





For years, rotary drum screens have been the industry's choice for applications requiring high solids removal efficiency at low cost. The innovative features of WesTech's larger **CleanFlo™ SHEAR™ Drum Screens** have been incorporated into a smaller package. The primary advantage of drum screens is eliminating debris carryover. Debris remains inside the screen until discharge. Unlike conventional moving media screens, there are no seals with a drum screen. In addition, there is no chance for debris to bypass the screen medium.

---

## Anaerobic Digester Wastewater Recovery

Anaerobic digestion as a means of generating methane for commercial use is a growing practice (see Anaerobic Digester – CNG/Co-Gen Flow Sheet). The sludge produced from the digester has traditionally been sent to sludge dryers, sludge ponds, and/or spread on fields. However, these techniques can be expensive and subject to restrictions due to regulations, seasonal conditions, etc.

This is a system to process digester sludge and produce saleable byproduct streams as well as a clean water stream which can be used for process use or even boiler feed. There are many challenges with processing this waste stream and care must be used to properly design the system to handle the various contaminants.

Feed to the drum screen is from the anaerobic digester with liquid effluent flowing by gravity to the screw press. Solids from these units move by gravity to the solids transfer screw conveyor. Periodically, water is sprayed on the drum screen to clean the screen. These two devices remove large solids, straw, and other debris which has passed through the digester.

The liquid from the screw press flows by gravity to the centrifuge feed tank and is pumped to the centrifuge. The centrifuge is the pretreatment to the ultrafiltration (UF) units and removes 50–60% of the suspended solids. The solids removed by the centrifuge are of the size distribution which would readily foul the UF units.

## Two Streams

Spiral wound membranes are used in the UF units. The UF units produce two streams – the concentrate and the permeate. Both of these streams are valuable

byproducts and have worth as liquid fertilizer. The concentrate stream contains the concentrated suspended solids. Although this stream is a good fertilizer, the suspended solids restrict its use to the pre-emergence timeframe of the crops due to the fact that the solids can coat the leaves and “suffocate” the plants. A means must be provided to store the liquid until it can be used in the spring. All the streams used for liquid fertilizers are most economically applied by means of a center pivot irrigation system.

The permeate is virtually free of suspended solids and can be sprayed on crops throughout the growing season. Additionally, it makes a very good feed to reverse osmosis (RO) units if maximum water recovery is desirable. If reverse osmosis is used, the concentrate also has value as a liquid fertilizer. In this flow sheet the RO permeate is recycled to the digester.

## Utilizing Reverse Osmosis Waste

In this flow sheet, the anaerobic digester is using feedlot manure as the feed source. This material requires the addition of water to prepare it to the digester. RO waste is used for this purpose since it is very low in total dissolved solids (TDS) and prevents the buildup of dissolved salts and minerals in the digesters which would have an adverse effect on their performance.

However, as noted above, this water could be used for a variety of purposes, including process water or boiler feed water.

The clean-in-place (CIP) chemicals used in cleaning the UF and RO are generated in small enough quantities that they may be recycled to the digesters. This means this treatment system generates virtually no waste products and that all liquid streams and solids generated by the system are valuable byproducts.