hearing was held in the Waupaca High School Auditorium. Approximately 200 people attended.

The Town Board denied approval for a Comprehensive Plan amendment. A Zoning Map Amendment denial was a procedural consequence of Plan amendment denial.

The Town of Lind Comprehensive Plan called for commercial/industrial development to be located near the USH 10 corridor. The Vanguard/Brooks proposal, a significant commercial/industrial use, was not close to that corridor.

A major concern expressed at the hearing was the use of offsite food waste. The sheer amount of food waste at an estimated 225 tons per day was over twice the amount of manure. There was no proposed limit to the use of off-site food waste.

**THE TEXT AMENDMENT PROPOSED BY
VANGUARD/BROOKS WOULD EXEMPT THEIR
DIGESTER PROPOSAL FROM ANY COUNTY AND TOWN
REVIEW AND APPROVAL.**

The proposed text amendment to the County Zoning Ordinance intends to make the proposed Vanguard/Brooks digester project a permanent accessory use, permitted as "a matter of right" without any County or Town review and approval. It says so. (Attachment C1)

Add anaerobic digesters to the list of Agricultural 'Accessory Uses' which are permitted as a matter of right in both the Ag Enterprise and Ag Retention Zoning Districts, by inserting a new subparagraph (10) in Section 6.10.5.a. of the Zoning Ordinance that reads:

An anaerobic digestion facility that produces energy, regardless of whether the energy is used primarily on the farm, so long as the energy is produced in part from materials or byproducts grown or produced on the farm. An anaerobic digestion facility permitted under this subsection may also utilize biodegradable organic feedstock for the production of energy brought to the farm from elsewhere, provided, however, in no event shall any human waste or hazardous waste be utilized as a feedstock. An anaerobic digestion facility permitted under this subsection shall not be considered a solid or hazardous waste facility under section 6.7.9 (Attachment C1)

There are no limits on size, location, off farm inputs or to amounts or nature, employees, ownership or operation.

**THE PROPOSED TEXT AMENDMENT IS BAD ZONING
POLICY AND BAD PUBLIC POLICY.**

The proposed text amendment is contradictory to the very concept of an accessory use and accessory structure in zoning practice generally and the County zoning scheme specifically. The County Ordinance is not out of date. It is carefully crafted to prohibit a proposal like Vanguard/Brooks' as an accessory use or accessory structure permitted as a matter of right with no limitations or conditions and no County or Town review or approval. That is why existing regulations require digester input to come from the farm, that digester output be used on the farm,

that the digester be located on the same parcel as the farm and that the farm owns and operates the digester.

The proposed amendment is not just an addition to existing requirements. It is a subtraction and will create confusion as to the efficacy and application of other ordinance requirements. Do other ordinance limitations apply? Is it equitable to allow an anaerobic digester unlimited input, output, locations, ownership size and the like while applying limitations to other lesser digester proposals? The proposed amendment is a blueprint for subsequent questionable, inequitable and unfair administration and enforcement.

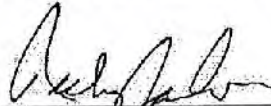
The proposed amendment is bad public policy. It is a special favor or special legislation for the benefit of one property owner. Most importantly, it is a surrender of public oversight and input for a significant land use with significant potential impacts on a Town and its citizens.

Town Boards within Waupaca County will be hard pressed to explain to their constituents that there is no required public notice, comment, scrutiny, or approval for a use that involves importing 225 tons or more per day of food garbage into their Town by an out-of-State corporation owner and operator.

An anerobic digester may be a great idea and indeed, the Waupaca Zoning Ordinance currently sets forth conditions and limitations for a digester to be permissible as an incidental and subordinate accessory use and accessory structure. But even great ideas, when they are expanded to an intensity that has the potential to significantly impact the community, should be subject to some public scrutiny. The proposed text amendment should be rejected.

Dated this 2 day of January, 2025.

TOWN COUNSEL LAW & LITIGATION, LLC



Richard J. Carlson
Town of Lind Attorney

AUG 02 2023

Addendum A
to Zoning Map Amendment Application

Waupaca AD1, LLC ("Vanguard") is proposing to construct, own, and operate an anaerobic digester site ("Anaerobic Digester System") on a portion of the Brooks Farms Dairy, LLC ("Brooks Farms") property located at N1757 County Road A, in the Town of Lind, Waupaca County (the "Brooks Farms Property"), as further described below and in the Application. The Anaerobic Digester System will be located southwest of the dairy farm improvements on the Brooks Farms Property, as further described and depicted in the Application. This Anaerobic Digester System project is the first of its kind in Waupaca County. As such, the existing Agricultural Enterprise Zoning District on the Brooks Farms Property does not expressly contemplate this use. An amendment to the Zoning Map for the subject portion of the Brooks Farms Property is therefore necessary to allow for the Anaerobic Digester System. Despite the Anaerobic Digester System use not being expressly included under the existing Agricultural Enterprise Zoning District, as further outlined below, the proposed Anaerobic Digester System will be intrinsically tied to the agricultural activities on the Brooks Farms Property and will generate numerous benefits for Brooks Farms, the Town of Lind, and the greater Waupaca County community. As such, Vanguard is respectfully submitting this Application to amend the Zoning District for the subject portion of the Brooks Farms Property to Rural Industrial - Intensive.

Across the United States, anaerobic digesters have been used on large dairy farms as a common and effective manure management technology that takes advantage of the microbial activity and organic matter in their manure streams to produce biogas. Smaller dairy farms have been excluded from this type of manure management system, and the numerous benefits it brings to dairy farms, as the volume of manure produced on site is not sufficient to effectively operate an anaerobic digester. Vanguard utilizes codigestion in its anaerobic digesters which augments the manure streams on medium and smaller-sized dairies with an alternate organic waste stream in the form of food waste, which would otherwise be sent to a landfill or directly land-applied. This codigestion process allows a smaller volume of manure to create enough biogas to make the system feasible, allowing family-run dairy farms, like Brooks Farms, to reap the many benefits of this type of system. Vanguard's food waste is typically obtained from several sources including grocery stores, food manufacturers, restaurants, and breweries; and in a variety of forms, including off-spec batches of food and beverage, process wash water from manufacturing plants and breweries, grease from fryolators, back of house discarded food, and packaged food (collectively, "Food Waste"). Much of the Food Waste accepted would be considered fit for human consumption if not for the potential for spoilage concerns, like expiration dates, or a failure to maintain the food at proper temperatures. The incoming Food Waste will be taken into a reception tank or Vanguard's Organics Receiving Area, an enclosed building where the Food Waste is then removed and separated out of any packaging that it arrived in. Once separated from any packaging, the Food Waste is combined with the dairy farm's manure and sent to the Anaerobic Digester System tanks where organic material will break down for approximately 28 days. During this process, the organic material is converted to methane gas that is captured, cleaned, and transferred to the local utility at an injection point on the site. The liquid remaining after digestion is then sent through a screw press, where fibrous solids are removed. This solid can be used as a soil amendment or animal bedding by the farm. The liquid from the screw press will then be sent through a membrane filtration system, where the stream will be separated into a thicker, more nutrient rich fertilizer

4/3 0 8 2023

product with which the farm can apply necessary nutrients to fields at varied rates depending on the crop needs, and a low solids, low nutrient water that can be used to irrigate fields.

As outlined above and as further provided in the attached Project Overview, the Anaerobic Digester System, while requiring an amendment to the Zoning District of a portion of the Brooks Farms Property, will function cooperatively with and to the benefit of Brooks Farms. In so doing, the Anaerobic Digester System will achieve many of the goals of the existing Agricultural Enterprise Zoning District by supporting the continued viability of local, family-owned farms such as Brooks Farms. To minimize any possible concerns regarding the rezoning of the subject portion of the Brooks Farms Property, Vanguard has proposed, and is working with Brooks Farms, to record a deed restriction against the subject portion of the Brooks Farms Property restricting the use of the Brooks Farms Property for certain non-agricultural uses that would otherwise be allowed under the Rural Industrial – Intensive Zoning District.

Addendum A – Conditional Use Permit Application – Brooks Farms Dairy, LLC (new lagoon)

Brooks Farms Dairy has submitted an application for a conditional use to construct a new lagoon on its dairy farm. The lagoon will be utilized by the farm and also in conjunction with the new proposed Vanguard Renewable anaerobic digester project, which has submitted separate applications for that project. The proposed lagoon will be a 12.9M gallon concrete walled lagoon that will serve as storage for the low-nutrient water that is a by-product of the anaerobic digestion process. This low-nutrient water will be utilized to irrigate crop fields on Brooks Farms. Increasing the storage capacity on Brooks Farms allows Brooks to collaboratively work with Vanguard, who is constructing, owning, and operating an anaerobic digester on a portion of the Brooks Farms property.

Anerobic Digester System Project Overview

Project Information

- Project Site: 7.851 acres on Brooks Farms' Property to be subdivided by CSM. The subdivided parcel to be operated by Vanguard under a lease with a 20-year term lease with four 5-year option extensions.
- Anaerobic Digester System Inputs:
 - All of the manure produced at Brooks Dairy (currently estimated to be approximately 111 tons per day).
 - Approximately 225 tons of Food Waste per day.
- Anaerobic Digester System Outputs:
 - Low nutrient water to be used for irrigation on Brooks Farms.
 - Nutrient rich concentrated fertilizer to be land applied per Brooks Farms' nutrient management plan.
 - Separated solids material to be used as a soil amendment or as bedding for cows.
 - Renewable natural gas injected into WEC pipeline for local use, as well as for natural gas usage at the Anaerobic Digester System and Brooks Farms.
- 10-12 permanent employees.
- No significant noise increase from normal operations on farm.
- Approximately 20 trucks per day to site.
- ✓ Anaerobic Digester System will receive food waste deliveries Monday-Saturday.
- Anaerobic Digester System operators will be on site Monday-Friday and on call 24/7.

Farm Benefits

- Sustainable manure management system for continued farm operations.
- Diversification of income streams to support sustained farm operations.
- Eliminate farm reliance on imported fertilizers.
- Reduce need for deliveries of sand to farm.
- Replace sand-laden manure spreading on fields, with irrigation water and fertilizer.
- Reduce need for well water for irrigation of fields.

Community Benefits

- Local job creation.
- Improvement to Cross Road.
- Reduction of materials into local landfills.
- Sequestering methane emissions from food, beverage, and farm waste.
- Odor reduction from spreading digestate instead of manure.
- Local economy impacts of 12-15 months construction.

- a. Required parking is one (1) space per employee on the largest work shift or one (1) space for every two hundred (200) square feet of product display area, depending on the specific land use type.
 - b. Any roadside stand or similar use shall conform to setback, sign and other provisions of this Ordinance, but may be ordered removed by the County Highway Committee, if the Planning and Zoning Committee determines that the use constitutes a traffic hazard or nuisance. Such removal shall be at the landowner's cost if such stand was established after the effective date of this Ordinance. Otherwise the removal cost shall be a consideration of the Highway Committee and the landowner, but the County shall in no way be obligated to pay the cost of removal of such stands.
 - c. In the Farmland Preservation Overlay the use shall meet the standards set forth in Section 6.10.5 for an Agricultural Accessory Use.
5. **Agricultural Accessory Use:** Any of the following land uses on a farm:
- a. A building, structure or improvement that is an integral part of, or incidental to, an agricultural use. This may include, for example:
 - (1) A facility used to store or process raw agricultural commodities, all of which are produced on the farm.
 - (2) A facility used to keep livestock on the farm.
 - ✓ (3) A facility used to store or process inputs primarily for agricultural uses on the farm.
 - (4) A facility used to keep or service vehicles or equipment primarily employed in agricultural uses on the farm.
 - (5) A facility used for manure storage or bunker silo. Setbacks for manure storage facilities are measured from the inside liner.
 - (6) A wind turbine or solar energy facility that collects wind or solar energy on the farm, and uses it to provide energy primarily for use on the farm.
 - ✓ (7) A manure digester, bio-fuel facility, or other facility that produces energy primarily from materials grown or produced on the farm, primarily for use on the farm.
 - ✓ (8) A waste storage or processing facility used to store or process animal waste produced solely from livestock kept on the farm.
 - (9) Farms regularly open for tours, demonstrations, hayrides, corn mazes, farm breakfasts, and other similar events.
 - b. Any activity or business operation that is an integral part of or incidental to, an agricultural use. An example of this land use is a greenhouse:
 - c. A farm residence, including normal residential appurtenances.
 - d. A business, activity, or enterprise, associated with an agricultural use, which meets all of the following requirements:
 - ✓ (1) It is conducted on a farm by an owner or operator of that farm.

1.6 General Interpretation

The following rules of construction shall apply to this Ordinance: The particular shall control the general; in case of any difference of meaning or implication between the text of this Ordinance and any caption or illustration, the text shall control; the word "shall" is always mandatory, whereas the word "may" is permissive; words used in the present tense shall include the future, and words used with singular number shall include the plural, and the plural the singular, unless the context clearly indicates the contrary; building or structure includes any part thereof; the phrase "used for" includes arranged for; the person includes an individual, a corporation, a partnership, an incorporated association or any other similar entity, unless the context clearly indicates the contrary. Where a regulation involves two (2) or more items, conditions, provisions or events connected by the conjunction and, or, either...or, the conjunction shall be interpreted as follows; and indicates that all the connected items, conditions, provisions or events shall apply, or indicates that the connected items, conditions or events may apply singly or in any combination; either...or indicates that the connected items, conditions, provisions or events shall apply singly, but not in combination; the masculine gender includes the feminine and the neutral. Words used in this Ordinance shall be defined first by referring to this Ordinance. If this Ordinance does not contain a definition for the word or words, then the word or words shall be as defined in a common English dictionary used by the Planning and Zoning Director.

1.7 Definitions of Words or Phrases

The following words, phrases and terms, wherever they occur in the Ordinance, shall be interpreted as herein defined. Definitions for land uses are outlined in Section 6.0.

1. **Accessory Use:** A use of land or structure or portion thereof customarily incidental and subordinate to the principal use of the land or structure and located on the same parcel with the principal use except for such accessory parking facilities as are specifically authorized to be located elsewhere, as distinguished from a principal use.
2. **Accessory Structure:** A subordinate structure, the use of which is incidental and customary to that of the principal structure, located on the same lot as the principal structure. No accessory structure or part thereof shall be used for living, sleeping, or eating quarters.
3. **Brew Pub:** A facility for the production of 31,000 gallons or less per year of fermented malt beverages in accordance with Wis. Stats. 125.295 in which a license to operate a restaurant has also been issued under Wis. Stats. 97.30 on the same premises.
4. **Brewery:** A facility for the production of fermented malt beverages, as defined in Chapter 125 of the Wis. Stats., that are sold wholesale and /or off premises directly to retailers as authorized by statute.
5. **Brewery, Micro:** A facility for the production of 100,000 gallons or less per year of fermented malt beverages, as defined in Chapter 125 of Wis. Stats., that are sold wholesale and/or off premises directly to retailers as authorized by statute.
6. **Brewery, Nano:** A facility for the production of less than 10,000 gallons of fermented malt beverages per year that may be bottled, packaged, possessed, stored, sold, shipped, transported, delivered and/or consumed on premise in accordance with

- h. Drainage facilities shall be established to protect surface and groundwater resources.
 - i. Noxious weeds shall be controlled.
 - j. All materials or wastes which might cause fumes or dust, which constitute a fire hazard, or which may be edible or otherwise attractive to rodents or insects may be stored outdoors only if enclosed in containers which are adequate to eliminate such hazards.
 - k. No materials or wastes shall be deposited on a site so as to allow their transportation off the site by normal natural causes.
 - l. No such facility shall discharge at any point into any public or private sewage disposal system or waterway, or into the ground, any liquid or solid materials except in accordance with the regulations of the Wisconsin Department of Natural Resources and the Wisconsin Department of Public Health.
 - m. Toxic and hazardous materials including, but not limited to, gasoline, oil, antifreeze, brake fluids, freon and transmission oil shall be removed from any scrapped engines, vehicles, appliances, or containers on the premises and shall be recycled or disposed of in compliance with applicable regulations.
9. **Solid or Hazardous Waste Facility:** Land uses that include any area, lot, land, parcel, building, or structure, or part thereof, used for deposit, disposal, processing, or transfer of solid, demolition, or hazardous waste.
- a. The following situations do not need to meet the standards set forth below for a solid or hazardous waste facility:
 - (1) Existing facilities and expansion of existing facilities by adding not more than fifty percent (50%) additional capacity, provided that continuing operations and operations of expanded areas follow basically the same current operating patterns and comply with applicable laws and rules.
 - (2) Transfer, treatment and disposal of farm manure and similar farm animal waste generated from farms in Waupaca County or immediately adjoining lands.
 - (3) Solid or hazardous waste facilities that otherwise would meet the tests of applicability, but that are on the same land where the waste is generated and are conducted as part of the farm or business, other than waste treatment/disposal business on that land.
 - b. Any waste facility to which this Ordinance applies must have advance approval and the issuance of a Conditional Use Permit by Waupaca County before operations may be commenced.
 - c. To approve such a facility, the Planning and Zoning Committee must determine that the facility will not harm the health, safety and welfare of the community and the good order and convenience of the community and the public.
 - d. In making approvals, the Committee is encouraged to impose reasonable requirements on applications in order to avoid nuisance conditions.

PROPOSED ZONING DISTRICT: RURAL INDUSTRIAL INTENSIVE (RI-I)

12-09-21 2
Parcel Boundary and Property (PMP)

12-09-21 1

12-09-22 1

12-09-21 3

12-09-21

12-09-21 1

12-09-21

12-09-22

12-09-21



8/16/2023, 9:58:15 AM

To Order Maps Or To Report A Problem Visit:
www.co.wisconsin.gov/maps

Facilities - Building (2018 LIDAR)

Zoning Collector GPS

Parcel Numbers

Map Data Sources -> Wisconsin County Land Information

ATTENTION!

THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT
INTENDED TO REPRESENT A PROFESSIONAL SURVEY. THE
BOUNDARIES SHOWN ON THIS MAP ARE BASED ON THE BEST
AVAILABLE DATA AND SHOULD NOT BE USED FOR ANY
LAW ENFORCEMENT OR OTHER LEGAL PURPOSES. THE
COUNTY ENGINEER'S OFFICE IS NOT RESPONSIBLE FOR
ANY ERRORS OR OMISSIONS ON THIS MAP. FOR MORE
INFORMATION, CONTACT THE COUNTY ENGINEER'S OFFICE.



Attachment 2:

**What was NOT Disclosed to the Town of Lind Prior to Planning
Commission Decisions**

**What Citizens Learned After Submitting FOIA Requests and
Corresponding with WI DNR Staff**

What was disclosed to the Town of Lind Planning Commission prior to the September 5th, 2023 Meeting:

- Copy of the Comprehensive Plan Amendment Application
- Copy of the Zoning Map Amendment Application
- Copy of Conditional Use Permit Application for Solid/Hazardous Waste Facility/Anaerobic Digester
- Copy of Conditional Use Permit Application for Manure Lagoon

What was not disclosed to the Town Planning Commission prior to the September 5, 2023 Meeting but information that was received when concerned citizens did open records request to the WI DNR.

WASTE WATER DISCHARGE:

2022.08.16 Joseph Carlson, Braun intertec, sends email to Heidi schmitt Marquez WI DNR stating that "the facility (biodigester) **will not have any regulated wastewater discharges.**

2022.11.08 Heidi Schmitt Marquez, WI DNR, in email to Joseph Carlson, Braun Intertec states that the **Brooks CAFO permit will be modified to add an industrial wastewater outfall/discharge**

Industrial Food Waste:

2022.10.06 Heidi Schmitt Marquez, WI DNR, in an email to Joseph Carlson, Braun Intertec, requests clarification re: the source of food waste that will be used in the biodigester.

2022.11.08 Joseph Carlson, Braun Intertec, in an email to Heidi Schmitt Marquess, WI DNR, clarifies the sources of food waste that will be used in the biodigester: **"the majority of these food wastes will be sources from industrial food processing and food manufacturing facilities."**

2023.03 MSA Professional Services Report entitled "Vanguard Renewables Waupaca AD1" submitted to the WI DNR states **"the daily amount of food waste received is anticipated to be approximately 225 tons per day... which correlates to approximately 15,000,000 gallons annually of offsite waste. All of the application documents state 225 tons per day.**

NEW POINT SOURCE DISCHARGE:

2022.12.13 Joe Baeten, WI DNR, in an email to Andy Skwor (MSA) copying in Jenise Anderson, (MSA), Libby McDonald, Alexander Wrocklage and Sofia de la Puente (all from Vanguard Renewables) and Bethani Chambers (WI DNR) states that **the Brooks CAFO and biodigester are in the Upper Fox/Wolf Impaired Waterway/TMDL**. He goes on to state, "Since this (digester) is a **NEW POINT SOURCE DISCHARGE**; the farm will need to either conduct Water Quality trading or request reserve capacity."

2023.06.15 WI DNR conducts evaluation of an Unnamed Tributary to Walla Walla Creek that will be the 'receiving waters' for the biodigester's industrial wastewater discharge.

2023.08.08 and 2023.08.14 Waupaca County Planning and Zoning receives Brooks'/Vanguard's Conditional Use Permit and Zoning Map Amendments that **DO NOT mention the point source/industrial wastewater discharge by the Brooks/Vanguard biodigester**, instead they state "low nutrient water to be used for irrigation on the Brooks farm."

2023.08.14 Joe Baeten sends a memorandum to David Bolha, WNDNR Water Quality Biologist with results of the 6/15 water quality evaluation of Walla Walla Creek. The evaluation found that **"total nitrogen was high, relative to the concentration typically found in an unimpacted surface water."** The total nitrogen was 8.7 mg/L (per EPA, recommended levels are between 2 mg/L and 6 mg/L) in the Unnamed Tributary directly adjacent to the biodigester and will be receiving "an average, recurring discharge of 41,000 gallons per day" of industrial wastewater.

Nutrient Management Plan:

2023.3 MSA report for Vanguard Renewables Waupaca AD1 Brooks Farms Dairy LLC, Waupaca County, WI to WI DNR states **"the farm is aware that the nutrients brought into their permit will exceed what their acreage can currently have applied**. The farm is discussing options, including but not limited to selling the additional nutrients that Vanguard is bringing into the digesters. **The agreement between Vanguard and the Farm states that the Farm's nutrient management plan will not be exceeded."**

Who will Manage the Digesters:

2023.3 MSA report for Vanguard Renewables Waupaca AD1 Brooks Farms Dairy LLC, Waupaca County, WI to WI DNR uses contradictory language.

Page 13 states "Vanguard personnel are required to operate, **manage**, and maintain all facilities of the transfer system, **anaerobic digesters**, and digester recirculation." However, page i states: "**the digesters will be managed by a third party.**"

Handling of Digestate:

2022.11.02: Email from Joseph Carlson (Braun Intertec) to Heidi Schmitt Marquez, DNR states "land application of liquid or solid digestate is subject to NR 214 ADM. CODE: LAND TREATMENT OF INDUSTRIAL LIQUID WASTE and BY-PRODUCTS SOLIDS AND SLUDGES."

2023.11.30: Email from Heidi Schmitt Marquez, WI DNR to Lind citizen states, " **INDUSTRIAL WASTE CANNOT SIMPLY BE RE-LABELED FERTILIZER**; the waste would be subject to an additional process or additions to change its characteristics substantially enough to be able to be called a fertilizer product rather than a waste.

2024.01.14 Planning and Water Quality-Based Effluent (Digestate) Limitations for Brooks Farms Dairy LLC WPDES Permit No WI-0066885 document states, "since the **anaerobic digestion system is expected to take in manure and food waste**, PFOS and PFAS may be present in the effluent (digestate). Therefore, **effluents (digestate)** should be monitored for PFOS and PFAS every 2 months."

*Supporting Documents Can Be Made Available
Upon Requests*

Attachment 3:

**Lessons Learned from Environmental and Regulatory Violations from
Co-digesters Owned and Operated by Vanguard Renewables.**

MA & VT Regulatory Violations from Co-Digesters Owned by Vanguard Renewables

Digester Details	Regulatory Issues & Violations
Spencer AD1 Jordan Dairy Farm 56 Northwest Rd Spencer, MA Low cost energy, hot water, heat biogas	Inaccurate Documentation¹ - Facility failed to include EPA certificate of conformity stating that the engine at the facility meets the applicable emission standards. - Facility failed to conduct a sound survey within 180 days of continuous operation of their combined heat and power engine generator which was required as a condition of their permit. - Facility failed to conduct a stack test within 180 days of continuous operation of their combined heat and power engine generator which was required as a condition of their permit. - Facility, "...failed to submit an Environmental Results Program Certification for an emergency engine within 60 days of the date of commencement of operation. Specifically, Respondent installed and began operating a 300-kW emergency engine at the facility in 2013 but did not submit an ERP certification form to MassDEP until June 28, 2021." Environmental Violations - Emitted over their permitted threshold for hydrogen sulfide for 25 days between April 17, 2020 and October 27, 2021. Failure to Report Violations - Emissions reports from April 2019-2020 did not include emissions from an emergency engine that was installed in 2018 and operated for 105 hours in 2019. Failure to Monitor and/or Record Emissions - Facility failed to "...continuously monitor and average over an hourly block basis the methane, hydrogen sulfide, oxygen, and carbon dioxide concentrations of the gas stream exiting the anaerobic digester at the facility, as required by the Plan Approval, on 559 days between April 17, 2020 and October 27, 2021." - Facility failed "to keep specified records in compliance with the Plan Approval...on at least 559 days between April 17, 2020 and October 27, 2021 respondent was not maintaining complete hourly on-site records of methane, hydrogen sulfide and carbon dioxide concentrations and temperature of the gas stream exiting the anaerobic digester before combustion..." Fined \$13,788 by MassDEP in 2022
Haverhill AD1 Crescent Farms 75 Willow Avenue Haverhill, MA Electricity for grid	Inaccurate Documentation² - Facility failed to conduct a sound survey within 180 days of continuous operation of their combined heat and power engine generator which was required as a condition of their permit. - Facility failed to conduct emissions testing within 180 days of continuous operation of their combined heat and power engine generator which was required as a

¹ <https://fileservice.eea.comacloud.net/V1.4.0/FileService.Api/file/CETracker/cedecfej>

² <https://fileservice.eea.comacloud.net/V1.4.0/FileService.Api/file/CETracker/ghgfjdqj>

	condition of their permit. • 2018- MassDEP found during an inspection that the facility was operating an emergency engine for non-emergency purposes for 5,370 hours (which continuously would be over 7 months). • 2021- MassDEP found during an inspection that since 1/21 the facility had installed and operated a temporary diesel boiler to maintain the temperature of the digester at the same time the CHP was running. The heat from the CHP was not being recovered. Environmental Violations • As a result of their failure to construct a secondary control system to control potential hydrogen sulfide emissions, this resulted in numerous exceedances of their permit (see chart on p. 5) ○ 52 permit violations for exceedance of hydrogen sulfide in 3 years, 8 months ■ 2/11/19-10/05/22 • In November 2021, part of the digester failed and released 51,309 cf of biogas into the environment. • In March 2022, the facility released around 1.3 million gallons of digestate on ground surfaces adjacent to the operation. Failure to Report Violations • ...for the period of 10/14/20 to 10/15/20, respondent failed to send an email to MassDEP stating that the facility had returned to compliance. ○ For that day, hydrogen sulfide emissions were over twice (537 ppm) as high as the threshold (200 ppm). Failure to Monitor/ Measure Emissions • Inspection uncovered that the digester did not have a secondary control system for hydrogen sulfide emissions. • Facility failed to produce any records of emissions for CHP and backup flares during inspection on 5/13/2021. Fined \$77,950 by MassDEP in 2022
Hadley AD1 Barstow Longview Farms 172 Hockanum Rd Hadley, MA Electricity for grid	Environmental Violations • An unannounced inspection of facility on August 22, 2021 revealed violations of MassDEP air-quality and hazardous waste management requirements. • Failed to manage waste oil in accordance with provisions of Massachusetts regulations including proper signage "Waste Oil." ○ Failed to complete hazardous waste manifests accurately for waste oil ○ Failed to properly mark and label container(s) accumulating waste oil. ○ Failed to develop and implement requirements governing emergency procedures, prevention, and response. ○ Failed to perform required inspections of waste oil container(s) and accumulations area(s) Failure to Monitor and/or Keep Accurate Records • Failed to conduct routine checks of the Carbon Monoxide catalyst on each engine for efficiency on a quarterly basis using hand held combustion gas analyzer.

	• Related to flare: Failed to conduct compliance testing for total particulate matter required within 90 days of commencement of continuous operation of EU8. • Related to receiving tank: Failed to conduct weekly monitoring of hydrogen sulfide content entering and leaving the first drum in the series to determine when to replace drums. • Related to biofilter: Did not properly monitor moisture sensors to control optimal moisture control and did not notify MassDEP of a change in protocol. • Failed to monitor the differential pressure gauge to measure pressure drop across the biofilter. • Failed to routinely record the moisture level of biofilter media or confirm that the biofilter media was uniformly wetted. • Failed to record the pressure drop across the biofilter media on a weekly basis. • Did not maintain records required by the Plan Approval onsite for a minimum of five (5) years • Did not make records required by the Plan Approval available to MassDep and personnel upon request. Notice of Non-Compliance: 2 additional NON's; 10/14/2016 4/30/2018. Fined \$2000 by MassDEP in 2020
Rutland AD1 Jordan Dairy Farms 51 Muschopauge Rd Rutland, MA Electricity for grid	Environmental Violations³ • From 2020-2021, MassDEP found that this facility violated their air permit by emitting more hydrogen sulfide than their permit allowed for 87 days in a row. • The facility was in violation of their air permit for the month of November 2021 when it emitted 0.29 tons of VOCs and the limit is 0.23 tons. Failure to Report Violations • Facility failed to report excess emissions of VOC from the flare at the facility within 3 business days after discovery of the exceedance and with a written report within 10 days. • Facility failed to report excess emissions of hydrogen sulfide from the facility within 3 days and with a written report within 10 days thereafter on 12 of the 87 days between March 4, 2020 and November 8, 2021. Failure to Monitor/ Measure Emissions • Facility failed to continuously monitor and average over an hourly block basis the methane, hydrogen sulfide, oxygen, and carbon dioxide concentrations of the gas stream exiting the anaerobic digester at the facility, as required by the Plan Approval, on 615 days between March 4, 2020 to November 8, 2021. • "Respondent failed to continuously measure the biogas consumption rate of the flare and did not monitor the run-time of the flare in hours as required by Plan Approval on 122 days between September 1 2021 and December 31, 2021." • "Respondent failed to keep specified records in compliance with the Plan Approval... on at least 165 days between March 4, 2020 to November 8, 2021, respondent was not maintaining complete hourly on-site records of methane, hydrogen sulfide and carbon dioxide concentrations and temperature of the gas

³ <https://fileservice.eea.comacloud.net/V1.4.0/FileService.Api/file/CETracker/qfbdahac>

	stream exiting the anaerobic digester before combustion...” • “Respondent failed to follow a specified monitoring schedule and protocol... Respondent sampled gas exiting the digester at the facility using a portable analyzer instead of a sorbent tube on 36 days... when the in-line analyzer was not working properly. In addition, the Respondent sampled stale gas rather than fresh gas on 90 days from March 4, 2020 to June 1, 2020, producing erroneous readings of the concentration of hydrogen sulfide in the gas.” Fined \$28,201 by MassDEP in 2022
Salisbury AD1 Goodrich Farms 589 Shard Villa Rd Salisbury, VT	Environmental Violations • On May 27, 2021 staff from the Vermont Environmental Agency visited the Goodrich Farm site due to a reported spill of 25,000-30,000 gallons digestate into stormwater drain leading to the gravel wetland area due to operator error. Additional digestate was present in a constructed stormwater gravel wetland area adjacent to the facility parking lot. • Vermont Environmental Agency staff conducted a follow-up visit on June 21, 2021 and observed two to four inches of digestate present at the bottom of the constructed stormwater gravel wetland area. Agency staff issued a Notice of Alleged Violation directing removal and proper disposal of the digestate waste from the stormwater gravel wetland area. • September 8, 2021, Salisbury AD 1 removed 11.43 tons of material from the stormwater gravel wetland area and it was disposed of at the Addison County Solid Waste Management District Transfer Station. The digestate spilled from the facility is classified as solid waste as defined by Vermont SWMR 6201. ◦ Agency alleged conduct constituted violations of Vermont Solid Waste Management Rules ■ Disposal of solid waste outside of a certified facility is prohibited ■ Discharge reporting with 24 hours requirement ■ Solid Waste Management Facility Certification Condition 9: Owner and Operator shall take all steps necessary to prevent and/or control spills. ◦ Respondents admitted the factual findings in order to resolve the case. Failure to Report Violations • First digestate spill happened on April 21, 2021 but was not reported until May 26, 2021 in violation of discharge reporting within 24 hours requirement. Fined \$4500.00⁴ by (Vicki add details here)
Deerfield AD1 Bar Way (Garellick) Farms	2020⁵ Environmental Violations • The facility exceeded their hydrogen sulfide emissions limit (over 200 ppm) multiple times between August 2019-April 2020.

⁴ State of Vermont Superior Court Environmental Division Assurance of Discontinuance Agreement dated March 15, 2023. Vermont Superior Court Filing 10/10/23 Environmental Division.

⁵ <https://fileservice.eea.comacloud.net/V1.4.0/FileService.Api/file/CETracker/fcdgfige>

188 Mill Village Rd
Deerfield, MA

- Document did not say exactly how many times these exceedances occurred and how high the levels went.
- “For a period of approximately 24 hours, respondent did not achieve 98% hydrocarbon destruction while routing biogas to flare 1.”
- Facility failed to properly handle waste oil from generators according to hazardous waste regulations.

Failure to Monitor and/or Record Emissions

- Facility failed to monitor the hydrogen sulfide concentration of the activated carbon filter on a weekly basis.
- Facility failed to conduct routine checks of the carbon monoxide catalyst’s control efficiency on a 90-day schedule.
- Facility did not maintain an audible alarm to alert the operator of the absence of a flame while biogas was routed to the flare.
- Respondent failed to maintain onsite records for each time the ferric chloride/ferric hydroxide system for hydrogen sulfide control was implemented including but not limited to time and date.
- Facility failed to record the hourly block average hydrogen sulfide concentrations at the outlet of the digester, leading to the generator set.

Failure to Report Violations

- The facility failed to notify the MassDEP about any of the hydrogen sulfide exceedances when they should have reported them within 3 business days.

Fined \$2,000 by MassDEP in 2020

2022⁶

Environmental Violations

- Deerfield AD 1, LLC has reported 58 exceedances of its daily average hydrogen sulfide emission limit.
- After evaluation of these exceedances, the MassDEP has determined that there were 15 emission limit exceedances that appeared to have been preventable and/or the result of operator error, in noncompliance with Section III. Paragraph 7. A. as follows:
 - Deerfield AD 1, LLC has reported thirteen (13) exceedances of the H2S emission limit starting 10/28/2020 and continuing to 11/11/2020. The exceedances were the result of higher levels of gas production by the anaerobic digester and failure of the operator(s) to make an adjustment to the system when the levels of H2S became elevated.
 - Deerfield AD 1, LLC has reported two (2) exceedances of the H2S emission limit starting 2/23/2020 and continuing to 2/24/2020 that were, according to Deerfield AD 1, LLC, due to a failure of the ferric chloride H2S control system because the supply of ferric chloride was not maintained and was depleted (operator error).

Fined \$7,500 by MassDEP in 2022

⁶ <https://fileservice.eea.comacloud.net/V1.4.0/FileService.Api/file/CETracker/gbjdbdhj>

Hydrogen Sulfide Exceedances for Haverhill AD1

Dates of Exceedance	Reported Concentration Limit > 200 ppm
2/11/19	211
2/12/19	212
2/13/19	236
3/11/19	612
3/12/19	765
8/05/20	240
8/06/20	207
10/14/20	537
10/15/20	403
10/27/20	312
10/28/20	278
3/16/21 (AM)	600
3/16/21 (PM)	400
3/22/21	460
5/07/21	302
10/15/21	224
10/18/21	254
10/20/21	204
10/21/21	340
10/22/21	230
10/25/21	368
10/26/21	334
10/27/21	201
10/28/21	213
1/03/22	204
1/06/22	206
1/07/22	228
1/12/22	238
1/13/22	201
1/19/22	296
1/20/22	293
1/21/22	258
1/24/22	311
1/25/22	323
1/26/22	324
1/27/22	245
1/28/22	292
1/31/22	297
2/01/22	297
2/02/22	300
2/03/22	300
2/04/22	250
6/22/22	400
9/09/22	250
9/16/22	210
9/19/22	250
9/20/22	270
9/21/22	220
9/22/22	225
10/03/22	250
10/04/22	250
10/05/22	210

Agency for Toxic Substances and Disease Registry Profile for Hydrogen Sulfide

Three Exposure periods: Acute (14 days or less); Intermediate (15-364 days); and Chronic 365 days or more)

Death

- Death occurring after acute exposure to hydrogen sulfide appears to be the result of respiratory failure or arrest, with most cases initially presenting with respiratory insufficiency, noncardiogenic pulmonary edema, coma, and cyanosis.
- There have been numerous case reports of human deaths after acute exposure to presumably high concentrations (≥ 500 ppm) of hydrogen sulfide gas (Beauchamp et al. 1984)... Snyder et al. (1995), summarizing 10 years of data (1983–1992) from the Poison Control Centers National Data Collection system, indicated that at least 29 deaths and 5,563 exposures were attributed to hydrogen sulfide during that time period.
- After being exposed to hydrogen sulfide in a bathroom connected to a manure pit, a man developed nausea, vomiting, dizziness, dyspnea, and died a few hours later; hemorrhagic bronchitis and asphyxiation were noted as the cause of death (Parra et al. 1991).
- After developing decerebrate responses to painful stimuli and partial seizures, with subsequent indications of brain stem damage, a 16-year-old boy died (Hagley and South 1983). He was exposed to what was presumed to be hydrogen sulfide in a liquid manure tank; 2 weeks after exposure, hydrogen sulfide concentrations measured 30 cm below the tank manhole were >150 ppm, the detection limit of the equipment.
- In another incident, a 16-year-old boy was 10 meters away from an underground liquid manure storage tank (the contents of which had been agitating for 30–60 minutes) when he began coughing, vomited, lost consciousness, and died (Morse et al. 1981). Autopsy showed tracheobronchial aspiration of stomach contents, focal pulmonary hemorrhages and edema, and small petechial brain hemorrhages. Hydrogen sulfide concentrations were found to be >60 ppm (equipment detection limit) under similar conditions in the vicinity of the accident 2 days later.
- In another report, two maintenance workers at an animal tanning company collapsed and died no more than 45 minutes after entering a sewer manhole. A hydrogen sulfide concentration of 200 ppm was obtained just inside the manhole 6 days after the accident (NIOSH 1989).
- In another case, a worker at a poultry feather processing plant died after being exposed to hydrogen sulfide gas for an estimated 15–20 minutes (Breysse 1961). Testing performed later in the area where the exposure occurred indicated that hydrogen sulfide concentrations ranged from 2,000 to 4,000 ppm. Pulmonary, intracranial, and cerebral edema along with cyanosis were noted at autopsy.
- Studies performed using laboratory animals exposed to high concentrations of hydrogen sulfide gas have yielded results similar to those observed in humans exposed at high levels. Exposure of Sprague-Dawley rats to 1,655 ppm killed all five animals within 3 minutes (Lopez et al. 1989). All male F-344 rats exposed to 500–700 ppm hydrogen

sulfide gas for 4 hours died, while no rats died when exposed to concentrations up to 400 ppm under these conditions (Khan et al. 1990; Lopez et al. 1987, 1988a, 1988b).

- Acute exposure to >500 ppm hydrogen sulfide is considered to cause rapid respiratory failure (Beauchamp et al. 1984). (p. 26).

Chronic Health Effects

- A significant increase in respiratory symptoms (OR=11.92; 95% CI=4.37–12.42) was reported by residents living in two communities (Odessa, Texas and Puna, Hawaii) with chronic low levels of industrial sources of hydrogen sulfide, as compared to residents living in two comparable communities without known sources of hydrogen sulfide pollution (Legator et al. 2001). The most commonly reported respiratory symptoms were wheezing (25–30%), shortness of breath (40–45%), and persistent cough (10%); each of these effects had an incidence of approximately 5% in the referent communities.
- Increases in similar respiratory symptoms were also observed in residents of communities where toxic waste containing high levels of hydrogen sulfide were illegally dumped in Côte d'Ivoire (Dongo et al. 2012), in residents living near sour gas/oil fields (sour gas is natural gas containing significant amounts of hydrogen sulfide) in southeast New Mexico (Kilburn et al. 2010), and in communities near swine feeding operations in east North Carolina (Schinasi et al. 2011). A positive association was found between 12-hour mean hydrogen sulfide atmospheric concentrations and the incidence of self-reported signs of respiratory effects (particularly runny nose, wheezing, and difficulty breathing and nasal irritation) (Schinasi et al. 2011).
- In a study of residents living near a hog manure lagoon, an increased frequency of shortness of breath while climbing stairs was observed when compared to residents living 3 km from the lagoons or residents living in another state. However, there were no increases in the frequency of shortness of breath while at rest or while walking (Kilburn 2012). Expiratory flows and vital capacity were also significantly decreased in the exposed residents; a higher incidence of chest tightness, dry mouth, and throat tightness was also reported.

Attachment 4:

**Lessons Learned and Additional Concerns Raised from a Review of
Denials of Permits Submitted to the Pennsylvania Department of
Environmental Protection by Vanguard Renewables for a Similar
On-Farm Codigester Proposal**



"As we discussed during our meeting on April 9th, we would like to withdraw the Plan Approval Application for the proposed Elverson AD1 site (Plan Approval No. 06-03192B). We plan to resubmit a revised and complete Plan Approval Application for the same site when we have more clarity on... See more

AHS.DE.PA.GOV

www.ahs.dep.pa.gov



Sandra Thomas, Kim Pierson Dupre and 39 others

15 comments 1 share



Like



Comment



Share



Anonymous

April 2 · 🌐

...

On 3/21/25, the PA DEP issued its second technical deficiency letter to Elverson AD1 regarding its air quality permit application:

https://www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleAuth.aspx?AuthID=1495687

Here is the deficiency letter (email) that was sent to Elverson AD1:

From: Wetzel, Brian <briwetzel@pa.gov>

Sent: Friday, March 21, 2025 7:17 AM

To: kmartin@vanguardrenewables.com

Cc: Suddard, Kelsey <KSuddard@braunintertec.com>; Pascucci, Vincent <vpascucci@pa.gov>

Subject: Elverson AD PA 06-03192B - Technical Deficiency Letter 2

Upon receipt of this e-mail, please send a brief reply to acknowledge receipt

Kim Martin

Vice President of Development

Elverson AD 1, LLC

133 Boston Post Road

Weston, MA 02493-2525

Re: Technical Deficiency Letter 2

Elverson AD 1, LLC

Plan Approval No 06-03192B

APS ID# 1119752, AUTH ID# 1495687

Caernarvon Township, Berks County

Kim:

The Department has reviewed your application and has determined that the following significant deficiencies exist. This information is being requested pursuant to 25 Pa. Code §127.12(a)(2).

Technical Deficiencies

1. The Application's Cover Letter.



measurements of the gas exiting the H₂S removal system (pretreatment step) and the renewable natural gas going to the pipeline. The difference in the two values represents the amount of H₂S being emitted to the atmosphere." Why does Elverson believe monthly monitoring of the H₂S emissions from the tail gas is sufficient even though the H₂S data from the Salisbury, VT (Attachment C) indicates high variability in the H₂S content of the digester gas.

- b. Page 6. Response to Item 11 claims "H₂S content of the Elverson AD 1 biogas is based on actual monitored data from six operating Vanguard Organics co-digestion sites. Based on this data, annual average H₂S in the biogas is expected to be well below 500 ppm." Attachment C only lists data for the Salisbury, VT facility. Please provide the data for the other five co-digestion sites along with permitted material throughputs.

2. Section A. Facility Description.

- a. The description mentions "The proposed facility will receive biomass feedstock (dairy cattle manure) from Kurtland Farms..." Where will the delivered manure be stored? The provided site plan indicates a manure pit (Structure 11). What is the size of this pit? How will malodors from manure delivery be minimized/eliminated?
- b. The description further states "Excess fiber removed from the digester will be stored on a covered storage pad until the materials are used for animal bedding." This operation is not designated on the Site Plan Layout nor is it discussed further in this application. Please discuss this operation including throughputs, handling procedures and address any emissions, including possible odors, associated with the process. Will all material be used onsite or will excess material be shipped offsite?
- c. Please discuss the end use of the digestate from the lagoon, including the amount and responsible party for the disposal of the liquid. Where will excess material be shipped if there are no end users of the liquid?

3. Section B. Regulatory Overview.

a. Subsection B.2.a

i. Fugitive Particulate Matter (123.2). The section claims "The unpaved roadway is located interior to the site away from the property boundary. Based on the expected fugitive emissions from the unpaved roadway and distance of the roadway from the property, emissions are not expected to be visible outside the property boundary." Per the site plan provided, the unpaved (gravel) roadway to the proposed lagoon area is accessed from State Route 23. Please address the procedures to prevent dust and carryout of dirt and/or mud onto State Route 23.

ii. Odor Emissions (123.31). Lagoon emissions/odors were not discussed. Please address how odors will be minimized from this source.

- 1. Section C. Potential to Emit Calculations, Subsection C.7 – Digestate Lagoon. The section claims "The digestate lagoon is also not heated or mixed.", yet Table 12, Road Emissions list 10 vehicles per day hauling a total of ~60,000 gallons of digestate from the site. How will this pumping frequency not result in mixing and the release of emissions?

2. Section D. Best Available Technology

- a. Subsection D.3 – Biogas Upgrading System. The analysis claims "Any additional add-on control for VOC, H₂S, and CH₄ would not be economically feasible and likely not



feasible controls and then the economic feasibility of the available control for the tail gas for this site.

- b. Subsection D.7 – Roadways. The application states "There will be a small stretch of unpaved roadway for trucks to load digestate from the digestate lagoon, located interior to the site, away from any property boundaries." What will be done to prevent fugitive dust and carryout of dirt and/or mud onto State Route 23?
- c. Please provide a Top Down BAT Analysis for controlling/reducing emissions from the lagoon operations.

3. Section E. Proposed Monitoring, Work Practice Standards, and Recordkeeping

- a. Subsection E.2 – Anaerobic Digesters and Flare. It is mentioned that "Elverson AD 1 will also maintain flow meter(s) to measure the flow of gas from the anaerobic digesters to the flare." By what method and how often will the H₂S concentration of the gas from the digesters be monitored/recorded? Further, the facility proposes H₂S emissions in the tail gas to be less than 5 ppm. The National Institute for Occupational Safety and Health (NIOSH) lists the odor threshold of hydrogen sulfide between 0.01 – 1.5 ppm, while the U.S. Department of Health and Human Services Public Health Service Agency for Toxic Substances and Disease Registry lists an odor threshold of 0.0005 – 0.3 ppm. Please address how malodors from the tail gas will be minimized/controlled.
- b. Subsection E.4 – Hydrolysis Tanks and Odor Control System. The section states that "Monitoring associated with the odor control system will be proposed upon selection of control device type." According to the facility's 12/16/24 technical deficiency response, carbon adsorption is now proposed to control emissions from the hydrolysis tanks. Please provide monitoring, work practice standards, and recordkeeping requirements for the carbon canisters. Further, how and at what frequency will the H₂S exhaust content of the hydrolysis tanks control system be monitored?
- c. Please provide monitoring, work practice standards, and recordkeeping requirements for the lagoon operations.

4. Attachment A, Permit Application Forms

a. General Information Form.

i. Land Use Information. The applicant has checked "Yes" to Question 5 - *Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval?* & Question 6 - *Have you attached Municipal and County Land Use Letters for the project?* The zoning approval documentation in Attachment G is a meeting agenda and not the zoning approval. Please provide proof of zoning approval and provide the Municipal and County Land Use Letters.

ii. Section F. Please provide the latitude and longitude for the stack locations.

1. Attachment B. Potential to Emit Calculation

- a. Process Rates, Data, and Assumptions. The max flow of the biogas is listed as 650 scfm, yet the DMT Carborex MS proposal provided in the facility's 12/16/24 technical deficiency response specifies a flow of 600 scfm. Please address the discrepancy.
- b. Tables 3 & 4. Emergency Generator Criteria Pollutant Potential to Emit & Emergency



Manufacturer Information specifies a 265 kW generator with a max natural gas throughput of 2,782 cf/hr. Please address the discrepancies.

c. Table 5. Safety Flare Criteria Pollutant Potential to Emit.

i. The CO₂ emission factor of 107 lb/mmBtu can't be verified; nor can the emissions of CO₂ & CO₂e be verified. Please address.

1. Table 8. Biogas Upgrading System Potential to Emit.

i. The tail gas flow is listed as 350 cfm; however, the airflow in the DMT Carborex MS proposal in the facility's 12/16/24 technical deficiency response specifies an airflow of 400 cfm. Please address the discrepancy.

ii. The emissions of H₂S and NH₃ can't be confirmed. Please provide detailed calculations for the emissions.

1. Table 9. Hydrolysis Tanks Potential to Emit.

i. The calculations specify a volumetric flow of 1,000 cfm; however, the spec sheet from CARBTROL specifies an airflow of 100 acfm. Please address.

ii. The concentration source is listed as "Process Knowledge". Please provide supporting data for the basis for the concentrations, i.e. testing, monitoring of similar operations, etc.

iii. The NH₃ emissions can't be confirmed. Please provide detailed calculations for the emissions.

1. Table 11. Digestate Lagoon Potential to Emit.

i. The calculations assume "*The total biogas generated in the lagoon is estimated to be 12% of the biogas generated in the digester*". Please provide the supporting basis for this value.

ii. Please provide the supporting documents for the basis of the expected microbial activity in the lagoon.

iii. CH₄ emissions specify a "Covered Lagoon Estimation" yet Section C.7, Digestate Lagoon specifies an open lagoon. Please clarify the discrepancy.

iv. H₂S emissions state that "*300 ppmv is a typical average H₂S concentration; short term peaks can reach 2,500 ppm*". How long and frequent will the 2,500 ppm events last & occur? What will be done to eliminate these events? Please note, The National Institute for Occupational Safety and Health (NIOSH) has determined that 100 ppm is immediately dangerous to the life or health of workers. Further, the Occupational Safety and Health Administration (OSHA) lists an exposure of 1,000 to 2,000 ppm as nearly instant death.

v. CH₄, NH₃, H₂S emissions can't be confirmed. Please provide the supporting equations and supporting documents for the basis of the calculations.

vi. The calculations use an average temperature to determine emissions. Please provide worst case emissions based on the average highs for the area.

1. Table 12. Paved Roads Potential to Emit.

i. The calculations specify a line item for "loading at lagoon". Please explain this operation and the material throughput.

1. Attachment C. Biogas Hydrogen Sulfide Data – Salisbury, VT Co-Digestion Facility. Please provide the hard data used to generate the analysis/table. Further, the facility's response to



sites. Additionally, please provide a breakdown of the other Vanguard facilities to include the amount and type of incoming feeds and facility throughputs.

2. Please provide a copy of the Pennsylvania Natural Diversity Index (PNDI) for this project.

Please be aware that the habitat screening for the Northern Long-Eared Bat (*Myotis septentrionalis*) is now required in all counties of the Commonwealth of Pennsylvania and must be completed by the permittee. All previous PNDI receipts dated prior to March 31, 2023, are no longer valid, and an updated PNDI search is required to be run prior to the performance of any additional regulated work.

3. In regards to the facility's 12/16/24 technical deficiency response to DEP's 11/18/24 technical deficiency letter.

- a. Comment 2 Response. The response mentions that "All food waste, including fats, oils, grease, and glycerin will be delivered via enclosed tanker truck as a pumpable liquid or slurry." Prior to receipt, what specifications will the material need to meet? What testing will be performed by Elverson and/or the shipping facility prior to receipt? If testing will be performed, at what frequency will they be conducted?
- b. Comment 3 Response. Elverson responded that "The estimated throughput of food waste is approximately 225 tons per day with a maximum volume of approximately 330 tons per day. The estimated throughput of manure is approximately 33 tons per day." Yet Section B of the application lists a total of 357.5 tons. Please address the discrepancy. Furthermore, the application stated that this process will average 10 truck deliveries of food waste per day. As this equates to each truck carrying 25 tons at a rate of 225 tons per day, the higher daily rates do not equate to 10 trucks per day. Please verify and explain the estimate of the daily number of trucks which will deliver food waste to the facility. Will all incoming/outgoing trucks be 6,000-gallon tractor trailers?
- c. Comment 4 Response. Elverson responded that "Overpressure and underpressure protection for the hydrolysis tanks will be provided via a pressure vacuum relief valve system." How will odors and emissions be minimized during overpressure events?
- d. Comment 6 Response states "To avoid the release of raw biogas to the atmosphere during a flare shutdown, the digesters have headspace that can store additional raw biogas production. Depending on the day and the operating conditions, the digester membranes will be operated at partial capacity. Headspace within the membrane is subject to fluctuation, but it can take up to an hour for gas buildup in the membrane to occur in the event of a flame out." Will the facility be permanently staffed so that issues like those mentioned are address immediately? If gas buildup were to occur, what would the consequences be if it were not addressed?
- e. Liberty Comment 2 Response. Elverson indicated "Vanguard will prepare an ambient air quality modeling analysis. The analysis will be used to predict estimated ambient hydrogen sulfide concentrations at the Facility's property line and nearby sensitive receptors. Vanguard will submit a memo summarizing the modeling methodology and results to the PA DEP and Caernarvon Township. Vanguard expects to submit the memo by mid-January and will keep the PA DEP and Caernarvon Township updated on any changes to this estimated schedule." Please be aware that a modeling protocol must be submitted for DEP's review and approval before the modeling results are submitted.



5. In regards to any changes made to those items listed above, please provide updated emissions calculations, tables and applicable application forms.

Summary:

Please submit a response fully addressing each of the significant technical deficiencies set forth above within 30 days or DEP may deny the application, or, if this timeframe is insufficient, please promptly propose an alternative expeditious schedule for your response. Should you have any questions regarding the identified deficiencies, please contact me to discuss your concerns or to schedule a meeting. The meeting should be scheduled within the 30 day period allotted for your reply, unless otherwise extended by the Department.

If you believe the stated deficiencies are not significant, instead of submitting a response to those deficiencies, you have the option of asking the Department to make a decision based on the information with regard to the subject matter of that deficiency that you have already made available. If you choose this option with regard to any deficiency you should explain and justify how your current submission satisfies the deficiency. Please keep in mind that if you fail to respond, your application may be denied.

You may also follow your application through the review process via *eFACTS on the Web* at: <http://www.ahs2.dep.state.pa.us/eFactsWeb/default.aspx>. If you have any questions or concerns on this matter, please call me at 717.705.4875 or briwetz@pa.gov.

Brian Wetzel | Air Quality Permitting

Department of Environmental Protection

Southcentral Regional Office

909 Elmerton Avenue | Harrisburg, PA 17110

Phone: 717.705.4875 | Fax: 717.705.4830

www.dep.pa.gov

PRIVILEGED AND CONFIDENTIAL COMMUNICATION

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21 comments 9 shares



Authorization Search Details

[Search again](#)

Authorization ID:	1495687
Permit number:	06-031928
Site:	ELVERSON AD 1 LLC
Client:	ELVERSON AD 1 LLC
Authorization type:	Minor Facility Plan Approval New Source Performance Std
Application type:	New
Authorization is for:	FACILITY
Date received:	08/09/2024
Status:	Withdrawn on 4/18/2025

Sub-Facilities for Authorization

Sub-Facility ID	Sub-Facility Name	Description	eMap PA Location
1390564	BIOGAS UPGRADE PROCESS	Process	View Map in eMapPa
1390546	BOILER 1	Combustion Unit	View Map in eMapPa
1390553	BOILER 2	Combustion Unit	View Map in eMapPa
1380933	DIGESTER TANK 1	Process	View Map in eMapPa
1390561	DIGESTER TANK 2	Process	View Map in eMapPa
1390556	EMERGENCY GENERATOR (265 KW)	Process	View Map in eMapPa
1390580	ENCLOSED FLARE	Air Pollution Control Device	View Map in eMapPa
1426041	HYDROLYSIS TANK 2 (325,000 GAL)	Process	View Map in eMapPa
1426042	HYDROLYSIS TANK 3 (30,000 GAL)	Process	View Map in eMapPa
1390555	NATURAL GAS	Fuel Material Location	View Map in eMapPa
1426043	ODOR CONTROL SYSTEM, CARBON ADSORPTION	Air Pollution Control Device	View Map in eMapPa

Is this authorization type included in Permit Decision Guarantee? : Yes

Permit Decision Guarantee status: VOID

Authorization status: Withdrawn on 4/18/2025

Elapsed business days: 161

Permit Review Standard Task Information:

Task	Start Date	Target Date	Completion Date
☒ Completeness Review	8/9/2024	n/a	8/22/2024
☒ Technical Review	8/22/2024	8/1/2025	4/18/2025

Permit Review Notes:

Date	Review Note
4/18/2025	The technical review and decision review are complete and either the permit decision and/or permit issuance are forthcoming.
3/21/2025	Applicant has been issued a deficiency letter. If applicable, this application no longer qualifies for the Permit Decision Guarantee.
12/16/2024	Applicant has sent documents responsive to the Deficiency Letter. The review of the application has resumed.
11/18/2024	Applicant has been issued a deficiency letter. If applicable, this application no longer qualifies for the Permit Decision Guarantee.
8/22/2024	The permit application package is complete, has been accepted, and is undergoing technical review.

Log in to DEP's eNOTICE to track this permit with automatic email updates

WJ
8/22/24



Pennsylvania
**Department of
Environmental Protection**

May 30, 2025

Ms. Kim Martin
Elverson AD1, LLC
133 Boston Post Road, Building 15, 2nd Floor
Weston, MA 02943

Re: Withdrawal of Application
Elverson AD1
NPDES Permit Application No. PAD060115
Caernarvon Township, Berks County

Dear Ms. Martin:

On September 24, 2024 the Berks County Conservation District (district) received the above-referenced application. On April 22, 2025, the Department of Environmental Protection (DEP) notified you by letter that the application was technically deficient and identified the deficiencies that must be corrected.

The 30-day time period, with any applicable extensions, expired on May 23, 2025 and the information required to make your application technically adequate has not been received. Therefore, the DEP considers your application to be withdrawn and no further action will be taken. Fees are not refunded when an NOI or application is considered withdrawn and DEP's Payback policy does not apply. You may submit a new application for the project at your discretion.

If you have questions about the information contained in this letter, please contact me by e-mail at natphillip@pa.gov or by telephone at 717.705.4798 and refer to Application No. PAD060115.

Sincerely,

Nathan Phillips

Digitally signed by Nathan
Phillips
Date: 2025.05.30 07:22:39
-04'00'

Nathan Phillips, P.E.
Permit Section Chief
Southcentral Regional Office

cc: Berks County Conservation District
Matthew Mack, P.E., Mack Engineering, Inc.



Anonymous
January 17 · 🌐

Last month, the PA Department of Environmental Protection sent an "Intent To Deny" letter to Vanguard Renewables, stating that one of its application permits for the proposed digester facility at Kurtland Farms was "incomplete due to Elverson's [AD1] failure to provide sufficient information for the Department to provide a technical review, as required by applicable laws and regulations."

The DEP gave Vanguard 15 days to respond, and if no response was received, they requested that Vanguard withdraw the application until all of the information needed for the review was available.

I wrote to the DEP and asked them to please check the status of Vanguard's application. This is the reply I received from the DEP this morning...

Good Morning,

I apologize for the delay in getting back to you. Regarding the general permit application submitted by Elverson AD1, LLC, the Department originally granted an extension for their response to the Administrative Incompleteness Review Letter on December 6, 2024, providing them until January 8, 2025. This was to allow them to attend the scheduled Township meeting and provide us with a more accurate response to our questions, based on discussions at the meeting. Since the meeting was postponed, the Department has asked that Elverson AD1, LLC withdraw their application until they have all the necessary information to respond to our comments in the Administrative Incompleteness Letter.

If you have any additional questions, please let me know.

Thank you,

Michele



Southcentral Regional Office
909 Elmerton Ave | Harrisburg, PA 17110
Phone: 717.705.4924

<http://www.caernarvon.org/.../Elverson%20AD1%20-%20DEP...>

DEP.P
www.dep.p





more



PDF

air-quality.pdf



20

12 comments



Like



Comment



Anonymous

February 19 · 🌐

...

I mentioned here earlier that when asked on their construction permit application if the project site for Elverson AD1 is located in an area known for karst features, Vanguard's engineering firm checked the "no" box, and when asked to identify naturally occurring geologic formations or soil conditions that may have the potential to cause pollution after earth disturbance activities are completed, Vanguard's engineering firm responded, "None the underline geologic formation is sandstone."

Why does their answer matter? If they had checked "yes" for karst features, they would have had to perform a subsurface geotechnical investigation or explain why they did not perform it.

According to the Pennsylvania Stormwater Best Management Practices Manual:

"Karst aquifers are vulnerable to contamination when the natural filtration capability of soil is bypassed due to thin soils, sinkholes or subsurface open fractures and voids. Contaminants can enter the karst system and travel long distances over a relatively short period of time....The worst scenario is to ignore karst features entirely and thus significantly increase the potential for costly delays, repairs, catastrophes and legal proceedings."

Vanguard's engineering firm submitted a geologic map (see attached photo) of Caernarvon Township along with their construction permit application. It claims to show that the bedrock under Elverson AD1 is sandstone and dolomite, but if you zoom in on it, you discover that most, if not all, of the bedrock under Elverson AD1 is dolomite, a soluble bedrock that fractures and develops karst features (like sinkholes and depressions) over time.

In 2016, a report was prepared for Sunoco to assess the potential impacts and provide for the protection of surface and groundwater from contamination due to the construction of its Mariner 2 pipeline in karst regions.

Here is an aerial photo of one of those regions, showing Caernarvon Township. Kurtland Farms can be seen in the lower right-hand corner. Ten depressions (indicated by yellow triangles) are shown on that property and several more to the west of it. Interestingly, there was at one time a surface mine (indicated by a blue square) on Kurtland Farms (that spot appears to be where a retention basin for stormwater is located today), and another surface mine was located not far from it:

<https://files.dep.state.pa.us/.../PPP%20Karst%20Plan...>

Here is another aerial photo of that area. Kurtland Farms can be seen in the upper left-hand corner (look for the two blue squares). The numerous yellow triangles to the south of the farm is





to note that these yellow triangles are NOT everywhere in the photo -- In fact, they seem to end just a little to the east of Kurtland Farms:

<https://files.dep.state.pa.us/.../PPP%20Karst%20Plan...>

Why would those photos indicate surface mines on and adjacent to Kurtland Farms? Many years ago, there were dolomite limestone quarries and a lime kiln at and near that location. The lime was used to make pig iron and also used as a fertilizer.

Here is a book titled, Geology and Mineral Resources of the Honeybrook and Phoenixville Quadrangles, Pennsylvania (1938)

<https://pubs.usgs.gov/bul/0891/report.pdf#page=125>

It states:

"In The Conestoga Valley only two limestone quarries were being worked in 1937. Amos J. Stoltzfus is quarrying limestone 2 miles west of Morgantown beside the highway and burning it in three kilns. In a modern plant the lime is pulverized and packed in barrels and bags. The product is sold as 'Maxwell's Hill blue stone lime for all agricultural purposes.'"

"Just north of the crossroads three-quarters of a mile east of Morgantown, Walter Stoltzfus is taking limestone from an old quarry in which the beds dip 70 degrees and pulverizing it in a small plant for use raw on the soil."

That crossroads was likely what is today Twin Valley Road and Main St.

Here is an 1862 map of Robeson and Caernarvon Townships, Berks County. Near the bottom, you see the Conestoga Turnpike (now Rt.23/Main St), and to the right of its intersection with what is now Twin Valley Road, you see the property of Abraham Kurtz, Lime Quarries, and a dot marked LK (Lime Kiln).

https://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~222076~5505761:Robeson-and-Caernarvon-Townships%2C-B?sort=pub_list_no%2Cseries_no&qvq=q:caernarvon%20berks%20county%20pa;sort:pub_list_no%2Cseries_no;lc:RUMSEY~8~1&mi=0&trs=1

In summary, the site of Elverson AD1 has multiple karst features and a history of mining limestone. A subsurface geotechnical investigation should be required by the DEP before any permits are issued for it.



PDF

geology-AD1.pdf



18

24 comments



Like



Comment



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End of results



From: Suddard, Kelsey <KSuddard@braunintertec.com>
Sent: Monday, December 16, 2024 4:00 PM
To: Hartline, Darrell <dahartline@pa.gov>; Development@vanguardrenewables.com
Cc: Hanlon, Thomas <thanlon@pa.gov>; Wolff, Jennifer <jwolff@braunintertec.com>;
Bibilonisambolin, Sarah <sarahb@braunintertec.com>; Sol Ucciani
<succiani@vanguardrenewables.com>; Oliver Wan <owan@vanguardrenewables.com>; Annalee
May <amay@vanguardrenewables.com>; Libby McDonald
<lmcdonald@vanguardrenewables.com>; jslade@all4inc.com; pmallon@all4inc.com
Subject: [External] RE: Elverson AD 1 Air Quality Plan Approval Application Technical Deficiency
Letter

ATTENTION: This email message is from an external sender. Do not open links or attachments from unknown senders. To report suspicious email, use the [Report Phishing button in Outlook](#).

Mr. Hartline,

Please find linked below a response to your November 18, 2024 Technical Deficiency Letter for the proposed Elverson AD 1, LLC Plan Approval Application.

 [Technical Deficiency Letter Response, B2403969.pdf](#)

Please let me know if you have any questions or require any additional information.

Regards,



Kelsey Suddard, PE

Senior Engineer

1826 Buerkle Road | St. Paul, MN 55110

651-442-7322

ksuddard@braunintertec.com

braunintertec.com | [Twitter](#) | [LinkedIn](#) | [Facebook](#)

*PE license in Minnesota

From: Hartline, Darrell <dahartline@pa.gov>
Sent: Monday, November 18, 2024 6:46 AM
To: Development@vanguardrenewables.com
Cc: Suddard, Kelsey <KSuddard@braunintertec.com>; Hanlon, Thomas <thanlon@pa.gov>
Subject: Elverson AD 1 Air Quality Plan Approval Application Technical Deficiency Letter

Upon receipt of this e-mail, please send a brief reply to acknowledge receipt

Ms. Kim Martin

Vice President of Development
Elverson AD 1, LLC
133 Boston Post Road

Weston, MA 02493-2525

Re: Technical Deficiency Letter
Elverson AD 1, LLC

Plan Approval Application

Plan Approval No. 06-03192B
APS ID# 1119752, AUTH ID# 1495687
Cacrnarvon Township, Berks County

Dear Ms. Martin:

The Department of Environmental Protection (DEP) has reviewed the above referenced application and has identified the following significant technical deficiencies in the proposal. This information is being requested pursuant to 25 Pa. Code §127.12(a)(2).

Technical Deficiencies

1. Please identify all equipment associated with emission sources and controls and provide appropriate descriptions, makes, model numbers, throughputs and exhaust stack descriptions as requested in the plan approval application. We need to know what equipment you plan to install and operate.
2. Fats, oils, grease and glycerin will be delivered to Hydrolysis Tank #3 but are not discussed in the narrative. How will these materials be delivered and handled to minimize odors?
3. Please provide an estimate of the throughput (tons/day) of each of the three (3) main waste material categories.
4. Do the hydrolysis tanks have a system to control pressure in the tanks? If so, how will it work?
5. When the hydrolysis tanks odor control system is down for maintenance or repair, how will the odors be minimized?
6. When the biogas is flowing to the flare, in the event of a flame out and the flare does not re-ignite, what will happen to the biogas?
7. What will be the combustion temperature range for the safety flare to operate effectively?
8. The hydrogen sulfide concentration in the tail gas will be determined by a mass balance calculation. Please provide your proposed test method to determine the hydrogen sulfide concentration.
9. Please respond to the two (2) comments submitted in the Liberty Environmental Inc. comment letter, dated November 13, 2024, on behalf of Caernarvon Township. See attachment.

Please submit a response fully addressing the significant technical deficiencies set forth above within 30-calendar days or DEP may deny the application. Or, if you believe that time frame is not feasible, please promptly propose an alternative, expeditious time frame for providing the requested information.

If you believe that the stated deficiencies are not significant, instead of submitting a response to the deficiency, you have the option of asking DEP to make a decision based on the information with regard to the subject matter of that deficiency that you have already made available. If you choose this option with regard to any deficiency, you should explain and justify how your current submission satisfies that deficiency. Please keep in mind that if you fail to respond, your application may be denied.

Any meeting should be scheduled within the 30-day period allotted for your reply, unless otherwise extended by DEP. You may also follow your applications through the review process via eFACTS on the Web at: <http://www.ahs2.dep.state.pa.us/eFactsWeb/default.aspx..>

Should you have any questions regarding the identified deficiencies, please feel free to contact me at 717-705-4879 or dahartline@pa.gov to discuss your concerns or to schedule a meeting.

Attachment

Sincerely,

Darrell Hartline

December 16, 2024

Project B2403969

Mr. Darrell Hartline
Air Quality Permitting Section
Air Quality Program
Pennsylvania Department of Environmental Protection

Re: Technical Deficiency Letter
Elverson AD 1
Plan Approval No, 06-03192B
APS ID# 1119752, AUTH ID# 1495687
Caernarvon Township, Berks County

Dear Mr. Hartline:

On behalf of Elverson AD 1, LLC, Braun Intertec Corporation submits the following response to the Technical Deficiency Letter dated November 18, 2024 for the Air Quality Plan Approval Application for the proposed Elverson AD 1 renewable natural gas (RNG) facility (Plan Approval No. 06-03192B, APS ID# 1119752, AUTH ID# 1495687) to be located in Berks County, Pennsylvania (Facility). Each of the comments or questions in the Technical Deficiency Letter are addressed below.

1. Please identify all equipment associated with emission sources and controls and provide appropriate descriptions, makes, model numbers, throughputs and exhaust stack descriptions as requested in the plan approval application. We need to know what equipment you plan to install and operate.

Response:

Updated portions of the Plan Approval Process Form are included as Attachment A to this letter to identify all equipment associated with emission sources and controls and to provide descriptions, makes, models numbers, throughputs, and exhaust stack parameters. Please note that this information is based on a similar project and is the best available information at this time. Makes, models, and equipment specifics may vary from what is presented in Attachment A upon construction of the proposed Facility, but emissions estimates for this equipment presented in the Plan Approval Application represent worst case emissions. Attachment A includes the following updated portions of the Process Form: Section B – Process information; Section C Air Cleaning Device, item 8 Adsorption Equipment and item 12 Flares; and Section F Flue and Air Contaminant Emissions, item 2 Stack and Exhauster. Attachment B includes manufacturer specifications.

The Plan Approval Application presented two possible control technology types for control of odors from the hydrolysis tanks. Vanguard will move forward with the carbon adsorption system rather than the biofilter, so Attachment A does not include information on the biofilter. Additionally, the Facility will have two hydrolysis tanks instead of three hydrolysis tanks (hydrolysis tank 1 has been removed from the proposed Facility). An updated process flow diagram reflecting these changes is included as Attachment C.

2. Fats, oils, grease and glycerin will be delivered to Hydrolysis Tank #3 but are not discussed in the narrative. How will these materials be delivered and handled to minimize odors?

Response:

All food waste, including fats, oils, grease, and glycerin will be delivered via enclosed tanker truck as a pumpable liquid or slurry. The liquid tanker truck will park in one of the unloading bays. At this bay, the truck will connect through a camlock and hose assembly to the unloading port. Material flows from the unloading port directly into one of the hydrolysis tanks through a pipeline system. The unloading of materials is a fully enclosed process. Additionally, the head space of the hydrolysis tanks is vented to a carbon adsorption system to minimize odors.

3. Please provide an estimate of the throughput (tons/day) of each of the three main waste material categories.

Response:

The process has two main waste material categories: 1.) food waste which is inclusive of fats, oils, and greases, and 2.) manure. The estimated throughput of food waste is approximately 225 tons per day with a maximum volume of approximately 330 tons per day. The estimated throughput of manure is approximately 33 tons per day. However, feedstock throughput will vary based on availability and digester needs,

4. Do the hydrolysis tanks have a system to control pressure in the tanks? If so, how will it work?

Response:

Yes, overpressure and underpressure protection for the hydrolysis tanks will be provided via a pressure vacuum relief valve system.

5. When the hydrolysis tanks odor control system is down for maintenance or repair, how will the odors be minimized?

Response:

The hydrolysis tanks will vent to a carbon adsorption system. The carbon canisters will operate in a lead-lag configuration. Therefore, a back-up carbon canister is always available for standby duty in the event that maintenance is required on the lead canister.

6. When the biogas is flowing to the flare, in the event of a flame out and the flare does not re-ignite, what will happen to the biogas?

Response:

If the flare flames out and does not re-ignite, emergency shutdown systems will be activated to stop the biogas upgrading process and stop the flow of gas to the flare.

To avoid the release of raw biogas to the atmosphere during a flare shutdown, the digesters have headspace that can store additional raw biogas production. Depending on the day and the operating conditions, the digester membranes will be operated at partial capacity. Headspace within the membrane is subject to fluctuation, but it can take up to an hour for gas buildup in the membrane to occur in the event of a flame out. Furthermore, the flare is used for emergency purposes so typical industry standards do not anticipate the simultaneous occurrence of a flare ignition and subsequent flameout, followed by a failed re-ignition attempt under emergency conditions.

7. What will be the combustion temperature range for the safety flare to operate effectively?

Response:

The manufacturer-provided temperature range for the safety flare is 1382-2120 degrees Fahrenheit (see Attachment B).

8. The hydrogen sulfide concentration in the tail gas will be determined by a mass balance calculation. Please provide your proposed test method to determine the hydrogen sulfide concentration.

Response:

Hydrogen sulfide is analyzed at the inlet (post-hydrogen sulfide removal) using electrochemical sensors. Hydrogen sulfide is measured in the product gas stream using a gas chromatograph.

9. Please respond to the two comments submitted in the Liberty Environmental Inc. comment letter, dated November 13, 2024, on behalf of Caernarvon Township.

Comment 1. Liberty Environmental Inc.

Hydrolysis Tank Odor Control System – The permit application identifies that a single “odor control system” will be installed on the three hydrolysis food waste slurry storage tanks. The system is described on page 13 of the application as “either an activated carbon (or similar media) absorption system or biofilter”. We request that PA DEP require the applicant to identify which of these two systems will be used, to provide vendor guaranteed emission rates, and to provide specifications and operation/maintenance procedures for the odor control system. Because a single 1,000-cfm system is proposed to control the three storage tanks, we also believe it is important to describe how the system will operate to ensure control of odors during storage tank slurry loading from tanker trucks. Liberty notes that the applicant provided “generic” specifications from vendor Biorem for a “biofilter” and for a “catalytic activated carbon dry scrubber” in Attachment E, but provided none of the specific information requested in Section C of the application forms, and did not include any stack parameters associated with these air pollution control devices.

Response:

The proposed Facility will control odors from the two hydrolysis tanks through carbon adsorption. Updated Plan Approval Forms and vendor guarantees for a similar project are included in Attachment A and B respectively.

A single 1,000 cfm odor control system was previously proposed when the Facility design included an Organics Receiving Area which would have generated the majority of the odors, has a significantly higher volumetric flow rate than the hydrolysis tanks, and that would require a larger odor control system. Since removing the Organics Receiving Area from the Facility design, the expected odor concentration is significantly lower, thus a lead-lag carbon canister odor control system is sufficient to provide the odor control necessary.

Comment 2. Liberty Environmental Inc.

Compliance with PA’s Hydrogen Sulfide Ambient Air Quality Standards – The permit application identifies emissions of hydrogen sulfide (H₂S), a highly malodorous compound that is regulated in Pennsylvania with ambient air quality standards (25 PA Code 131.3) limiting ambient air concentrations to a maximum of 0.1 ppm (1-hour average) and 0.005 ppm (24-hour average). The applicant identifies H₂S concentrations of up to 5 ppm in the “biogas upgrading system tail gas”, up to 10 ppm in the safety flare exhaust (98% destruction of 500 ppm H₂S in the biogas), and H₂S annual emissions of about 400 pounds per year from the “digestate lagoon”. We request that PA DEP

require the applicant to demonstrate that overall project H₂S emissions will meet the PA ambient air quality standards at the facility property line and at the "sensitive receptors" (schools, churches, medical care facilities) identified on the applicant's Figure 2.

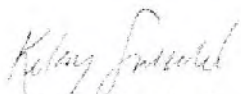
Response:

To demonstrate compliance with Pennsylvania's hydrogen sulfide Ambient Air Quality Standards at 25 PA Code 131.3, Vanguard will prepare an ambient air quality modeling analysis. The analysis will be used to predict estimated ambient hydrogen sulfide concentrations at the Facility's property line and nearby sensitive receptors. Vanguard will submit a memo summarizing the modeling methodology and results to the PA DEP and Caernarvon Township. Vanguard expects to submit the memo by mid-January and will keep the PA DEP and Caernarvon Township updated on any changes to this estimated schedule.

Please contact Kelsey Suddard at 651.442.7322 or ksuddard@bruanintertec.com should you have any questions or require any additional information.

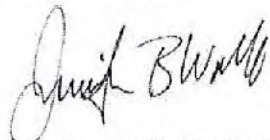
Sincerely,

BRAUN INTERTEC CORPORATION



Kelsey E. Suddard

Senior Engineer



Jennifer B. Wolff, PG, CPG, CHMM

Associate Director, Senior Scientist

Attachment:

Attachment A: Plan Approval Forms

Attachment B: Manufacturer Information

Attachment C: Process Flow Diagram

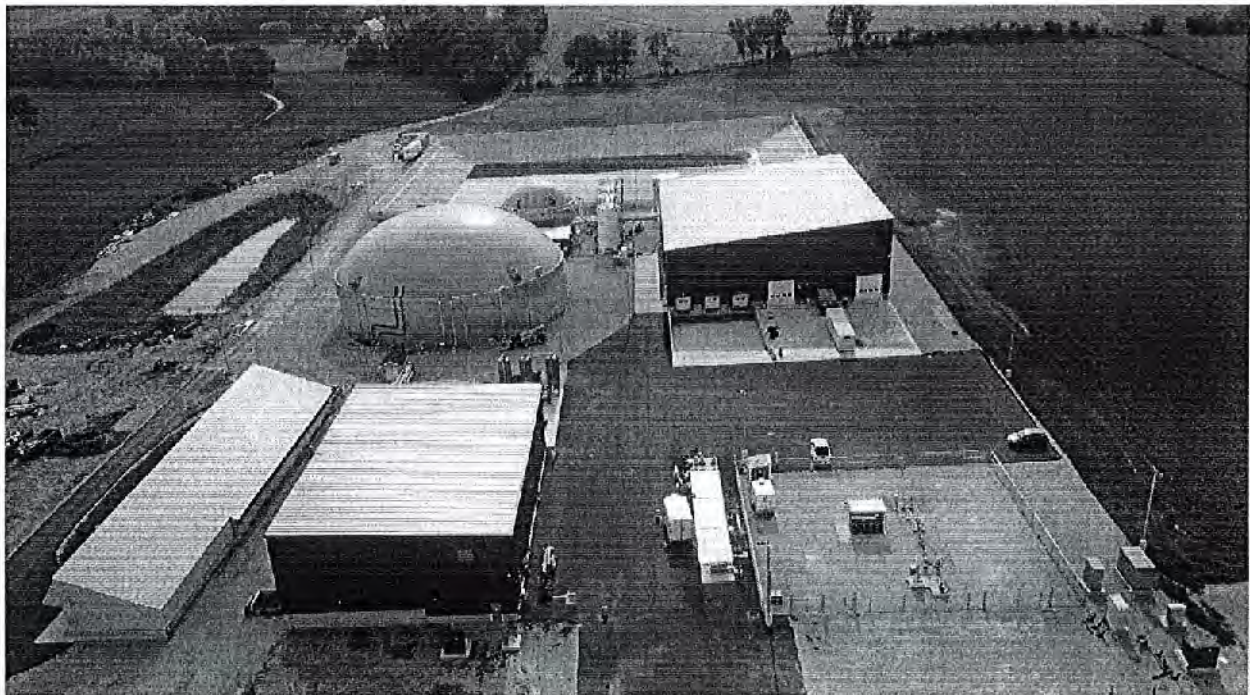
Attachment 5:

**Information on the Two Farms with Digesters that this Committee Was
Encouraged to Visit**

Here is information on the two farms that Zoey Brooks Nelson suggested that the Waupaca County Planning and Zoning Committee members should visit to gain information on co-digesters. The first farm, Dinnerbelle Farms in Eden, WI has been operational only since late May of 2025. Of special note is the maximum acceptance rate of industrial food waste materials (500 tons per day). The second farm, Abel Farms of Eden, WI is a manure only digester according to DNR records and is housed on a farm with 4400 dairy cows.

