

Sludge Dewatering Optimization

Reduce Sludge Cake and Disposal Costs

Background

In wastewater treatment, dewatering is the process of reducing sludge volume and converting it from a liquid slurry to a solid product. The methods used to dewater wastewater sludge are varied, but two of the most common are belt filter presses and centrifuges. Effective sludge dewatering is key to minimizing labor, power, hauling and landfilling costs.

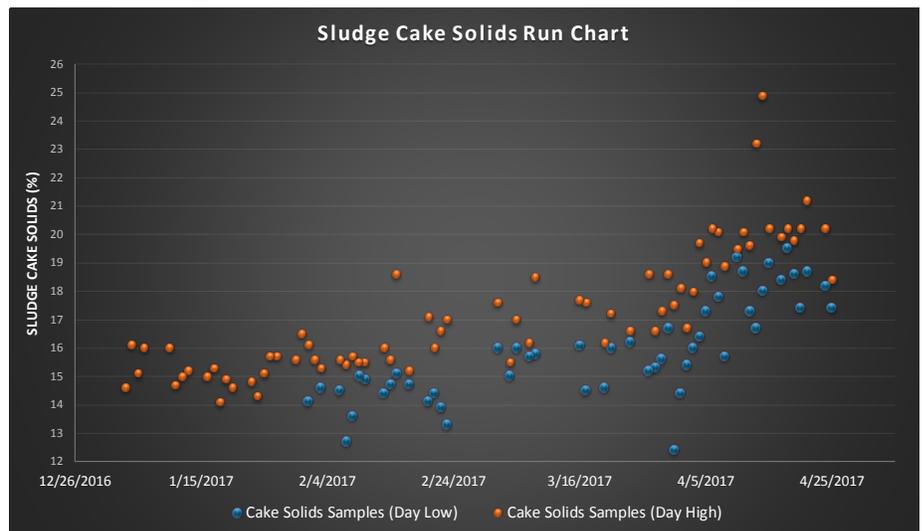
Challenges

Athlon Solutions was challenged with improving dewatering operations at a Gulf Coast refinery to maximize the performance of the belt filter press. Upon inspection of the belt press operations, Athlon Solutions determined that inadequate amounts of drive water and wide variability in the polymer feed caused inefficient chemical mixing and sludge treatment. Additionally, insufficient sludge plows and poor distribution of the sludge on the belt filter press gravity section resulted in a poor free water drainage. Athlon Solutions concluded that a combination of mechanical, operational and chemical performance flaws led to less than optimum sludge dewatering effectiveness and chemical use.

Recommendations

Athlon Solutions followed a mechanical, operational and chemical (MOC) approach and recommended:

- Installing a dedicated water supply to the polymer feed panel to increase the amount and reliability of drive water
- Installing additional plows on the belt press gravity section to aid with free water drainage
- Modifying a sludge distribution header to distribute the sludge slurry across the whole width of the belt
- Optimizing polymer dosage for maximum sludge dewatering
- Operating the belt press within the design loading, speed and belt tension



Performance Results

After implementing Athlon Solutions' recommendations, refinery operations observed significant improvement in the dewatering operations. Wastewater sludge dewatered more effectively, reducing the volume of cake produced by 25%. Increasing the percent solids in the dewatered sludge cake from 15% to 19% resulted in more than \$90K/year reduction in sludge disposal cost.