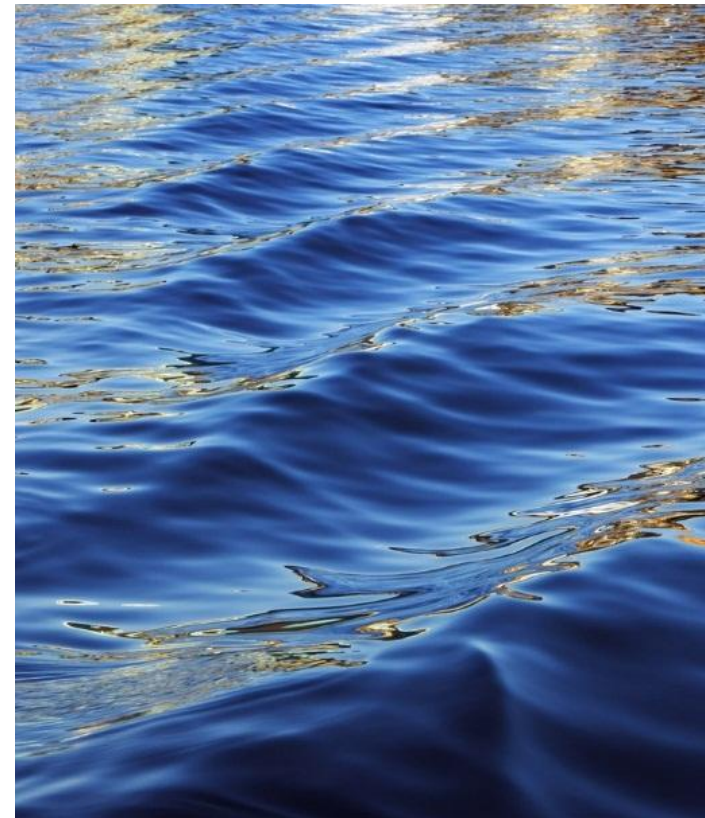


Sludge Handling



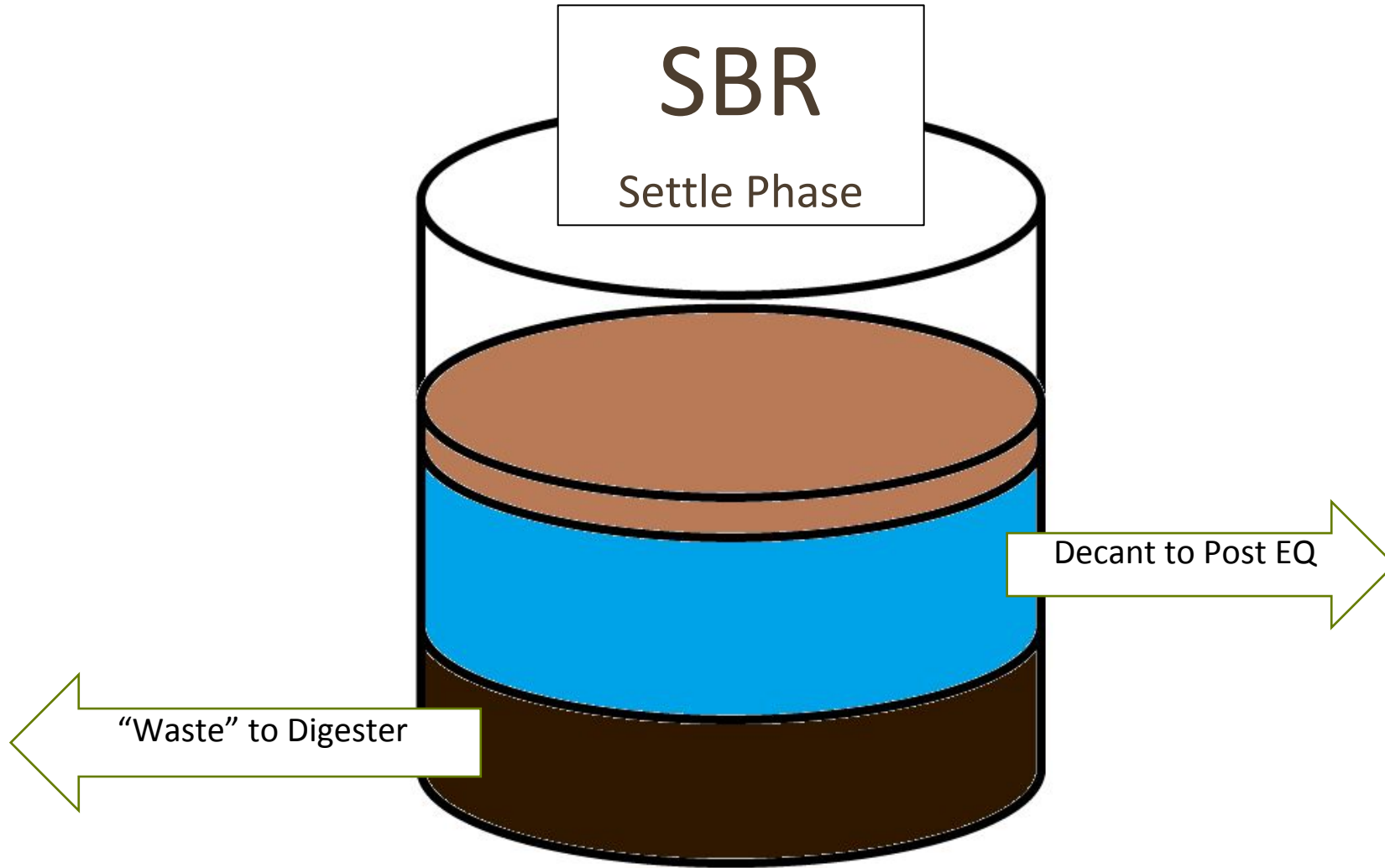
Key Largo Wastewater Treatment District



Sludge Handling

- Reasons for Wasting
- Waste Volume
- Treatment of Wasted Solids
- Liquid vs. Solid Hauling and Savings

What is Wasting?



Reasons for Wasting

- Maintain healthy concentration of biomass
 - Settling phase will produce clear treated water in the last stage of biological treatment
- Rid plant of accumulated inorganic matter
 - Cannot be digested by bacteria

Reasons for Wasting

- Process control tool
 - Maintain 9 day sludge age in treatment tanks.
 - To sustain a diverse biomass which oxidizes organic matter in the sewage as well as the removal of nutrients as required by FDEP.