Dinnerbelle Farms, Eden, WI: Vanguard co-digester on a 275 dairy cow farm. A quote from their Air permit states: Eden will receive biomass feedstock (dairy manure) from the Dinnerbell Dairy farm and food waste from nearby food production facilities. Manure and food waste will be fed into an anaerobic digester. The expected food waste acceptance rate is approximately 100,375 tons per year (275 tons per day) **with a maximum acceptance rate of 182,500 tons year (500 tons per day)**. Food waste materials will be fed into the digester continuously during operation. **Less than half of the material fed to the anaerobic digester will be comprised of manure and more than half will be comprised of food waste materials from local third-party organizations and facilities.** Dinnerbelle Farms co-digester was completed and announced it was operational on May 28, 2025.

<https://americanbiogasCouncil.org/vanguard-renewables-opens-anaerobic-digestion-and-depackaging-facility-at-dinnerbell-farms-in-eden-wisconsin/>

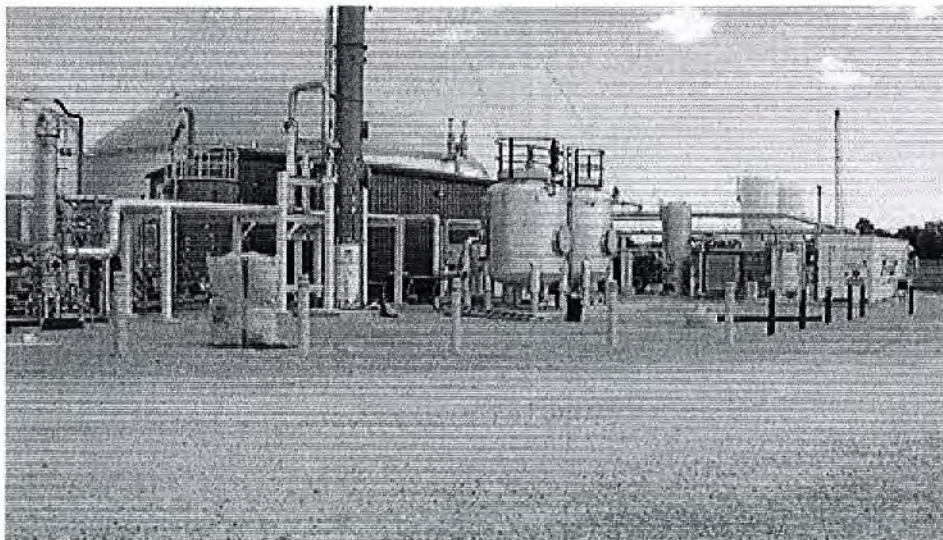


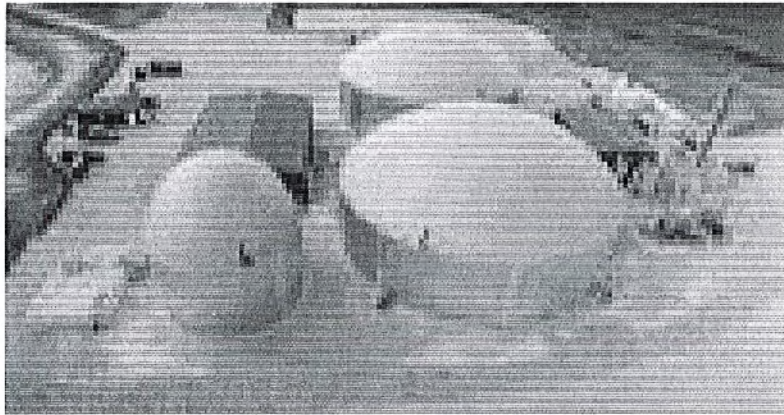
Source: <https://lynngroup.ca/index.php?biotrix=1>

Abel's Dairy, Eden, WI: “ A project to build and operate a dairy anaerobic digester is getting more than \$28 million in loans and grants from the federal government. The U.S. Department of Agriculture says Abel Project LLC is receiving a \$25 million loan and \$1 million grant from the Rural Energy For America Program, along with a nearly \$2.2 million USDA Rural Development Business and Industry loan guarantee. According to USDA, the digester will capture and convert biomethane to natural gas on site. The converted gas will supply local utilities and the digester is expected to create 8 jobs.”

<https://fox11online.com/news/local/abel-project-llc-anaerobic-digester-natural-gas-dairy-farm-fond-du-lac-county-usda-reap-grant-loan-business-industry/>

2.0 PROJECT OVERVIEW Abel Dairy Farm in Eden, Wisconsin is proposing to expand the development of an existing agricultural site to include facilities for the production of renewable natural gas at N4050 County Road UU in the Township of Eden, Fond Du Lac County, Wisconsin... This project will transfer manure from the existing dairy barns to a treatment system that will utilize advanced anaerobic digestion to convert manure to raw biogas for capture, collection and treatment. The unconverted manure (“digestate”) will then be transferred to the existing manure storage facilities on Abel Dairy Farm for land application through their existing permitted programs. (Source: WI DNR CAFO Narrative for Abel Dairy Renewable Natural Gas Facilities April 2023)





CORRESPONDENCE/MEMORANDUM

DATE: October 24, 2023
TO: Ronald Binzley
FROM: Alexander Torres Negron
SUBJECT: Review of Application for ROPA Coverage for Eden AD1.

FID #: 420161500

GENERAL APPLICATION INFORMATION

Owner/Operator: Eden AD1
N4599 Pine Road
RNG Facility
Eden WI, Fond Du Lac County, Wisconsin

Responsible Official: Kim Martin
133 Boston Post Road, Building 15, 2nd Floor
Weston, MA 02493
(781) 232-7597
development@vanguardrenewables.com

Permit Contact Person: Libby McDonald
Development Manager
133 Boston Post Road, Building 15, 2nd Floor
Weston, MA 02493
(617) 571-0323
development@vanguardrenewables.com

Application Prepared By: Kelsey Suddard
Senior Engineer
Braun Intertec Corp.
1826 Buerkle Road
St. Paul, MN 55110
(651) 442-7322
ksuddard@braunintertec.com

Application Received: September 1, 2023

Additional Information Received: October 10, 13 and 19, 2023

ROP Coverage Number: 42016150A-ROPA

Eden AD1 is a new biogas treatment and distribution facility.

Facility Status: Natural Minor Non-Part 70 Source

I. ROP ELIGIBILITY REVIEW

This facility qualifies for the Type A Registration Permit (ROPA) coverage based on the following analysis:

A. Facility Description

Eden AD1 ("Eden") will be located in Eden, Fond Du Lac County, Wisconsin. The area is in attainment for all air criteria pollutants. The facility is proposing to construct a Renewable Natural Gas (RNG) generating facility. The facility primary NAICS code description is 221210 – Natural Gas Distribution. Emissions units at the proposed facility will include an emergency flare (1,300 scfm), a gas upgrading process (for removal of CO₂ and H₂S), two natural gas-fired boilers (4 MMBtu/hr each), a natural gas-fired solids dryer (3.5 MMBtu/hr), two natural gas-fired back-up generators (750 kW each), one diesel-fired fire pump engine (106 HP), hydrolysis tanks, and organics unloading and de-packaging operations taking place within the organics receiving area (ORA) building. Fugitive sources at the proposed facility will include truck traffic on paved roads, material handling using a skid loader or similar equipment and equipment component (valves, pumps, etc.) leaks (negligible non-methane VOC emissions).

Eden will receive biomass feedstock (dairy manure) from the Dinnerbell Dairy farm and food waste from nearby food production facilities. Manure and food waste will be fed into an anaerobic digester. The expected food waste acceptance rate is approximately 100,375 tons per year (275 tons per day) with a maximum acceptance rate of 182,500 tons year (500 tons per day). Food waste materials will be fed into the digester continuously during operation. Less than half of the material fed to the anaerobic digester will be comprised of manure and more than half will be comprised of food waste materials from local third-party organizations and facilities.

The anaerobic digester uses microorganisms to break down the manure and food waste, producing biogas containing methane (CH₄), carbon dioxide (CO₂), nitrogen (N₂), oxygen (O₂), hydrogen sulfide (H₂S), and water vapor (H₂O). Biogas produced in the digester will first pass through a blower to increase the gas pressure. After the inlet blower, the biogas will pass through a gas upgrading process for CO₂ and H₂S removal and dehydration. The finished renewable natural gas will pass through a gas flow meter prior to being fed into the natural gas supply line for delivery to natural gas customers.

Gases from the ORA building will be collected using a forced ventilation system and passed through an odor control system for control of ammonia and hydrogen sulfide prior to being exhausted through a stack. The hydrolysis tanks will also include a forced ventilation system which will collect exhaust gases from these tanks and pass them through a separate odor control system for control of ammonia and hydrogen sulfide prior to being exhausted through a stack.

Excess fiber removed from the digester will be dried in a natural gas-fired rotary dryer to approximately 40% moisture content and used for animal bedding or land-applied to a nearby farm field.

The proposed boiler will use pipeline quality natural gas only. All compressors and pumps will be powered using electric motors.

The proposed facility will use the emergency flare to combust biogas during limited process upset and equipment startup periods, including periods when renewable natural gas cannot be routed to the pipeline.

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Tony Evers, Governor
Adam N. Payne, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711



August 28, 2023

FILE REF: R-2023-0068
WPDES Permit #: WI-0059382

Steve Abel
Abel Dairy Farms LLC
W4050 Cty Rd UU
Eden, WI 53019

Subject: Conditional Approval of Plans & Specifications for a Manure Digesters and associated waste transfer system at, Abel Dairy Farms LLC at T14N, R18E, Section 09 in Eden Township, Fond Du Lac County

Dear Mr. Abel:

This letter is to inform you that the Wisconsin Department of Natural Resources (Department) has reviewed and conditionally approves the above referenced plans and specifications, submitted under certification by Jason Wert, P.E., Rettew Associates, Inc. and received on April 13, 2023. Revisions were needed to make the plans complete, which occurred on May 30, 2023. Further revisions were received on August 17, 21, 22, 23 and 24, 2023. Some of the plan package revisions were prepared by Burns and McDonnell. The review was conducted in accordance with s. 281.41, Wis. Stats., chs. NR 151 and NR 243, Wis. Adm. Code, and applicable NRCS Standards. The attached engineering report describes the project, lists standards that apply and provides compliance analysis. Questions may be directed to the assigned regional staff or the review engineer Bernie Michaud (contact information is at the end of this letter).

Proposed Project: The proposed project includes the following facilities that are reviewable under s. NR 243.15, Wis. Adm. Code: two manure digesters, hydrolysis tank, two reception tanks, two manure processing buildings and associated waste transfer pipes. This project approval does not include the raw manure pipeline bringing liquid manure from the main CAFO production area to the digesters, the two digestate pipelines which return to the main CAFO production area or the condensate pipeline which delivers condensate to the main CAFO production area. It is anticipated that plans for these will be submitted as a separate project. Construction on these pipelines cannot commence until Dept. approval is received.

Conditions of Approval: The plans and specifications for project number R-2023-0068 are hereby approved and subject to chs. NR 151 and NR 243, Wis. Adm. Code, and the conditions listed below:

1. **Revisions:** If revisions are made to the approved plans and specifications, revised plans and specifications shall be submitted for approval modification, in accordance with ss. NR 108.03 and NR 108.04, Wis. Adm. Code, and s. 281.41(1)(c), Wis. Stats. Submit revised plans and specifications via the Department's e-Permitting System. **Note:** This includes revisions for local permitting. If a formal approval modification may not be warranted, contact the review engineer to confirm.
2. **Approval Period:** In accordance with ss. NR 243.15(1)(a)1., and NR 108.04(2)d., Wis. Adm. Code, if construction is not commenced within 2 years from the approval date, the approval is void, and a new approval must be obtained prior to commencing construction.
3. **Notification:** Prior to construction and when construction is complete, notify the Department's regional contact and county contact provided a copy of the approval (contact information is at the end of this letter).
4. **Inspection:** During the construction of critical components, inspection shall be performed by a Wisconsin registered professional engineer or other qualified third party (excludes the owner and construction contractor and their employees).

5. **Post-Construction Documentation:** In accordance with the permit, a post-construction report must be submitted to the DNR's e-Permitting website (<http://dnr.wi.gov/permits/water>) within 60 days of completing construction. The report must include documentation specified by s. NR 243.15(10), Wis. Adm. Code.

Limitation of Approval: The Department reserves the right to order changes or additions should conditions arise making this necessary. This approval is not to be construed as a determination on the issuance of a Wisconsin Pollutant Discharge Elimination System Permit or opinion as to the ability of the proposed system to comply with effluent limitations in such a permit, approval of an Environmental Impact Statement that may be prepared, or approval for any activities requiring a permit under chs. 30 or 31, Wis. Stats. Where necessary, plans and specifications should be submitted to the Department of Safety and Professional Services or other state or local agencies to ensure conformance with applicable codes or regulations of such agencies.

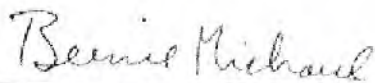
Tax Treatment: Tangible personal property, that becomes part of a waste treatment of pollution abatement plant or equipment, may be exempt from sales tax under s. 77.45(26), Wis. Stats. Similarly, property purchased or constructed as a waste treatment facility and used for industrial waste treatment may be exempt from general property taxes under s. 70.11(10), Wis. Stats. A prerequisite to exemption is filing a statement on prescribed forms. To obtain the forms, and information about this sales tax exemption, please contact the Department of Revenue, P.O. Box 8933, Madison, WI 53708, or check their website <http://www.revenue.wi.gov/>.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to WIS. STAT. §§ 227.52 and 227.53, you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to WIS. STAT. § 227.42, you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. All requests for contested case hearings must be made in accordance with WIS. ADMIN. CODE § NR 2.05(5), and served on the Secretary in accordance with WIS. ADMIN. CODE § NR 2.03. The filing of a request for a contested case hearing does not extend the 30-day period for filing a petition for judicial review.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
For the Secretary



Bernie Michaud, P.E.
CAFO Engineer Supervisor
Watershed Management Program

Enclosures: Wisconsin DNR Engineering Report

email: Steve Abel; Abel Dairy Farms LLC
(920) 251-3737; steve@abeldairyfarm.com

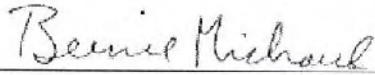
Paul Tollard; Fond Du Lac County
(920) 906-4672; paul.tollard@fdlco.wi.gov

Victoria Ziegler; DNR-Southeast Region
(920) 391-8946; Victoria.Ziegler@wisconsin.gov

Michelle M Scott; DNR-Southeast Region
(920) 252-0679; Michelle.Scott@wisconsin.gov

PURPOSE OF THIS REPORT: This report documents review of plans and specifications for each structure or practice indicated below, including findings regarding the structure or practice's compliance with applicable standards. The reviewer considered if management and site assessment were conducted, documented, and reflected in the final design, and if proper construction and related plans (operation and maintenance, inspection, erosion control if applicable) were provided, and demonstrated compliance with applicable rules standards.

DECISION RECOMMENDATION: Based on my review completed on August 28, 2023, the proposed plans and specifications meet ch. NR 243, Wis. Adm. Code, and applicable NRCS Standards. Therefore, I recommend the plans and specifications be approved.



Bernie Michaud, P.E.

Water Resources Engineer

WISCONSIN DEPARTMENT OF NATURAL RESOURCES ENGINEERING REPORT**GENERAL INFORMATION****Farm Name:** Abel Dairy Farms LLC**WPDES Permit#:** WI-0059382**Location Address:** W4050 Cty Rd UU, Eden WI**DNR Project #:** R-2023-0068**Engineering Plans Certified by:****Initial Submittal:****Revised Submittal(s):**

Jason Wert, P.E.

April 13, 2023,
complete May 30, 2023

August 17, 21, 22, 23 and 24, 2023

Site Assessment: Geographical features of the site include soils that are Casco soils, and Beecher and Fox silt loam. The nearest stream is approximately 950 ft to the southwest and the nearest wetlands are within 150 ft to the west and east of the proposed construction area. Clean runoff will be diverted around waste handling areas to existing waterways. No karst features are known to exist within 1,000 ft of the proposed facilities or systems. No ground water supply wells are located within 250 feet of the proposed facilities or systems.

Soil investigations were performed in February, 2023 consisting of 8 soil borings in the proposed project area, which found the primary subsoils consist generally of fill over lean clay, then silty sand then gravelly silty sand with a fines content in the range of 14 to 65%. Bedrock was not found. Sub-surface saturation was found in 5 of the 8 test pits but were at depths greater than the required separation distance.

Proposed Facilities:

Anaerobic Digester Tanks 1 and 2: The proposed design was submitted to meet NRCS 313, and 522 (10/17R) and ACI-350. The design is compliant with s. NR 243.15(3), Wis. Adm. Code. The two tanks are located south of Abel Dairy's main manure lagoon. Below is a summary of what is proposed.

- The proposed digester tanks will be 100 ft in diameter and 27 ft tall. The tank bases consist of the floor slabs, foundations and footings and will be constructed of cast-in-place reinforced concrete. The floor slabs will be 6-inches thick. The tank walls will be made of precast reinforced concrete panels 10-inches thick and approximately 7 ft wide. The wall panels will fit into a keyway formed around the perimeter of the base. The panels will be bound together with steel cable "tendons" which run through conduits inside the panels and are tensioned. The keyway and voids between the panels will be filled with combinations of concrete, grout, and sealants to provide a liquid tight vessel.
- The proposed storage will have a total and maximum operating level (MOL) volume of 1.57 MG and 1.46 MG gallons respectively. The digesters are designed to be operated with 2 ft of freeboard. The digester tanks do not provide active liquid manure storage. The floor elevation will be 1040 ft and the MOL elevation will be 1065 ft. The tanks will be covered.
- The tank structural design calls for the sub-base to provide a 4000 psf bearing capacity. The sub-base is to be prepared as recommended in the Geotech report prepared by American Engineering Testing dated March 17, 2023.
- The tanks will be hydrostatically tested for liquid losses as specified in ACI-350 and the construction quality assurance plan prior to use.
- In the event of major spill, the proposed downslope stormwater retention pond can be used for spill containment.
- The digesters are operated with a SCADA system which monitors such things as liquid flows and levels. The digesters are also equipped with a flammable gas detection system and flares to release gas if necessary.

Biological Hydrolysis Tanks: The proposed design was submitted to meet NRCS 313, and 522 (10/17R) and ACI-350. The design is compliant with s. NR 243.15(3), Wis. Adm. Code. The hydrolysis tank will be located east of the north digester tank. Below is a summary of what is proposed.

- The proposed hydrolysis tank will be 43 ft in diameter and 27 ft tall. The tank base consisting of the floor slabs, foundations and footings will be constructed of cast-in-place reinforced concrete. The

floor slab will be 6-inches thick. The tank walls will be made of precast reinforced concrete panels 10-inches thick and approximately 7 ft wide. The wall panels will fit into a keyway formed around the perimeter of the base. The panels will be bound together with steel cable “tendons” which run through conduits inside the panels and are tensioned. The keyway and voids between the panels will be filled with combinations of concrete, grout, and sealants to provide a liquid tight vessel.

- The proposed storage will have a total and maximum operating level (MOL) volume of 0.29 MG and 0.27 MG gallons respectively. The tank is designed to be operated with 2 ft of freeboard. The floor elevation will be 1040 ft and the MOL elevation will be 1065 ft. The tank will be covered.
- The tank structural design calls for the sub-base to provide a 4000 psf bearing capacity. The sub-base is to be prepared as recommended in the Geotech report prepared by American Engineering Testing dated March 17, 2023.
- The tank will be hydrostatically tested for liquid losses as specified in ACI-350 and the construction quality assurance plan prior to use.

Waste Transfer System: The proposed design was submitted to meet with NRCS Standard 634 (11/22). The design is compliant with s. NR 243.15(4), Wis. Adm. Code.

- There will be two, side by side, poured in-place reinforced concrete reception tanks located adjacent to the digester Primary Operation Building. The tanks will be designed according to ACI-350 criteria. The raw manure tank will be 20-ft long by 21-ft wide by 15 ft deep. The digestate tank will be 9-ft long by 21-ft wide by 15 ft deep. Both tanks will have walls 1-ft, 3-inches thick and a floor 2-ft thick along the perimeter. The floor elevations will be 1025-ft and the top of the tank lids will be 1040-ft.
- The raw manure tank will receive liquid manure from the main CAFO production area via a proposed 8-inch pipe (not yet approved) and two pumps will pump manure to other parts of the digester system. The digestate tank will receive digestate from the digestate cooler and two pumps will pump the digestate back to the main CAFO production area via two proposed pipelines (not yet approved).
- The Abel Dairy manure digester system has many liquid waste transfer pipelines (including liquid manure and digestate) in the digester lease area. This system is complicated, and pipelines can be either above or below ground. NRCS Standard 634 (and by extension NR 243.15) applies only to below ground waste transfer pipes. Pipe material is specified as either stainless steel, Sch. 80 PVC, or SDR-11 HDPE. Design pumping pressures range from 15 to 75 psi. Most design flow velocities range from 2 to 2.5 fps. The plans reference the International Plumbing code for construction. Plans include details for above ground pipe hangers.
- The plans do not include very much information on the 8-inch HDPE raw manure pipeline from the “Farm” (line 1000), the two HDPE pipes which return digestate either to the manure lagoon or the solids separation building (lines 4113 and 4114), or the condensate return line, as they leave the digester lease area and connects to the Abel’s CAFO production area. This review and approval does not include these pipelines and plans for these pipelines should be submitted for Dept. approval in a separate engineering plan submittal. Plans are expected to show conformance with the WI NRCS Standard 634 and Specification 634.

Manure/Digestate Processing Buildings (Primary and Secondary): The proposed design was submitted to meet with NRCS Standards NRCS 313 and 522 (10/17R). The design is compliance with s. NR 243.15(4), Wis. Adm. Code. The Primary Operations building will be east of the digester tanks and the Secondary Operations Building will be west of the digester tanks. Information Below is a summary of what is proposed.

- The Primary Operations Building will be 80-ft long by 50-ft wide. The floor slab will be 6-inch thick reinforced concrete and will slope to central floor drains to collect potential spills.
- The Secondary Operations Building will be 50-ft long by 30-ft wide. The floor slab will be 6-inch thick reinforced concrete and will slope to central floor drains to collect potential spills.

DAYS OF AVAILABLE LIQUID WASTE STORAGE: This project is not anticipated to alter Abel Dairy Farms days of available liquid waste storage.

Matt Woodrow; DATCP
(920) 427-8505; matthew.woodrow@wisconsin.gov

Aaron O'Rourke; DNR, Eau Claire
(715) 839-3775; aaron.orourke@wisconsin.gov

JB Randolph; Northern Biogas
(304)672-1717; jrandolph@northernbiogas.com

Bernie Michaud; DNR-Central Office
(608) 512-2065; Bernard.Michaud@wisconsin.gov

Jason Wert; Rettew Associates, Inc.
(814) 308-0643; jwert@rettew.com

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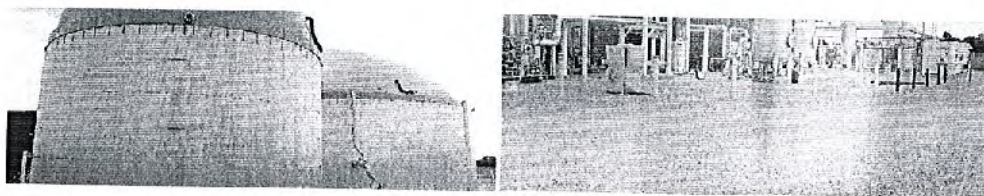
Fond du Lac County dairy farm's digester project receives \$28 million in federal funds

by Brady Meyer, FOX 11 News

Fri, June 14, 2024 at 8:56 PM

Updated Fri, June 14, 2024 at 9:42 PM





8

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Abel Dairy Farms Digester (WLUK)

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VILLAGE OF EDEN (WLUK) --An anaerobic digester project at a Fond Du Lac County farm is getting a massive boost from the federal government.

Northern Biogas, along with Abel Farms, are getting more than \$28 million in loans and grants. The goal is to improve sustainability and supply local utilities. However, some have questions about the process.

Even after nearly 170 years in the small village of Eden, Abel Dairy Farms continues to evolve. Co-owner Steve Abel said the payoff of their anaerobic digester will be widespread.

ADVERTISEMENT

Attachment 6:

Digesting the Facts: Digestate and Risks to Rural Communities

Digesting the Facts: Digestate and Risks to Rural Communities

Anaerobic digesters (ADs) are enclosed vessels that use heat and microorganisms to break down organic materials such as manure, human waste, food waste, and more. ADs turn methane from these wastes into biogas, which, when refined, can be used interchangeably with natural gas. ADs have operated on landfills and in wastewater treatment plants (WWTPs) since the 1970s. Within the last decade, ADs started popping up on factory farms to handle and treat the shocking amounts of manure that factory farms produce which has contaminated the air, water, and soil of countless rural communities across the United States. However, ADs do not eliminate the risks of spreading factory farm manure on thousands of acres of farmland in rural communities. Rather, ADs trade one risk for another in the form of digestate: the waste from the AD process.

Digestate shares many of the same contaminants found in factory farm manure. Instead of a solution to manure problems and water contamination, ADs are yet another trade-off for rural communities because digestate produces new risks for the environment and public health compared to raw manure when it is spread or sprayed on agricultural fields. The biogas and agriculture industries are pushing to construct AD projects faster than rural communities can learn about these risks and states can regulate them. Indeed, despite the rapid proliferation of ADs in rural communities, the EPA and USDA have yet to create regulations for managing digestate to avoid water, air, and soil contamination. As a result, it is up to rural communities to protect themselves from this new and unregulated source of contamination. **This fact sheet lays out what communities need to know about digestate when an AD is proposed.**

But first, let's look at the factory farm manure that gets fed into anaerobic digesters.

Not Your Grandpa's Manure: Is manure from factory farms safe for human and environmental health?

Manure has been used as a fertilizer to aid crop growth for thousands of years (Gur-Arieh and Madella 2024). However, within the last 50 years, factory farms have drastically changed the quantity and quality of manure.

Quantity- In 2024, animals on factory farms produced 941 billion pounds of manure each year—twice the weight of sewage produced by the US population (Food & Water Watch 2024). Mismanagement of manure releases nutrients that contaminate surface waters and groundwater.

- ❖ The **nitrogen** and **phosphorus** in manure causes algae to overgrow, deplete oxygen levels in the water, and suffocate aquatic life (EPA 2025a).
- ❖ The **nitrogen** in manure turns into **nitrate** when applied to soil. Excess nitrates runoff into groundwater. At least 43 million people rely on groundwater from wells as their only source of water (USGS 2019). Ingesting contaminated water can cause numerous health problems, including thyroid, colon, stomach, kidney, and colorectal cancers (Ward et al. 2018; Mendy and Thorne 2024). For pregnant women, it can result in birth defects or “blue baby syndrome” (Stayner et al. 2022; Knobeloch et al. 2000).

Quality- Factory farms introduce many contaminants into manure that do not occur naturally including:

- ❖ **Heavy metals** such as arsenic, copper, and zinc are added to animal feed and excreted by animals. Arsenic, specifically, is a concern due to its cancer causing properties (Jaishankar et al. 2014).
- ❖ **Antibiotic resistant bacteria (ARBs) and antibiotic resistant genes (ARGs)** “develop the ability to defeat the drugs designed to kill them,” making infections difficult or impossible to cure (CDC 2025). Manure from factory farms is one of the primary sources of ARBs and ARGs because livestock require antibiotics in heavily confined spaces to prevent the rapid spread of infection (Zeng et al. 2025).
- ❖ **Microplastics** are very small particles of plastic (5 mm or less) resulting from the breakdown of plastic over time (Long et al. 2024). Microplastics in manure come from the environment itself (contaminated water, soil, or air), fertilizers, pipes and hoses used for irrigation, the plastic coating on animal feed bags, and plastic mulch (Liu et al. 2021). Studies on animals show that microplastics can: 1) disrupt liver and intestine functions, 2) negatively impact the immune system, 3) disrupt neural development in children, 4) create memory and learning dysfunctions, 5) reduce fertility in men and women, and 6) cause chronic

respiratory diseases (Li et al. 2023). ARGs are also able to attach onto microplastics and travel throughout the soil, into sources of groundwater and surface water (Liu et al. 2021).

Despite scientific evidence and the cases of contamination in rural communities, the factory farm industry and sympathetic regulatory agencies like the Environmental Protection Agency, U.S. Department of Agriculture, and agricultural extension programs at land grant-universities have claimed that the massive quantity of manure generated by factory farms is a safe and natural fertilizer.

To make matters worse, manure is dangerously under-regulated in the US. For a factory farm that requires a National Pollutant Discharge Elimination System (NPDES) permit under the Clean Water Act, manure is managed using nutrient management plans (NMPs) (EPA 2012). NMPs are technical documents created by consultants or state regulatory agencies to guide factory farms on when, where, and how much manure to spread on their fields in order to avoid runoff. In practice, the factory farm uses NMPs to self-regulate with little oversight from the state to verify if these plans are actually being followed. The testing requirements that do exist for manure are very weak, with tests only required for agricultural nutrients and pH levels. Testing is not required for microplastics, pharmaceuticals, or antibiotic resistant bacteria, or heavy metals (ibid). Ultimately, NMPs are designed to produce the most crops, not to protect human health and the environment.

So, which is it? Is manure a pollutant or a fertilizer? If factory farm manure isn't a pollutant, why do we need expensive, risky technologies like AD to "treat" it? Most academic studies of digestate only focus on crop production, not environmental issues or public health impacts related to digestate mismanagement. Negative consequences of ADs and digestate are understudied or unknown as industry is building ADs faster than their impacts can be studied. But studies are emerging that challenge the industry hype around ADs. These studies are explored below.

Anaerobic Digestate: Solution or Sludge?

What is anaerobic digestion?

Anaerobic digestion describes a natural process in which bacteria breaks down organic matter without the presence of oxygen (EPA 2020). An anaerobic digester is a sealed vessel where anaerobic digestion takes place. On factory farms, manure is the most common substance placed into a digester. Because ADs are complicated, expensive systems that require continuous supplies of manure, they tend to be located on large-scale farms or combine the waste stream from multiple factory farms.

ADs create two types of by-products:

- ❖ **Biogas** can be burned in generators to create electricity and heat or it can be refined into renewable natural gas (RNG). RNG can be used as vehicle fuel for natural gas vehicles or injected into a natural gas pipeline.
- ❖ **Digestate** is the waste product leftover from the digester after producing biogas. Digestate is often (but not always) separated into solid and liquid forms.
 - **Liquid digestate** (also called pressate, effluent, or parlor water (in dairy farming) is the liquid component of digestate. The liquid is stored in lagoons before being applied to fields as liquid fertilizer or as irrigation water for spray irrigation. Liquid digestate typically has high levels of nitrate compared to solid digestate.
 - **Solid digestate** includes the solids (also called sludge) that sinks to the bottom of ADs and storage lagoons. These solids are dried and used for fertilizer or animal bedding. Solid digestate typically contains more phosphorus than liquid digestate.

Manure digestate can create MORE water pollution than raw manure – with no new requirements.

During the digestion process, the amount (or volume) of manure is not reduced, but rather transformed from organic to inorganic compounds (Penn State Extension 2023a). Transformations in chemistry turn nitrogen into ammonium. When spread on fields, microbes in the soil turn ammonium into nitrate, which, as discussed above, causes negative impacts on human health. The AD process also makes nitrates more water soluble, thus more

prone to becoming agricultural runoff that contaminates water if spread in excessive amounts- a practice that is endemic to industrial livestock production (Pranckietiene et al. 2023; Penn State Extension 2023b). If phosphorus levels are already elevated, application of digestate can cause phosphorus runoff which contaminates streams, rivers, and lakes (Pranckietiene et al. 2023; Nicholson et al. 2017). Despite acknowledging these new and unique environmental risks, the EPA and USDA have not created any mandatory requirements for land spreading digestate. USDA encourages participants in some voluntary conservation programs to consider additional measures to address the risks from digestate, but leaves state and local governments to address this new source of potential pollution under existing rules for manure management.

Manure Digesters are not Wastewater Treatment Plants:

1. Claims of pathogen reduction are exaggerated for manure digesters.

AD are common on wastewater treatment plants (WWTPs) around the US. ADs at WWTPs operate within a *thermophilic temperature range* (122 °F to 140 °F) which can eliminate dangerous pathogens in waste due to high temperatures. However, most ADs on factory farms are operated in mesophilic range (86 °F to 104 °F) which is less effective at eliminating pathogens (Burch et al. 2022). Manure digesters operate at lower temperatures because it enhances biogas production (EPA 2020). There are several examples of studies that show digesters are not a reliable way to eliminate harmful pathogens:

- ❖ Researchers in Ireland found over a dozen types of pathogens in digestate, many including several that were concerning for human health including *Cryptosporidium parvum*, *Salmonella*, norovirus, enteropathogenic *E. coli* (EPEC), *Listeria monocytogenes* and *Campylobacter coli* (Nag et al 2020).
- ❖ ADs operating in the mesophilic range are unable to eliminate antibiotic resistant bacteria (Marutescu et al. 2022).
- ❖ On-farm studies of the ability of digesters to inactivate pathogens found that pathogen reduction was two times lower than studies performed in lab conditions. Researchers highlighted that pathogen reduction is highly variable from farm to farm (Burch et al. 2018).

2. On-Farm ADs are NOT Required to Test or Treat Digestate after the AD process.

When it comes to the waste from the WWTP process, the EPA requires that sewage sludge (also known as biosolids) is tested for heavy metals and treated before spreading on agricultural fields (EPA 1994). For manure digestate, testing and post-treatment of digestate is not required before spreading on fields (EPA 2020). Similar to WWTPs, many on-farm ADs dewater the digestate, or separate the liquids from the solids, but this is where the treatment ends. At WWTPs, post-treatment measures, such as aerobic treatment, removal of heavy metals, and filtration of microplastics, are all ways to reduce contaminants and harmful pathogens in digestate before applying to farmland (Wang et al. 2021). Still, even WWTPs cannot eliminate all contaminants, as shown by the discovery of contamination of agricultural soils from spreading WWTP sewage sludge tainted with per- and polyfluoroalkyl substances, also known as PFAS.

The AD Air Emissions Tradeoff

ADs reduce methane (CH₄) from the storage of raw manure, but doing so creates, 1) more climate change super-pollutants, and 2) more toxic air emissions for farmworkers and rural communities.

- ❖ In storage and when spread on fields, digestate can produce nitrous oxide (N₂O) (Thomas and Hao 2017; Verdi et al 2019; Wang et al. 2022). Increasing nitrous oxide emissions undermines the climate benefits of reducing methane.
- ❖ Depending on the climate, temperature, and soil pH levels, ammonia (NH₃) emissions can increase significantly for digestate in storage and when spread on fields (Holly et al. 2017; Zilio et al. 2020; Pederson et al. 2021). High ammonia emissions can also increase nitrous oxide emissions from soil (Horwath et al. 2025).
- ❖ Ammonia emissions can cause health issues including eye, nose, and throat irritation, diarrhea, headache, nausea, chest tightness, shortness of breath, reduced lung function and heart palpitations (Wyer et al. 2022). When ammonia from digestate combines with other gasses in their air- such as sulfuric acid from biogas production (Frazier et al. 2017)- it can form secondary fine particulate matter

(PM_{2.5}). As PM_{2.5} levels in the air increase, it increases the risk of serious health issues such as chronic obstructive pulmonary disease (COPD) and premature death (ibid).

- ❖ Digestate also produces emissions from volatile organic compounds (VOCs) which can be hazardous to human health. A study of VOC emissions from digestate detected 49 different types of VOCs. Almost a third (32.77%) of the VOCs emitted from digestate were hazardous to human health: 8 of the compounds were carcinogenic and 14 were known to cause organ damage in humans (Zheng et al. 2019).

Key Takeaways for Rural Communities:

- ❖ ADs do not eliminate the risks of spreading excessive amounts of factory farm manure on thousands of acres of farmland in rural communities. Soil, air, and water contamination can still occur if digestate is handled badly.
- ❖ Digestate is not manure: it comes with new risks and should be treated and regulated differently.
- ❖ Federal regulations from the EPA and USDA have not kept up with the rapid pace of AD development, leaving states, counties, parishes, townships, and villages to fill in the blanks themselves to protect public health and safety.

Challenging the Rising Tide of Rural Waste: Questions to ask if an AD is proposed for your community

- ❖ Please provide a complete list of all digesters you operate that have had incidents, what those incidents were, any violations or fines issued by state or local governments, and what the AD company did to remediate these issues.
- ❖ How will digestate be stored, handled, and disposed of?
 - How many months worth of storage for digestate is planned on site?
 - Is landspreading the main form of digestate disposal for this project?
 - How many acres would be required to dispose of the digestate from this project?
 - Does the landowner CURRENTLY have enough farmland (not timberland) to spread the digestate? If not, where will it be spread?
 - Will digestate be given or sold to neighboring farmers or landowners?
- ❖ What are the testing protocols for digestate?
- ❖ Who is liable in the case of soil, surface and/or well water contamination from digestate?
- ❖ Should road damage occur on local roads by either the trucking of waste or the trucking of excess digestate, what written guarantees will you provide that they will be reimbursed for those damages?
- ❖ Will the AD company provide written guarantees that they will reimburse the local government for emergency services that may be required in case of accidents resulting in fire, explosions, etc. from gas production?

SIDEBAR 1:

Suspect Sludge: Lessons for the regulation of Digestate from the Biosolids PFAS Crisis

The lack of testing and treatment required for digestate is particularly concerning due to the emergence of a PFAS contamination crisis caused by land application of treated sewage sludge from WWTPs (Carey 2022). PFAS are a group of over 9000 industrial chemicals used since the 1940s in products such as Teflon, stain resistant fabrics, firefighting foam, waterproof apparel and nonstick food packaging (ibid). PFAS are known as “forever chemicals” due to their inability to break down naturally in the environment. PFAS contamination spreads through water, air, and soil where it can bioaccumulate throughout the food chain before being consumed by humans. Scientists have just begun to learn the negative impacts of PFAS on human health. Although much is still unknown, studies have shown PFAS has a negative effect on the metabolism, endocrine function, bone health in fetuses and children, chronic kidney and liver diseases, miscarriages in pregnant women, thyroid dysfunction and various cancers (Jha et al. 2021).

For decades, the EPA has promoted WWTP spreading sewage sludge on farmland without knowing that it was contaminated by PFAS (Schauffler 2022). The WWTP process reduces some contaminants, but not PFAS. About 60% of sewage sludge, also known as biosolids, is spread on 70 million acres of farmland every year (EPA 2025b; Environmental Working Group 2025). And many of those acres are still growing food (Tabuchi 2025). Decades of applying tainted sludge resulted in bioaccumulation of PFAS in soil, leaving farmers with sick, dying livestock and land that was too contaminated to grow crops. Farms all over the US are facing the loss of their livelihoods after PFAS contamination was identified. PFAS was discovered on farms in Maine in 2016. Since then, over 100 farms had soils test positive for PFAS (Overton 2025). PFAS contaminated farmland has also been identified in Michigan, Vermont, New York, South Carolina, Texas, and Tennessee (Carey 2022; Eggers 2024; Scotten 2025; Tabuchi 2025). Due to the EPA's slow response, states are leading the charge in limiting and regulating the spread of the biosolids PFAS crisis (Huges and Henderson 2025). In 2022, Maine banned spreading biosolids on agricultural land followed by Connecticut in 2024. Six other states are currently considering their own biosolids spreading bans or limits on spreading biosolids (ibid). However, no states have banned the practice of spreading digestate from co-digesters, which are also shown to add PFAS to digestate though contaminated food waste.

END SIDEBAR

SIDEBAR 2:

Co-digestion of Manure and Food Waste Incorporates PFAS and More Microplastics into Farm Soils.

Co-digesters are ADs that combine two or more inputs such as manure, food waste, yard waste, and biosolids. "Food waste" is a broad category of waste that includes waste food and beverage manufacturers, leftover or expired food from grocery stores, large institutions (such as hospitals or schools) (EPA 2025c). Adding food waste to an AD dramatically increases the amount of biogas, but it also introduces more microplastics and PFAS into digestate. While more focus in the media is placed on biosolids as a source of PFAS, food packaging is also a source of PFAS contamination (Phelps et al. 2024). Nonstick coatings on paper wrappers, cardboard containers, and plastic containers for example, have been shown to contain PFAS (ibid). Food packaging also creates microplastics that remain in digestate after the AD process (Porterfield et al. 2023a). While co-digester companies such as Vanguard Renewables, claim that depackaging machines-machines that separate food waste from packaging before heading to the digester- reduce the risk of PFAS and microplastics in digestate (Gribkoff 2022), research shows that high levels of microplastics were still present in digestate after the depackaging process (Porterfield et al. 2023b). Regardless of whether depackaging machines were part of the process, EPA studies suggest that PFAS from packaging migrates into the waste itself (EPA 2021). In other words, even if depackaging machines were used, PFAS remains present in food waste.

Unlike manure digesters, the content of the digestate from co-digesters can vary significantly day-to-day, depending on where the waste is coming from. The feedstock of the co-digester becomes a shifting "soup of the day," making it hard to know what contaminants end up in the digestate and increasing the risk of PFAS and other pollutants, while also adding variability in the nutrient content available to crops when the digestate is applied to cropland as fertilizer. The food manufacturing sector includes many different types of production, from slaughtering, to processing, to packaging. Inputs could include waste from the beer production process at breweries, fats and oils used to fry foods, slaughterhouse waste, milk parlor waste and much more. Due to the wide variety of inputs, co-digesters are significantly more likely than manure digesters to create noxious odors. Think of a human stomach: if someone eats something that upsets their stomach, There are many examples in the real world of co-digesters failing to reduce odors, instead producing nuisances for the surrounding rural community:

- ❖ In Weld County, Colorado a food waste and manure co-digester was shut down in 2017 after 600 complaints were filed by neighbors. Locals claimed that they expected some odors, "But they didn't expect the dizziness, headaches and eau de 'scorched manure,' either," (Marmaduke 2017).

- ❖ In Greene County, Ohio a food waste and manure co-digester was shut down by the Ohio Attorney General in 2023 after years of complaints of horrible odors from neighbors and numerous environmental violations (Spicker and Bishop 2023).
- ❖ In Newaygo County, Michigan, a food waste and manure co-digester was at the center of a permitting fight in 2024 as neighboring communities petitioned the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to deny a new permit to the operating company, Generate, based on years of water pollution, noxious odors, and lack of testing for PFAS and microplastics (FLOW 2025). Generate withdrew their permit application in March 2025.

END SIDEBAR

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Toxic Air Emissions from Anaerobic Digesters

Anaerobic digesters can emit various air pollutants, including methane, nitrogen oxides, and volatile organic compounds, which can negatively impact air quality. Proper design and air pollution control technologies are essential to minimize these emissions and comply with environmental regulations. National Laboratory B
biocycle.net

Noxious Air Emissions from Anaerobic Digesters

Anaerobic digesters, while beneficial for waste management and renewable energy production, can also produce various air emissions that may be harmful to the environment and public health.

Types of Emissions

- Methane (CH₄): A potent greenhouse gas, methane is released during the anaerobic digestion process. Although it is captured for energy use, some methane can escape, contributing to climate change.
- Nitrogen Oxides (NO_x): These gases can form during the combustion of biogas generated by anaerobic digesters. NO_x emissions are linked to respiratory problems and contribute to smog formation.
- Hydrogen Sulfide (H₂S): This toxic gas can be present in digester gas and poses serious health risks, including respiratory issues and potential fatalities at high concentrations.
- Volatile Organic Compounds (VOCs): These compounds can be emitted during the digestion process and may lead to air quality issues, including the formation of ground-level ozone.

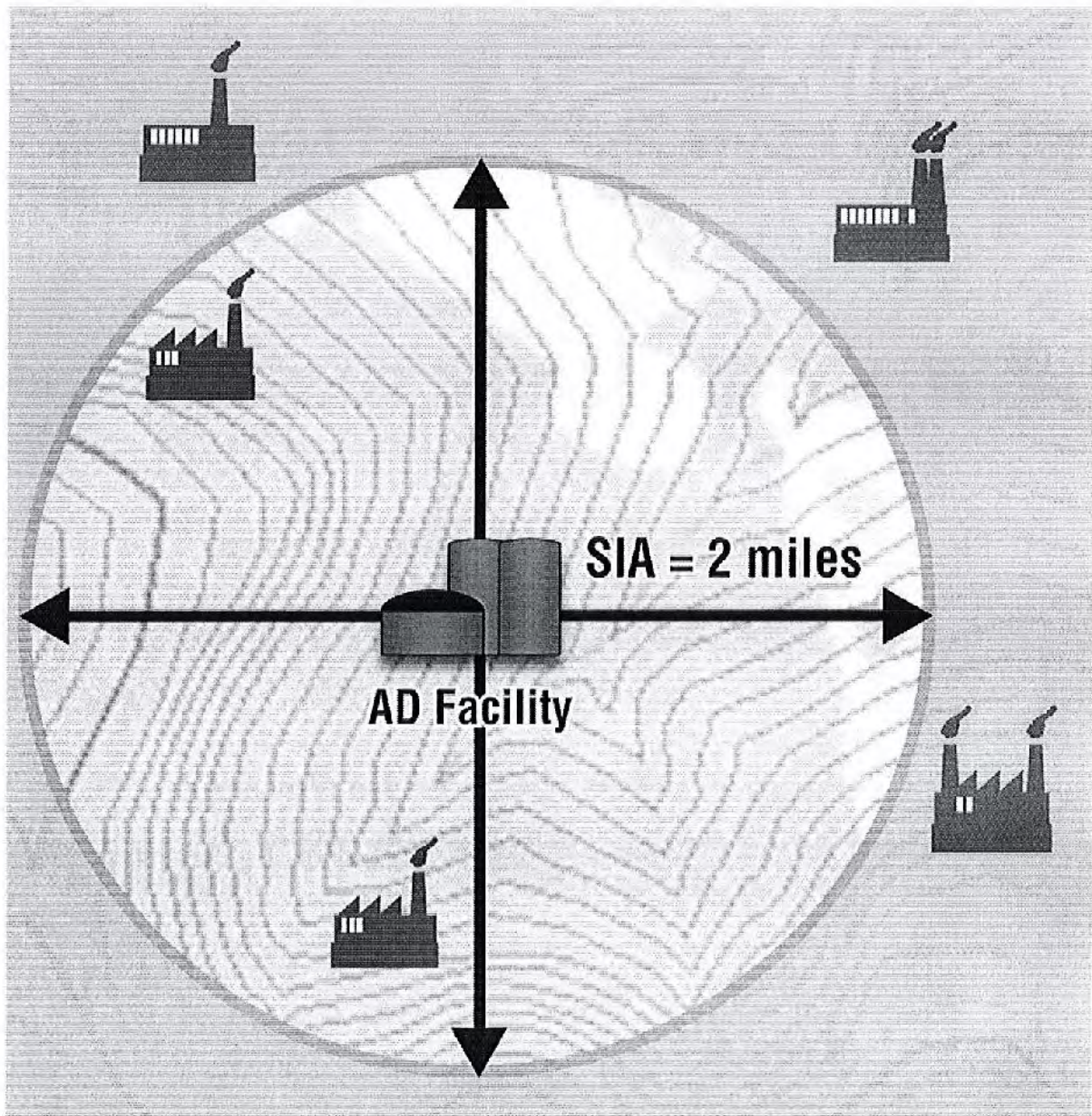
Regulatory Considerations

The air quality permitting process for anaerobic digesters is influenced by the Clean Air Act. Facilities must implement air pollution control technologies to minimize emissions. Stricter regulations apply in areas with existing air quality issues, requiring careful site evaluation and emission estimation.

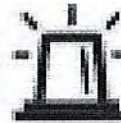
Understanding and managing these emissions is crucial for the sustainable operation of anaerobic digesters and for protecting air quality.

B biocycle.net  Lawrence Berkeley National Laboratory

Figure 1. Significant Impact Area (SIA) to map interactive emission sources



Odor nuisance



Health risks

Air pollutants

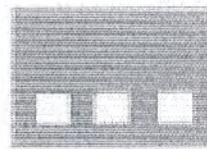
H_2S
Propanethiol
Methanethiol
Benzene
Acetaldehyde
Ethyl acetate



Unloading



Conveying



Pretreatment



Anaerobic
digestion



Digestate
dewatering

Food waste anaerobic digestion plant

Attachment 7:

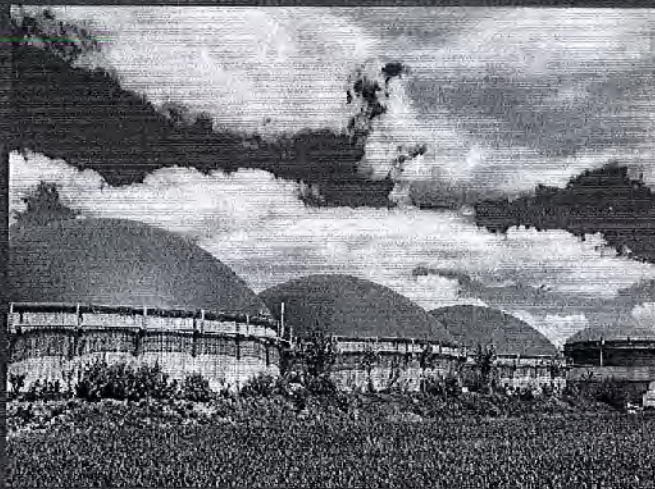
**Comparison of Contaminants Found in Manure-only Digester Inputs
versus Manure and Industrial Food Waste Digester Inputs**

Manure Only Digester Inputs	Contaminants
Liquid Manure	Microplastics, pathogens (Campylobacter, Escherichia coli O157:H7, Salmonella, Listeria, Cryptosporidium, and Giardia), hormones, high concentration of salt, dietary supplements, and antibiotics
Process Wastewater	Sanitizers, disinfectants, heavy metals

Co-Digester Inputs	Contaminants
Liquid Manure	Salmonella, Listeria, Cryptosporidium, and Giardia), hormones, high concentration of salt, dietary supplements, and antibiotics, hormones, pesticides
Process Wastewater	Sanitizers, disinfectants, heavy metals, manure, urine,
Industrial Food Waste	Microplastics, Per- and polyfluoroalkyl substances (PFAS & PFOS), Polycyclic aromatic hydrocarbons (PAHs), pesticides, Polychlorinated biphenyl (PCBs), heavy metals, mycotoxins, bacteria, mold, heavy metals, biological oxygen demand (BOD), biogenic amines, endocrine disrupting chemicals, pharmaceutical residuals, antibiotic resistant bacteria, coagulants and flocculants
Agricultural By-Products/ Crop Residues	Mycotoxins, herbicides, pesticides, heavy metals, VOCs, pathogenic microorganisms
FOG (Fats, Oils, and Greases)	Mycotoxins, pesticides, heavy metals, PFAS
Slaughterhouse Waste	sanitizers, disinfectants, bones, antibiotics (doxycycline, chlortetracycline, and sulfadiazine), cationic and anionic surfactants, pathogenic bacteria (Salmonella spp., Listeria sp., E. coli, Shigella sp., and Staphylococcus sp.)
Brewery Waste	Acidic and alkaline solution residue, coloring agents, process water additives, pfas,
Milkhouse Wastewater	Sodium hydroxide (caustic soda), trisodium phosphate, nitric acid, phosphoric acid, chlorine dioxide, antifoaming agents

Sources

Manure	https://pmc.ncbi.nlm.nih.gov/articles/PMC7166490/
	https://doi.org/10.1016/j.envadv.2023.100372
	https://archive.epa.gov/ada/web/html/cafos.html
	https://www.ars.usda.gov/arsuserfiles/20360500/pdf_pubs/P2194.pdf
	https://www3.epa.gov/npdes/pubs/cafo_ch5.pdf
Process Wastewater	https://extension.okstate.edu/fact-sheets/anaerobic-digestion-of-animal-manures-inhibitory-and-toxic-materials.html
	https://www.sciencedirect.com/science/article/abs/pii/S0269749122000744
	https://www.getchemready.com/wastewater-treatment/wastewater-treatment-chemicals/
	https://pmc.ncbi.nlm.nih.gov/articles/PMC8304211/
	https://pmc.ncbi.nlm.nih.gov/articles/PMC11587131/
Industrial Food Waste	https://pmc.ncbi.nlm.nih.gov/articles/PMC9219000/
	https://pmc.ncbi.nlm.nih.gov/articles/PMC10082887/
	https://pmc.ncbi.nlm.nih.gov/articles/PMC10740816/
	https://adbioresources.org/newsroom/wrap-research-persistent-herbicides/
	https://pmc.ncbi.nlm.nih.gov/articles/PMC8426456/
FOG Agriculture by-products, crop residues	https://extension.okstate.edu/fact-sheets/anaerobic-digestion-of-animal-manures-inhibitory-and-toxic-materials.html
	https://pmc.ncbi.nlm.nih.gov/articles/PMC7608650/
	https://doi.org/10.1016/j.oecol.2021.02.001
	https://www.mdpi.com/2304-8158/12/13/2624
	https://pmc.ncbi.nlm.nih.gov/articles/PMC7552645/
Brewery Waste	https://www.dps.nj.gov/sites/efiles/efilement341/files/documents/2020-01/wastewater-bmps-breweries.pdf
	https://pubs.acs.org/doi/10.1021/acs.est.4c11265
	https://www.sciencedirect.com/science/article/abs/pii/S2589014X22001906
	https://pmc.ncbi.nlm.nih.gov/articles/PMC8477996/
	https://agriculture.institute/milk-processing-packaging/types-of-cleaning-agents-dairy-industry/
Slaughterhouse Waste	https://www.scoinas.com/knowledge-base/chlorine-dioxide-in-dairy-processing-enhancing-milk-quality-and-safety/
	https://www.scoinas.com/knowledge-base/chlorine-dioxide-in-dairy-processing-enhancing-milk-quality-and-safety/
Milkhouse Wastewater	https://www.scoinas.com/knowledge-base/chlorine-dioxide-in-dairy-processing-enhancing-milk-quality-and-safety/
	https://www.scoinas.com/knowledge-base/chlorine-dioxide-in-dairy-processing-enhancing-milk-quality-and-safety/



THE DIRTY TRUTH: BIODIGESTERS & CO-DIGESTERS

A reality check about
digestate and its risk to
public health and safety

Garbage In, Garbage Out: What's Really In Biodigester Feedstock?

Liquid Manure: Pathogens (Campylobacter, Escherichia Coli O157:H7, Salmonella, Listeria, Cryptosporidium, and Giardia), hormones, high concentration of salt, microplastics, dietary supplements, antibiotics, hormones, pesticides

Process Wastewater: Sanitizers, disinfectants, heavy metals, manure, and urine

Industrial Food Waste: Microplastics, PFAS, PFOS, polycyclic aromatic hydrocarbons (PAHs) pesticides, heavy metals, PCBs, mycotoxins, bacteria, mold, heavy metals, biogenic amines, endocrine disrupting chemicals, pharmaceutical residuals, antibiotic resistant bacteria, coagulants, and flocculants

Fats, Oils, and Greases (FOG): Creates high biochemical oxygen demand (BOD), mycotoxins, pesticides, heavy metals, PFAS, hydrogen sulfide, and ammonia

Agricultural By-Products/Crop Residues: Mycotoxins, herbicides, pesticides, heavy metals, VOCs, and pathogenic microorganisms

Slaughterhouse Waste: Paunch, fat, lard, blood, urine, hooves, feathers, manure, bones, creates high BOD, sanitizers, disinfectants, antibiotics (doxycycline, chlortetracycline, and sulfadiazine), cationic and anionic surfactants, and pathogenic bacteria (Salmonella spp., Listeria sp., E. coli, Shigella sp., and Staphylococcus sp.)

Brewery Waste: Creates high BOD, acidic and alkaline solution residue, coloring agents, process water additives, and PFAS (if the water used in the brewery process contains PFAS)

Milkhouse Waste: Sodium hydroxide (caustic soda), trisodium phosphate, nitric acid, phosphoric acid, chlorine dioxide, sanitizers disinfectants, and antifoaming agents

Sources

Manure

<https://pmc.ncbi.nlm.nih.gov/articles/PMC7166490/>

<https://doi.org/10.1016/j.envadv.2023.100372>

<https://archive.epa.gov/ada/web/html/cafos.html>

https://www.ars.usda.gov/arsuserfiles/20360500/pdf_pubs/P2194.pdf

https://www3.epa.gov/npdes/pubs/cafo_ch5.pdf

<https://extension.okstate.edu/fact-sheets/anaerobic-digestion-of-animal-manures-inhibitory-and-toxic-materials.html>

Process Wastewater

<https://extension.okstate.edu/fact-sheets/anaerobic-digestion-of-animal-manures-inhibitory-and-toxic-materials.html>

Industrial Food Waste

<https://www.sciencedirect.com/science/article/abs/pii/S0269749122000744>

<https://www.getchemready.com/wastewater-treatment/wastewater-treatment-chemicals/>

<https://pmc.ncbi.nlm.nih.gov/articles/PMC8304211/>

<https://pmc.ncbi.nlm.nih.gov/articles/PMC11587131/>

<https://pmc.ncbi.nlm.nih.gov/articles/PMC9219000/>

<https://pmc.ncbi.nlm.nih.gov/articles/PMC10082887/>

FOG Agriculture by-products, crop residues

<https://pmc.ncbi.nlm.nih.gov/articles/PMC10740816/>

<https://adbioresources.org/newsroom/wrap-research-persistent-herbicides/>

<https://pmc.ncbi.nlm.nih.gov/articles/PMC8426456/>

<https://extension.okstate.edu/fact-sheets/anaerobic-digestion-of-animal-manures-inhibitory-and-toxic-materials.html>

<https://pmc.ncbi.nlm.nih.gov/articles/PMC7608650/>

FOG

<https://doi.org/10.1016/j.ocsci.2021.02.001>

<https://www.mdpi.com/2304-8158/12/13/2624>

<https://pmc.ncbi.nlm.nih.gov/articles/PMC7552645/>

Brewery Waste

<https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/wastewater-bmps-breweries.pdf>

<https://pubs.acs.org/doi/10.1021/acs.est.4c11265>

Slaughterhouse Waste

<https://www.sciencedirect.com/science/article/abs/pii/S2589014X22001906>

<https://pmc.ncbi.nlm.nih.gov/articles/PMC8477996/>

Milkhouse Wastewater

<https://agriculture.institute/milk-processing-packaging/types-of-cleaning-agents-dairy-industry/>

<https://www.scotmas.com/knowledge-base/chlorine-dioxide-in-dairy-processing-enhancing-milk-quality-and-safety/>

Attachment 8:

**Fremont, MI's Experience with Forever Chemicals (PFAS) found in
Digestate Spread on their Farmlands from a Manure and Food Waste
Digester**

But critics say that neither the Legislature nor Whitmer are considering the combined effect of the House and Senate bills — weakening oversight of a polluting industry — on Michigan’s water quality. “What I’d recommend is that SB 275 allow credits for renewable natural gas produced from wastewater treatment plants and landfills. They are highly regulated,” Ruble said. “But if you monetize manure, they’re going to make more manure. CAFOs will expand.”

Case study in Fremont, Michigan

In Fremont, a Newaygo County farm town surrounded by big CAFOs, the sturdiness of one of EGLE’s first draft biodigester permits is being tested by a coalition of state and regional environmental groups. EGLE issued the draft permit earlier this year to Generate Fremont Digester, which owns a biodigester for farm and food wastes that was built 12 years ago in the city’s industrial park, and shut down in January.

The digester’s operating history is dismal. In 2017, under the administration of Republican Gov. Rick Snyder, Generate Fremont was awarded a permit to manage digestate under the weak state rules that applied to spreading raw manure on farms. The permitted practices caused an uproar in Newaygo County as residents complained of terrible odors from spreading and storing the digestate.

EGLE investigated and found numerous violations. The state also evaluated the relative risks of the stew of contaminants in manure and food wastes being added to the digester. After the company applied for a new permit, EGLE responded in 2023 with operating conditions for storing, spreading and monitoring that are much stricter than any ever imposed on a Michigan biodigester handling manure.

“We all know what manure smells like when it’s being spread,” said Kathy Morrison, a fruit farmer who lives outside Fremont. “But this digestate? I can’t even describe how bad it was. It was like sticking your head in a full porta-potty.”



Kathy Morrison, a farmer who produces fruit outside Fremont, and opposes operation of the city's bio-digester on Sept. 17, 2024, photo by Keith Schneider, for Investigate Midwest

Initially, Bill Caesar, the company's president, threatened to close the facility permanently. "Not only are the proposed changes to our permit prohibitively expensive," he told EGLE, "these regulations are also operationally impossible for us to comply with."

The company reconsidered, though, and EGLE has asked for comments on its draft permit. The environmental coalition, led by For Love of Water (FLOW), a Traverse City-based environmental law and policy group, has urged EGLE to hold a hearing to allow the public an

opportunity to strengthen the draft permit.

The group identified several permit provisions they said need to be strengthened. They include requiring Generate Fremont to consider safer alternatives for disposing of digestate other than spreading it on fields. A number of alternatives are available and in use across the country, including the Sedron Technologies Varcor system.

The groups said that another primary weakness is Generate Fremont's disregard for providing the information and adhering to the conditions that the permit requires.

"Biodigester buildup with federal government and state subsidies looks likely to be massive, so any environmental impacts will also be massive," said Carrie La Scur, FLOW's legal director. "This is not your grandma's digester. They're industrial scale, to match other industrial ag installations that have transformed farm country and devastated soil and water quality. Regulation of industrial digesters is in its infancy. What permits will be required? What impacts will be evaluated? There are many questions, and we want to make sure they get answered."

EGLÉ agreed to a public hearing scheduled for Nov. 20.



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
MATERIALS MANAGEMENT DIVISION



PHILLIP D. ROOS
DIRECTOR

December 16, 2024

Logan Randles
Generate Fremont Digester, LLC
1634 Locust Street
Fremont, Michigan 49412

Dear Logan Randles:

SUBJECT: Land Application of Digestate Containing PFAS; Generate Fremont; 1634 Locust Street; Fremont; Newaygo County; Waste Data System Number 493259

On November 22, 2024, staff from the Department of Environment, Great Lakes, and Energy (EGLE), collected samples of the digestate that Generate Fremont Digester, LLC (Generate) land applies via Agricultural Use Approval (AUA) 17-AUA-001 and submitted the samples for laboratory analysis of per – and polyfluoroalkyl substances (PFAS). The samples were collected from the digestate stored in Generate's two lagoons near Holton, Michigan. EGLE received laboratory analysis which indicated that the digestate contained PFAS compounds on December 9, 2024. The laboratory analysis is attached for reference.

EGLE appreciates the steps Generate took to voluntarily and immediately cease land application of the digestate while EGLE analyzed and considered the laboratory data. Eleven different PFAS compounds were detected in the samples, and two PFAS compounds, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), were present at levels that exceed maximum contaminant levels (MCLs) for drinking water under the Safe Drinking Water Act, MCL 325.1001 *et seq.*, and groundwater cleanup criteria under Part 201 of the Natural Resources and Environmental Protection Act (NREPA), MCL 324.20101 *et seq.*

EGLE understands the time constraints facing Generate as the seasonal window for land application of the digestate will close later this month. However, additional evaluation of the data and the characteristics of the digestate is required to fully understand the risk posed to soil and groundwater from its land application. Even with additional evaluation, it may not be possible to determine with any certainty, the nature and extent of the impacts to soil and groundwater. Given these unknowns, EGLE strongly recommends that Generate cease land application of the digestate. EGLE has determined that land application of this material may constitute a violation of the AUA as follows:

- Section 2F(6) of the AUA states that Generate shall ensure the annual applications of the digestate and constituents contained in the digestate applied to agricultural land do not exceed the concentration of contaminants that would cause the creation of a "facility" as defined by Part 201. Section 2S of the AUA prohibits the mixture of the material to be land applied with other wastes or wastewaters from Generate or other facilities that are not inert as defined by Part 115, Solid Waste Management, of the NREPA, and the rules promulgated thereunder. The detection of multiple PFAS compounds makes the inertness of the digestate questionable. Further, Section 7 of the AUA makes clear that if materials that are land applied are determined to pose an unacceptable risk to public health, safety, welfare, or the environment, the person responsible for placement of the materials (Generate) will be liable for the performance of response activities and response activity costs under Part 201.
- The effect of land applying PFAS contaminated digestate is unknown. The science related to acceptable concentration of PFAS in soils, crop uptake of PFAS compounds, and risks to agricultural properties is still being developed. Applying PFAS impacted digestate may contaminate groundwater, nearby residential wells, soil, and crops grown on impacted fields.

Generate must maintain compliance with the AUA. EGLE reserves all enforcement authorities in the event it is determined that Generate violated the AUA and/or caused contamination of soil, groundwater, or surface water. EGLE will take enforcement action if the digestate application violates the AUA or creates a facility as defined by Part 201. Should Generate choose to continue land application of the digestate, EGLE recommends that Generate:

- Renotify property owners and adjacent neighbors of planned land application and include information regarding the PFAS detections and notification that PFAS was detected in digestate above drinking water MCLs and groundwater cleanup criteria.
- Provide copies of the notifications to EGLE, and document receipt of the notification by the residents.

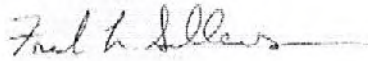
If Generate proceeds with land application of the digestate, but does not notify affected landowners, residents, and neighbors of the PFAS data, then, to ensure property owners are informed of any potential risks to their property, EGLE will make those notifications directly.

The results of this most recent sampling event have been of great interest to the community and the results will be released pursuant to a citizen request and as public information today.

Logan Randles
Page 3
December 16, 2024

EGLE encourages Generate to seek alternative methods for handling the digestate. Alternative options include transporting the digestate to an appropriate wastewater treatment plant or solidification and landfilling. Please contact me with questions via email at SellersF@Michigan.gov.

Sincerely,



Fred L. Sellers
District Supervisor
Kalamazoo District Office
Materials Management Division
269-569-1476

Attachment

cc: Phillip D. Roos, Director, EGLE
Aaron B. Keatley, Chief Deputy Director, EGLE
Hugh C. McDiarmid Jr., Communications Manager, EGLE
Liz Browne, Division Director, EGLE
Abigail Hendershot, MPART Executive Director
Phil Roycraft, EGLE
Amy Peterson, MPART Operations Manager
Rhonda Oyer, EGLE
Abhijit Muduganti, EGLE



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

09 December 2024

Work Order: 2411239

Kent Walters
EGLE-MMD-GRAND RAPIDS
350 Ottawa Avenue NW, Unit 10
Grand Rapids, MI 49503-2341
RE: GENERATE FREEMONT

This is the official environmental laboratory report for testing conducted by the Michigan Department of Environment, Great Lakes, and Energy. Analyses performed by the laboratory were conducted using methods published by the U.S. Environmental Protection Agency, Standard Methods for the Examination of Water and Wastewater, ASTM, or other published or approved reference methods.

Kirby Shane
Laboratory Director

Total Charges for Reported Analyses:	\$750.00
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MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
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TEL: (517) 335-9800
FAX: (517) 335-9600

EGLE-MMD-GRAND RAPIDS
350 Ottawa Avenue NW, Unit 10
Grand Rapids MI, 49503-2341

Project: GENERATE FREEMONT
Location ID: 498637
Project Manager: Kent Walters

Reported:
12/09/2024

Analytical Report for Samples

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received	Qualifier
EB-01	2411239-01	Water	11/22/2024	11/22/2024	
NL-01	2411239-02	Water	11/22/2024	11/22/2024	
SL-01	2411239-03	Water	11/22/2024	11/22/2024	

Qualifiers and Definitions

Y48	Results are estimated due to the water sample containing a significant sediment layer ($\geq$ 0.5 mL).
Q1on	Result is estimated/suspect due to qualifier ion ratio outside of QC limits.
IDA01	Result is estimated/suspect due to isotope dilution analog recovery in the sample outside of QC limits.
I	Dilution required due to matrix interference; reporting limit (RL) raised.
ND	Indicates the analyte was not detected at or above the method reporting limit (RL)
RL	Reporting Limit
NA	Not Applicable

Case Narrative

Samples were received 11/22/2024 2:55:00PM for client EGLE-MMD-GRAND RAPIDS as a part of project GENERATE FREEMONT.

Temperature of samples upon receipt was recorded at 1.00° C and samples were received on ice

Samples were logged and designated as Work Order # 2411239 on 11/22/2024 2:59:00PM.

This Report was created 12/9/2024 1:22:17PM.

Additional Notes/Narrative (if applicable):



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: EB-01
Lab ID: 2411239-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-PFAS Isotope Dilution										
763051-92-9	11Cl-PF3OUdS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
356-02-5	3:3FTCA	ND	4.0	ng/L	1	11/27/24	B4K2623	8327	BM	
757124-72-4	4:2FTS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
914637-49-3	5:3FTCA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
27619-97-2	6:2FTS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
812-70-4	7:3FTCA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
39108-34-4	8:2FTS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
756426-58-1	9Cl-PF3ONS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
919005-14-4	ADONA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
13252-13-6	HFPO-DA	ND	4.0	ng/L	1	11/27/24	B4K2623	8327	BM	
2991-50-6	NEtFOSAA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
2355-31-9	NMeFOSAA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
375-22-4	PFBA	ND	4.0	ng/L	1	11/27/24	B4K2623	8327	BM	
375-73-5	PFBS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
30334-69-1	PFBSA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
335-76-2	PFDA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
307-55-1	PFDoDA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
335-77-3	PFDS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
646-83-3	PFECHS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
375-85-9	PFHpA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
375-92-8	PFHpS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
307-24-4	PFHxA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
355-46-4	PFHxS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
41997-13-1	PFHxSA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
375-95-1	PFNA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
68259-12-1	PFNS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
335-67-1	PFOA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
1763-23-1	PFOS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
754-91-6	PFOSA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
2706-90-3	PFPeA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
2706-91-4	PFPeS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
376-06-7	PFTeDA	ND	4.0	ng/L	1	11/27/24	B4K2623	8327	BM	
72629-94-8	PFTeDA	ND	4.0	ng/L	1	11/27/24	B4K2623	8327	BM	
2058-94-8	PFUnDA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-4:2FTS			115 %	31-202		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-5:2FTS			18.9 %	10-220		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-8:2FTS			81.2 %	16-189		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-PFDoDA			104 %	60-139		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-PFDoDA+13C2-PFTeDA			95.0 %	41-133		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-PFTeDA			83.0 %	10-133		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C3-HFPODA			93.1 %	62-136		11/27/24	B4K2623	8327	BM	



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ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: EB-01

Lab ID: 2411239-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-PFAS Isotope Dilution										
	Isotope Dilution Analog: 13C3-PFBS	98.2 %	58-132			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C3-PFHxS	99.9 %	80-124			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C4-PFBA	101 %	76-124			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C4-PFHxA	106 %	81-125			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C5-PFHxA	106 %	81-124			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C5-PFPeA	103 %	78-123			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C6-PFDA	103 %	77-126			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C7-PFUnDA	102 %	75-127			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C8-PFOA	96.2 %	81-125			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C8-PFOS	98.5 %	79-122			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C8-PFOSA	95.0 %	80-122			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C9-PFNA	99.8 %	80-126			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: d3-N-MeFOSAA	116 %	64-144			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: d5-N-EtFOSAA	117 %	64-149			11/27/24	B4K2623	8327	BM	



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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: NL-01
Lab ID: 2411239-02

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-PFAS Isotope Dilution										
763051-92-9	11Cl-PF3OUdS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
356-02-5	3:3FTCA	ND	4.0	ng/L	1	11/27/24	B4K2623	8327	BM	
757124-72-4	4:2FTS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	IDA01
914637-49-3	5:3FTCA	2.1	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
27619-97-2	6:2FTS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
812-70-4	7:3FTCA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
39108-34-4	8:2FTS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
756426-58-1	9Cl-PF3ONS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
919005-14-4	ADONA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
13252-13-6	HFPO-DA	ND	4.0	ng/L	1	11/27/24	B4K2623	8327	BM	
2991-50-6	NBtFOSAA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
2355-31-9	NMeFOSAA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
375-22-4	PFBA	ND	40	ng/L	10	12/03/24	B4K2623	8327	BM	I
375-73-5	PFBS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
30334-69-1	PFBSA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
335-76-2	PFDA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
307-55-1	PFDoDA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
335-77-3	PFDS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
646-83-3	PFECHS	13	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
375-85-9	PFHpA	2.3	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
375-92-8	PFHpS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
307-24-4	PFHxA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
355-46-4	PFHxS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
41997-13-1	PFHxSA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
375-95-1	PFNA	4.3	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
68259-12-1	PFNS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
335-67-1	PFOA	8.7	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
1763-23-1	PFOS	7.8	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
754-91-6	PFOSA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
2706-90-3	PFPeA	ND	20	ng/L	10	12/03/24	B4K2623	8327	BM	I
2706-91-4	PFPeS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
376-06-7	PFTeDA	ND	4.0	ng/L	1	11/27/24	B4K2623	8327	BM	
72629-94-8	PFTTrDA	ND	4.0	ng/L	1	11/27/24	B4K2623	8327	BM	
2058-94-8	PFUnDA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-4:2FTS			224 %	31-202		11/27/24	B4K2623	8327	BM	IDA01
Isotope Dilution Analog: 13C2-6:2FTS			76.6 %	10-220		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-8:2FTS			86.7 %	16-189		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-PFDoDA			84.3 %	60-139		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-PFDoDA+13C2-PFTeDA			69.4 %	41-133		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-PFTeDA			48.5 %	10-133		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C3-HFPODA			66.3 %	62-136		11/27/24	B4K2623	8327	BM	



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ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: NL-01

Lab ID: 2411239-02

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-PFAS Isotope Dilution										
	Isotope Dilution Analog: 13C3-PFBS	91.1 %	58-132			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C3-PFHxS	100 %	80-124			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C4-PFBA	77.5 %	76-124			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C4-PFHpA	112 %	81-125			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C5-PFtxA	103 %	81-124			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C5-PFPeA	95.0 %	78-123			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C6-PFDA	99.7 %	77-126			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C7-PFUnDA	94.9 %	75-127			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C8-PFOA	107 %	81-125			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C8-PFOS	99.1 %	79-122			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C8-PFOSA	95.5 %	80-122			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C9-PFNA	106 %	80-126			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: d3-N-MeFOSAA	120 %	64-144			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: d5-N-EtFOSAA	115 %	64-149			11/27/24	B4K2623	8327	BM	



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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: SL-01
Lab ID: 2411239-03

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-PFAS Isotope Dilution										See note Y48
763051-92-9	11Cl-PF3OUdS	ND	4.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
356-02-5	3:3FTCA	ND	8.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
757124-72-4	4:2FTS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	IDA01
914637-49-3	5:3FTCA	12	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
27619-97-2	6:2FTS	9.8	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
812-70-4	7:3FTCA	3.5	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
39108-34-4	8:2FTS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	IDA01
756426-58-1	9Cl-PF3ONS	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
919005-14-4	ADONA	ND	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
13252-13-6	HFPO-DA	ND	40	ng/L	10	12/03/24	B4K2623	8327	BM	I
2991-50-6	NEFOSAA	ND	10	ng/L	5	12/03/24	B4K2623	8327	BM	I, IDA01
2355-31-9	NMeFOSAA	ND	4.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
375-22-4	PFBA	ND	40	ng/L	10	12/03/24	B4K2623	8327	BM	I
375-73-5	PFBS	ND	20	ng/L	10	12/03/24	B4K2623	8327	BM	I
30334-69-1	PFBSA	ND	4.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
335-76-2	PFDA	2.8	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
307-55-1	PFDODA	ND	4.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
335-77-3	PFDS	ND	4.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
646-83-3	PFECHS	210	4.0	ng/L	2	12/03/24	B4K2623	8327	BM	
375-85-9	PFHpA	5.9	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	QIon
375-92-8	PFHpS	ND	10	ng/L	5	12/03/24	B4K2623	8327	BM	I
307-24-4	PFHxA	ND	20	ng/L	10	12/03/24	B4K2623	8327	BM	I
355-46-4	PFHxS	ND	20	ng/L	10	12/03/24	B4K2623	8327	BM	I
41997-13-1	PFHxSA	ND	4.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
375-95-1	PFNA	5.7	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
68259-12-1	PFNS	ND	4.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
335-67-1	PFOA	17	10	ng/L	5	12/03/24	B4K2623	8327	BM	I
1763-23-1	PFOS	47	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	
754-91-6	PFOSA	ND	4.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
2706-90-3	PFPeA	ND	20	ng/L	10	12/03/24	B4K2623	8327	BM	I
2706-91-4	PFPeS	11	2.0	ng/L	1	11/27/24	B4K2623	8327	BM	QIon
376-06-7	PFTeDA	ND	8.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
72629-94-8	PFTtDA	ND	8.0	ng/L	2	12/03/24	B4K2623	8327	BM	I
2058-94-8	PFUnDA	ND	10	ng/L	5	12/03/24	B4K2623	8327	BM	I
Isotope Dilution Analog: 13C2-4:2FTS			240 %	31-202		11/27/24	B4K2623	8327	BM	IDA01
Isotope Dilution Analog: 13C2-6:2FTS			92.2 %	10-220		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C2-8:2FTS			228 %	16-189		11/27/24	B4K2623	8327	BM	IDA01
Isotope Dilution Analog: 13C2-PFDODA			82.4 %	60-139		12/03/24	B4K2623	8327	BM	I
Isotope Dilution Analog: 13C2-PFDODA+13C2-PFTeDA			59.9 %	41-133		12/03/24	B4K2623	8327	BM	I
Isotope Dilution Analog: 13C2-PFTeDA			12.5 %	10-133		11/27/24	B4K2623	8327	BM	
Isotope Dilution Analog: 13C3-HFPODA			77.5 %	62-136		12/03/24	B4K2623	8327	BM	I



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ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: SL-01
Lab ID: 2411239-03

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-PFAS Isotope Dilution										
See note Y48										
	Isotope Dilution Analog: 13C3-PFBS	85.1 %	58-132			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C3-PFHxS	98.7 %	80-124			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C4-PFBA	107 %	76-124			12/03/24	B4K2623	8327	BM	I
	Isotope Dilution Analog: 13C4-PFHpA	96.8 %	81-125			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C5-PFHxA	82.1 %	81-124			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C5-PFPeA	105 %	78-123			12/03/24	B4K2623	8327	BM	I
	Isotope Dilution Analog: 13C6-PFDA	83.4 %	77-126			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C7-PFUnDA	82.9 %	75-127			12/03/24	B4K2623	8327	BM	I
	Isotope Dilution Analog: 13C8-PFOA	93.8 %	81-125			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C8-PFOS	86.5 %	79-122			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: 13C8-PFOSA	99.6 %	80-122			12/03/24	B4K2623	8327	BM	I
	Isotope Dilution Analog: 13C9-PFNA	95.6 %	80-126			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: d3-N-MeFOSAA	111 %	64-144			11/27/24	B4K2623	8327	BM	
	Isotope Dilution Analog: d5-N-EtFOSAA	158 %	64-149			12/03/24	B4K2623	8327	BM	IDA01



