VANDER HAAK DAIRY – LYNDEN, WA

DAIRY FARM IN WASHINGTON – FIRST OF ITS KIND IN WASHINGTON STATE

SYSTEM DESIGN

Vander Haak Dairy was the first dairy in Washington state to install an anaerobic digester. The dairy utilizes on-farm waste and manure from two neighboring operations to feed the digester.

Manure is scraped into a receiving pit and then pumped into a two-stage mixed plug flow™ digester. During the first stage, waste is mixed and heated to 100°F using recovered heat from the engine-generator set. Residue from the first stage of the digestion system flows by gravity into the second stage where manure is transported through a semi-solid “plug” as new influent is added to the digester. After approximately 20 days, the remaining materials flow into an effluent pit.

Biogas generated from the digester is burned in a reciprocating engine set. Thirty to sixty percent of heat from the engine is used to heat the digesters and the rest is used to dry bedding fiber and heat a house. Excess heat is available to meet additional needs of the dairy.

PROJECT BENEFITS

Vander Haak Dairy’s digester project includes the following benefits:

- Odor reduction
- Electricity production
- Energy and cost savings (e.g., bedding and fertilizer reduced heating cost)
- Estimated annual return of ~8 percent (average years 1-10); ~22 percent (average years 11+)

Digester effluent is separated into solid and liquid streams. Solids are used for on-farm bedding and the rest is sold to neighboring dairies or aftermarkets (e.g., composters) for soil amendment. Liquid effluent is stored in a lagoon where it can be easily pumped to fertilize the land.

“If dairy farming on the West Coast is to survive, we need to move ahead with projects like this.”

—Darryl Vander Haak
Owner, Vander Haak Dairy

- Population Feeding Digester: 750
  (system designed to support up to 1,500)
- Baseline System: Storage Tank or Pond or Pit
- Digester Type: Two-Stage Mixed Plug Flow™
- Co-Digestion: Egg breakage, fish solids, food breading, sauce, other feedstock’s. (18.4 % substrates, mainly from fish processing plant)
- System Designer: DVO, Inc. (Design); Andgar, Corp. (General Contractor)
- Biogas Use: Electricity
- Generating Capacity: 600 kW
- Receiving Utility: Puget Sound Energy
- Project Funding: USDA