



**AnAer™**

**Optimize Your Anaerobic Digester**

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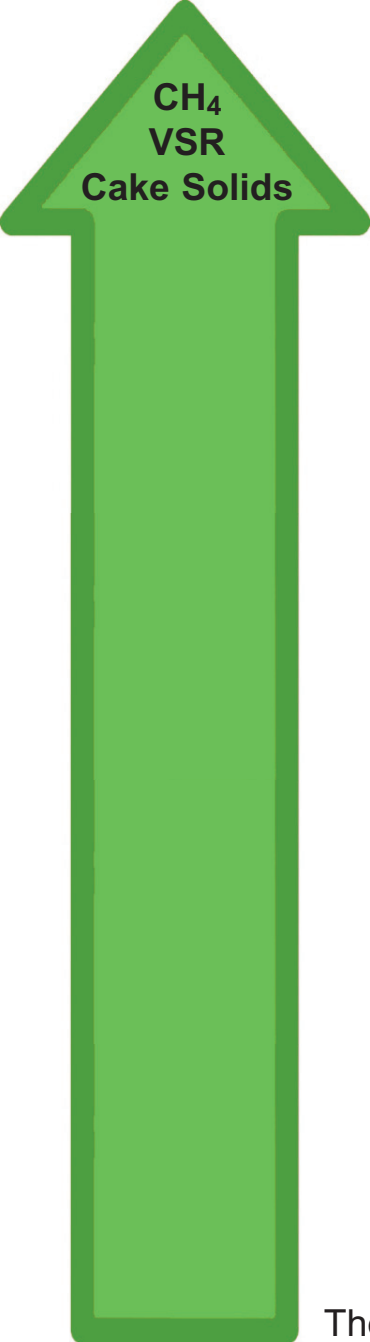
## AnAer will:

- Produce more biogas  
~13.5 ft<sup>3</sup>/lb volatile solids (VS) destroyed
- Reduce/eliminate digester upsets
- Control nutrient recycle
- Provide the AD with a consistent feed source with balanced VFA/Alkalinity ratio to optimize process stability
- Maximize volatile solids destruction (55+%)

## While at the same time

- Save energy
- Reduce the use of valuable methane to heat influent
- Eliminate the need for a coagulant
- Increase dewatered cake solids
- Reduce the polymer consumption during dewatering
- Proper pH control in the SNDR eliminates struvite buildup in downstream piping and dewatering

