

# Reducing Energy Consumption through Manure Treatment Technologies

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# Why Consider Manure Treatment?

Reduction in hauling costs

- Remove water from material being hauled to fields

- Increases distance that drier materials can be hauled

Reduction in liquid storage needs/increased cattle numbers for same sized storage

Create segregated nutrient streams

- Solids: P

- Liquids: N

Create products (e.g., bedding)

Reduced odors?

Water reuse

- Water for cattle

- Water for reuse on site

# Potential Issues

How does the cost of hauling manure compare to the cost of treatment?

What level of treatment do you need to accomplish your desired goals?

Irrigation

Seepage Cells

Recurring Surface Water Discharge

On-site reuse

Cattle watering

Maintenance of treatment equipment



# Landspreading “Math” Example

How many tankers does it take?

50 acre field

5,000 gallon tankers

15,000 gallons liquid manure/acre



15,000 gallons per acre / 5,000 gallon tankers = 3 tankers per acre

3 tankers x 50 acres = **150 tankers!**



# Permitted Wisconsin Manure Treatment Systems

Son Bow (CAFO)

Majestic Meadows (CAFO)

BC Organics (proposed)

Emerald Dairy (inactive) (CAFO)

Springfield Clean Water



# Treatment Train

Anaerobic Digestion (optional)

- Product stabilization

- Energy production/GHG offset

Solids separation

Ultrafiltration

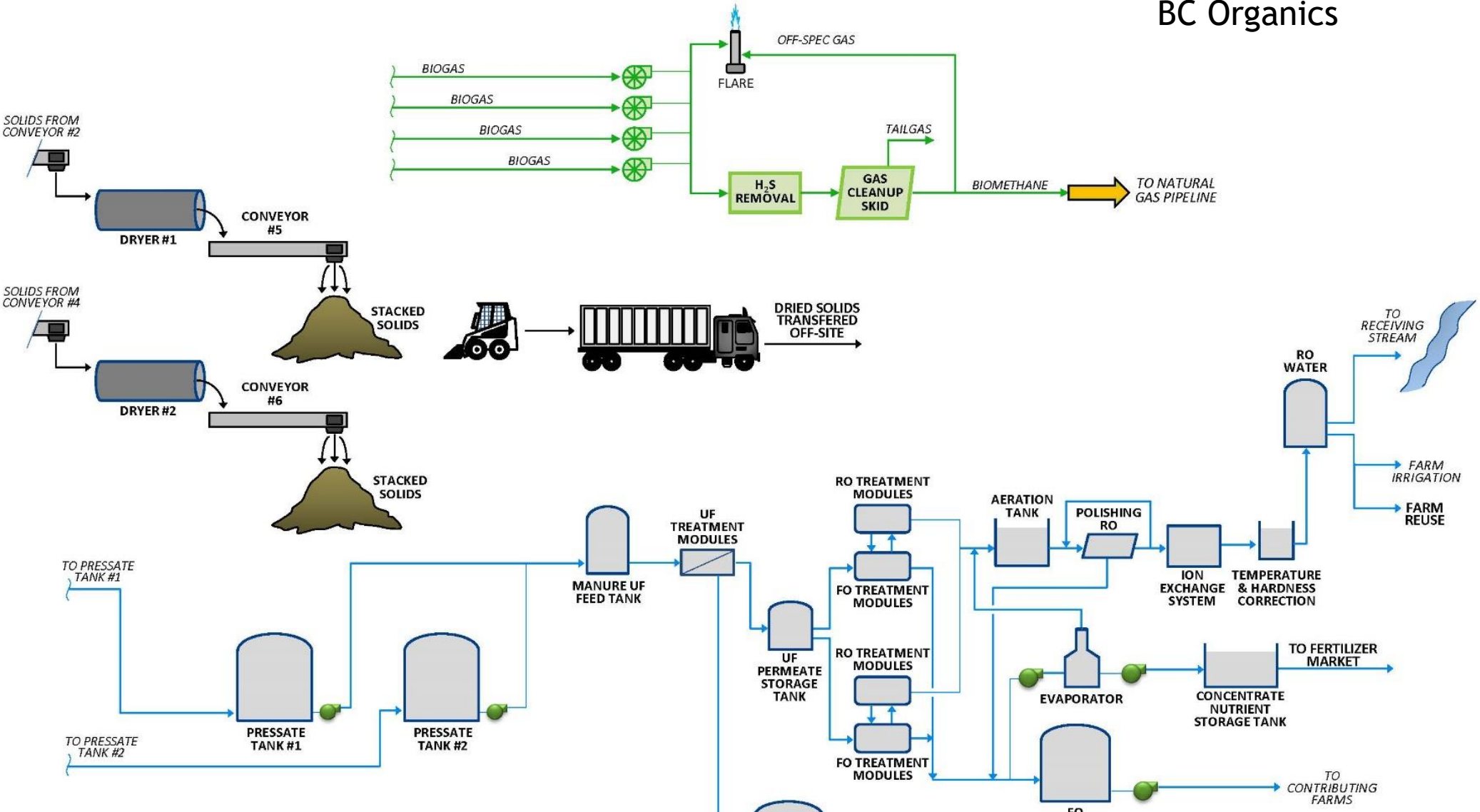
Reverse osmosis

Air stripping (optional)

Activated carbon (optional)

Disinfection

# BC Organics



# Common Problems

Consultant inexperience with NPDES/WPDES permit requirements

- Permitting process

- CAFO TBELs vs. WQBEL

Ammonia, the small molecule

- Requires acidification to increase its size and get caught by membranes

Temperature

Discharge locations

- Wetland issues

- Low flow receiving waters

- High quality/low quality streams

- Available WLA in TMDL areas?

WET Testing Anion/Cation deficiency toxicity associated with RO discharges

Question?