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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Organics-PFAS Isotope Dilution - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B4K2623 - Method: 3512			Prepared: 11/26/2024							
Blank (B4K2623-BLK1)										
11CI-PF3OUdS	ND	ng/L							11/27/2024	
3:3FTCA	ND	ng/L							11/27/2024	
4:2FTS	ND	ng/L							11/27/2024	
5:3FTCA	ND	ng/L							11/27/2024	
6:2FTS	ND	ng/L							11/27/2024	
7:3FTCA	ND	ng/L							11/27/2024	
8:2FTS	ND	ng/L							11/27/2024	
9CI-PF3ONS	ND	ng/L							11/27/2024	
ADONA	ND	ng/L							11/27/2024	
HFPO-DA	ND	ng/L							11/27/2024	
NEtFOSAA	ND	ng/L							11/27/2024	
NMeFOSAA	ND	ng/L							11/27/2024	
PFBA	ND	ng/L							11/27/2024	
PFBS	ND	ng/L							11/27/2024	
PFBSA	ND	ng/L							11/27/2024	
PFDA	ND	ng/L							11/27/2024	
PFDoDA	ND	ng/L							11/27/2024	
PEDS	ND	ng/L							11/27/2024	
PFECHS	ND	ng/L							11/27/2024	
PFHpA	ND	ng/L							11/27/2024	
PFHpS	ND	ng/L							11/27/2024	
PFHxA	ND	ng/L							11/27/2024	
PFHxS	ND	ng/L							11/27/2024	
PFHxSA	ND	ng/L							11/27/2024	
PFNA	ND	ng/L							11/27/2024	
PFNS	ND	ng/L							11/27/2024	
PFOA	ND	ng/L							11/27/2024	
PFOS	ND	ng/L							11/27/2024	
PFOSA	ND	ng/L							11/27/2024	
PFPeA	ND	ng/L							11/27/2024	
PFPeS	ND	ng/L							11/27/2024	
PFTeDA	ND	ng/L							11/27/2024	
PFTeDA	ND	ng/L							11/27/2024	
PFUnDA	ND	ng/L							11/27/2024	
Isotope Dilution Analog: 13C2-4:2FTS	191	ng/L	150.1		127	31-202			11/27/2024	
Isotope Dilution Analog: 13C2-6:2FTS	141	ng/L	152.2		92.7	10-220			11/27/2024	
Isotope Dilution Analog: 13C2-8:2FTS	142	ng/L	153.6		92.6	16-189			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDA	162	ng/L	160.0		101	60-139			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDA+13C2-PFTeDA	159	ng/L	160.0		99.5	41-133			11/27/2024	
Isotope Dilution Analog: 13C2-PFTeDA	156	ng/L	160.0		97.4	10-133			11/27/2024	
Isotope Dilution Analog: 13C3-HFPODA	324	ng/L	320.0		101	62-136			11/27/2024	
Isotope Dilution Analog: 13C3-PFBS	150	ng/L	149.1		101	58-132			11/27/2024	
Isotope Dilution Analog: 13C3-PFHxS	161	ng/L	151.7		106	80-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFBA	166	ng/L	160.0		104	76-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFHpA	170	ng/L	160.0		107	81-125			11/27/2024	
Isotope Dilution Analog: 13C5-PFHxA	175	ng/L	160.0		109	81-124			11/27/2024	
Isotope Dilution Analog: 13C5-PFPeA	170	ng/L	160.0		106	78-123			11/27/2024	
Isotope Dilution Analog: 13C6-PFDA	162	ng/L	160.0		101	77-126			11/27/2024	
Isotope Dilution Analog: 13C7-PFUnDA	165	ng/L	160.0		103	75-127			11/27/2024	
Isotope Dilution Analog: 13C8-PFOA	165	ng/L	160.0		103	81-125			11/27/2024	



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ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Organics-PFAS Isotope Dilution - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B4K2623 - Method: 3512					Prepared: 11/26/2024					
Blank (B4K2623-B1.K1)										
Isotope Dilution Analog: 13C8-PFOS	156	ng/L	153.4		101	79-122			11/27/2024	
Isotope Dilution Analog: 13C8-PFOA	163	ng/L	160.0		102	80-122			11/27/2024	
Isotope Dilution Analog: 13C9-PFNA	164	ng/L	160.0		102	80-126			11/27/2024	
Isotope Dilution Analog: d3-N-MeFOSAA	183	ng/L	160.0		115	64-144			11/27/2024	
Isotope Dilution Analog: d5-N-EtFOSAA	184	ng/L	160.0		115	64-149			11/27/2024	
LCS (B4K2623-B51)										
11Cl-PF3OUdS	37.6	ng/L	37.80		99.5	79-128			11/27/2024	
3:3FTCA	37.9	ng/L	40.00		94.6	76-129			11/27/2024	
4:2FTS	36.4	ng/L	37.40		97.2	79-130			11/27/2024	
5:3FTCA	37.1	ng/L	40.00		92.6	76-126			11/27/2024	
6:2FTS	38.0	ng/L	38.00		100	78-129			11/27/2024	
7:3FTCA	42.0	ng/L	40.00		105	60-130			11/27/2024	
8:2FTS	39.0	ng/L	38.40		102	78-132			11/27/2024	
9Cl-PF3ONS	36.3	ng/L	37.30		97.2	81-127			11/27/2024	
ADONA	38.4	ng/L	37.80		101	82-128			11/27/2024	
11TPO-DA	40.2	ng/L	40.00		100	78-130			11/27/2024	
NEtFOSAA	39.8	ng/L	40.00		99.4	80-128			11/27/2024	
NMeFOSAA	40.6	ng/L	40.00		102	79-129			11/27/2024	
PFBA	39.1	ng/L	40.00		97.8	79-126			11/27/2024	
PFBS	37.0	ng/L	35.40		105	82-127			11/27/2024	
PFBSA	38.8	ng/L	40.00		96.9	77-130			11/27/2024	
PFDA	39.2	ng/L	40.00		98.0	81-131			11/27/2024	
PFDoDA	39.8	ng/L	40.00		99.4	83-129			11/27/2024	
PFDS	36.7	ng/L	38.60		95.1	80-130			11/27/2024	
PFECHS	37.7	ng/L	36.96		102	78-127			11/27/2024	
PFHpA	40.2	ng/L	40.00		101	82-127			11/27/2024	
PFHpS	38.9	ng/L	38.20		102	79-132			11/27/2024	
PFHxA	40.8	ng/L	40.00		102	82-128			11/27/2024	
PFHxS	37.3	ng/L	36.50		102	81-129			11/27/2024	
PFHxSA	39.7	ng/L	40.00		99.2	78-127			11/27/2024	
PFNA	38.9	ng/L	40.00		97.2	81-128			11/27/2024	
PFNS	39.1	ng/L	38.40		102	80-129			11/27/2024	
PFOA	40.1	ng/L	40.00		100	81-130			11/27/2024	
PFOS	36.4	ng/L	37.04		98.2	82-129			11/27/2024	
PFOSA	39.7	ng/L	40.00		99.3	80-128			11/27/2024	
PFPeA	39.9	ng/L	40.00		99.8	83-127			11/27/2024	
PFPeS	37.0	ng/L	37.60		98.4	80-129			11/27/2024	
PFTeDA	39.7	ng/L	40.00		99.2	80-133			11/27/2024	
PFTtDA	39.6	ng/L	40.00		99.1	73-124			11/27/2024	
PFUnDA	41.9	ng/L	40.00		105	81-130			11/27/2024	
Isotope Dilution Analog: 13C2-4:2FTS	193	ng/L	150.1		129	31-202			11/27/2024	
Isotope Dilution Analog: 13C2-6:2FTS	131	ng/L	152.2		85.9	10-220			11/27/2024	
Isotope Dilution Analog: 13C2-8:2FTS	137	ng/L	153.6		89.5	16-189			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDM	166	ng/L	160.0		104	60-139			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDA+13C2-PFTeDA	166	ng/L	160.0		104	41-133			11/27/2024	
Isotope Dilution Analog: 13C2-PFTeDA	166	ng/L	160.0		104	10-133			11/27/2024	
Isotope Dilution Analog: 13C3-HFPODA	304	ng/L	320.9		94.9	62-136			11/27/2024	
Isotope Dilution Analog: 13C3-PFBS	145	ng/L	149.1		97.5	58-132			11/27/2024	
Isotope Dilution Analog: 13C3-PFHxS	156	ng/L	151.7		103	80-124			11/27/2024	

Organics-PFAS Isotope Dilution - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
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Batch B4K2623 - Method: 3512

Prepared: 11/26/2024

LCS (B4K2623-BS1)

Isotope Dilution Analog: 13C4-PFBA	167	ng/L	160.0		104	76-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFHxA	169	ng/L	160.0		106	81-125			11/27/2024	
Isotope Dilution Analog: 13C5-PFHxA	173	ng/L	160.0		108	81-124			11/27/2024	
Isotope Dilution Analog: 13C5-PFPeA	170	ng/L	160.0		106	78-123			11/27/2024	
Isotope Dilution Analog: 13C6-PFDA	164	ng/L	160.0		103	77-126			11/27/2024	
Isotope Dilution Analog: 13C7-PFUnDA	160	ng/L	160.0		99.7	75-127			11/27/2024	
Isotope Dilution Analog: 13C8-PFOA	165	ng/L	160.0		103	81-125			11/27/2024	
Isotope Dilution Analog: 13C8-PFOS	159	ng/L	153.4		104	79-122			11/27/2024	
Isotope Dilution Analog: 13C8-PFOSA	164	ng/L	160.0		103	80-122			11/27/2024	
Isotope Dilution Analog: 13C9-PFNA	166	ng/L	160.0		104	80-126			11/27/2024	
Isotope Dilution Analog: d3-N-MeFOSAA	182	ng/L	160.0		114	64-144			11/27/2024	
Isotope Dilution Analog: d5-N-EtFOSAA	186	ng/L	160.0		116	64-149			11/27/2024	

LCS Dup (B4K2623-BS1)

11CI-PF3OUdS	38.5	ng/L	37.80		102	79-128	2.42	200	11/27/2024	
3:3FTCA	39.7	ng/L	40.00		99.2	76-129	4.69	200	11/27/2024	
4:2FTS	39.1	ng/L	37.40		104	79-130	7.21	200	11/27/2024	
5:3FICA	39.1	ng/L	40.00		97.7	76-126	5.31	200	11/27/2024	
6:2FTS	39.3	ng/L	38.00		103	78-129	3.26	200	11/27/2024	
7:3FTCA	42.9	ng/L	40.00		107	60-130	2.21	200	11/27/2024	
8:2FTS	42.1	ng/L	38.40		110	78-132	7.55	200	11/27/2024	
9CI-PF3ONS	38.0	ng/L	37.40		102	81-127	4.52	200	11/27/2024	
ADONA	39.7	ng/L	37.80		105	82-128	3.33	200	11/27/2024	
HEFO-DA	41.2	ng/L	40.00		103	78-130	2.46	200	11/27/2024	
NMeFOSAA	41.6	ng/L	40.00		104	80-128	4.62	200	11/27/2024	
NMeFOSAA	41.1	ng/L	40.00		103	79-129	1.13	200	11/27/2024	
PFBA	40.1	ng/L	40.00		100	79-126	2.43	200	11/27/2024	
PFBS	37.7	ng/L	35.40		107	82-127	1.87	200	11/27/2024	
PFBSA	39.7	ng/L	40.00		99.2	77-130	2.40	200	11/27/2024	
PFDA	39.1	ng/L	40.00		97.8	81-131	0.255	200	11/27/2024	
PFDoDA	40.9	ng/L	40.00		102	83-129	2.92	200	11/27/2024	
PFDs	37.8	ng/L	38.60		98.0	80-130	3.01	200	11/27/2024	
PFECHS	38.1	ng/L	36.96		103	78-127	1.21	200	11/27/2024	
PFHpA	42.1	ng/L	40.00		105	82-127	4.66	200	11/27/2024	
PFHpS	38.5	ng/L	38.20		101	79-132	0.827	200	11/27/2024	
PFHxA	41.5	ng/L	40.00		104	82-128	1.60	200	11/27/2024	
PFHxS	38.2	ng/L	36.50		105	81-129	2.39	200	11/27/2024	
PFHxSA	39.9	ng/L	40.00		99.8	78-127	0.653	200	11/27/2024	
PFNA	41.7	ng/L	40.00		104	81-128	7.10	200	11/27/2024	
PFNS	39.6	ng/L	38.40		103	80-129	1.12	200	11/27/2024	
PFOA	41.0	ng/L	40.00		102	81-130	2.17	200	11/27/2024	
PFOS	37.8	ng/L	37.04		102	82-129	3.72	200	11/27/2024	
PFOSA	40.8	ng/L	40.00		102	80-128	2.58	200	11/27/2024	
PFPeA	41.1	ng/L	40.00		103	83-127	2.96	200	11/27/2024	
PFPeS	38.9	ng/L	37.60		103	80-129	5.01	200	11/27/2024	
PFTeDA	42.3	ng/L	40.00		106	80-133	6.35	200	11/27/2024	
PFTeDA	38.7	ng/L	40.00		96.8	73-124	2.30	200	11/27/2024	
PFUnDA	42.7	ng/L	40.00		107	81-130	1.80	200	11/27/2024	
Isotope Dilution Analog: 13C2-4:2FTS	186	ng/L	150.1		124	31-202			11/27/2024	
Isotope Dilution Analog: 13C2-6:2FTS	135	ng/L	152.2		89.0	10-220			11/27/2024	
Isotope Dilution Analog: 13C2-8:2FTS	143	ng/L	153.6		93.0	16-189			11/27/2024	



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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Organics-PFAS Isotope Dilution - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
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Batch B4K2623 - Method: 3512

Prepared: 11/26/2024

LCS Dup (B4K2623-BSDI)

Isotope Dilution Analog: 13C2-PFDoDA	164	ng/L	160.0		102	60-139			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDA+13C2-PFPeDA	149	ng/L	160.0		92.9	41-133			11/27/2024	
Isotope Dilution Analog: 13C2-PFPeDA	128	ng/L	160.0		79.8	10-133			11/27/2024	
Isotope Dilution Analog: 13C3-HFPODA	312	ng/L	320.0		97.5	62-136			11/27/2024	
Isotope Dilution Analog: 13C3-PFBS	147	ng/L	149.1		98.6	58-132			11/27/2024	
Isotope Dilution Analog: 13C3-PFPeS	157	ng/L	151.7		103	80-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFBA	164	ng/L	160.0		103	76-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFHpA	167	ng/L	160.0		104	81-123			11/27/2024	
Isotope Dilution Analog: 13C5-PFHxA	167	ng/L	160.0		104	81-124			11/27/2024	
Isotope Dilution Analog: 13C5-PFPeA	169	ng/L	160.0		106	78-123			11/27/2024	
Isotope Dilution Analog: 13C6-PFDA	168	ng/L	160.0		103	77-126			11/27/2024	
Isotope Dilution Analog: 13C7-PFUnDA	166	ng/L	160.0		104	75-127			11/27/2024	
Isotope Dilution Analog: 13C8-PFOA	167	ng/L	160.0		104	81-125			11/27/2024	
Isotope Dilution Analog: 13C8-PFOS	156	ng/L	153.4		101	79-122			11/27/2024	
Isotope Dilution Analog: 13C8-PFOA	162	ng/L	160.0		101	80-122			11/27/2024	
Isotope Dilution Analog: 13C9-PFNA	165	ng/L	160.0		103	80-126			11/27/2024	
Isotope Dilution Analog: d3-N-MeFOSAA	181	ng/L	160.0		113	64-141			11/27/2024	
Isotope Dilution Analog: d5-N-EtFOSAA	189	ng/L	160.0		118	64-149			11/27/2024	

MRL Check (B4K2623-MRL1)

11CI-PF3OUdS	3.56	ng/L	3.780		94.2	76-128			11/27/2024	
3,3FTCA	3.88	ng/L	4.000		97.0	58-153			11/27/2024	
4,2FTS	4.18	ng/L	3.740		112	69-139			11/27/2024	
5,3FTCA	4.24	ng/L	4.000		106	65-139			11/27/2024	
6,2FTS	4.60	ng/L	3.800		121	58-134			11/27/2024	
7,3FTCA	4.68	ng/L	4.000		117	48-140			11/27/2024	
8,2F18	4.24	ng/L	3.840		110	65-141			11/27/2024	
9CI-PF3ONS	3.80	ng/L	3.740		102	72-139			11/27/2024	
ADONA	3.96	ng/L	3.780		105	75-128			11/27/2024	
HFPO-DA	4.58	ng/L	4.000		114	55-150			11/27/2024	
NMeFOSAA	4.26	ng/L	4.000		106	60-142			11/27/2024	
NMeFOSAA	4.22	ng/L	4.000		106	67-135			11/27/2024	
PFBA	4.00	ng/L	4.000		100	55-131			11/27/2024	
PFBS	3.74	ng/L	3.540		106	64-126			11/27/2024	
PFBSA	4.14	ng/L	4.000		104	75-131			11/27/2024	
PFDA	4.02	ng/L	4.000		100	67-139			11/27/2024	
PFDoDA	4.10	ng/L	4.000		102	75-128			11/27/2024	
PFDS	4.42	ng/L	3.860		115	71-136			11/27/2024	
PFECHS	4.60	ng/L	3.696		124	69-134			11/27/2024	
PFHpA	4.56	ng/L	4.000		114	66-131			11/27/2024	
PFHpS	4.16	ng/L	3.820		109	63-140			11/27/2024	
PFHxA	4.52	ng/L	4.000		113	65-132			11/27/2024	
PFHxS	3.42	ng/L	3.650		93.7	68-139			11/27/2024	
PFHxSA	4.12	ng/L	4.000		103	76-128			11/27/2024	
PFNA	4.48	ng/L	4.000		112	58-143			11/27/2024	
PFNS	4.40	ng/L	3.840		115	71-137			11/27/2024	
PFOA	4.10	ng/L	4.000		102	58-144			11/27/2024	
PFOS	3.94	ng/L	3.704		106	75-135			11/27/2024	
PFOSA	4.24	ng/L	4.000		106	76-132			11/27/2024	
PFPeA	3.96	ng/L	4.000		99.0	67-128			11/27/2024	
PFPeS	3.74	ng/L	3.760		99.5	73-134			11/27/2024	



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Organics-PFAS Isotope Dilution - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
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Batch B4K2623 - Method: 3512

Prepared: 11/26/2024

MRL Check (B4K2623-MRL1)

PFTeDA	4.38	ng/L	4.000		110	71-132			11/27/2024	
PFTrDA	3.90	ng/L	4.000		97.5	70-121			11/27/2024	
PFUnDA	4.48	ng/L	4.000		112	76-126			11/27/2024	
Isotope Dilution Analog: 13C2-4-2FTS	190	ng/L	150.1		127	31-202			11/27/2024	
Isotope Dilution Analog: 13C2-6-2FTS	101	ng/L	152.2		66.4	10-220			11/27/2024	
Isotope Dilution Analog: 13C2-8-2FTS	145	ng/L	153.6		94.1	16-189			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDA	166	ng/L	160.0		104	60-139			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDA + 13C2-PFTeDA	149	ng/L	160.0		93.3	41-133			11/27/2024	
Isotope Dilution Analog: 13C2-PFTeDA	126	ng/L	160.0		78.7	10-133			11/27/2024	
Isotope Dilution Analog: 13C3-HFPODA	307	ng/L	320.0		96.0	62-136			11/27/2024	
Isotope Dilution Analog: 13C3-PFBS	146	ng/L	149.1		97.6	58-132			11/27/2024	
Isotope Dilution Analog: 13C3-PFHxS	155	ng/L	151.7		102	80-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFBA	165	ng/L	160.0		103	76-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFHpA	170	ng/L	160.0		107	81-125			11/27/2024	
Isotope Dilution Analog: 13C5-PFHxA	173	ng/L	160.0		108	81-124			11/27/2024	
Isotope Dilution Analog: 13C5-PFPeA	168	ng/L	160.0		105	78-123			11/27/2024	
Isotope Dilution Analog: 13C6-PFDA	162	ng/L	160.0		101	77-126			11/27/2024	
Isotope Dilution Analog: 13C7-PFUnDA	162	ng/L	160.0		101	75-127			11/27/2024	
Isotope Dilution Analog: 13C8-PFOA	164	ng/L	160.0		103	81-125			11/27/2024	
Isotope Dilution Analog: 13C8-PFOS	157	ng/L	153.4		102	79-122			11/27/2024	
Isotope Dilution Analog: 13C8-PFOSA	162	ng/L	160.0		101	80-122			11/27/2024	
Isotope Dilution Analog: 13C9-PFNA	164	ng/L	160.0		102	80-126			11/27/2024	
Isotope Dilution Analog: d3-N-MeFOSAA	183	ng/L	160.0		114	64-144			11/27/2024	
Isotope Dilution Analog: d5-N-EtFOSAA	187	ng/L	160.0		117	64-149			11/27/2024	

Matrix Spike (B4K2623-MS1)

Source: 2411197-01

11Cl-PF3ONS	37.2	ng/L	37.80	ND	98.3	74-127			11/27/2024	
3-3FTCA	38.2	ng/L	40.00	ND	95.4	76-135			11/27/2024	
4-2FTS	38.1	ng/L	37.40	ND	102	78-134			11/27/2024	
5-3FTCA	38.5	ng/L	40.00	ND	96.4	76-131			11/27/2024	
6-2FTS	40.6	ng/L	38.00	ND	107	76-134			11/27/2024	
7-3FTCA	43.0	ng/L	40.00	ND	107	57-143			11/27/2024	
8-2FTS	42.9	ng/L	38.40	ND	112	80-134			11/27/2024	
9Cl-PF3ONS	38.3	ng/L	37.40	ND	102	80-130			11/27/2024	
ADONA	41.1	ng/L	37.80	ND	109	81-135			11/27/2024	
HFPO-DA	44.3	ng/L	40.00	ND	111	76-135			11/27/2024	
NEFOSAA	45.8	ng/L	40.00	ND	115	80-131			11/27/2024	
NMeFOSAA	41.5	ng/L	40.00	ND	104	80-131			11/27/2024	
PFBA	44.0	ng/L	40.00	4.90	97.8	80-132			11/27/2024	
PFBS	37.6	ng/L	35.40	1.34	102	82-132			11/27/2024	
PBBSA	43.3	ng/L	40.00	0.620	107	74-140			11/27/2024	
PFDA	40.2	ng/L	40.00	ND	101	81-134			11/27/2024	
PFDaDA	42.2	ng/L	40.00	ND	106	83-132			11/27/2024	
PFDS	38.6	ng/L	38.60	ND	99.9	75-129			11/27/2024	
PFECHS	40.3	ng/L	36.96	ND	109	32-180			11/27/2024	
PFHpA	44.1	ng/L	40.00	1.24	107	76-136			11/27/2024	
PFHpS	38.7	ng/L	38.20	ND	101	78-135			11/27/2024	
PFHxA	45.7	ng/L	40.00	3.48	106	76-139			11/27/2024	
PFHxS	38.1	ng/L	36.50	ND	104	66-150			11/27/2024	
PFHxSA	42.7	ng/L	40.00	ND	107	74-135			11/27/2024	



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ENVIRONMENT, GREAT LAKES, AND ENERGY

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ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Organics-PFAS Isotope Dilution - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B4K2623 - Method: 3512					Prepared: 11/26/2024					
Matrix Spike (B4K2623-MS1)			Source: 2411197-01							
PFNA	42.5	ng/L	40.00	ND	106	81-132			11/27/2024	
PFNS	39.3	ng/L	38.40	ND	102	76-134			11/27/2024	
PFOA	46.2	ng/L	40.00	2.06	110	80-135			11/27/2024	
PFOS	43.2	ng/L	37.04	5.44	102	71-141			11/27/2024	
PFOSA	41.8	ng/L	40.00	ND	104	75-135			11/27/2024	
PFPeA	45.9	ng/L	40.00	2.76	108	71-143			11/27/2024	
PFPeS	38.0	ng/L	37.60	ND	101	79-133			11/27/2024	
PFTeDA	42.0	ng/L	40.00	ND	105	78-141			11/27/2024	
PFTrDA	41.5	ng/L	40.00	ND	104	72-128			11/27/2024	
PFUnDA	42.9	ng/L	40.00	ND	107	81-131			11/27/2024	
Isotope Dilution Analog: 13C2-4:2FTS	283	ng/L	150.1		188	31-202			11/27/2024	
Isotope Dilution Analog: 13C2-6:2FTS	143	ng/L	152.2		93.7	10-220			11/27/2024	
Isotope Dilution Analog: 13C2-8:2FTS	152	ng/L	153.6		99.0	16-189			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDA	159	ng/L	160.0		99.6	60-139			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDA+13C2-PFTeDA	132	ng/L	160.0		82.3	41-133			11/27/2024	
Isotope Dilution Analog: 13C2-PFTeDA	92.7	ng/L	160.0		57.9	10-133			11/27/2024	
Isotope Dilution Analog: 13C3-HFPODA	244	ng/L	320.0		76.2	62-136			11/27/2024	
Isotope Dilution Analog: 13C3-PFBS	142	ng/L	149.1		95.1	58-132			11/27/2024	
Isotope Dilution Analog: 13C3-PFHxS	159	ng/L	151.7		105	80-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFBA	164	ng/L	160.0		103	76-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFHpA	179	ng/L	160.0		112	81-125			11/27/2024	
Isotope Dilution Analog: 13C5-PFHxA	175	ng/L	160.0		109	81-124			11/27/2024	
Isotope Dilution Analog: 13C5-PFPeA	164	ng/L	160.0		102	78-123			11/27/2024	
Isotope Dilution Analog: 13C6-PFDA	172	ng/L	160.0		107	77-126			11/27/2024	
Isotope Dilution Analog: 13C7-PFUnDA	162	ng/L	160.0		101	75-127			11/27/2024	
Isotope Dilution Analog: 13C8-PFOA	171	ng/L	160.0		107	81-125			11/27/2024	
Isotope Dilution Analog: 13C8-PFOS	155	ng/L	153.4		101	79-122			11/27/2024	
Isotope Dilution Analog: 13C8-PFOSA	156	ng/L	160.0		97.4	80-122			11/27/2024	
Isotope Dilution Analog: 13C9-PFNA	173	ng/L	160.0		108	80-126			11/27/2024	
Isotope Dilution Analog: d3-N-MeFOSAA	192	ng/L	160.0		120	64-144			11/27/2024	
Isotope Dilution Analog: d5-N-EtFOSAA	190	ng/L	160.0		119	64-149			11/27/2024	
Matrix Spike Dup (B4K2623-MSD1)			Source: 2411197-01							
11Cl-PF3OUdS	35.0	ng/L	37.80	ND	92.6	74-127	5.93	16.6	11/27/2024	
3:3FTCA	38.1	ng/L	40.00	ND	95.2	76-135	0.157	19.2	11/27/2024	
4:2FTS	38.1	ng/L	37.40	ND	102	78-134	0.105	19.3	11/27/2024	
5:3FTCA	36.5	ng/L	40.00	ND	91.3	76-131	5.38	16.1	11/27/2024	
6:2FTS	39.1	ng/L	38.00	ND	103	76-134	3.67	16.8	11/27/2024	
7:3FTCA	40.3	ng/L	40.00	ND	101	57-143	6.29	22.5	11/27/2024	
8:2FTS	39.9	ng/L	38.40	ND	104	80-134	7.30	17.5	11/27/2024	
9Cl-PF3ONS	37.2	ng/L	37.40	ND	99.4	80-130	2.92	13.1	11/27/2024	
ADONA	40.3	ng/L	37.80	ND	107	81-135	2.02	13	11/27/2024	
HFPO-DA	42.1	ng/L	40.00	ND	105	76-135	5.00	23.2	11/27/2024	
NEtFOSAA	40.9	ng/L	40.00	ND	102	80-131	11.3	14.3	11/27/2024	
NMeFOSAA	39.8	ng/L	40.00	ND	99.4	80-131	4.28	14.2	11/27/2024	
PFBA	43.3	ng/L	40.00	4.90	95.9	80-132	1.79	11.6	11/27/2024	
PFBS	36.4	ng/L	35.40	1.34	98.9	82-132	3.30	13.6	11/27/2024	
PFBSA	40.6	ng/L	40.00	0.620	99.9	74-140	6.41	15.6	11/27/2024	
PFDA	39.4	ng/L	40.00	ND	98.6	81-134	2.01	15.9	11/27/2024	
PFDoDA	40.9	ng/L	40.00	ND	102	83-132	3.27	12.6	11/27/2024	



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Organics-PFAS Isotope Dilution - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
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Batch B4K2623 - Method: 3512

Prepared: 11/26/2024

Matrix Spike Dup (B4K2623-MSD1)

Source: 2411197-01

PFDS	34.3	ng/L	38.60	ND	89.0	75-129	11.6	18.7	11/27/2024	
PFECHS	39.7	ng/L	36.96	ND	107	32-180	1.55	15.4	11/27/2024	
PFHpA	43.0	ng/L	40.00	1.24	104	76-136	2.57	13.3	11/27/2024	
PFHpS	40.8	ng/L	38.20	ND	107	78-135	5.38	14.7	11/27/2024	
PFHxA	45.3	ng/L	40.00	3.48	105	76-139	0.791	12.6	11/27/2024	
PFHxS	38.7	ng/L	36.50	ND	106	66-150	1.56	14.7	11/27/2024	
PFHxSA	40.7	ng/L	40.00	ND	102	74-135	4.75	14.8	11/27/2024	
PFNA	40.6	ng/L	40.00	ND	101	81-132	4.67	13.7	11/27/2024	
PFNS	38.3	ng/L	38.40	ND	99.8	76-134	2.57	14.5	11/27/2024	
PFOA	43.9	ng/L	40.00	2.06	104	80-135	5.24	12.4	11/27/2024	
PPOS	42.3	ng/L	37.04	5.44	99.5	71-141	2.01	13.2	11/27/2024	
PFOSA	40.3	ng/L	40.00	ND	101	75-135	3.55	13.8	11/27/2024	
PFPeA	45.6	ng/L	40.00	2.76	107	71-143	0.481	11.5	11/27/2024	
PFPeS	36.8	ng/L	37.60	ND	97.9	79-133	3.26	14.3	11/27/2024	
PFTeDA	41.2	ng/L	40.00	ND	103	78-141	1.73	16.2	11/27/2024	
PFTeDA	37.9	ng/L	40.00	ND	94.8	72-128	9.11	19.1	11/27/2024	
PFUnDA	41.9	ng/L	40.00	ND	105	81-131	2.45	13.2	11/27/2024	
Isotope Dilution Analog: 13C2-4,2,1TS	271	ng/L	150.1		180	31-202			11/27/2024	
Isotope Dilution Analog: 13C2-6,2,1TS	120	ng/L	152.2		79.0	10-220			11/27/2024	
Isotope Dilution Analog: 13C2-8,2,1TS	145	ng/L	153.6		94.3	16-189			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDA	130	ng/L	160.0		81.3	60-139			11/27/2024	
Isotope Dilution Analog: 13C2-PFDoDA+13C2-PFTeDA	105	ng/L	160.0		65.6	41-133			11/27/2024	
Isotope Dilution Analog: 13C2-PFTeDA	69.8	ng/L	169.0		43.6	10-133			11/27/2024	
Isotope Dilution Analog: 13C3-HFPoDA	246	ng/L	320.0		76.9	62-136			11/27/2024	
Isotope Dilution Analog: 13C3-PFBS	143	ng/L	149.1		95.6	58-132			11/27/2024	
Isotope Dilution Analog: 13C3-PFHS	155	ng/L	151.7		102	80-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFBA	164	ng/L	160.0		102	76-124			11/27/2024	
Isotope Dilution Analog: 13C4-PFHpA	174	ng/L	160.0		109	81-125			11/27/2024	
Isotope Dilution Analog: 13C5-PFHxA	173	ng/L	160.0		108	81-124			11/27/2024	
Isotope Dilution Analog: 13C5-PFPeA	166	ng/L	160.0		103	78-123			11/27/2024	
Isotope Dilution Analog: 13C6-PFDA	170	ng/L	160.0		106	77-126			11/27/2024	
Isotope Dilution Analog: 13C7-PFUnDA	157	ng/L	160.0		98.1	75-127			11/27/2024	
Isotope Dilution Analog: 13C8-PFOA	173	ng/L	160.0		108	81-125			11/27/2024	
Isotope Dilution Analog: 13C8-PPOS	153	ng/L	153.4		99.7	79-122			11/27/2024	
Isotope Dilution Analog: 13C8-PFOSA	157	ng/L	160.0		98.4	80-122			11/27/2024	
Isotope Dilution Analog: 13C9-PPNA	176	ng/L	160.0		110	80-126			11/27/2024	
Isotope Dilution Analog: d3-N-MeFOSAA	188	ng/L	160.0		117	64-144			11/27/2024	
Isotope Dilution Analog: d5-N-EtFOSAA	187	ng/L	160.0		117	64-149			11/27/2024	



Michigan Department of Environment, Great Lakes, and Energy
Laboratory Services Section
Environmental Lab

Analysis Request - PFAS

For Environmental Water

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

2211239	Project Name: Generate Fremont Digestate Lagoons		Matrix: Water
Location ID: 498637	Activity: 33650	Sample Collector: Kent Walters	
Dept / Division / District: EGLE/MMD/GRDO	Location Code:	Sample Collector Phone: 616-278-4350	
State Project Manager: Kent Walters	Sub Location Code:	Contract Firm Primary Contact:	
State Project Mgr Email: WaltersK7@michigan.gov	Primary Contact Phone:		
CC Email 1: SellersF@michigan.gov	Overflow Lab Choice: Merrit		
CC Email 2:	*Rush Turnaround Request		Temp: 1.0
CC Email 3:	Days: Appr By:		1.0

*Project Turnaround Time other than standard (15 business days) must be pre-approved and scheduled with a Laboratory Manager. Details on Page 2.

	Lab Use Only	Field Sample ID	Collection Date	Collection Time	Bottle Count	Comments
1	01	EB-01	11/22/24	1110	3	
2	02	NL-01	11/22/24	1130	3	
3	03	SL-01	11/22/24	1150	3	High % of solids
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

ANALYSIS SELECTION

(Applies to all samples listed above)

☐ PFAS - Method 1633 (2x 250 mL plastic bottles per sample with 2 additional bottles per 20 samples for QC)	☒	☐ PFAS - Method 8327 (3x 15 mL plastic test tubes per sample)
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Any Known Hazards:

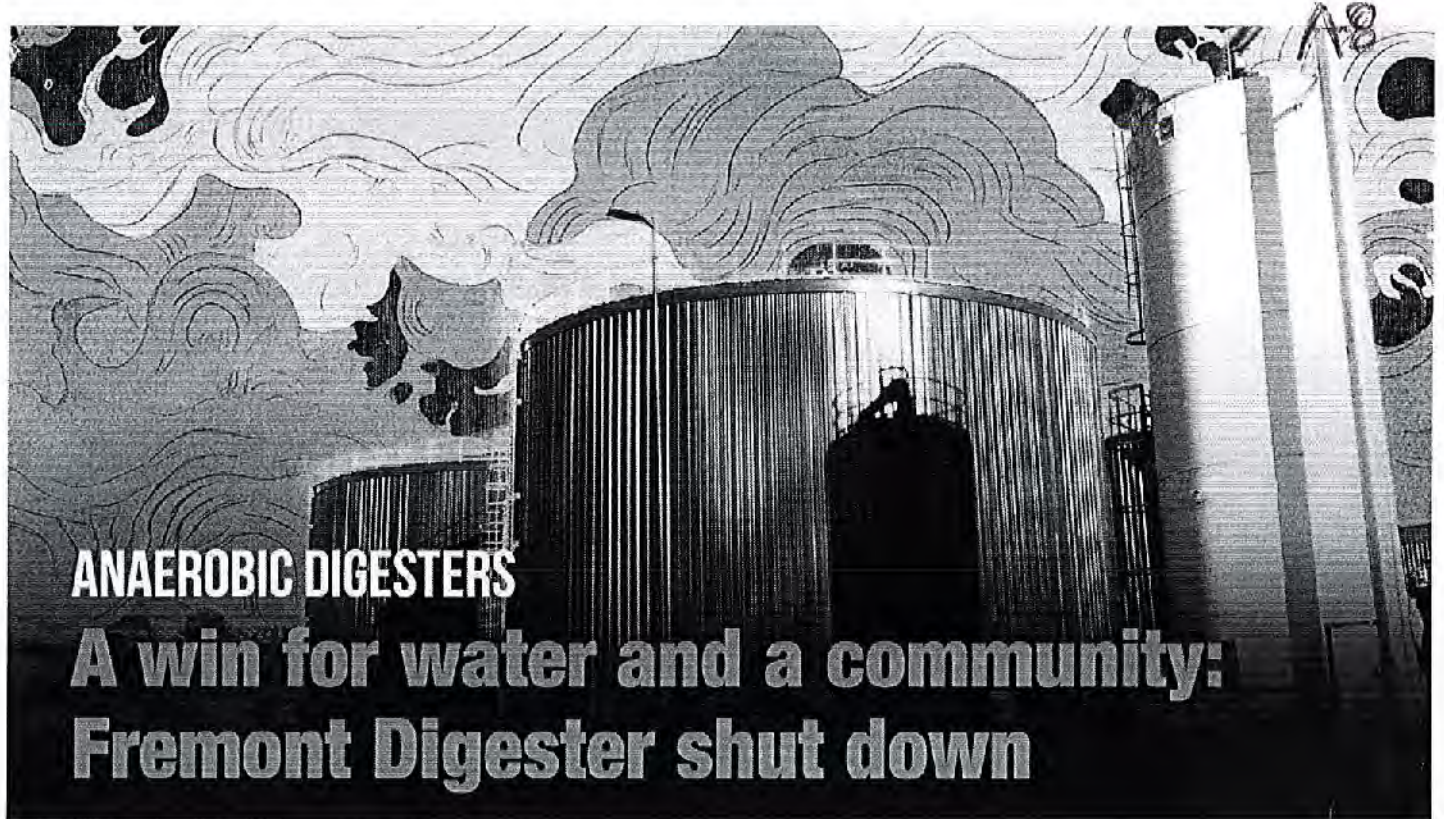
Chain of Custody	Relinquished By: Kent Walters, Org EGLE	Received By: [Signature]	Date / Time: 11/22/24 1455
	[Signature]	[Signature]	
	Print Name & Org	Print Name & Org	
	Signature	Signature	

Fatal Fertilizer: PFAS Contamination of Farmland from Biosolids and Potential Federal Solutions

Pace Environmental Law Review (/journal/52183/pace-environmental-law-review), Mar 2023

Molly Carey (/search/?q=authors%3A%22Molly+Carey%22)

Farmers across the country are increasingly discovering devastating levels of per- and poly-fluoroalkyl substances (PFAS) contamination in their soil, water, and farm products from the spread of biosolid fertilizer. Contamination from these “forever chemicals” is causing farmers to close their businesses, lose their incomes and property values, and confront potential adverse health effects from toxic exposure. PFAS are not federally regulated, leaving farmers with no options for federal assistance with contamination crises. This article examines federal regulations that govern the spread of biosolids as well as existing and proposed federal regulations of PFAS. To fill in federal regulatory gaps, this article proposes federal policy recommendations to prevent and remediate PFAS contamination of farmland and provide financial assistance, medical monitoring, and mental health services for affected farmers.



ANAEROBIC DIGESTERS

A win for water and a community: Fremont Digester shut down

Fremont, Michigan is a rural community in west Michigan's Newaygo County, about an hour north of Grand Rapids. Since 2012 it has been home to a **huge anaerobic digester** (<https://flowwateradvocates.org/policy-brief-anaerobic-digesters-michigan/>), owned since 2017 by the Delaware-incorporated company Generate Upcycle, part of multi-billion dollar "clean energy" investment firm Generate Capital.

Anaerobic digesters use bacteria to decompose organic waste (such as commercial food waste and factory farm sewage) and generate biogas. The byproduct of this process is **a concentrated sludge called "digestate."** The digestate – often full of heavy metals and biological hazards – is held in massive cesspits, then sprayed on fields ("field application") as fertilizer.

In addition to creating noxious, intolerable odors, the digestate makes its way through field drains and runoff and into lakes, streams, groundwater – and residential water wells.

Following years of maneuvering by Generate Upcycle and repeated extensions of its outdated, inadequate "Agricultural Use" authorization, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) finally moved to require a more stringent Groundwater Discharge Permit for the facility. Despite the proposed permit's notable weaknesses (<https://flowwateradvocates.org/flow-coalition-submits-fremont-digester-comments/>), Generate Upcycle chafed at the stricter pollutant limits (<https://www.wastedive.com/news/michigan-anaerobic-digestion-rule-oversight-generate-upcycle/745140/>). EGLE is required by law to protect drinking water sources – including groundwater – by regulating pollutants.

In November 2024, at the request of FLOW and a coalition of Fremont residents and allies, EGLE held a **public hearing** on the proposed groundwater discharge permit. **Community members spoke very movingly about their experiences living near the digester:**

Fremont Anaerobic Digester - November 2024 Public Hearing



“EGLE must allow zero wiggle room for this industry to turn rural Michigan into their dumpster.”

– Kathy Morrison, Fremont resident

Citing the expense and challenge of complying with the stronger environmental standards proposed by EGLE, Generate Upcycle [closed the doors](https://www.ourmidland.com/news/article/farmers-claim-state-overregulates-across-industry-20250053.php) (<https://www.ourmidland.com/news/article/farmers-claim-state-overregulates-across-industry-20250053.php>) of the Fremont digester and is now in the final stages of decommissioning it.

A recent email from EGLE read: “On March 10, 2025, Generate Fremont Digester, LLC requested to withdraw their Groundwater Discharge Permit Application. The draft permit that was placed on public notice will not be issued. Any authorization to discharge from this facility would require a new application describing the expected discharge and issuance of an appropriate permit.”

FLOW is heartened that the community of Fremont and its waters are no longer threatened by the digester's odors and toxic byproducts (though the impacts of its past operations are likely to linger), and we are inspired by the many community members who bravely made their voices heard. In its [comments to EGLE \(pdf\)](https://forloveofwater-wp-uploads.s3.us-east-2.amazonaws.com/wp-content/uploads/2024/08/8.2.2024-FINAL-FLOW-Coalition-Fremont-digester-comments.pdf) (<https://forloveofwater-wp-uploads.s3.us-east-2.amazonaws.com/wp-content/uploads/2024/08/8.2.2024-FINAL-FLOW-Coalition-Fremont-digester-comments.pdf>), the FLOW Coalition made specific recommendations regarding field application locations and conditions; response to citizen odor complaints and odor compliance; pre-treatment of digestate to remove chemicals of emerging concern (CECs), microplastics, PFAS/PFOAS, pathogens, and heavy metals; compliance and enforcement; and more.

Propped up by "green energy" incentives and fed by the waste of factory farms, anaerobic digesters are a burgeoning industry. **We call on agencies and lawmakers to figure out how to manage this technology in a way that protects us all.**

Tags: [anaerobic digesters](https://flowwateradvocates.org/tag/anaerobic-digesters/) (<https://flowwateradvocates.org/tag/anaerobic-digesters/>), [EGLE](https://flowwateradvocates.org/tag/egle/) (<https://flowwateradvocates.org/tag/egle/>), [factory farms](https://flowwateradvocates.org/tag/factory-farms/) (<https://flowwateradvocates.org/tag/factory-farms/>), [fremont regional digester](https://flowwateradvocates.org/tag/fremont-regional-digester/) (<https://flowwateradvocates.org/tag/fremont-regional-digester/>)

3 comments on "A win for water: Fremont Regional Digester shut down"



Jane Morawski (<http://N/A>) on [May 2nd, 2025 - 9:16pm](https://flowwateradvocates.org/fremont-regional-digester-shut-down/#comment-81108) (<https://flowwateradvocates.org/fremont-regional-digester-shut-down/#comment-81108>)

SHUT DOWN THIS VERY DANGEROUS PIPELINE AND ANYTHING CONNECTED WITH IT LIKE A TUNNEL AND SEPTIC POLLUTION AND SLUDGE AND LEAD AND HEAVY METAL POLLUTION ET AL.

THE GREAT LAKES CAN'T BE COMPROMISED IN ANY WAY!! KEEP THE WATER CLEAN AND PURE.

THERE SHOULD BE FINES FOR ANYONE WHO CONTAMINATES THE WATER.

[Reply](#)



Kathy Morrison on [May 3rd, 2025 - 2:20pm](https://flowwateradvocates.org/fremont-regional-digester-shut-down/#comment-81151) (<https://flowwateradvocates.org/fremont-regional-digester-shut-down/#comment-81151>)

Huge thank you to FLOW for your work and contributions in standing up to help shine a spotlight on the Newaygo, Muskegon, and Oceana county areas where we were suffering the ill effects of digestate land application, both in terms of our quality of life and concern for the health of our soil and both surface and well water. FLOW's public statements have been powerful and extremely helpful in adding to the voiced concerns of the local residents. We are very grateful for FLOW.

[Reply](#)



Jimmy on [May 5th, 2025 - 1:05pm \(https://flowwateradvocates.org/fremont-regional-digester-shut-down/#comment-81243\)](https://flowwateradvocates.org/fremont-regional-digester-shut-down/#comment-81243)

Thank you for helping the residents of Newaygo, Muskegon, and Oceana counties, FLOW!! <3

[Reply](#)

Leave a Reply

Your email address will not be published. Required fields are marked *

Comment *

Name *

Email *

Website

**FREMONT REGIONAL DIGESTER
FLOW Coalition calls on EGLE to deny
groundwater discharge permit**

"I am used to farm smells. I am a farmer myself. Manure spread, and even the turkey CAFO a mile away, were unpleasant but familiar smells that our community has lived with. The digestate was nothing like these. I could only liken it to having my head in a full port-a-potty. I am over a mile away."

KATHY MORRISON, FREMONT AREA FARMER

Fremont, Michigan is a rural community in west Michigan's Newaygo County, about an hour north of Grand Rapids. The pillars of Newaygo's economy are tourism, agriculture, and small manufacturing, reflected in its median household income of just over \$37,000 – barely over *half* the state median. It is home to over 800 farms, 230 natural lakes, 350 miles of rivers and streams, thousands of acres of the Manistee National Forest, and 50,000 people.

Since 2012, it's also home to a huge anaerobic digester owned since 2017 by the Delaware-incorporated company Generate Upcycle, part of multi-billion dollar "clean energy" investment firm Generate Capital.

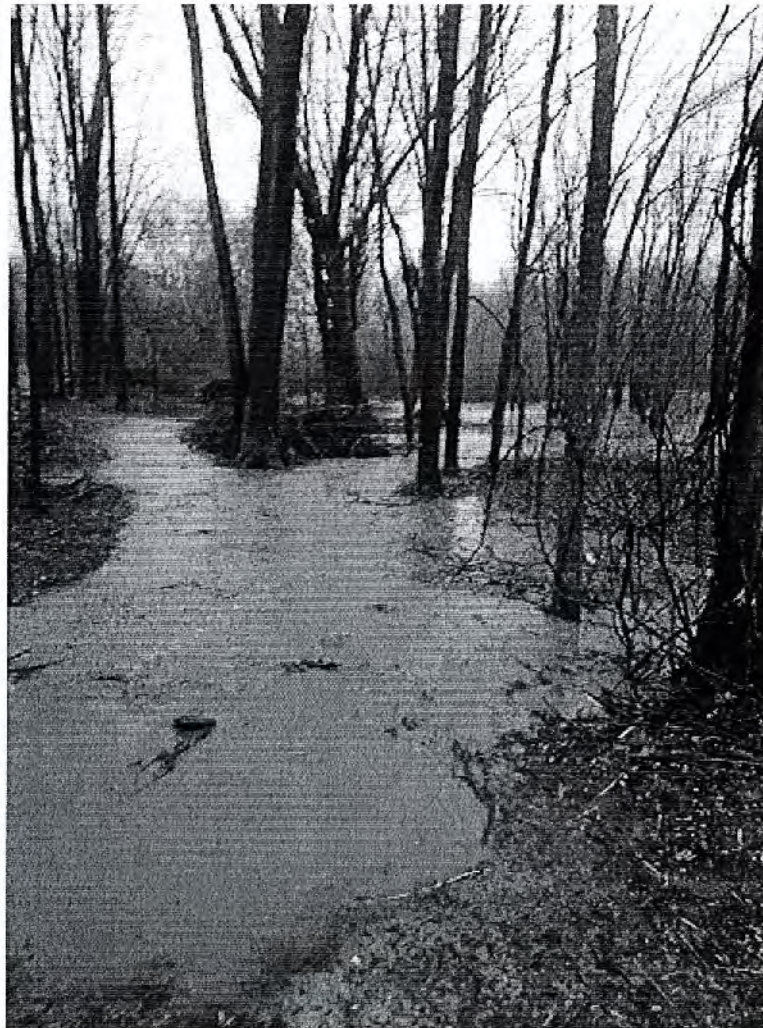
Anaerobic digesters use bacteria to decompose organic waste (such as commercial food waste and factory farm sewage) and generate biogas. The byproduct of this process is a concentrated sludge called "digestate." The digestate – often full of heavy metals and biological hazards – is held in massive cesspits, then sprayed on fields as "fertilizer."

But it doesn't stay there.

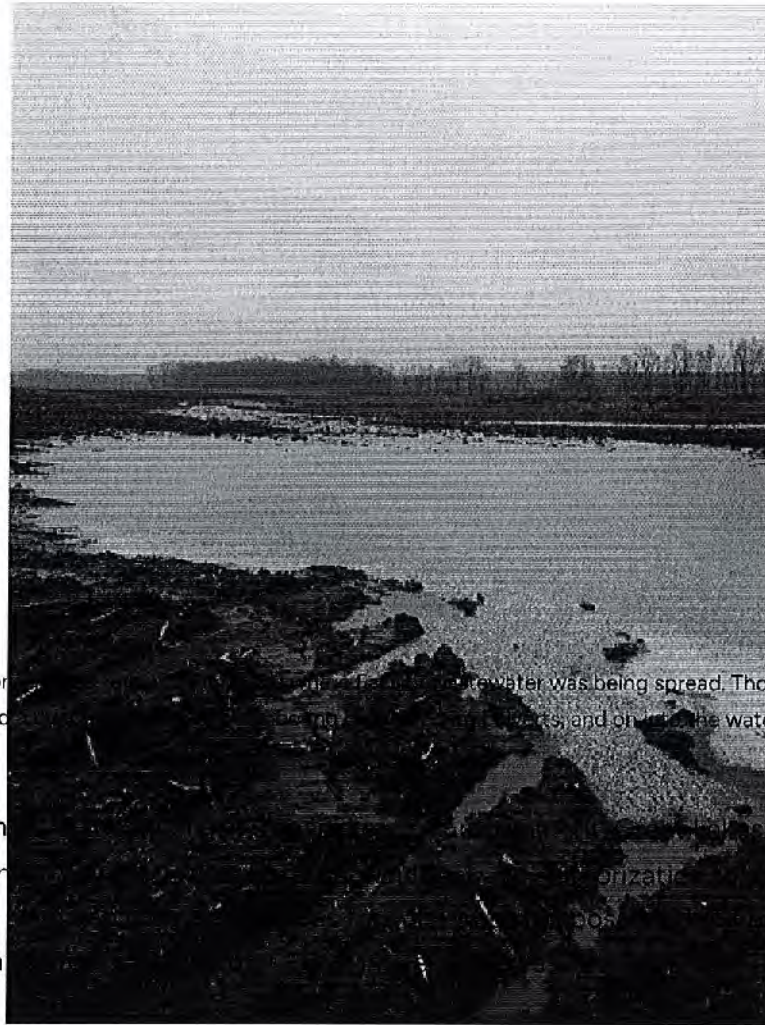
In addition to creating the noxious, intolerable odors described by resident Kathy Morrison and others, the digestate makes its way through field drains and runoff and into lakes, streams, groundwater – and residential water wells.

"Many residents that live near these fields of wastewater spread and near the two ten million gallon lagoons are unable to afford testing...to assure themselves that their drinking water has not been compromised by the digestate."

KATHY MORRISON



PICTURED ABOVE: Sprinklers at the site were used to spread digester water. Thousands of gallons ran off the field and formed a large pond in the watershed.



Despite these hazards, in 2019, the Michigan Department of Environment and Energy (EGLE)'s Solid Waste Division granted Generate Upcycle a groundwater discharge authorization to spread digestate without many of the protections required by Michigan law. For the next two years, Generate Upcycle violated its authorization and discharged digestate into the ground. In 2021, EGLE issued a \$13,860 fine.

Following years of maneuvering by Generate Upcycle to avoid a more protective permit and repeated extensions of its outdated, inadequate authorization, EGLE has now proposed a groundwater discharge permit that does not go far enough to protect the health and well-being of the watershed, farmland, and people in the surrounding community. As part of the application process, EGLE granted Generate Upcycle a waiver of the hydrogeological report required by Michigan law, based on Generate Upcycle's claims that a hydrogeological report was too burdensome, because the facility spreads digestate at over 700 sites (<https://forloveofwater-wp-uploads.s3.us-east-2.amazonaws.com/wp-content/uploads/2024/08/8.2.2024-FINAL-FLOW-Coalition-Fremont-digester-comments.pdf>). To the contrary, the variety of affected terrain and waterways is a powerful reason for a comprehensive hydrogeological report.

That's why FLOW is leading a coalition of residents and organizations in submitting public comments to EGLE (<https://forloveofwater-wp-uploads.s3.us-east-2.amazonaws.com/wp-content/uploads/2024/08/8.2.2024-FINAL-FLOW-Coalition-Fremont-digester-comments.pdf>), detailing our concerns about the proposed permit. Our concerns include:

- Insufficient soil and groundwater monitoring standards and parameters
- Inadequate hydrogeological study
- Discharge concentrations higher than allowed under Michigan laws and the Michigan Environmental Protection Act (MEPA)
- Inadequate protection of natural resources under the Public Trust Doctrine, the Michigan Constitution, and the Michigan Environmental Protection Act (MEPA)

- Failure to evaluate feasible and prudent alternatives, as required by MEPA.

The FLOW Coalition comments make specific recommendations regarding field application locations and conditions; prompt, effective response to citizen odor complaints and odor compliance; pre-treatment of digestate to remove chemicals of emerging concern (CECs), microplastics, PFAS/PFOAS, pathogens, and heavy metals; compliance and enforcement; and more.

The Coalition of signatories includes Fremont area farmer Kathleen Morrison, Michigan Farmers Union, Michigan Lakes and Streams Association, Michiganders for a Just Farming System, Progress Michigan, Socially Responsible Agriculture Project, and U.S. Representative Rashida Tlaib, as well as Michigan environmental law clinics and organizations. The FLOW Coalition has requested a public hearing in or near Fremont, and coordination with the Office of the Environmental Justice Public Advocate, to initiate a comprehensive evaluation of measures needed to operate the digester safely.

The problems with the Fremont Digester aren't just a case of one bad apple. Industrial scale biodigesters create vast waste streams full of concentrated toxins – a threat to land, air, and water.

The FLOW Coalition calls on EGLE to go back to the drawing board, and figure out how to handle this technology in a way that protects us all.

4 comments on “FLOW Coalition submits Fremont digester comments”

 Peggy Case, MCWC president (<http://saveMIwater.org>) on August 13th, 2024 - 8:54am
(<https://flowwateradvocates.org/flow-coalition-submits-fremont-digester-comments/#comment-71959>)

Michigan Citizens for Water Conservation should certainly sign on to these comments. Many of our members live in Newago County. This sounds like another example of a state agency willing to bypass environmental protection law and common sense regulations to prop up industrial pollution, similar to the threat to Osceola and Mecosta Counties generated by the granting of waste injection well permits to the proposed potash mine.

[Reply](#)



Sandy Bihn (<http://www.lakeeriewaterkeeper.org>) on August 13th, 2024 - 9:37am
(<https://flowwateradvocates.org/flow-coalition-submits-fremont-digester->

Attachment 9:

**Emerging Issues of Persistent Chemical Contaminants and
Microplastics Contaminants in Food Waste and Ending up in
Digestate**

EMERGING ISSUES IN
FOOD WASTE MANAGEMENT

August 2021

Persistent Chemical Contaminants



U.S. Environmental Protection Agency
Office of Research and Development

EPA/600/R-21/115

8. CONCLUSIONS AND RESEARCH GAPS

This issue paper summarizes the available information on persistent chemical contaminants in food waste streams and the composts or digestates derived from food waste streams to investigate whether food waste is a leading contributor to contamination in compost and digestate. Food waste is defined in this paper as food that is produced for human consumption but not ultimately consumed by humans. Food waste streams may include items other than food waste, including compostable and non-compostable food contact materials. Conclusions based on the available information are presented in Section 8.1. Section 8.2 identifies areas where scientifically rigorous data are needed to address important research gaps.

8.1. Conclusions

Overall, this paper demonstrates that food waste streams are a source of PFAS contamination in composts and digestates but are likely not a major source of contamination for the four persistent herbicides of interest (clopyralid, aminopyralid, aminocyclopyrachlor, and picloram). The available data on PCBs and PAHs in food waste and associated composts and digestates are briefly discussed but were not further considered due to the lack of recent U.S. compost and digestate data and, in the case of PCBs, due to the U.S. ban on PCBs. It should be noted that in most cases, the conclusions listed below are based on limited available data. In addition, a challenge to studying food waste streams is that they are rarely processed alone, therefore most of the available research reports contaminant concentrations in soil amendments produced from feedstock mixtures.

Detailed conclusions for PFAS are listed below:

- PFAS has been detected in food waste, with one study reporting three PFAS (PFBA, PFHxS, and PFNA) in the range of 0.11–1 µg/kg in samples collected from grocery stores, hospitals, schools, restaurants, retirement communities, and residences (MacRae et al., 2020).
- PFAS has also been detected in food (i.e., precursor of food waste), supporting the finding that food waste contains PFAS. Food items from non-contaminated areas were found to have concentrations in the 0.1 to 10 µg/kg range, with higher levels seen in food items collected from areas with known sources of PFAS (Table 1). Analysis of different food types purchased from grocery stores showed that seafood and meat are important contributors to PFAS in food items (FDA, 2020d; Schechter et al., 2010), possibly due to bioaccumulation.
- Food contact materials (defined in this paper as materials and articles that come into contact with food, specifically food packaging and food serveware) are a source of PFAS contamination in food waste streams. PFAS from food contact materials may migrate into food that is ultimately wasted or the PFAS-containing food contact materials may be included in food waste streams. Paper plates, paper bowls, microwave popcorn bags, fast-food wrappers and paperboards have all been shown to either contain elevated levels of total fluorine, indicating likely PFAS treatment, or specific PFAS (Dickman et al., 2020; Chiang et al., 2018; Schreder and Dickman, 2018; Schaidler et al., 2017; Yuan et al., 2016).
- Compostable food contact materials had higher PFAS concentrations than non-compostable samples. In one study, compostable paper tableware samples had higher concentrations of 6:2 FTOH than non-compostable samples made in the U.S. and China (Yuan et al., 2016). This finding is supported by comparisons of PFAS levels in composts made with and without compostable food packaging. Analysis of 10 U.S. composts showed that in general, PFAS concentrations were higher in composts with compostable food packaging (Choi et al., 2019).
- In food waste streams that contain both food waste and food contact materials, the latter may contribute more to the overall PFAS levels on a per weight basis. Median PFAS concentrations ranged from <1 to 485 µg/kg in food contact materials, compared with PFAS concentrations of <10 µg/kg in U.S. food items from non-contaminated areas (Table 1). The primary contributor (food waste or food contact materials) to

PFAS contamination depends on several factors, including the source of food waste and the type of food contact material. In addition, some composting facilities do not accept food items that have been shown to contain PFAS (e.g., seafood, meat) due to odor problems and issues with rodents and flies (U.S. EPA, 2020e).

- Composts made from food waste contain higher levels of PFAS compared with composts made from green waste. Comparing results across three studies (which originated from the same research group), PFAS concentrations in decreasing order were: biosolids-based products (i.e., treated biosolids, composted biosolids) > food waste compost > green waste compost ≈ other organic composts (Lazcano et al., 2020; Choi et al., 2019; Lazcano et al., 2019). An additional study on composts in Europe also showed that kitchen waste compost had higher PFAS concentrations than green waste compost (Brandli et al., 2007a).
- There were insufficient data to determine how the composting process affects PFAS concentrations when comparing final PFAS levels in the compost with initial PFAS levels in the feedstock. The limited data from one study on biosolids composting show that there was no clear trend and concentrations increased or decreased depending on the specific PFAS and feedstock (Williams, 2021).
- No data were available to draw conclusions on PFAS levels in digestates made from food waste compared with digestates made from other wastes. One study that examined digested sludge showed no clear trend in how the anaerobic digestion process affected PFAS levels (Gomez-Canela et al., 2012). Various factors, such as hydraulic residence time, digestion duration, and the possible presence of precursors in the feedstock, can affect final PFAS concentrations.
- Given the very limited data available, general conclusions cannot be made with confidence about human health and environmental risks associated with land application of compost or digestate produced from PFAS-contaminated food waste. There is a need to determine with confidence the actual exposure levels and risks associated with food waste compost and digestate and to compare these with exposure levels and risks associated with other options for food waste management—and to broadly communicate these findings. For emerging PFAS, hazard/toxicity data to support quantitative risk assessments may be limited or may not exist. When present in land-applied biosolids (compost or digestate), PFAS have the potential to be taken up by plants and crops and/or leach into groundwater (Costello and Lee, 2020; Wang et al., 2020; Ghisi et al., 2019; Lan et al., 2018; Gottschall et al., 2017; Blaine et al., 2013; Lindstrom et al., 2011; Yoo et al., 2011; Washington et al., 2010; Yoo et al., 2010; Yoo et al., 2009), which can be consumed by humans or used for agricultural purposes. Also, studies have shown that PFAS in biosolids have the potential to leach into groundwater after land application or to enter surface water through runoff (Coker, 2020b; Beecher and Brown, 2018b).
- Regardless of whether PFAS are actually present at levels of concern in composts and digestates made from food waste, concerns about contamination can, and have, affected the marketability and value of these products, in addition to decisions and policies applicable to food waste collection, management, processing, and consequently, the reduction of food waste.
- Strategies to mitigate risks due to the land application of PFAS-contaminated compost or digestate include (i) upstream solutions, such as phase-outs and bans, (ii) feedstock restrictions, (iii) restricted uses for composts and digestates, and (iv) concentration limits in composts and digestates. There are currently no federal regulations on PFAS in compost or digestate from sources that do not contain domestic sewage sludge, although some states have established screening steps for biosolids compost or for feedstocks. Also, composters in Minnesota that accept food waste are required to collect and treat contact water (MPCA, 2020, 2019). In response to concerns about PFAS in food contact materials, some cities and states have adopted or are considering the adoption of policies prohibiting PFAS in food packaging and some manufacturers have also begun voluntary phase-out of 6:2 FTOH in food contact materials. For example, compostable food contact materials certified by the Biodegradable Products

Institute may no longer contain intentionally added fluorinated chemicals.

Detailed conclusions for the persistent herbicides of interest are listed below:

- No studies were identified that reported concentrations of clopyralid, aminopyralid, picloram, or aminocyclopyrachlor in food waste or feedstock mixtures containing food waste. However, clopyralid has been detected in food samples in the United States (FDA, 2018). The detection of only clopyralid in food samples is consistent with the registered use sites of the four persistent herbicides, where only clopyralid had agricultural settings (e.g., fruits, vegetables, and cereal grains) as a registered use site.
- There were no data available that supported a comparison of persistent herbicide concentrations in food waste and green waste or a comparison of composts made from different wastes.
- Documented cases of clopyralid, aminopyralid, picloram, and aminocyclopyrachlor in contaminated compost show that the source of contamination is green waste, manure, or hay (Table 5). Food waste has not been indicated in any documented incident to date.
- As food waste is invariably mixed with green waste, manure, and other organic feedstocks that are available to compost producers, if food items were contaminated with persistent herbicides, these levels would likely be diluted by the wide variety of foods found in municipal food waste streams and/or other feedstocks present. Surveys of persistent herbicide contamination in mixed feedstock composts may be useful when considering which amendments to avoid when composting with food waste.

8.2. Research Gaps

PFAS contamination in food waste presents challenges for a broad range of stakeholders, including but not limited to those involved in waste management and recycling facilities, and those who purchase and intend to use compost and digestate as soil amendments. Additional research is needed to inform decisions and policies applicable to food waste collection, management, processing, and consequently, the reduction of food waste. Priority research needs include:

Priority Research Needs

- **Research to obtain additional data on PFAS species and concentrations in finished composts and digestates generated from food waste and used as soil amendments in the United States.** This data is imperative to determining the magnitude of PFAS contamination in composts and digestates and calculating the potential risks to human health and the environment from land application of compost and digestate made from food waste. Current available data on U.S. composts and land-applied products are limited to three studies originating from the same research group, thus additional studies on composts would be useful to expand the available literature. More data is also needed to compare composts with and without compostable materials, especially given that new guidelines and standards (e.g., total fluorine limits for BPI-certified compostable products) have taken effect. Differences in regulations across regions as well as differences in food items accepted by composting facilities also support the need for additional research on PFAS levels in composts. No data were identified that would enable the determination of whether food waste digestates would have higher, similar, or lower PFAS concentrations compared with digestates produced from other feedstocks.
- **Research to obtain additional data on PFAS species and concentrations in food waste streams in the United States.** Studies have shown that both food waste and food contact materials may contain PFAS and from the limited data, food contact materials appear to have higher concentrations of PFAS. Additional data should be obtained to confirm this finding especially with new guidelines and standards now adopted. In addition, data is needed to assess PFAS concentrations in food waste from different sectors and food types (e.g., seafood, vegetables). This data is needed to inform strategies to mitigate

risks of land applied composts and digestates, by identifying which types of food waste and/or food contact materials could be restricted from composting and anaerobic digestion feedstocks to reduce contamination levels, as the U.S. EPA encourages increased recycling of food waste.

- **Research to assess exposure and potential risks to human health and the environment from land application of PFAS-contaminated compost and digestate produced from food waste.** One of the primary concerns about PFAS in land-applied compost or digestate is that it may transfer to the soil, be taken up by plants and crops, or leach into groundwater. Full risk assessments are not available on the risks to human health and the environment posed by the land application of food waste compost and anaerobic digestate containing PFAS and the data needed to estimate with confidence the human health and environmental risks are very limited. When adequate data become available, risk should be examined not only as an absolute, but rather relative to the risk of other potential pathways for food waste.
- **Research to understand the comparative risks of different food waste management options, including further research to determine the fate of PFAS through various wastewater and solids treatment processes.** In the United States, food waste is typically landfilled, sent directly "down the drain," incinerated, or used as animal feed, if not composted or anaerobically digested. Quantitative analyses of exposure and risk comparing these options to composting and anaerobic digestion of food waste are not available, but are needed, to determine whether one option presents less risk than the others to human health and the environment due to persistent chemical contaminants. When adequate data become available for PFAS, there is a need to examine the risk of land-applied compost and digestate not only as an absolute, but rather relative to the risk of other potential pathways for food waste. Research specifically on the fate of PFAS through wastewater treatment processes would be applicable for several food waste management pathways, as PFAS can be introduced directly to the WWTP by sending contaminated food waste "down the drain," or indirectly through collected leachate (landfills) or contact water (composting). This research should take into consideration concentrations in process and plant influent and effluent as well as in the solids generated, including investigating transformations of PFAS and their precursors during biological treatment as well as separation and sorption of PFAS into sludge solids.

Additional Research Needs

- **Development of a multilaboratory-validated analytical method to detect PFAS in solids** (e.g., food waste, composts, digestates), although standardized methods do exist within organizations for PFAS testing in non-drinking water matrices (e.g., state of California, U.S. Department of Defense). EPA's two approved laboratory methods, Method 537.1 and Method 533, are only for use with drinking water. CWA Method 1600 is currently under development by EPA in collaboration with the U.S. Department of Defense for fish tissues, biosolids, soils, sediments, and non-drinking water aqueous matrices (surface water, groundwater, wastewater influent/effluent, landfill leachate) (U.S. EPA, 2021o, 2019c). A standardized analytical method for PFAS in composts would allow for more comparable data comparisons across studies.
- **Expansion of PFAS analytical methods to identify more than the 30–50 compounds under the current methods,** given that there are more than 4,700 individual PFAS documented. Nontargeted screening of U.S. composts and biosolids-based products demonstrated that in addition to the PFAS quantified, additional PFAS precursors were also present, such as sulfonamides, fluorotelomer sulfonates, and/or diPAPs. Methods are needed to identify and quantify the increasing number of PFAS.
- **Further research on PFAS fate and transformation during composting and anaerobic digestion.** The limited data available showed no clear trends when comparing PFAS concentrations in the feedstock with PFAS concentrations in the final product. This is further complicated by the potential presence of precursors in the feedstock. More data is needed to assess the extent of and conditions favorable for

precursor transformation and to understand the factors that affect PFAS levels.

- **Research to support determination of an acceptable PFAS limit for land-applied biosolids, composts, and digestates, that could affect drinking water sources and surface water due to potential leaching and runoff.** This research would include development of models to predict leaching and runoff, and full-scale field work for validation and parameter estimation for the models. There is ongoing research in this area, including studies from EPA grantees (U.S. EPA, 2019e) as well as the U.S. Geological Survey and New Hampshire (NHDES, 2020). EPA also initiated problem formulation for PFOA and PFOS in biosolids, the first step in the risk assessment process (U.S. EPA, 2021n).
- **Research to determine the long-term impacts as well as the transformation of PFAS over time after land application of PFAS-contaminated soil amendments.** Given their resistance to degradation, more data is needed to understand their fate and persistence in environmental media after the use and application of composts and digestates generated from food waste.

Emerging Issues in Food Waste Management: Plastic and Persistent Chemical Contaminants

Innovative Science for a Sustainable Future

Overview

EPA encourages the recycling of food waste for several reasons. Recycling food waste can reduce methane emissions from landfills, and it can recover valuable nutrients and energy. However, there are concerns about the levels of plastic and persistent chemical contaminants, including per- and polyfluoroalkyl substances (PFAS), in food waste streams. Food waste streams consist of food and other items (such as compostable food packaging) that get collected – intentionally and unintentionally – for composting or anaerobic digestion.

This fact sheet provides an overview of two EPA reports synthesizing the published science about contamination in food waste streams, the effects of this contamination on composting and anaerobic digestion (two common ways to recycle food waste), and potential risks to human health and the environment of applying compost or digestate (the product from anaerobic digestion) made from food waste streams to land as soil amendments. The reports also discuss efforts by multiple stakeholders to prevent and mitigate plastic and PFAS contamination in food waste streams.



Persistent Herbicides

Food waste streams are likely not a major source of contamination by the persistent herbicides clopyralid, aminopyralid, picloram, and aminocyclopyrachlor. All documented cases of compost contamination by these herbicides in the literature identified leaves and grass, manure, or hay as the source of the contamination.

Plastic in Food Waste Streams

Plastics, including microplastics, have been repeatedly observed in composts made from food waste streams. Plastics may break down into smaller particles during processing, expanding the types of risk they may cause to human health and the environment. Recent studies have shown that food waste streams collected for composting had levels of plastic contamination of up to 2.8 percent by weight. A recent study of grocery store food waste found 300,000 pieces of microplastics per kilogram waste. Available data indicate food waste streams are a greater contributor to plastic contamination in compost than yard waste streams, due to contamination with food packaging. Food itself is also a source of microplastic particles, with levels of up to 3.84 microplastic particles per gram and 325 microplastic particles per liter observed in food in the United States.

PFAS in Food Waste Streams

PFAS have been reported in food, food packaging, food waste streams and compost made from food waste streams. Only one study was identified that measured PFAS concentrations in food waste streams, finding levels between 0.11 and 1 microgram per kilogram ($\mu\text{g}/\text{kg}$). The limited data available indicates food packaging (<1 to $485 \mu\text{g}/\text{kg}$) may contribute more than food (generally $<10 \mu\text{g}/\text{kg}$) to PFAS concentrations in food waste streams. PFAS concentrations were demonstrated to be higher in composts with compostable food packaging. Composts made from a variety of materials, such as food waste, leaves and grass, and manure, show a range of contamination levels and suggest that biosolids have the highest concentration of PFAS, followed by food waste, then yard waste and other organic wastes.

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Risks from Contamination

Much remains unknown about the fate of PFAS and plastics during composting and anaerobic digestion and when applied to land in compost and digestate, making it challenging to evaluate risks to human health and the environment. When present in biosolids, PFAS can be taken up by plants and crops and/or leach into groundwater, which can be consumed by people and animals or used for agriculture. Microplastics can alter soil health, run off into and harm other terrestrial and aquatic environments, and degrade into nanoplastics which may be taken up by plants. However, the available literature does not provide evidence of environmental or human health effects occurring as a result of contamination in compost and digestate made from food waste streams.

Prevention and Mitigation Measures

Efforts are underway to decrease plastic and PFAS levels in food waste streams and associated composts. Some states have set standards for plastic in compost. Cities are trying a variety of approaches (e.g., education, hauler contract provisions) to limit plastic contamination in compost, as are composters and anaerobic digestion facilities (e.g., manual picking, screens). It is unclear to what extent technologies (e.g., shredders, grinders, de-packagers) may inadvertently introduce microplastics into the end products by breaking down larger pieces of plastic. To address PFAS contamination, some locations require collection and treatment of contact water from composting sites that accept food waste or prohibit PFAS in food packaging. Some manufacturers are voluntarily phasing out particular PFAS from food packaging, and compostable food packaging certified by the Biodegradable Products Institute can no longer contain intentionally added fluorinated chemicals.

Priority Research Needs

Better understanding the risks posed by compost or digestate contaminated by microplastics or PFAS may allow for more composting and anaerobic digestion of food waste, with appropriate prevention and mitigation measures, and lead to reduced methane emissions from landfills. Currently the presence of visible plastic particles in soil amendments and concerns about microplastic and PFAS contamination reduces the value and marketability of compost and digestate made from food waste. Therefore, composting and anaerobic digestion facilities sometimes prohibit or reject food waste streams, thus reducing the amount of food waste diverted from landfills. Also, the presence of plastic particles may alter biogas potential during anaerobic digestion and emissions during composting. Priority research needs to inform policies and decisions include:

- Field data on concentrations and types/sizes of PFAS and plastic particles in food waste streams and associated composts and digestates.
- Impacts of technologies (e.g., shredders, grinders, de-packagers) commonly used on food waste streams on the size and concentrations of plastic particles.
- Potential exposure and risks to human health and the environment from land application of contaminated compost and digestate.

More Information:

Emerging Issues in Food Waste Management: Plastic Contamination (August 2021)

Persistent Chemicals (August 2021)

www.epa.gov/land-research/food-waste-research

Microplastics in Composts, Digestates & Food Wastes

A New Comprehensive Review of Scientific Literature Finds that Microplastics are a Systemic Challenge in Organics Recycling

Katherine K. Porterfield^{1,2}, Sarah A. Hobson³,
Deborah A. Neher^{1,4}, Meredith T. Niles^{1,5} & Eric D. Roy^{1,2,3}

¹ Gund Institute for Environment, University of Vermont

² Department of Civil and Environmental Engineering, University of Vermont

³ Rubenstein School of Environment and Natural Resources, University of Vermont

⁴ Department of Plant and Soil Science, University of Vermont

⁵ Department of Nutrition and Food Sciences, University of Vermont

Background

Recent efforts to divert food waste to composting and anaerobic digestion raise concerns that microplastics (plastic particles <5 mm) from food packaging could be unintentionally added to agricultural soils¹ (Figures 1 and 2). During the December 2019 Universal Recycling Stakeholders Group meeting, participants expressed concerns over microplastic contamination in organic soil amendments derived from mechanically depackaged food waste². Since that time, our interdisciplinary team conducted a systematic literature review, and discovered that microplastic contamination is a near ubiquitous challenge in organics recycling; no technology or processing strategy is inherently free of contamination risk.

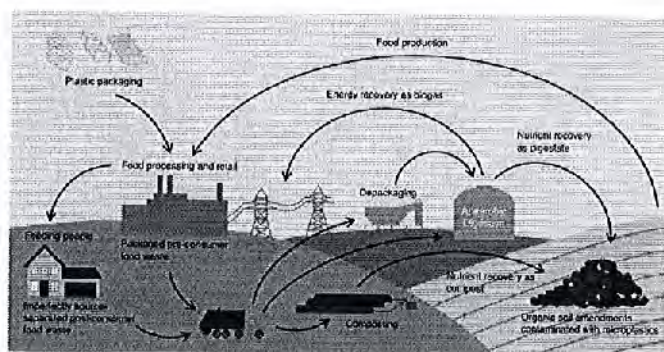


Figure 1. Pathways for microplastics entry into the environment via organic soil amendments

Microplastic Abundance in Organic Amendments

Few studies have characterized plastic abundance in composts, digestates, or food wastes (primarily in Europe and Asia). Reported plastic abundance varies widely both within and between studies. Researchers more frequently measure microplastic contamination in units of particle count per dry weight of material, however a smaller number have reported values on a weight per weight (w/w) basis (Table 1). The overlapping ranges of microplastic abundance in food-waste derived composts and digestates indicates that neither practice necessarily produces contaminant-free soil amendments.

Key Findings

1. There are limited studies (especially in the U.S.) that quantify and characterize plastic abundance in composts, digestates, and food waste.
2. Microplastic contamination is a systemic challenge in organics recycling; no technology or processing strategy is inherently free of contamination risk.
3. Microplastics enter agricultural soils in many ways (e.g., biosolids, plastic mulching, irrigation, atmospheric deposition) and the relative contribution of food waste-derived organic soil amendments is understudied. All sources should be comprehensively considered for microplastic regulation.
4. The lack of standard methods for measuring microplastics in complex organic materials (e.g., composts and digestates) complicates comparison among studies.
5. More scientific research is needed to understand the potential risks of microplastics in agricultural soils.

Our preliminary data for depackaged food wastes and digestate in Vermont fall within the range of values reported in Table 1 (count per weight basis). The presence of microplastics in composts derived from green waste (e.g., yard waste) indicates that packaging from food waste is not the only possible source of microplastics in organic soil amendments.

Material	Plastics (particles/ dry kg)	Plastics (% w/w dry)
Green waste-derived compost	12 to 82,800 [Refs. 3,4]	0.00024 to 0.053% [Refs. 3,5]
Food waste-derived compost	20 to 30,000 [Refs. 6,7]	0.001 to 0.14% [Refs. 3,8]
Food waste-derived digestate	70 to 1,670 [Refs. 7,21]	0.01 to 0.25% [Refs. 9,21]
Food waste	40 to 1,400 [Refs. 9,10]	0.025 to 5.6% [Refs. 9,11]

Table 1. Typical ranges of plastic abundance reported in the scientific literature. Note that count and % w/w values in each row are not necessarily from the same studies. Some higher values have been reported for compost, digestate, & food waste.



Figure 2. Visible plastic contamination in (A) organic municipal solid waste compost windrows prior to screening (credit: E.D. Roy, S. Asia), (B) screw-press separated solid digestate from co-digestion of dairy manure and food waste (credit: E.D. Roy, United States), and (C–D) Putative microplastics found in food waste digestate (credit: K.K. Porterfield, United States).

Multiple Entry Points

Microplastics may enter agricultural soils through multiple pathways. Primary microplastics—those that are intentionally engineered to be small¹²—are applied directly to agricultural soils in the form of plastic-coated controlled-release fertilizers, treated seeds, and capsule suspension plant protection products¹³. Sources of secondary microplastics—formed by the breakdown of larger plastic particles¹²—include plastic mulching, land application of contaminated soil amendments (e.g., biosolids, composts, and digestates), irrigation water, roads, and atmospheric deposition^{14,15}.

Impacts on Soil, Plants, & Animals

Several studies report negative effects of microplastics in soil-plant systems. These include physical effects such as changes to soil porosity, water repellence, and bulk density^{16,17}, as well as biological effects such as changes in microbial community composition, reduced plant growth, and deleterious effects on organisms higher in soil food chains^{18,19}. However, results are variable and there is currently no easy way to extrapolate the relevance of existing ecotoxicity studies to Vermont soils. More scientific evidence is needed before conclusions regarding the potential risks of microplastics in agricultural soils can be fully assessed.

A Need for Standardized Methods

Currently there is a mismatch between existing regulations and scientific approaches for measuring microplastics. Existing regulations and ecotoxicity studies typically delineate thresholds or toxicity levels on a w/w basis^{1,20}. Conversely, the most common methods for identifying microplastics (light microscopy and Fourier Transform Infrared Spectroscopy) generate count per weight values. There is currently no consistent method to convert microplastic abundance between count per weight and w/w units, making the translation of scientific results into regulation challenging. Enforcement of regulatory thresholds defined by w/w units will require advancements in methods. Furthermore, plastic size classes included also vary widely across studies.

Methodological differences likely exert a strong influence on measures of microplastic abundance and underscore the need to develop standard methods for measuring microplastics in the environment.

Policy Recommendations

Precautionary microplastics legislation would be most effective with a broad focus on soil amendments versus any one technology or material. We are in an early stage of beginning to understand this systemic issue. It is critical for legislation to bolster monitoring and research on microplastics to enable design of data-driven, risk-based regulatory standards that protect Vermont soils and enhance the sustainability of organics recycling.

We recommend the following specifically related to H.501 as currently written.

- A priority for microplastics >1 mm is a practical choice as measuring particles <1 mm is more challenging.
- The overall 0.5% dry weight limit (with a stricter 0.1% by dry weight limit on film plastics) is arbitrary but likely to identify materials with higher plastic content.
- H.501 be amended to include efforts to quantify baseline plastic contamination in agricultural soils and support scientific research on microplastic risks and management strategies.
- Standardized methods are necessary to implement H.501, including standard sampling, isolation, and identification protocols, which are feasible but will require adequate funding and resources to overcome multiple challenges. Measuring microplastics on a % dry weight basis is more challenging than on a count per dry weight basis. A stricter limit on film plastics is advantageous due to their light weight and abundance, but adds complexity.
- Time and cost associated with measurements could create substantial burdens for practitioners, depending on implementation details. For example, time needed to analyze a sample may exceed the time an operation can store that material on site.
- H.501 be amended to require reevaluation of regulatory limits when more data become available.
- Given the similarity of H.501 to German policy, we suggest asking German experts for lessons learned.