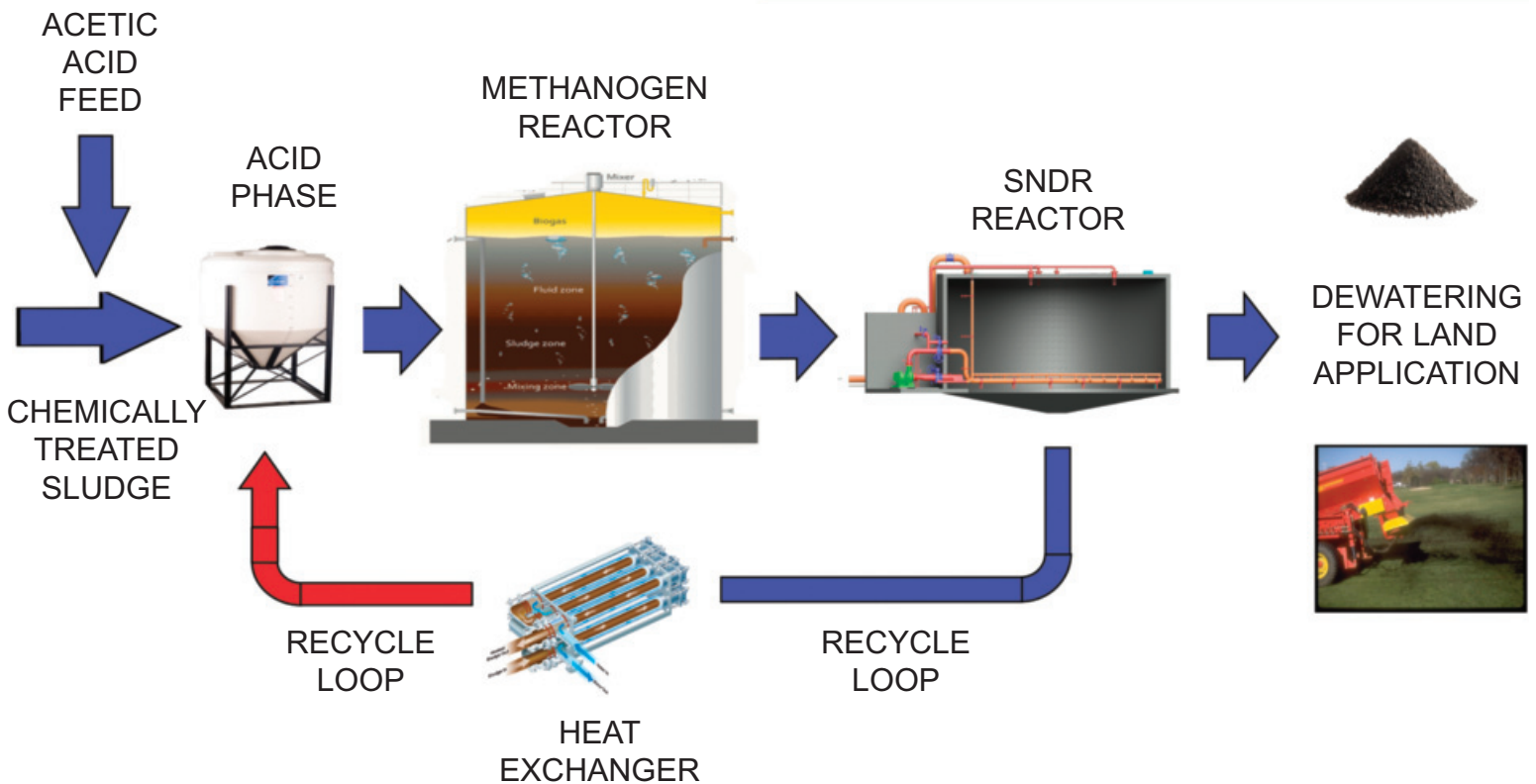
With today's pressure to do more with less, Thermal Process Systems' AnAer is the ideal solution.



CH<sub>4</sub>  
VSR  
Cake Solids



\$ \$ \$ \$  
Energy  
Nutrient  
Recycle  
Polymer



In conventional anaerobic digestion, the main activities are hydrolysis (the solubilization of material), acidogenesis (the breakdown of organic matter into VFAs), and methanogenesis (the conversion of VFAs into methane rich biogas). Hydrolysis and acidogenesis happen quickly – typically 1-2 days HRT – while methanogenesis is a more time consuming process. Separating these activities maximizes the efficiency and performance of the anaerobic digester.

The environment within the acid phase reactor is ideal to accept a thickened feed for hydrolysis and acidogenesis. Process kinetics are rapid with HRT between 1-2 days allowing for a smaller more economical tank and mixer. VFA rich material is transferred to the methanogen reactor to convert acetic acid to biogas. Process kinetics are slower for this conversion requiring 12-15 days HRT to achieve 55% VS destruction with stable and consistent methane production.

SNDR recycle provides temperature control, consistent feed with balanced VFA/Alkalinity ratio. A portion of the SNDR liquor is recycled back into the acid phase while passing through a heat exchanger to supply additional heat upfront. Recycle is non-fouling to the heat exchanger and flow rate is sufficient to maintain ideal temperature control in the acid phase while also providing a consistent feed substrate. The SNDR is efficient at breaking down the longer chain VFAs so there is more acetic acid available to be converted to biogas. This helps the anaerobic system maintain a proper VFA to alkalinity ratio to sustain healthy and stable operation.