Waste Volume

- Currently, the District treats 1.3 MGD (million gallons day) of sewage

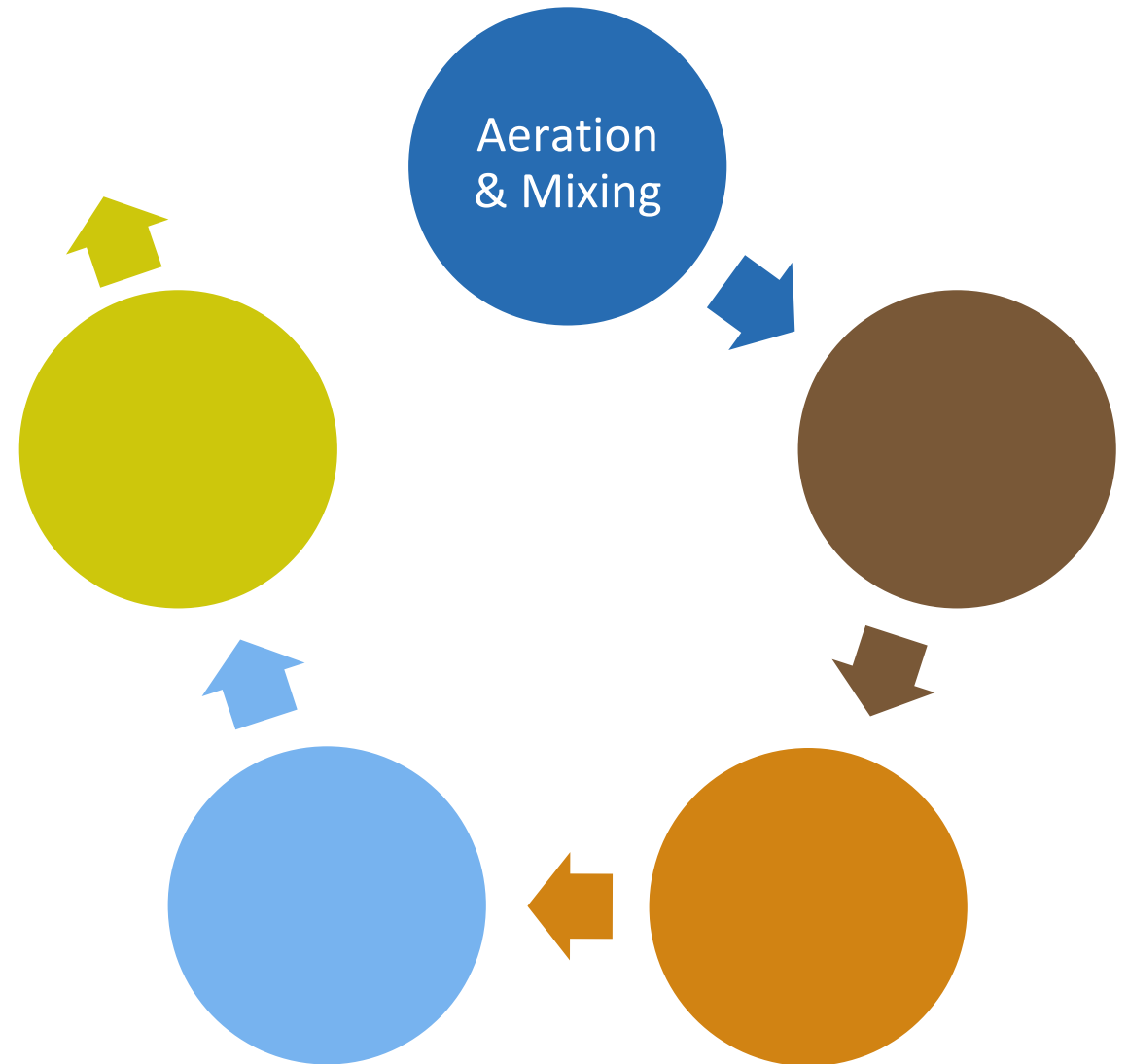
Of the total 2.8% is wasted daily = 36,400 gallons or 1 foot in our digester tank

- Concentration of waste solids averages about 7,000 MG/L (milligram per liter) or 0.7% solids

