Integrated Environmental Management System
Central Pennsylvania Nutrient Mass Balance Demonstration

Background The Gettysburg Energy & Nutrient Recovery Facility (GERNF) was developed in response to Pennsylvania's Phase 1 & Phase 2 Chesapeake Bay TMDL WIP strategy supporting advanced technology and nutrient trading markets to achieve nonpoint source nutrient reductions and promote private sector investment – see **Exhibit 1**.

- Approved as Pennsylvania's largest certified nutrient credit generator in 2010.
- Developed and financed as a public-private partnership (P3) and began operations as a commercial, pay-for-performance, nutrient credit generator in June 2013.
- Reference for CBP 2016 approval of monitored manure treatment technology as a best management practice for achieving TMDL nutrient reductions (BMP-MTT19).
- Operations placed on hold in 2018 due to limited nutrient credit market demand and state/federal agency inaction to renew the nutrient reduction quantification protocol.

Evolution In 2022, EnergyWorks, PDA, DEP, SCC and NRCS renewed efforts to develop an approved protocol that would enable GENRF and other monitored manure treatment systems to resume pay-for-performance nutrient reduction operations.

- GENRF feedstock supply was expanded to include dozens of Hillandale contract egg producers located in 7 central Pennsylvania counties.
- EnergyWorks and PSU College of Agricultural Science co-authored a white paper, entitled *Unlocking the Benefits of Advanced Manure Treatment Technologies to Meet the Chesapeake Bay TMDL Challenge*. The paper was endorsed by the PA State Conservation Commission and experts from industry and academia – see **Exhibit 2**.
- The GENRF conservation function was recast from edge of field nutrient transport buffering to in-field excess nutrient reduction/avoidance.
- Nutrient reductions from manure treatment create additional opportunities for advanced in-field conservation activities (4R practices, enhanced efficiency fertilizers, bio stimulants), increasing subbasin scale nutrient use efficiency and reducing agricultural nutrient surplus (mass balance). The combination of these coordinated operations is an Integrated Environmental Management System (IEMS).

Demonstration In December 2024, Pennsylvania requested CBP approval and support for demonstration of the central PA IEMS as a "regulatory sandbox" project – see **Exhibit 3**.

- A narrated video and plan for implementation describe the IEMS as a science and technology-based, "farm to fork" systems approach - see **Exhibit 4**.
- The IEMS demonstration follows the sandboxing framework recommended by the Environmental Policy Innovation Center (EPIC) – see **Exhibit 5**.