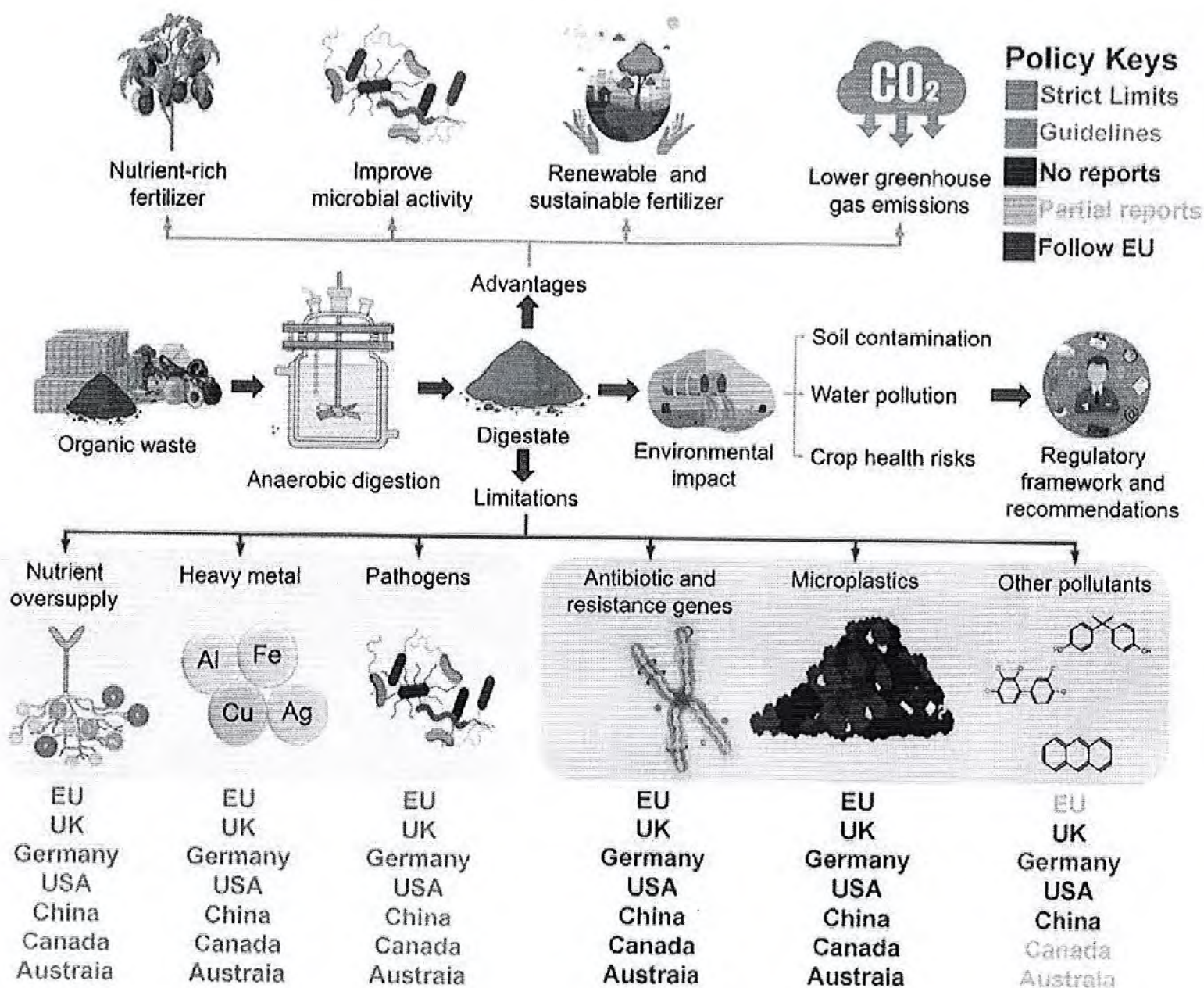
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CONTACT

Eric Roy
eroy4@uvm.edu

Kate Porterfield
kporterf@uvm.edu



Attachment 10:

Microbial Community and Antibiotic Resistant Gene Distribution in Food Waste, Anaerobic Digestate and Digestate from Agricultural Biogas Plants as a Reservoir for Antimicrobial and Antibiotic Resistance Genes - Implications for the Environment



Microbial community and antibiotic resistance gene distribution in food waste, anaerobic digestate, and paddy soil

Xin-rong Pan ^{a, b}, Seyit Yuzusak ^c, Jia-min Lou ^a, Lei Chen ^b, Yin Lu ^a , Jian-e Zuo ^{b, d}  

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Highlights

- Actinobacteria, proteobacteria, and bacteroidetes were the potential hosts of ARGs.
- Firmicutes was most abundant in food waste and anaerobic digestate.
- Multidrug resistance genes were the most abundant ARG type.

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Digestate from Agricultural Biogas Plants as a Reservoir of Antimicrobials and Antibiotic Resistance Genes—Implications for the Environment

[Izabela Wolak](#)¹, [Sylvia Bajkacz](#)², [Monika Harnisz](#)¹, [Klaudia Stando](#)², [Magdalena Męcik](#)¹, [Ewa Korzeniewska](#)^{1,*}

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Abstract

Antimicrobials and antibiotic resistance genes (ARGs) in substrates processed during anaerobic digestion in agricultural biogas plants (BPs) can reach the digestate (D), which is used as fertilizer. Antimicrobials and ARGs can be transferred to agricultural land, which increases their concentrations in the environment. The concentrations of 13 antibiotics in digestate samples from biogas plants (BPs) were investigated in this study. The abundance of ARGs encoding resistance to beta-lactams, tetracyclines, sulfonamides, fluoroquinolones, macrolide-lincosamide-streptogramin antibiotics, and the integrase genes were determined in the analyzed samples. The presence of cadmium, lead, nickel, chromium, zinc, and mercury was also examined. Antimicrobials were not eliminated during anaerobic digestion. Their concentrations differed in digestates obtained from different substrates and in liquid and solid fractions (ranging from 62.8 ng/g clarithromycin in the

solid fraction of sewage sludge digestate to 1555.9 ng/L doxycycline in the liquid fraction of cattle manure digestate). Digestates obtained from plant-based substrates were characterized by high concentrations of ARGs (ranging from 5.73×10^2 copies/g_D *cfxA* to 2.98×10^9 copies/g_D *sul1*). The samples also contained mercury (0.5 mg/kg dry mass (dm)) and zinc (830 mg/kg dm). The results confirmed that digestate is a reservoir of ARGs (5.73×10^2 to 8.89×10^{10} copies/g_D) and heavy metals (HMs). In addition, high concentrations of integrase genes (10^5 to 10^7 copies/g_D) in the samples indicate that mobile genetic elements may be involved in the spread of antibiotic resistance. The study suggested that the risk of soil contamination with antibiotics, HMs, and ARGs is high in farms where digestate is used as fertilizer.

Keywords: ARGs, heavy metals, sewage sludge, slaughterhouse waste, cattle manure, maize silage

1. Introduction

Due to growing levels of waste generation around the world and a higher demand for alternative and environmentally friendly energy, anaerobic digestion (AD) is becoming an increasingly popular method of stabilizing various types of organic matter substrates [1]. The popularity of installations such as biogas plants (BPs) is on the rise in Europe, including in Poland, and the number of BPs continues to increase. A total of 132,000 engineering biogas projects have been implemented around the world, including 17,783 in Europe. Biogas is upgraded to biomethane in 700 plants worldwide, 540 of which are located in Europe [2,3]. In Poland, the first BP was commissioned for use in 2005, and there were 128 agricultural BPs at the end of 2021 [4].

Most BPs use manure [5], sewage sludge [6], slaughterhouse waste [7], meat and bone meal [8], ensilaged biomass such as maize silage [9] and sugar beet silage [10], potato pulp [11], and confectionery press cake [12] as substrates for AD. These substrates are processed into nutrient-rich digestate. Digestate contains organic and mineral compounds, nitrogen, macronutrients, and micronutrients, and it is colonized by digestate-specific microbiota composed of diverse microbial communities which participate in AD [13]. For many years, digestate has been used mainly as agricultural fertilizer around the world [14]. Digestate is a rich source of nutrients that promote plant growth, but it also contains antibiotics and their metabolites, antibiotic-resistant bacteria (ARB), antibiotic resistance genes (ARGs), and heavy metals (HMs). Therefore, there is a high risk that these micropollutants will be transmitted to the soil when digestate is used as organic fertilizer [15].

Most antimicrobials, ARB, ARGs, and HMs present in digestate originate from substrates that are used in the AD process. Sewage sludge, the byproduct of wastewater processing in wastewater

treatment plants (WWTPs), is also used as feedstock in BPs, and it contains large quantities of drugs, ARB, ARGs, and HMs [13] because most pharmaceuticals are not fully metabolized in the human body and are evacuated to WWTPs with wastewater. Moreover, HMs also reach WWTPs with industrial wastewater and manure, and they contribute to environmental pollution and can participate in the transmission of ARGs. Heavy metals such as cadmium (Cd), mercury (Hg), nickel (Ni), chromium (Cr), and lead (Pb) are characterized by high biostability and a long half-life in the environment, and they can also exert selection pressure on microorganisms [16]. Sewage sludge produced during wastewater treatment is used as a substrate for AD in agricultural BPs, often in combination with other agricultural feedstocks.

In digestate, pharmaceuticals and HMs can also originate from manure and agricultural wastes that are rich sources of mineral substances and microorganisms and are most widely used as substrates in AD. According to the literature, global annual antibiotic consumption in livestock production has been estimated at 172 mg/kg in pigs, 148 mg/kg in chickens, and 45 mg/kg in cattle [14]. In animals treated with antibiotics, 30% to even 90% of antimicrobials and their metabolites are retained in urine and feces, and thousands of tons of drugs are evacuated to the environment with manure [14,15]. In China, the world's largest meat producer, 45,000 tons of antibiotics were excreted with animal feces in 2013 [14].

Drugs that are introduced to the environment with digestate-based fertilizers can be highly toxic, and they can cause selection pressure which increases the concentrations of ARGs in soil and contributes to antibiotic resistance (AR) [9]. In addition, no distinction between human and veterinary medicinal products is made in Europe; therefore, the same antimicrobials or drugs belonging to the same class are used in human and veterinary medicine. For example, fluoroquinolones and sulfonamides are classified as veterinary drugs in China, but they account for 2.2% and 9.2%, respectively, of all antimicrobials sold in Europe, and are used in both human and veterinary medicine. Beta-lactams and tetracyclines are also widely used in human and veterinary medicine in Europe [17,18,19]. Macrolides [20], lincosamides [21], and dihydrofolate reductase inhibitors (trimethoprim) [22] have also been identified in agri-food products. Due to the wide availability of pharmaceutical products on the market, pathogens that are resistant to a single drug can develop resistance to an entire class of related antimicrobials [23,24].

The rate at which chemotherapeutics and HMs are degraded in soil is determined by temperature, soil texture, organic carbon content, and the resistance profile of soil-dwelling microorganisms [14]. Pharmaceuticals accumulated in soil can be carried by surface runoffs to water bodies which are used in livestock production [15], and they can be ingested by animals in successive stages of the food chain. These drugs can then be transmitted to humans via contaminated animal-based

products [16]. Fresh produce can be a source of clinically significant drug residues, ARB, and ARGs for consumers [25]. Antibiotic-resistant bacteria pose a significant risk of infection, and the therapeutic efficacy of antimicrobials is being compromised by growing levels of AR in humans and animals.

Antibiotics and HMs present in the environment can contribute to the spread of ARGs and ARB in soil, and they can trigger the emergence of new ARGs or increase their concentrations in a given environment [16]. Antimicrobial resistance genes can also spread rapidly between microbial communities via horizontal gene transfer (HGT) because microorganisms present in substrates subjected to AD and digestate can harbor mobile genetic elements (MGEs) such as integrons [17]. For this reason, the concentrations and spread of antibiotics, HMs, and ARGs in digestate produced by agricultural BPs should be monitored to prevent or limit the transmission of ARB and ARGs in the environment, and to minimize selection pressure on environmental microorganisms.

The digestate can be considered a rich source of valuable minerals, but at the same time, unfortunately, it can also be a reservoir of antibiotics, ARGs and heavy metals for plants and microorganisms. There is a large research gap in the literature related to this topic, because there are still only few data on the content of ARGs, HMs, and pharmaceuticals and their persistence in the fermentation mass based on various substrates, which during soil fertilization with digestate can significantly affect their content in soil and edible vegetables. So far, there are no studies available with the content of so many antibiotic groups, HMs, and ARGs in digestate based on different substrates and the possible environmental implications for the soil–plant–animal–human system related to their transfer to the soil along with digestate used as fertilizer. Therefore, in this preliminary study, digestate samples from agricultural BPs stocked with various substrates, including sewage sludge, animal manure, and green waste, were analyzed for the presence of beta-lactam (amoxicillin, ampicillin), tetracycline (tetracycline, oxytetracycline, doxycycline, chlortetracycline), sulfonamide (sulfamethoxazole, sulfonamide), fluoroquinolone (enrofloxacin, ciprofloxacin), macrolide (clarithromycin), lincosamide (clindamycin) antibiotics, and dihydrofolate reductase inhibitors (trimethoprim). Digestate samples were also examined for the presence of HMs such as Cd, Pb, Ni, Cr, zinc (Zn), and Hg, as well as genes encoding resistance to beta-lactams (*bla*_{TEM}, *bla*_{OXA}, *cfxA*), tetracyclines (*tetA*, *tetM*), sulfonamides (*sul1*, *sul2*), fluoroquinolones (*aac 6'-Ib-cr*, *qepA*), and macrolide-lincosamide-streptogramin (MLS) class antibiotics (*ermF*). The prevalence of class 1 and 2 integrase genes (*int1* and *int2*) was also determined in digestate samples. The environmental implications of uncontrolled transmission of drugs and ARGs to agricultural land were assessed.

2. Materials and Methods

2.1. Characteristics of Biogas Plants and Digestate Samples

Three fully operational agricultural BPs in Poland were selected for the study and labeled as BP1, BP2, and BP3. The selected BPs process various types of substrates whose characteristics and composition are presented in [Table 1](#).

Table 1.

Characteristics and composition of the examined digestate samples.

Sample	Composition of Substrates	pH	Dry Mass (%)	FOS/TAC Ratio	NH ₄ ⁺ g/L	TN g/L	TP g/L
BP1S	Sewage sludge	8.40	14.9	0.15	1.10	6.50	2.80
BP1W		7.62	16.00	0.17	1.16	6.50	2.46
BP2S	Cattle manure, maize silage	6.70	3.01	0.19	1.20	na	3.00
BP2W		6.88	3.00	0.14	1.43	na	3.65
BP3S	Maize silage, slaughterhouse waste, potato pulp, confectionery press cake	7.83	4.80	0.18	2.40	na	na
BP3W		7.90	4.30	0.14	1.60	na	na

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na—not available.

Digestate samples collected from each BP were labeled with the number of the corresponding BP and the sampling season (S—spring, W—winter): BP1S, BP1W, BP2S, BP2W, BP3S, and BP3W.

The presence and concentration of drugs and HMs, as well as the presence and abundance of ARGs, were examined depending on the substrate composition of digestate samples. Digestates were sampled in winter and spring, which differ in the availability of various substrates and weather

conditions (such as temperature) and are characterized by increased disease incidence and, consequently, antibiotic consumption. Digestate samples were collected directly from the outlets of full-scale bioreactors operating under mesophilic conditions. Digestate produced by all three BPs is used as organic fertilizer in agricultural production.

2.2. Determination of Antibiotics in Digestate Samples

The analytical procedure for identifying antibiotics in the preliminary study was based on the methods that had been used in our previous research [26,27,28]. Digestate samples were analyzed for the presence of the following antibiotics according to the procedure presented in Table S1: amoxicillin—AMO, ampicillin—AMP, tetracycline—TC, oxytetracycline—OXY, doxycycline—DOX, chlortetracycline—CHLOR, sulfamethoxazole—SMX, sulfonamide—SFD, enrofloxacin—ENF, ciprofloxacin—CIP, clarithromycin—CLR, clindamycin—CLD, and trimethoprim—TRI.

The limit of quantification (LOQ) was set at 0.1 ng/L of fresh liquid digestate fraction and 0.1 ng/g of fresh solid digestate fraction.

2.3. Determination of HMs in Digestate Samples

The presence and concentrations of six HMs, i.e., Cd, Pb, Ni, Cr, Zn, and Hg in digestate samples were determined by inductively coupled plasma optical emission spectroscopy (ICP-OES). The analyses of digestate samples were conducted in an accredited laboratory of the Institute for Ecology of Industrial Areas (IETU), Katowice, Poland [29,30].

2.4. gDNA Isolation

Digestate samples (2 g) were placed in 2 mL Eppendorf tubes and centrifuged at 8000 rpm for 10 min. The supernatant was discarded after centrifugation. Genomic DNA (gDNA) was isolated from the pellet in triplicate, according to the instructions provided by the manufacturer of the Fast DNA Spin Kit for Soil® (MP Biomedicals™, Carlsbad, CA, USA). The concentration and quality of the isolated gDNA were evaluated with the Multiskan Sky spectrophotometer (Thermo Scientific™, Waltham, MA, USA). Additionally, gDNA was isolated in triplicate from each sample, and the isolates were pooled to obtain a representative gDNA sample for each digestate sample. The samples were freeze-stored (−20 °C) until analysis.

2.5. Quantification of ARGs and Integrase Genes

The presence and abundance of genes encoding resistance to beta-lactams (*bla*_{TEM}, *bla*_{OXA}, *cfxA*), tetracyclines (*tetA*, *tetM*), sulfonamides (*sul1*, *sul2*), fluoroquinolones (*aac 6'-Ib-cr*, *qepA*), and macrolide-lincosamide-streptogramin (MLS) class antibiotics (*ermF*) were analyzed in digestate samples. The prevalence of class 1 and 2 integrase genes (*int1* and *int2*) was also determined. Genes conferring resistance to the above classes of antibiotics were analyzed because these antimicrobials are widely used in agriculture and in human and veterinary medicine. The presence and abundance of integrase genes were examined to assess the degree to which MGEs participate in the spread of AR. Antibiotic resistance genes were quantified in the quantitative Polymerase Chain Reaction (qPCR) in the LightCycler® system (Roche Diagnostics, Mannheim, Germany). The SYBR Green dye (Roche Diagnostics, Mannheim, Germany) was used in the reaction mixture with a total volume of 15 µL. The qPCR mix contained 0.8 µL of the DNA matrix, 0.4 µL of the corresponding primer with a concentration of 10 µM, 7.5 µL of SYBR Green, and 5.9 µL of RNase-free water. Genes were amplified in triplicate, and amplification parameters are presented in [Table S2 \(Supplementary Materials\)](#). Melt curves were generated and analyzed for non-specific amplification. Fluorescence excitation spectra were analyzed with the use of LightCycler® v. software (version 1.5.0). The number of gene copies was expressed in terms of absolute abundance (AA) in 1 g of digestate (ARG copy number/g_D).

2.6. Statistical Analysis

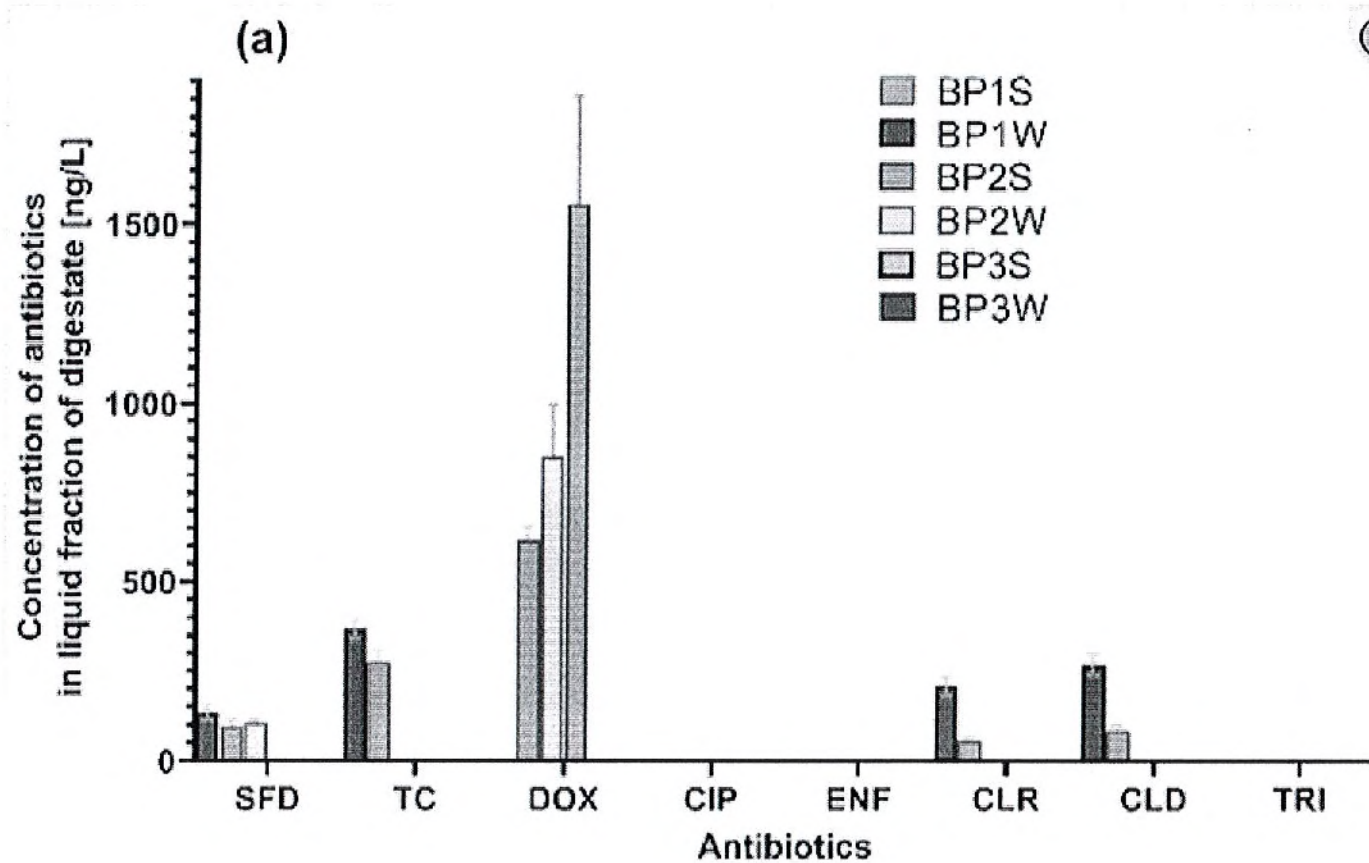
Significant differences between ARG and HM concentrations in samples were determined in the Kruskal–Wallis non-parametric test (Statistica v. 13.3). The correlations between ARG abundance, antibiotic concentrations, and HM concentrations in samples were determined in the Principal Component Analysis (PCA). Principal Component Analysis was applied using as variables all data from samplings BP1S, BP1W, BP2S, BP2W, BP3S, and BP3W regarding the concentration of 13 antibiotics such as AMO, AMP, TC, OXY, DOX, CHLOR, SMX, SFD, ENF, CIP, CLR, CLD, and TRI; ARGs concentration, such as *bla*_{TEM}, *bla*_{OXA}, *cfxA*, *tetA*, *tetM*, *sul1*, *sul2*, *aac 6'-Ib-cr*, *qepA*, *ermF*; and the integrase genes concentration (*int1* and *int2*) and HMs concentration such as Cd, Pb, Ni, Cr, Zn, and Hg. Moreover, non-parametric Spearman's correlation analysis was performed to indicate the effect of antibiotic concentration on the ARGs and integrase genes studied. The results were regarded as statistically significant at $p < 0.05$. The results of statistical analyses were visualized with the use of GraphPad Prism 8.4 software (v. 9.5.0).

3. Results and Discussion

3.1. Presence and Concentrations of Antibiotics in Digestate Samples

The study revealed that 8 out of the 13 tested antibiotics were present in digestate samples. The presence of pharmaceuticals was determined by the composition of the examined digestates. Digestate samples differed significantly in antibiotic concentrations (Figure 1; Table S3, Supplementary Materials) (Kruskal-Wallis, ANOVA, $p < 0.05$). None of the examined digestate samples contained SMX, OXY, CHLOR, AMO, or AMP.

Figure 1.



farmland. Such strategies should be urgently implemented to minimize the health risks and adverse economic impacts of agricultural products containing drugs, ARB, and ARGs.

Bioremediation and microbial electrolysis techniques are promoted in the agricultural sector to remove antibiotic residues and reduce AR. Heavy metals can be extracted from soil or wastewater with kaolin and sulfate-reducing bacteria. An integrated global strategy is needed to control the use of antibiotics in hospitals and the livestock sector, and novel methods should be introduced to optimize wastewater treatment, composting, and bioremediation of soil pollutants.

4. Conclusions

Studies evaluating the presence and concentrations of various antibiotic classes and HMs in complex matrices, such as digested cattle manure, maize silage, sewage sludge, slaughterhouse waste, green waste, and confectionary press cake, pose an analytical challenge because different protocols have to be applied depending on digestate fraction and composition. Moreover, the composition of digestate samples can vary considerably because many agricultural BPs process mixed substrates with different proportions of plant biomass and manure. Industrial residues such as slaughterhouse waste also pose a considerable challenge for researchers. Despite these problems, this study demonstrated that most of the analyzed antibiotics and HMs were not degraded during the AD process. Digestate samples were highly contaminated with various drugs and HMs whose concentrations were influenced by the composition of the substrates processed by the examined BPs. Attention should also be paid to factors that contribute to the spread of AR in plant substrates. Unlike sewage sludge and cattle manure digestates, plant-based digestates did not contain drugs, but were characterized by high concentrations of many ARGs and selected HMs. Digestate can be regarded as a reservoir of ARGs due to the high abundance of various ARGs. Digestate samples were free of beta-lactams, but contained numerous genes encoding resistance to this class of antibiotics, which could point to high levels of AR already in the substrates. High concentrations of integrase genes also suggest that MGEs participate in the transmission of AR in digestate. The results of this study indicate that the use of digestate as organic fertilizer increases the risk of soil contamination with antibiotics, HMs, and ARGs.

Supplementary Materials

The following supporting information can be downloaded at:

<https://www.mdpi.com/article/10.3390/ijerph20032672/s1> , Table S1: Procedures used in the determination of antimicrobials in digestate samples; Table S2: Parameters of the qPCR reaction; Table S3: Antibiotic concentrations in digestate samples; Table S4: The presence and absolute abundance of antibiotic resistance genes (ARGs) in digestate samples (abbreviations are explained

Attachment 11:

**Organic Micropollutants, Heavy Metals, and Pathogens in Anaerobic
Digestate Based on Food Waste**



ScienceDirect

Journal of Environmental Management

Volume 313, 1 July 2022, 114997

Organic micropollutants, heavy metals and pathogens in anaerobic digestate based on food waste

Oksana Golovko ^a , Lutz Ahrens ^c, Jenny Schelin ^b, Mattias Söregård ^a, Karl-Johan Bergstrand ^c, Håkan Asp ^c, Malin Hultberg ^c, Karin Wiberg ^a

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Highlights

- Risk factors (CECs, pathogens, heavy metals) in biofertilizer based on food waste.

- Food-borne pathogens and heavy metals were below the maximum accepted levels.
- For CECs, 133 compounds were analyzed and 48 CECs were detected.
- Highest concentrations were found for pyrooxidine, nicotine, caffeine, theobromine.
- The CEC profile was similar in biofertilizers from different biogas plants.

Abstract

Anaerobic digestate based on food waste is increasingly used as fertilizer in food production. This study examined the characteristics of anaerobic digestate based on food waste from three biogas plants in Sweden. The characterization included measurements of heavy metals ($n=7$), chemicals of emerging concern (CECs), such as currently used drugs and pesticides ($n=133$), and an extended range of food-borne pathogens, including two notable sporeformers and some widespread antibiotic-resistant bacteria. The amounts of *Escherichia coli*, *enterococci*, and *Salmonella* and the concentrations of the target heavy metals were all below the maximum accepted levels at all three locations studied. However, the spore-forming *Bacillus cereus* was found to be present at high levels in samples from all three biogas plants. Among the 133 CECs investigated, 48 were detected at least once, and the highest concentrations were found for pyrooxidine, nicotine, caffeine, theobromine, and nicotine. The biofertilizers from the different biogas plants had similar CEC profiles, which indicate similarities in household waste composition and thorough mixing in the biogas plants. If this profile is found to be spatially and temporally consistent, it can help regulators to establish priority lists of CECs of top concern. Assuming increasing use of biofertilizers for food production in the future, it would be beneficial to have concentration limits for CECs Risk estimation based on risk quotients (RQs) indicated generally low environmental risks associated with application of biofertilizer to soils for food crop production. However, the toxicity of CEC mixtures needs to be considered when estimating the risks from application of biofertilizers on agricultural land or in other production systems.

Attachment 12:

Co-digesters Destabilize Nutrients Found in Manure and Industrial Food Waste And Make them More Prone to Runoff: Wisconsin is Already Experiencing Drinking Water Contamination from Excess Nitrates and PFAS

Co-digesters destabilize the nutrients found in manure and industrial food waste and when spread on farmland make them more prone to runoff into surface waters and infiltration into groundwater. Co-digestion also exposes manure to contaminants found in industrial food waste that remain in the digestate including forever chemicals, heavy metals, pesticides/herbicides/antibiotic resistant bacteria and other pathogens, and microplastics. These contaminants attach themselves to the soil and water and can become a toxic brew harmful to soil and plants grown for animal and human consumption, to both surface and groundwater, to fish and wildlife, and most importantly to public health. Re-classifying digestate as agricultural waste simply because it went through an on-farm co-digester DOES NOT MEAN it is safe for field application.

Farm co-digesters have less stringent regulations, oversight, and testing of the digestate than municipal/industrial facilities such as wastewater treatment plants or landfills. The DNR and the EPA do not require that digestate (byproduct of co-digestion) be tested prior to land application.

Part 2: Questions on Public Health and Environmental Protections

Question 1: Does the proposed zoning amendment **limit the amount of outside industrial waste to be brought into the township?**

Question 2: Does this proposed zoning amendment require the independent testing of the outside waste being brought into the township for contaminants such as forever chemicals, heavy metals, antibiotic resistance bacteria and other pathogens as well as microplastics? Does the amendment ensure that the co-digester owner/operators/land owner where the co-digester is sited are solely responsible for these testing costs?

Question 3: Because industrial food waste and its packaging often contain forever chemicals, heavy metals, antibiotic resistant bacteria and other pathogens as well as microplastics that are **not destroyed during the digestion process**, Does this zoning amendment proposal require the testing of the digestate (both liquid and solid by-products of co-digestion) for nutrient content as well as for multiple contaminants, including those mentioned, prior to land application? Does the proposal call for the co-digester owner/operator/landowner where co-digester is sited to solely cover the costs for this independent testing?

Question 4: Does the zoning amendment require that any digestate that is deemed unsafe for land application be disposed of in a State certified hazardous waste facility, with costs solely the financial responsibility of the co-digester owner/operator/landowner where co-digester is sited?

Question 5: Does this proposed amendment require that any water used in the digestion process be tested by an independent contractor prior to and after digestion to determine if any new contaminants are present at the sole cost to the co-digester owner/operator/landowner where co-digester is sited?

Question 6: Does this proposal detail the types of storage structures and the amount of storage needed for both the solid and liquid digestate? Does this proposal require adequate storage year round so that digestate is only applied during spring/fall spreading times due to the increased risk of soil and water contamination from digestate?

Question 7: Does this proposed amendment ensure that if the digestate (liquid or solid) is to be sold or bartered, a full analysis of the test results for the digestate is provided to the purchaser/barterer prior to application?

Question 8: Does this proposed amendment require that all private and public wells located near a co-digester or near land where digestate may be spread are tested, by an independent contractor, prior to the co-digester start-up for the presence of pathogens, forever chemicals, heavy metals, and microplastics so that a baseline study is available? Does the proposal require that the co-digester owner/operator/landowner where co-digester is sited bear these costs rather than the township?

Question 9: Does this proposed amendment require that the co-digester owners/operators/or land owners where the digester is sited pay for any new wells or special water filtering devices that may be needed for any private or public wells negatively affected with new levels of or newly found contaminants from the co-digester or its byproducts?

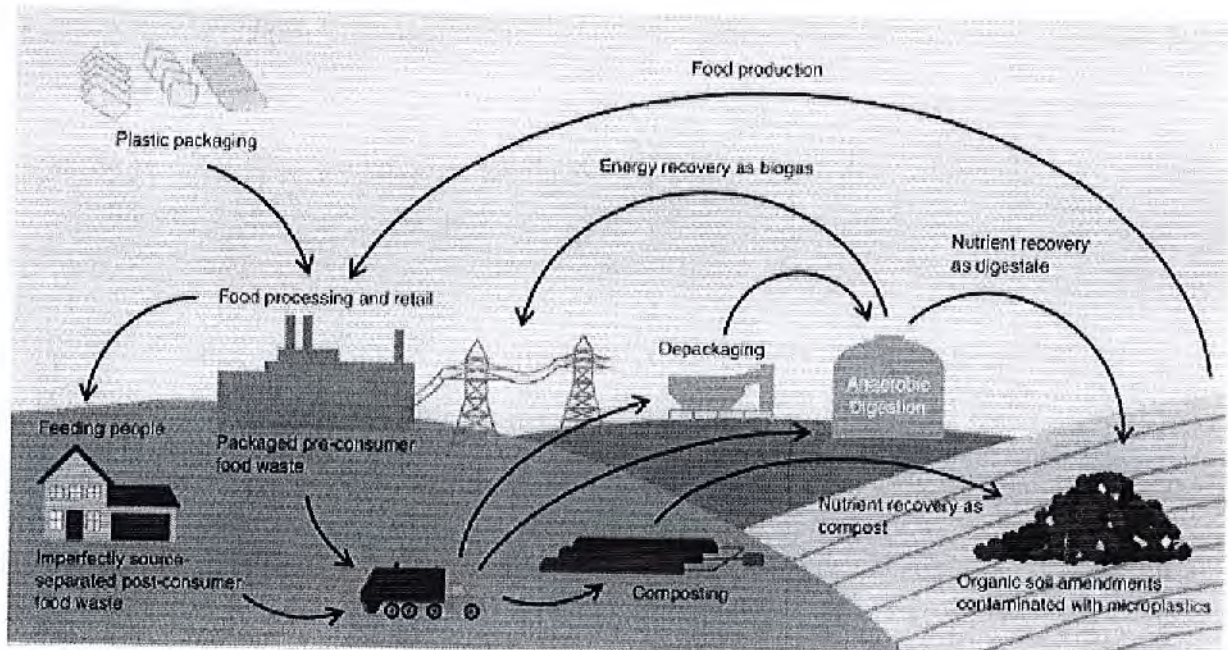
Question 10: Does this proposed amendment address the increased risk to neighbors living within 2 miles of a co-digester site to toxic air emissions including hydrogen sulfide from the co-digester, digestate, and the flaring off during start-up, process upsets, and when gas can't be injected into the digester? What does this proposal do to address odor issues, especially related involving the storage lagoons where digestate containing industrial food waste/manure are stored?

ADs are much more common on landfills and wastewater treatment plants in the US than on farms (Goldstein, 2025). Unfortunately, many legislative bills encourage the build-out of these industrial machines, transforming the state's picturesque farm country into industrial sites. These bills encourage the increased use of ADs that take many different inputs besides manure, including animal blood from slaughterhouses, fats and greases, plastic from food packaging, and expired food from grocery stores. With these inputs, the waste from ADs, digestate, contains more industrial contaminants than manure including heavy metals (Wei et al., 2024), perfluoroalkyl and polyfluoroalkyl substances (PFAS) (Phelps et al., 2024), nano and microplastics (Porterfield et al., 2023), and antibiotic resistant pathogens (Marutescu et al., 2022), and pathogens from food production (Karanth et al., 2023). All of these contaminants have negative effects on public health.

Groundwater is the only source of drinking water for many rural communities across Wisconsin including in your own district. Unwittingly, many legislative proposals open the door to serious public health problems in rural communities by taking away what little oversight exists for groundwater in the state of Wisconsin. Not only is digestate more toxic than manure alone, it is more water soluble and more prone to running off fields when in contact with water (Penn State Extension, 2024). Due to the altered chemistry of digestate, farmers need to work harder to avoid water contamination (Horta and Carneiro, 2021). Even if digestate is managed responsibly, it can still leach into groundwater and expose locals to harmful pathogens, microplastics, heavy metals, PFAS, and other industrial contaminants present in industrial food waste. The build-out of ADs on-farms and in rural communities disproportionately benefits the largest agricultural producers, not small and medium sized farms. The equipment for ADs, not counting basic operating costs and costs of managing additional digestate, can cost millions of dollars (AgSTAR, 2020). As a result, most ADs are located on concentrated animal feeding operations (CAFOs), not on small farms. However, even on large farms, ADs are heavily reliant on wasteful government tax breaks and subsidies. In California, the state that revolutionized the use of ADs, the Center for Food Safety (2024) found that, "...the state of California overestimated the public's return on investment in dairy digesters on mega-dairies by 17-fold."

In Wisconsin, Zahn's Farms LLC in Gillette, WI, a 11,400 animal unit dairy CAFO ~~dairy CAFO~~ received a \$43 Million tax exemption from the Wisconsin Economic Development Council; a \$15 Million conduit loan from the Town of Gillette, and a \$3 Million qualified tax credit for its digester. Small dairy farmers are going out of business every single day. Taxpayer funds should be used to protect Wisconsin existing small and medium family farms, not for dubious technologies that supposedly create "green energy." ADs turn farm fields into landfills with people living near them exposed to unbearable odors and toxic air pollution (Mosavi, 2023). Depending on the size, ADs can take in tons of off-site waste per day. Indeed, even if the facility is located on a small farm, if enough waste is added, the AD can generate the same volume of waste as a large CAFO. Farmers and AD operators are left to manage and dispose of the millions of gallons of digestate left behind. If legislators don't fully understand the dangers associated with on-farm anaerobic digesters and provide more stringent regulations and oversight, farms in Wisconsin will be responsible for handling significantly more industrial waste digestate and integrating it into prime agricultural soils. These practices raise serious concerns about soil contamination of farmland.

For example, microplastics in digestate can continually break down, leach into crops, and reduce crop production for farmers (Jia et al., 2023). Contaminants from industrial food production belong in a landfill, not in our food.



A case in point is the Generate Fremont Regional Digester in Michigan, a facility that ultimately ceased operations due to significant environmental and community health concerns.

The Fremont case is a cautionary tale of what can go wrong when industrial-scale digesters operate without stringent oversight and regulation. Residents reported intolerable odors, and documented instances of digestate runoff contaminating local waterways and potentially affecting residential wells. Dozens of neighbors protested the permit at a packed public hearing.

On-farm co-digesters need more scrutiny, to reduce the exacerbating risks to our communities and environment. Wisconsin must learn from Fremont's experience. Any legislation supporting anaerobic digesters should include:

- Comprehensive environmental review requirements;
- Protections for groundwater and drinking water including sufficient monitoring of waste Containment structures which are prone to nutrient leakage;
- Protections to reduce any risks to local infrastructure due to increased waste and digestate transport from animal feeding operations by trucking or pipelines due to the elevated risk for spills and contamination that communities will have to pay for
- Sufficient setback requirements between digesters and residential properties including sufficient setback requirements for digestate stockpiles and aquifers, especially in karst regions in the State

- Requirements that stockpiles of manure, other feedstock, as well as digestate be covered to prevent runoff during rain/snow events that increase the risk of pollution to surface and groundwater
- Additional regulations for digestate than for manure, because digestate has different physical and chemical properties and higher risk of more pathogens, heavy metals, and microplastics than manure
- Transparency and public participation provisions; and
- Limits on digesters processing out-of-basin waste or expanding factory farm infrastructure.

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Home Water, Air, & Soil Pollution Article

Phosphorus Losses to Surface Runoff Waters After Application of Digestate to a Soil Over Fertilised with Phosphorus

Open access Published: 14 October 2021

Volume 232, article number 439, (2021) Cite this article

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Water, Air, & Soil Pollution

Aims and scope

Submit manuscript

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Abstract

Anaerobic digestates from biogas plants can be used as agricultural fertilisers providing recycling nitrogen (N) and other nutrients for crop needs. It is still unclear the impact on phosphorus (P) losses to runoff waters of digestates as sources of N instead of inorganic N fertilisers in over fertilised soils with P. A field experiment was done in a sandy and acidic soil high in P. The experimental design was completely randomised with five treatments. The

and the P content of the digestate and also the effect of digestate in mobilising soil sorbed P to available forms (Horta & Carneiro, 2020; Nest et al., 2016; Nziguheba et al., 1998) can be an advantage in agronomic nutrient's management but poses a risk in the environmental management of soil P legacy.

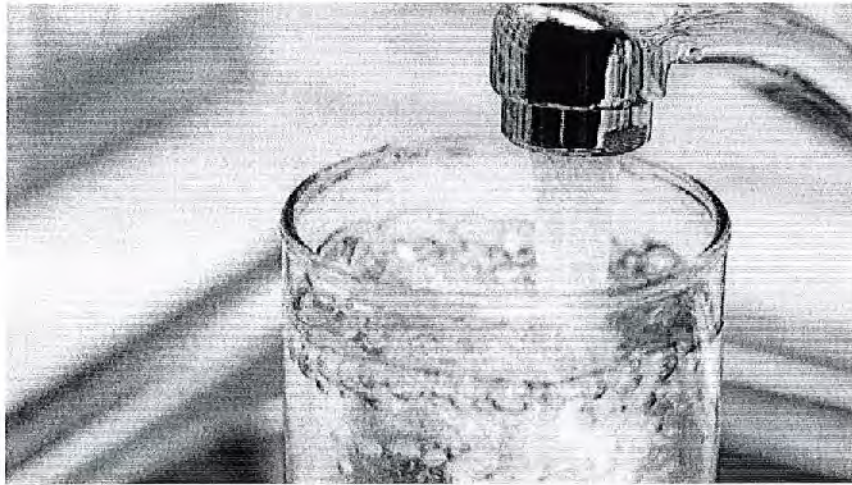
5 Conclusions

The main pathway of P loss from this over fertilised dystic Regosol was by surface runoff waters. The P losses occurred in dissolved forms and in particles of $\phi < 0.023 \mu\text{m}$ ($\text{DRP}_{0.023}$) which poses the greatest environmental risk of eutrophication since this orthophosphate forms are immediately algal available. In addition, the concentration of total dissolved P (TDP) in the runoff waters of all treatments was always higher than 0.05 mg L^{-1} considered the threshold level to prevent eutrophication of fresh waters. On average, TDP ranged between 0.5 (Ni/PS) and $2.6 \text{ mg L}^{-1} \text{ (DG/CS)}$. Irrespective to the past P additions to soil (from inorganic fertilisers or from organic amendments), the losses of P were mainly in inorganic P forms. The digestate application increased the losses of P to runoff waters both in inorganic and organic forms. During the experiment from December 2018 to May 2019, the rainfall was lower (212 mm) than the climatological normal for the region (433 mm) and runoff water was also low in all treatments and ranged between 412 L ha^{-1} in DG/CS and 1155 L ha^{-1} in Ni/DS. Consequently, the mass losses of TDP were low and ranged between 0.61 (Ni/MF) and $2.35 \text{ g ha}^{-1} \text{ (DG/CS)}$. Halting P fertilisation originated a decrease in soil Olsen P in all treatments: $5.5 \text{ (DG/CS)} < 6.1 \text{ (Ni/MF)} < 10.0 \text{ (Ni/PS)} < 13.5 \text{ Ni/CM} < 20.0 \text{ mg kg}^{-1} \text{ (Ni/DS)}$. Sediments loss was also negligible, which did not allow to evaluate the loss of P by soil erosion. At the end of the experiment, Olsen P in Ni/MF was 25 mg kg^{-1} and in Ni/CM 23 mg kg^{-1} closer to 20 mg kg^{-1} considered the threshold level for agronomic purposes. Nevertheless, the concentration of P in runoff waters remained high in all treatments and the fertilisation with digestate increased not only the risk of P losses to fresh waters but also prevented the decrease of the available P in the over fertilised soil.

Data Availability

The data of the present work is available for download from the “Repositório Científico do Instituto Politécnico de Castelo Branco” (Scientific Repository of the Polytechnic Institute of

New EPA Standards for PFAS will protect millions of Wisconsinites



Press Releases, Clean Water

April 10, 2024, By Amy Barrilleaux, Communications Director

More work ahead to protect rural communities, end PFAS use in consumer products

Today the Environmental Protection Agency (EPA) announced the first ever national drinking water standards for harmful PFAS “forever chemicals.” Public water systems across Wisconsin will now be required to meet strict Maximum Contaminant Levels for five different types of PFAS compounds, levels which are far lower than the standards Wisconsin currently has in place.

“The national drinking water standards established today reinforce how harmful these chemicals truly are,” says Clean Wisconsin Water and Agriculture Program Director Sara Walling. “This badly-needed action from the EPA ensures that Wisconsinites who get their drinking water from public systems will have peace of mind knowing that the water flowing from their taps is protected from dangerous levels of PFAS contamination.”

Millions of people in Wisconsin get their water from public water systems. **About 355,000 Wisconsinites are served by systems that do not meet the new EPA standards for PFAS.**

“Our understanding of the toxicity of these chemicals has greatly improved in the past decade,” says Clean Wisconsin Science Director Paul Mathewson. “The EPA must take into account the cost and feasibility of treatment when setting these standards, and it is telling that even after this consideration, they set the Maximum Contaminant Level in the single parts per trillion. Standards for most other drinking water contaminants are set thousands or millions of times higher.”

The EPA also announced today that nearly \$1 billion in newly available funding through the Bipartisan Infrastructure Law will be coming to impacted communities to help build treatment systems that remove PFAS from drinking water.

“Clean Wisconsin commends the Biden Administration for its action today to protect families across Wisconsin and the country. Funding to support remediation at the municipal, public and private levels demonstrates the administration’s commitment to public health and safe drinking water,” Walling says.

While federal funding will be available for families who get water from private wells, the new drinking water standards announced by the EPA only apply to public drinking water systems. Walling says the responsibility of protecting the hundreds of thousands of Wisconsinites who rely on private wells ultimately falls to the state.

“We don’t have groundwater standards in Wisconsin for PFAS, so that means no real protection for rural families from these dangerous chemicals. It’s the state’s job to create and enforce groundwater standards, but the most recent effort by the DNR to do so was blocked by the Natural Resources Board. Clean Wisconsin is calling for a renewed effort to pass groundwater standards in the state as quickly as possible,” she says.

Drinking water is just one way people are exposed to PFAS chemicals, which are used in a wide variety of consumer products, including non-stick pans, fast food wrappers, carpets, upholstery, firefighting foam, cosmetics, shoes and clothing.

“Given the harm possible at such low levels and the cost of treating contaminated water sources, we must work to phase out any non-essential uses of PFAS as quickly as possible,” Mathewson says. “PFAS are known as ‘forever chemicals’ because they persist in the environment and in the bodies of animals and people. It’s important that we address production and use on the front end

before more of these toxic chemicals end up in our environment and in our food supply."

PFAS (or per-and-polyfluoroalkyl substances) are a class of thousands of different chemicals manufactured since the 1940s. The toxic compounds have made their way into waterways across Wisconsin, prompting the DNR to issue numerous fish consumption advisories. PFAS have also been detected in municipal drinking water systems and private water wells in many communities including Eau Claire, La Crosse, Madison, Rhinelander, Marshfield, Manitowoc, French Island, Marinette, Peshtigo and Wausau. Studies have shown that high-level exposure to PFAS is associated with suppressed vaccine response, increased risk of some cancers, increased cholesterol, and increased risk of high blood pressure in pregnant women.

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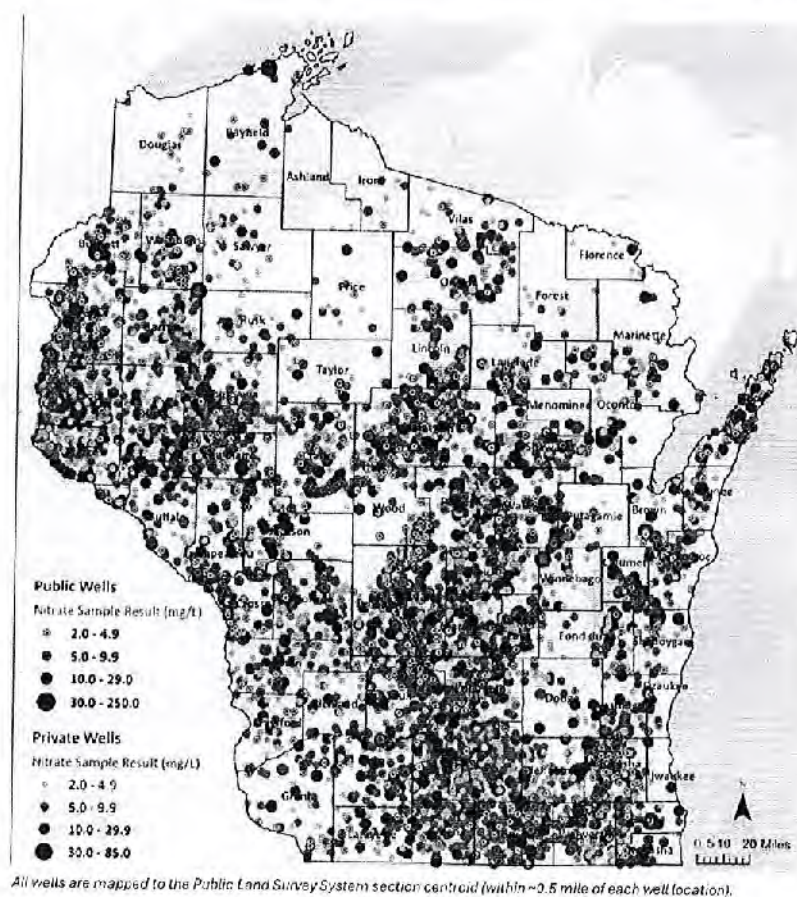
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Nitrates on Tap: The Cost of Nitrate Contamination in Wisconsin's Drinking Water



Wisconsin is facing a public health and environmental crisis fueled by widespread nitrate contamination in drinking water. Thousands of households, particularly in rural areas and regions with karst geology or shallow bedrock, are confronting mounting financial burdens and health concerns made more complex by the need to manage nitrate contamination. Nitrate exposure has been linked to serious health effects, including cancer, pregnancy complications, and infant methemoglobinemia (blue baby syndrome). For both municipalities and private well owners, contamination drives up costs through increased reliance on water treatment infrastructure, bottled water, and well replacement — costs that are largely borne by ratepayers and homeowners, not the polluters responsible.

Figure 1: 2020-2025 State Nitrate Standards Exceedances in Wisconsin Wells¹



Key Facts

- Nitrate contamination of Wisconsin's surface and groundwater is primarily caused by widespread use of nitrogen fertilizer and manure application.
- More than 90% of nitrate pollution is linked to agriculture. It is estimated that over 16 million pounds of nitrogen was applied beyond crop needs in 2022.
- Every county and watershed in the state is experiencing nitrate contamination of surface and groundwater at levels that impact public health.
- Health risks include a variety of cancers, pregnancy complications, and blue baby syndrome.
- Nitrate contamination contributes to eutrophication and toxicity of harmful algal blooms and threatens aquatic life.

¹ The standards include the Preventive Action Limit (2 mg/L) and Enforcement Standard (10 mg/L), as required by Ws. Stat. § 160. All data sourced from the Department of Natural Resources' Groundwater Retrieval Network (July 2020-July 2025). Public wells include municipal, other than municipal, transient, and non-transient. Private well data includes monitoring wells.



Costs of Inaction

- Four municipalities (Chippewa Falls, Plover, Janesville, and Trempealeau) have spent over \$45 million on nitrate mitigation.
- Including county-wide private well replacement estimates, total costs exceed \$116 million in the four municipalities.
- Private well owners face ongoing costs for nitrate treatment and may pay up to \$20,000 to replace a contaminated well, but continual treatment and well replacement isn't a long-term solution.
- Wisconsin's fragmented policy response has failed to address root causes.

Policy Recommendations

To reduce nitrate pollution and protect public health, Wisconsin should adopt a multitiered policy approach that includes short-, medium-, and long-term strategies.

SHORT-TERM

- Expand eligibility for and fully fund the Private Well Compensation Program.
- Expand funding for the Private Well Compensation Program using nitrogen fertilizer tonnage fees.

MEDIUM-TERM

- Standardize when large animal operations are required to implement on-farm groundwater monitoring.
- Obtain financial data from public water systems on the upfront and ongoing costs of remediating nitrate contamination.

LONG-TERM

- Revise outdated groundwater public health standards, set surface water standards, and establish stronger fertilizer and manure application rules in high-contamination areas.
- Initiate or resume rulemaking now that recent court decisions and changes to agency boards have removed key barriers to regulatory action.
- Condition cost-share payments for farmers on demonstrated nutrient management plan compliance.
- Create a statewide manure hauler registration and tracking system.

A coordinated, science-based policy response is urgently needed to address nitrate pollution at its source. Delaying action will only raise the financial and human costs, and put the safety of Wisconsin's water, ecosystems, and public health further at risk.

Read the full report at greatlakes.org/nitratesWI.

HOME > ALL STATES > WISCONSIN > WAUPACA WATERWORKS

UTILITY

Waupaca Waterworks

LOCATION

WAUPACA, WISCONSIN

SERVES

6,062

SOURCE

GROUNDWATER

DATA

2018-2024

16

Contaminants Exceed EWG's Health Guidelines

25 TOTAL CONTAMINANTS

EXPLORE THIS UTILITY

Overview

Contaminants

Find a Filter

Take Action

Overview

EWG's drinking water quality report shows results of tests conducted by the water utility and provided to the Environmental Working Group by the Wisconsin Department of Natural Resources, as well as information from the [U.S. EPA Enforcement and Compliance History database \(ECHO\)](#). For the latest quarter assessed by the U.S. EPA (April 2024 - June 2024), tap water provided by this water utility was in compliance with federal health-based drinking water standards.

LEARN ABOUT LEAD IN THIS UTILITY →

Legal does not necessarily equal safe.

- Getting a passing grade from the federal government does not mean the water meets the latest health guidelines.
- Legal limits for contaminants in tap water have not been updated in almost 20 years.
- The best way to ensure clean tap water is to keep pollution out of source water in the first place.

Contaminants Detected

EXCEED GUIDELINES OTHER DETECTED

Bromodichloromethane

Potential Effect: Cancer



This Utility: 2.54 ppb No Legal Limit

42x

EWG's Health Guideline: 0.06 ppb

Chloroform

Potential Effect: Cancer



This Utility: 3.41 ppb No Legal Limit

8.5x

EWG's Health Guideline: 0.4 ppb

Dibromoacetic acid

Potential Effect:



This Utility: 0.523 ppb No Legal Limit

17x

EWG's Health Guideline: 0.03 ppb

Dibromochloromethane

Potential Effect: Cancer



This Utility: 1.95 ppb No Legal Limit

20x

EWG's Health Guideline: 0.1 ppb

Dichloroacetic acid

Potential Effect: Cancer



This Utility: 1.24 ppb No Legal Limit

6.2x EWG's Health Guideline: 0.2 ppb

Haloacetic acids (HAA5)

Potential Effect: Cancer



This Utility: 2.60 ppb Legal Limit: 60 ppb

26x EWG's Health Guideline: 0.1 ppb

Nitrate

Potential Effect: Cancer



This Utility: 5.73 ppm Legal Limit: 10 ppm

41x EWG's Health Guideline: 0.14 ppm

Nitrate and nitrite

Potential Effect: Cancer



This Utility: 5.84 ppm Legal Limit: 10 ppm

42x EWG's Health Guideline: 0.14 ppm

Perfluorohexane sulfonate (PFHXS)

Potential Effect:



This Utility: 0.791 ppt Legal Limit: 10 ppt

791x EWG's Health Guideline: 0.001 ppt

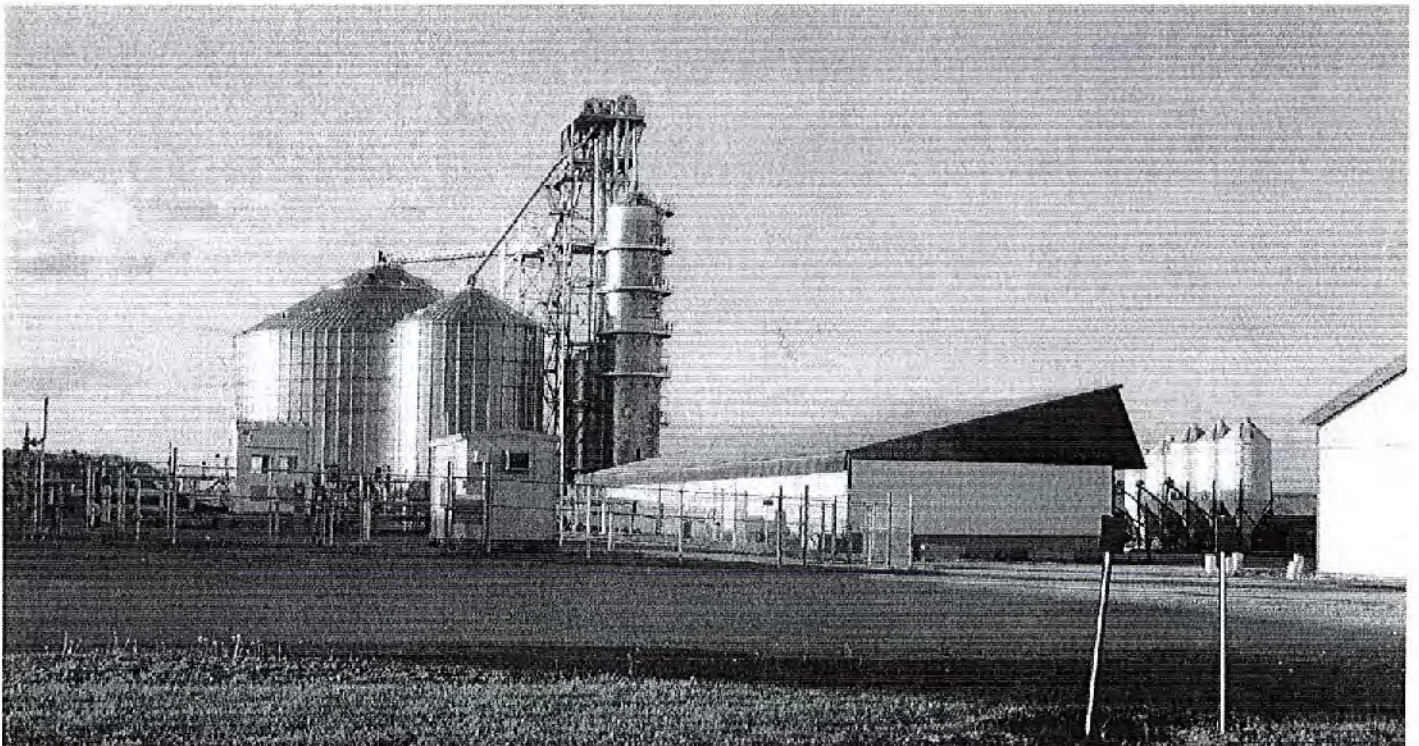
Attachment 13:

**A Small Wisconsin Town Bet Big on a Biodigester. Now the Project is
Defaulting on Its Loans**

Feature

A Small Wisconsin Town Bet Big on a Biodigester. Now the Project Is Defaulting on Its Loans.

Pitched as a boon to small towns, the biodigester financed \$41.5 Million via the town of Gillett, promising jobs and future tax revenue.



Wed August 27th, 2025

Feature • Climate



Zahn's Farms LLC, an approximately 11,500-head dairy operation in Gillett, Wisconsin, is the site of WI RNG Hub North, a manure methane digester project funded using \$41.5 million worth of tax-exempt municipal bonds financed by the town. On June 1, the project, developed and run by Aerogy LLC, missed their \$1.7 million principal payment, raising questions about the fate of the project and its impact on Gillett.

Methane digesters, like the one at Zahn's Farms, are frequently pitched as climate-smart solutions to one of the biggest environmental critiques of animal farming: the emissions and pollution caused by manure. According to the non-profit World Resources Institute, manure from cows and pigs constitutes one percent of total U.S. greenhouse gas emissions. Biodigesters are a technology for processing the manure by allowing microbes to break down the organic material. The result is biogas, a mix of primarily methane and carbon dioxide, that is touted by the booming biogas industry as renewable energy.

In the case of this project, the biogas is piped all the way to California in exchange for lucrative alternative fuel credits. These credits are paid for by fossil fuel companies, ostensibly to comply with California's Low Carbon Fuel Standard, but according to Carbon Pulse, researchers have warned that the "generous credits" are "distorting markets and undermining climate goals."

A blog from one of the mechanical contractors involved in the dairy digester paints the Zahn's Farms project as creating a new path forward, where cow waste is the future: "When people think of Wisconsin dairy farms, they picture rolling farmland, hardworking farmers, and fresh milk turning into world-class cheese. What they rarely picture is the waste."

There are "tons of it, produced daily by hundreds of Holstein dairy cows," the post continues. "But what if that waste could fuel homes, power local businesses, and reduce our reliance on fossil fuels?"

Aerogy, the renewable fuel platform behind the project, is a company created by Macquarie Capital, a multinational investment bank headquartered in Australia. In a press release, Macquarie Capital touted the Zahn's Farms "anchor investment" project and the level of financing secured.

The town of Gillett issued \$41.5 million worth of municipal bonds that led to the creation of the biogas facility. Minnesota-based UMB Bank served as the trustee, allowing developers of the project to access cash at a reduced interest rate. The bondholders then, in theory, get that interest back, tax-free, and the developers get a low-interest loan.

There are numerous reasons why a company might want to use municipal bonds. It allows them to raise money quickly without having to sell off a stake of their own business. Industrial revenue bonds also do not show up on company books — essentially, the town of Gillett ended up serving as a conduit for funding this project, for free. Local involvement also gives the appearance of public support.

Another appealing feature: municipal bonds tend to have long maturities — the period between issuance and when the bondholder gets its money back. But the project here only has a seven-year maturity, a shorter-than-usual timeline, which suggests the developers were eager to sell.

A pitch for funding from Progressive Energy, an investment partner in the project, points to this possibility. "Our business is going nicely but we wish to ramp it up faster and the likelihood of a profitable exit in three to five years is very real based off of recent transactions (by Shell, BlackRock and BP) in the market," the CEO and COO of the company wrote in a post on AskForFunding.com.

"It's just directly extracting wealth from our communities and giving it to high-income people. And it's blatant. It's not subtle at all," Lisa Doerr, a Wisconsin hay farmer and advocate with Sustain Rural Wisconsin Network, tells Sentient. When any type of company typically opens in a city, they're charged taxes. Because the financing for the digester was via municipal bonds, the financing was tax-exempt.

A source familiar with the matter wrote to Sentient that, “WI RNG FUD NORTH LLC is currently in discussions with bondholders to restructure the debt, which is 100% owned by institutional investors and backed solely by the credit of the WI RNG project.” They also wrote that the Town of Gillett “has no financial exposure to the bonds” and “is not responsible for the repayment of the debt or any other financial obligations.”

One possible reason for the defaulted payment could be that the market for digester tax credits created by California’s Low Carbon Fuel Standard has now plummeted. In a presentation for the biodigester, one consulting group based their accounting on a \$170 per metric ton tax credit price. But a report analyzing prices from July 28–August 3, 2025 found that the average price per metric ton was down to \$53.08. A source familiar with the matter wrote to Sentient that a new regulatory framework could “positively impact LCFS prices.” This “positive price momentum” might occur in late 2026, the source wrote.

In the same presentation, the value of each cow’s yearly manure was pitched as \$1,360 based on all the tax credits the company would receive. To a city council that represents a population of approximately 1,200, this probably looked pretty good: The prospect of a company that could make millions in revenue each year was pretty attractive in the long-term, when they could start being taxed. That is, if the company ever got to the point of generating revenue.

Alternative fuel tax credits can be purchased from dairy and other farm digester projects, when manure is “digested” and turned into energy, like biogas. But methane digesters are imperfect solutions to a massive problem. In some cases, these projects increase the number of cows on farms, creating more manure, and ultimately worsening the problem the new technology was pitched to fix. In Kewaunee County, Wisconsin, research by the non-profit group Friends of the Earth shows that “herd sizes at CAFOs with a digester grew by 58%.”

Biogesters can also go awry, and end up emitting toxic gases into the atmosphere. There are also high-risk incidences that would occur when piping biogas — according to the non-profit Public Interest Research Group, “a gas pipeline incident

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digesters reduce methane from manure storage by only about 25%, and methane can leak from multiple parts of the digester system.

Critics of factory farm expansion see mostly downsides. “All they bring is more consolidation and a whole other set of pollution issues,” Doerr says, not to mention a decline in nearby property values. “The benefits are hard to see.”

In a Facebook message, a representative from Zahn’s Farms wrote to Sentient, “I see Sentient is an anti-animal extremist group, Zahn’s Farms LLC is not the owner nor the operator of the anaerobic digester, nor is responsible for making bond payments. Aerology [*sic*] LLC is who you are looking to communicate with.” Note: Sentient is a non-profit news outlet, not an advocacy group or extremist group of any kind, and a member of the Institute of Nonprofit News.

Aerogy and Macquarie Capital both declined to comment. The mayor of Gillett and the Wisconsin Economic Development Corporation did not respond to requests for comment.

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The Author

Attachment 14:

**Financial Incentives Analysis for Biodigester Projects:
A Perspective from Freedom Township, MI**

Financial Incentives Analysis for Biodigester Projects

Freedom Township, Washtenaw County, Michigan

Prepared for Township Review - October 2025

Executive Summary

PROJECT SPECIFICS:

- Location: 1,000-head dairy farm in Freedom Township
- Type: Co-digestion facility (manure + food waste)
- Food waste will be trucked in and de-packaged

Corporate actors developing biodigester/anaerobic digestion projects in Michigan can access **\$4-8 million in upfront capital incentives** and generate **\$1.5-\$3.5 million annually** in ongoing revenue from federal tax credits, RINs, gas sales, and food waste tipping fees. Over a 20-year project life, **total financial benefits could reach \$35-75 million** on a typical \$10-12 million facility investment.

Key Finding: The primary beneficiaries are large corporations and Wall Street investors, not local communities. BlackRock (through BlackRock Real Assets) owns Vanguard Renewables, which was acquired for \$700 million in 2022.

CRITICAL CONCERN: Food waste introduces significant PFAS contamination risks that will impact farmland, groundwater, and the broader community. EPA warns of serious health risks from PFAS in digestate applied to land.

Vanguard Renewables is OWNED BY BlackRock, not the other way around.

- BlackRock Real Assets acquired Vanguard Renewables in July 2022
 - Deal valued at approximately \$700 million
 - BlackRock could invest over \$1 billion in future growth
 - Source: Waste Dive, July 20, 2022
 - Link: <https://www.wastedive.com/news/vanguard-renewables-blackrock-anaerobic-digestion-biogas/627684/>
-

PROJECT SPECIFICATIONS FOR 1,000-COW DAIRY OPERATION

Manure Production

A 1,000-pound dairy cow produces an average of 80 pounds of manure each day. For a 1,000-head operation:

- **Daily manure production:** ~80,000 pounds (40 tons)
- **Annual manure production:** ~14,600 tons

Food Waste Co-Digestion

Jordan Dairy Farms in Massachusetts with 300 cows takes in 9,125 wet tons of manure and 16,425 tons of source-separated organics (food waste) per year. Scaling this to a 1,000-cow operation:

- **Annual food waste capacity:** 50,000-60,000 tons
- **Daily truck deliveries required:** 150-200 tons/day = **10-15 truck trips daily**
20 trucks

Sources:

- EESI Fact Sheet on Biogas: <https://www.eesi.org/papers/view/fact-sheet-biogasconverting-waste-to-energy>
- Massachusetts Case Studies: <https://www.mass.gov/info-details/anaerobic-digestion-case-studies>

Expected Energy Production

A 500-cow dairy operation typically produces enough manure to generate approximately 600,000-800,000 kWh annually. With 1,000 cows plus food waste co-digestion:

- **Manure alone:** 1,200,000-1,600,000 kWh/year equivalent in biogas
- **With food waste co-digestion:** Co-digestion can increase biogas production by 30-300% compared to manure alone
- **Total production potential:** 3,000,000-5,000,000 kWh equivalent in renewable natural gas

Typical Project Cost

As of September 2022, California digesters for dairies with 1,000-5,000 cows cost \$4.7 million on average. For Michigan with food waste infrastructure:

- **Estimated total capital cost:** \$10-12 million
- Includes: digesters, food waste receiving/de-packaging equipment, gas upgrading, pipeline connection

Source: DeSmog: <https://www.desmog.com/intro-dairy-anaerobic-digesters-biogas-cow-manure-us-farms/>

Financial Incentives Available in Michigan

1. FEDERAL INVESTMENT TAX CREDIT (ITC) - Section 48/48E

What It Is: A federal tax credit that reduces the upfront cost of building a biodigester by 30-60% of eligible project costs.

How It Works:

- Base credit: 6% of project costs
- With prevailing wage & apprenticeship requirements: 30%

- Additional 10% bonus for domestic content
- Additional 10% bonus for location in "energy community"
- **Maximum potential: 60% of project costs**

Michigan Eligibility: Yes, all of Michigan qualifies. Some areas may qualify as "energy communities" for bonus credits.

For a \$10 Million Project:

- Base ITC (6%): \$600,000
- With wage requirements (30%): \$3,000,000
- Maximum with bonuses (60%): \$6,000,000

Sources:

- SKS Development, February 2025: "For projects that begin construction before 2025, the ITC starts at 6% for biogas projects, with a 5x multiplier for satisfying the prevailing wage and apprenticeship requirements. Additional 10% bonuses are available for satisfying domestic content requirements, and/or being located in either an energy community or a low-income community. In total, the ITC can be as much as 60% of the biogas project's eligible basis."
- Link: <https://sksgreen.com/how-to-maximize-government-incentives-for-the-upfront-cost-of-construction-of-your-biogas-project/>
- Baker Tilly: "Under section 48 Investment Tax Credit for Qualified Biogas Property, the ITC eligible basis could include all property that was integral to the production of energy, power-generation equipment, as well as feedstock preparation, feedstock collection (e.g., anaerobic digesters), gas upgrading equipment and ancillary systems critical to biogas production."
- Link: <https://www.bakertilly.com/insights/changes-biogas-tax-credits-2025>

Note: Projects starting in 2025 or later face more restrictive rules under Section 48E, which may exclude anaerobic digesters and gas conditioning equipment from the credit basis.

2. SECTION 45Z CLEAN FUEL PRODUCTION TAX CREDIT (2025-2029)

What It Is: An annual tax credit for each gallon (or gallon equivalent) of clean fuel produced and sold.

How It Works:

- Base rate: \$0.20 per gallon equivalent
- With prevailing wage & apprenticeship: \$1.00 per gallon equivalent
- Must have lifecycle GHG emissions below 50 kg CO₂e/mmBTU
- Credits adjusted based on emissions reduction achieved
- Available for fuel produced 2025-2029 (recently extended from 2027)

For a Facility Producing 1 Million Gallon-Equivalents of RNG Annually:

- Base rate: \$200,000/year
- Full rate: \$1,000,000/year
- **5-year total (2025-2029): \$1-5 million**

Real-World Example: Aemetis Biogas in California started generating 45Z credits in January 2025 and is actively selling them to monetize the value.

Sources:

- Congress.gov: "The credit may be claimed by taxpayers producing and selling qualifying transportation fuel between 2025 and 2027... The CFPC is technology neutral and subsidizes the production of any transportation fuel with zero or low lifecycle greenhouse gas (GHG) emissions."
 - Link: <https://www.congress.gov/crs-product/IF12502>
 - U.S. Department of Treasury, January 10, 2025: "Section 45Z provides a tax credit for the production of transportation fuels with lifecycle greenhouse gas (GHG) emissions below certain levels. The credit is in effect in 2025 and is for sustainable aviation fuel (SAF) and non-SAF transportation fuels."
 - Link: <https://home.treasury.gov/news/press-releases/jy2780>
 - Crux Climate: "Unlike fixed-value tax credits such as the §45X advanced manufacturing credit, the value of a §45Z credit depends on how much a fuel reduces lifecycle greenhouse gas emissions relative to a petroleum baseline. Fuels with very low or zero emissions can earn up to \$1.00 per gallon."
 - Link: <https://www.cruxclimate.com/insights/ss45z-clean-fuel-production-credits-what-tax-credit-buyers-need-to-know>
-

3. RENEWABLE IDENTIFICATION NUMBERS (RINs) - D3 CELLULOSIC

What It Is: Federal Renewable Fuel Standard credits that biogas producers generate and sell to oil refiners who must purchase them to meet federal mandates.

How It Works:

- Biogas from anaerobic digestion qualifies for high-value D3 "cellulosic" RINs
- Producers generate RINs for each gallon-equivalent of renewable natural gas
- RINs are traded on open markets
- Obligated parties (oil refiners) must purchase and retire RINs annually

Market Value:

- D3 RINs historically traded at \$2.00-\$3.00+ each (compared to \$0.85 for lower-tier RINs)
- Current market values fluctuate based on supply/demand

For a Medium Dairy Digester:

- Annual RIN generation: 200,000-500,000 RINs
- At \$2.50/RIN average: **\$500,000-\$1,250,000 annually**

Sources:

- BioCycle, June 2023: "D3 RINs are trading at about three times the value of D5 RINs — about \$2.85 each for D3 and \$0.85 each for D5 at the time of this writing (Fall 2017)... All landfill gas RINs qualify for D3 status, thanks to some effective lobbying on the part of the solid waste industry."
 - Link: <https://www.biocycle.net/101-for-rins/>
 - Amp Americas: "RNG qualifies as a cellulosic biofuel and receives a D3 RIN for ethanol gallon equivalent of fuel used in transportation."
 - Link: <https://www.ampamericas.com/resources/rng-101>
 - CDM Smith, June 2023: "The biogas industry is ripe for trading renewable identification numbers, or RINs, a natural gas currency that is commanding record-high prices."
 - Link: <https://www.cdmsmith.com/en/Client-Solutions/Insights/RINs-Renewable-Gas-as-a-Revenue-Source>
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4. USDA RURAL ENERGY FOR AMERICA PROGRAM (REAP) GRANTS

What It Is: Direct federal grants covering up to 50% of project costs for renewable energy systems in rural areas.

How It Works:

- Grant funding: Up to 50% of project costs
- Maximum grant: \$1,000,000
- Also offers guaranteed loans up to \$25 million (75% of project)
- Eligibility: Farms where >50% of gross income is from farming
- Competitive application process with quarterly deadlines

Enhanced by Inflation Reduction Act:

- \$2 billion in additional funding through 2031
- Grant maximum increased from \$500,000 to \$1,000,000
- Federal share increased from 25% to 50% for qualifying projects
- Biodigesters in "energy communities" qualify for 50% rate

For a \$10 Million Project:

- **Maximum grant: \$1,000,000**
- Plus potential loan guarantee for additional \$7.5 million (75% of remaining)

Real-World Examples:

- Vermont dairy digesters (2024): Individual grants of \$747,000-\$929,000
- Pennwood Farms, Pennsylvania: \$264,574 REAP grant + \$264,450 REAP loan
- Aemetis Biogas, California: Closed \$25 million in USDA-guaranteed loans (20-year terms)

Sources:

- USDA Rural Development: "With the passage of the Inflation Reduction Act, the Rural Energy for America Program (REAP) has been provided over \$2 billion for renewable energy systems and energy efficiency improvement grants... The maximum grant size was increased from \$250,000 to \$500,000 for energy efficiency projects and from \$500,000 to \$1 million for renewable energy systems."
 - Link: <https://www.rd.usda.gov/inflation-reduction-act/rural-energy-america-program-reap>
 - Agricultural Digesters, July 2025: "Grants, totaling more than \$2.4 million, were formally announced by USDA... Machia & Sons Dairy LLC: \$929,360 grant (REAP)... Machia Brothers Dairy LLC: \$747,124 grant (REAP)."
 - Link: <https://agriculturaldigesters.com/news/2-4-million-allocated-for-digesters-at-three-vermont-dairy-farms/>
-

5. PRODUCTION TAX CREDIT (PTC) - Section 45 (If Generating Electricity)

What It Is: An annual per-kilowatt-hour tax credit for renewable electricity production, available for 10 years.

How It Works:

- \$0.027/kWh for projects under 1 megawatt
- \$0.021/kWh for projects over 1 megawatt
- Claimed annually for 10 years from when project is placed in service
- Only applies if digester generates electricity (not RNG for pipeline)

For a 500 kW System Running 8,000 Hours/Year:

- Annual production: 4,000,000 kWh
- At \$0.027/kWh: **\$108,000 annually for 10 years**
- **10-year total: \$1,080,000**

Note: Most new biodigester projects focus on RNG production for pipeline injection rather than electricity, as RINs and 45Z credits provide higher returns.

Sources:

- SKS Development: "The PTC is based on the amount of renewable electricity produced by the system. The PTC rate is \$0.027 per kilowatt-hour (kWh) for projects under 1 megawatt of alternating current

(MWac) and \$0.021/kWh for projects over 1 MWac. The PTC rate fluctuates annually based on inflation, and the credit lasts for 10 years after the project is placed in service."

- Link: <https://sksgreen.com/how-to-maximize-government-incentives-for-the-upfront-cost-of-construction-of-your-biogas-project/>
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6. RENEWABLE NATURAL GAS SALES

What It Is: Direct revenue from selling the renewable natural gas produced.

Market Value:

- Depends on natural gas market prices
- Premium paid for "green" gas attributes
- Typically \$3-8 per MMBtu (million BTU)

For a Medium Facility:

- Annual RNG production: 50,000-150,000 MMBtu
 - **Annual revenue: \$150,000-\$600,000**
-

7. ADDITIONAL REVENUE STREAMS

Tipping Fees from Food Waste:

- Co-digesting food waste with manure increases gas production by 30-300%
- Facilities charge \$30-80/ton to accept food waste
- **For 1,000-cow operation:** Can accept 50,000-60,000 tons annually
- **Requires 10-15 truck trips DAILY** for food waste delivery
- **Annual tipping fee revenue: \$1,500,000-\$4,800,000**

Real Example: Jordan Dairy Farms (300 cows) accepts 16,425 tons/year of food waste from HP Hood & Sons, Cabot Creamery, Kayem Foods, and Cains Foods.

Sources:

- Massachusetts Case Studies: <https://www.mass.gov/info-details/anaerobic-digestion-case-studies>
- EPA Dairy Digester Guide: <https://www.epa.gov/agstar/anaerobic-digestion-dairy-farms>

Digestate Products:

- Solid bedding material for dairy cows
 - Liquid fertilizer
 - Savings/revenue: \$50,000-150,000 annually
-

CRITICAL HEALTH & ENVIRONMENTAL CONCERN: PFAS CONTAMINATION

What is PFAS?

Per- and polyfluoroalkyl substances (PFAS) are "forever chemicals" that:

- Do not break down in the environment
- Accumulate in human and animal bodies
- Are linked to cancer, high cholesterol, kidney disease, and other health problems
- Contaminate soil, groundwater, and crops

How PFAS Enters Biodigesters

The EPA reports that biosolids (similar to digestate from anaerobic digesters) are thought to have the highest concentration of PFAS, followed by food waste, then yard waste. Both the EPA and organics experts say a major source of PFAS in compost comes from packaging.

Food Waste is a Primary PFAS Source:

- Food packaging contains PFAS (take-out containers, wrappers, boxes)
- Even after "de-packaging," residual PFAS remains on food
- No current regulations limit PFAS in food waste going to digesters
- PFAS concentrate during the digestion process

Sources:

- Waste Dive (Sept 2021): <https://www.wastedive.com/news/epa-pfas-compost-digestate-chemical-packaging/606092/>
- EPA PFAS in Sewage Sludge: <https://www.epa.gov/biosolids/and-polyfluoroalkyl-substances-pfas-sewage-sludge>

What Happens to PFAS in Biodigesters?

Studies quantifying 92 PFAS in biosolids from eight treatment facilities found that anaerobic digestion does NOT destroy PFAS. At facilities using anaerobic digestion followed by heat drying, PFAS concentrations INCREASED by 102%.

Key Finding: Sources of PFAS contribute more to PFAS concentrations in biosolids than treatment processes. Anaerobic digestion confirmed the prevalence of PFAAs in biosolids after treatment.

Sources:

- NIH Study on PFAS in Biosolids: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10500628/>
- Frontiers in Environmental Chemistry: <https://www.frontiersin.org/journals/environmental-chemistry/articles/10.3389/fenvc.2024.1383185/full>

EPA's January 2025 Risk Assessment: GRAVE WARNINGS

The EPA's draft risk assessment finds that "there can be human health risks exceeding EPA's acceptable thresholds, sometimes by several orders of magnitude," from living near sites that have land applied contaminated biosolids or from using groundwater or products impacted by such a site.

The EPA determined the chemicals could leach from the material whether it's land applied, disposed of in a landfill or incinerated. PFAS contamination can also be persistent, impacting sites where biosolids were applied long after the practice is halted.