Treatment of Wasted Solids

1. Aeration and Mixing

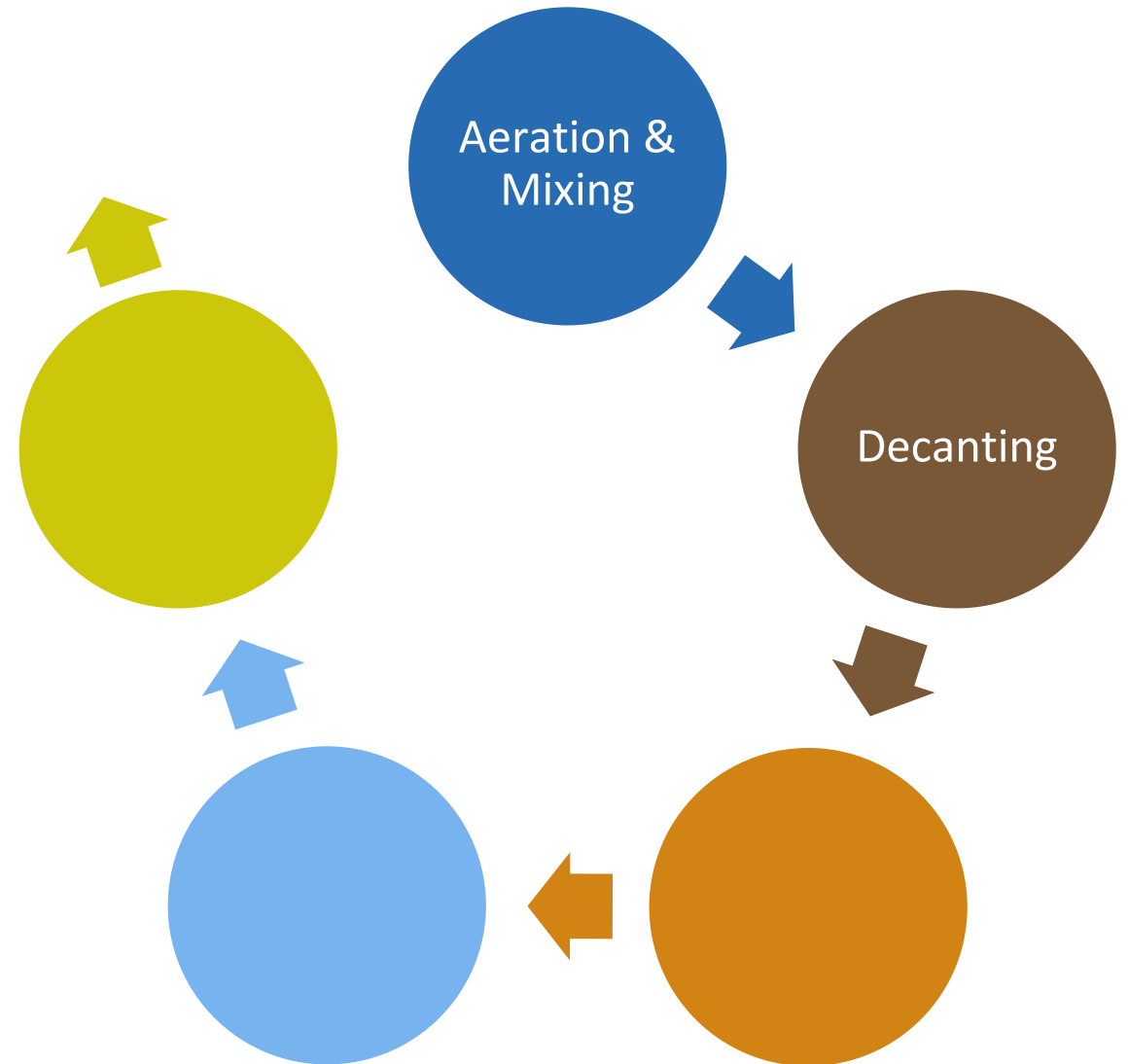
- Digester wastesolids can be manipulated into endogenous respiration (self cannibalization)
- Major byproduct are H₂O and organics



