Mushroom Farm Compost H2S Mitigation Pilot

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Overview

- Mitigation
- Pilot research on a Compost Wharf with Lagoons
  - Location is typical of wharves used for mushroom farms
- AMI’s Partners have designed and will carry out the pilot
- Environmental Consultant
- Technical Advisor from Penn State University
- Project Objectives
- Procedures to achieve these objectives

Overview

- Private consulting firm founded in 2015 to carry out the pilot.
- Specializes in helping agricultural operations comply with environmental regulations and protect natural resources.
- Has experience as the Mushroom Farm Resource Conservationist at the Chester County Conservation District.
- Contributed to updating the Best Practices for Environmental Protection in the Mushroom Farm Community and has written numerous Mushroom Farm Environmental Management Plans (MFEMPs).
- Assists the mushroom industry in designing systems to manage wastewater runoff.
- In 2021, helped measure H2S emissions on a mushroom farm using a handheld monitor, identifying high emissions from wastewater tanks.

PSU Technical Adviser

- Associate Research Professor in the Department of Plant Pathology and Environmental Microbiology.
- Director of the Mushroom Research Center at Penn State University.
- Conducts research on cultivated mushrooms, including production, disease control, and engineering-based projects.
- Background includes Ph.D. research on odor emissions from mushroom composting, a postdoc at Ohio State University, and work on manure management at the Iowa Department of Natural Resources.

Collect Baseline Data of H2S & Ammonia Emissions

- Install several air quality monitors and weather station equipment on a mushroom farm in Chester County, PA.
- Monitors to be placed upwind and downwind of emission sources like substrate preparation areas and wastewater storage tanks.

Analyze Baseline Data

- Collect data over approximately 9 months during peak emission periods.
- Analyze data to identify the primary source of emissions on the farm.

Implement Best Management Practice (BMP)

- If the wastewater tanks are confirmed as the main emission source, install a geo-membrane cover with activated carbon filters over a concrete wastewater tank.
- The cover will capture and filter out gasses, including H2S.

Experimental Design and Methods

- Deploy 6 continuous MultiRae gas monitors, 3 upwind and 3 downwind of potential emission sources.
- Install a weather station to monitor conditions affecting emissions.
- Collect data bi-monthly, plot, and analyze it to identify the primary emission source.
- Install a geo-membrane cover with activated carbon filters from Anue Water Technologies over the identified emission source.
- Monitor air quality post-installation to assess the BMP’s effectiveness and determine the lifespan of the filters.