EPA Found Health Risks at Concentrations as Low as 1 Part Per Billion.

Source: Waste Dive (Jan 2025): <https://www.wastedive.com/news/epa-warns-of-pfas-exposure-from-biosolids-in-long-awaited-report/737360/>

Real-World PFAS Contamination Cases

Maine Organic Farm: A Maine organic farm was found to be contaminated — despite land application not being allowed for farms to achieve organic certification — because the site's prior owner had spread contaminated biosolids.

Texas Farmer Lawsuit: In Johnson County, Texas, a farmer is suing Synagro over contamination allegedly stemming from the company's biosolid-based fertilizer.

Multiple States Taking Action:

- Maine: BANNED land application of biosolids
- Michigan: Regulators have begun testing for PFAS in sewage sludge
- Vermont, Connecticut, Minnesota: Passed laws banning PFAS in food packaging
- Washington, Maryland: Implementing PFAS monitoring requirements

Source:

- Waste Dive: <https://www.wastedive.com/news/epa-warns-of-pfas-exposure-from-biosolids-in-long-awaited-report/737360/>
- Marten Law: <https://martenlaw.com/news/wastewater-biosolids-come-under-pfas-regulation>

EPA's Position: No Obligation to Regulate

Shocking Reality: The EPA is pushing to dismiss a lawsuit that would compel the agency to identify and regulate several "forever chemicals" in sewage sludge. The EPA argued that while it's required to list contaminants it has identified in sewage sludge, it's not actually obligated to add any newly identified chemicals like PFAS or to limit those pollutants.

Environmental advocates are calling for an immediate moratorium by the EPA that stops the land application of sewage sludge nationwide. "Sludge has no business being spread on any land and when it is, it triggers a serious health crisis for farmers and their neighbors".

Source:

- Waste Dive (Sept 2024): <https://www.wastedive.com/news/epa-pfas-biosolids-lawsuit-rebuttal-sewage-sludge-report/726926/>
- WBUR: <https://www.wbur.org/news/2025/01/16/pfas-sewage-sludge-biosolids-epa-health-risk-assessment>

PFAS Pathways to Human Exposure from Freedom Township Digester

1. Digestate Applied to Farmland

- PFAS leaches into groundwater
- Crops uptake PFAS from contaminated soil
- Animals grazing on contaminated land accumulate PFAS in milk and meat

2. Groundwater Contamination

- Private wells in Freedom Township at risk
- Municipal water supplies potentially affected
- Contamination can persist for decades

3. Air Emissions

- De-packaging operations release PFAS particles
- Truck traffic spreads contaminated dust

4. Runoff

- Storm events wash PFAS from fields into waterways
- Affects downstream communities

Michigan Has No PFAS Limits for Digestate

Current Status:

- Michigan is "testing" but has NOT established limits
- No requirement for digesters to monitor PFAS in food waste inputs
- No requirement to track PFAS in digestate outputs
- No liability for long-term contamination

Questions for Vanguard/BlackRock:

1. Will you test ALL incoming food waste for PFAS?
2. Will you test ALL digestate for PFAS before land application?
3. What PFAS levels will you guarantee not to exceed?
4. Who is liable if Freedom Township's groundwater becomes contaminated?
5. Will you provide baseline PFAS testing for all private wells in Freedom Township?
6. Will you provide health monitoring for township residents?
7. What is your cleanup bond/insurance for PFAS contamination?

The Bitter Irony

Modern Farmer reports: "If we put money towards biogas, we're essentially helping to subsidize and further entrench industrial livestock production, and essentially the worst possible ways of managing waste, which is manure lagoons." The study found that herd size at CAFOs with digesters grew 3.7 percent year over year—24 times the growth rate of typical dairies.

Translation: Federal subsidies for "green" digesters actually incentivize larger factory farms and MORE pollution, while creating new PFAS contamination pathways.

Source: Modern Farmer (Aug 2024): <https://modernfarmer.com/2024/04/biogas-mega-dairies-problem/>

MICHIGAN-SPECIFIC FINANCIAL SUMMARY (1,000-COW DAIRY WITH FOOD WASTE)

UPFRONT CAPITAL BENEFITS (One-Time):

Incentive	Amount	Source
Investment Tax Credit (30-60%)	\$3,000,000 - \$7,200,000	IRS Section 48 (on \$10-12M project)
REAP Grant (up to 50%)	\$750,000 - \$1,000,000	USDA
TOTAL UPFRONT	\$3.75M - \$8.2M	

This reduces the effective cost of a \$10-12M facility to \$2-8M

ANNUAL OPERATING REVENUE (1,000-Cow Dairy + Food Waste):

Revenue Stream	Annual Amount	Duration	Total Value
45Z Tax Credits	\$400,000 - \$1,500,000	5 years (2025-2029)	\$2M - \$7.5M
D3 RINs	\$600,000 - \$1,500,000	20+ years	\$12M - \$30M
RNG Sales	\$200,000 - \$700,000	20+ years	\$4M - \$14M
Tipping Fees (MAJOR)	\$1,500,000 - \$4,800,000	20+ years	\$30M - \$96M
Digestate/Bedding	\$75,000 - \$200,000	20+ years	\$1.5M - \$4M
TOTAL ANNUAL	\$2.8M - \$8.7M/year		

Note: Tipping fees are the LARGEST revenue source for co-digestion facilities. This is why they NEED to truck in massive amounts of food waste.

20-YEAR PROJECT FINANCIAL SUMMARY (1,000-Cow + Food Waste):

Conservative Scenario:

- Upfront incentives: \$4,000,000
- Annual revenue (average): \$2,800,000/year
- 20-year operating revenue: \$56,000,000
- **Total financial benefit: \$60,000,000**
- Less initial investment: -\$11,000,000
- **Net benefit: \$49,000,000**

Aggressive Scenario:

- Upfront incentives: \$8,200,000
- Annual revenue (average): \$6,500,000/year
- 20-year operating revenue: \$130,000,000
- **Total financial benefit: \$138,200,000**
- Less initial investment: -\$11,000,000
- **Net benefit: \$127,200,000**

Most Likely Scenario (Mid-Range):

- Upfront incentives: \$6,000,000
- Annual revenue (average): \$4,500,000/year
- 20-year operating revenue: \$90,000,000
- **Total financial benefit: \$96,000,000**
- Less initial investment: -\$11,000,000
- **Net benefit: \$85,000,000**

KEY INSIGHT: Why Tipping Fees Drive This Business Model

Notice that tipping fees can represent 50-65% of annual revenue. This is NOT primarily about renewable energy or helping dairy farmers. **This is about creating a profitable waste disposal business** that happens to generate gas as a byproduct.

BlackRock/Vanguard NEEDS those 10-15 truck trips daily bringing food waste. Without massive food waste volumes, the project economics don't work as well.

WHO BENEFITS?

Primary Beneficiaries:

1. **BlackRock** - Owns Vanguard Renewables, paid \$700M for company in 2022
2. **Vanguard Renewables** - Developing 100+ digesters nationwide by 2026-2028
3. **TotalEnergies** - Joint venture with Vanguard for additional projects
4. **Dominion Energy** - Partnered with Vanguard, investing \$200M+
5. **Oil & Gas Companies** - Purchase RINs to meet federal mandates instead of reducing their own emissions

Limited Local Benefits:

- Host farm receives modest annual payment
 - Host farm gets some bedding material and heat
 - Creates 2-5 permanent jobs (often filled by outside contractors)
 - Increases heavy truck traffic for food waste deliveries
-

KEY CONCERNS FOR FREEDOM TOWNSHIP

Truck Traffic Reality:

- **10-15 heavy trucks PER DAY** delivering food waste (50,000-60,000 tons annually)
- **3,650-5,475 truck trips per year** on township roads
- Increased road maintenance costs
- Safety concerns on rural roads
- Noise and diesel exhaust pollution

De-packaging Operations:

- Food waste arrives in packaging (plastic, cardboard, etc.)
- Must be removed before digestion
- Creates additional waste stream and PFAS exposure
- Requires specialized equipment and labor
- Potential for litter, odors, and pests during processing

###Financial Reality:

- **These are highly profitable industrial operations**, not community benefit projects
- Wall Street and major energy corporations are investing because returns are substantial
- BlackRock didn't pay \$700 million for Vanguard because of altruism
- The financial incentives create powerful motivation to site these facilities, regardless of community impact

Environmental Justice Issues:

From Food & Water Watch (August 2025):

"The LCFS awards large numbers of 'credits' for factory farm gas, which fossil fuel companies then purchase and use to greenwash their operations while continuing their polluting business as usual. This has turned a program intended to deliver clean air and real climate progress into a slush fund for the biggest, most polluting factory farms."

Source: <https://www.foodandwaterwatch.org/2025/08/26/taking-on-false-climate-solutions-factory-farm-biogas-in-californias-low-carbon-fuel-standard-program/>

The RIN System Reality:

From Grist (November 2022):

"What we're seeing is essentially factory farm, biogas, and anaerobic digesters being used in tandem with large factory farm operations, which obviously is raising a lot of concern and opposition from communities... They're not getting the co-benefits that supposedly come from capturing methane, burning methane, or digesting waste."

Source: <https://grist.org/agriculture/biogas-boom-ira-incentives/>

CRITICAL QUESTIONS FOR THE TOWNSHIP

1. Who truly benefits from these substantial financial incentives?

- BlackRock/Vanguard Renewables can access \$6-8M in upfront benefits
- Generate \$3-9M annually in ongoing revenue (\$85M+ over 20 years)
- What does Freedom Township receive?

2. Who bears the costs and risks?

- Township residents: odors, **10-15 truck trips DAILY**, potential groundwater contamination, **PFAS exposure**
- Federal taxpayers: funding the tax credits and grants
- Host farm: minimal benefits, major infrastructure on property, **long-term PFAS liability**
- Future generations: **permanent PFAS contamination of soil and water**

3. PFAS Contamination - The Forever Problem:

- Food packaging is a primary PFAS source
- Anaerobic digestion does NOT destroy PFAS
- EPA warns of severe health risks from land-applied digestate
- **Michigan has NO limits on PFAS in digestate**
- Once contaminated, farmland and groundwater remain contaminated indefinitely
- **Who pays for cleanup when contamination is discovered in 10-20 years?**

4. Why is food waste needed at all?

- Manure alone doesn't provide enough profit

- Tipping fees (\$1.5M-\$4.8M/year) are the primary revenue driver
- This is a **waste disposal business**, not primarily renewable energy

5. **Why are tax credits necessary if this is genuinely "renewable energy"?**

- Projects wouldn't pencil out without massive subsidies
 - Taxpayers subsidize corporate profits while bearing environmental risks
-

RECOMMENDATIONS FOR THE TOWNSHIP

1. **Require comprehensive PFAS testing and monitoring:**

- Baseline testing of ALL private wells in 2-mile radius
- Quarterly testing of ALL incoming food waste loads
- Monthly testing of ALL digestate before land application
- Mandatory PFAS concentration limits (even if state doesn't require)
- Public disclosure of all test results

2. **Require massive liability insurance and cleanup bonds:**

- Minimum \$50 million environmental liability insurance
- \$25 million cleanup bond specifically for PFAS contamination
- 30-year monitoring and remediation fund
- Personal guarantees from BlackRock/Vanguard executives

3. **Require full financial disclosure** from any biodigester applicant:

- All anticipated tax credits, grants, and RINs revenue
- Documentation of ownership structure
- Disclosure of any Wall Street or private equity backing
- Pro forma showing dependence on food waste tipping fees

4. **Community benefit agreements** should be proportional to corporate benefits:

- If operators receive \$85M+ over 20 years, community should receive meaningful compensation
- Consider requiring 10% of gross revenues to township
- Mandatory road maintenance fund based on truck trips
- Annual health monitoring for all residents within 2 miles

5. **Traffic impact requirements:**

- Full traffic study for 10-15 trucks daily
- Road improvement bond before operations begin
- Restricted hours for truck traffic
- Mandatory route restrictions away from schools and residential areas

6. **De-packaging facility requirements:**

- Fully enclosed building (not outdoor operations)
- Air filtration systems
- Regular air quality monitoring
- Litter control plan with penalties

7. Consider local zoning restrictions specific to industrial biodigestion facilities:

- Minimum setbacks from homes, wells, schools
- Prohibition on land application of digestate in township
- Prohibition on accepting waste from outside Michigan

8. Demand state action:

- Push Michigan to establish PFAS limits for digestate
- Require EPA to regulate PFAS in biosolids
- Support legislation for PFAS compensation fund

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APPENDIX: Real-World Financial Example

Aemetis Biogas (California, May 2025):

- Completed \$1.6M in LCFS and D3 RIN sales in **just April 2025**
- Generating 45Z tax credits starting January 2025

- Has 36 miles of biogas pipeline installed
- Plans for more digesters with expected 120%+ increase in credits
- Has closed \$25M in USDA-guaranteed loans

Source: <https://www.aemetis.com/aemetis-biogas-completes-1-6-million-of-lcfs-and-d3-rin-sales-in-april/>

Note: Michigan projects won't have LCFS revenue, but this demonstrates the scale of financial benefits corporations are capturing.

Document prepared October 2025 for Freedom Township, Washtenaw County, Michigan All dollar figures are estimates based on industry reports and may vary by project specifics



Added on October 6, 2025

Sara Swanson (<https://themanchestermirror.com/author/sara/>)

Guest editorial: Don't let the manure hit the fan; biogas plant still a possibility in Freedom Township

Text Size

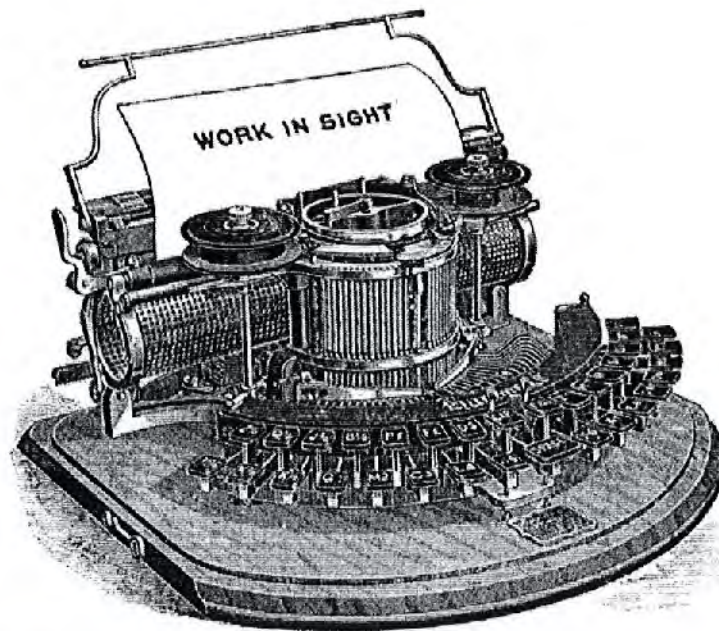
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Editor's note: Guest editorials are by local leaders or experts with specific knowledge of a topic and may contain opinions. Views expressed in any editorial are always exclusively those of the author.

Cheryl Ruble has been working as a volunteer leader with several state and national organizations for over three years, challenging the greenwashed industry narrative surrounding biofuels, particularly manure-based biogas produced using anaerobic digesters, while also promoting truly clean energy policies. She has been working even longer (since 2018) to advance a just, sustainable, resilient, and transparent food and farm system rooted in the One Health principle: the recognition that human, animal, and environmental health are deeply interconnected and therefore must be prioritized equally.



by Cheryl Ruble, MD

In January 2024, *The Manchester Mirror* reported plans (<https://themanchestermirror.com/2024/01/15/horning-farms-using-latest-technology-to-be-good-neighbors/>) for a commercial-scale gas plant on a local dairy farm in the heart of Freedom Township. The project is a partnership between the farm and Vanguard Renewables (“Vanguard”), a company controlled by BlackRock, the world’s largest investment firm. Vanguard aims to extract methane gas (“biogas”) from cow manure and large volumes of trucked-in industrial waste using a process known as anaerobic digestion.

The proposed gas complex would also include a refinery to scrub impurities from raw biogas to produce “pipeline-grade” biomethane, also known as renewable natural gas (“RNG”). RNG is chemically identical to fossil gas and used interchangeably. Methane, by any other name, burns and leaks the same.

Freedom Township residents responded swiftly with well-founded concern—attending public meetings, contacting local officials and state legislators, asking tough questions and pressing for answers, and organizing to inform neighbors and fight the project. Their efforts are ongoing. Notably, Freedom Township’s

Zoning

Ordinance

(https://cms6.revize.com/revize/freedomtownship/Documents/Ordinances%2520-%2520Forms/2014_Zoning_Ordinance_02_01_14.pdf) currently prohibits “farm-based production of methane or any fuel product from an anaerobic digester” (Page 5–62).

More than a year and a half later, Freedom Township and neighboring Manchester-area communities remain in the dark as to the status of the project. Vanguard has been utterly silent—no response, no updates, no answers. In other communities, including Lind, Wisconsin (<https://sraproject.org/community-story/wisconsin-residents-defeat-multi-million-dollar-factory-farm-gas-operation/>), and West Jefferson, Ohio (<https://www.nbc4i.com/news/investigates/company-pulls-out-of-biodigester-project-in-west-jefferson/>), Vanguard officially pulled out

following fierce public backlash. Yet in Freedom Township, despite equally strong local resistance, they haven't called it off. So, what exactly is Vanguard waiting for?

Two bills have been introduced in Michigan that would deregulate digesters and digestate, weakening Freedom Township's ability to prohibit these facilities and protect against soil and water contamination from their waste byproduct. Washtenaw County is currently debating whether to support digesters as part of its Materials Management Plan, which would help clear the way at the county level. And legislation establishing a low-carbon fuel standard (LCFS) is expected to be introduced in the state senate that would make biogas production in Michigan, already a lucrative business model, even more profitable.

Why Freedom Township?

Refined biogas is typically compressed and injected into pipelines for commercial distribution and sale. For this reason, biogas developers often target dairy partners near existing gas infrastructure. Freedom Township is already a pipeline corridor crossed by multiple oil and gas lines and hosting a Consumers Energy gas compressor station.

According to Penn State Extension (<https://extension.psu.edu/safety-around-anaerobic-digesters>): "Most digesters experience spills and leaks, which can be significant to the environment and may lead to serious injuries or an explosion in rare cases...The danger of fire and explosion is especially significant near digesters and gas reservoirs."

Freedom Township is already saddled with more than its fair share of explosion risk.

Follow the Money

Proponents describe this "waste-to-energy" model as a win-win for farmers, rural communities, and the environment.

Make no mistake: biogas production is about harvesting a crop of financial rewards under the guise of sustainability, not taking meaningful climate action or helping family farms survive and thrive independently. Contracted farms are bound to large corporations. The commercial biogas industry would collapse without generous public subsidies, lucrative state and federal carbon credits, and substantial IRA tax breaks. Vanguard is investing in a cash cow, not in Freedom Township, Manchester, or other nearby communities.

Co-location on a farm allows biogas companies to operate under looser regulatory frameworks and tap into subsidies intended for farms. The corporation takes the lion's share of the profits, while the farm is left with the hard and messy part: raising the animals and managing the waste byproduct known as digestate.

Business as Usual

Biogas carbon credit schemes let industrial polluters buy discounted credits from biogas producers and claim *net-zero* without actually cutting their own greenhouse gas emissions. It's cheaper than doing the real work.

Carbon markets are a windfall for biogas companies and heavy polluters. Unfortunately, rural, urban, and downstream communities bear the brunt of the pollution.

And the tax credits? Biogas companies and their investors profit off the credits, turning taxpayer money into private gain.

Digesters Are Not a Waste Management Solution

Anaerobic digestion does not reduce waste volume, nor does it eliminate odor or pathogens. Nutrient pollution may worsen because the nitrogen and phosphorus in digestate are more water-soluble, which increases the risk of runoff into lakes, rivers, and streams, and leaching into groundwater that supplies private drinking water wells. The consequences? Harmful algal blooms, fish kills, and toxic nitrate levels in well water. The proposed digester site is roughly a mile or less from Pleasant Lake's shoreline and from hundreds of homes that rely on well water.

Co-digesters: Contaminants In, Contaminants Out, and Worse Odors

"Co-digesters" raise further concerns by mixing manure with other contaminated industrial waste streams, including municipal yard waste, food waste, agricultural processing waste, FOG (fats, oils, and grease), slaughterhouse and rendering waste, and even pharmaceutical waste. Such mixes can result in even more intense odors.

Digestate from these sources can contain PFAS, microplastics, plasticizers, heavy metals, pathogens, antibiotic resistance genes, endocrine disruptors, pesticides, herbicides, cleaning chemicals, and other harmful substances. Microplastics are especially prevalent in depackaged food waste. Vanguard seeks to build an on-site depackaging facility to separate foodstuffs from plastic packaging, with the resulting microplastics-laden waste fed into the digester.

The biogas industry freely uses the word *organic* to describe industrial digester feedstocks and digestate. In this context, *organic* simply means carbon-based—not chemical-free, toxin-free, or USDA-certified under any legitimate organic food or farm standard. They rebrand digestate as a nutrient-rich *organic* fertilizer and pass it off to farmers or market it for sale as a *value-added* product instead of paying for proper disposal. Those contaminants can end up in your soil, and eventually in your water and food.

But What Could Possibly Go Wrong?

Michigan's Fremont Regional Digester should serve as a cautionary tale. After Generate UpCycle ("Generate") began adding larger volumes and new sources of industrial liquid waste to its feedstock, neighbors reported severe odor and digestate pollution. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) determined that applying the contaminated digestate to farmland posed serious risks to groundwater and surface water. EGLE ordered stricter oversight, including a groundwater discharge permit, which Generate disputed. The draft permit drew fierce opposition at a packed public hearing in November 2024. In

March 2025, Generate withdrew its application, and the digester later shuttered—a testament to the power of an engaged, informed, resolute community.

Will Michigan Clear the Tracks for Biogas Interests?

The Michigan biogas train hasn't left the station, but it's loaded, fueled, and waiting for the green light. Oil and gas giants like Chevron, utilities such as Consumers Energy and DTE Energy, waste management companies like Vanguard, investment firms like BlackRock, and major agribusinesses are already on board. They're waiting on **THREE KEY OUTCOMES** to clear the tracks and send the train barreling forward at full throttle.

1. Deregulating Digestate

Digesters are not magic machines that turn contaminated waste streams into guaranteed safe and *beneficial use* products. Yet despite well-documented environmental and public health risks, many Michigan lawmakers are pushing to deregulate both digesters and digestate.

Now more than ever, Michigan legislators should be strengthening—not dismantling—critical environmental protections. Safeguarding public health must take precedence over easing regulatory burdens or lowering compliance costs for polluting industries. Protecting people is not a “business expense” to be minimized or an operational inefficiency to be streamlined.

House Bills 4265 and 4257, introduced by Representatives Joey Andrews [D-3] and Jerry Neyer [R-2], would fast-track industrial biogas projects and strip away meaningful oversight of digestate. The House passed both bills on June 12.* They now await consideration in the Senate Energy and Environment Committee

(<https://www.senate.michigan.gov/information/committees/all-committees/2025-2026/energy-and-environment/>).

**To see how your Representative voted, visit [michiganvotes.org](https://www.michiganvotes.org/) (<https://www.michiganvotes.org/>) and search HB 4265 (https://www.michiganvotes.org/votes/2025/house/roll-call-155?utm_source=chatgpt.com) and HB 4257 (https://www.michiganvotes.org/votes/2025/house/roll-call-154?utm_source=chatgpt.com).*

2. Materials Management Plans (MMPs)

A 2022 amendment to Part 115 of Michigan's Natural Resources and Environmental Protection Act (NREPA) governing solid waste management replaced the term “solid waste” with “materials.” Now we have *Materials Management Facilities* instead of *Solid Waste Management Facilities*, and counties must replace *Solid Waste Management Plans* with *Materials Management Plans* (MMPs). A name change doesn't alter the harmful nature of some waste streams.

The stated goal of MMPs is to promote recycling and keep solid waste out of landfills, inarguably essential steps. But the amendment also advances biogas interests by prioritizing anaerobic digestion as a so-called sustainable waste management strategy. Proponents are even angling to reclassify

anaerobic digestion as a form of recycling, claiming the land application of digestate returns nutrients to the soil, while ignoring the addition of harmful contaminants.

Zero waste strategies should focus on preventing waste generation in the first place. Diversion has a role, but source reduction is key. Waste-to-biogas schemes claim to *divert* and *recycle*, yet moving landfill waste to farmlands isn't recycling; it's relocating. It's not diversion; it's dumping. Pro-biogas policies encourage more, not less waste, undermining true zero waste aims.

Counties have been tasked with formulating MMPs tailored to their waste management needs. Materials Management Planning Committees (MMPC) are meeting now. The biogas industry is betting on pro-digester MMPs.

Deregulating digestate and advancing digester-friendly MMPs will pave the way for the big biogas prize—a state low-carbon fuel standard (LCFS).

3. A Michigan LCFS Would Likely Seal the Freedom Digester Deal

Senator Sam Singh [D-28] is expected to reintroduce a state LCFS, dubbed the Michigan Competitive Fuels Act. Similar legislation (Senate Bill 275) failed to advance in 2023-24. In theory, an LCFS promotes the transition to cleaner transportation fuels. In practice, it's a windfall for oil and gas companies. In California, 80% of LCFS credit value goes to combustion biofuels like manure biogas and "renewable diesel" made from biofuel crops. Michigan is right to act, but wrong to lean on biofuels. Biogas doesn't live up to its *green-and-clean* promises when its full carbon footprint is counted and unintended consequences are factored in.

Currently, RNG must be burned as fuel in a state with an LCFS (California, Oregon, Washington, New Mexico) to earn credits. That means transporting it or injecting it into an interstate pipeline that *theoretically* carries the methane molecules to the state. Biogas producers are clamoring for a Midwest LCFS to shorten the delivery route and expand the biogas market.

If Michigan enacts an LCFS, it could all but guarantee a gas plant in Freedom Township.

Will rural Michiganders be left with any say over the siting of utility-scale digester operations?

Consumers Energy has invested in at least four Michigan dairy digester projects; DTE Energy operates eight in Wisconsin and will likely invest in stateside digesters should conditions become more favorable. Several other companies have built digesters in Michigan. Expect more digester-dotted rural landscapes if Michigan aligns with the biogas lobby.

Co-locating digesters on farms shifts the burden of waste disposal onto farmers and rural areas, and can jeopardize soil and water quality, and public health. The biogas industry is driven by carbon and tax credits, not community concerns.

Call to Action

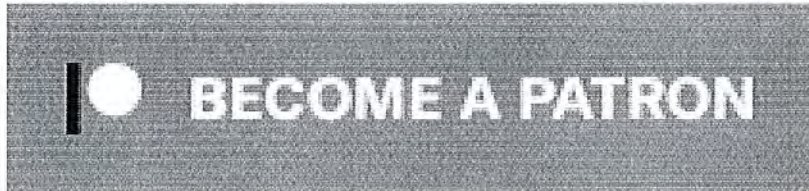
Tell members of the Senate Energy and Environment Committee and your own state senator to reject House Bills 4257 and 4265. But don't stop there. Urge your local elected officials, legislators, and Governor Whitmer to put the brakes on biogas. Even the Governor's signature *MI Healthy Climate Plan*

(<https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Offices/OCE/MI-Healthy-Climate-Plan.pdf?rev=d13f4adc2b1d45909bd708cafc6bffffa>)

promotes biogas as a climate solution.

Speak up now, or others will decide for you—collective community vision must prevail over corporate intrusion.

For as little as \$1 a month, you can keep Manchester-focused news coverage alive.



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[editorial-dont-let-the-manure-hit-the-fan-biogas-plant-still-a-possibility-in-freedom-township/](https://www.patreon.com/themanchestermirror?utm_content=post_button&utm_medium=patron_button_and_widgets_plugin&utm_campaign=1345247&utm_term=&utm_source=https://thema))

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by Sara Swanson
(<https://themanchestermirror.com/author/sara/>)

Sara Swanson is an editor, writer and founder of the Manchester Mirror.

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[redirect_to=https%3A%2F%2Fthemanchestermirror.com%2F2025%2F10%2F05%2Fguest-editorial-dont-](https://themanchestermirror.com/wp-login.php?redirect_to=https%3A%2F%2Fthemanchestermirror.com%2F2025%2F10%2F05%2Fguest-editorial-dont-let-the-manure-hit-the-fan-biogas-plant-still-a-possibility-in-freedom-township%2F)
[let-the-manure-hit-the-fan-biogas-plant-still-a-possibility-in-freedom-township%2F](https://themanchestermirror.com/wp-login.php?redirect_to=https%3A%2F%2Fthemanchestermirror.com%2F2025%2F10%2F05%2Fguest-editorial-dont-let-the-manure-hit-the-fan-biogas-plant-still-a-possibility-in-freedom-township%2F))



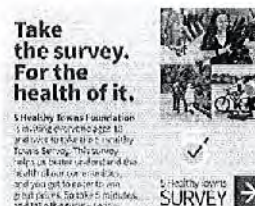
(<http://www.worthrepeating.org>)



(<https://www.srslymanchester.org/>)



(<https://www.patreon.com/themanchestermirror>)



(<https://www.5hfsurvey.com>)



(<http://www.suttoninsurance.com>)



(<https://www.chelseastate.bank/index.html>)

Attachment 15:

Recent Fires, Explosions, and Spills at Dairy Digesters in the U.S.



NEWTON COUNTY EMERGENCY MANAGEMENT AGENCY, IN CONJUNCTION WITH MOROCCO VOL. FIRE DEPT.

FOR IMMEDIATE RELEASE

Response to Structure Fire at Curtis Creek Dairy Central Digester

Morocco, IN – The Newton County Emergency Management Agency (EMA) assisted the Morocco Volunteer Fire Department in response to a reported structure fire and possible explosion at the Curtis Creek Dairy central digester just before 4:00 PM CST on Wednesday, October 29, 2025.

Upon arrival, moderate winds were driving smoke toward other nearby buildings on the property. Out of an abundance of caution, those buildings and surrounding buildings were evacuated. The fire was contained to a small area within the mechanical section of the facility.

The Lake County Hazmat Team monitored air quality throughout the incident to confirm that there was no threat to the public and nearby residences. The fire remains under investigation at this time.

The Newton County EMA coordinated with multiple response agencies to support incident operations and ensure responder safety.

Agencies assisting at the scene included:

Morocco Volunteer Fire Department

Rensselaer Fire Department

Keener Township Fire Department

Lake Township Fire Department

Lincoln Township Fire

Wheatfield Volunteer Fire Department

Newton County EMS

Newton County Sheriff's Department

Newton County 911 Communication Center

Lake County Hazmat Team

Media Contact:

Matthew VanDrunen

Director, Newton County Emergency Management Agency

Email: mvandrunen@newtoncounty.in.gov



32

2

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https://www.newsbug.info/newton_county_enterprise/news/fire-officials-investigating-fire-at-curtis-creek-dairy/article_0f7a0109-ed2a-43d1-8b11-03d72496c378.html

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Fire officials investigating fire at Curtis Creek Dairy
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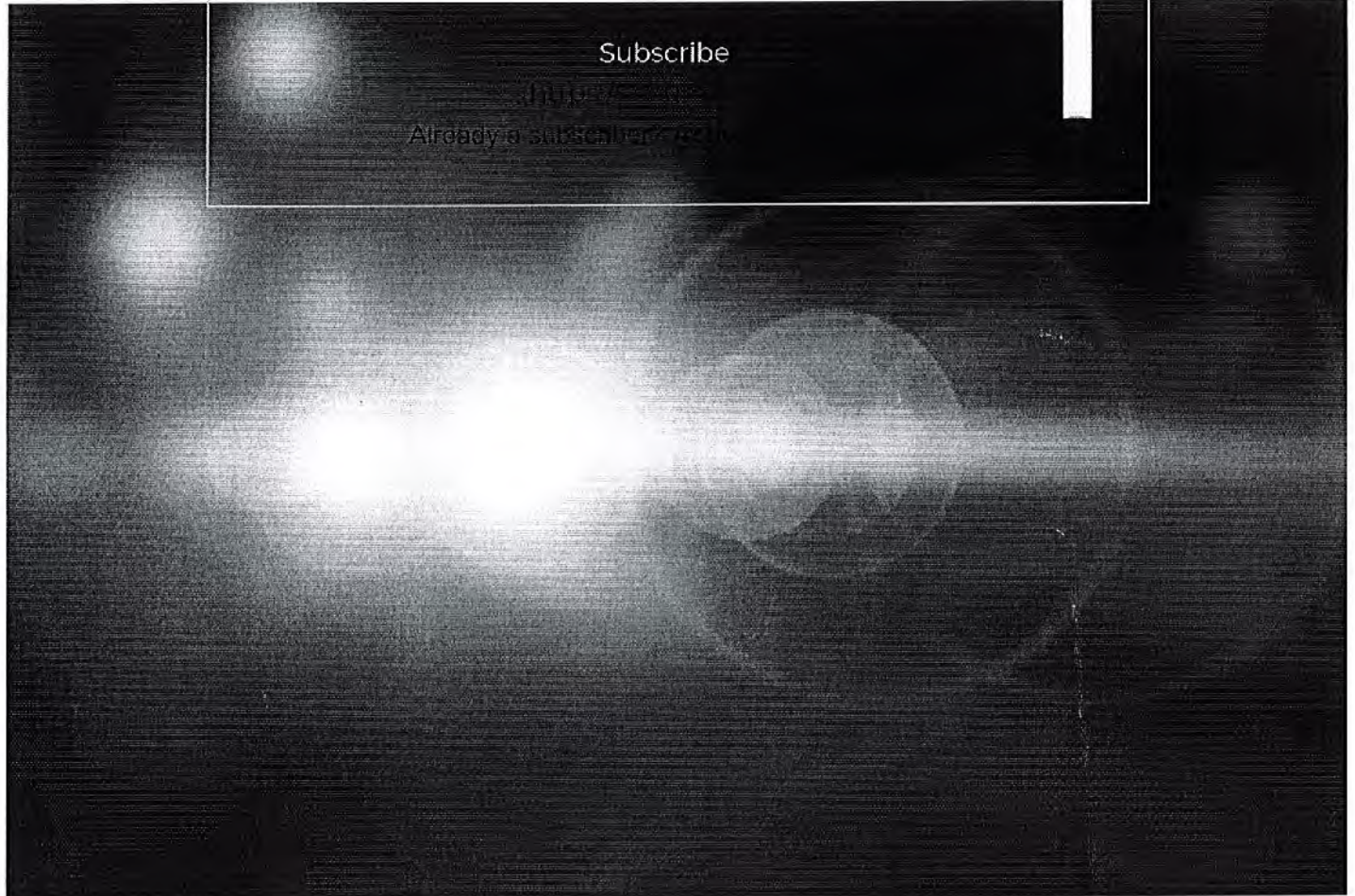


Nov 4, 2025

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A fire at Curtis Creek Dairy central digester is under investigation, according to Newton County emergency response personnel.

Newton County Emergency Management Agency Director Matthew VanDrunen said in a press release that his agency assisted the Morocco Volunteer Fire Department in response to a reported structure fire and possible explosion at the Curtis Creek Dairy central digester just before 4 p.m. CST on Oct. 29.

According to information from EMA, upon arrival, moderate winds were driving smoke toward other nearby buildings on the property. Out of an abundance of caution, those buildings and surrounding buildings were evacuated. The fire was contained to a small area within the mechanical section of the facility.

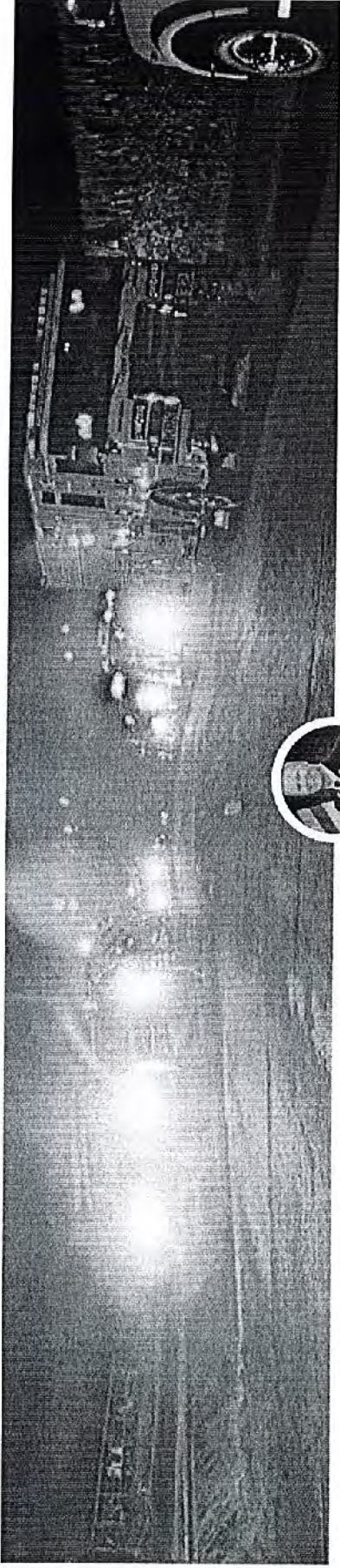
The Lake County Hazmat Team monitored air quality throughout the incident to confirm that there was no threat to the public and nearby residences. The fire remains under investigation at this time.

The Newton County EMA coordinated with multiple response agencies to support incident operations and ensure responder safety.

Agencies assisting at the scene included: Morocco Volunteer Fire Department, Rensselaer Fire Department, Keener Township Fire Department, Lake Township Fire Department, Lincoln Township Fire

Wheatfield Volunteer Fire Department, Newton County EMS, Newton County Sheriff's Department, Newton County 911 Communication Center and Lake County Hazmat Team.

Morocco Volunteer Fire Chief Jeremy Vanderwall said in a social media post, "Just want to say a huge thank you to all the departments that came together last night to tackle what could have been a major event! Every time I call for assistance with fire calls there are so many people in many different departments who drop what they're doing and come! Yesterday was no different! I was over an hour away from the scene when the call came out. Several people stepped in and took the reins and worked the problem until I could get there and I am extremely grateful! Citizens of Newton and Jasper County rest easy knowing that you have an abundance of outstanding selfless men and women who are willing to risk it all for you! Proud to be a part of it!"



JONATHAN DRUCKER

Wasco Incident - Hazmat with Fire

DATE: JUNE 16, 2025 TIME: 22:02

INCIDENT NUMBER

2528392

INCIDENT TYPE

HAZMAT WITH FIRE

LOCATION: 13000 BLOCK OF GUIN CLIFF RD CLOSEST COMMUNITY: WASCO

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INCIDENT NARRATIVE

WASCO, Calif., On June 16, 2025, at 10:02 p.m., Kern County firefighters responded to a reported fire on the 13000 block of Gun Club Road. Upon arrival, crews discovered a large fire in a methane gas digester at the Poso Creek Family Dairy. The digester, used to break down manure and produce methane gas through a natural process, had ignited, with flames rapidly spreading across the eight-acre system.

The fire threatened approximately 20,000 gallons of compressed natural gas (CNG) tanks stored nearby, posing a significant risk to the surrounding community. As a precautionary measure, firefighters immediately requested an evacuation order for a two-mile radius around the incident. Kern County Sheriff's deputies, alongside fire crews, notified residents in the affected area. All dairy employees safely evacuated. ReadyKern and Genasys Protect were activated to distribute this critical information to the public.

Fortunately the CNG tanks' pressure relief valves functioned properly, venting safely when exposed to the fire's heat. Firefighters, including the KCFD Hazmat Response Team, worked together to safely extinguish the fire and mitigate the remaining hazards.

The evacuation order has been lifted. There are no further advisories in place.

No injuries have been reported and the cause of the fire is under investigation.

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INJURIES/FATALITIES

INJURIES: 0 FATALITIES: 0

PROPERTY LOST/SAVED

ESTIMATED VALUE **LOSS:** \$0

ESTIMATED VALUE **SAVED:** \$0

KCFD EQUIPMENT ASSIGNED

ENGINES: E24, E25, E26, E31, E32, E33, E37, E65 **PATROLS:** P33, P37 **TRUCKS:** NONE

SPECIALTY EQUIPMENT: BATT2, BATT3, BATT6, DIV3, HM65, SF3, WT31, INFO2

TOTAL PERSONNEL

34

ASSISTING AGENCIES

KERN COUNTY ENVIRONMENTAL HEALTH, CHP, KCSO

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No OSHA probe of diver who died in farm digester

Questions raised about diver's equipment and temperature of tank

By Erin Jordan, The Gazette Government safety inspectors will not be looking into the death last week of an experienced Quad Cities scuba diver who failed to surface from a dive to repair a broken cable at the bottom of a million-gallon anaerobic digester where cattle manure and food waste generate biogas.

Bob Baenziger Jr., 54, of East Moline, died around 10 a.m. June 8 when he was unable to return to the top of the liquid in the tank at Sievers Family Farms in Stockton, according to New Liberty Fire Chief Chad Petersen.

"As his fiancée was trying to pull him up, there were complications and he didn't surface," Scott County Sheriff's Capt. Joe Caffery said. "For

► DIVER, PAGE 10A

► FROM PAGE 1A

whatever reason, he relayed to her through radio communications that he was taking his helmet off. So when she pulled the rope up, the helmet came up."

A team of commercial divers from Chicago later recovered Baenziger's body from inside the tank. The State Medical Examiner has done an autopsy on Baenziger, but does not yet have results about the cause and manner of his death.

Because Baenziger was a self-employed contractor, he was exempt from Occupational Safety and Health Administration inspections, Iowa OSHA Administrator Russell Perry said. And the farm, which has 10 or fewer employees, also doesn't fall within the purview of the worker safety agency.

"Therefore, the investigation will be closed with no further action," Perry said.

The incident originally was described as happening in a manure tank, but it was in one of the farm's two digester tanks, where cow manure and food waste are used to create methane, which can generate electricity and heat.

The Sievers Family Farm digester system, operated since 2013, is one of four on-farm digester systems in Iowa.

The same day Baenziger died, Gov. Kim Reynolds signed into law a bill that allows on-farm digesters, rather than open-air manure pits, at animal feeding operations.

Owner Bryan Sievers did not return a text and call seeking comment about Baenziger's death. He told The Gazette in April the temperature in the tanks is maintained between 99 and 105 degrees to encourage bacteria and microorganisms to break down the waste into biogas.

There was some question after Baenziger's death whether the temperature in the tank was higher when he went into it with full scuba gear and an oxygen tank.

Petersen, the fire chief who was one of the first emergency responders on the scene, said the water at the surface of the tank was 120 degrees, which was too hot for the commercial divers brought in to recover Baenziger's body.

"We were not anticipating that kind of heat," Petersen said. "We knew at that point in time we had to do something different."

Petersen, who also is a volunteer with the Bennett Fire Department, called in neighboring fire crews to haul nearly 100,000 gallons of water from a nearby quarry to cool the tank. After they added the water, foam at the top of the digester dissipated and the divers could see Baenziger's body, floating above several feet of manure and food waste solids at the bottom of the tank and were able to make the recovery, Petersen said.

Frank Frosolone, owner of Northern Divers USA, the company that recovered Baenziger's body, said it did not appear Baenziger had on the proper gear for a dive into liquids contaminated with manure and food waste.

"It's a contaminated dive, so we had to use specialized suits with double seals and triple backup air supply and communications. You got to have the right stuff," he said. Frosolone said he did not believe Baenziger was using protective equipment, such as a harness or a backup air source. "He didn't have any of that stuff," he said.

Baenziger was an experienced diver, trained in the U.S. Army, who had done commercial dives at offshore oil wells 20 years ago, said his mother, Linda Baenziger, of Davenport. More

recently, Baenziger had completed dives at a nuclear facility and on the Mississippi River, she said.

"He did a lot on the river," said Quinton Baenziger, Bob Baenziger's son, from West Des Moines. "If a barge would get a rope caught in its prop, he would do that. Or repair a hole in a barge itself. He had experience doing underwater welding."

Baenziger's primary job was as an independent contractor, who installed insulation and windows and did other major and minor home repairs.

Baenziger's fiancée, Eliza Bisbee, who was there when the accident happened, said he "loved golf and anything water. Jet Skis, tubing, just floating, fishing."

UNUSUAL FARM ACCIDENT

Hundreds of farmers and farmworkers die each year from work-related injuries. The U.S. Centers for Disease Control and Prevention reported the farm fatality rate in 2017 was 20.4 deaths per 100,000 workers. Transportation incidents, including tractor rollovers, are the leading cause of farm deaths.

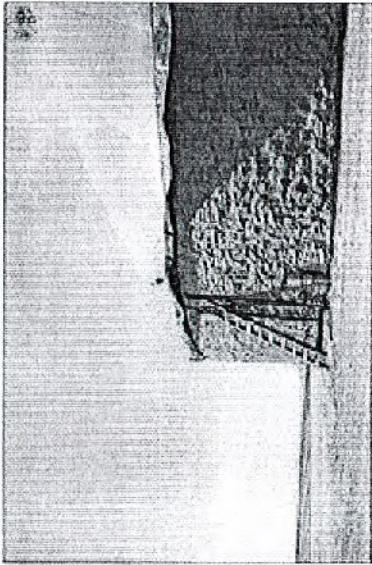
Baenziger's death and the 22-hour recovery of his body from a digester tank was a first for many of the law enforcement officers and rescue personnel.

"We do respond to farmrelated accidents, but typically they are a tractor that overturned in a ditch or a combine fire. Sometimes there's an entrapment in a grain bin," Caffery said. "When the call came in and it was a million-gallon manure pit, that was a new one for me."

T. Renee Anthony, a University of Iowa professor of Occupational and Environmental Health, said any time farmers make repairs in a confined space, such as a digester or a grain bin, they should test the air to determine potential contaminants, check to see if the repair person has the proper gear and figure out how they will get the person out if there's an emergency.

"Nobody wants to have a fatality on their farm," she said. "Every farmer that has a digester or manure storage needs to know there are lifeand- death consequences of going into those spaces."

Comments: (319) 339-3157; erin.jordan@thegazette.com



One of two large, sealed digester tanks is seen April 26 at Sievers Family Farms in Stockton.
(Andy Abeyta/The Gazette)

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4 Cases in USA (2011–2016)

- 1 April 17, 2011, Linwood, New York. Noblehurst Farms lost its digester, in an early morning fire.
<https://www.manuremanager.com/noblehurst-farms-loses-digester-in-fire-3731/>
- 2 July 2012, Oakley Farm in Aumsville, Oregon. An explosion at the anaerobic manure digester.
https://www.oregonlive.com/pacific-northwest-news/2012/07/methane_fueled_explosion_at_a.html
- 3 Aug. 6, 2014, Town of Vienna, Wisconsin. An explosion destroyed the roof of a 1.25-million-gallon manure digester.
<https://www.manuremanager.com/manure-digester-explosion-in-wisconsin-sparks-fire-15850/>
- 4 Nov. 2016, Lowell, Michigan. Lowell Energy AD digester exploded due to a buildup of methane gas, resulted in a ruptured tank cover, a lingering odor and spilled waste.
<https://www.waste360.com/safety/michigan-biodigester-explodes-methane-gas-buildup>

3 Cases in USA in 2017 & 2018

- 5 Jan. 22, 2017, International Paper in Cantonment, Florida. An explosion caused significant structural damage to the largest pulp digester as well as the power house at the mill.
<http://www.northescambia.com/2017/01/my-heart-sank-mill-manager-speaks-out-about-explosion-future-of-ip>
- 6 Jan. 2018, Missouri. Gas build-up leads to explosion at Blue River Wastewater Treatment Plant, Part of the building collapsed.
<https://www.kshb.com/news/local-news/gas-build-up-leads-to-explosion-at-blue-river-wastewater-treatment-plant>
- 7 Aug. 30, 2018, Chicago. An explosion at a water reclamation plant in appears to have been caused by methane gas ignited by a worker's welding torch.
<https://www.wateronline.com/doc/explosion-at-chicago-water-reclamation-plant-injures-0001>

2 Cases in USA in 2020 & 2021

- 8 April 2020. Jay, Maine.
A paper mill disabled by a dramatic explosion.
No one was injured but 230 workers were left without jobs.
The mill will close in the first quarter of 2023.

<https://apnews.com/article/explosions-maine-susan-collins-angus-king-4dfd183575a0f364a4545bec0e1132e6>

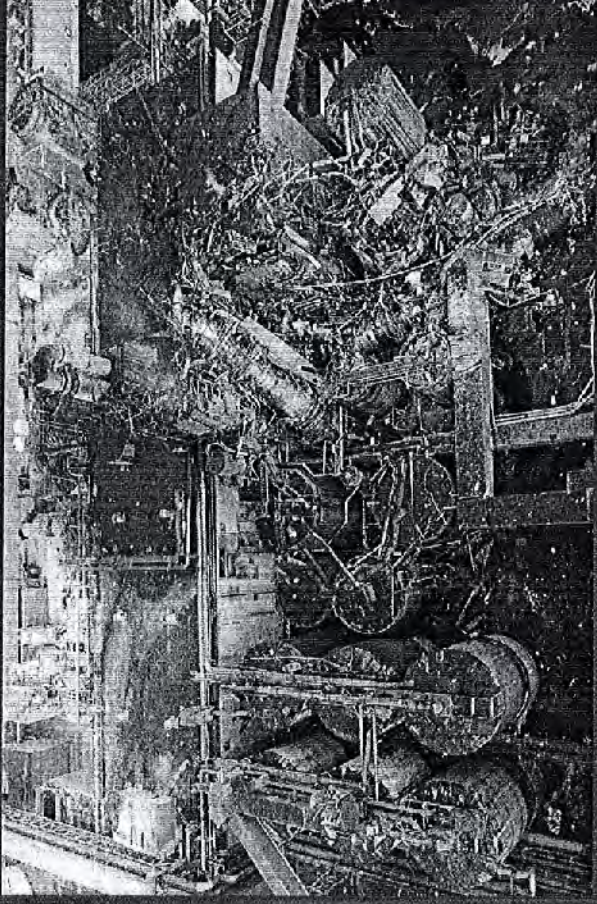


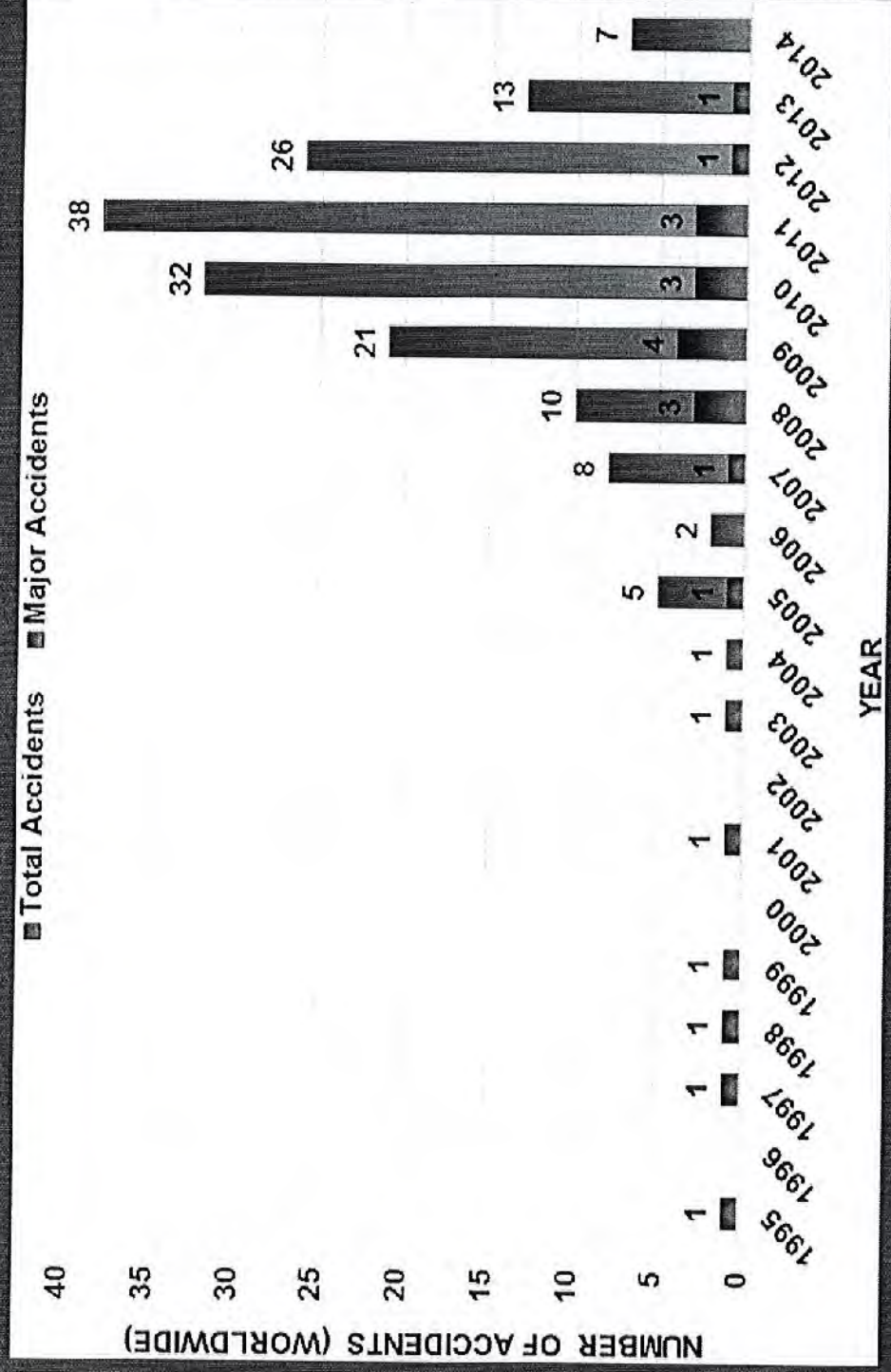
Photo from AP News.

<https://apnews.com/article/391dff9b3768186d3ad318fa30f11fb/gallery/8139f20f69904163b8ebe9756ecea959>

- 9 June 8, 2021, Stockton, Iowa. Bob Baenziger Jr., 54, died while performing a dive to repair a broken cable at the bottom of a million-gallon anaerobic digester tank at Sievers Family. *(From multiple source, including <https://www.desmoinesregister.com/story/news/2021/07/30/diver-robert-baenziger-jr-drowns-iowa-farm-accident/5427513001/>)*

169 Cases in Europe (1995–2014)

12% (20 cases) of the 169 were major accidents (*major emission, fire, or explosion leading to serious danger to human health or the environment*).



Casson Moreno et al. 2016. Renewable Energy. 96, 1127-1134.



By Erin Jordan, - correspondent

Feb. 22, 2025 5:30 am, Updated: Mar. 3, 2025 12:01 pm

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Digesters and a dairy barn are seen at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18, 2024. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohlfman/The Gazette)

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Iowa OSHA is investigating a central Iowa biogas digester after a whistleblower alleged a 2023 fire injured two employees and that the site has ongoing natural gas leaks that endanger workers.

Meanwhile, Marshall Ridge Dairy is seeking a state permit to nearly double its herd from 8,000 dairy cows to 15,000.

Marshall Ridge, a \$42 million facility that extracts methane from cow manure and turns it into renewable natural gas, had a fire in September 2023 that burned through the roof of a million-gallon digester tank, released methane and other gases and injured two employees, according to a complaint filed with the U.S. Environmental Protection Agency.

Rodney Richwine, who said he is a project manager for CE BP — said in the complaint filed Dec. 5 that the company failed to install a pipeline to pump renewable natural gas



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any that owns the digester along with as the facility struggled to connect with big-time profits.

"This means that instead of reducing methane emissions, the site actually increased them," Richwine wrote. "It then allowed that gas to leak into the atmosphere for seven months."

The company receives from the state of Iowa subsidies, heated and mixed it to produce

Clean Energy Fuels declined to answer questions about Richwine's allegations, but said the company recently changed operators at Marshall Ridge.

"The owners of the renewable natural gas (RNG) digester at Marshall Ridge Dairy terminated their relationship with the operator earlier in February and have brought in one of the most well respected RNG operators in the country," CE BP Renew Co said in an email Feb. 17.

"RNG is a fuel that brings tremendous environmental and economic benefits to the end users like the thousands of buses and trucks that cleanly operate on it and helps to mitigate methane emissions at dairy farms. We look forward to the new contractor with their vast experience taking over the operation of the RNG digester at Marshall Ridge."

Safety issues under investigation

The Sept. 27, 2023, fire that burned through the roof of one of Marshall Ridge's three digester tanks wasn't reported to the State Center Fire Department, Fire Chief Brad Pfantz said.

"If it was something where the structure was on fire for a period of time, someone would have called 911," he said. "I'm guessing the liner on the top of those is vinyl. It's methane gas from manure that's inside it. That gas somehow ignited and melted the vinyl roof. Once that burns off, there's nothing left to burn."

The same digester tank was without a roof for several weeks last fall as operators repaired a leak, the company said.

Richwine said in his complaint the 2023 fire "destroyed the roof membrane of digester 503 which held thousands of cubic feet of methane and injured two workers."



An aerial photo of the Marshall Ridge Energy Center near Story City, Iowa, Nov. 13, 2023, after a fire burned through the vinyl roof of one of the digester tanks. (Source: Beacon)

Richwine said he was concerned gasses site May 1, 2024, with stakeholders from indicate high levels of natural gas, which



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employees and visitors. He toured the noticed alarms were going off to

"The operators told us it was a nuisance

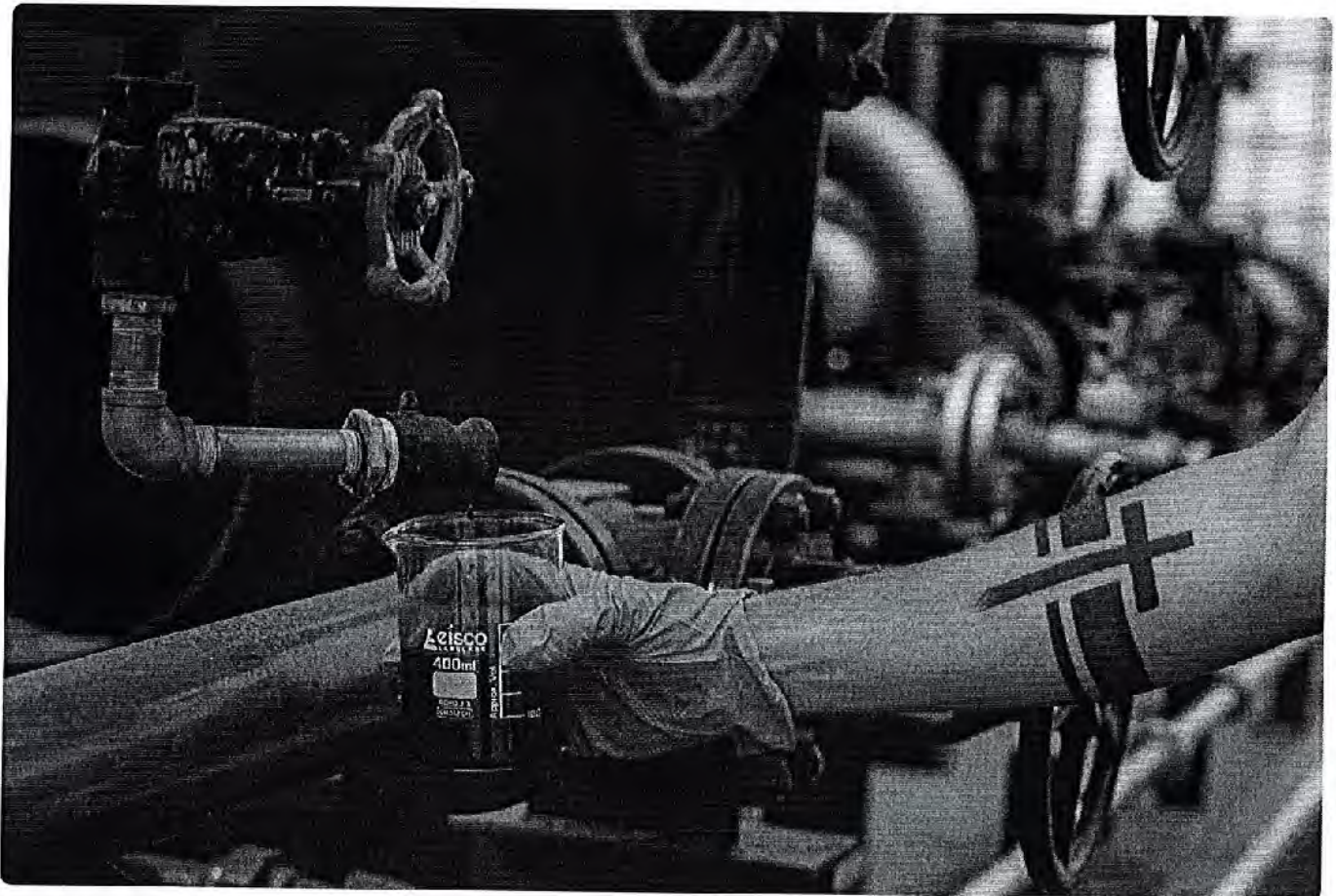
Richwine said in the complaint.

Iowa OSHA is investigating Marshall Ridge related to workplace safety.

"In November 2024, DIAL/IOSHA received a direct complaint from the complainant concerning the Marshall Ridge Energy Center," Spokeswoman Stefanie Bond said in an email. "As the department is currently investigating this facility based on the November 2024 complaint, we are unable to provide further details at this time."

Richwine's allegations about the 2023 fire came too late for the agency to investigate.

"In December 2024, DNR (Iowa Department of Natural Resources) shared an incident tracking form with IOSHA regarding a fire that occurred in September 2023," Bond said. "However, the information received by IOSHA in December 2024 was more than 14 months after the incident, and the statute of limitations had expired."



Blake Iske takes a sample at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18, 2024. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohman/The Gazette)

How does a digester work?

Marshall Ridge, which started operations in February 2023, takes manure from Kevin and Holly Blood's 8,000 dairy cattle, adds water and pumps the mix into one of three 1.3-million gallon digesters. The process releases gas, including methane, that is collected from the top of the digesters and filtered to remove water vapor, carbon dioxide and hydrogen to create renewable natural gas.

When The Gazette toured the Marshall Ridge site Sept. 18, Project Manager Mike Raymer said it was producing 250 to 325 Metric Million British Thermal Units (MMBTU) of renewable natural gas per day.

Black Hills Energy injects the compressed gas into the Northern Natural Gas pipeline that runs underground near State Center. Large facilities like these can earn more than \$10,000 per day in credits designed to reduce greenhouse gas emissions from industries — including agriculture.

But it hasn't always been smooth sailing.

"Getting commissioned and getting oper
We were struggling."



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"Everybody wants something yesterday.

Iowa DNR monitoring air quality

Later

Always

When energy facilities like Marshall Ridge have trouble processing methane or are doing repairs on equipment, they are allowed to flare gas into the air. But Marshall Ridge exceeded its state limit of 2,000 flare hours per year in March 2024, according to DNR records. The site again flared too much in August, records show.

"Sometimes they can't get it on the pipeline, so they have to burn it off," said Bill Gross, senior environmental specialist with the DNR's Region 5 office.

When Gross visited the site last May he discovered Marshall Ridge had installed a pressure release vent without getting a permit. After Gross received Richwine's complaint to the EPA, he talked with an engineer in the Air Quality Bureau and they decided in January Marshall Ridge needed to get a permit for the vent.

"Because they didn't report it to us first, that's kind of a penalty," he said.

Dairy wants more animals

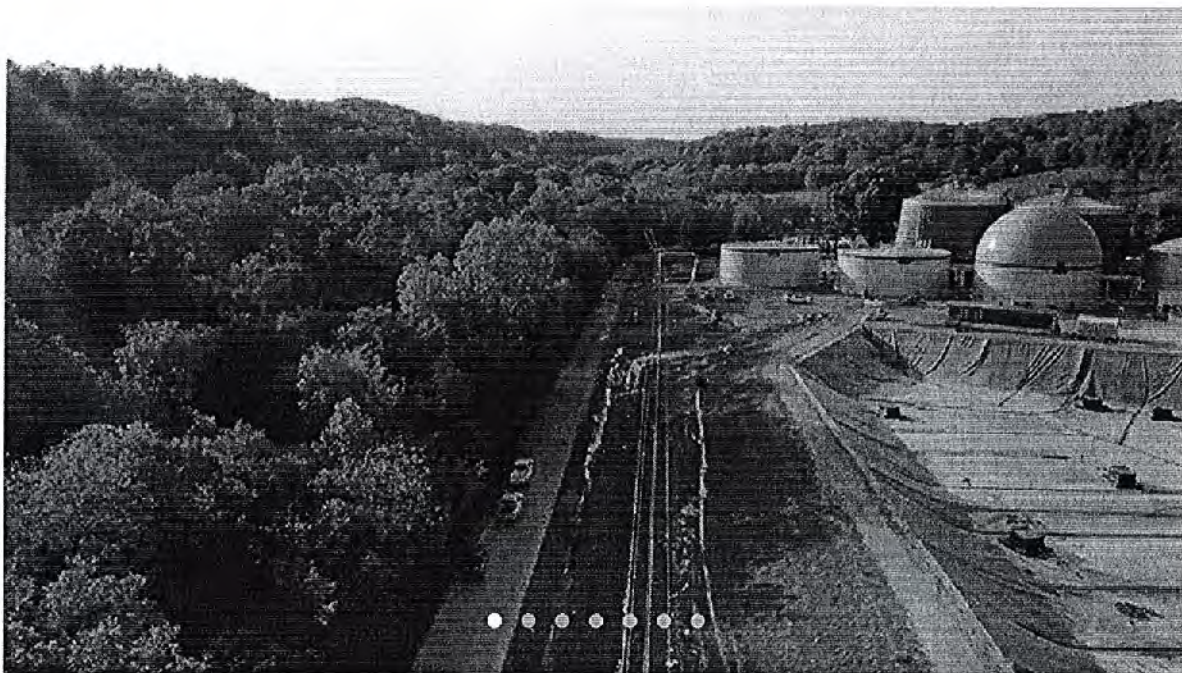
Iowa has permitted 15 new digester facilities since 2021, when the Legislature passed a law allowing animal feeding operations with digesters to exceed the state's limit of 8,500 animal units.

Marshall Ridge Dairy, which is permitted to have up to 11,200 animal units (about 8,000 dairy cows), now plans to expand its herd by another 7,000 cows, according to a report the operators made to the Marshall County Board of Supervisors. Operators want to build a new confinement building, free stall, barn and milking parlor, according to a Jan. 16 story in the Times-Republican.

The DNR still is considering this permit application.

The Iowa Driftless Defenders, a group opposing a new on-farm digester in Winneshiek County, said in recent court petitions they are concerned for the safety of rural residents nearby because of potential manure leaks and incidents like fires. There have been several fires at Wisconsin digester facilities, including one in 2009 in Emerald, Wis., and another in 2014 in Waunakee, according to news reports. A 2020 fire at a dairy near Kewaunee, Wis., was in a manure drying facility near an underground digester.

Bolt failure crux of 3 Rivers collapse



Images from the 3 Rivers anaerobic digester tank collapse on Sept. 10, 2024.

DUANE CROSS

MCO Publisher•Editor

Representatives from 3 Rivers Energy Partners attended the Planning and Zoning Commission meeting on Feb. 4 to provide updates on the facility's progress, cleanup efforts, and safety measures following a tank rupture at the anaerobic digester on Sept. 10, 2024.

3 Rivers General Manager Marshall Miller said an investigation revealed a bolt failure was the primary cause of the rupture. He added that an

ongoing lawsuit addresses the failure, and the company is working internally to prevent similar incidents.

One concern discussed was the safety measures in place regarding gas lines near Moore County High School. Gas lines on Goodbranch Road are 770 feet from the school, while those along Highway 55 are 720 feet away.

Miller assured board members that both lines are equipped with remotely controlled shutoff valves, which can be activated quickly in the event of a leak.

Current safety recommendations advise sheltering in place rather than evacuating in the case of a gas-related emergency.

3 Rivers also is consulting with environmental specialist Tony Grow on the strategic placement of a safety berm. The company anticipates purchasing the adjoining Dickey farm on Goodbranch Road, where a surge wall would help contain potential spills.

Additionally, vegetation buffers will be established at both ends of the property to provide an added layer of environmental protection. Miller emphasized that 3 Rivers remains committed to environmental responsibility and cooperation with county officials to ensure the safe and successful completion of its projects.

Moore County is finalizing a contract with Grow Environmental Solutions to oversee environmental compliance for the 3 Rivers project and the Silicon Ranch solar farm development. Committee chairman Dexter Golden noted the contract was near completion.

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Tank collapses at anaerobic digester plant

September 10, 2024

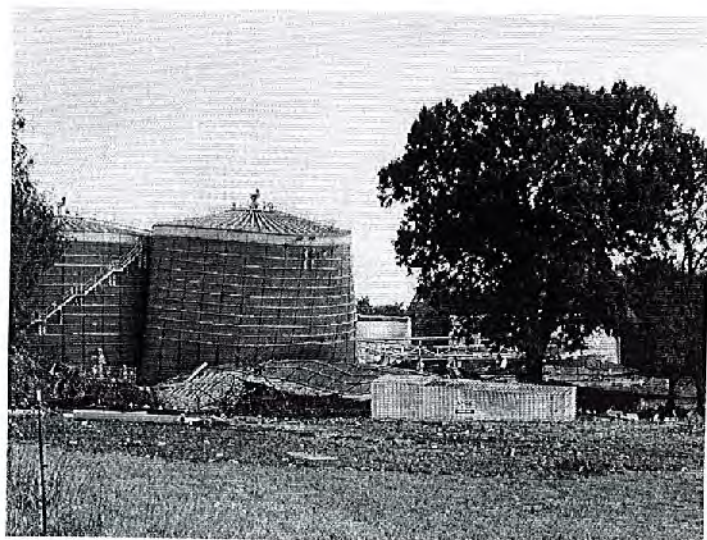
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A tank at 3 Rivers Energy Partners anaerobic digester located on Goodbranch Road in Moore County collapsed during testing on Monday spilling 2.2 million gallon of lake water. | *Photo Provided*

By Tabitha Evan Moore, EDITOR AND PUBLISHER

LYNCHBURG — By all accounts, it looked like the scene was a disaster. That's the word from local officials as they gathered this morning to access the clean up necessary after a tank collapsed at an anaerobic digester plant.

Around 8:30 p.m. on Monday, one of the three holding tanks at Energy Partner's anaerobic digester otherwise known as Lynchburg, was overflowing, spilling 2.2 million gallons of water across Goodbranch Road. 3 Rivers immediately responded to the scene. There were no injuries.

According to one local official, during the test, the bottle used to test the tank caused it to impede. At least one nearby tank was also impacted.

{EDITOR'S NOTE: This article is being made available for the public service. This is an ongoing story and we will post updates as they come.

"It looks like a tornado came through," Moore County Mayor Stewart said. "It's a muddy mess. One of the tanks is in the road and it's blocking traffic."

The force of the tank failure and water volume destroyed the trailer and downed multiple trees in its path. Mud and debris were scattered on Tuesday as both 3 Rivers and local officials looked to clean up the scene.

On Monday night, local officials closed Goodbranch Road from the high school while responding to the scene. It remained closed this morning, and would likely remain closed for the majority of the day.

"Duck River will need to come in and address power being out," Mayor Stewart stated. "Houses from Harry Hill to Baker Road will be without power for a while."

According to one official, TEMA tested the water Monday and found it was lake water. 3 Rivers confirmed that detail on Tuesday.

3 Rivers say they are committed to transparency

The Times reached out to 3 Rivers Energy Partners who stated that an investigation procedure during which the incident occurred, is conducting an audit as a measure to identify any structural weaknesses before future incidents.

"This step is essential in ensuring our operations meet the highest industry standards," representative Kegan Rivers told us.

They also explained that their immediate focus is on the community and ensuring that the facility is secure.

"We are currently working closely with local authorities and their prompt actions were greatly appreciated," Rivers told us. "The investigation is already underway, and we are conducting a comprehensive audit to determine the root cause of the failure."

3 Rivers immediately responded to our request for a copy of the investigation report.



Calvert, Matthew <matt.calvert@dnr.iowa.gov>

City of Waverly Biosolids Spill

2 messages

Grant Benschoter <gbenschoter@waverlyia.com>

Wed, May 14, 2025 at 1:44 PM

To: "FO1.Notify, DNR" <fo1.notify@dnr.iowa.gov>

Cc: "Calvert, Matthew" <matt.calvert@dnr.iowa.gov>, Justin McGlaun <jmcglaun@waverlyia.com>

Good Afternoon,

This is the 5-day written report for a biosolids spill incident that occurred on May 14, 2025, at 7 am. After some investigation, it was determined that the facility's primary digester pressure relief valve was stuck in the closed position. This caused the floating digester lid to operate at a much higher level because it was sitting on a large pocket of methane gas. Ultimately, this large pocket of methane gas displaced enough volume to release 50-100 gallons of treated biosolids through the water seal gap and over the top edge of the digester. Once the pressure relief valve was opened, the elevated level quickly corrected itself and the spill stopped (7:15 am). The top edge of the digester was sprayed off and the contents that made it to the ground, below, were treated with hydrated lime. This incident was reported to Matt Calvert of the IDNR, via phone, within the required 24-hour timeframe. Attached are pictures of the event, before and after the lime treatment.

Exercising of our digester's pressure relief valves was already on our maintenance schedule, however, frequency of this task will be increased to ensure this doesn't happen again.

Best Regards,

GRANT BENSCHOTERWASTEWATER PLANT FOREMAN
PUBLIC WORKS DEPARTMENTCITY OF
WAVERLY

319-352-6248

✉ gbenschoter@waverlyia.com

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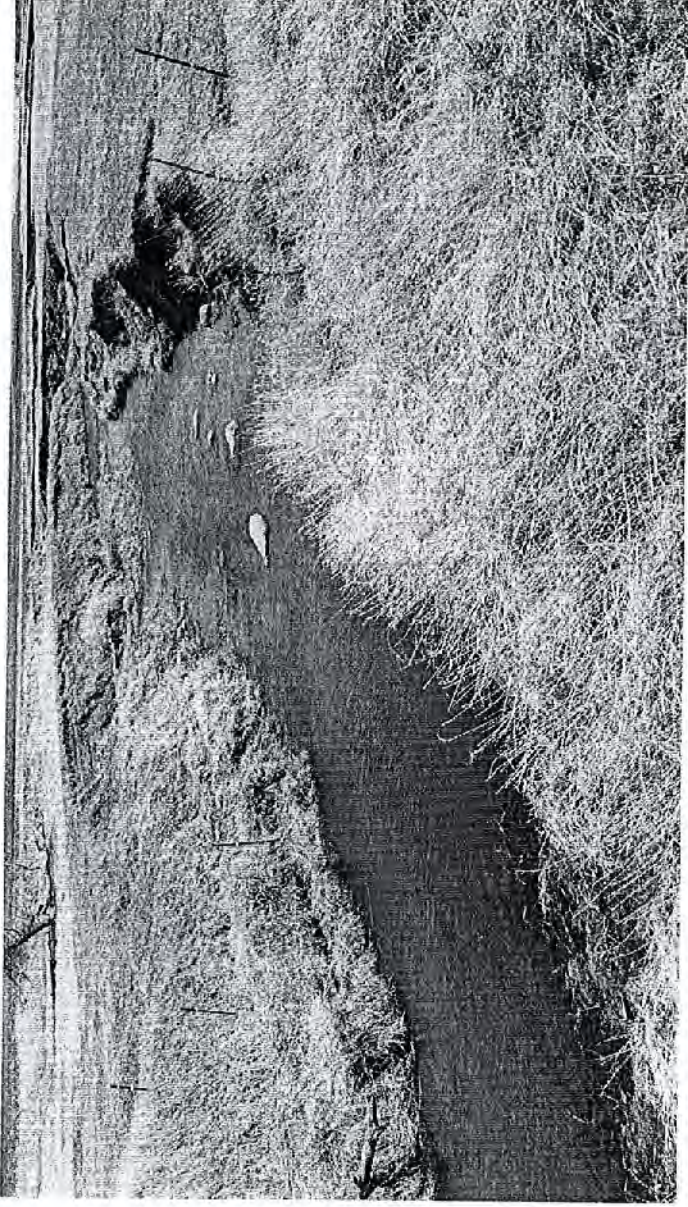
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Farm field drainage failure leads to creek contamination, dead fish

BY: JARED STRONG - JULY 19, 2024 4:29 PM





📷 Creeks are protected waterways in Iowa. (Photo by Jared Strong/Iowa Capital Dispatch)

Underground drainage tiling apparently failed and formed a sinkhole in a corn field in northwest Iowa that allowed manure to flow into a creek, where it killed small fish for miles, according to the Iowa Department of Natural Resources.

The manure came from Roorda Dairy west of Paullina, which has about 4,200 dairy cattle, DNR records show. The dairy was irrigating a field with manure and didn't notice the damaged tile line because of standing corn, said Tom Roos, a senior environmental specialist for the department.

“With all these rain events, a tile line must have burst,” he said.

Paullina is in O'Brien County in far northwest Iowa, parts of which have suffered from severe flooding in recent weeks. The pressure from influxes of water into tile drains can cause weak areas to rupture, after which soil can flow into the tiling and create a sinkhole.

On Wednesday, someone noticed dead fish in nearby Mud Creek and reported it to state law enforcement. A DNR investigation found that the manure had been flowing into the creek through the drainage tiling and killed fish along about 9 miles of the stream, until it met another creek.



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It's unclear how many gallons of manure might have spilled into the creek and how many fish it killed, Roos said. An investigation is ongoing.

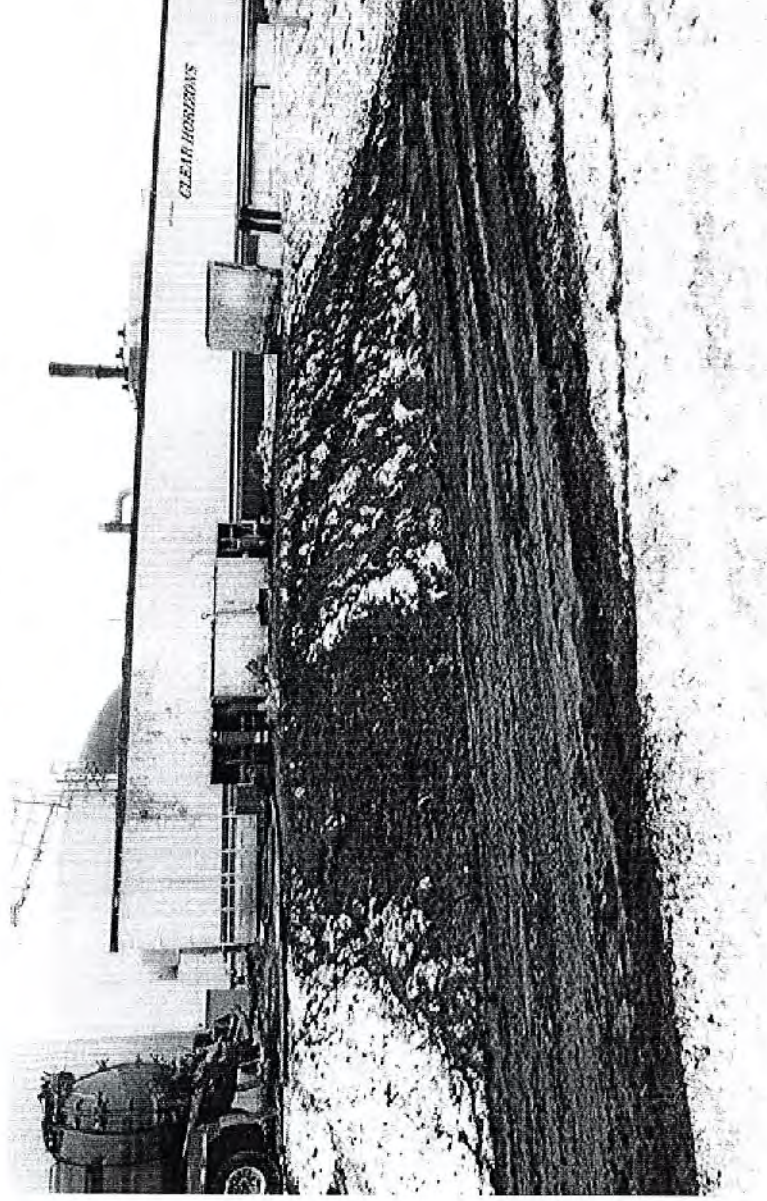
The dairy promptly plugged a culvert to prevent more manure from reaching the creek, Roos said. He did not know how long the spill had occurred.

Roorda Dairy paid a \$5,000 fine to the DNR in 2022 for starting construction on a manure digester without state approval. Digesters use bacteria to consume the manure and emit flammable gases such as methane that can be used to heat or power farm operations.