Treatment of Wasted Solids

2. Decanting

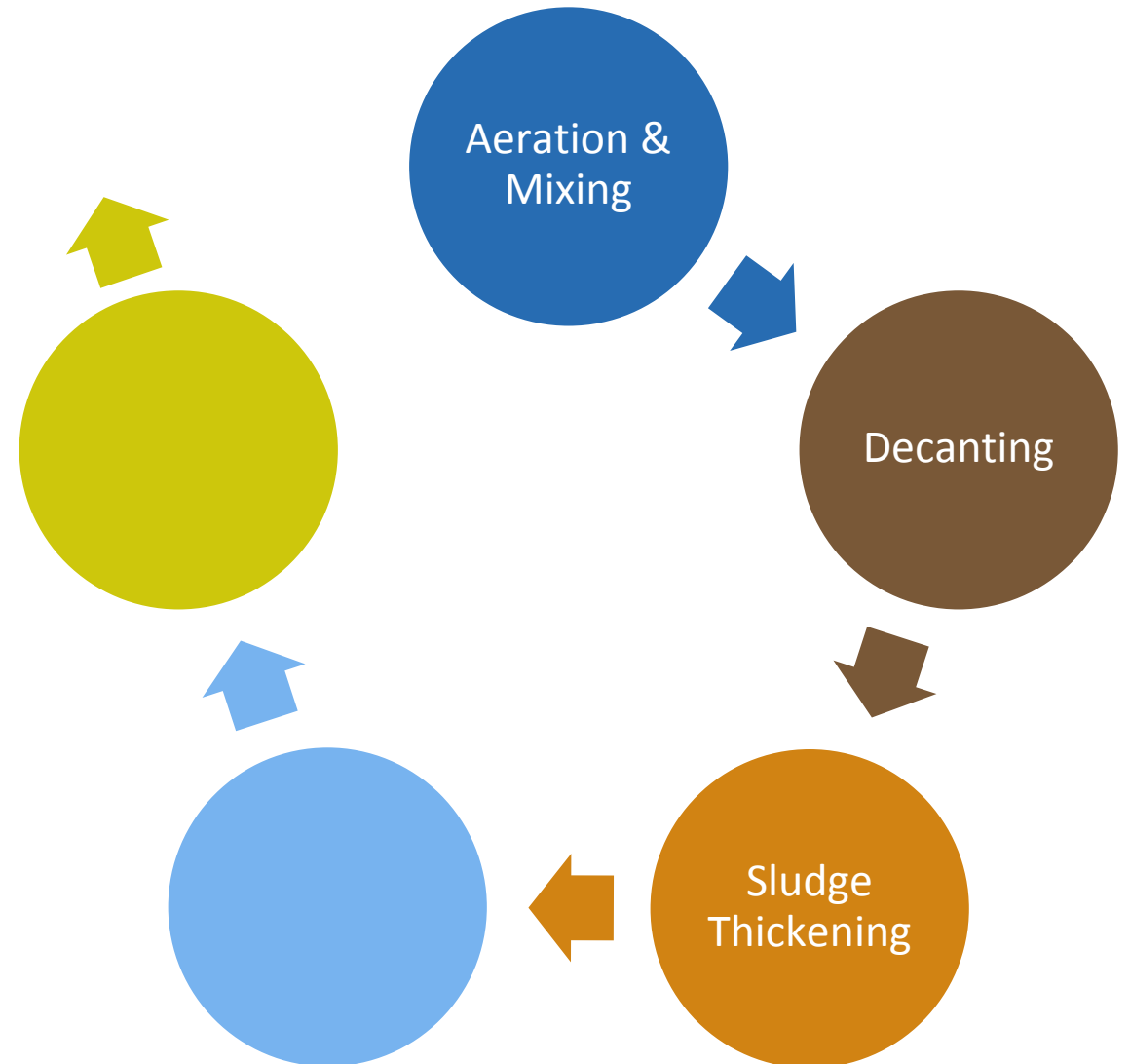
- Separating clear liquid from digester solids.
- Concentrates digester solids from 0.7% to 2.0%



