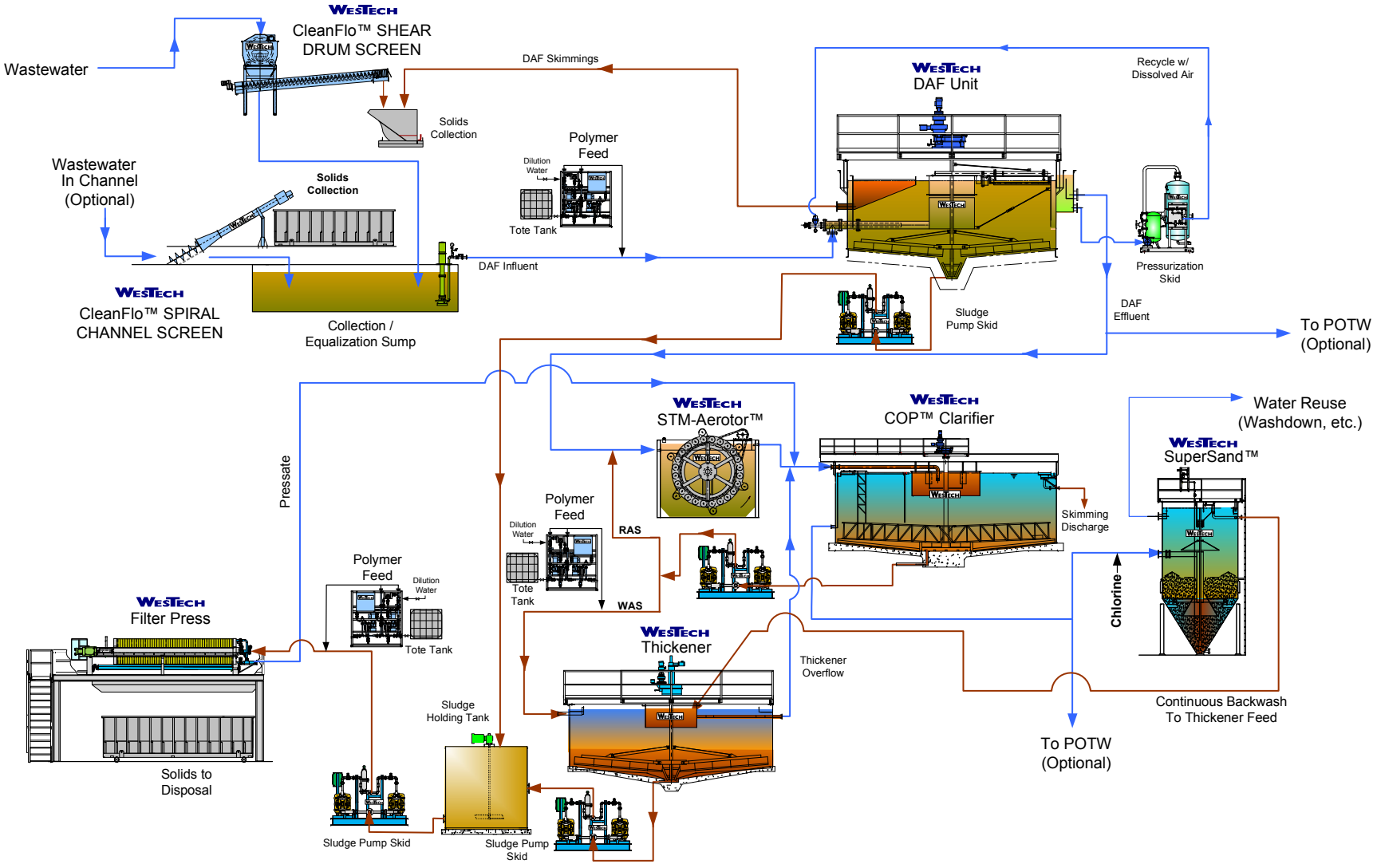

High Strength BOD Wastewater Treatment System

WesTech

DWN: **RCS** Date

WesTech ***CleanFlo™ Spiral Screens*** provide efficient, economical screening for plants with flows less than 10 MGD. Screening, conveying, and compaction are all performed by one drive motor. The stainless steel screen panel is automatically cleaned by long-wearing segmented brushes attached to a one-piece shaftless spiral auger. The shaftless spiral transports the screenings up the collection tube, where they are compacted and dewatered to 30-35% water content. These units are ideal for both municipal and industrial applications, especially in plants with smaller flow requirements.

High Strength BOD Wastewater

High strength BOD wastewater is produced in a number of industrial processes. These include petrochemical, chemical, food processing, and pulp and paper plants. Biochemical oxygen demand (BOD) is the amount of dissolved oxygen needed by waterborne aerobic biological organisms to break down organic material. The BOD is a measure of organic water pollution. Biological oxidation has been used for decades to reduce BOD and remains the preferred treatment method.

Anaerobic treatment is economical when the organic load and temperature are high and the wastewater lacks essential nutrients. Anaerobic treatment converts biomass to energy-rich biogas (methane) which may be used as fuel. Effluent from anaerobic treatment has low BOD, with corresponding minimal environmental disruption. Anaerobic reactors harness biological reactions and are sensitive to temperature and pH. They also require significant time to start up and recover from upsets.

High Strength BOD Wastewater Steps

1. Primary Clarification
If influent levels of oil or solids are high, primary clarification may be required. This may be accomplished using either sedimentation or flotation prior to biological treatment. Evaluation of these processes is based on influent water quality, contaminant to be removed, and chemicals required for the biological process.

2. Anaerobic Pretreatment
Anaerobic pretreatment is typically indicated for BOD levels over 2,000 mg/L and temperatures over 25°C. Significant amounts of alkalinity may need to be added to maintain reactor pH. Biogas can be captured and used as an energy source to offset the operating cost of the plant. If biogas is not used as a fuel, treatment such as activated carbon may be necessary for odor removal. Control of pH is a critical component of any anaerobic process. Nutrients may need to be added.

3. Activated Sludge
Industrial effluents often don't contain all the necessary nutrients for biological growth. Nitrogen, phosphorus, and other nutrients must frequently be added to ensure biomass growth and BOD removal.

Continuous flow, suspended growth aerobic systems (CFSGAS) are designed to handle continuous flow. They do not provide a bed for a bacterial film, but rely on waterborne bacteria. Suspension and aeration are typically provided by an air pump, which provides constant stirring in addition to oxygenation.

This typically produces better effluent quality (lower BOD) than attached growth or anaerobic treatment. A medium to promote fixed film bacterial growth may be added to handle high levels of wastewater biomass. Adding anoxic zones can discourage filamentous bacterial growth, promote nitrification, and produce better settling characteristics.

4. Effluent Polishing
The effluent quality desired may raise the need for total suspended solids (TSS) or fats, oil and grease (FOG) removal through media filtration. If there are non-biodegradable organic constituents present, chemical oxidation may be employed to reduce chemical oxygen demand (COD). Waterborne pathogens and viruses require disinfection using chlorine, ozone, or UV light.

5. Solids Dewatering
Dewatering using a thickener, belt press, filter press, centrifuge, or drying bed reduces waste disposal costs.