STATE POLITICS

State-financed manure digester plagued by spills, explosion

Company not sure if it wants to stick with Dane County project



Nearly 400,000 gallons of manure flowed from a Dane County biodigester after a pipeline broke in 2013. The Waunakee project to generate electricity and remove phosphorus is the first of its kind in Wisconsin, but has fallen



By Lee Bergquist of the *Journal Sentinel*

Jan. 29, 2015

0

An experimental project in Dane County designed to capture livestock waste that pollutes Lake Mendota has been hit by a litany of troubles, including manure spills and a 2014 incident that caused a fire and methane gas explosion.

A state-financed manure digester system near Waunakee is the first of its kind in Wisconsin. It has been touted by supporters, including Dane County officials, for generating electricity, limiting the spreading of excess cattle manure and reducing emissions of greenhouse gases.

But the \$12 million system — financed with \$3.3 million in state funds — has fallen far short of expectations.

In three years, pipeline breaks have caused three manure spills, totaling more than 400,000 gallons. In August, an explosion of methane gas knocked the roof off one of the digesters, sending smoke billowing high into the air.

The state Department of Natural Resources started enforcement action against the developer, Milwaukee-based Clear Horizons, for the spills, lax record keeping and violating agreements to remove a key pollutant from the manure. In November, the DNR referred the matter to Justice Department lawyers for prosecution, documents show.

Despite the subsidy, Clear Horizons said that it had lost \$2.8 million since the start of the project in late 2010, according to the DNR in a March 25, 2014, document

reviewing the company's troubles.

Since September, a Clear Horizons official said the company has spent more than \$1 million on repairs and other changes.

Once all problems have been addressed, Norman Doll said this week that his parent company, PPC Partners Inc., might exit the business entirely. Clear Horizons has built one other digester at a farm near Waterloo in Jefferson County.

"No question, there were mistakes made on our part," said Doll, a former president of Pieper Electric, a subsidiary of PPC Partners Inc., who was brought in last year as troubles mounted.

"Any incident by itself wouldn't have looked so bad. But when you couple them together, it's definitely a problem."

A Variety Of Hurdles

Clear Horizons' troubles underscore the financial and operational hurdles that can arise involving projects managing vast amounts of manure.

The operations, located in the Town of Vienna, include three manure digesters that capture methane, a greenhouse gas. The gas is used for combustion to generate electricity, which is sold. Manure, a source of methane, is piped from three neighboring dairy farms.

Wisconsin ranks near the top in states with anaerobic digesters.

The big difference with the Clear Horizons operation is the installation of other equipment to remove phosphorus from the manure.

Manure is agriculture's most basic of fertilizers. But when applied in excess, or improperly, phosphorus and nitrogen can release a bumper crop of nutrients, which have long plagued Madison-area lakes.

The Yahara River watershed violates state water quality standards for phosphorus, and local officials are required by state law to take steps to turn things around in a county with an estimated 50,000 dairy cows.

Amid that backdrop, the administration of former Gov. Jim Doyle, a Democrat, provided county officials \$6.6 million in help to finance the start-up of the Waunakee digester, which went into operation in late 2010, and a second, near Middleton.

The digester in the Town of Springfield near Middleton involves Gundersen Health System of La Crosse. The operator of hospitals and clinics is using the digester to reduce energy costs. Like the Clear Horizons operation, the Gundersen plant has also been outfitted with equipment to remove phosphorus.

The Gundersen facility, which started operating last year, isn't experiencing environmental problems, the DNR said.

It's a different story with Clear Horizons.

The company is obligated to remove 60% of the phosphorus from manure in its agreement with county and state officials. That's not happening, the DNR says.

In 2011, the average removal rate was 63%; in 2012 it was 56%; in 2013, it plummeted to 44%, documents from an enforcement conference with the company show. In some weeks this past December, as little as 23% of the phosphorus was being removed, records show.

The phosphorus is removed by using a centrifuge to separate the solids and liquids. The solids, with 60% of the phosphorus, are dried into a product sold for bedding material for cattle outside the watershed, according to Doll.

As for the spills, the biggest occurred in November 2013 when a pipe ruptured, sending an estimated 380,000 gallons of waste into a nearby stream, documents submitted by the company to the DNR show.

Two smaller spills occurred in March and July of last year. The company says the manure never left the site. The spills were caused by faulty pipe design and the pipes have been replaced.

Clear Horizons estimates that little phosphorus ever entered local waterways and that an estimated 80 tons of phosphorus have been kept out of the Dane County waters in the past three years.

Then came the explosion, which knocked off the roof made of a lightweight membrane material. Doll said workers used a fan to inflate the roof after cleaning.

"The assumption was made that since the valves were closed, there would be no methane gas in the tank," Doll said. "That was a bad assumption."

Another mistake: The fan was a type that can produce sparks.

"It blew up and started the roof on fire," Doll said.

Doll, who worked for Pieper for 28 years, took over the project shortly after the explosion and replaced the top managers. The plant now has employees on the job around the clock in the event of other mishaps.

DNR Allegations Disputed

Clear Horizons says it disagrees with the DNR on the extent of the company's failure to cut phosphorus and has explained that a design flaw that recirculates wastewater from one of the farms is making the situation look worse than it is. The DNR disputes this.

There have been numerous meetings with the state and the county as the problems have mounted.

"There is no excuse — there were management missteps," said David Merritt, Dane County's director of policy and program development. "But we firmly believe the facility will be brought into compliance this year."

The experience has soured the company on the business, but Doll envisions a market for disposing manure that Dane County's watershed can't accommodate.

"If someone comes along and says we'll buy it for this amount, and it was a good offer, we would certainly consider it," Doll said.

Many of the assumptions the company made at the start were wrong.

In the future, the business model will have to be tweaked, and farmers sending manure to comparable operations may need to pay the plant to accept it, he said.

Under the existing system, Clear Horizons takes it for free.



About Lee Bergquist

Lee Bergquist covers environmental issues and is author of "Second Wind: The Rise of the Ageless Athlete."

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LSP Demands Answers Surrounding Recent Manure Spill in Kandiyohi County



Riverview's Meadow Star Dairy Suffers Manure Leak From Biogas Digester System

March 7, 2025

PENNOCK, Minn. — The Land Stewardship Project (LSP) today called on one of the country's largest dairy farming firms and the Minnesota Pollution Control Agency (MPCA) to release details on a recent manure spill that was reported in southwestern Minnesota's Kandiyohi County.

CONTACT

Matthew Sheets,
LSP western
Minnesota
organizer, e-mail

Upcoming Events

November 2025
Friday November 7 –
Saturday November 8
Emerging Farmers
Conference
Thursday November
13
8:30 am
Women in Conservation
Northern Network
Gathering: Stories from the
Field
Friday November 14
9:00 am
Scaling Up Soil Health
Strategic Bus Tour
Wednesday
November 19
12:15 pm

According to the *West Central Tribune*, Riverview, LLP officials reported to state officials that on Feb. 28 manure escaped a holding tank at the Meadow Star Dairy near Pennock. Riverview owns the operation, and the tank is part of a manure digester biogas system installed at the dairy by Amp Americas. Amp Americas has also constructed digesters at Riverview's East Dublin Dairy near Murdock in Swift County, Swenoda Dairy near Montevideo in Swift County and Louriston Dairy near Murdock in Chippewa County.

When contacted by the Land Stewardship Project, a spokesman for the MPCA provided this statement:

"We are aware of a spill of manure at a farm in Kandiyohi County. We are monitoring clean-up and working with the reporting party to determine the cause. At this time, there is no indication that there has been an impact to waterways. It's important to note that proper siting helps ensure that surface waters are still protected when a major release like this happens. The amount that was released is part of an ongoing investigation. A majority of the release was contained in a stormwater pond, and the owner has transferred the contents to an existing manure storage basin onsite."

An official with Amp Americas told the *Tribune* that a "mechanical, physical failure of the tank occurred." The *Tribune* reported that "less than a week's worth" of manure was spilled — no other specifics were provided on the amount of manure released.

According to an article published in *Agweek* in 2015, Meadow Star Dairy originally went online milking 7,000 cows, with 1,500 dry cows also housed on the 20-acre site. Based on the figure that on a daily basis a lactating cow produces 18 gallons of manure and a dry cow 10 gallons of manure, a conservative estimate is that Meadow Star produces at least 141,000 gallons of manure daily.

To put the spill in context, it would take the average-sized Minnesota dairy farm (223 head) six months to produce the same amount of manure that Meadow Star does in just five days. If the spill had occurred at an average-sized Minnesota dairy, the amount spilled over a five-day period would be less than what Meadow Star produces in just 3.5 hours.

[We Can Do Better Book Discussion at Iowa Nature Summit](#)

December 2025

Tuesday December 2

11:00 am

[Integrating Habitat into Croplands: Prairie Strips and Bird Conservation](#)

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October 27, 2025



Riverview is based in Morris, Minn., and is one of the largest milk producers in the country. It also has operations in Arizona, Nebraska, New Mexico and South Dakota. Despite serious concerns raised by local residents related to potential impacts on water and air quality, North Dakota officials recently gave Riverview the green light to build a 12,500-head dairy near Abercrombie, in the eastern part of the state.

The Land Stewardship Project is concerned about the lack of information available to local residents related to the manure spill at Meadow Star Dairy. This is particularly important given serious concerns raised in the past by farmers and other rural residents when it comes to Riverview's potential environmental impacts. Earlier this week, during an LSP town hall meeting held near Morris with Minnesota Attorney General Keith Ellison, participants expressed concerns about the impact Riverview's facilities were having on local water resources. LSP is calling on officials with Riverview and the MPCA to release the following information in an expedited manner:

1. Specifically, how much manure was released during the incident?
2. What is the specific nature of the "mechanical" failure that caused the spill, and does similar infrastructure exist at other Riverview facilities in the region?
3. How much time elapsed between the release of the manure and its discovery?
4. What measures are being taken to prevent the contamination of local water resources?
5. What measures are being taken by Riverview to prevent similar future incidents from occurring at Meadow Star, as well as other facilities owned by the firm?
6. What enforcement actions are being taken by the MPCA in reference to this incident?

As the MPCA moves toward amending its current set of feedlot rules, this manure spill reinforces that rural residents who live and farm in communities near such facilities deserve transparency from the owners of large concentrated animal feeding operations as well as the government agencies whose stated mission is to protect the environment and serve the public good. People and communities that are most likely to be impacted by such incidents deserve to hear firsthand how they occurred and what's being done to prevent future spills.

Reflections from

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October 24, 2025

Another Farm

Crisis Looms,

but it's Not too

Late to Take

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October 23, 2025

Tell Congress:

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Access for

Farmers by

Funding Local

Food Purchasing

October 23, 2025

The Land Stewardship Project (LSP) is a nonprofit organization dedicated to fostering an ethic of stewardship for farmland, promoting sustainable agriculture and developing healthy communities in the food and farming system. LSP has offices in the Minnesota communities of Montevideo, Lewiston and South Minneapolis.

Category: News Releases

Tags: CAFOs • clean water • dairy farming • factory farm • manure digesters • Manure spills • MPCA • Riverview

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Fire crews extinguish fire at dairy farm in Wasco



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Firefighters were dispatched to the dairy farm on Gun Club Road for the report of a fire at about 10 p.m. on Monday.

At the dairy farm, firefighters found a fire in the methane gas digester, according to officials. The digester is used to break down manure and produce methane gas.





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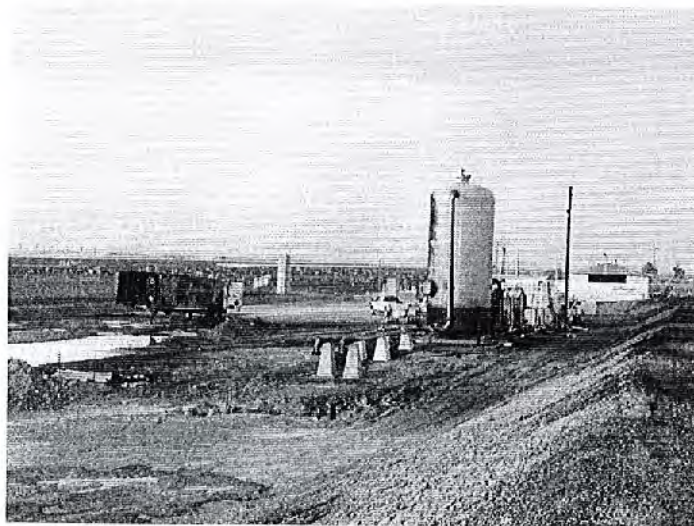
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Flames spread rapidly across the eight-acre system, according to fire officials.

The fire threatened about 20,000 gallons of compressed natural gas. All employees were evacuated, according to KCED.

Out of precaution an evacuation order for the nearby community was requested.

The compressed natural gas pressure relief valves were used to safely vent the fire's heat. Firefighters and the hazmat response team safely extinguished the fire.



Firefighters extinguish fire at Poso Creek Family Dairy

The evacuation order has been lifted.

No injuries were reported, and the cause of the fire is under investigation.

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Methane leak at Oregon dairy leads to explosion, fire

Published 8:37 am Thursday, July 26, 2012

By **Staff Reports** (<https://capitalpress.com/author/capitalpressstaff/>)

AUMSVILLE, Ore. (AP) — A co-owner of an Oregon dairy farm says methane that was released from a methane digester “caught a spark,” resulting in an explosion and fire at two large methane tanks.

Betty Bielenberg is co-owner of Oakley Farms. She tells The Oregonian that no people or animals were hurt Wednesday afternoon and that the fire was mostly out by the time firefighters arrived.

She says it all started when the rubber top of a methane digester expanded and began to release methane.

Methane is an odorless, colorless gas. A methane digester is a large tank that uses methane from cow manure to produce clean energy.

Aumsville is in the Willamette Valley.

Information from: The Oregonian, <http://www.oregonlive.com>

KGW has amateur video of the fire on their website at: <http://www.kgw.com/video/featured-videos/Aumsville-dairy-fire-explosion-caught-on-cam-163769456.html>

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(<https://capitalpress.com/2025/11/06/oregon-ranchers-deploy-high-tech-fix-after-fire-destroys-fencelines/>)



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(<https://capitalpress.com/2025/11/04/oregon-farmers-launch-network-for-small-scale-growers-in-arid-regions/>)



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Supreme Court grills both sides in hearing on Trump's tariffs

(<https://capitalpress.com/2025/11/05/supreme-court-grills-both-sides-in-hearing-on-trumps-tariffs/>)



FFA/4-H

Oregon's Cruikshank named FFA's Western region vice president

(<https://capitalpress.com/2025/11/04/oregons-cruikshank-named-ffas-western-region-vice-president/>)

Attachment 16:

**Insuring Biogas Operations: Risk Exposures Most Standard Insurers
Exclude from Their Coverage**

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Insuring Biogas Operations

The United States now has over 2,000 locations producing biogas in all 50 states. What is the opportunity to insure these businesses?

by MICHAEL TIGHE, EXECUTIVE VICE
PRESIDENT

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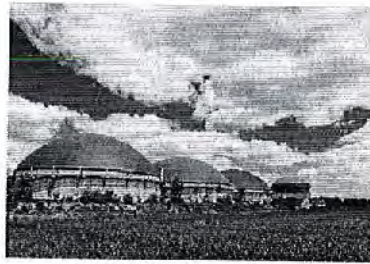
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Converting waste into energy is not science fiction, it's happening now and is a rapidly growing industry. Insuring

this type of transformative operation doesn't come without risk. Undoubtedly there may be unintended liability exposures for the biogas industry. In this article we'll touch on the process of anaerobic digestion production of biogas, risk exposures most standard insurers may look to exclude from coverage, and why the environmental alternative energy insurance marketplace is more suitable for comprehensive coverage.

Biomethane or biogas is generated when microorganisms, in the absence of oxygen, digest/break down organic materials such as food and animal waste. Biogas can be produced from: farm manure, sludge from wastewater treatment plants, captured gas at landfills, food waste systems, yard clippings, and crop residues. Anaerobic digesters create ideal oxygen-free conditions and speed up the process. In the U.S. biogas research with the use of

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anaerobic digesters started in the late 1970's at Penn State, Cornell, and Wisconsin. The United States now has over 2,000 locations producing biogas in all 50 states with 250 anerobic digesters on farms, 1,269 water resource recovery facilities, 66 standalone systems that digest food waste, and over 650 landfills. The E.U. has close to 5 times more operating digesters with Germany leading the way.

The government sees promise in these projects. There are 96 U.S. financial incentives nationwide for this industry including corporate tax credits, property tax reductions, and loan/grant programs. By processing waste in this manner, we may see less pollution in our waterways and on our farmland. Capturing methane gas from food waste and purifying it for fuel produces a lot of energy. One hundred tons of food waste per day can generate energy to power 800 – 1,400 homes each year.

There are special insurance risks and opportunities for insurance agents in this field. The basic nature of the biogas process involves many different volatile

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and/or toxic components which could be addressed in a Pollution policy. Biogas contains 50 -70% methane, 30-40% percent carbon dioxide and trace amounts of carcinogens such as arsenic, ethylbenzene, nitrous oxide, lead and toluene present. Biogas is toxic, flammable, and potentially explosive. Noxious gases are also released through ventilation systems from confinement houses, and environmental contaminants are also released through vapor from waste decomposing in lagoons, spray fields, and other waste collection sites. Although manure digesters might have the potential to reduce methane emissions into the air, emissions of other air pollutants, such as nitrogen oxides may increase to unacceptable levels. Breathing air with a high concentration of nitrogen oxides can cause breathing problems, headaches, and chronically reduced lung function.

A typical Commercial General Liability policy will not protect biodigester operators from third party bodily injury/property damage pollution claims. Depending on how the lawsuit is filed, the insurance company may also choose not to

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defend and cite the pollution exclusion built into the policy. An explosion, subsequent clean up, and restoration of the affected area may not be properly covered due to the hostile fire exclusion.

A typical General Liability/Pollution Liability package policy can better protect these operations. Within this type of policy, the definition of a pollutant is extremely broad. The ISO definition of a pollutant is "any solid liquid, gaseous, or thermal irritant or contaminant including smoke, vapor, soot, fumes, acids, alkalis, chemicals, and waste." A combined package policy is a more effective solution for the insured since one insurance company, underwriter, and policy review and handle a claim on its merit to determine where it fits into the policy vs. two separate carriers trying to determine if their policy should respond. An example of this difference is our Pollution policies are not "Named Peril" like other insurance policies. Environmental carriers can insure construction projects of a system, including all subcontractors, and for a multi-year term to include the statute of repose. They can also write annual

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renewable policies for system operations at a third-party location. Gradual pollution coverage can address water runoff issues from farm lagoons, air quality, and odor issues, the application of residual onto crops, damaging landfill liners or cap, or improper discharge into waterways from water treatment facilities. The treated residual digestate is a byproduct rich in nitrogen which is often used as fertilizer and other soil amendments. There are pollution risks associated with applying this material on crops/farmland, especially near water sources.

There is also environmental exposure pertaining to the transportation of biogas. When using public gas pipelines, the gas needs to be compressed to the pressure at which the pipeline is operated. Leaks do occur and Premises Pollution Liability can be obtained to insure these exposures for the owner and operator of the pipeline. Depending on the geographic location, its often difficult to obtain Auto Liability and physical damage coverage for compressed natural gas distribution trucks. Besides the over the road pollution exposure, unloading and dispensing compressed gas

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into fuel stations is an additional hazard that can be included for coverage under a GL/Pollution package policy. The disposal and transportation of biogas digestate may also pose issues for some insurance markets.

There are many reasons why the environmental insurance marketplace should be involved in writing these risks.

The surplus lines marketplace has the ability to modify coverage forms and add back exposures typically excluded (or not addressed) by admitted markets.

Packaging coverages together can better protect this industry and leaves a renewable energy insured with fewer coverage gaps. An environmental insurance specialty wholesaler may add value bringing additional markets into play and reviewing policy forms to ensure effective coverage. For more information or to discuss a biogas account, please [contact us](#).

Sources

www.EPA.gov

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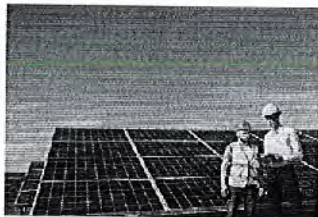
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Beacon Hill developed a customized environmental insurance solution for a large solar panel installation contractor in Florida

by LARRY SIMMONS, VICE
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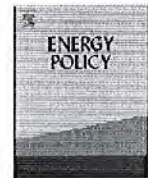
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Impact of Biogas Plants on Rural Residential Property Values



Impact of biogas plants on rural residential property values and implications for local acceptance



Kahsay Haile Zemo^{a,*}, Toke Emil Panduro^b, Mette Termansen^b

^a Department of Environmental Science, Aarhus University, Frederiksborgvej 399, 4000, Roskilde, Denmark

^b Department Food and Resource Economics, University of Copenhagen, Rolighedsvej 25, 1958, Frederiksberg C, Denmark

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ABSTRACT

In this paper, we investigate the impact of large- and farm-scale biogas plants on the rural residential property values. We use data from 11,279 rural housing transactions in the period 2007–2015 and trace spatial effects of biogas plants on the local property market. Our results show that large biogas plants have a significant negative impact on rural residential property values while farm-scale biogas plants have a significant positive impact. The findings suggest that preferences for or against biogas plants cannot be explained by either a NIMBY or a PIMBY phenomenon and the paper explores potential reasons for the observed disparity in valuation of farm- and large-scale biogas plants. An economic impact assessment of the choice of facility type, based on a concrete case study, indicates that the impact on residential property values may tip the scale in favor of farm-scale biogas plants. Based on these results, policy implications for planning and expansion of biogas production are discussed.

1. Introduction

Biogas plays a crucial role in the transition to a fossil-fuel free energy system. Renewable energy policies worldwide promote the establishment of biomass and bioenergy plants (Nakada et al., 2014). Denmark has set a target to be independent of fossil fuels by 2050 (Lund and Mathiesen, 2009) and manure-based biogas plants is an integral part of the energy and green growth plan. The goal is that 50% of the manure produced will be utilized for biogas production by 2020 (Bundgaard and Kofoed-Winuff, 2014). To achieve this plan, in addition to the existing biogas plants, at least 50 large biogas plants are expected to be built in the near future (EBA, 2013; Jacobsen et al., 2013).

One of the main challenges with biogas plants is strong and widespread opposition from local communities (Bjerg and Fredenslund, 2014; Skott, 2006; Upham and Shackley, 2007; Upreti and van der Horst, 2004). The externalities related to existing large biogas plants are related to odors, noise pollution from transportation of manure with heavy trucks, and visual pollution (Bjerg and Fredenslund, 2014). A study on 11 large biogas plants in Denmark shows that residents complain about their neighboring biogas plants (Skott, 2006). The skepticism of residents towards biogas plants has led to long and time consuming approval processes of new biogas plants, usually 5–10 years (Norgaard and Tybirk, 2014). This is recognized as one of the main barriers to biogas development (Lybak et al., 2014).

Discussion of opposition to biogas plants or any renewable energy agency facilities is often associated with a “Not in my backyard” (NIMBY) argument (Bertsch et al., 2016). However, there is also evidence against the NIMBY principle in the context of renewable energy projects (e.g., Bell et al., 2005; van der Horst, 2007; Wolsink, 2007). For instance, Wolsink (2007) argues that local opposition to renewable energy cannot be explained by egoistical motives of local residents. Warren et al. (2005) also find an “inverse NIMBY” syndrome whereby residents living close to windfarms tend to have a more positive attitude than those living further away. Similarly, rural communities in the American Midwest exhibit a “Please in My Backyard” (PIMBY) phenomenon to wind turbines (Sowers, 2006). For biogas, some survey studies have documented a strong support from local people (e.g., Kortsch et al., 2015; Soland et al., 2013). The main factors that are often mentioned as the drivers of local acceptance of renewable energy projects are the balance between perceived benefits (e.g. employment, environment, waste management, energy security) and costs (e.g. odor emission, visual pollution, noise pollution) of the project from personal and societal viewpoints, and other cultural, social and psychological factors (e.g., Brinkman and Hirsh, 2017; Devine-Wright, 2007; Oehlmann and Meyerhoff, 2017; Soland et al., 2013; Wolsink, 2007). Only few studies have attempted to estimate local communities’ acceptance of bioenergy plants in monetary values. An important recent contribution is a contingent valuation study by Lee et al. (2017) that estimate the degree of support and opposition of local people to the construction of a biofuel

* Corresponding author.

E-mail address: khz@envs.au.dk (K.H. Zemo).

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plant in Michigan. They find that, on average, a supporter is willing to pay \$59.16 for establishment of a biofuel plant in their vicinity and an opponent is willing to pay \$95.74 to prevent such plants from coming to their area. A related study by Modica (2017) analyzes the impact of biogas plants on urban housing values based on revealed preference data from Piedmont, a region in Italy, and find no evidence of impact. However, Pechrova and Lohr (2016) find a negative impact of biogas plants on house price based on eight biogas plants in the Jihomoravsky region of Czech Republic, using the hedonic pricing method. Our study is different from the existing studies in a number of ways. Lee et al. (2017) study biofuel plants which may have different local impacts compared to manure-based biogas plants, and they do not consider the effect of distance from the potential plant and size of the plant on acceptance of the plants. Their estimates are also based on contingent valuation data and potentially influenced by hypothetical bias and problems of scope and embedding (Hausman, 2012). In contrast to our study, Modica (2017) focuses on the urban housing market and consider different kinds of biogas plants (e.g. industrial and municipal wastewater treatment). Most importantly, the acceptability of biogas plants may be different across countries (e.g., Schumacher and Schultmann, 2017) and even from one region to another within a country (e.g., Kortsch et al., 2015). Given the very few economic valuation studies of local residents' opposition and support of biogas plants and the inconclusive results, it is important to gain more evidence on the effects. This study investigates the impact of large and farm scale manure-based biogas plants on rural residential property values. Farm-scale biogas plants are characterized by being small plants with an average processing capacity of 25,000 tons of manure and other substrates per year. Large-scale biogas plants have a processing capacity of up to 500,000 tons of substrates per year. A farm-scale biogas plant is owned by a single farm and treats manure from that farm whereas a large biogas plant is owned by either farm cooperatives, energy companies, or other private investors and treats manure from 40 to 100 farms (Foged, 2012). Davine-Wright (2007) argues that public attitude towards different scales of renewable energy facilities is likely to vary considerably since the difference in the scale of the facilities results in a differential impact on the local economy, community and environment. Thus, the externalities such as heavy traffic, odor, noise and visual pollution related to farm-scale biogas plants are likely to be minor relative to large biogas plants. We address the difference in scale by analyzing the impacts of the large- and farm-scale biogas plants separately. We hypothesize that large biogas plants have a negative capitalization effect and thus, local residents want to avoid having large biogas plants in their neighborhood while farm-scale biogas plants are likely to have a reduced negative impact. We estimate the capitalization effect of biogas plants using a hedonic valuation methodology based on data on single-dwelling rural properties traded in Denmark between 2007 and 2015.

2. Theory and empirical model

We use a spatial generalized additive model (GAM) for the empirical quantification of the impact of biogas plants on rural residential property values. This follows a standard hedonic pricing methodology seeking to reveal the impact of environmental externalities from transactions in the property market. Rosen (1974) was the first to formally describe a hedonic pricing model by specifying a hedonic equilibrium price schedule as a function of structural and neighborhood characteristics. The hedonic function cannot be used to measure the value of non-marginal environmental changes directly because a major change in environmental quality may change the equilibrium hedonic price for houses. According to Kuminoff and Pope (2014) such change or adjustment of hedonic price gradient drives a wedge between the average willingness to pay and the average capitalization effect.¹ Thus,

¹ We thank an anonymous reviewer for bringing the capitalization framework to our attention.

it is only possible to estimate the capitalization effect from a first stage hedonic regression. A growing number of recent studies have used capitalization framework to interpret the results of first stage hedonic price regressions (e.g., Connolly et al., 2019; Irwin et al., 2017; Munro and Tolley, 2018).

Standard spatial econometric models such as spatial error models and spatial lag models (or a combination) are the most commonly used models to analyze housing price data. However, the use of these models has been criticized (e.g., Gibbons and Overman, 2012; von Graevenitz and Panduro, 2015). It is argued that the assumptions about the structure of the omitted spatial process in standard spatial econometric models can be too restrictive as the researcher rarely has any prior knowledge of the appropriate scale of the spatial process. Furthermore, that the geographical entities captured by the spatial fixed effects are too rigid to represent the more gradual changes in real spatial data. Instead, flexible semi-parametric models such as generalized additive models (GAMs) have been suggested to analyze housing market data (Geniaux and Napoléone, 2008; von Graevenitz and Panduro, 2015). Unlike standard econometric and fixed effect models, GAM does not depend on the use of a spatial weight matrix and geographical entities. It captures the effects of spatial covariates by the smoothing function of coordinates.² A GAM (Hastie and Tibshirani, 1990) is an extension of the generalized linear model (GLM) where a linear predictor is specified as the sum of smooth functions of covariates (Wood, 2006).

In this paper, we specify the hedonic price model as follows:

$$\log(P_i) = \beta_0 + \beta_1 X_i + \beta_2 \log(dis_i) + \beta_3 region_i + \beta_4 year_i + \beta_5 region \times year + \int f(x_{lon,i}, y_{lat,i}; k; \alpha) + \varepsilon_i \quad (1)$$

where P_i is a log transformed price of a house, is a vector of control variables in the parametric component of the model such as structural and neighborhood variable, dis_i is log transformed distance from farm and large biogas plants, β is the corresponding parameter vector for each of the variables, f_j are smooth functions of the geographical coordinates of the properties, x_i . In addition, dummy variables for the year of transaction and the region are also included to control for price variation over time and region. A GAM does not require any assumption about the structure of the omitted spatial process, and it is handled by using geographical coordinates of each property as model inputs through a smoothing function. When the smoothing function includes the geographical location of the property, Künmann and Wand (2003) call the model a "Geoadditive model" and von Graevenitz and Panduro (2015) call it a "smoothed fixed effects model". The smoothing function is the sum of k spline bases $b(x_{lon,i}, y_{lat,i})$, each multiplied by its coefficient, α . Splines are polynomials that are pieced together to form a flexible function. Splines are good bases for representing smoothing terms in statistical models. We estimate the GAM model using thin plate regression splines and choose the number of bases functions. Unlike other splines (e.g., cubic regression splines, P-splines), thin plate regression splines produce knot free bases, smooths more than one predictor, and is computationally cheap.³

3. Survey area and data

Currently, there are 27 large manure-based biogas facilities and 48 farm-scale biogas plants in Denmark (DEA, 2016). These plants are

² von Graevenitz and Panduro (2015) estimate both GAMs and Spatial fixed effect models. They show that parameter estimates for several spatially varying regressors are sensitive to the scale of fixed effects. Under such circumstance, a GAM has advantage over fixed effect model. Thus, they argue that as the researcher will rarely know the appropriate scale of the fixed effects, spatial fixed effect models may lead to misspecification and mismeasurements.

³ Detailed information on GAMs, different types of splines, measures of prediction performance can be found in Wood (2006).

Table 1
Spatial GAM estimation of the impact of farm and large scale biogas plants.

	GAM: Pooled Data	GAM: Large biogas plant	GAM: Farm biogas plant
Distance from a biogas plant (log)	0.0411*** (0.0133)		
Distance from large biogas plant (log)		0.0668*** (0.0218)	
Distance from farm scale biogas plant (log)			−0.0773*** (0.0268)
S (x,y, k = 40)	40***	40***	40***
Effective degree of freedom (edf, k)	38.12	31.19	33.25
GCV	0.1808	0.1721	0.1845
R ² (adjusted)	0.429	0.413	0.434
Number of observations	11, 279	7, 235	4, 044

*P < 0.1; **P < 0.05; ***P < 0.01.

located in the rural area of Denmark. Large biogas plants have the capacity to treat up to 500,000 tons of livestock manure per year. Large biogas plants receive and treat manure from many farms, often 40–100 farms. Farm-scale biogas plants are characterized by only receiving manure from the farm itself. The processing capacity of farm-scale biogas plants is on average 25,000 tons of manure per year (Foged, 2012). Farm and large biogas plants in Denmark need a building permit and a fire safety approval. Other requirements for installation of biogas plants include environmental impact assessment (EIA) screening, a land-use plan and an environmental assessment. Furthermore, several legalizations are also considered during the approval process of biogas projects which is specified in the land-use planning law, environmental protection law, nature protection law, by-products instruction, tender procedure law, supply law and the environmental protection act. The approval procedures for large biogas plants are complicated and thus take much longer time than farm biogas plants. The responsible authority for the permission of biogas plant projects in Denmark is the municipality but the Ministry of Environment is responsible for biogas plants with high impact on the environment (Kirchmeier et al., 2010).

In our study, we used rural house sales in proximity to all the 27 large biogas plants and 38 of the small biogas plants. Ten farm biogas plants were excluded from our analysis since the time of establishment of the plants was not known. Manure-based biogas plants are distributed across regions of Denmark but many of them are located in Jutland and Southern Denmark. This is due to input availability (manure) since livestock production is mainly carried out in these regions (see, Table D.2, Appendix D). In Appendix D, we also provide socio-economic information across provinces of Denmark. As can be seen from Table D.1, there are only minor differences of socio-economic factors such as income, employment, quality of life and area per dwelling across provinces of Denmark.

In total, the dataset used for our analysis contains 11,279 sales of single dwelling houses traded in the period 2007–2015 in rural Denmark. The house sales data contain structural characteristics of the houses, such as the size of the house, number of rooms, and age of houses (OIS, 2016). The data contains the exact location of each sold property. Thus, proximity to neighborhood characteristics of houses such as proximity to railways, large roads, cities, coastlines, lakes, forest area and so forth, was calculated using the rgeos package in the R environment (Bivand et al., 2014; R Core Team, 2017). The spatial data were extracted from the national spatial database Geodanmark (DGA, 2017) which is part of the European Inspire endeavor. The Euclidean distance to the nearest farm and large biogas plants from each property was also calculated. The description and summary of all variables used in the model estimation are presented in Appendix A. In our analysis, properties that are traded before the establishment of biogas plants are treated as if they were not exposed to any externality related to biogas plants.

A large number, 7,235, of the sold rural properties were located within 6000 m of a large biogas plant while 4044 rural houses sales were located within 4000 m of a farm-scale biogas plant. The distribution of the data is unique, which enables us to conduct a separate

analysis of the impact of biogas plants on rural house price. For properties that are located within 4000 m of a farm-scale biogas plant, the nearest large biogas plant is more than 7,000 m away. For properties that are within 6,000 m of a large biogas plant, the nearest farm-scale biogas plant is more than 5,000 m away. Thus, the nature of the data enables us to separate the effects of farm and large-scale biogas plants successfully. The selection of the threshold distances are motivated by a study by Schumacher and Schultmann (2017) who find that the majority of people would accept biogas plants 3.1 km or further away. Furthermore, selecting properties traded within a radius of the above stated distances, ensures a sufficient amount of transactions with varying degree of exposure to the biogas externality. The reason for selecting different distance for farm and large-scale biogas plants is the difference in intensity of the impact (Hjerg and Fredenslund, 2014; Lybæk et al., 2014).

4. Results

The estimated hedonic implicit price for nearness to biogas is presented in Table 1 along with important test statistics. The model estimate for the entire hedonic models can be found in appendix B. First, we estimate the impact of biogas plants by pooling the datasets for rural property values in the vicinity of small and large biogas plants, and then we estimate separate models for the two datasets using spatial GAMs. We use PanJen (R package) to specify the functional form of the distance to biogas plant variable (Jensen and Panduro, 2016). PanJen provides a ranking of different transformations according to their Bayesian Information Criterion (BIC). The results of different transformations are given in appendix C and show that the logarithmic form is the most suitable functional form for the Euclidian distance of biogas plants to the properties.

The level of spatial smoothing over spatial coordinates was evaluated using a varying number of bases functions. The sensitivity analysis shows a minimal variation in the magnitude of the distance from biogas plant estimate. The results reported in Table 1 are based on 40 bases functions. The hedonic model was also estimated, but not presented here, using a simple linear regression model and a linear regression with spatial-temporal weight matrix.⁴ We found the biogas parameter estimates to be robust over different model types. To verify our finding we also attempted to conduct a difference-in-difference (DiD) analysis as our data includes the creation date of each plant and this is the recommended econometric approach (e.g., Modica, 2017). We followed an empirical strategy similar to Modica (2017): First, we

⁴ The spatial-temporal weight matrix is a more realistic weight matrix than the weight matrix often used in standard spatial econometric models. Temporal aspects are captured by taking account of the characteristics of the nearest neighbors that are sold within a year (or before) the property under consideration. In the estimation, we directly entered the spatial element i.e. the weighted average of the dependent variable (house price) of the neighboring observations (W_iP_i) as a regressor. Results from the OLS and GLS with spatial-temporal term can be made available upon request.

constructed treatment and control groups using a threshold distance beyond which, properties were considered to be unaffected by the biogas plants (Schumacher and Schulmann, 2017; Skott, 2006). Second, we created a dummy for the treatment group, i.e. we constructed treated and untreated groups within a treatment group based on the opening date of biogas plants. Following this strategy, we only have 66 house sales in the proximity of farm-size plants before the opening of the plants, which is not a sufficient number of observations. However, in future it would be possible to follow this approach as new biogas plants are being developed.

The hedonic model that only accounts for large biogas plants provides a negative and significant coefficient associated with the log-transformed distance to a large biogas plant. Rural residential property value significantly increases with increasing distance from large biogas plants, but the rate of increase diminishes with increasing distance from a large biogas plant. The parameter estimate of the logged distance from a large biogas plant is interpreted as a 0.0668% increase in rural house price associated with a 1% increase in distance to a large biogas plant. The result indicates that the large biogas plants have a negative impact on local people. The pooled hedonic model that disregards the type of biogas plant reveals that rural house prices drop by 0.0411% with a 1% increase in the proximity of a biogas plant. The estimate of the impact of biogas plants is 40% lower for the pooled model than the model estimated only for large biogas plants. The parameter estimate of the distance from farm biogas plants shows a significant positive capitalization effect. For a 1% increase in distance from farm biogas plant, there is 0.0773% decrease in rural house price, keeping all else constant. Stating it differently, when proximity to farm biogas plant increases by 1% the rural house price increases by 0.0773%. In monetary terms, using mean house prices in our sample in Table A.1, the capitalized value corresponds to approximately 1280.25 Euro decrease in house price and approximately 1154.34 Euro increase in house price for a 10% increase in proximity to large and farm scale biogas plants respectively. These findings suggests that the impact of large biogas plant seems to support a NIMBY argument while the result for the farm-scale biogas plants seems to confirm a PIMBY phenomenon. However, before jumping to such conclusions, it is important to understand the underlying reasons for the diverging results and the implications for the NIMBY and PIMBY debate. An in-depth discussion is provided in section 6.

The log-transformation of the distance variable results in a diminishing marginal price effect with increasing distance (Fig. 1). For example, a move from 100 to 200 m has a larger impact on price than a move from 1000 to 1100 m. The lines for pooled (solid line) and large biogas plants (dashed line) show the capitalized value of properties at different distances, while the dotted line represents the capitalized value of small-scale biogas plants. The positive capitalization effect of farm-scale biogas plants can be interpreted as a measure of local residents' strength of support for such plants. The illustration shows that the impacts are confined to neighbourhoods relatively close to the plants. However, the impact estimates derived above do not, on their own, tell us whether their magnitude will alter an economic assessment of the choice of alternative locations and/or choice of facility type. To get a better sense of the trade-offs we use a concrete case for illustration.

4.1. Policy impact assessment illustration

The municipality of Holbæk in Denmark has proposed a large-scale biogas plant with a capacity of 450,000 tons of livestock manure per year. If approved, the biogas plant will be located north of a small town with approximately 250 inhabitants (Kvanløse), and south of a busy highway going through Holbæk municipality (Fig. 2). If the large-scale biogas plant (big circle) were to be replaced by small-scale farm biogas plants, about 18 plants (small circles) would need to be constructed assuming a capacity of 25,000 ton/year/plant. The small-scale plants

depicted with blue points in Fig. 2 were located on actual farms. The farm scale plants are hypothetical and just analyzed for illustrative purposes.

The initial investment cost of a biogas plant is estimated to be 60 Euro/ton and 44 Euro/ton for farm-sized biogas plants and large biogas plant, respectively, according to (Bundgaard and Kofoed-Wiuff, 2014). The operation cost is estimated to be 3.5 Euro/ton for both types of plants (Bundgaard and Kofoed-Wiuff, 2014). The large biogas plant has an additional operational cost of slurry transportation which equates to 3.5 Euro/ton (Bundgaard and Kofoed-Wiuff, 2014). We assume that the facilities produce the same amount of energy per ton manure and therefore, any differences in production efficiency is disregarded in the calculations.

The impact of the location of the biogas on the neighboring properties can be calculated using the estimated hedonic price function. Note that the analysis is not a full welfare economic calculation but can serve as an illustration of total price effects in the case study. The aggregate capitalized value for the location impact of a biogas plant can be calculated as follows; $\sum_i \frac{\partial p_i}{\partial Dis_i} (Dis_i^0 - Dis_i^1)$ or $\sum_i \hat{\beta}_2 R \left(\frac{Dis_i^0}{Dis_i^1} - 1 \right)$, where the current proximity of the biogas plant is represented by Dis_i^1 and Dis_i^0 represents the threshold distance beyond which the effect is zero. As stated previously, the majority of people in Germany, France and Switzerland accept biogas plants at a distance of 3100 m or further away (Schumacher and Schulmann, 2017) and Fig. 1 also indicates that beyond 3000 m, the capitalized value is almost zero. Hence, we set Dis_i^0 to be 3000 m. The distance to all homes, that would be impacted by the two biogas plants scenarios, were calculated and their capitalized value was calculated as outlined above. The impact of the two scenarios were calculated to be about 110 mill EUR and –12 mill EUR for the farm-scale and the large-scale biogas scenario, respectively. These impact calculations are high and for comparison, the initial investment cost and the operation cost calculated over a ten year period using a 3% discount rate is also given in Table 2. This implies that the estimated neighborhood impacts are big enough to change the outcome of the cost-benefit analysis (Table 2). However, the results should be interpreted with caution as they are based on average cost and performance estimates for the production and the specific neighborhood characteristics of the illustrative case. The neighborhood impact is mainly driven by the density of nearby neighbors (Fig. 2). In total 617 and 3709 homes were found to be affected by the large-scale and farm-scale biogas plants respectively. In other locations this relative impact could be different and alter the final outcome.

5. Discussion

Model results indicate that proximity to a large biogas plant results in a negative capitalization effect whereas proximity to a farm-scale biogas plant results in a positive capitalization effect. The considerable negative impact of large biogas plants on rural house price suggests a significant opposition of local people, which is manifested by significant delays in the approval process of large biogas plants (Nørgaard and Tybirk, 2014) and this in turn is hampering biogas development. Conversely, the positive capitalization effect of farm-scale biogas plants suggests a strong support of local people to these plants. Potential explanations for the divergence in the valuation of farm and large biogas plants are provided in the following subsections. Our results contrast with a finding of Medsen (2017), who finds no effect of proximity to biogas plant on house price. One reason for this could be the disparity in local acceptability of biogas plants from region to region and from country to country. Unlike Pechrova and Lohr (2016) who find a negative effect of biogas plants on housing price, we find both positive and negative capitalization effects of biogas plants.

$$\frac{\partial p_i}{\partial Dis_i} = \hat{\beta}_2 \left(\frac{Dis_i^0}{Dis_i^1} \right)$$

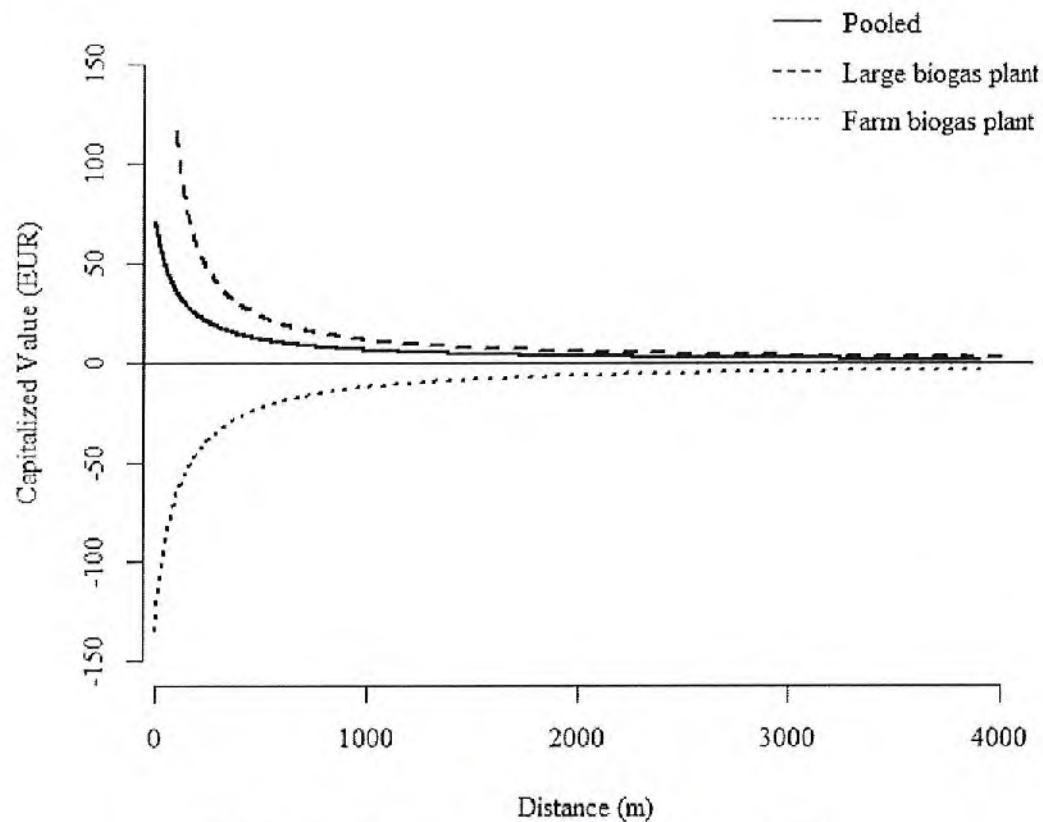


Fig. 1. The relationship between distance from biogas plants and capitalized value.

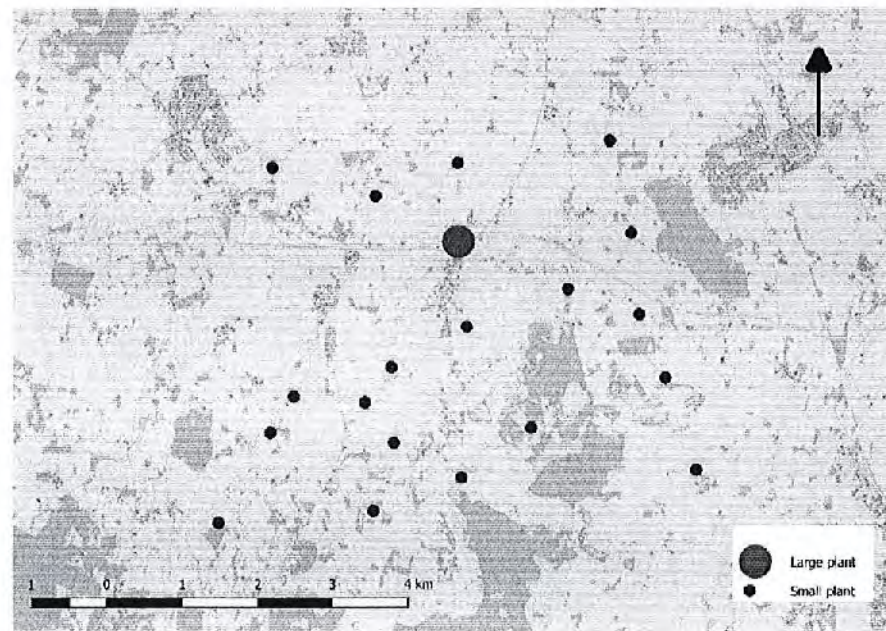


Fig. 2. Location of the planned biogas plant near Kvanløse town and the location of 18 farm-scale biogas plants that would need to replace it.

Table 2
Cost assumption and calculated impacts of farm-sized and large biogas plants.

Type of Biogas Plant	Cost the first year (mill EUR)	Cost after 10 years (mill EUR)	mean neighborhood impact (mill EUR)	Affected properties (number)	Total neighborhood impact (mill EUR)
Farm scale	– 28,575	– 40,838	0.0299	3709	110
Large scale	– 22,950	– 47,476	– 0.0196	617	– 12

The disparity in impact between farm and large-scale biogas plants can be due to the scale of implementation of the biogas plants corroborated by economic and behavioral reasons. The following subsections (section 5.1 and 5.2) discuss the potential reasons for the disparity in impact between the different types of biogas plants.

5.1. Nature of the biogas types

According to Devine-Wright (2007) the scale of implementation of renewable energy facilities can be of micro (at household level), meso (at local level) and macro (at large-scale level). He argues that the difference in scale of implementation results in a different impact on the local economy, community and environment and a variation in public acceptance of renewable energy facilities should be expected. This explanation can also apply to biogas plants. Manure-based biogas production positively contributes to job creation, reduction of greenhouse gas emission, energy security and agricultural waste management. However, biogas production process involves negative externalities such as odor emission, noise pollution, visual pollution, congestion and road damage. Thus, benefits and negative consequences of biogas can be expected to vary between farm- and large-scale biogas plants. Considering only the production capacity of the two scales of biogas plants, an average farm-scale biogas plant is up to 20 times smaller than a large-scale biogas plant. The processing capacity of a farm-scale biogas plant is on average 25,000 tons of substrate per year whereas a large biogas plant treats 50,000–500,000 tons per year (Foged, 2012). Due to the difference in the processing capacity, the number and size of tanks (pre-storage tanks, digester tanks, slurry storage tanks and biogas storage tanks) are different between farm and large biogas plants. Hence, the visual pollution from erected biogas plants, odor emission (during off-loading of manure or leakage from a plant) and noise pollution are higher from large biogas plants than from farm-scale biogas plants (Bjerg and Fredenslund, 2014). Furthermore, a farm-scale biogas plant is attached to one farm and use manure and other feedstock that is normally produced on that farm whereas large biogas plant is characterized by being large and receives manure from 40 to 100 farms (Al Seadi et al., 2008; Foged, 2012). Large-scale biogas production therefore involves heavy truck transportation of manure which subsequently causes road damage, congestion and noise but these negative consequences are absent in farm-scale biogas plants (Bjerg and Fredenslund, 2014). Thus, these differences between the two scales of biogas plants may be the sources of disparity on the valuation. However, this variation is not sufficient to explain the opposite impacts of farm- and large-scale biogas plants on property value. Hence, other potential economic and behavioral explanations are explored in the following section.

5.2. Economic and behavioral reasons

One of the straightforward reasons for the positive capitalization effect of farm-scale biogas plants is that there is a direct personal benefit that local residents get by being close to farm-scale biogas plant that they would otherwise not experience near large biogas plants. As stated above, one of the benefits of biogas plants is agricultural waste management by which there is a significant reduction of odor nuisance from livestock operations due to degasification of raw manure. Treating manure in biogas reduces odor up to 75% (Bundgaard and Kotoed-

Wiaff, 2014). Hence, local residents may prefer to be a neighbor to a farm with a farm biogas plant rather than a farm without it i.e. a farm-scale biogas plant may serve as means to reduce odor nuisance to neighbors. This is consistent with Skott (2006) who suggests that farming operations such as the presence of a large pig farm in the vicinity may have larger economic costs than the presence of a biogas plant. Large-scale biogas plants do not necessarily reduce odor from spreading of manure on the farms in its vicinity as neighboring farms may choose not to supply manure to the plant and there may even be higher odor emission from the plants due to leakage during off-loading of manure from trucks since they transport manure from many farms and longer distances.

In addition to the personal benefits and costs, local residents evaluate the positive and negative effects of a renewable energy facility on society and environment (for review, see, Huijts et al., 2012). For example, the societal and environmental benefits of biogas production include greenhouse gas reduction, waste management, employment, and energy security. A growing number of studies on the community acceptance of renewable energy facilities have documented that local residents evaluate acceptance of a renewable energy facility by weighing its overall perceived benefits and costs (Rertsch et al., 2016; Devine-Wright, 2007; Guo et al., 2015; Huijts et al., 2012; Liu et al., 2013). Therefore, depending on the balance between overall perceived benefits and costs, the proximity to a renewable energy plant can be valued positively or negatively. This is clearly shown by Lee et al. (2017) who estimate local community's valuation of biofuel plants using a single bounded dichotomous choice question in Michigan. They find that more than 70% of respondents in their sample support construction of a biofuel plant and on average, a supporter is willing to pay \$59.16 for construction of a biofuel plant in their vicinity. On the contrary, about 30% of the respondents oppose the establishment of a biofuel plant and an opponent is willing to pay \$95.74 on average to prevent such plant from coming to their area. Similarly, the results in the current paper could suggest that the positive capitalization effect indicates, that the overall positive outcomes outweigh negative consequences. In contrast the negative capitalization effect of large-scale biogas plant shows that its overall perceived negative costs outweigh the benefits.

Psychological factors such as trust in actors who are responsible for biogas plants may also contribute to the disparity in valuation directly or indirectly via perceived benefits and costs. The literature on local acceptance of renewable energy facilities indicates that trust in the owners of renewable energy facilities increases local residents' acceptance (e.g., Devine-Wright, 2007; Huijts et al., 2012; Oehlmann and Meyerhoff, 2017; Upham and Shackley, 2007; Upreti and van der Horst, 2004). Large scale biogas plants are owned by external investors, energy companies or farm cooperatives while farm-scale biogas plants are owned by single farms. A farmer who owns a farm biogas plant is a part of the community and neighbors could be more accepting towards his/her business than towards external investors of a large biogas plant. This is in line with Warren and McFadden (2010) who claim that local acceptance of renewable energy technology is more positive if it is operated by local community.

5.3. Implications for local acceptance: revisiting the NIMBY versus PIMBY debate

Our findings have important implications for the interpretation of NIMBY and PIMBY phenomena in relation to renewable energy plants. Our results suggest that neither NIMBY nor PIMBY principles explain local residents' behavior (opposition and support) to biogas plants. The positive impact of an increasing proximity to small-biogas plant on residential property value refutes the NIMBY argument. Similarly, the negative impact of large biogas plants disproves the PIMBY phenomenon. We argue that the support of the local people to small biogas plants is not explained by PIMBY i.e. it does not arise from pure altruism. If this had been the case, we would also expect support for large biogas plants. Similarly, the opposition to large biogas plants does not necessarily reflect a NIMBY phenomenon. We argue that local community's opposition to large biogas plants is simply due to intolerable negative consequences, which outweigh perceived benefits. If pure selfishness or ignorance was the source of opposition then we would expect the same direction of impact for small-biogas plants. Therefore, the results indicate that the impact of a large biogas plant on residential property shows "genuine" opposition of local residents to biogas plants. The findings of this paper supports previous studies that have criticized and documented evidence against the existence of the NIMBY phenomenon (e.g., Soland et al., 2013; Warren et al., 2005; Wolsink, 2007). However, further research is needed to firmly establish the underlying drivers for the relationships we observe in the data.

6. Conclusions and policy implications

In this paper, we investigated the impact of biogas plants on rural property value. In doing so, we used house price data from 11,279 housing transactions from 2007 to 2015 in rural Denmark and 65 manure based agricultural biogas plants (27 large and 38 farm-scale biogas plants). We trace a spatial effect of biogas plants on local property market to 4,000 m and 6,000 m for farm and large biogas plants respectively using a spatial generalized additive model (spatial GAM). Our results show that rural house price declines by 0.0668% when a distance to large biogas facility gets nearer by 1% while rural house price increases by 0.0773% with 1% increasing proximity to a small biogas plant which respectively suggests an opposition and a support of local residents to the respective biogas plants. Several economic and behavioral factors may lead to the disparity in valuation of farm- and large-scale biogas plants. The findings suggest that neither NIMBY nor PIMBY explain the local community's opposition or support to biogas plants. The results are based on comparison of property values

at varying distances from the biogas plant keeping all other factors constant. The analysis would be strengthened by including analysis of house sales before and after establishment of biogas plants using a so-called Difference in Difference approach. However, at this stage sufficient data required for this analysis is not available.

Looking ahead, studies of this kind potentially have important policy implications for planning and implementation of biogas plants. Firstly, based on scenarios for farm- and large-scale biogas plants we show that the impact is able to change the outcome of the economic case in favor of farm-scale biogas plants. Secondly, policy makers could use the results of this study to compensate residents that live close to large biogas plant as it has large impact on local residents well-being. Providing such estimates and actions may in turn speed up the approval process of large biogas plants which at the moment takes 5–10 years (Norgaard and Tybirk, 2014). These findings are therefore important for future biogas expansion plans. Deployment of large biogas plants near residential areas may not be the right way forward due to strong opposition of local communities, particularly if compensation is an infeasible option. Similarly, targeting at expansion of farm-scale biogas plants to achieve the biogas goals and reduce the opposition from local residents may also be a sub-optimal solution despite being the favored option from the impact assessment. This is mainly due to financial constraints such as investment and operation costs that farmers face to engage in biogas production (Bundgaard and Kofoed-Winnif, 2014). Thus, to achieve the biogas goal and reduce the local opposition at the same time it could be optimal to target medium-sized biogas plants. For example, Zemo and Teilmansen (2018) suggest that a partnership based biogas plants with an expected size between farm- and large-scale plants may provide a balanced approach. In addition, these kinds of plants are likely to involve local residents directly or indirectly in biogas production as input suppliers or output buyers and this may in turn increase the acceptance of biogas plants. Our findings may have wider relevance to other renewable energy projects with public good benefits and local externalities.

Declaration of interest

None.

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Appendix A

Table A.1
Summary and descriptions of Continuous and Dummy variables

Description		Mean		
		Pooled data	Large biogas plant	Farm biogas plants
Continuous variables				
Price	Price of the house traded in Danish Kroner	1,317,000	1,431,000	1,115,000
Size (log)	The logarithm of the size of the house in square meters	4.928	4.935	4.914
Rooms (log)	The logarithm of the number of rooms in the house	1.528	1.537	1.512
Density	Population density	286.5	284.3	290.5
Convenience store	Proximity to convenience store (in meters)	1998	1973	2041
Convenience store (squared)	Proximity to convenience store (squared)	4,918,000	4,850,000	5,039,000
Railways track	Proximity to the nearest railways track described on scale from 0 to 200 m; 200 m correspond to being located on the railways track	9.147	9.771	8.031
Lake	Proximity to the nearest lake described on a scale from 0 to 400 m; 400 corresponds to being located at the border of the lake	36.060	41.82	25.76

(continued on next page)

Table A.1 (continued)

	Description	Mean		
		Pooled data	Large biogas plant	Farm biogas plants
Coastline	Proximity to the coastline labelled on a scale 0–400 m; 400 m corresponds to being located at the boarder of coastline	5.501	3.187	9.642
Forest	Proximity to forest area described on scale 0–400 m; 400 m corresponds to being located at the boarder of forest	259.0	145.6	137.6
Large road	Proximity to the nearest largest road described on a scale 0–200 m; 400 m corresponds to being located at the boarder of large road	34.75	32.92	38.00
Large road (square root-ed)	Proximity to the nearest largest road	3.231	3.089	3.485
City	Distance in meters to the nearest city	2383	3158	995.5
Distance to a biogas plant (log)	The logarithm of the distance to the nearest biogas plant	8.110		
Distance to large biogas plant (log)	The logarithm of proximity to the nearest large biogas plant; the scale of 0–6000 m; 0 corresponds to being located at boarder of large biogas plant		8.278	
Distance to farm biogas plant (log)	The logarithm of proximity to the nearest farm biogas plant; the scale of 0–4000 m; 0 corresponds to being located at boarder of farm biogas plant			7.808
		Mean/counts		
Dummy variables				
Age 2000–2015	Houses built from 2000 to 2015	0.07403	0.08321	0.05762
Age 1980–1999	Houses built from 1980 to 1999	0.07749	0.07837	0.07591
Age 1948–1979	Houses built from 1948 to 1979	0.5683	0.5645	0.5752
Age 1910–1948	Houses built from 1910 to 1948	0.1842	0.1715	0.207
Age 1875–1910	Houses built from 1875 to 1910	0.07421	0.07588	0.07122
Age 1875	House built before 1875			
Tile roof	Tile roof	0.1915	0.2203	0.14
Cement roof	Cement roof	0.187	0.2079	0.1496
Fiber roof	Fiber roof	0.5407	0.4865	0.6377
Board roof	Board roof	0.02261	0.0246	0.01904
Flat roof	Flat roof	0.02775	0.02571	0.0314
Rebuild 1970s	House rebuilt between 1970 and 1979	0.1355	0.1442	0.1199
Rebuild 1980s	House rebuilt between 1980 and 1989	0.08174	0.07878	0.08704
Rebuild 1990s	House rebuilt between 1990 and 1999	0.06845	0.05612	0.0905
Rebuild 2000s	House rebuilt between 2000 and 2015	0.07838	0.07035	0.09273
2007	Number of house traded in 2007	1957	1273	684
2008	Number of house traded in 2008	1439	911	528
2009	Number of house traded in 2009	1139	725	414
2010	Number of house traded in 2010	1421	911	510
2011	Number of house traded in 2011	1086	674	412
2012	Number of house traded in 2012	1183	731	452
2013	Number of house traded in 2013	1112	708	404
2014	Number of house traded in 2014	1186	774	412
2015	Number of house traded in 2015	756	528	228
Sjælland	Number of house traded in Sjælland	639	639	
Lolland	Number of house traded in Lolland	357	357	
Fyn	Number of house traded in Fyn	991	991	
Midtjylland	Number of house traded in Midtjylland	5277	4761	516
Nordjylland	Number of house traded in Nordjylland	4015	487	3528

Appendix B

Table B.1
Spatial GAM estimation results

	GAM: Pooled Data	GAM: Large biogas plant	GAM: Farm biogas plant
Constant	14.41*** (4.304)	11.378*** (2.7367)	9.3478*** (2.3853)
Size (log)	0.5914*** (0.0227)	0.647*** (0.0264)	0.7467*** (0.0375)
Rooms (log)	0.0432 (0.0221)	0.0374 (0.0254)	0.0708* (0.0368)
Age 2000–2015	0.301*** (0.0374)	0.2416*** (0.0407)	0.4755*** (0.0749)
Age 1980–1999	0.2641*** (0.0364)	0.2316*** (0.0399)	0.3785*** (0.0717)
Age 1948–1979	0.0388 (0.0326)	0.0213 (0.0349)	0.1248* (0.067)
Age 1910–1948	0.0595* (0.0335)	0.0806* (0.0363)	0.0853 (0.0675)
Age 1875–1910	−0.0473 (0.0349)	−0.0341 (0.0376)	0.0103 (0.0704)
Tile roof	−0.0117 (0.0283)	−0.0436 (0.0311)	0.0866 (0.0532)
Cement roof	−0.0478* (0.0289)	−0.0975*** (0.0319)	0.0654 (0.0535)
Fiber roof	−0.0781*** (0.0269)	−0.1267*** (0.0295)	0.0425 (0.05)
Board roof	−0.037 (0.0398)	−0.0756 (0.0438)	0.0766 (0.0723)
Flat roof	−0.0752** (0.0376)	−0.0975** (0.0431)	−0.0118 (0.0649)
Rebuild 1980s	0.0236 (0.0165)	0.0357* (0.0193)	0.0041 (0.0264)

(continued on next page)

Table B.1 (continued)

	GAM: Pooled Data	GAM: Large biogas plant	GAM: Farm biogas plant
Rebuild 1990s	0.0853*** (0.0179)	0.0659*** (0.0225)	0.1237*** (0.026)
Rebuild 2000s	0.0205 (0.0168)	0.0183 (0.0203)	0.0227 (0.0259)
Density	0.0001*** (0.00094)	0.0002*** (0.0001)	0.0001* (0.0001)
Convenience store	0.0001*** (0.00002)	0.0002*** (0.00005)	0.0001** (0.00003)
Convenience store (squared)	−4.329e 08*** (8.130e-09)	−4.467e 08*** (1e-08)	−3.7e 08** (1.5e 08)
Railways trucks	−0.0002 (0.0001)	−0.0005** (0.0002)	0.0001 (0.0003)
Lake	0.0001 (0.0001)	0.0001** (0.0001)	−0.0001 (0.0001)
Coastline	0.0008*** (0.0001)	0.0011*** (0.0002)	0.0007*** (0.0002)
Forest	0.00013*** (0.00004)	0.00014*** (0.00005)	0.0002*** (0.0001)
Large road	−0.0016*** (0.0003)	−0.0016*** (0.0004)	−0.0016*** (0.0006)
Large road (squared)	0.0124*** (0.0042)	0.0131*** (0.0049)	0.0085 (0.0069)
Circles	0.000003 (0.000009)	0.00004** (0.00002)	0.0006 (0.00004)
Distance from a biogas plant (log)	0.0411*** (0.0133)		
Distance from large biogas plant (log)		0.0668*** (0.0218)	
Distance from farm biogas plant (log)			−0.0773*** (0.0268)
2008	−0.1126* (0.0651)	−0.1036* (0.06)	0.0779 (0.074)
2009	−0.2336*** (0.0722)	−0.2221*** (0.0566)	0.0711 (0.0818)
2010	−0.2348*** (0.0685)	−0.2349*** (0.0632)	−0.0545 (0.0732)
2011	−0.402*** (0.07)	−0.398*** (0.0645)	−0.0297 (0.0797)
2012	−0.5085*** (0.0709)	−0.508*** (0.0654)	−0.0773 (0.0753)
2013	−0.6918*** (0.0859)	−0.6747*** (0.0792)	−0.2631*** (0.0835)
2014	−0.4167*** (0.065)	−0.4196*** (0.0609)	−0.3942*** (0.0845)
2015	−0.6181*** (0.0755)	−0.608*** (0.0696)	−0.1434 (0.0928)
Lolland	3.944 (5.41)	−1.377 (3.2017)	
Fyn	5.196* (2.848)	0.1724 (1.9218)	
Midtjylland	−7.666 (5.049)	−1.7128 (3.6237)	
Nordjylland	−3.529 (5.102)	−1.0268 (3.9553)	1.2612 (2.7167)
2008 × Lolland	0.2696** (0.1042)	0.271*** (0.0951)	
2009 × Lolland	−0.0262 (0.1164)	−0.0307 (0.1073)	
2010 × Lolland	−0.1956* (0.1179)	−0.1939* (0.1089)	
2011 × Lolland	0.5057*** (0.1237)	0.4911*** (0.114)	
2012 × Lolland	−0.172 (0.124)	−0.1758 (0.1144)	
2013 × Lolland	0.1095 (0.1322)	0.0881 (0.1218)	
2014 × Lolland	−0.2822** (0.115)	−0.273** (0.1061)	
2015 × Lolland	−0.1001 (0.1266)	−0.1114 (0.1167)	
2008 × Fyn	0.0755 (0.0857)	0.0738 (0.079)	
2009 × Fyn	0.0405 (0.0931)	0.0404 (0.086)	
2010 × Fyn	0.0953 (0.0888)	0.0908 (0.0818)	
2011 × Fyn	0.2653*** (0.0933)	0.2678*** (0.086)	
2012 × Fyn	0.2606*** (0.0957)	0.2689*** (0.0884)	
2013 × Fyn	0.365*** (0.1048)	0.3589*** (0.0766)	
2014 × Fyn	0.1003 (0.0998)	0.0991 (0.0828)	
2015 × Fyn	0.4474*** (0.1011)	0.4466*** (0.0933)	
2008 × Midtjylland	0.1601** (0.0694)	0.1418** (0.0644)	
2009 × Midtjylland	0.1767** (0.0766)	0.1555** (0.0711)	
2010 × Midtjylland	0.2175*** (0.0725)	0.2079*** (0.0672)	
2011 × Midtjylland	0.2912*** (0.0747)	0.2853*** (0.0693)	
2012 × Midtjylland	0.4034*** (0.0751)	0.3978*** (0.0697)	
2013 × Midtjylland	0.5911*** (0.0895)	0.5918*** (0.0828)	
2014 × Midtjylland	0.314*** (0.0705)	0.3395*** (0.0655)	
2015 × Midtjylland	0.5563*** (0.0808)	0.554*** (0.075)	
2008 × Nordjylland	0.1615** (0.0705)	0.1243 (0.0939)	−0.0315 (0.0793)
2009 × Nordjylland	0.2504*** (0.0779)	0.2113** (0.1037)	−0.0511 (0.0874)
2010 × Nordjylland	0.1975*** (0.0739)	0.1914** (0.0967)	0.0089 (0.0786)
2011 × Nordjylland	0.335*** (0.0759)	0.3457*** (0.1037)	−0.0441 (0.0954)
2012 × Nordjylland	0.4377*** (0.0765)	0.4649*** (0.1045)	−0.0017 (0.081)
2013 × Nordjylland	0.5973*** (0.0907)	0.5964*** (0.1113)	0.1574* (0.089)
2014 × Nordjylland	0.3024*** (0.0722)	0.3967*** (0.162)	0.2601*** (0.0898)
2015 × Nordjylland	0.5865*** (0.0833)	0.739*** (0.1078)	0.0588 (0.1003)
S(x,y, k = 40)	40***	40***	40***
Effective degree of freedom (edf, k)	38.12	31.19	33.25
CCV	0.1868	0.1721	0.1845
R ² (adjusted)	0.429	0.413	0.434
Number of observations	11, 279	7, 235	4, 644

*P < 0.1; **P < 0.05; ***P < 0.01.

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Appendix C

Table C.1

Test of functional forms of distance to biogas plant using Paudyal

Distance to biogas plant (pooled data)				Distance to farm scale biogas plant			Distance to large biogas plant				
	AIC	BIC	ranking (BIC)		AIC	BIC	ranking (BIC)		AIC	BIC	ranking (BIC)
$\log(x)$	20068.67	20251.94	1.0	$\log(x)$	7481.05	7638.67	1.0	$\log(x)$	12073.89	12252.94	1.0
x^2	21668.22	21851.49	2.0	smoothing	7713.07	7896.51	2.0	x^2	13537.40	13716.45	2.0
X	21823.69	22007.16	3.0	base	7750.90	7902.22	3.5	x	13691.49	13870.54	3.0
smoothing	21917.98	22141.74	4.0	$1/x$	7750.90	7902.22	3.5	base	13845.22	14017.38	4.5
base	22065.98	22241.92	5.5	$\text{sqr}(x)$	7753.85	7905.17	5.5	$1/x$	13845.22	14017.38	4.5
$1/x$	22065.98	22241.92	5.5	$x + x^2$	7753.85	7905.17	5.5	smoothing	13803.60	14022.30	6.0
$x + x^2$	26272.20	26404.15	7.0	x^2	7759.22	7916.84	7.0	$x + x^2$	16852.19	16969.27	7.0
$\text{sqr}(x)$	26272.21	26404.16	8.0	X	7760.31	7917.93	8.0	$\text{sqr}(x)$	16852.20	16969.28	8.0

Appendix D

Table D.1

Socio-economic information across provinces of Denmark

	Average income (DKK)- 2016	Employment rate 2016	Average area per dwelling (m ²)-2018
All Denmark	223,438	72.8	112.2
Province Byen København	223,635	72.3	84
Province Københavns omegn	255,631	73.8	97.5
Province Nordsjælland	276,241	77.1	117.8
Province Bornholm	193,344	69.3	123.3
Province Østsjælland	243,164	76.7	115.1
Province Vest- og Sydsjælland	268,030	70.8	118.7
Province Fyn	204,770	69.0	115.9
Province Syddjylland	211,571	73.4	122.5
Province Østjylland	221,133	72.5	113.8
Province Vestjylland	212,054	74.8	128.0
Province Nordjylland	204,872	71.7	121.9

Table D.2

Livestock by type, region and unit

	Cattle	Pigs
All Denmark	1,545,417	12,307,667
Province Byen København, Province Københavns omegn and Province Nordsjælland	10,331	69,403
Province Bornholm	16,318	252,249
Province Fyn	92,031	1,267,506
Province Syddjylland	530,621	2,561,384
Province Østjylland	130,595	1,794,530
Province Vestjylland	340,625	2,447,197

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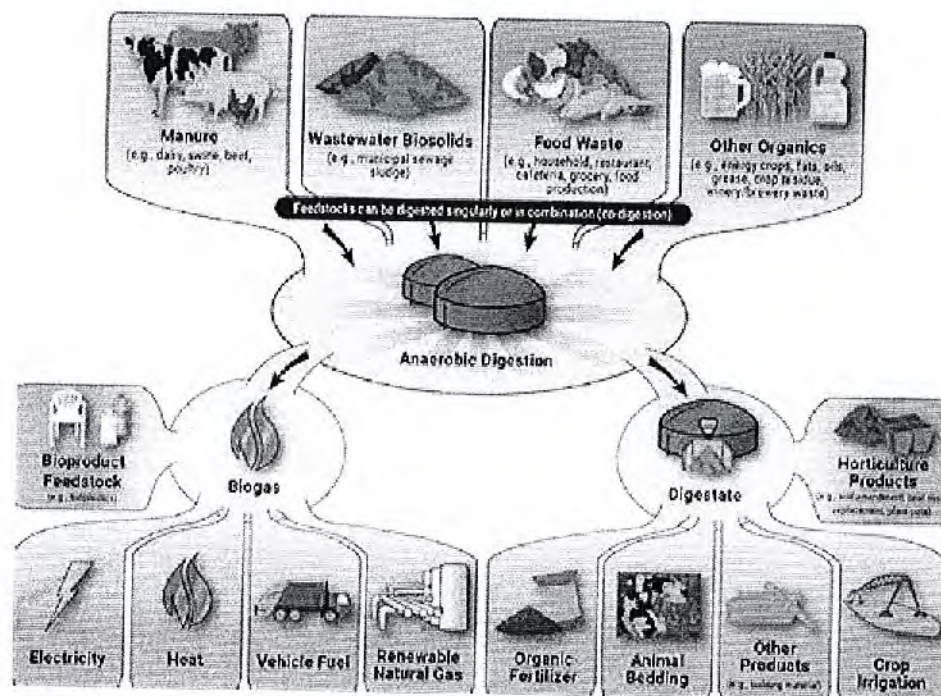
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Attachment 18:

**Reasons Why Townships Should Continue to Have Local Control
Over On-farm Co-digesters**

Reasons Why TOWNSHIPS SHOULD CONTINUE TO HAVE LOCAL CONTROL OVER CO-DIGESTERS



Source:

<https://circuitaborrano0q1.z21.web.core.windows.net/biogas-production-process-diagram.html>

On-farm co-digesters have less stringent rules and oversight than other co-digesters such as municipal wastewater treatment plants. Adding industrial food waste to manure and farm process waste water makes co-digesters industrial facilities and are rightly classified as solid or hazardous waste facilities. Current regulations do NOT necessarily require that feedstocks (manure and/or industrial food manufacturing or food processing waste) for co-digesters be tested prior to inputting them into a co-digester nor do they require the digestate (byproduct of digestion) be tested for PFAS/other "forever chemicals," other pathogens, heavy metals, or microplastics prior to land application or when used for irrigation.

*Comparing Regulations for Land Spreading Across Industries
with Anaerobic Digesters in Wisconsin*

	On-Farm Animal Feeding Operations Regulations	Landfill Solid Waste Regulations	Wastewater Domestic Sewage Sludge Management Regulations
Sampling Regs	Manure, process wastewater and soil on fields used for land application shall be sampled by the permittee in accordance with this chapter and WPDES permit conditions. Manure or process wastewater shall be analyzed on at least an annual basis for nitrogen, phosphorus and percent solids in years when the manure or process wastewater is applied. The department may require more frequent monitoring and monitoring for other parameters as part of a WPDES permit where necessary to provide representative samples of manure and process wastewater. Manure and soil samples shall be analyzed by a laboratory certified under s. ATCP 50.50. Samples of process wastewater that are not mixed with manure shall be analyzed using applicable methods specified in ch. NR 219. The department may specify alternative methods for sampling in the WPDES permit. The permittee shall submit appropriate quality control information for sampling and analysis upon written request of the department. Note: NRCS Standard 590 requires soil testing once every 4 years.	Analysis of the waste material for the following parameters. The limit of detection and the limit of quantitation shall be reported with the sample results. If a substance is detected below the limit of quantitation, the detected value with the appropriate qualifier shall be reported. 1. pH. 2. Nutrient content including Kjeldahl-nitrogen, ammonia-nitrogen, nitrate and nitrate-nitrogen, phosphorous and potassium. 3. Salt content including chloride, fluoride and sulfate. 4. Biological populations including total coliforms, fecal coliform and any virus present in the waste material. 5. Metals content including aluminum, barium, beryllium, cadmium, copper, iron, manganese, magnesium, sodium, strontium and zinc. 6. A bulk chemical analysis for additional analytes may be required by the department based on the information provided in pars. (a) to (d).	A representative sample of the sludge shall be analyzed by the permittee as specified in the permit, for any or all of the following parameters, depending on the treatment facility size, processes used for treatment, methods of beneficial use or disposal, and characteristics of industrial discharges to the treatment facility: 1. Characteristics such as the percentage of total solids, volatile solids, pH and specific oxygen uptake rate (SOUR). 2. Nitrogen, phosphorus and potassium. 3. Arsenic, beryllium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium and zinc. 4. Fecal coliform, salmonella, enteric viruses and viable helminth ova. 5. Selected phenolics, pesticides, toxic substances and persistent organics. 6. Priority pollutant scan. 7. Toxicity characteristics leaching procedure (TCLP) test if landfilling. 8. Paint filter test if landfilling. 9. Any other parameters which the department determines may be present in the sludge and which may result in detrimental effects to public health or the environment.

Analysis of Regulations
Conducted by
Dr. Sarah D'Onofrio

On-farm co-digesters are generally not owned or operated by the farmer. The farmer leases his land and supplies manure and process wastewater from the farm to the codigester company. Co-digester companies have no "skin in the game" locally and their loyalty lies with making money for their shareholders. They rely heavily on taxpayer incentives, tax credits, tipping fees for taking all the industrial food waste, and carbon credits schemes which they sell to industrial polluters so that these companies can claim net-zero without actually cutting their own greenhouse gas emissions.

Co-digesters (touted as the newest manure management technique) do NOT significantly reduce the amount of manure. Mixing manure daily with tons of industrial food waste magnifies the waste problem. Waupaca County should NOT become a "dumping ground" for industrial food waste that other communities do not want.

In the Town of Lind example: 9,274,741 gallons/year of manure and process wastewater along with 19,079,468 gallons/year of off-site industrial food waste. Storage for waste volume on the farm would be 18,495,540 gallons between the current waste storage pit and the permeate waste storage facility. This did not include the 5% (953,973 gallons of solid waste that would be separated from the liquid waste). The nutrients from the industrial food waste brought into the farm's permit would have exceeded what acreage there was available for land application under the WPDES permit.

Mixing manure with industrial food waste changes the chemical composition and makes the digestate (by-product of codigestion) higher in nutrients and more water soluble risking increased leaching into soil and runoff into surface and ground water and/or nearby wells.

- Several risks are associated with the application of digestate to land including: a. Nutrient leaching: excessive application can lead to nutrient runoff, polluting waterways. b. Pathogen Contamination: Digestate may contain pathogens that can affect soil and water quality; c. Ammonia emissions: The application process can release ammonia, contributing to air pollution; d. Heavy metal Accumulation: Some digestate sources may contain heavy metals that accumulate in the soil. Land application exacerbates sedimentation problems and runoff of nitrates and phosphorus can lead to nutrient pollution, causing excessive growth of algae in water bodies, known as algal blooms. These blooms deplete oxygen levels in water, creating "dead zones" where aquatic life cannot survive, ultimately harming fish and other organisms, and habitat.

<https://www.usgs.gov/water-science-school/science/nitrogen-and-water>
<https://www.epa.gov/nutrientpollution>

Industrial food waste and food packaging contains "forever chemicals" such as PFAS and PFOS and the potential for antibiotic resistant bacteria/genes and other pathogens, heavy metals, and microplastics that are NOT destroyed during the codigestion process, particularly in on-farm co-digesters which generally operate at temperatures of 86° to 104° F. These contaminants remain in the digestate (byproduct) of codigestion and when spread on the land have the potential to pollute our soil, ground and surface water, and nearby wells. Microplastics in digestate refer to tiny plastic particles found in organic fertilizers produced from the anaerobic digestion of organic waste. These microplastics can accumulate in agricultural soils and potentially affect soil health and crop growth.

