

Attempts to use waste products for wastewater denitrification have had limited success. There are four primary concerns with waste products that are completely avoided with MicroC™ Premium Carbon Sources.

1 Product Consistency

- Variability in product consistency can severely impact process control and other plant processes and equipment
- **Carbon content/ organic strength:** variability in waste products can make nutrient removal process control very difficult and can result in permit violations
- **Physical properties:** variability in physical properties such as viscosity or solids content can impact equipment feed rates.

MicroC™ products are blended by ISO9000 certified manufacturers, there is no variability in carbon content or physical properties.

2 Impurities

- Impurities can be present in waste products that can result in discharge permit violations and toxic effects on the biomass.
- **Heavy metals** – silver, copper, iron, lead, etc.
- **Volatile Organic Compounds** – benzene, toluene, MEK
- **Bacteriacides and Fungicides** - quarternary ammonium compounds, chlorinated compounds

MicroC™ products do not contain impurities. MicroC™ products have undergone intense scrutiny and testing by regulatory agencies and has been approved for use in every instance.

3 Product Stability

- Many waste products are **unstable** and will begin to lose their carbon content with time due to fermentation reactions or other degradation pathways.
- Growth within the waste products themselves can occur which can clog feed lines and pumps.

MicroC™ products are formulated to prevent degradation and loss of carbon content with time.

4 Supply/Availability

- Waste products are byproducts of an industrial activity and are therefore prone to **supply disruptions** due to seasonality or other activity in the industry itself.
- Many waste products such as waste glycerine are highly sought after for other applications. Prices are very unstable for some waste products.

MicroC™ Products are manufactured specifically for the wastewater market. Production is not limited. MicroC™ products have significantly greater price stability compared with waste carbon sources.