Treatment of Wasted Solids

3. Sludge Thickening

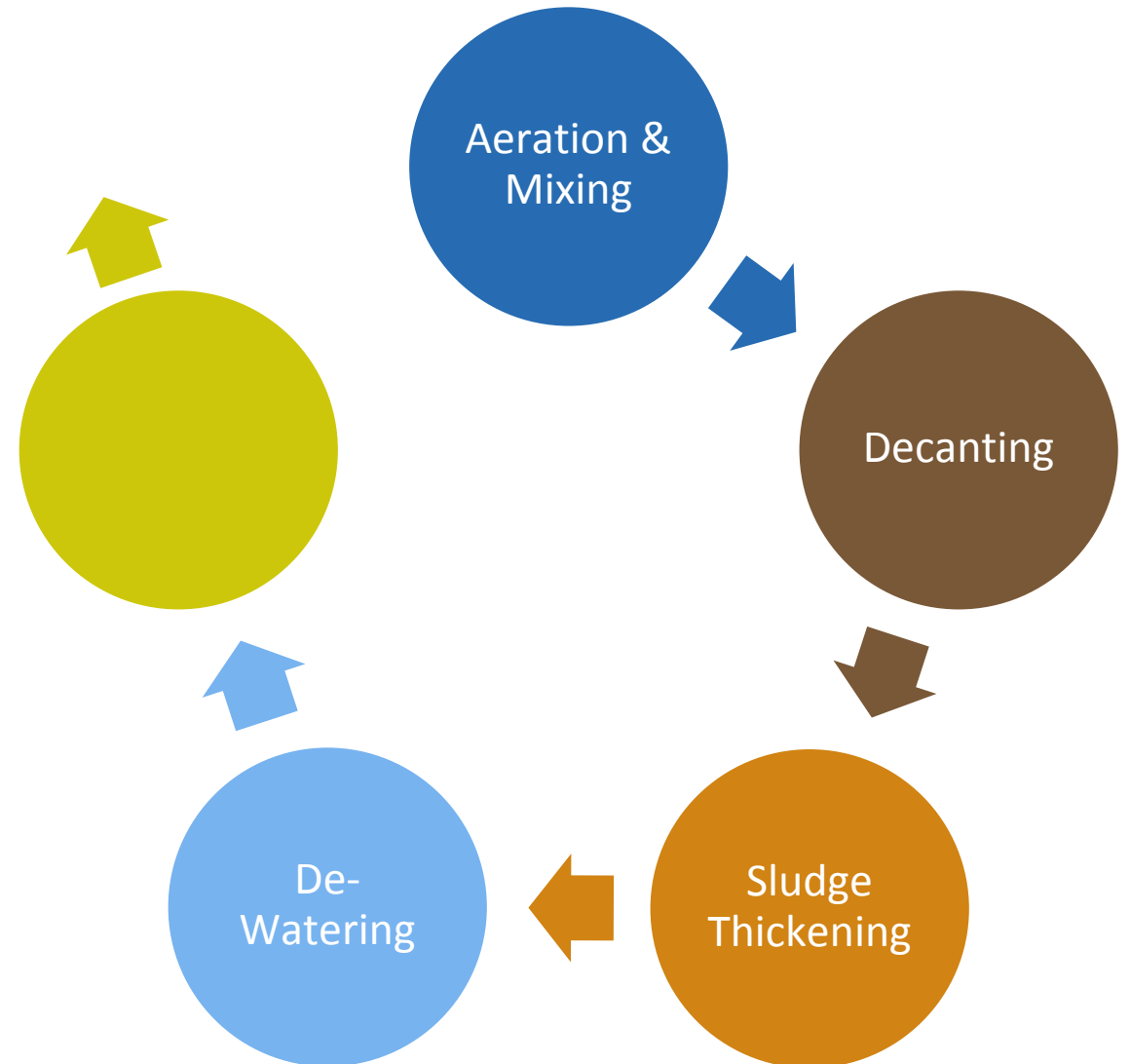
- Polymer added to the 2.0% digester solids and flocculated.
- Again separating more liquid from digester solids.
- Concentrates digester solids from 2.0% to 5.0-7.0%



Treatment of Wasted Solids

4. De-Watering

- Polymer is added to the 5.0-7.0% digester solids by contracted company.
- Solids are processed through a centrifuge. Resulting in a 20% solid cake.