The following chart shows the type of Industrial food waste that often goes into a co-digester along with the contaminants found in each of the waste streams. Sources are listed in second graphic:

Manure Only Digester Inputs	Contaminants
Liquid Manure	Microplastics, pathogens (Campylobacter, Escherichia coli O157:H7, Salmonella, Listeria, Cryptosporidium, and Giardia), hormones, high concentration of salt, dietary supplements, and antibiotics
Process Wastewater	Sanitizers, disinfectants, heavy metals
Co-Digester Inputs	Contaminants
Liquid Manure	Salmonella, Listeria, Cryptosporidium, and Giardia), hormones, high concentration of salt, dietary supplements, and antibiotics, hormones, pesticides
Process Wastewater	Sanitizers, disinfectants, heavy metals, manure, urine,
Industrial Food Waste	Microplastics, Per- and polyfluoroalkyl substances (PFAS & PFOS), Polycyclic aromatic hydrocarbons (PAHs), pesticides, Polychlorinated biphenyl (PCBs), heavy metals, mycotoxins, bacteria, mold, heavy metals, biological oxygen demand (BOD), biogenic amines, endocrine disrupting chemicals, pharmaceutical residuals, antibiotic resistant bacteria, coagulants and flocculants ;
Agricultural By-Products/ Crop Residues	Mycotoxins, herbicides, pesticides, heavy metals, VOCs, pathogenic microorganisms
FOG (Fats, Oils, and Greases)	Mycotoxins, pesticides, heavy metals, PFAS
Slaughterhouse Waste	sanitizers, disinfectants, bones, antibiotics (doxycycline, chlortetracycline, and sulfadiazine), cationic and anionic surfactants, pathogenic bacteria (Salmonella spp., Listeria sp., E. coli, Shigella sp., and Staphylococcus sp.)
Brewery Waste	Acidic and alkaline solution residue, coloring agents, process water additives , pfas ;
Milkhouse Wastewater	Sodium hydroxide (caustic soda), trisodium phosphate, nitric acid, phosphoric acid, chlorine dioxide, antifoaming agents

Sources

Manure	https://pubmed.ncbi.nlm.nih.gov/articles/PMC7166490/ https://doi.org/10.1016/j.envadv.2023.100977 https://archive.epa.gov/ada/web/html/catos.htm https://www.ars.usda.gov/arsuserfiles/20360500/pdf/pubs/P2193.pdf https://www.epa.gov/pubs/pubs/efo_ch5.pdf https://extension.okstate.edu/fact-sheets/anaerobic-digestion-of-animal-manures-inhibitory-and-toxic-materials.html
Process Wastewater	https://extension.okstate.edu/fact-sheets/anaerobic-digestion-of-animal-manures-inhibitory-and-toxic-materials.html
Industrial Food Waste	https://www.sciencedirect.com/science/article/abs/pii/S0269749122000744 https://www.getchemready.com/wastewater-treatment/wastewater-treatment/chemicals/ https://pubmed.ncbi.nlm.nih.gov/articles/PMC8904211/ https://pubmed.ncbi.nlm.nih.gov/articles/PMC11587131/ https://pubmed.ncbi.nlm.nih.gov/articles/PMC9218000/ https://pubmed.ncbi.nlm.nih.gov/articles/PMC10082687/
FOG/Agriculture by-products, crop residues	https://pubmed.ncbi.nlm.nih.gov/articles/PMC10749815/ https://adaptorsources.org/newsroom/wran-research-persistent-herbicides/ https://pubmed.ncbi.nlm.nih.gov/articles/PMC8426456/ https://extension.okstate.edu/fact-sheets/anaerobic-digestion-of-animal-manures-inhibitory-and-toxic-materials.html https://pubmed.ncbi.nlm.nih.gov/articles/PMC7606550/
FOG	https://doi.org/10.1016/j.psc.2021.02.001 https://www.mdpi.com/2304-8158/12/13/2624 https://pubmed.ncbi.nlm.nih.gov/articles/PMC2552645/
Brewery Waste	https://www.des.nh.gov/sites/gz/files/ehbhm341/files/documents/2020-01/wastewater-emps-breweries.pdf https://pubs.acs.org/doi/10.1021/acs.est.4c11265
Slaughterhouse Waste	https://www.sciencedirect.com/science/article/abs/pii/S2589014X22001906 https://pubmed.ncbi.nlm.nih.gov/articles/PMC8477996/
Milkhouse Wastewater	https://agriculture.institute/milk-processing-packaging/types-of-cleaning-agents-dairy-industry/ https://www.spilmas.com/knowledge-base/online-doodle-in-dairy-processing-enhancing-milk-quality-and-safety/

Digestate and “Forever Chemicals”: Millions of people in Wisconsin get their water from public water systems. About 355,000 Wisconsinites are served by systems that **Do Not Meet** the EPA standards for PFAS according to Clean Water, April 10 2024. Case in point is the City of Waupaca, where testing of water for Total PFOS and PFOA resulted in a 3.22 ppt, 460X the EWG’s health guideline of 0.007ppt. **Source: EGS’s Tap Water Database.** In a county like Waupaca County, where PFAS and nitrates are already present in public and private water systems, additional inputs from an anaerobic co-digester facility could elevate contamination levels.

Digestate contains more nutrients such as nitrates and phosphorus and is more water soluble. (Pranckietiene et al. 2023; Penn State Extension 2023a &b). When excessive nutrients are spread on the land, the risk for runoff into surface and groundwater and nearby wells is increased. Nitrate contamination in Wisconsin’s drinking water is a significant public health concern. It primarily stems from agricultural practices, particularly the over-application of nitrogen fertilizers. This

has led to elevated nitrate levels in groundwater and surface water, affecting many residents. The Environmental Protection Agency (EPA) has set a maximum contaminant level of 10 mg/L for nitrates in drinking water. Many private wells in Wisconsin exceed this standard, with estimates suggesting that at least 10% of these wells are contaminated. In a county, like Waupaca County, where PFAS and nitrates are already present in public and private water systems, additional inputs from an anaerobic co-digester facility could elevate contamination levels.

[ewg/wp-content/uploads/2025/09/AGL_NitrateReport_Sept2025_Final.pdf](#)
[https://wgnhs.wisc.edu/pubshare/TR007.pdf](#)

Phosphorus and nitrate pollution significantly impair waterways in Wisconsin, leading to issues like harmful algal blooms and decreased water quality. These pollutants primarily come from agricultural runoff, which poses risks to both aquatic life and human health.

[https://dnr.wisconsin.gov/topic/SurfaceWater/ConditionLists.html](#)

[https://www.ewg.org/research/double-trouble-wisconsins-land-and-water-are-inundated-pollution-animal-manure-and-excess](#)

[https://www.wpr.org/environment/wisconsin-dnr-adds-51-waters-its-list-polluted-waterways](#)

[https://www.epa.gov/tmdl](#)

Waupaca County already has 26 waterways with impairments according to the Wisconsin DNR's website's impaired water search tool. These impairments include elevated phosphorus levels that require a TMDL (total maximum daily load), High PCBs, High Mercury levels, elevated water temperatures resulting in degraded biological communities, degraded aquatic vegetation.

Anaerobic co-digesters flare off toxic gases during startup, during process upset (when whatever is fed into the digester causes the digestion process to react negatively much like when humans have a stomach upset), and when gas cannot be injected into a pipeline. Additionally, methane is leaked throughout the codigestion process and continues to be emitted when digestate is not covered.

Anaerobic co-digesters/digestate generate harmful air pollutants including ammonia and hydrogen sulfide, and volatile organic compounds (VOCs) which

contribute to respiratory issues, eye and lung irritation, and environmental degradation of air quality.

Hazardous Air Pollutants from Anaerobic Digesters

Anaerobic digesters produce biogas through the breakdown of organic materials in the absence of oxygen. While this process generates renewable energy, it also releases several hazardous air pollutants.

Main Pollutants

Pollutant	Description	Health Effects
Methane (CH ₄)	A potent greenhouse gas, 25 times more effective than CO ₂ at trapping heat.	Contributes to climate change.
Carbon Dioxide (CO ₂)	A byproduct of burning biogas for energy.	Contributes to global warming.
Hydrogen Sulfide (H ₂ S)	A toxic gas that can cause respiratory issues and is lethal in high concentrations.	Can lead to asphyxiation and death.
Ammonia (NH ₃)	Released during the digestion process.	Can irritate the eyes, skin, and respiratory tract.

Nitrogen Oxides (NO _x)	Produced during combustion of biogas.	Contributes to smog and respiratory problems.
Sulfur Dioxide (SO ₂)	Emitted during biogas combustion.	Can cause respiratory issues and acid rain.

The presence of biogas, which is highly flammable, increases the risk of fires and explosions or asphyxiation accidents/deaths near digesters. Rural volunteer fire departments, emergency medical personnel, and emergency government agencies are ill prepared for digestate spills, digester fires, or explosions. These preparedness costs are rarely reimbursed by the facility

<https://www.thegazette.com/agriculture/iowa-osh-a-investigating-state-center-dairy-digester-after-fire-gas-leaks/>

<https://www.ingstadmedia.com/manure-spill-due-to-a-tank-failure/>

<https://www.msn.com/en-us/public-safety-and-emergencies/health-and-safety-alerts/firefighters-extinguish-fire-at-poso-creek-family-dairy/ar-AA1GUeBI>

<https://iowascapitaldispatch.com/2024/07/19/farm-field-drainage-failure-leads-to-creek-contamination-dead-fish/>

<https://koel.com/iowa-dairy-fined-after-workers-chose-to-ignore-massive-spill/>

https://www.gmtoday.com/news/illinois/report-says-diver-drowned-while-working-in-iowa-farm-tank/article_188c0d68-f0ad-11eb-8173-3f68d1fd252a.html

When manure is mixed with any type of industrial food processing or food manufacturing waste, the digestate (byproduct of co-digestion) becomes either industrial wastewater or industrial waste slurry according to the WI DNR. Excess industrial wastewater is often discharged into nearby wetlands or streams and becomes a new point source of pollution.

In the case in the Town of Lind, the WI DNR was asked to allow 41,000 gallons per day of industrial waste water to be discharged into a ditch that drained into Walla Walla Creek. Walla Walla Creek is a Class 2 trout stream that drains into the Wolf River to the Fox River to Lake Michigan. This would have been considered a new point source of pollution and would have required water quality trading as the wetland was already under a TMDL (total maximum daily load).

Without the ability to place conditions on a codigester located on agricultural zoned land, townships will NOT be able to put limits on the amount of industrial

food waste being brought into the township. In the case in Lind, 225 tons of industrial food manufacturing/processing waste per day. In Eden, WI up to 500 tons of industrial food waste per day on a 400 animal unit farm.

Increased truck traffic due to importing tons of industrial food waste/day from outside the community and transporting the excess digestate often results in significantly increased truck traffic per day on rural roads. This heavy traffic on rural roads creates congestion and increases the risk of accidents. Increased truck traffic often accelerates pavement wear and produces shoulder erosion resulting in road degradation and need for costly road repair not covered by the codigester company. Rural communities do NOT have the infrastructure or resources and the financial burden falls upon local taxpayers and public budgets.

Property Values: In many areas, studies have shown that property values have dropped by 5-15% within 2 years of the startup of a codigester. Decreased property values results in decreased property tax revenue for Townships.

Odour	Biogas plants handle large amounts of organic waste, leading to strong smells.	Deters potential buyers, lowering demand for nearby properties.
Noise and Traffic	Increased heavy vehicle traffic for deliveries causes noise pollution.	Makes areas less attractive, especially for those seeking quiet.
Visual Intrusion	Industrial structures can dominate rural landscapes.	Reduces aesthetic appeal and recreational value of properties.

Source: <https://www.sciencedirect.com/science/article/pii/S0301421519301715>

Odors: Decomposing organic material releases strong, unpleasant odors from waste reception areas and digestate storage tanks or lagoons, particularly in warmer months. Gases such as hydrogen sulfide and ammonia are often released. <https://www.sciencedirect.com/science/article/abs/pii/S004896972304768X>

Food waste anaerobic digestion plants underestimate air pollutants and control strategies.

<https://ecori.org/johnston-anaerobic-digester-odors-causing-problems-for->

[https://www.ohioattorneygeneral.gov/Media/News-Releases/September-2023/AG-Yost-Announces-Shutdown-of-Renergy-Fould Smell](https://www.ohioattorneygeneral.gov/Media/News-Releases/September-2023/AG-Yost-Announces-Shutdown-of-Renergy-Fould_Smell)

https://www.cleveland.com/metro/2017/06/collinwood_residents_hold_their.html

Noise: Continuous truck traffic and facility machinery increase noise pollution, especially during early morning or nighttime operations and this risk is even higher when Townships are not able to put conditions on a co-digester facility such as times and days of operation.

<https://invc.com/resources/noise-control-case-studies/remote-control/e-control-anaerobic-digester-noise/>

To protect soil, water, nearby wells, and air quality testing and ongoing monitoring is essential. Without local control, who will be financially responsible for the ongoing costs of water, soil, private well, and air testing? These costs will end up being borne by local townships if the codigester operation fails to provide full monitoring coverage.

If contamination spreads to private wells, streams or farmland, remediation could involve well replacement, long-term water filtration systems, or soil excavation and removal/disposal of contaminated soil. These costs will end up being borne by local townships if codigester operation fails to provide full coverage for these necessary expenses to protect the health, safety and well being of the citizens and environment.

If local control and being able to place conditions on a codigester is removed, believing in and relying on the EPA and DNR to have our backs is risky. Both agencies are understaffed, under-resourced and lack the muscle to enforce current regulations. Neither agency has sufficient research data to support the safety of co-digesters or land application of digestate. Both agencies are being pressured by special interest groups to approve these co-digesters facilities as quickly as possible. The Clean Air and Clean Water Acts are currently facing significant rollbacks under the current administration, which is aiming to weaken regulations that protect air and water quality. These changes could lead to increased pollution and health risks for Americans, particularly affecting vulnerable communities.

Ultimately, while an anaerobic digestion facility may promise environmentally friendly renewable energy, there are limited economic benefits for a Township with many secondary costs. Secondary costs range from increased health risks to humans, degraded living conditions and decreased property values; environmental concerns for our soil, ground and surface water and nearby wells as well as increased air pollution; increased infrastructure costs including road damage and cleanup expenses should spills or contamination of soil or water occur. Townships will see decreased revenue because co-digesters that produce gas are considered utility companies in Wisconsin and therefore are not required to pay property taxes unless an agreement for payment in lieu of taxes is entered into prior to building the facility. Without Local Control there will be NO local enforceable oversight, no conditions placed on a facility to protect the health, welfare, safety of local residents or good order of the community, no mitigation requirements, no financial assurances or long-term accountability, and these burdens will ultimately fall on local townships and residents.

Attachment 19:

U.S. Congressional Representative, Majorie Taylor Greene's Letter in Support of Murray County, GA's Opposition to a Co-digester

MARJORIE TAYLOR GREENE
1400 Belmont, Georgia
Committee on Oversight and Accountability
Chairwoman, Subcommittee on Environment
Committee on Environment and Public Safety



JOHN MARSHALL GREENE
Washington, D.C. 20515

Congress of the United States
House of Representatives

November 7, 2025

Director Jeffrey Cown
Georgia Environmental Protection Division
2 Martin Luther King Jr. Drive SE
Suite 1456, East Tower
Atlanta, GA 30334

Dear Director Cown,

I am writing to request that you consider the Murray County community's concerns regarding an upcoming approval hearing for a project located at 3845 Berry Bennett Rd., Chatsworth, GA, 39705. The Murray County community is petitioning that their health and neighborhood homes be protected from an incoming food and animal waste processing facility planned for development in Chatsworth.

In Murray County, located in Northwest Georgia, Vanguard Renewables is currently scheduled to construct a biowaste processing and methane gas facility that will process industrial and agricultural waste into renewable natural gas and low-carbon fertilizer. The community strongly opposes the construction of this new facility and is concerned that it would hurt their community with its potential release of ammonia, hydrogen sulfide, PFAS chemicals, and other toxic substances detrimental to respiratory health and the overall well-being of the people. More than 3,090 residents have signed a petition opposing the incoming anaerobic waste facility, and my office has received an outpouring of phone calls and messages in strong opposition to it. I ask that you please consider the public outcry of opposition, which has been never ending since the announcement of the plant. The members of the community do not want such a toxic processing facility in their backyard.

These types of processing plants have a history of damaging communities across the country. Lawsuits have been filed in Florida, Colorado, and Texas by farmers and residents of the community who have experienced gas leaks, unbearable odors, and polluted soil and wells.

On December 4, 2025, Georgia's Environmental Protection Division is scheduled to hold a public hearing regarding the necessary permit awaiting approval for the facility. The community of Murray County respectfully requests that the permit be denied due to the significant health risks posed by the waste facility. I support the community's efforts in advocating for clean air and safe drinking water, and I ask that you take their thoughts and concerns into consideration as you evaluate Vanguard Renewables' permit application.

Thank you for your consideration.

Sincerely,

Marjorie Taylor Greene
Member of Congress

Attachment 20:

**The Misbegotten Promise of Anaerobic Digesters
The Deceptive Promise of Biogas as a Methane Solution
Hard to Digester: Greenwashing Manure
Additional Articles**

The misbegotten promise of anaerobic digesters

by [Jessica McKenzie](#)
12.03.2019, 9:30am

Environment

(B)

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[Flickr/USDA/Lance Cheung](#)

Investigations Part 01

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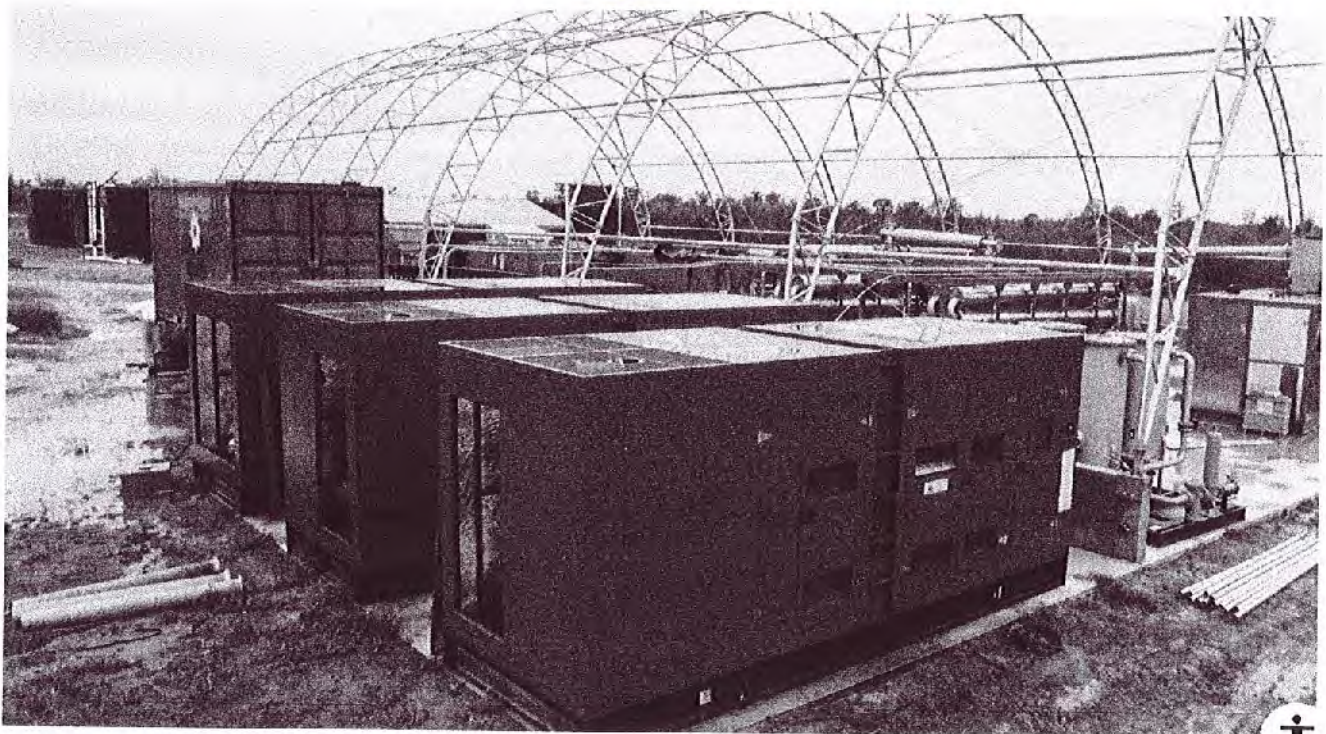
Federal agencies and state governments are spending millions on anaerobic digesters to wring renewable energy from animal poop. But critics say



“cow power” from factory farms is neither clean nor green.

At a glance, anaerobic digesters seem like the perfect solution to one of society's many messes: They take the waste from cows, pigs, and chickens raised en masse for human consumption, and from literal shit generate energy to power our cars, homes, and electronics. What could be more renewable than manure?

To that end, last year, the New York State Energy Research and Development Authority (NYSERDA) announced \$16 million in funding for new and existing on-farm anaerobic digesters, an additional windfall for a sector that has already received more than \$26 million from the agency. It's a big investment, but NYSERDA is just one government agency bankrolling the digester industry: A database of renewable energy policies and programs across the country lists 96 financial incentives for anaerobic digesters, including property tax reductions, corporate tax credits, loan programs, grant programs, and performance-based incentives.



Because methane is calculated to be 25 times more potent a greenhouse gas than carbon dioxide, burning it for fuel and releasing carbon dioxide is still considered to be a greenhouse gas reduction

Flickr/USDA/Lance Cheung



The thing is, digesters are expensive: expensive to build, expensive to maintain. They can sometimes generate enough energy to power an entire farm, reducing one big bill and offsetting the cost of the digester, but the excess energy isn't usually so excessive that selling it back to the grid nets the farm significant profits. Without outside funding, it simply doesn't make financial sense for most farms to build or operate a digester. The question is, do the environmental benefits justify significant—and ongoing—public investment?

Critics say absolutely not. While biogas from digesters may be renewable, it is hardly “clean” or “green” in the way most people understand those concepts. The biogas produced through anaerobic digestion is a mix of methane, carbon dioxide, and other trace gases. Burning biogas for energy converts methane into carbon dioxide, and also produces carbon monoxide, nitrogen oxides, sulfur dioxide, and other hazardous air pollutants. The carbon dioxide generated during anaerobic digestion and during the combustion of methane is released into the atmosphere.

The only reason that anaerobic digesters can be considered a “green” technology is because methane is calculated to be 25 times more potent a greenhouse gas than carbon dioxide, so burning it for fuel and releasing carbon dioxide into the atmosphere instead is still considered to be a greenhouse gas “reduction.”

Manure releases methane only when it decomposes in oxygen-free (anaerobic) conditions, like a pit or lagoon.

But are digesters even necessary? Around 80 percent of digesters in the U.S. are on dairy farms, but methane emissions from manure deposited on fields from pastured cows are virtually nil. Manure releases methane only when it decomposes in oxygen-free (anaerobic) conditions, like a pit or lagoon. Most of the livestock farms that store manure in pits or lagoons are large concentrated animal feeding operations (CAFOs) where animals are confined for more than 45 days of the year. So, critics say, anaerobic digesters are solving problems only created by large-scale factory farming in the first place, problems that are avoided in more sustainable systems, especially pasture-based ones.



This purportedly green technology has divided environmentalists into two camps: The first, which includes organizations like the World Wildlife Fund and the Environmental Defense Fund, are those who think that anaerobic digesters make the best of a bad, but inevitable, situation. The second group, which includes Food & Water Watch, says the government is greenwashing and subsidizing factory farming at the expense of sustainable producers and genuinely clean, renewable energy like wind and solar.



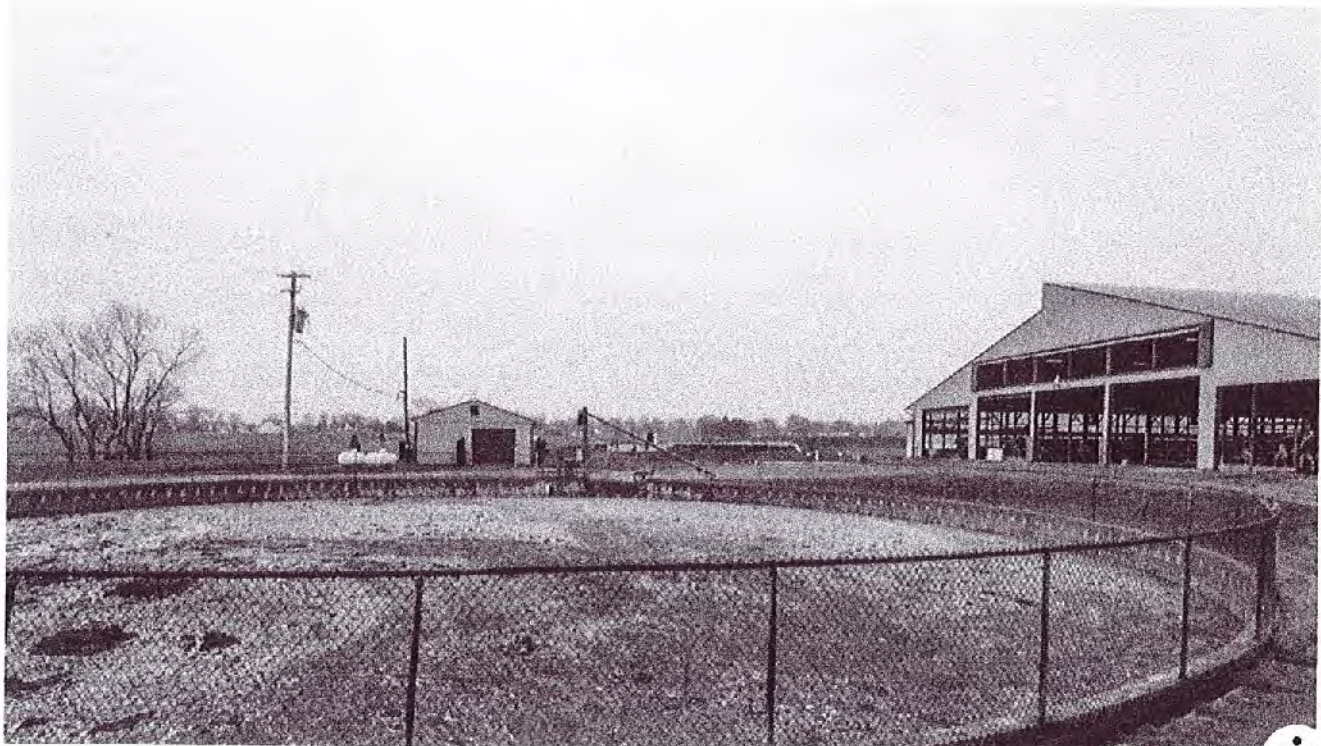
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Every day, a 1,400-pound dairy cow will generate about 120 pounds or 14 gallons of feces and urine. At larger dairies, that can really add up. Take Fair Oaks Farms in Indiana, for example, home to 38,000 dairy cows. One of Fair Oaks' on-site digesters takes in 650,000 gallons of manure from 15,000 cows every day—and that is less than half of the manure the farm produces. It is an almost unfathomable amount of cow crap. Without a digester, disposing of it all is tricky, and the more you have, the harder it is.



There are two options for most farms—spreading and storing, or some combination of the two. Daily spreading is exactly what it sounds like: Collecting the manure, loading it into a mechanized spreader, driving out, and spraying it on cropland and pasture. Manure is rich in essential soil nutrients—nitrogen, phosphorus, and potassium—so it can be a good fertilizer, and as long as the spreading is done quickly, it emits very little methane. However, daily spreading has some downsides, especially if one has to spread when conditions are poor: Spreading on saturated ground can compact and degrade the soil, and spreading too heavily or in the winter when the ground is frozen can result in manure run-off. While nitrogen, phosphorous, and potassium can be beneficial for cropland, excessive amounts in streams, rivers, and lakes can cause toxic algal blooms and hypoxia, leading to aquatic “dead zones” where marine life can’t survive.

The alternative to spreading is to indefinitely store the manure until it can either be spread on the ground or hauled away. Smaller farms might stockpile dry manure under a tarp or in a three-sided structure with an impervious floor, to prevent the manure from contaminating the water table, or they might compost it with straw and other organic waste.



Giant swimming pools of liquid manure are oxygen-free environments, and manure stored in them releases methane, carbon dioxide, and other noxious gases that can be fatal

Flickr/USDA/Lance Cheung



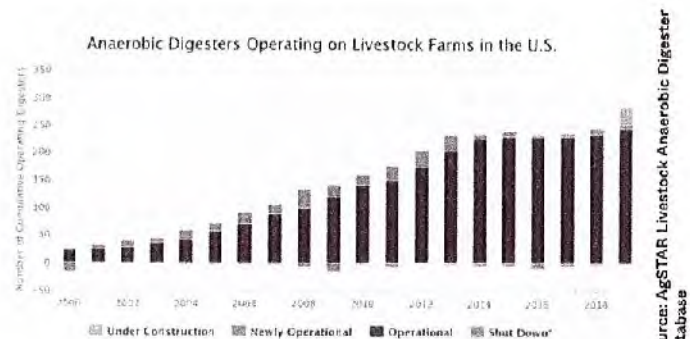
Larger farms are more likely to build giant pits or lagoons to store liquid manure. Like digesters, these giant swimming pools of liquid manure are oxygen-free environments, and manure stored in them releases methane, carbon dioxide, and other noxious gases that can be fatal to humans and animals. They are also vulnerable to structural failures and extreme weather events, which can cause storage pits to overflow or leak.

After Hurricane Florence in 2018, millions of gallons of hog manure flooded North Carolina. In 2013 alone, Wisconsin farms spilled more than one million gallons of manure. These accidents pollute the environment with nitrogen, phosphorous, and potassium, but raw manure can also contain hormones, antibiotics, and bacteria like E. coli. And then there's the smell.

Anaerobic digesters were supposed to help with all that.

With only 400 cows, Wagner Farms is an unusually small dairy to have an on-site anaerobic digester, and the smallest in New York to own and operate one. Less than 15 miles from Albany, the surrounding area is surprisingly suburban, with single-family homes set into neatly trimmed lawns.

Keith Wagner, the farm's anaerobic digester operator, says their location restricts how much the third-generation family farm can grow. Fields are smaller and harder to come by near Albany than they are in the western part of the state. That was one reason Wagner Farms invested in an anaerobic digester a decade ago.



The chart below shows the growth in the number of cumulative operating digester projects on livestock farms



"The idea was, instead of growing larger, you know, we wanted to grow vertically instead of horizontally," Wagner says, although the payoff hasn't been as high as they hoped. Wagner would like to see New York institute something like Vermont's Cow Power program, which pays farmers for the energy generated, plus an additional four-cents per kilowatt-hour "for the environmental benefits."

Even just 400 cows produce a lot of manure. It's collected in an enormous vat housed in an outbuilding with red siding and a sloped roof. The manure is scraped directly from the surrounding barns into the pit with a skidsteer, which is kind of like a snow plow, but used here for cow poop; the rest is hauled in with a dump truck and unloaded "right here where we're standing."

At our feet is a semi-circular hole at least eight feet wide, with an open metal flap like a giant's toilet seat cover. The lid, rim, and floor are splattered with dark brown muck, and the adjacent walls are caked up to the ceiling. Inside the pit, a grayish, greenish-brown soup swirls, moved by submerged blades. The pit beneath our feet can hold 12,000 gallons of manure and Wagner says they get about that much every day. Periodically, unseen pipes empty their contents into the cauldron with a splash. A giant bubble of gas rises to the surface and bursts, thickly. The stench is momentarily overwhelming.

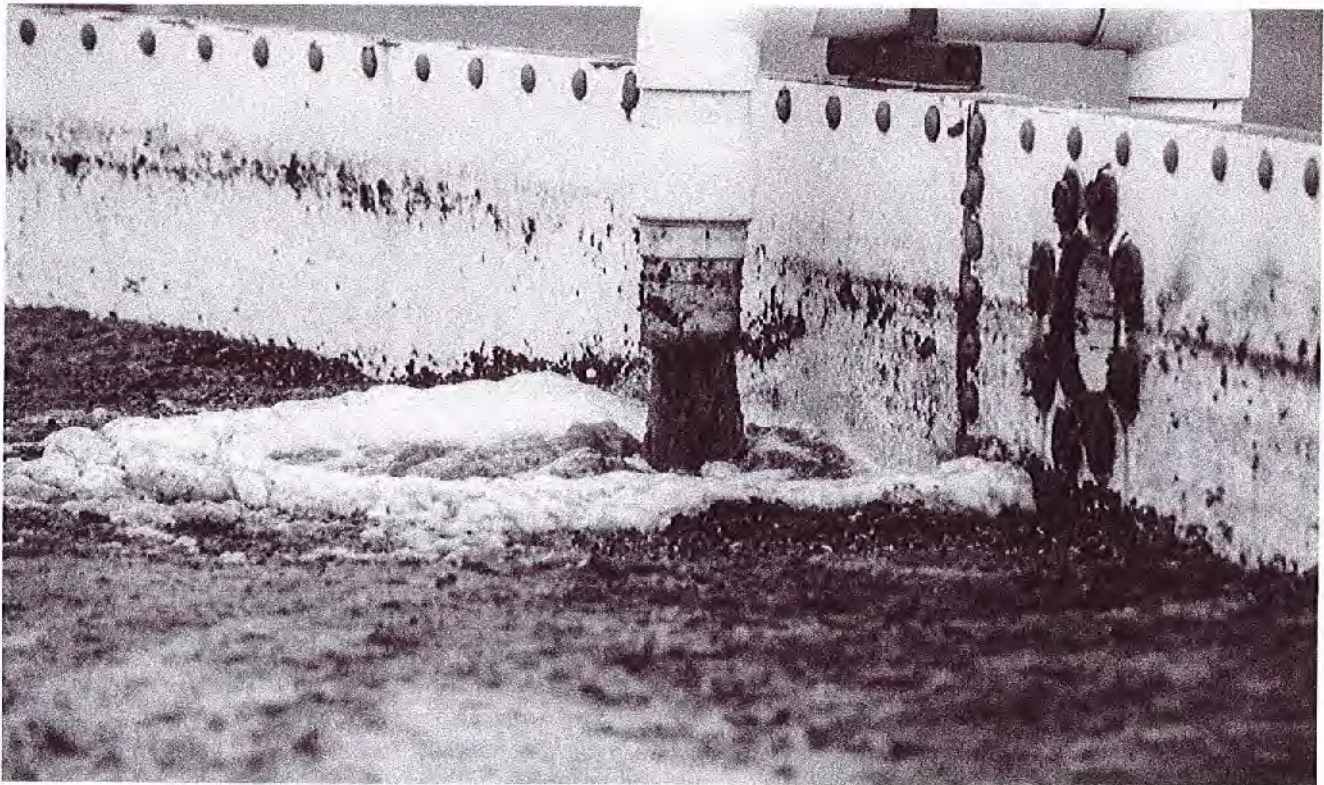
Interest in anaerobic digesters in the United States first peaked during the fuel shortages of the 1970s.

The shit slurry in front of me is the first step to converting manure into biogas through anaerobic digestion. Once in the pit, propellers agitate the manure so that it isn't too clumpy or thick to pump. Wagner Farms sometimes adds food scraps to the mix, which both increases the amount of biogas produced and brings additional income to the farm in the form of "tipping fees," or payment from towns or companies for disposing of food waste. The manure is pumped into the digester twice an hour, Wagner says, five to eight minutes at a time. The digester itself can hold up to 265,000 gallons of manure.

Inside the digester it's basically like "one giant heated swimming pool," says Wagner.

Bacteria eat the organic matter in the manure, producing methane, carbon dioxide, and trace amounts of ammonia and hydrogen sulfide. Those gases rise to the ceiling of the soft-top digester. The biogas is then piped from the digester to a generator that produces the electricity that powers the farm; any excess electricity is traded back to the grid through remote net metering and the Wagners get a credit on their next electricity bill.

The remaining effluent from the digester is separated into solids and liquids: The solid digestate is like fibrous compost, dry and fluffy to the touch when I crumbled a handful between my fingers. It smells earthy, but not unpleasantly so. Wagner Farms uses this as bedding for their cows. The liquid digestate flows into a pit lagoon to be later spread over the 1,000 acres on which Wagner Farms grows forage crops.



A database of renewable energy policies and programs across the country lists 96 financial incentives for anaerobic digesters

[Flickr/USDA/Lance Cheung](#)

Sometimes, the digester produces more biogas than the generator can handle. When I visited, excess methane from the digester was being regularly flared off—burned, but not for energy—so that the digester wouldn't explode from being too pressurized. Essentially it was like watching money and energy disappear into the wind—greenhouse gas emissions

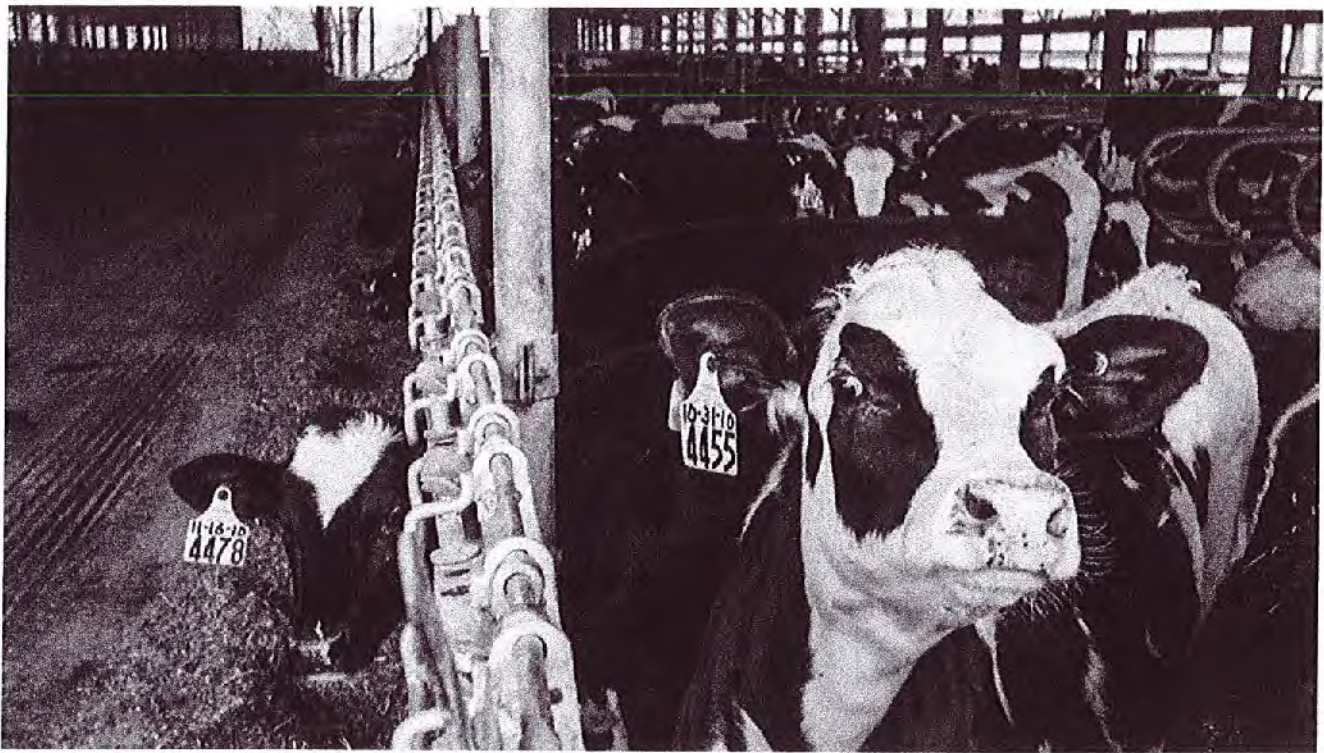


with no benefit to Wagner Farms, or the energy grid. When asked how much methane is flared off, Wagner said he didn't know because there wasn't an incentive to monitor that.

Investment in anaerobic digesters in the United States first peaked during the energy crisis of the 1970s, when fuel shortages prompted many Americans to start thinking about energy alternatives. But enthusiasm waned in the '80s for several reasons: The price of oil dropped, digesters had a high rate of failure, and they became prohibitively expensive to fix and maintain. Around 85 percent of anaerobic digesters shut down, and by 1994 there were only 25 operating in the country.

Interest ticked back up again in the late 1990s, in part because of a growing awareness of the greenhouse effect and in part because communities near livestock farms were demanding something be done about the smell. A significant boost came during the Obama administration, when then-Secretary of Agriculture Tom Vilsack announced that U.S. dairy farmers would cut greenhouse gas emissions by 25 percent. But some advocates for family-owned and operated farms had a problem with how Vilsack planned to achieve that.

To understand their frustration, it's important to note that the past few decades have been especially difficult for small dairies, and many have been forced to shutter. The number of dairy farms in the United States has steadily fallen over the past half century, from 648,000 in 1970 to just 75,000 in 2006. In 2018, more than 2,700 dairy farms closed, bringing the total number of dairies in the country to just 37,468. But this drastic contraction has not affected all dairies equally: Between 2000 and 2006, the number of farms with 30 to 200 cows fell by 30 percent; in that same time period, the number of farms with at least 2,000 cows more than doubled.



One of Fair Oaks' on-site digesters takes in 650,000 gallons of manure from 15,000 cows every day—and that is less than half of the manure the farm produces

Flickr/USDA/Lance Cheung

At the same time, greenhouse gas emissions from the agricultural sector have increased by 8.8 percent since 1990, and the primary driver of that increase has been manure management. The Environmental Protection Agency (EPA) cites a 57.1 percent increase in combined methane and nitrous oxide emissions from livestock manure management systems.

Greenhouse gas emissions have increased largely because of farm consolidation, because farms over a certain size have virtually no other choice but to store liquid manure, which emits more greenhouse gas emissions than other manure management systems. When the Obama administration announced that they would reward those mega-dairies with lavish grants for anaerobic digesters, it irked the small farmers raising dairy herds in environmentally sustainable ways. As Paris Reidhead reported in 2010 for *The Milkweed*, a dairy news publication, the \$20 million in funding for digesters was made available only for farms with at least 1,000 animal units; an animal unit is 1,000 pounds of animal flesh, or about 700 dairy cows.

"I was in Copenhagen at the event where Vilsack was promoting manure digesters as a solution to greenhouse gas emissions," says John Peck, the



executive director of Family Farm Defenders, a nonprofit organization in Wisconsin. “He admitted then that only 10 percent of U.S. farms will qualify.”

“It’s like a classic problem. We’re going to subsidize the worst actors to clean up their mess.”

Curt Gooch, senior extension associate at the Cornell PRO-DAIRY program—which has a contract with NYSEDA to provide support to the digester industry—thinks it’s entirely natural for government agencies to fund anaerobic digesters only on the biggest farms. “We know the economics of digesters will basically never work on a 500-cow dairy in New York,” he said. “So why would we put them on a 50-cow dairy?”

An alternative would be to put in place environmental regulations that compel agricultural producers with high greenhouse gas emissions to fund their own manure management solutions. Instead, the government forks over millions earmarked for addressing environmental problems to the very farms that create and profit from the pollution in the first place.

“It’s like a classic problem,” says Peck. “We’re going to subsidize the worst actors to clean up their mess.”

Bankrolling the worst actors with public money has, in at least one notable case in Wisconsin, backfired spectacularly. In 2010, Dane County contributed \$3.3 million for the construction of an anaerobic digester to combat manure pollution in the local watershed and regional lakes. The digester failed again and again.





Critics argue the government is incentivizing the dairy industry's worst actors to continue with business as usual

[Flickr/USDA/Lance Cheung](#)

As Jim Eichstadt reported in a 2015 issue of *The Milkweed*, in a five-month period in late 2013 and early 2014, there were three separate liquid manure spills totaling 435,000 gallons. In 2014, a fire and explosion blew the cover off one of the digesters, rendering it inoperable. On top of that, there were “numerous” air quality violations, Eichstadt wrote.

But even if all goes as planned with a digester, there are still likely to be negative environmental impacts from large operations. And it's not just greenhouse gas emissions: Water pollution from manure management is also a huge issue. Nutrients like phosphorus don't simply disappear in the digester, Peck points out.

Phosphorus pollution is a serious and growing problem, and contributes to those nasty algal blooms that can kill fish and other aquatic life, according to a 2018 study in *Water Resources Research*, a journal of the American Geophysical Union. And it's not the only potential pollutant still present in digester effluent.



“A growing body of evidence has suggested that currently available and feasible agricultural technology and practices cannot be expected to eliminate discharges into groundwater from dairies.”

“The nitrogen that is in the manure to start with doesn’t magically go away in the digester,” says Brent Newell, Food Project Senior Attorney at Public Justice. “It’s either going to go up in the air as ammonia, or it’s going to be on the ground as, you know, excess nitrogen. It’s going to pollute groundwater.”

A monitoring report prepared for the Central Valley Regional Water Quality Control Board in California found alarming “groundwater impacts” from confined animal facilities throughout the region, essentially everywhere they looked. Many of these facilities used anaerobic digesters to deal with their waste. The report came to a sobering conclusion:

digesters

“A growing body of evidence has suggested that currently available and feasible agricultural technology and practices cannot be expected to eliminate discharges into groundwater from dairies, nor alter volume or character of those discharges so that they are at or below some applicable water quality objectives. Likewise, currently available and feasible technologies and practices are not expected to result in returning groundwater quality to drinking water standards in many aquifers.”





Manure is rich in essential soil nutrients, and as long as the spreading is done quickly, it emits very little methane

USDA/Lance Cheung

Breese Hollow Dairy is 30 miles from Wagner Farms in Hoosick Falls, New York, a few miles shy of the Vermont border. The foothills of the Green Mountains frame a picturesque vision of 60 Jersey cows at pasture. The scene could have been ripped from a milk carton.

Chuck Phippen used to work on aircraft engines at Pratt & Whitney in Connecticut, but he wanted to be a grass-based dairy farmer, so 25 years ago he and his wife bought some land in Ilion, New York. When they moved the farm to Hoosick Falls 16 years ago, the 170 acres were half corn and half alfalfa. They converted everything that had been corn to a pasture mix: perennial ryegrass, orchard grass, and red clover.

Twice a day, Phippen brings the cows in to be milked, and then lets them back out to pasture. He does rotational grazing, meaning he'll fence off part of the pasture for the cows and after a while move them to a different part of the pasture, so that the grass in the first area has time to recover and regrow.

Federal and state subsidies are creating perverse incentives for more and bigger factory farms.



Manure isn't a problem in Breese Hollow. The cows go where they go. If they happen to be in the holding area, waiting to be milked, the manure is shoveled outside. There was a modest heap by a tractor, no more than knee high, waiting to be spread on the fields. Manure deposited at pasture emits negligible amounts of methane, and there is a growing body of research that responsibly grazing cows can help sequester carbon.

When the environmental benefits of anaerobic digesters are calculated, they are generally compared to the environmental costs of keeping manure in long-term storage, something that happens only on large farms with confined animals. They aren't generally compared to the kind of grass-based system that Phippen practices. Pasture-based systems can be harder to scale, but farmers also get a premium price for milk from grass-fed cattle that can help make up for that.

Phippen points out that there are other environmental costs to keeping animals permanently confined, and these aren't always accounted for when adding up the benefits of anaerobic digesters: You need to bring in grain that was grown far away in vast, unsustainable monocultures, so there is the financial and environmental toll of growing the feed and hauling it in by truck. Cows kept in confinement need more antibiotics to keep from getting sick, and chemicals to stave off hoof-rot from standing on concrete all day, every day. And then of course, if you need to build a digester to handle manure, that's expensive, too.





Some advocates believe the government is greenwashing and subsidizing factory farming at the expense of environmentally friendly producers

USDA/Lance Cheung

Phippen observes that sustainable, pasture-based dairies don't make a lot of money for the larger agricultural industry—the feed producers and the antibiotics producers and the chemical companies and the anaerobic digester designers—which could explain the lack of investment in pasture-based systems that are better for the environment as a whole.

"I totally agree with soil health, and that might be a great thing," says Phippen. "But who makes money off of that?"

Anaerobic digesters have received little critical coverage from the press. Local news outlets readily promote the "Save the farm, save the environment" storyline, and even national outlets uncritically describe biogas and methane as "renewable" or even "clean" energy sources. Just this weekend, NPR and PBS Newshour teamed up to report on the benefits of waste-to-energy systems on dairy farms.



Meanwhile, federal and state subsidies are creating perverse incentives for more and bigger factory farms: A Food & Water Watch [report](#) from earlier this year pointed out that, “multinational meat giant Smithfield Foods not only plans to push the U.S. factory farms that raise their animals to construct digesters, but also intends on building new factory farms specifically to tap into the potential to generate biogas.”

“The money being funneled into digesters is waste capital that should instead be invested in zero-emission renewable energy sources, like solar and wind.”

These perverse problems aren’t limited to the United States. Europe has wholeheartedly embraced biogas from anaerobic digesters as a “green” energy, but because processing poop alone doesn’t produce as much usable biogas as a mix of manure and food waste, some farmers have begun growing corn for the sole purpose of feeding digesters. As George Monbiot [reported](#) for *The Guardian*, that has been an environmental catastrophe, damaging soils and “threaten[ing] the fertility of the land, the health of our freshwater ecosystems and the homes at risk from flooding.”

“Biogas digesters are a false solution that do nothing to actually mitigate emissions from agriculture,” the Food & Water Watch report states. “On-farm digesters can cost anywhere from an estimated \$400,000 to \$5 million to construct depending on the size, design, and features. The money being funneled into digesters is waste capital that should instead be invested in zero-emission renewable energy sources, like solar and wind.”

Although the current administration isn’t known for loving renewable energy projects, the money is still flowing. As recently as [July 2019](#), the USDA advertised a whopping \$400 million in funding for renewable energy and energy efficiency projects for farms and other rural small businesses, which includes anaerobic digester projects. In New York, the \$26 million that NYSEERDA invested went to just 22 digesters—an enormous average per-project amount. And some of those operators could still get even more: Of the additional \$16 million in funding that NYSEERDA has announced, at least half is earmarked for refurbishing existing digesters.





As recently as this July, the USDA has advertised a whopping \$400 million to support projects like anaerobic digesters

USDA/Lance Cheung

“It’s a ton of money,” says Patty Lovera, food and water program director at Food & Water Watch. “And if that money is available from federal programs or state programs, let’s use that money for something better, to improve either renewable energy or farming practices.”

“This so-called solution, you know, further entrenches and subsidizes that corporate-controlled system,” says Newell. “We should be subsidizing family farmers who are doing the kinds of climate practices that benefit rural communities, financially and environmentally, and that put us on a path to where animal agriculture and agriculture in general is more regenerative and resilient and less extractive and exploitative.”

“[Dairy farmers] would always laugh and say, if manure ever became a problem, you were just too big for your britches.” 

The appeal of anaerobic digesters is in their simplicity: power from poop, energy from waste. But this framing is misleading—energy production was always a byproduct, never the primary goal. (If energy production was the main incentive, one might expect the companies building, installing, and operating digesters to have done a better job eliminating inefficiencies, like the need to flare off excessive biogas.) Unfortunately, as a solution for manure management, anaerobic digesters are hardly a simple or complete solution, but rather one step in an insufficient and fallible process.

When it comes down to it, the problem is not really manure, because manure is a problem only in vast amounts.

“When I was growing up my neighbors were all dairy farmers,” says Peck. “And they would always laugh and say, if manure ever became a problem, you were just too big for your britches.”

The simplest solution is obviously to not amass manure in such large quantities—but that would require a complete reversal of assumptions about market consolidation and economies of scale. On the other hand, current milk production often exceeds demand, so maybe scale isn’t what is most needed right now, especially when mass production is strongly correlated with greater greenhouse gas emissions.

Taking steps to slow or reverse the consolidation of dairies and to encourage pasture-based farming could help curb air pollution that contributes to climate change. Instead, state and federal agencies are spending many millions on making giant factory farms that are too big for their britches marginally better for the environment, and calling it “green.”

Or at least, green enough.

“Nothing’s perfect. There isn’t a perfect solution for anything, and nobody in this world is perfect,” says Gooch. For supporters, anaerobic digesters may simply be the best farm waste solution we have—for now.



Also tagged [anaerobic digesters](#), [cafes](#), [cows](#), [dairy farms](#), [manure](#), [sustainability](#), [usda](#)



Jessica McKenzie is an independent journalist based in Brooklyn, New York. Her work has been published in *The New York Times*, *National Geographic*, *Audubon Magazine*, *Backpacker*, and *Grist*. She also writes a newsletter called [Pinch of Dirt](#).

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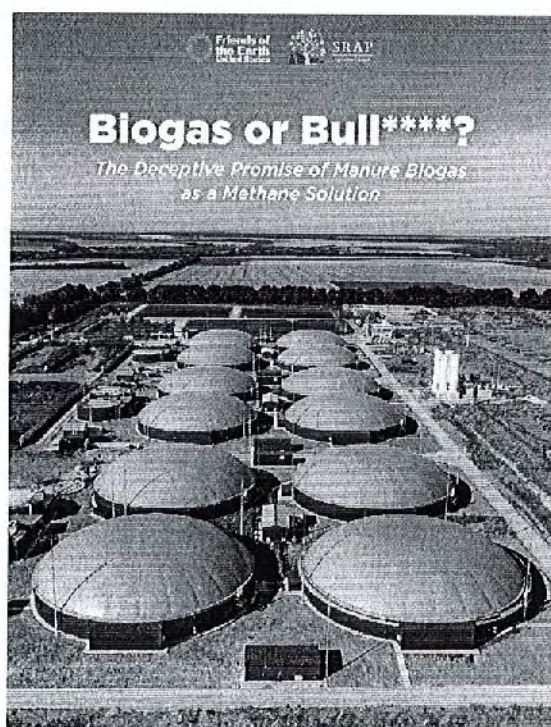


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The Deceptive Promise of Manure Biogas as a Methane Solution

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produce massive volumes of waste that generate methane emissions, an extremely potent greenhouse gas. Anaerobic digesters can capture those methane emissions to produce so-called “biogas,” which can generate electricity or be processed into transportation fuel. This strategy is the cornerstone of the Biden administration’s methane reduction plan for the agriculture sector, and the Inflation Reduction Act has infused billions of dollars into programs and tax incentives that can be used to support biogas production.

The stakes for this strategy to work are high. The world is on track to reach a 2°C increase in temperature this century, which will have catastrophic impacts, including for our food and agriculture system. Rapidly reducing methane emissions, a short-lived greenhouse gas with a global warming potential 80 times higher than carbon dioxide over a 20-year time frame, is a crucial part of the pathway to limit global temperature increases. The U.S. has joined more than 150 countries in signing the Global Methane Pledge to reduce methane emissions by 30% from 2020 levels by 2030. Animal agriculture is the largest source of U.S. methane emissions, so focusing on climate solutions for this sector should be a priority. However, this report provides evidence that manure biogas will further entrench inherently unsustainable and unjust systems of industrial animal agriculture and fossil fuel energy for decades to come - all for methane reduction benefits that have been considerably overstated by the U.S. government, are inadequately tracked, and are insufficient to meet climate targets.

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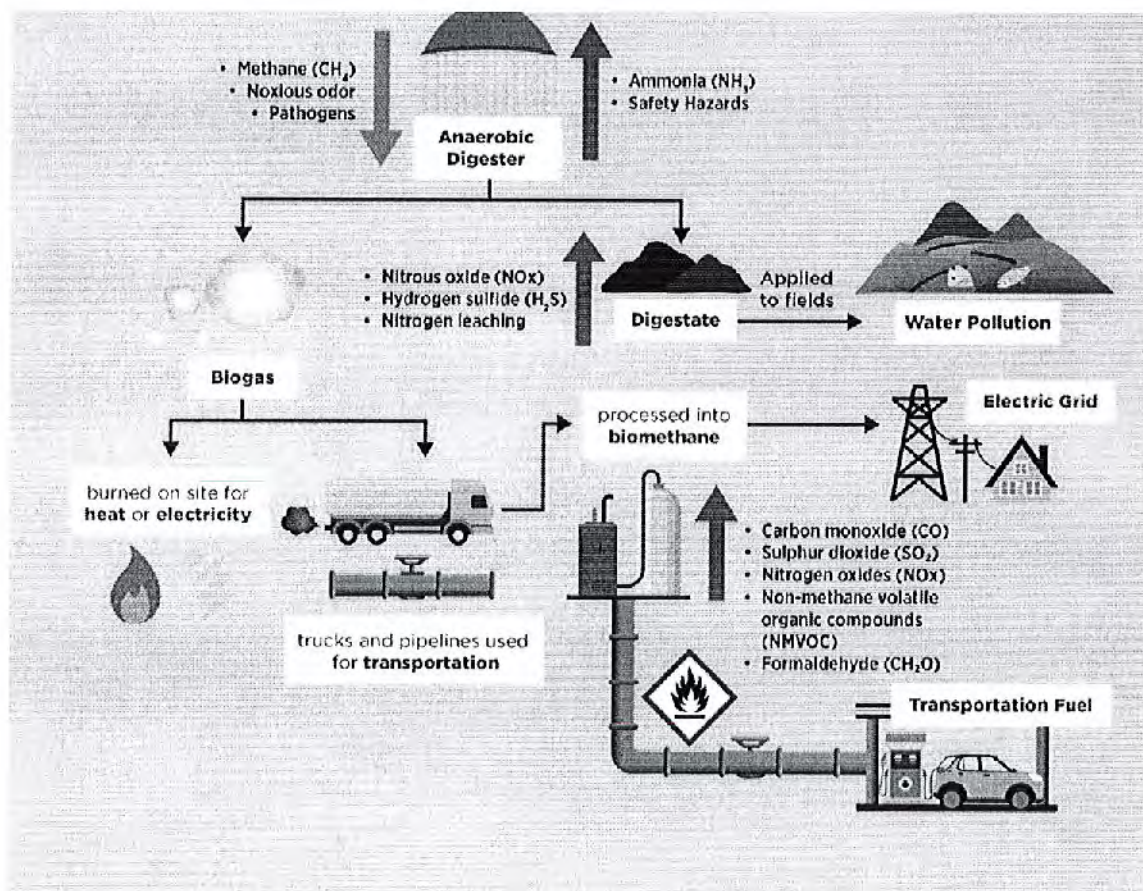
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pollution, disproportionately affecting low-income communities and communities of color. Manure biogas relies on the existence and perpetuation of CAFOs using the most hazardous manure management practices. It fails to address CAFOs' harms to rural communities, workers, farmed animals, and the environment. In fact, its production generates additional environmental, public health, and safety concerns for communities living near CAFOs and biogas plants, including increased production of ammonia during anaerobic digestion, higher concentrations of nutrients in the leftover material (digestate) that contribute to water pollution, new pipelines and trucks to transport manure or biogas through communities, and more toxic air pollution from biogas processing than is produced by fossil gas.

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We make the case that policies rewarding biogas production create three perverse incentives for CAFO operators and biogas producers: 1) to utilize inferior manure management practices that maximize methane production, 2) to increase herd sizes to maximize manure production, and 3) to increase consolidation to take advantage of the economies of scale inherent in biogas production. Each of these trends will exacerbate the environmental and public health harms associated with CAFOs and the harms from various stages of manure biogas production. The perverse

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the agriculture sector largely relies on voluntary adoption of digesters and aspires to reduce methane emissions by only 9% by 2030. In contrast, we found that gradually reducing herd sizes as part of a just transition and implementing feasible alternative manure management practices at a large number of dairies can achieve more than half of the methane reductions needed to meet the Global Methane Pledge target for agriculture - and without all the environmental and health harms associated with manure biogas.

This report provides some of the first quantitative evidence that CAFOs with digesters are more likely to increase their herd sizes relative to statewide populations. We compared the herd sizes of 73 dairy facilities with digesters at the time the digester was installed with recent herd size data obtained from state permits, and our findings support the notion that policies rewarding biogas production incentivize increasing herd sizes. We also modeled emissions from these dairies to show how changes in herd sizes and different manure management strategies impact methane emissions.

Key Findings

1. **Herd sizes at facilities with digesters grew 3.7% year-over-year, which is 24 times the growth rate for overall dairy herd sizes in the states covered by our data set.** Overall, the 73 facilities with dairy digesters in our data set added nearly 85,000 dairy cows total. If these dairy populations continued to grow at their historical rates,

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3. **Installing dairy digesters will fall far short of the ambition needed to reduce agricultural methane emissions in line with President Biden's commitment to the Global Methane Pledge.** Assuming 500 new dairy digesters were installed by 2030 and those digesters yielded emissions reductions comparable to those in our dataset, their associated methane emissions reductions would account for less than a quarter of the reductions needed to reduce agricultural methane emissions by 30%.
4. **Reducing herd sizes and implementing feasible alternative manure management strategies on a large number of dairy farms could yield 55% of the reductions that are needed to slash agricultural methane emissions by 30% in 2030.** We modeled reducing herd sizes by 20% and implementing feasible alternative manure management scenarios on 1,500 large dairies and found that this strategy would yield more than half of the reductions needed to reduce agricultural

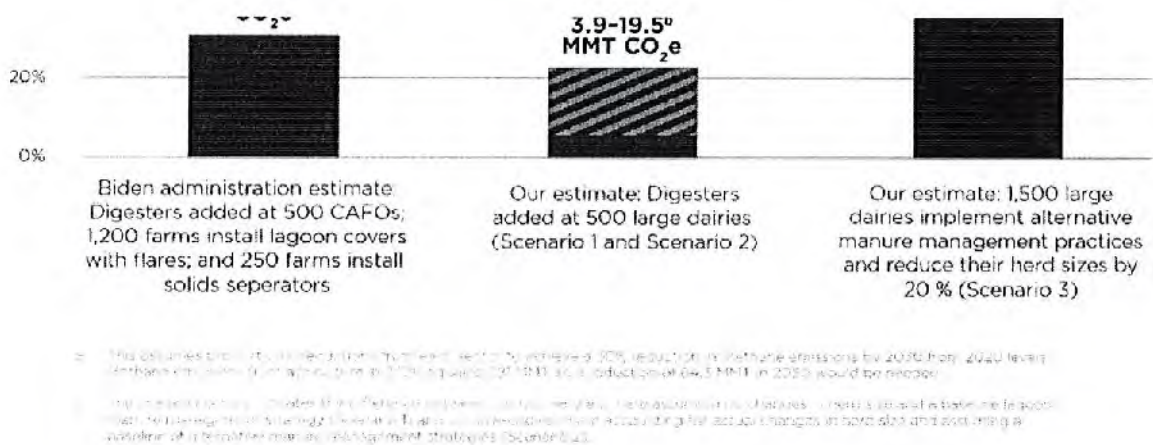
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5. Paying dairy farmers to reduce their herd sizes would be nearly three times more cost-effective than subsidizing anaerobic digesters. If the government paid producers to reduce their herd sizes through a per-cow payout equal to the average net revenue per cow over the last ~20 years, the cost of mitigating one metric ton of CO₂e would be less than \$10 total. This is nearly three times less than the cost of mitigating one metric ton of CO₂e by installing digesters, and it would be more consistent with administration's commitment to environmental justice. Paying farmers to reduce herd sizes or transition to another type of farming would also make dairy farming more profitable for the farmers who remain in the sector, because profits are currently suppressed by low prices driven by an



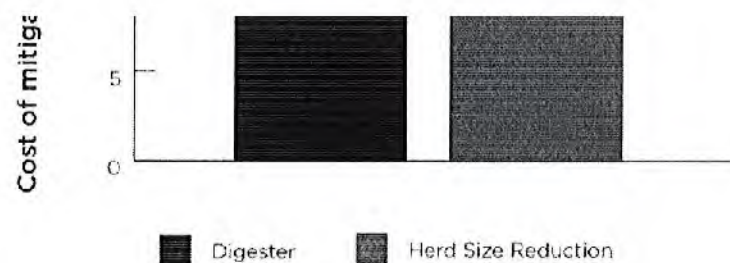
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- Data collection and disclosure from CAFOs with digesters is wholly insufficient to accurately measure methane emissions.** Given the massive amount of public federal funding dedicated to subsidizing manure biogas, it is astonishing that neither the Environmental Protection Agency nor the Department of Agriculture is monitoring and reporting on methane emissions from CAFOs with digesters or collecting basic information such as animal populations in ways necessary to understand whether these investments are resulting in actual GHG reductions.

Incentivizing manure biogas production increases the competitive advantage for large-scale producers, contributes to industry consolidation, and crowds out funding for truly effective conservation practices. Anaerobic digesters are expensive to construct and operate, making them economically feasible only for the largest farms and only with considerable public subsidies in most cases. This further tilts the playing field in favor of the largest livestock operators that are positioned to capitalize on policies and incentives rewarding manure biogas production, contradicting President Biden's commitment to ensure fair markets for livestock producers. Ironically - and tragically -

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covers) are so expensive to construct, grants and loans covering their capital costs comprise a considerable portion of the budget for several USDA conservation programs, which are consistently overdrawn. Plus, 22% of once-operational digesters are now shuttered, making digester subsidies an even more wasteful use of taxpayer resources.

Moreover, because manure biogas requires expensive capital investments for infrastructure (e.g., anaerobic digesters, pipelines, and natural gas processing facilities), it will take years or decades for biogas companies and CAFO operators to recoup initial costs. Therefore, government support for building out manure biogas now risks locking us into the factory farming and fossil fuel systems that manure biogas production depends on for decades to come.

With a narrowing timeframe to stave off the worst impacts of climate change, we need aggressive action to reduce methane from the country's largest source - not voluntary measures that marginally reduce methane emissions while entrenching the highly polluting factory farming and fossil fuel systems driving climate change and environmental injustice in the first place. At a time when there is scientific consensus that high-polluting countries like the United States need to shift away from fossil fuels and reduce industrial livestock production, support for manure biogas does the opposite. Manure biogas - or "factory farm gas" - is a greenwashing measure that actively undermines the Biden

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biogas production) to more cost-effective methane reduction solutions that do not exacerbate environmental injustice and industry consolidation. Instead, policies should support a just transition away from factory farming to regenerative agriculture and away from fossil fuels to truly renewable energy.

Additional Policy Recommendations

1. Do not create new funding streams or other policy incentives for manure biogas.
2. Prevent double-dipping between subsidies, tax incentives, and programs like the Renewable Fuel Standard and California's Low Carbon Fuel Standard. Related, ensure GHG reductions attributed to manure biogas are not double-counted.
3. Set a specific methane reduction target and pathway for the agricultural sector aligned with the Global Methane Pledge.
4. Require and improve methane monitoring and reporting from livestock operations.
5. Pursue agricultural methane reduction strategies that support environmental justice and fair markets for producers:
 - Methane emissions from industrial livestock facilities should be monitored, publicly disclosed, and regulated in a way similar to how the administration has approached regulating methane emissions from the oil and gas sector.

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6. Regulate waste from both CAFOs and digesters, including treatment and application of digestate.
7. Require disclosure of basic data from CAFOs and digester operators, and fund and conduct research to assess the impacts of manure biogas policies on methane emissions, industry consolidation, and rural communities.
8. In instances where public funds have already been designated to support manure biogas, grants and loans should include conditions and exclusions to reduce public health and environmental harms and increase transparency.

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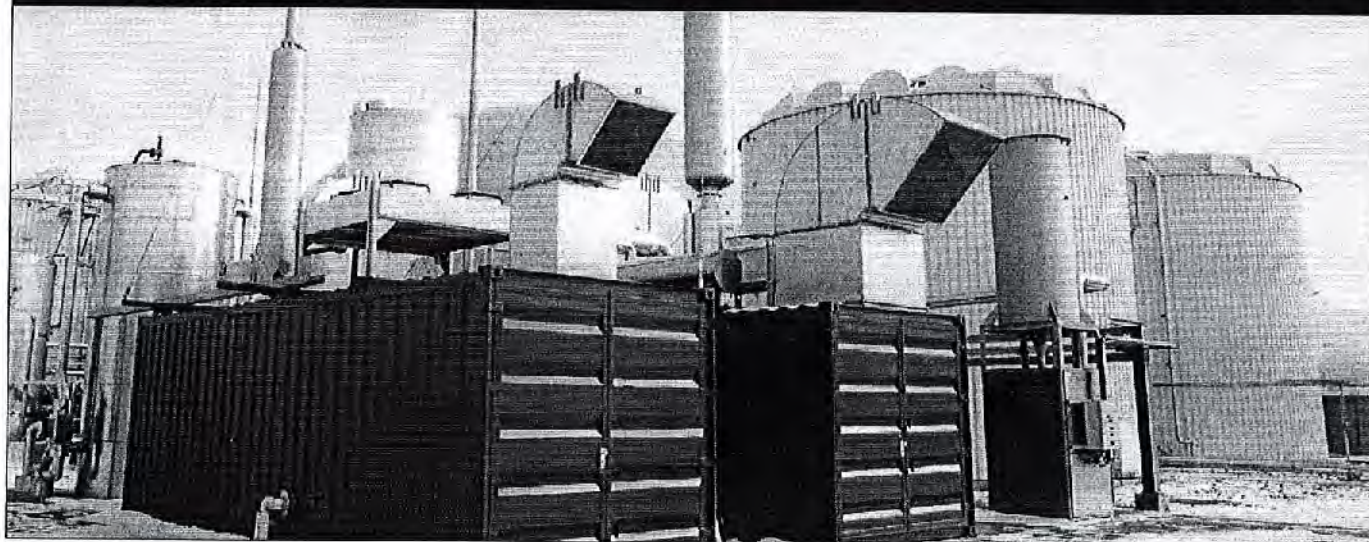
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HARD TO DIGEST:

GREENWASHING MANURE INTO RENEWABLE ENERGY



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Most food animals in the United States are grown on highly concentrated factory farms, and the vast amounts of waste those animals produce poses a huge environmental and public health problem. Historically, farmers used animal manure as fertilizer, but factory farms produce far more manure than can be used responsibly on local fields. The over-application of manure leads to runoff from agricultural fields into waterways. The runoff dramatically alters the ecosystem, contributing to algae blooms and “dead zones” as well as impacting fishing and recreation economies and public health.¹

Manure digesters have been offered up by agribusiness and policy makers as a way to turn factory farm manure into “renewable” energy. When animal waste is stored in pits and lagoons on factory farms, it releases methane, a potent greenhouse gas, and other air pollutants.² Manure digesters capture the methane released by decomposing waste and burn it for energy. Promoted as a “win-win” for farmers, communities and the nation,³ these taxpayer-funded operations purport not only to reduce greenhouse gases but also to reduce environmental impacts associated with excess manure.³

In reality, these technologies have negligible impacts on the deep environmental problems caused by factory farms, and, if anything, serve to further entrench this disastrous method of food production. Indeed, the biggest and most obvious potential of taxpayer-subsidized manure digesters is to help sustain factory farms with new revenue streams from energy

production. Policy makers, instead of using taxpayer dollars to prop up factory farms, should be implementing and enforcing environmental and public health regulations for factory farms.

Digesting Waste

Factory farm production of cows, pigs and poultry generated 13 times more waste than the entire human population in the United States in 2012. The problem is often intensified in certain regions of the country where specific types of factory farms have proliferated, such as dairy operations in California. For example, in 2012, the factory-farmed dairy cows in Tulare County alone produced five times as much waste as the human population of metropolitan New York City.⁴

Many factory farms store their vast quantities of manure in pits or lagoons, where microorganisms digest the waste

More Than Just Manure: Other Feedstocks for Digesters

Digesters can produce energy from a variety of biomass material, and animal manure is one of the least productive source materials — largely because farm animals have extracted much of the available energy from the feedstock. Cow manure yields just over one-tenth as much biogas as food scraps, for example.¹⁰ One private consultant for biogas projects noted that the “manure-only” digesters will not attract investors because of inefficiencies.¹¹

Promoters of digesters, like the USDA, are considering ways to mix manure with better source material to improve fuel production, including building “community” digesters that accept a variety of biomass materials from multiple sources.¹² The food waste from Disney World, for example, is fed with a mix of other biomass materials into a \$30 million facility in Orlando, Florida.¹³

Trucking all of these materials to and from the digesters incurs significant fossil fuel use and presents risks of spills and accidents. And given the marginal energy potential of manure in digesters, it is not clear that this will be financially feasible — unless taxpayers subsidize the process. Creating a large, centralized facility that depends on a steady supply of animal manure to operate could also incentivize the construction of new factory farms in the area surrounding the digester, similar to the way a new slaughterhouse can drive the growth of factory farms in a region.

Just like manure lagoons without any methane capture system, digesters may accidentally spill or leak liquid manure and also present environmental risks from explosions associated with methane production. A 1.25 million gallon manure digester in Wisconsin, constructed in part with public funds, spilled 380,000 gallons of manure into nearby waterways in 2013, then another 22,000 gallons in 2014. The digester then experienced a major methane explosion.¹⁴ Faced with the reality of such dangerous accidents at digesters, along with other concerns, some rural residents have opposed the construction of digesters.¹⁵

through a chemical process called “anaerobic digestion.” The digestion produces “biogas,” mostly a mixture of methane and carbon dioxide. The methane, the main component of natural gas, can then be burned to generate electricity or heat.

The most common manure-to-energy approach in the United States are manure digesters, designed to capture methane gas from these manure lagoons, which can be burned to produce energy. This approach is promoted as a good fit for many types of factory farms, which are already producing large volumes of manure and emitting methane, a powerful greenhouse gas.⁵

Manure digesters require a great deal of manure to generate energy, compared to other feedstocks, as the animal’s own digestion has already broken down the food.⁶ That is why, according to an economic analysis by the U.S. Department of Agriculture (USDA), anaerobic digester systems that generate and sell electricity are not economically viable, as opposed to those that use the biogas as a replacement for natural gas for on-farm heating needs.⁷

As of the fall of 2016, there were nearly 250 manure digesters in the United States, almost all of them located on dairy and swine operations.⁸ The U.S. Environmental Protection Agency (EPA) has noted that there are enough factory farms to potentially support the operation of more than 8,000 digesters.⁹ Such ambitious forecasting ignores the environmental and economic realities associated with this failed technology — and the inherent unsustainability of the factory farm model.

Manure Remains

Even factory farms that safely manage manure during methane capture still have to manage the huge volume of waste that remains following the digestion process.¹⁶ Digesters do not make the nutrient loads (nitrogen and phosphorous) in the manure evaporate or disappear; they merely extract methane gas from the manure. In fact, if digesters add water to manure during the digestion process, the total volume of waste may actually increase.¹⁷

Factory farms with digesters then resort to the same problematic waste disposal efforts that they have always used — spreading the digested manure as fertilizer, leading to runoff from over-application. In fact, the process of digestion makes certain nutrients, such as nitrogen and phosphorus, more water soluble, meaning that rainwater is more likely to wash those nutrients from fields into nearby streams.¹⁸

Additionally, trucking tons of digested manure to surrounding farms incurs significant environmental costs associated with fossil fuel use and presents risks associated with spills. There are also economic costs involved in trucking tons of manure and digestate to and from digesters, and because of high transport costs, industry sources note that it is not always financially viable to utilize digested manure as fertilizer.¹⁹

Desperate to find a way to dispose of these mountains of manure, digester promoters are even exploring disturbing new

applications, such as using digested manure as a nutrition source for animals.²⁰ In all, the USDA has committed \$10 million for research into manure digesters.²¹

Greenhouse Gases

Animal agriculture is a major contributor to climate change, with some studies estimating that livestock account for nearly 15 percent of human-caused greenhouse gas emissions globally.²² Much of this is in the form of methane, a greenhouse gas that is 25 times more powerful than carbon dioxide, emitted from factory farms that use anaerobic (oxygen-deprived) manure management approaches such as lagoons and pits.²³ The EPA indicates that manure management on U.S. farms accounts for almost 10 percent of all human-caused methane releases in the United States.²⁴

Even more troubling, these emissions grew 65 percent between 1990 and 2013, which the EPA notes is related to larger and more concentrated dairy and swine farms using liquid manure management, such as lagoons.²⁵ The total number of livestock on the largest factory farms rose by 20 percent between 2002 and 2012. The number of dairy cows on factory farms doubled, and the average-sized dairy factory farm increased by half between 1997 and 2012. The number of hogs on factory farms increased by more than one-third, and the average factory farm size swelled nearly 70 percent from 1997 to 2012.²⁶

Anaerobic manure management practices chemically convert organic compounds found in waste into methane. By capturing and burning this methane, digesters purportedly offer a potential environmental benefit over traditional manure lagoons, both by decreasing greenhouse gas emissions and by producing energy that would offset fossil fuel consumption.²⁷

However, digesters do not offer clear environmental benefits over sustainable manure management practices, such as lower-density pasture-based animal production where manure decomposes aerobically (in the presence of oxygen) and becomes a natural fertilizer, releasing very little methane in the process.²⁸ This process involves no expensive machinery and no transportation of manure off the farm.

Given the various manure management practices available, digesters would appear to be the most expensive, most complicated way to reduce greenhouse gases produced from animal agriculture. And it is not clear that digesters actually reduce greenhouse gases.

Manure digesters do not capture all of the methane they produce, and some amount of methane that these facilities generate escapes as emissions. This “fugitive methane,” as scientists call it, can offset a portion of the greenhouse gas reductions that digesters offer.²⁹ And when digesters burn methane, they release greenhouse gases like carbon dioxide and nitrogen oxide, which contributes to smog.³⁰

Factory farms using digesters have balked at even modest efforts by regulators to reduce this pollution. After regulators in California started requiring manure digesters to install

catalytic converters to reduce emissions of nitrogen oxide as a public health measure, factory farms loudly protested that such upgrades are too costly.³¹

Subsidizing Factory Farms

Manure digesters are an extremely inefficient method of energy production and likely would not exist in the United States were it not for taxpayer subsidies. Start-up, maintenance and operating costs are often in the millions of dollars, and digesters often do not generate enough energy or revenue to be economically feasible.³²

The USDA is a major proponent of both the factory farm model and manure digesters and has spent tens of millions of dollars helping factory farms purchase and install digesters.³³ Other federal agencies and state government programs fund the construction of digesters as well.³⁴ Yet, the USDA notes that low energy prices in the United States mean that digesters, in most cases, do not make economic sense as sources of electricity alone.³⁵

The USDA and other promoters of digesters often present manure-based biogas alongside wind and solar as a source of green, renewable energy that can help the United States reach its goal of increased energy independence.³⁶ But this campaign to rebrand factory farms as being part of the green economy ignores the economic failures of this technology.

Digesters require significant energy to collect, pump and truck manure to and from the digester and to heat the manure once it is in the digester. As much as half of the energy produced from digesters may be needed to operate the digester itself.³⁷ Sometimes factory farms do not even generate energy from all the available gas but simply “flare off” the biogas they produce, to reduce either odors or emissions.³⁸

Because the manure is free and construction costs can be subsidized, factory farms have the potential to reap a major economic benefit, and some factory farms no doubt have

Digesters for Odor Reductions?

One widely cited benefit associated with digesters is their ability to reduce the noxious odors associated with factory farms.⁴⁸ USDA economists, noting the limited economic potential of digesters as energy producers, have observed that the odor reductions provided by digesters may create the necessary economic justification for constructing these very expensive machines.⁴⁹

However, it is not clear that digesters are effective at reducing odors. One government study from Wisconsin examined a variety of manure management practices and determined that “anaerobic digesters do not predictably reduce odors or ambient [ammonia] concentrations near manure storage lagoons. . . .”⁵⁰

seen revenues increase with digesters. Overall, however, methane digesters have high failure rates.³⁹

For example, even though over a third of the funding for a \$900,000 digester on a dairy farm in San Diego County, California came from taxpayers, the EPA indicated that it was no longer in operation only a few years later.⁴⁰ It is perhaps unsurprising, as an independent analysis of start-up and maintenance costs indicated that, even accounting for grant funding, it would have taken 71 years for the digester to pay for itself.⁴¹ As of spring 2016, the EPA indicated that 13 of 26 digesters that had been constructed in California, the nation's largest dairy state, had been shuttered.⁴²

One especially controversial funding mechanism that the USDA uses to subsidize digesters is the Environmental Quality Incentives Program (EQIP). Designed to improve the environmental performance of American agriculture, this program has been used increasingly to subsidize factory farms. An estimated \$750 million in EQIP funds was spent on manure management between 1997 and 2010, including helping factory farms construct manure pits and digesters.⁴³ The USDA also funds manure digesters through the Rural Energy for America Program (REAP), which has spent hundreds of millions of dollars to support biofuel projects.⁴⁴

Finally, promoters of poultry manure-to-energy technologies have distorted state and national energy policy to include this environmentally damaging technology as a source of renewable energy. And the construction of these expensive facilities almost guarantees the expansion of factory farms in the area, to produce the steady supply of waste to feed them.

For example, North Carolina, a leading poultry-producing state, passed an energy bill mandating that utility companies obtain at least 900,000 megawatt-hours of electricity from poultry waste by 2014, creating a major incentive for the construction of manure-to-energy technologies such as digesters or incinerators — and the expansion of factory farms to feed these expensive facilities.⁴⁵

Likewise, the state assembly in Maryland has designated energy produced from poultry litter facilities as a “Tier 1” source of renewable energy, on par with solar and wind. The implications of this decision are great because the state also has a mandate for electricity suppliers to generate 20 percent of electricity retail sales from renewable sources by 2022.⁴⁶ As in North Carolina, poultry litter incinerators are being explored in Maryland, along with anaerobic digesters, to fix the problem of excess manure from locating too many animals in one area.⁴⁷

Conclusion

The political support for manure digesters and other manure-to-energy projects makes the excess manure associated with factory farms seem like less of a problem, but manure digesters in fact do not address most of the problems that the manure causes. Seldom in the public policy debate is it acknowledged that if factory farms were not concentrating

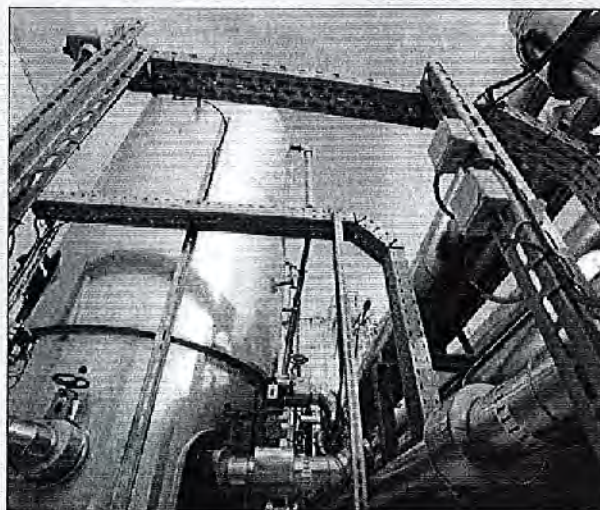
Carbon Markets

Manure-to-energy technologies like manure digesters claim to reduce emissions of greenhouse gases such as methane and carbon dioxide. Some policy makers believe that farmers should be financially rewarded for providing this environmental benefit. One such mechanism exists in carbon cap-and-trade programs such as California's.

The program allows factory farms that use manure digesters to generate “carbon offsets,” referring to the greenhouse gases that would have been emitted by the factory farm without the digester in place. Other highly polluting facilities, such as power plants, can then purchase the offsets so the facilities can emit more greenhouse gases themselves, rather than cleaning up their own facilities.⁵¹

These so-called “carbon markets” are rife with fraud, and it is difficult to verify that emissions actually are reduced. Moreover, offsets allow polluters to avoid the urgent need to stop polluting by allowing them instead to pay to continue harmful activities with impunity, while claiming that emissions have been reduced elsewhere.⁵²

The Brubaker Farm in Pennsylvania, for example, raises 30,000 pigs a year. Using taxpayer funds, the farmers built a manure digester to provide electricity for the farming operation and to sell back to the grid.⁵³ In 2015, the California Air Resources Board certified the Brubaker digester as a greenhouse gas offset generator.⁵⁴ The approval allowed a California energy company to claim offsets for the greenhouse gas reductions of the manure digester from the prior two years — so the energy company could keep polluting as normal, and the farm gets paid for environmental benefits it made already.⁵⁵ The government provides grants for manure digesters in order to provide an environmental benefit, but when those environmental benefits are used as offsets that allow another facility to keep polluting, that purpose is defeated.



huge amounts of waste in one place, we would not need this expensive “solution.”

The most common-sense improvement we can make to the environmental problems facing animal agriculture is to stop building new factory farms. We need policies that help smaller, independent and diversified farmers to thrive in a way that does not harm communities, the environment and public health. Until a shift to a more sustainable food system happens:

- The EPA and states should establish a moratorium on the construction of new factory farms and on the expansion of existing facilities. We will never solve the existing excess manure problem — and we will make it worse — if we do not stop the increased consolidation of the factory farm industry.
- States should strip animal manure out of State Renewable Portfolio Standards. Manure is a dirty source of energy that does not address the root of the problem: we need to diversify our highly concentrated milk and meat production system so that it is not producing unsustainable mountains of manure. Instead of allowing states to meet their renewable energy mandates with dirty technologies that rely on the excess production of manure and enable continued concentration of too many factory-farmed animals in the same region, we need to incentivize clean energy production while creating a food economy that is good for everyone.
- Congress should eliminate other financial incentives for manure-to-energy technologies by making sure that the Environmental Quality Incentives Program no longer serves as a subsidy for factory farms by capping the size of payments that can be made to any one operation.
- The EPA and states should establish better and enforce existing air and water pollution laws, and not stand in the way of local government efforts to impose strict health and zoning regulations for factory farms.
- The federal government and states should not replace enforceable regulations to reduce factory farm pollution with market-based efforts that create pay-to-pollute schemes.

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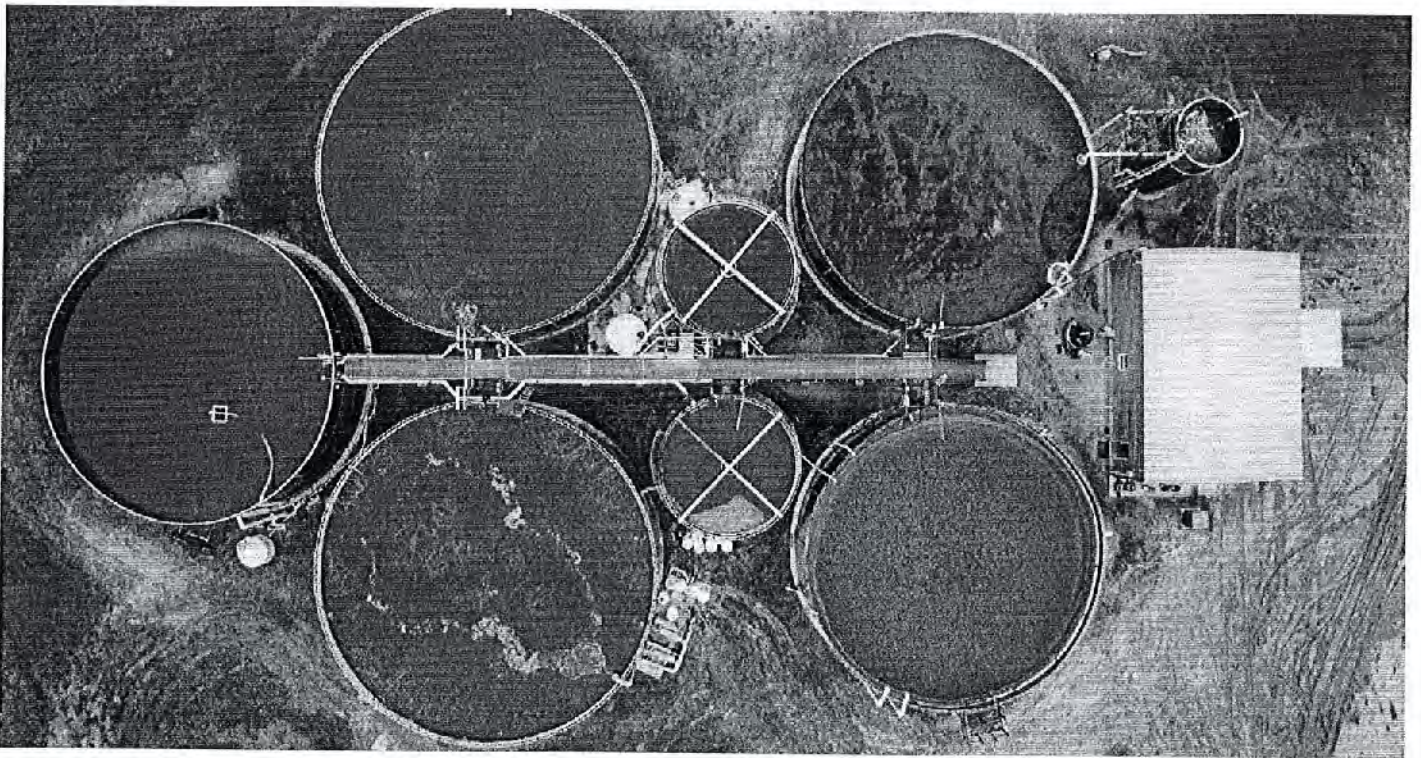
Food & Water Watch works to ensure the food, water and fish we consume is safe, accessible and sustainable. So we can all enjoy and trust in what we eat and drink, we help people take charge of where their food comes from, keep clean, affordable, public tap water flowing freely to our homes, protect the environmental quality of oceans, force government to do its job protecting citizens, and educate about the importance of keeping shared resources under public control.



Explainer

Why Biodigesters Fall Short as a Climate Fix

A new report from the World Resources Institute finds anaerobic digesters offer limited climate benefit for a high price tag.



A swine-turkey waste to renewable energy system on Doug Jernigan Farms. Credit: U.S. Department of Agriculture via Flickr

Thu August 14th, 2025

Explainer • Climate • Research



Livestock farms produce more than just meat and milk; they also generate massive amounts of manure — as much as 1.4 billion tons each year. Much of that waste is stored in massive lagoons until it can be applied to croplands, and the way the manure is stored fuels about nine percent of U.S. methane emissions. One technology long touted as a potential climate fix is anaerobic digestion, pitched as a way to turn all of that messy, smelly waste into clean energy. But new research from the World Resources Institute shows that though digesters produce energy — extracting methane to become biogas — they aren't all that effective at actually tackling the methane emissions themselves.

How Biodigesters Work to Break Down Manure

Manure methane emissions come mostly from dairy and hog farms. The way these farms store the manure varies, with some storage solutions better at keeping the manure out of the air than others. When manure is stored in lagoons — large open ponds — it decomposes without oxygen, creating the ideal conditions for methane-producing microbes.

“What the digester does is basically covers that storage,” Swati Hegde, who researches agricultural methane production at the World Resources Institute, tells Sentient. The other promise of digesters, Hegde says: “it captures that methane and converts it into something useful.” Or that’s the idea, at least.

Manure — and sometimes food or crop waste — is fed into a sealed, oxygen-free tank called a digester. In some climates, the tank is heated slightly, which helps the naturally occurring microorganisms “work faster,” Rebecca Larson, a professor at the University of Wisconsin-Madison who studies manure management and biogas production from anaerobic digestion, tells Sentient.

Inside the digester, microbes break down the organic material. This process

Besides biogas, digesters also produce solid effluent or digested manure, which can be processed into animal bedding and compost, while the slurry can be spread on fields as fertilizer. For that to work, practically and financially, there needs to be infrastructure and a market for the bedding and fertilizer.

The number of on-farm anaerobic digester projects has exploded in the last two decades, bolstered by state and federal funding, and EPA advisory support. Digesters were embraced by meat and dairy companies — sometimes in partnership with the natural gas and biofuels industries — as a way to show these industries were taking action to reduce methane emissions.

Methane makes up 12 percent of the U.S.'s greenhouse gas emissions. Agriculture is the largest source of methane emissions, with cattle burps making up 27 percent of the total. But methane emissions from animal manure are not insignificant — coming in at around nine percent.

Digesters were touted as a way to bring that 9 percent down, and the fix sounded especially appealing because of the potential for creating a new renewable energy source.

Biodigesters Aren't Great at Reducing Methane

Anaerobic digesters fare better in some ways, worse in others, according to WRI's report.

"We should be very cautious when we actually talk about the climate benefits of a digester," Hegde says. "It really depends on whether you are seeing it as a waste management technology or an energy generation technology," she says. In terms of energy generation, digesters do extract methane for eventual use as natural gas, which comes with its own set of drawbacks as a fossil fuel alternative.

But when it comes to manure management, Hegde says, digesters aren't the best option out there — reducing methane by only around 25 to 35 percent.

methane out of the atmosphere, so a switch to an anaerobic digester from one of those methods would be worse for climate action, not better.

The kind of digester also makes a difference. Most digesters in the U.S. are only able to remove less than a third of the waste that emits methane, the researchers report. If the leftover material is then kept in open lagoons or pits where it can keep on releasing methane, the digester can only reduce methane emissions by around 25 percent. Some digesters, the kind that are more commonly used in Europe, can keep that nutrient-rich manure in the tank and out of the air for longer periods of time, which is better for reducing emissions. These covered systems can reduce methane emissions by around 35 percent, which is better than 25 percent, but there are other factors to consider.

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Digesters require maintenance and oversight in order to operate safely. Sometimes things go awry, and manure spills happen — though as Larson points out, these

Report says biogas from mega-dairies is more of a problem, not solution

WXPR | By Mike Moen/Wisconsin News Connection

Published June 19, 2024 at 8:23 AM CDT



LISTEN • 1:59



By Lena Beck for Modern Farmer. Broadcast version by Mike Moen for Wisconsin News Connection reporting for the Modern Farmer-Public News Service Collaboration.

At the end of February, the town board of Lind, Wisconsin voted against changing the zoning laws to allow a nearby 600-cow dairy to install an anaerobic digester. These digesters are becoming more common, particularly at larger dairy operations housing thousands of cows, called concentrated animal feeding operations (CAFOs). This is partially because they have been included as a key ingredient in the Biden administration's pledge to reduce methane emissions in animal agriculture.

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At CAFOs, it is common to pool animal waste in one spot, called a manure lagoon. Anaerobic digestion creates a mixture of gases, which can be used for electricity or



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However, that's not quite how it works out. In Lind, an overwhelming number of citizens showed up for a public hearing to discuss the change—the Wisconsin Examiner reported that there were so many attendees, they exceeded the capacity of the building and the meeting had to be canceled. Community organizers, under the group name Citizens Protecting Rural Wisconsin, argued that digesters aren't the solution that they seem to be.

A new report by Friends of the Earth US and Socially Responsible Agriculture Project (SRAP) backs up that sentiment. The study suggests that methane digesters create incentives for the growth of industrial agriculture, further entrenching food systems that harm both people and the environment. These researchers, communities and advocates are working hard to resist the greenwashing of this technology—and sometimes they succeed. Vanguard Renewables, the company partnering with the dairy near Lind, officially withdrew its application to build in March.

The report

Anaerobic digesters are not typically things that you would ever see on a small, pasture-based dairy or farm. Digesters require a lot of manure to work, meaning that they are more poised to be installed on CAFOs that typically have hundreds or thousands of animals. This suggests that supporting biogas production incentivizes the growth of the CAFO industry.

"If we put money towards biogas, we're essentially helping to subsidize and further entrench industrial livestock production," says Chris Hunt, deputy director at SRAP and a contributor to this report, "and essentially the worst possible ways of managing waste, which is manure lagoons."

This growth was documented in the report, finding that herd size at the studied CAFOs with digesters grew 3.7 percent year over year—24 times the growth rate of typical

"Once you have a digester in place, there's an incentive to create more biogas, because there's now a market for biogas," says Hunt. "The only way of doing that is to create more waste. So, there's an incentive to add more animals to herd size."

Greenwashing

The Global Methane Pledge was launched at COP26, aiming to reduce global methane emissions by 30 percent by 2030, using 2020 levels as a baseline. In 2021, the US released its own methane reduction plan. Expanding manure biogas production was listed as a key way to reduce methane emissions in the agriculture sector. Between 2010 and 2020, the USDA Rural Business Cooperative Service supported grants and loans totaling \$117 million toward anaerobic digesters.

This plan aims to develop the industry further. Not only does it commit the USDA to launch additional work into biogas policies and research, but existing Farm Bill conservation programs such as the Conservation Stewardship Program (CSP) and the Environmental Quality Incentives Program (EQIP) will provide resources in service of manure biogas production.

In 2020, manure accounted for about 9 percent of the US's methane emissions. The greater source of methane from animal agriculture is through enteric fermentation—created through the process of digestion. This accounted for about 27 percent of US methane emissions. Using anaerobic digesters to produce biogas can only address that 9 percent, and it does nothing to reduce the 27 percent inherent to ruminant agriculture—animals such as cows, buffalo, goats and sheep.

The gases produced by anaerobic digestion are being used for electricity and to power vehicles, but as the report and other advocacy organizations argue, this doesn't make it a clean fuel.

"When you burn this fuel as an end use, it's essentially the same as burning fossil fuels," said Kat Ruane of Food & Water Watch during a recent webinar about biogas production in California. "It produces similar pollutants, it harms the environment in the same way and you're still pumping gas into the atmosphere that we really don't need to be there. So, clearly, this cannot be a solution to climate change."

be as much as 15 percent. Food & Water Watch used satellite images of methane plumes overlaid with geographic information about where digesters in the LCFS program were located. They documented 16 dairy operations that emitted plumes, producing 59 plumes between March 2017 and July 2023. The emission rates of these plumes reached as high as 1,729 kilograms of methane per hour. A “super-emitter” in the imaging system is classified as just 10 kilograms of methane per hour.

“Another huge greenwashing problem with this technology is just the fact that it does not work,” said Ruane. “[It’s] an absolutely mind-boggling amount of pollution being produced under the guise of supposedly helping the climate.”

In addition to research, Food & Water Watch mobilizes people on issues related to food systems and factory farming. On its website, you can read about its various objectives and wins against industrialized farming as well as calls to action on these issues. Hunt of SRAP also encourages people directly dealing with the impact of factory farming on their community to reach out directly.

“If any of your readers are facing a factory farm, they should contact us,” says Hunt. “We provide free support to communities throughout the US to help them protect themselves from the damaging impacts of industrial livestock operations.”

There’s no uniform approach for dealing with this issue, he says, as it depends a lot on regional factors, but SRAP provides resources such as the SRAP Help Hotline and SRAP Water Rangers Program, which offers free training on how to collect and analyze water samples, document pollution and report violations.

“There’s not really one universal secret. But this is what our organization does. So, I would encourage folks to reach out to us for help.”

Digesters don’t erase factory farm concerns

Even if biogas production wiped out methane emissions completely, that’s still a narrow view of the factory farm problem, says Hunt.

“Biogas doesn’t solve the factory farm issue,” says Hunt. “Greenhouse gas emissions aren’t the only problems in factory farms. As someone who’s been working on this issue for 20 years, it’s actually one of the problems with factory farms that concerns me the

He says that methane emissions are being misconstrued as the major problem caused by factory farms, and biogas has been used as the proxy for fixing all the problems explicitly with CAFOs. "But they don't do that at all," says Hunt.

Digesters don't address worker or animal rights abuses at CAFOs, nor all of the environmental concerns. Moreover, many of the human health impacts are not mitigated by anaerobic digesters.

"When you have too many animals in one place, you're going to have too much waste in one place, and that waste becomes a problem—that waste becomes a pollutant," says Hunt. "So, these facilities pollute the air, pollute the water and threaten public health and spoil people's drinking water. Adding digesters doesn't actually fix that."

As of 2020, there were more than 21,000 CAFOs in the US, and some are clustered geographically. In California's San Joaquin Valley, for example, some people live next to as many as 25 CAFOs.

The abundance of CAFOs in the San Joaquin Valley isn't accidental, says Leslie Martinez, community engagement specialist at the Leadership Counsel for Justice and Accountability (LCJA). The San Joaquin Valley has several historically Black communities that are now largely Latino, and the abundance of polluters is evidence of environmental racism—hazardous materials or operations being located or dumped in communities of color. Moreover, many of these communities are unincorporated, and this can make it more difficult for residents to advocate for themselves.

"First and foremost, I think it's really important that people understand the health impacts that come with so many large animals being confined in one area," says Martinez.

These impacts include sleep apnea, asthma and other respiratory issues, as well as not being able to go outside because of the intensity of the smell or due to being swarmed by flies. CAFOs present a threat of nitrate pollution, which can cause a variety of illnesses including blue baby syndrome. Manure contamination can also lead to severe pathogen-related illnesses such as listeriosis and tetanus. The SRAP and Friends of the Earth report posits that while anaerobic digesters achieve temperatures that can kill some pathogens, the real solution is not to have such high concentrations of animals in

Martinez, who was born and raised in Tulare County in the San Joaquin Valley, works closely with other local organizers to do policy work against the LCFS rewarding CAFOs, such as trying to eliminate methane crediting. She encourages everyone to speak up on the impacts of dairies.

"Attend a workshop, speak up and be like, 'As somebody who lives next to a dairy, as someone who lives next to a dairy with a digester, this is my reality of what I live with,'" says Martinez. "No one should be able to take away your right to clean air and clean drinking water and get away with it."

On the LCJA website, you can read more about this work and find information for taking action. Small dairy farmers who've had success should share their stories, too, she says.

"Small farmers, rise up," says Martinez. "There are success stories that I think need to be talked about. And I would love to hear what their solutions are to this epidemic of the CAFO industry."

A more sustainable future for dairy

As the SRAP and Friends of the Earth report states, "Only if one accepts the status quo model for industrial animal production as the baseline can it be argued that manure biogas has any benefits." For Hunt, biogas production is not compatible with climate change solutions at all.

"I don't think a sustainable future is compatible with the CAFO model," he says. "You can spend millions of dollars and stick a digester on top of your lagoon, you can stunt the emissions a little bit that way. But you're still left with all these other problems that are inherent in that model."

Martinez encourages those who consume milk and dairy products to think critically about how these products get to your table. Collectively, she says, we need to think about what sustainability is and what we as consumers are willing to accept.

"Right now, people are saying that you having access to [these products] is more important than a young child being able to go outside and ride their bike or walk home from school" says Martinez. "Because right now that's kind of what the trade-off is."

In her organizing, Martinez has been accused of being anti-dairy industry and anti-dairy farmer.

"But that is not true. I think that there is a place for dairies. And I think that that place for dairies is when you don't have thousands of cows. It's not sustainable," she said in the Food & Water Watch webinar. "If we want to genuinely keep dairies around in California or in Wisconsin, wherever, they have to be truly sustainable. And that means making big changes."

Lena Beck wrote this article for Modern Farmer.

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WXPR News



Mike Moen/Wisconsin News Connection

Mike Moen is a radio news reporter with nearly two decades of experience in the field. He has covered much of the upper Midwest, including Minnesota, Illinois, Wisconsin and the Dakotas. Many of his stories have aired nationally, including several public radio programs.

See stories by Mike Moen/Wisconsin News Connection

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Manure Digesters: Another False Solution That Makes Climate Injustice Worse

There are better responses to the climate crisis that also treat rural people and our land, air, and water with respect.

By JOHN E.
PECK · Apr 21, 2024
Common Dreams

12

There has been much media hype about manure digesters and how they will “solve” climate change by capturing and burning methane from confined animal feeding operations or CAFOs—aka factory farms. Billions in taxpayer handouts and other incentives through pollution offset trading markets are encouraging factory farms to expand and profit from their waste stream.

Some economists now speculate that factory farms are earning more from making methane than milk!

A recent Friends of the Earth and Socially Responsible Agriculture Project report goes even further, suggesting that if the U.S. really wanted to reduce its agricultural contribution towards greenhouse gases, it would make more sense for regulators to phase out or split up CAFOs and shift taxpayer support towards smaller grass-based livestock operations instead.

Sadly, the misguided notion of manure digesters as a “solution” to the climate crisis is nothing new. Back in 2009 at the United Nations Climate Change Conference in Copenhagen, I almost fell off my chair when then-U.S. Department of Agriculture (USDA) Secretary Tom Vilsack announced that manure digesters on factory farms were going to be a key part of former President Barack Obama’s climate change agenda. He later admitted that less than 10% of dairy farms (ie CAFOs) would be large enough to qualify for these USDA digester grants—another example of how federal policies support industrial agribusiness to the detriment of smaller farmers.

Intentional factory farm production and subsequent “climate smart” combustion of methane is not only oxymoronic, but will undermine the future prospect of life here on Earth.

This manure digester building binge has ramped up even more under President Joe Biden—with Vilsack once again back at the helm of the USDA. The latest Institute for Agriculture and Trade Policy report critiquing the Environmental Quality Incentive Program (EQIP) reveals just how much of this popular USDA effort has been hijacked by a small elite number of CAFOs, to the detriment of the majority of farmers who have their EQIP applications declined. Encouraging livestock grazing is NOT front and center among “climate smart” practices promoted under EQIP and the Natural Resources Conservation Service—that star role is held by waste lagoons and manure digesters.

A typical CAFO digester for 2000 dairy cows costs over \$2 million, with EQIP covering up to \$400,000. But there are many other funds available, such as through the Rural Energy for America Program (REAP), which bankrolled \$78 million for digesters in the last decade. The recent Inflation Reduction Act (IRA) added another \$250 million to EQIP, along with another \$2 billion for REAP, including a brand new 30% tax credit for all new digesters built.

The current trough of taxpayer funding for the manure methane industrial complex is long and deep, but there is even more potential revenue to be milked. In Wisconsin alone there are now 15 manure digesters getting money for their methane offsetting of 1.3 million carbon credits available

through the California Cap and Trade System. How does this work? Build a methane digester in Wisconsin, claim that by burning off this really bad methane it is equal to reducing the impact of so many tons of carbon dioxide emitted in California, and then get a bonus check for that hard offset work! The value of one carbon credit on the California market as of April 2023 was \$28.66.

The problem with this taxpayer mandated and subsidized “cap and trade” system is that it does not necessarily reduce overall greenhouse gas emissions—it just moves pollution around (and the atmosphere doesn’t care about your zipcode). Worse yet, if your offset claims prove to be bogus and corrupt, the climate crisis ends up much worse. This was exactly the case when Midwest activists alerted California officials that some of the Wisconsin CAFOs claiming methane offset credits were really engaged in wire fraud, since their digesters were either broken or not effectively functioning to capture methane as claimed. More details can be found in the SRAP expose of this 21st century Ponzi style scheme. Along with many allies, Family Farm Defenders has been diligently opposing such corporatized pollution trading mechanisms through the Alliance Against Farm Bill Offsets, whether they involve offsets for carbon sequestration pipelines, manure digesters, or “no-till” GMO monocultures.

My gut reaction 15 years ago to Vilsack's manure digester panacea to global climate change remains true today—why pay to fix a problem that doesn't even need to exist? Countless studies have shown that the most cost effective, eco-friendly, and often quite profitable form of animal husbandry—including dairying—is managed rotational grazing. If animals are just allowed to enjoy pasture outside (as they prefer and are meant to do by mother nature) and then also allowed to deposit their manure in a healthy perennial ecosystem, one does not end up with a methane crisis. It is only when one decides to confine thousands of animals in a warehouse, offer them nothing but TMR to consume (with dubious components like feather meal and ethanol leftovers), liquefy millions of gallons of their manure, and then store it in massive anaerobic lagoons, that one creates a pollutant 80+ times worse than carbon dioxide.

Sure, one can always capture and burn the methane that doesn't leak from a CAFO digester to make electricity or run a vehicle (which means more greenhouse gas pollution), but you still have the leftover sludge (aka digestate) to deal with. This is loaded with nitrates, phosphorous, and—depending upon what other waste gets dumped into the digester—PFAS, pharmaceuticals, agrochemicals, heavy metals—which will then seep into the ground and become part of runoff, contributing to tainted wells, beach closures, toxic fish, the list goes on and on. Besides methane, there are

other toxic CAFO gases—such as hydrogen sulfide, ammonia, and nitrous oxide—that cause chronic headaches for neighboring residents and hurt anyone else downwind.

And let's not forget the ever present danger of methane explosions and lagoon ruptures. When a massive lagoon leaked on a hog factory farm in Wayne County, North Carolina, in May 2022, spilling into the nearby Nahunta Swamp, it was revealed that hundreds of rotting pigs, along with deli meat and discarded hotdogs, were part of the digester feedstock to make the methane being sold to Duke Energy. Closer to home, just ask anyone who lives near Waunakee, Wisconsin, what it was like to have a poorly designed and managed digester both explode and also leak 400,000+ gallons of fresh manure into Lake Mendota about a decade ago. This single disaster set back Yahara Watershed cleanup efforts for years. It would have been so much cheaper, simpler, and less disastrous for Wisconsin state and Dane County taxpayers to have promoted composting instead (which some better CAFOs actually do, without lagoons).

In November 2022 Kari Lydersen wrote a disturbing investigation, chronicling the many risks to farm workers from factory farms and their manure digesters. She tells one story of Bob Baenziger, Jr., retired Army veteran and former offshore oil rig diver, who died in 2021 as a hired contractor trying to fix a broken cable in an Iowa manure digester. Drowning in such a squalid

pool is something straight out of Dante's *Inferno*. The same year Samuel Antonio Padilla Castro, a Honduran immigrant, was working a 12-hour shift at the Fair Oaks Farm in Indiana when his clothing was caught in manure handling equipment, strangling him to death. His death left behind a widow, three children, and a token \$10,500 Occupational Safety and Health Administration fine. Austin Frerick's profile of the McCloskey family, which owns Fair Oaks Farm, in his new book, *Barons*, reveals more of the underbelly of this "Dairy Disneyland," including their role as digester cheerleaders. Another Fair Oaks tourist and digester advocate he mentions is Tom Vilsack.

Our current "get big or get out" farm policy does not have much time or interest in agroecological approaches for healthier food that also ensure food sovereignty. Instead, corporate agribusiness is allowed to manipulate commodity markets—driving out what little competition exists from smaller farmers and local processors. The political allies of the food giants then ensure that taxpayers help underwrite the largest industrialized operations left standing, since they are the easiest to vertically integrate into the dominant oligopoly structure. Is it any surprise to see agribusiness lobbyists and their academic apologists now touting manure digesters as "climate smart" just in time for Earth Day and pushing for pollution trading offset schemes within the 2024 Farm Bill?

Thankfully, there are better responses to the climate crisis that also treat rural people and our land, air, and water with respect. Existing federal initiatives such as the Conservation Reserve Program could be expanded to better direct payments to farmers who are already doing so much responsible land and climate stewardship—without carbon offset peddlers skimming 25% off the top. The EQIP and REAP programs need to be overhauled to severely limit or even eliminate CAFO lagoon and digester grants and earmark more towards smaller grass-based diversified operations instead. This is the gist behind the EQIP Reform Act, introduced by Sen. Cory Booker (D-N.J.) and Rep. Mike Lee (R-Utah) last year as part of the Farm Bill debate.

More generally, factory farms must be treated as a pollution point source, subject to all the monitoring, regulation, and liability required for any other industrial operation. Why should CAFOs evade the common sense oversight that other businesses respect? Defending local control also remains critical. Last year grassroots activists in St. Croix County were able to push back and shut down a massive digester proposal near New Richmond, Wisconsin, being aggressively promoted by Nature Energy, a Shell Oil subsidiary. Thousands of folks recently responded to a statewide action alert successfully demanding that Wisconsin Gov. Tony Evers veto CAFO industry-crafted preemption legislation that would have hamstrung the right

to pass ordinances that would restrict their manure digesters and other rural mal-development projects. Democratic direct action can get the goods!

NASA space probes have revealed that there is a massive ocean of liquid methane on Titan, one of the moons circling Saturn. There is also not any life that we know of on Titan... Intentional factory farm production and subsequent "climate smart" combustion of methane is not only oxymoronic, but will undermine the future prospect of life here on Earth. Farmers can feed the world and the cool the planet—without the false promise of manure digesters.

Join Us: News for people demanding a better world



The intake pit of a digester producing biogas. Photo CC-BY-SA 4.0 © Vasyatka1 / Wikimedia Commons.

A gribusiness corporations are profiting from their climate pollution by producing and selling factory farm gas, greenwashed as “biogas.” Anaerobic digesters break down manure and other organic materials, creating a gas byproduct composed primarily of methane and carbon dioxide (CO₂) that can be used directly to produce electricity or heat, or “upgraded” for use as a transportation fuel.¹ Even if the technology were as efficient as the industry claims, it does nothing to address methane from enteric fermentation, the digestive process of cattle responsible for three times as many methane emissions than manure management in the U.S.²

Moreover, digesters exacerbate existing environmental injustices. They can release air pollutants like NO_x and sulfur dioxide, which contribute to respiratory illness as well as smog and haze formation, respectively.³ Digesters also do not erase livestock manure, which still needs to be disposed of (often on land); in fact, the use of digesters can enhance the

ability of the waste to pollute water sources with nutrients like phosphorus and nitrogen.⁴ Finally, the end product — factory farm gas — remains a dirty energy source that releases the same pollutants as fossil fuels when combusted.⁵

On-farm digesters are prohibitively expensive for all but large factory farms, and they are often subsidized through significant public funding.⁶ Programs like California's Low Carbon Fuel Standard gives fuels made from factory farm gas the lowest (and most lucrative) carbon intensity; this puts a premium on manure that can drive factory farm expansion, doubling down on pollutants plaguing over-burdened communities.⁷

Endnotes

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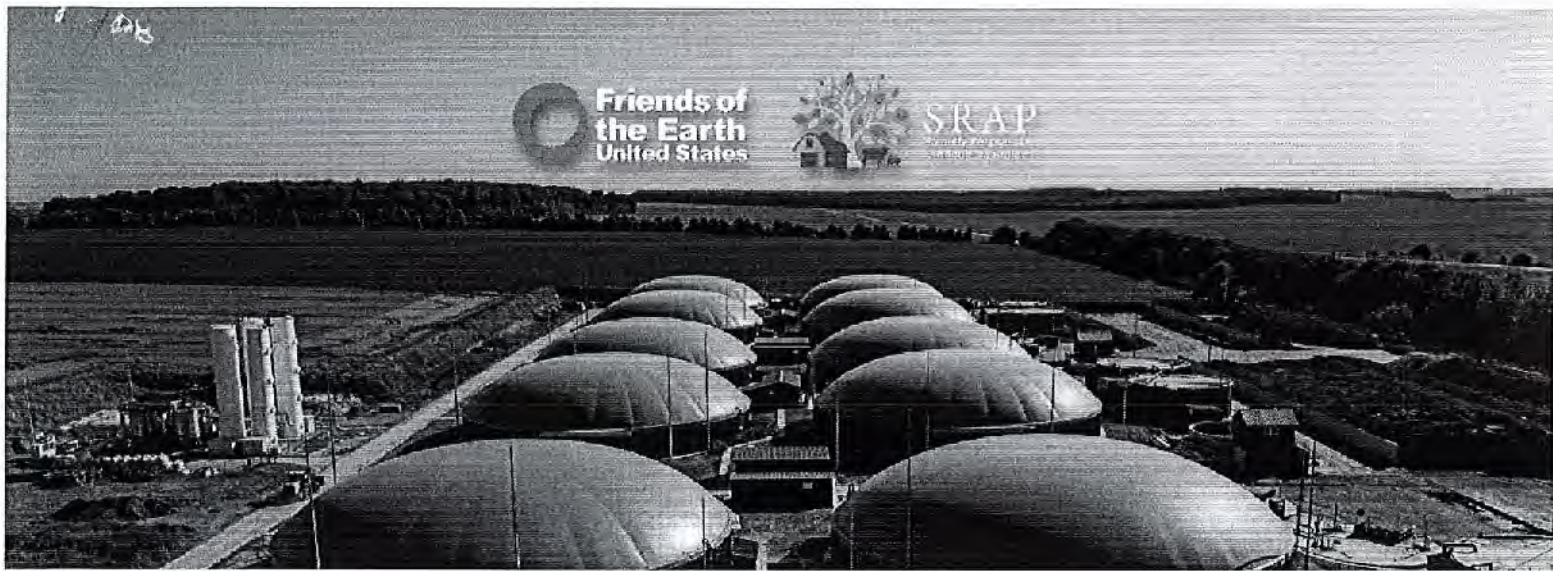
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FACT SHEET: REJECT MANURE BIOGAS AS A METHANE SOLUTION

Incentivizing manure biogas production harms environmental justice, contributes to industry consolidation, and crowds out funding for truly effective conservation practices. It is a greenwashing measure that insufficiently reduces methane emissions while further entrenching the inherently unsustainable and unjust systems of industrial animal agriculture and fossil fuel energy.

Industrial Animal Agriculture Is an Environmental and Public Health Hazard

Concentrated animal feeding operations (CAFOs), also known as factory farms, are heavily polluting facilities that threaten rural economies, public health, and quality of life for surrounding communities, which are disproportionately communities of color and low-income communities.¹ This is primarily due to the massive amounts of manure — as much as one billion tons — that industrial-scale farms generate.² The waste causes considerable water and air pollution and threatens the health of surrounding communities.^{3,4}

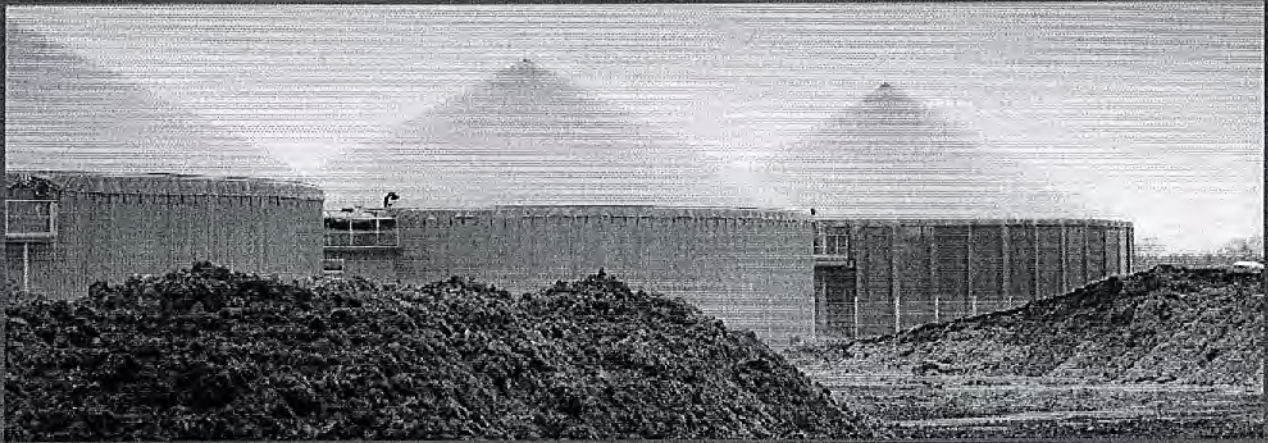
Factory farms are also major drivers of climate change, accounting for nearly 60% of emissions from the global food system and 36% of total U.S. methane emissions.⁵ Because methane is a powerful but short-lived climate pollutant, rapidly reducing methane emissions is critical to meeting global climate targets.⁶

However, rather than regulate the industrial animal agriculture industry's methane emissions, policies on both the federal and state levels reward these industrial-scale polluters through incentives and taxpayer-funded subsidies that encourage the expansion of manure biogas, or factory farm gas, under the guise of climate change mitigation.⁷

Unfortunately, these policies create perverse incentives for CAFOs to:

- 1** Use manure management strategies that maximize methane generation.
- 2** Expand livestock herds to produce as much manure as possible.
- 3** Consolidate such that even fewer farms confine an even larger number of animals to produce as much manure as possible.

What Is Manure Biogas?



During anaerobic digestion, bacteria break down animal waste in a closed, oxygen-free environment known as a digester. What is left behind from bacteria “eating” the waste is a combination of gases, primarily methane and carbon dioxide, called “biogas” or “factory farm gas,” as well as solid and liquid material (also called “digestate” and “effluent”).

The captured gas can be used to generate heat or electricity on-site or electricity sold onto the electric grid, processed into so-called “Renewable Natural Gas,” or converted to Compressed Natural Gas (CNG) or Liquefied Natural Gas (LNG) and used as vehicle fuel.

Manure Biogas Is Incompatible With the Goals of Environmental Justice and Public Health

- Manure biogas systems are typically only feasible at the largest CAFOs and rely on the existence and perpetuation of the most hazardous manure management practices that contribute to air and water pollution.⁸
- Factory farm gas systems have no impact on:
 - Greenhouse gas emissions from feed production and enteric fermentation.
 - Most forms of localized air and water pollution from CAFOs that threatens public health and the environment.
 - The overuse of antibiotics administered to livestock, a driver of antibiotic resistance in humans.
- Farmers locked in unfair contracts or workers facing dangerous working conditions on factory farms and in slaughterhouses.
- The suffering of more than nine billion animals raised for food in intolerably cruel conditions.
- Manure biogas generates additional environmental and public health concerns for communities living near CAFOs, including increased ammonia emissions during anaerobic digestion,⁹ higher concentrations of nutrients in digestate that contribute to water pollution,¹⁰ and new pipelines and trucks to transport manure or biogas.
- Burning factory farm gas creates even more toxic air pollution than burning fossil gas.¹¹

Incentivizing Manure Biogas Is an Ineffective Way to Reduce Agricultural Methane Emissions

Methane reductions from CAFOs with digesters are **likely overstated** by the U.S. federal government.¹²

- Research found that herd sizes at dairies with digesters **grew 3.7% year-over-year**, which is 24 times the growth rate for overall dairy herd sizes, driving increased GHG emissions from animal feed production, enteric fermentation, and manure.¹³
- The federal government assumes that without digesters, CAFOs would utilize the most methane-generating and harmful practice of storing liquid manure maintained in large lagoons or deep pits, but there are alternative manure management practices that generate fewer methane emissions and are less harmful than digesters.

Despite extensive public investments in digesters, the U.S. government is **not monitoring or reporting on methane emissions** from CAFOs with digesters or collecting basic information such as animal populations in ways necessary to understand whether these investments yield actual greenhouse gas reductions.

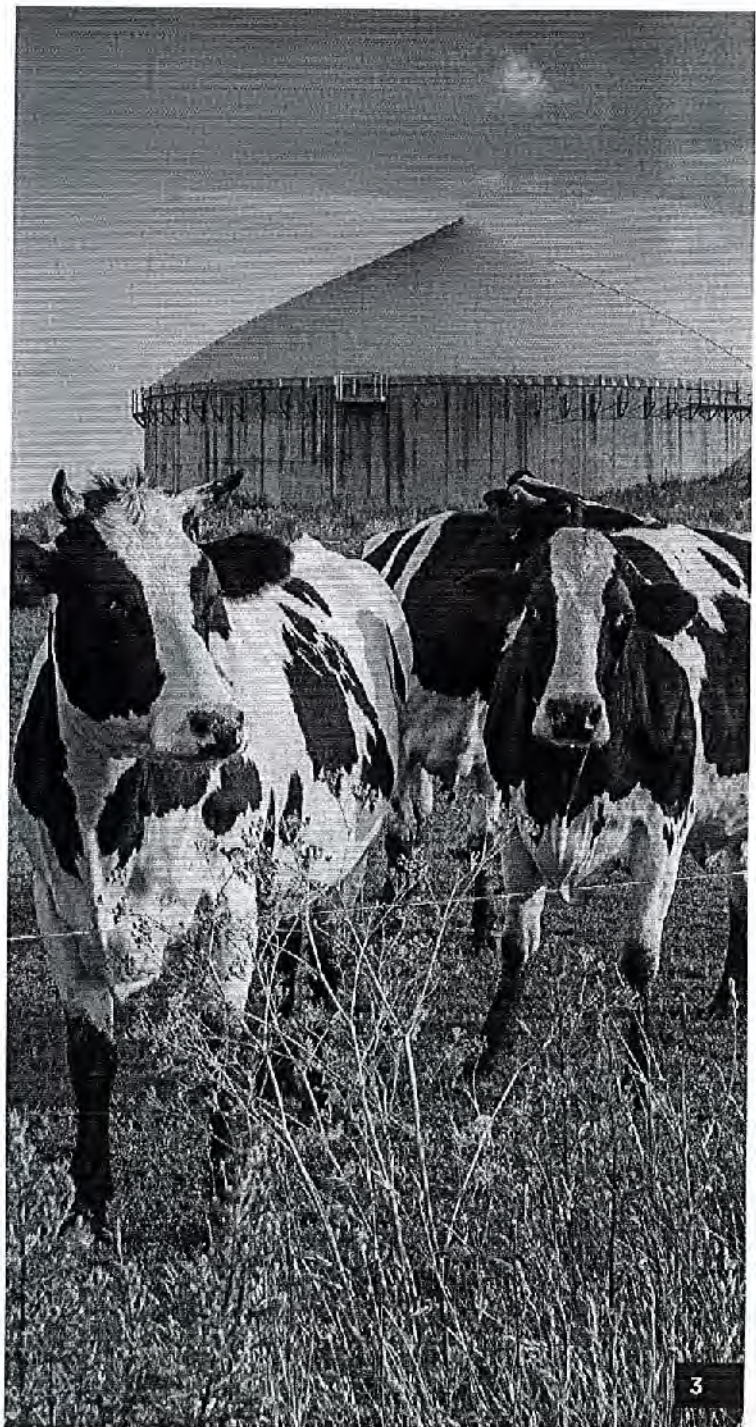
Even the overstated reductions from digesters will **fail to reduce agricultural methane emissions** in alignment with United States' commitment to the Global Methane Pledge to reduce methane emissions by 30% from 2020 levels by 2030.¹⁴

- The Biden administration's proposal to reduce agricultural methane emissions — largely by installing new digesters — would only reduce agricultural methane emissions by 9% by 2030 in a best-case scenario.¹⁵

Alternatives to Factory Farm Gas Are Less Expensive, More Effective, and Less Harmful

- Building and operating anaerobic digesters is expensive; instead, taxpayer dollars should support farmers and ranchers employing meaningful conservation practices.

- Reducing herd sizes by 20% and implementing feasible alternative manure management strategies on 1,500 dairy farms could yield 55% of the reductions that are needed to slash agricultural methane emissions in alignment with the Global Methane Pledge.¹⁶
- Simply paying dairy producers to reduce their herd sizes would be nearly three times more cost-effective than subsidizing methane digesters without the harms of factory farm gas production.¹⁷



Key Policy Recommendation: Support a Just Transition Away From Factory Farming and Fossil Fuels

Resources currently supporting manure biogas (i.e., grants and loans for digesters, technical assistance, tax credits, and incentives for biogas production) should be redirected to more cost-effective methane reduction solutions that do not exacerbate environmental injustice and industry consolidation. Instead, policies should support a just transition away from factory farming to ecologically regenerative agriculture and away from fossil fuels to truly renewable energy.

Additional Policy Recommendations:

- 1** Do not create new funding streams or other policy incentives for manure biogas.
- 2** Prevent double-dipping between subsidies, tax incentives, and methane-credit markets. Relatedly, ensure greenhouse gas reductions attributed to manure biogas are not double counted.
- 3** Set a specific methane reduction target and pathway for the agricultural sector aligned with the Global Methane Pledge.
- 4** Require and improve methane monitoring and reporting from livestock operations.
- 5** Pursue agricultural methane reduction strategies that support environmental justice and fair markets for producers:
 - Methane emissions from industrial livestock facilities should be monitored, disclosed, and regulated.
 - Leverage procurement to shift federal purchasing and food service toward plant-forward menus.
 - Prioritize funding for pasture-based livestock production in U.S. Department of Agriculture conservation programs.
- Implement policies such as the Farm System Reform Act that support a just transition to pastured animal production and plant-based food production, including placing a moratorium on large factory farms and providing voluntary buyouts for farmers who want to transition away from operating a CAFO.
- 6** Reduce food waste.
- 7** Regulate waste from both CAFOs and digesters, including treatment and application of digestate.
- 8** Require disclosure of basic data from CAFOs and digester operators and fund and conduct research to assess the impacts of manure biogas policies on methane emissions, industry consolidation, and rural communities.
- 9** When public funds have already been designated to support manure biogas, grants and loans should include conditions and exclusions to reduce public health and environmental harms and increase transparency.

Learn more at: foe.org/manure-biogas

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POLICY BRIEF

Impacts of Anaerobic Digesters

July 2024



The hidden environmental and economic costs of anaerobic digesters and biogas

What are anaerobic digesters?

Anaerobic digesters are facilities that decompose organic waste, separating biogas from solids and liquids, called "digestate." Biogas can be used on-site or processed into purified pipeline-grade biomethane for electricity or transportation. On confined animal feeding operations (CAFOs), a biodigester may be a cover on a cesspit. After the methane is captured, CAFO operators dump untreated digestate full of heavy metals and biological hazards like thermotolerant E.coli onto farm fields as "fertilizer."

How to regulate digesters

To comply with Michigan's constitutional and statutory environmental protections, regulation must address *all* of the environmental impacts of biogas/ biomethane production, including digestate disposal. Biogas emission calculations must include, at minimum, emissions from farm operations supported by digesters, the digester itself, conversion of biogas to biomethane, and combustion of biomethane. The state must carefully monitor heavily concentrated toxins that are discharged with digestate. Finally, common CAFO siting in rural, low-income communities, and CAFO expansion due to biodigester subsidies, require environmental justice analysis.

ANAEROBIC DIGESTERS TERMINOLOGY

Aerobic Digestion: The aerobic (oxygen-using) process of breaking down organic waste, leaving behind water and dense solid waste (compost). Can be a key part of an efficient, sustainable waste management system.

Biogas: A mix of various greenhouse gasses (including methane and carbon dioxide) and other impurities. Typically not pipeline quality; instead used for on-site power needs.

Biomethane: Purified biogas, with all carbon dioxide, water, and non-methane impurities removed (that is, emitted through a conversion process). Pipeline quality; is often sent off-site from the original digestion location.

Digestate: The sludge and solid waste remaining after anaerobic digestion. Often applied to crops, and eventually making its way to water bodies through runoff and groundwater flows.

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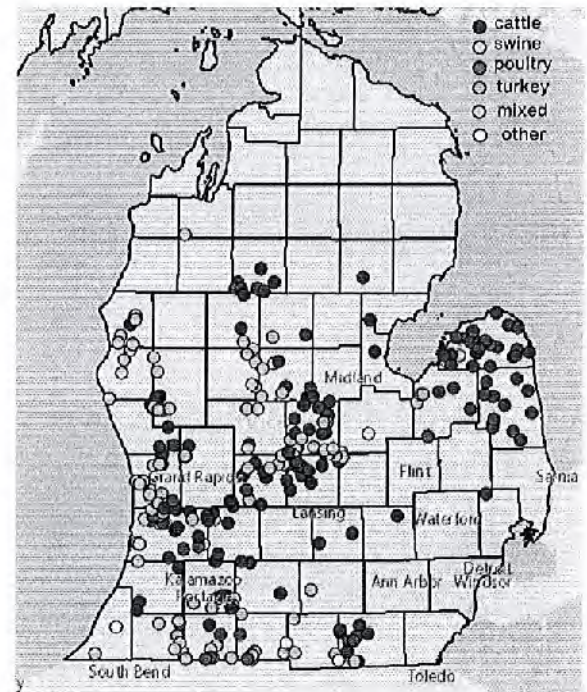
When digester incentives go wrong

A 2021 California Legislative Analyst's Office Report cast significant doubt on greenhouse gas (GHG) reduction claims by California's Dairy Digester Research and Development Program, which funds new digesters on dairy operations. Multiple departments claim full credit for biogas emissions reductions, leading to double and triple counting. GHG reductions themselves are questionable, because they ignore biomethane combustion emissions and the need for a biomethane truck fleet. Given these significant unknowns about actual environmental benefits, Michigan should not model its program on California's.

How should Michigan address anaerobic digesters?

Michigan must pay close attention to unintended economic incentives caused by digester subsidies. Biomethane production is much more expensive than fracked natural gas, so subsidies can upend gas industry economics. Cheap, subsidized biomethane may perpetuate rather than reduce traditional fuel-based heavy-duty trucking – with negative climate and air quality impacts. Due to economies of scale, only very large CAFOs can take advantage of digester subsidies, disadvantaging small family farmers and further consolidating the meat industry. CAFO and fossil fuel industry partnerships can turn CAFOs into manure producers that also happen to sell meat. Such effects are not purely theoretical: A “failing” Battle Creek CAFO recently avoided liquidation by shifting its business model to focus on energy production, including a digester. Michigan's anaerobic digester policy should prioritize food health and security, protecting land and water from contamination, to achieve genuine climate progress and accountability.

CAFO LOCATIONS IN MICHIGAN



FAST FACTS YOU NEED TO KNOW

Michigan CAFOs generate:

62.7 MILLION pounds of livestock sewage and other waste every day.

That's equivalent to the amount of human waste generated daily in a city the size of New York.



LOOKING TO DIVE DEEPER?

Find more on this topic at:
ForLoveOfWater.org



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FLOW (For Love of Water)
440 W. Front Street #100
Traverse City, MI 49684

(231) 944-1568
info@flowforwater.org



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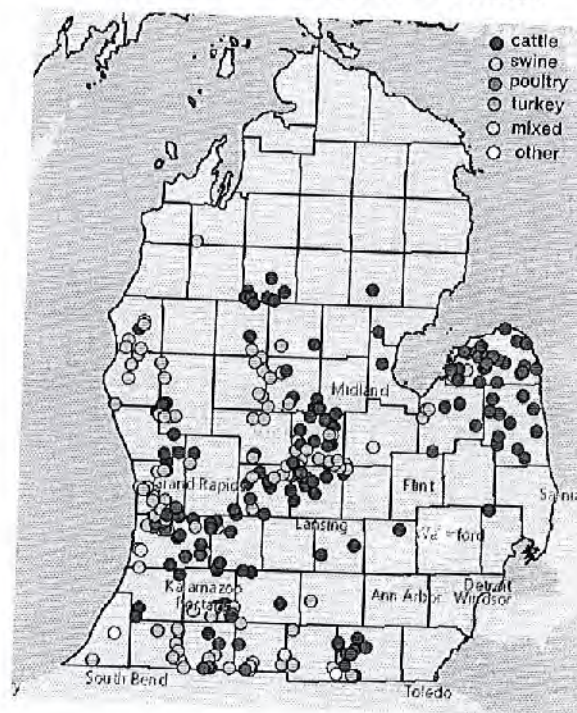
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Jason Snyder

From: Sue Johnson <udderchaos.farming@gmail.com>
Sent: Sunday, September 6, 2026 2:13 PM
To: Jason Snyder
Subject: Waupaca County Zoning Digester ordinance

Dear Jason Snyder,

I am writing to express my opposition to the proposed ordinance allowing co-digesters, data centers, and solar panels in Waupaca County.

Waupaca County is a wonderful place to live, with a strong tourism industry that relies on the natural beauty of our area, lakes, and streams. Having lived here for half my life, I plan to remain here permanently, and I do not believe these developments belong in our community.

Sincerely,

Leo and Sue Johnson
E5508 Yohr Rd
Manawa, WI

Rebecca Landre

From: Vanden Langenberg, Susan K - DNR <susan.vandenlangenberg@wisconsin.gov>
Sent: Tuesday, September 1, 2026 7:11 AM
To: Rebecca Landre
Subject: RE: Notice of Public Hearing-Planning and Zoning Committee-September 17, 2026

Hi Rebecca,

Please let the committee know that no DNR letter will be sent for the upcoming hearing.

Have a good day.

Sue Vanden Langenberg
Cell Phone: 608-843-3290
Susan.Vandenlangenberg@wisconsin.gov

Want to stay updated on Shoreland and Floodplain Zoning topics? View our [past newsletters](#) or [sign up](#) to receive the next issue!

Our core values include professionalism, integrity, and customer service.
Please visit our [survey](#) to provide feedback on your experience interacting with any DNR employee.

From: Rebecca Landre <Rebecca.Landre@waupacacounty-wi.gov>
Sent: Monday, August 31, 2026 11:31 AM
To: Vanden Langenberg, Susan K - DNR <susan.vandenlangenberg@wisconsin.gov>
Subject: Notice of Public Hearing-Planning and Zoning Committee-September 17, 2026

CAUTION: This email originated from outside the organization.
Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning,

Attached please find a Notice of Public Hearing for the upcoming Planning and Zoning Committee meeting. Please contact the Planning and Zoning Office with any questions. Thank you!

Becky Landre

Waupaca County
Planning & Zoning
811 Harding Street
Waupaca, WI 54981
715-258-6255
715-258-6347 direct

Jason Snyder

From: Jessica Remington <jessica.a.remington@gmail.com>
Sent: Wednesday, August 5, 2026 8:27 PM
To: Jason Snyder
Subject: Opposition to Chapter 34 Zoning Amendments

Dear Jason,

I grew up in Scandinavia, and my parents still live on our family farm, with my grandmother and uncle next door. My husband and I own our own 1908 farmhouse north of Iola.

I'm unsure if you are a voting member of this committee, but wanted to relay my sentiments to you as well. I am writing to express my strong opposition to the proposed zoning amendments regarding industrial co-digesters and data centers in Waupaca County. I urge the county to reject these changes in their current form, as they threaten to strip away local township control, undermine community's comprehensive plans, and risk the long-term safety of our rural environment.

Primary Concerns:

- **Industrialization of Agricultural Land:** Co-digesters that import massive amounts of off-site industrial food waste are heavy industrial operations, not standard agricultural accessory uses. Categorizing them as such strips towns of their ability to regulate heavy truck traffic, protect local air quality, and mandate necessary water and well testing.
- **Unprecedented Resource Demands:** Data centers bring immense, unstudied strain to our local power grid and require massive amounts of water for cooling. Our rural infrastructure is not equipped to handle these hyperscale utilities without risking the reliability and cost of utilities for local residents.
- **Erosion of Local Control:** Decisions of this magnitude must remain in the hands of individual town boards, who best understand their specific landscape, infrastructure limits, and the will of their residents.

I currently work as a Chief Financial Officer of a hospital, and understand the necessary due diligence that must be given to large impactful decisions. Because the long-term environmental and economic impacts of industrial co-digesters and data centers are not yet fully understood, I propose that Waupaca County enact moratorium on the permitting, zoning approvals, and construction of these facilities until impacts are better understood. We must not rush into permanent zoning changes that favor industrial developers at the expense of our rural heritage and natural resources.

If you do vote, please vote to protect our towns and pause these amendments until they are thoroughly investigated.

Thank you for your time, leadership, and service to our community.

Sincerely,
Jessica Remington
N8729 Lutz Road
Iola, WI

Rebecca Landre

From: Jason Snyder
Sent: Monday, August 10, 2026 6:59 AM
To: Jackie Beyer
Cc: Rebecca Landre
Subject: RE: Input Regarding meeting on 8/6

Thanks Jackie! We'll make sure this email gets to the full committee.

Have a great day!

Jason Snyder, Zoning Administrator
Waupaca County Planning and Zoning
811 Harding St.
Waupaca WI 54981
Ph (715)258-6255
Email: Jason.Snyder@co.waupaca.wi.us

From: Jackie Beyer <Jackie.Beyer@co.waupaca.wi.us>
Sent: Sunday, August 9, 2026 8:19 PM
To: Jason Snyder <Jason.Snyder@waupacacounty-wi.gov>
Subject: Fw: Input Regarding meeting on 8/6

From: Christy Kaminski <christine.lasee@gmail.com>
Sent: Wednesday, August 5, 2026 2:48 PM
To: Jackie Beyer
Subject: Input Regarding meeting on 8/6

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To: Jackie Beyer: Waupaca Planning and Zoning Committee

From: Christy Kaminski

Address: 653 Unions street, Manawa Wi 54949

Email/Phone: Christine.lasee@gmail.com

920-366-4827

Dear City Clerk and Members of the Committee,

I am writing to formally request the council to have a moratorium/ban on any proposed data centers and not allow them and co- digesters to be zoned as heavy industrial use in Waupaca county.

Please postpone any data center project until 2027 while you form a commission of independent experts in relevant fields to do a thorough, independent review of the environmental and social impacts, ensure robust public engagement from randomly selected citizens and from residents around any proposed location, and explore alternative locations or opportunities that minimize harm to our community.

I request that this letter be distributed to the committee members and included as part of the official public record.

As a resident of Waupaca, I am deeply concerned about the lack of transparent, independent environmental and utility impact data available for these massive projects. While I support economic development, it must not come at the expense of our infrastructure and natural resources.

My primary concerns focus on these areas:

- High water consumption and drought
- Unknown effects on local water tables
- High energy demands
- Increased utility bills
- Strain on electrical grid
- Long term ecological impacts
- Pollution, noise, sound, lights
- Unknown health effects on nearby humans, livestock and wildlife
- Emergencies like fires, runaways, spills
- Reduced property values
- Lack of input from independent experts
- Expansion of this project or other centers in Waupaca
- Infrastructure built on or through private property
- Lack of transparency
- Lack of understanding or trust in the overlay and zoning process
- Permitting data centers, industries & technology centers in residential zones
- Uncertainty, risks, no guaranteed end user, short contracts
- Lack of jobs created in relation to size of facility

I urge the Committee to withhold any rezoning approvals, official plan amendments, or building permits for these properties until independent, third-party environmental and grid-capacity assessments are fully completed and presented to the public for consultation.

Thank you for your time, consideration, and dedication to protecting Waupaca's environment and residents.

Sincerely,

Christy Kaminski

Jason Snyder

From: Reid Schoonover <reid@workingmanstudio.com>
Sent: Thursday, August 6, 2026 8:48 AM
To: Jason Snyder
Subject: AI Mega Data Centers -

Mr. Snyder,

Please record my opposition to any AI Mega Data Centers in Waupaca County. I believe these Data Centers will be detrimental to the residents of Waupaca County, to our/Waupaca County's natural resources, to the overall health of Waupaca County residents and of no financial benefit to Waupaca County taxpayers and the County in general, but actually, again, detrimental.

Reid Schoonover
Waupaca County Resident
Clintonville, WI

Jason Snyder

From: Tanya Gauer <2018tanyagauer@gmail.com>
Sent: Wednesday, August 5, 2026 5:35 PM
To: Jason Snyder
Subject: Concerns On The 8/6/26 Meeting

Good afternoon Jason,

My name is Tanya and I am a long time resident of Waupaca County. I was recently made aware of the meeting that's to take place tomorrow on 8/6/26. Like many of my neighbors, I am quite concerned.

From my understanding, this meeting isn't exactly about an incoming data center but preparing for one by updating bylaws, regulations etc as well as the possibility of not allowing the citizens of this county to vote on whether or not we want a data center built or where. For something that is so controversial, this would be a massive oversight. The citizens should be the ones to decide if we want one in our backyards.

Why would the county feel it's okay to take away this choice? How can this be something that the government feels they can have total control over without the citizens input? The government is supposed to work in service of its constituents and this feels like the exact opposite of that. It's one thing to build an extra storage building or repaint some roads but something that is so new to our society with so many lasting effects is another.

Wherever you decide to put this data center, what of the human neighbors of this structure? There is a lot of noise pollution involved which would make people want to move far away from such a thing therefore losing taxpayers to other counties. Not only that, but the people who are unable to move are going to get real upset over the amount of noise these things create. Their happiness will affect our communities. The noise that they create can be heard from hundreds of feet around the data center as per the below link: <https://www.eesi.org/articles/view/communities-are-raising-noise-pollution-concernsabout-data-centers>

Speaking of my neighbors, what about the tax ramifications? I'm sure someone with more power and money than I would gain to make their coffers even fuller. However, how much can the average Waupaca County citizen take financially? Many of us are incredibly burdened with the high cost of food, our gas currently sits at 4.09 a gallon, housing is mostly unaffordable and prices keep going up. Who is going to pay for this? It'll have to come out of the taxpayers pocket most likely. What will the government do when the majority of its citizens can't afford to live in its county? What about who pays for its energy consumption? Will that be an added line on all of our WPS bills? WPS has already notified its clients that their bills are about to get much more expensive as they are upgrading their facilities. They say it's to make energy production easier, faster etc but is that really the case or are they trying to prepare for the incoming data centers? Much of what's going on in our world is not sustainable, this is adding another layer to it.

<https://eelp.law.harvard.edu/extracting-profits-from-the-public-how-utility-ratepayers-are-paying-for-big-techs-power/>

And what about our waters? Waupaca County is known for the Chain of Lakes; what if this affects the Chain and therefore a huge chunk of our economy. There isn't a lot of data on whether or not data

centers can render our water non potable; however, the strain they take on water treatment facilities is great. Will our water treatment plants be able to hold up to something like this? Not to mention the on average consumption of 110 million gallons of water per year that an average size data center needs to cool itself. The city of Waupaca's own water treatment plant can currently only process about 1.8 million gallons of water. We have at least four treatment facilities in Waupaca County, let's assume each one can process 1.8 million gallons of water that's still only 7.2 million gallons for the whole county. Will the county build more water treatment plants for this and what concerns does the government have about running out of well water?

<https://www.eesi.org/articles/view/data-centers-and-water-consumption>

I could keep going on but this essay is enough for now. I hope you do take the time to read this and the articles I've sent to prove what I'm saying isn't a bunch of hogwash. Hopefully the turn out at the meeting I am unable to attend will also help you understand what Waupaca County citizens are feeling on the subject. Please remember, we are humans, people who live here. We have homes, jobs, daily lives, family and friends. We aren't just numbers on a report or things to be tossed away. Please keep this in mind when making your decision, it affects a lot more than a bunch of rich people's pockets.

Sincerely,

Tanya Gauer

Resident of Waupaca County and the City of Waupaca

Data Center Zoning

From: Ann Chrudinsky <Ann.Chru@pm.me>

To: jackie.beyer@co.waupaca.wi.us

Date: 8/5/26 12:26 PM

Resending to each member of the committee individually because the county's server rejected the email to the entire committee. Please see below. Thank you.

On Tuesday, August 4th, 2026 at 7:17 PM, Ann Chrudinsky <Ann.Chru@pm.me> wrote:

Hello, and thank you all for the arduous task before you.

I plan to attend the meeting on the 6th, but I wanted to also write to share my views, as I'm sure there will be many people who will wish to speak and I may not get the opportunity. At this point, I'm not in favor of data centers, based on preliminary research.

Questions to consider:

1. Why do data center investors seek to build where the natural water resource is plentiful if they 'don't use that much water' (closed loop, for example).
2. Why do they use constructing its own co-digester(s) as a selling point, if they don't pollute water?
3. Aside from the constant noise, which is a common complaint, consider the high-voltage power lines that must serve these data centers. Will the data center investors agree to bury the power lines to avoid electromagnetic pollution (damaging to our bodies)? If not, why not? (Cost) Is the committee willing to also take up the task of convincing Waupaca County residents that a set of power lines to serve the data center will not impact county natural resources and residents? -- I suggest the committee make a stipulation that the electric infrastructure serving data centers must be buried to mitigate electromagnetic pollution, at the very least.
4. Consider the amount of money Waupaca County tourism brings in -- \$117 million in 2025. Typically, a dollar changes hands four times once it enters a community. That means a total economic impact of \$468 million. Is the committee willing to lose that to gain an industry that may (probably will, based on other sites around the country) destroy the natural resources - particularly the water - that tourists seek in Waupaca County?
5. Consider whether you as a committee member would allow this to be built in your backyard. Why would anyone else want it near their home? Industrial parks are near homes.
6. Is there currently, or has there been within the last year, an inquiry or request in regard to considering Waupaca County as a potential construction site for a data center?

My recommendations:

- Data centers should locate in metropolitan areas that do not rely on natural resources for revenue. Data centers can apparently use reclaimed wastewater as coolant (see #1, above - although I don't know that they can use *all* of the reclaimed wastewater -- and the system still needs to be flushed, so it may still be detrimental to our abundant natural resources here).
- Place a moratorium on data centers in Waupaca County, since they do not really generate enough of an economic impact compared to tourism and manufacturing industries.

Thank you for your work to represent the people of Waupaca County and make your decisions based on the People's voice.

Sincerely,

Ann Chrudinsky
N4350 County Road K
Weyauwega, WI 54983
715-966-1343

Sent with Proton Mail secure email.

Rebecca Landre

From: Vanden Langenberg, Susan K - DNR <susan.vandenlangenberg@wisconsin.gov>
Sent: Wednesday, July 22, 2026 3:48 PM
To: Rebecca Landre
Subject: RE: Notice of Public Hearing-August 6, 2026

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Hi Rebecca,

Thanks for the notice.

Please let the committee know that no DNR letter will be sent for the upcoming hearings.

Have a good day.

Sue Vanden Langenberg
Cell Phone: 608-843-3290
Susan.Vandenlangenberg@wisconsin.gov

Want to stay updated on Shoreland and Floodplain Zoning topics? View our [past newsletters](#) or [sign up](#) to receive the next issue!

Our core values include professionalism, integrity, and customer service.
Please visit our [survey](#) to provide feedback on your experience interacting with any DNR employee.

From: Rebecca Landre <Rebecca.Landre@co.waupaca.wi.us>
Sent: Thursday, July 16, 2026 2:31 PM
To: Vanden Langenberg, Susan K - DNR <susan.vandenlangenberg@wisconsin.gov>
Subject: Notice of Public Hearing-August 6, 2026

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Good afternoon,
Attached please find a Notice of Public Hearing for the upcoming Planning and Zoning Committee meeting. The properties that are subject to the Public Hearings fall within the Shoreland District but are not directly related to Shoreland Regulations.
Please let me know if you have any questions or comments. Thank you!

Becky Landre

Waupaca County
Planning & Zoning
811 Harding Street
Waupaca, WI 54981
715-258-6255
715-258-6347 direct

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Jason Snyder

From: Isolsen@wolfnet.net
Sent: Wednesday, August 5, 2026 12:07 PM
To: Jason Snyder; Larry Olsen
Subject: Data Center meeting
Importance: High

Hi Jason, Thank you for leaving me the voice mail message that you needed our comments in writing. I had planned on attending the meeting tomorrow, Thursday, August 6th, at 9:00 a.m. at the County Highway Shop on County Road A, but unfortunately it doesn't look like I'll be attending. Both Larry and I DO NOT want a Data Center or co-digestors built in Waupaca County. **We feel there are too many unknowns, more cons than pros regarding their construction in our rural county.** We also think any thing of that magnitude should be put before the voters in Waupaca County in the form of a referendum, not just solely the opinions and votes of a select committee and/or county board members.

The governor of Texas has put a pause on data centers in their state. Alabama has been in the news regarding data centers. A A lot of cities and towns have been discussing them too, per the news. They take up a lot of acreage to build one and that would not fit in with our beautiful rural county. Nor would it's demand on utilities, our environment, and the aesthetic value of our properties in Waupaca County!

Good Luck! Thank you for "listening!" Larry and Sharon Olsen

PS Hope all is well with you!! Take care!

Jason Snyder

From: Victoria Gehrke <gctorie@yahoo.com>
Sent: Tuesday, August 4, 2026 7:12 PM
To: Jason Snyder
Subject: Written comment for P&Z Hearing on August 6th
Attachments: Our comment to P&Z (1).pdf

Good evening Jason,

I am attaching a written comment that I wish to be read into the record at the Planning and Zoning Committee's public hearing on Thurs, August 6th related to the proposed codigester ordinance. I apologize for sending this so late.

Respectfully submitted,
Victoria and Kent Gehrke

August 3, 2026

Waupaca County Planning and Zoning Committee
811 Harding Street
Waupaca, WI 54981

Dear Planning and Zoning Committee Members,

Citizens have spent hundreds of hours doing research for almost 3 years. We've spoken to national digester experts including air emission specialists, digester experts, EPA staff in Chicago and face to face in DC, a rural sociologist who did both her thesis and doctoral dissertation on digesters, an infectious disease doctor with digester experience, a county land and soil administrator where 3 separate codigester proposals were denied, municipal wastewater treatment staff, a US Fish and Game specialist, a soil/water scientist, an environmental health scientist, an epidemiologist from UW Madison, and realtors to highlight just a few. We have reviewed hundreds of pages of documents, research studies, and articles on codigesters. FOIA's were submitted when a codigester proposal was being considered in the Town of Lind and the documents revealed significant information and concerning facts that were not disclosed when the proposal was brought to the township and citizens. Citizens visited codigester facilities including one in Vermont, and digesters in Wrightstown and a codigester in Denmark, WI; spoke with citizens experiencing the negative impact of codigesters in MI and as far away as the UK and Ontario.

Citizens have done their due diligence in educating themselves about both sides of the issue. We've researched the complex nature and multifaceted components of codigesters and their byproducts called digestate. That research led to substantial concerns about the risk to our environment, human health, and our rural way of life and the conclusion that they are simply NOT ag accessories. And yes, we submitted an admittedly large well organized file folder to the Waupaca County Zoning office to ensure that this committee would have enough unbiased, non industry information, real life incidents of the problems that can occur with manure codigesters, and scientific studies to truly weigh the risks versus the merits of a manure codigester.

Proponents from the biogas and ag industries sing the praises of manure co-digesters, largely, because of the financial gains and government incentives, however many other experts have concluded that codigesters are both operationally and economically unfeasible and pose too many risks to the environment and to human health. This quote found in a research paper on farm digesters and the biogas controversy by Brent Kim of the John Hopkins Bloomberg School of Public Health is so very true and applicable. "When we adopt a measure to address a problem (such as too much manure for too little land), even an ineffective measure (adding tons of additional food waste in a codigester), society and policymakers tend to move on as if the problem is solved. Evaluating the state of scientific evidence surrounding purported solutions (such as codigesters) is a critical step when dealing with complex, systemic problems for which silver bullets rarely exist."

When the first codigester proposal was considered, county zoning staff interpreted zoning regulations and came to the conclusion that codigesters belonged in industrial zones and tell under solid/hazardous waste facilities. And in fact, a great deal of past federal funding for codigesters has come through under solid waste management dollars. After learning that the food waste was, in fact, industrial food waste, that all the waste would be considered industrial waste, that the planned discharge into our waterways would be industrial waste water and a new point source of pollution, and that three different industrial waste permits were needed for landspreading the digestate, it is even more fitting to site them in industrial zones and keep them under the solid/hazardous waste facility category. The facts about codigesters **haven't changed since that interpretation. Several things did change: learning the true industrial nature of these codigesters, and reading more and more factual, unbiased information and scientific research studies that raised even more concerns about codigesters and digestate. Ironically, because this proposed ordinance would make codigesters an ag accessory, we're asked to believe that this industrial waste will simply and "magically" transform into ag waste in a codigester. We're also asked to accept that bringing in unlimited tons of industrial food waste per day into our county and adding it to tons of manure and processing wastewater in a codigester is somehow going to eliminate the issue of too much waste for too little land, and reduce the risks to our water, soil, air quality. Facts say differently. VOTE NO!!!!**

- 1. Townships should retain local control and their comprehensive plans, preferred land use, and zoning decisions should be honored.**
- 2. Manure codigesters should be in industrial zones and NOT be considered an ag accessory.**
- 3. Manure codigesters should be classified as solid/hazardous waste facilities.**
- 4. A separate hearing should be held when yearly Chapter 34 zoning ordinances and amendments are being considered and NOT be lumped in with multiple conditional use permit hearings.**

Thank you for your time and your service.

Kent and Victoria Gehrke

Property owners in both the Town of Little Wolf and the Town of Lind

Jason Snyder

From: Sarah D'Onofrio <sarah.e.donofrio@gmail.com>
Sent: Tuesday, August 4, 2026 1:02 PM
To: Jason Snyder
Subject: Letter to be read into the Record at the 8/6 P&Z Hearing
Attachments: Final Waupaca County Letter.pdf

Hello,

I'm submitting a letter that I would like to be read aloud during the Waupaca County Planning and Zoning meeting (on 8/6). **Please make this letter a part of the official record.**

Thank you so much.

Dr. Sarah D'Onofrio

--

Sarah D'Onofrio, Ph.D.
Rural Sociologist, Community Organizer, and Anaerobic Digester Expert
She, Her, Hers



August 4, 2026

Dear Waupaca County Planning and Zoning Board,

Zoning ordinances are essential tools for local political officials to ensure appropriate land uses while also protecting public health, community safety and the environment. However, as currently written, **the changes to the Waupaca County Zoning Ordinance attempt to allow co-digesters into agricultural zones as agricultural accessories without acknowledging the industrial nature of co-digesters themselves.** It is inappropriate for the Planning and Zoning Board to put forth a zoning ordinance for co-digesters that allows them as agricultural accessories without properly addressing whether co-digesters are appropriate for agricultural land in the first place.

On behalf of the undersigned individuals, organizations, and their thousands of members across Wisconsin and the Midwest, we write to urge you to reject the proposed Manure Codigester Facility Ordinance in the 2026 Waupaca County Chapter 34 Zoning Ordinances. These changes would have devastating public health, economic, and environmental impacts on farmers and rural communities.

Co-digesters are often pitched as “win-win” for farmers that are struggling to make ends meet in a highly competitive global economy. However, the business model of co-digesters should concern everyone at this hearing: Co-digesters use manure and food waste as feedstock to produce gasses which can bring large profits to the digester company, not the farmer. The main job of the farmer is to simply manage the massive quantity of waste produced by the operation. That waste, they often fail to mention, is more hazardous and difficult to manage than manure. There are a wide range of by-products that can be considered “food waste” under Wisconsin law. Industrial food waste often contains contaminants that are harmful to soil health, human health, and agricultural production. Incorporating industrial food waste streams with animal manure does not eliminate these risks, but rather heightens them considering the standard of waste disposal is land application or discharges into local waterways. Lumping co-digesters with other forms of renewable energy production that do not produce significant quantities of waste as a function of daily operations is at best, short sighted and at worst, flagrantly deceptive. Moreover, co-digesters depend on a steady supply of large volumes of manure, creating economic incentives to maintain and expand large-scale livestock operations. **Rather than addressing the underlying pollution challenges posed by industrial animal agriculture, they reinforce the factory farm model that generates those impacts in the first place.**

Rolling out the welcome wagon to a class of industrial projects, owned and operated by global energy companies, without acknowledging the many varieties of non-agricultural waste processed by co-digesters puts the environmental health and safety of Waupaca County residents

at risk. **We, the undersigned organizations, collectively urge you to oppose the proposed Manure Codigester Facility Ordinance in the 2026 Waupaca County Chapter 34 Zoning Ordinances in the current form.** We are committed to working collaboratively on policies that promote sustainable agriculture and waste management while safeguarding public health and our natural resources.

Respectfully,

- Brianna Crowley, FarmSTAND
- Tyler Lobdell, Food and Water Watch
- Molly Armus, Friends of the Earth
- Danny Atkinson, Grassroots Organizing Western Wisconsin (GROWW)
- Ava Auen-Ryan, Iowa Citizens for Community Improvement
- Cheryl Ruble, MD., Michiganders for a Just Farming System
- Adam Voskuil, Midwest Environmental Advocates
- Sue Curtis, St. Croix CURES (Citizens Uniting for Responsible Environmental Stewardship)
- Tracy Staeder, Sierra Club Wisconsin Chapter
- Lisa Doerr, Sustain Rural Wisconsin Network
- Sherri Dugger, Socially Responsible Agriculture Project

Jason Snyder

From: Margie Dearth <mad54940@yahoo.com>
Sent: Monday, August 3, 2026 6:00 PM
To: Jason Snyder
Subject: Data centers

Just wanted to let you know prior to the meeting regarding Data Centers allowed in Waupaca County, my whole family is TOTALLY AGAINST allowing any or all data centers to be operating in our County. Please take our requests into consideration when making your decision. This will definitely have an IMPACT ON US ALL. It's worth having input from all the residents when making such a life changing impact, such as in a referendum. Thank you for taking the time to read this.

M Dearth

Fremont

[Yahoo Mail: Search, Organize, Conquer](#)

Jason Snyder

From: Carrie Thompson <carrie.thompson2379@gmail.com>
Sent: Saturday, August 1, 2026 2:06 PM
To: Jason Snyder
Subject: No

Any normal human being understands that data centers are not good for humans or the environment. These are for mass surveillance and digital id. No money is worth morals or values! I urge you to listen to your constituents! NO TO DATA CENTERS and NO TO AI CAMERAS!

<https://www.brockovichdatacenter.com/facts-myths.html>

Take a look at this information.
Carrie

Jason Snyder

From: Al Dorsch <adorsch9382@gmail.com>
Sent: Friday, July 31, 2026 11:36 AM
To: Jason Snyder
Subject: Data Center in Waupaca County

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To the Planning and Zoning Committee of Waupaca County concerning the establishing of data centers in Waupaca County.

I would urge the Committee to enact a moratorium on the building of data centers in Waupaca County for an extended period of time. A year and probably more to consider the huge impact(s) and future need of such a development.

Jason Snyder

From: Leslie <leslie.baker76@gmail.com>
Sent: Thursday, July 30, 2026 5:43 PM
To: Jason Snyder; cedinfo@waupacawi.gov
Subject: Data Center Meeting

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Dear Waupaca Planning and Zoning Committee,

I am writing to express concern regarding the decision to schedule the upcoming public meeting about the proposed data center at 9:00 a.m.

A project of this potential scale and long-term impact deserves meaningful public participation. Holding the meeting during standard working hours makes it extremely difficult, if not impossible, for many residents to attend.

Scheduling a meeting at a time when a large portion of the community is unavailable creates the appearance that public participation is being limited rather than encouraged. Whether intentional or not, that undermines confidence in the process.

I have lived in Waupaca almost 2 years now. I moved without knowing much about the area, and it has been such an amazing experience to be here in nature to enjoy the water and land the way it is. The people have also been amazing. I have been to your offices with questions regarding my taxes and house as I am a first time home buyer. Everyone has been so friendly and amazing. My heart hurts to think that we might be on the cities destroying the land for one of these centers. It tarnishes the beautiful view I have of this community.

I am opposed to the proposed data center and have significant concerns about how it could affect our community, neighboring properties, local resources, infrastructure, noise levels, the environment, and our overall quality of life. These concerns deserve to be heard and addressed in a setting that is genuinely accessible to the people who will live with the consequences of this decision.

I ask that no recommendation, approval, or significant decision regarding the project move forward until the public has been provided a fair and reasonable opportunity to participate.

Please reconsider the meeting time and demonstrate that the voices of Waupaca-area residents are a meaningful part of this process.

Thank you for your attention.

Sincerely,

Leslie Baker

646-247-8408

Jason Snyder

From: Blues Pastor <pastortom1966@gmail.com>
Sent: Thursday, July 30, 2026 8:49 PM
To: Jason Snyder
Subject: NO DATA CENTER

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As a county resident for more than 30 years. DATA centers are NOT wanted here.

Thank you
Tom Theama
E8462 Stage Rd.
New London, Wi. 54961