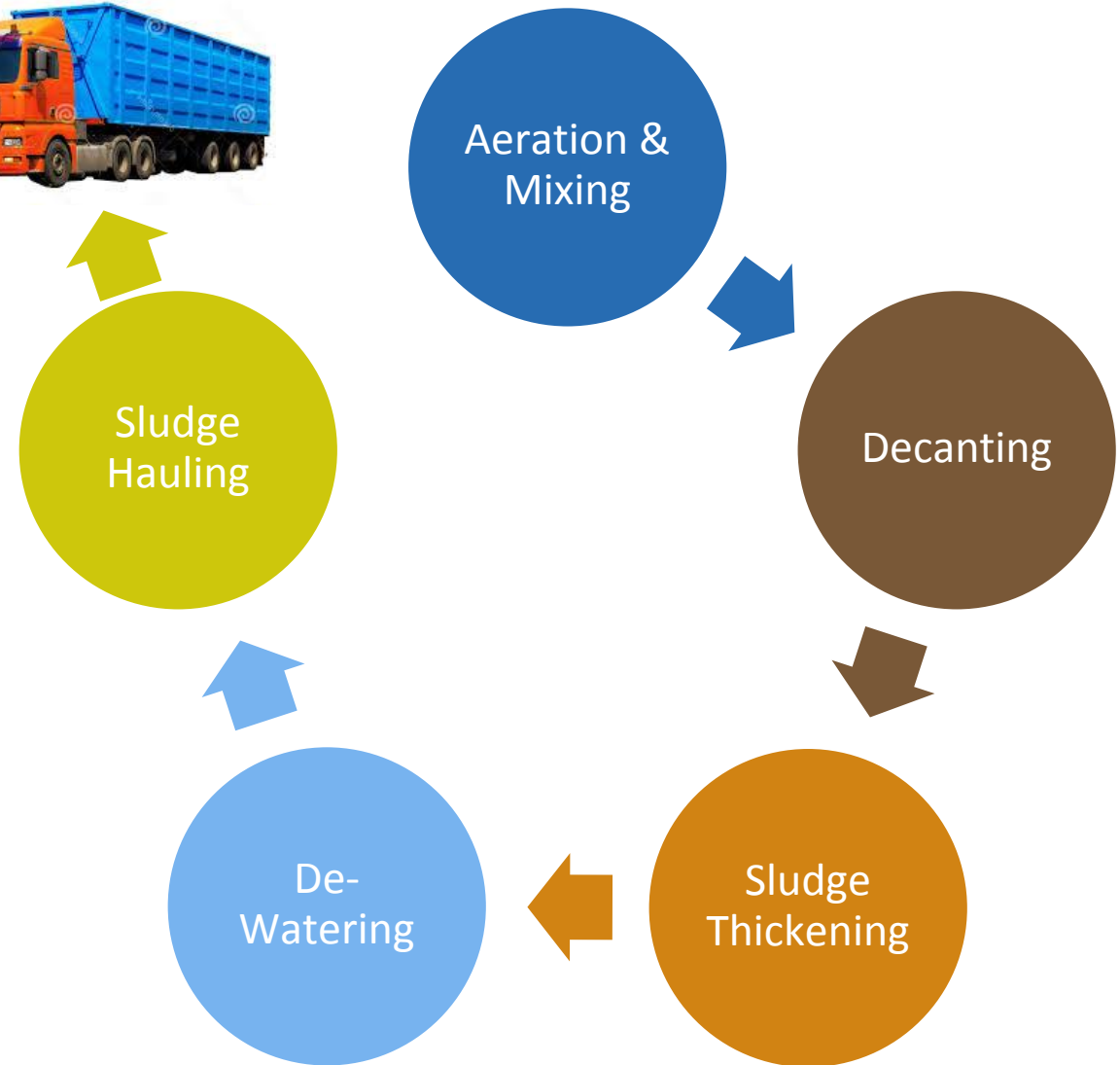


Treatment of Wasted Solids



5. Sludge Hauling

- Contracted company transports the 20% solid cake to composting facility.



Liquid vs. Solid Hauling and Savings

Liquid

- 2% Solid
- \$0.20 per gallon

Solid (2010)

- 20% Solid
- \$0.13 per gallon (polymer included)

Solid (Current)

- 20% Solid
- \$0.11 per gallon (polymer included)

Based on comparable figures

- Monthly hauling - 1MG:
 - Cost \$200,000
 - x 12 Months
 - \$2.4M annually

- Quarterly hauling - 1MG :
 - Cost \$130,000
 - x 4
 - \$520,000 annually

- Quarterly hauling - 1MG :
 - Cost \$110,000
 - x 4
 - \$440,000 annually

\$1.96M in annual savings!!!



Questions?