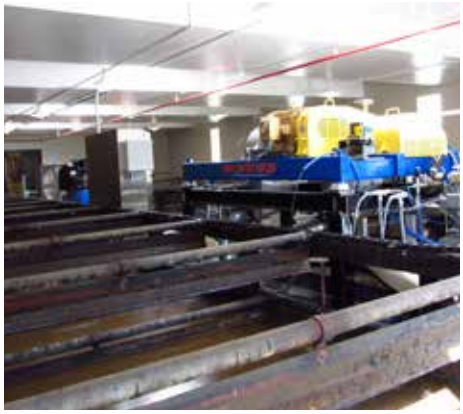


Kenosha Water Utility Wastewater Treatment Plant

Location: **Kenosha, Wisconsin**

Plant Size: **28 MGD**

Installation: **2011 (1) THK200 Sludge Thickener for WAS**
2015 (1) THK200 Sludge Thickener for Primary

Four aging DAFs occupied a substantial footprint and needed expensive rehabilitation. The DAF tanks released hazardous hydrogen sulfide (H2S) gas and the plant needed to increase digester capacity because of the low solids concentration. KWU WWTP is in the middle of a residential neighborhood. Only no-to-very low odor thickening technologies were considered for the plant upgrade.

OPERATING DATA

Feed @ 0.9-1.1% TS

WAS: 90-120 gpm

Primary: 35-50 gpm

98% capture

WAS: 0-1lb/DT polymer, seasonal use

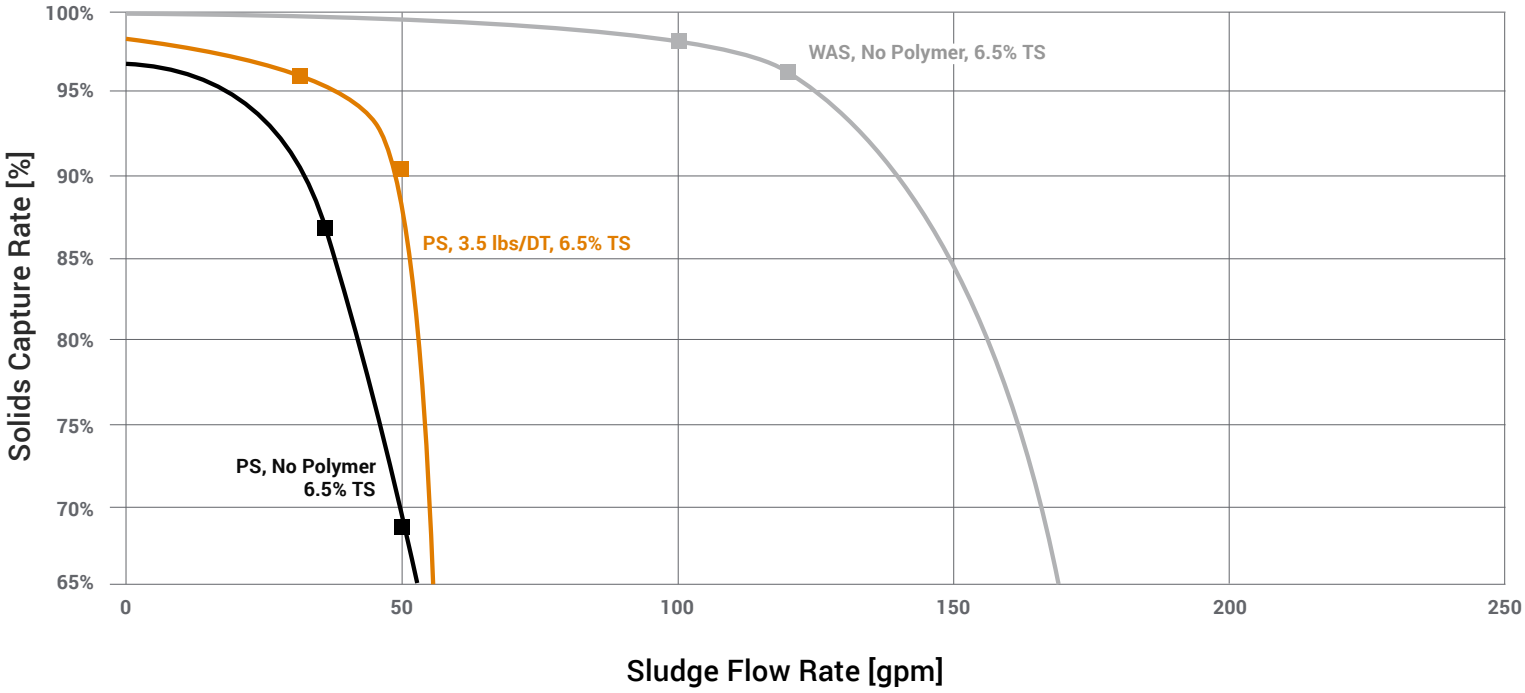
Primary: 0-4lbs/DT polymer, active

0.07 kW/gpm

5.5-6.5% TS TWAS

RESULTS

- Installed two THK200s, one for WAS and one for primary sludge
  - WAS THK required a 120 sq/ft footprint, reduced from the previous DAFs 5,000 sq/ft footprint
  - Primary THK thickening for digester optimization
- WAS and primary both thicken sludge to 6-7%
  - DAF/primary settling tanks previously thickened to 2-4%
- Reduced the digester volume from six to three digesters
  - Eliminated the need to rehabilitate all six digesters
- Consistent thickened solids output enhances the PONDUS operation
- Typically **no** polymer used for WAS, up to 0-1lb/DT for seasonal use



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Whitewater Wastewater Treatment Plant

Location: **Whitewater, Wisconsin**
Plant Size: **3.65 MGD**
Installation: **2017 (1) THK200 Sludge Thickener**

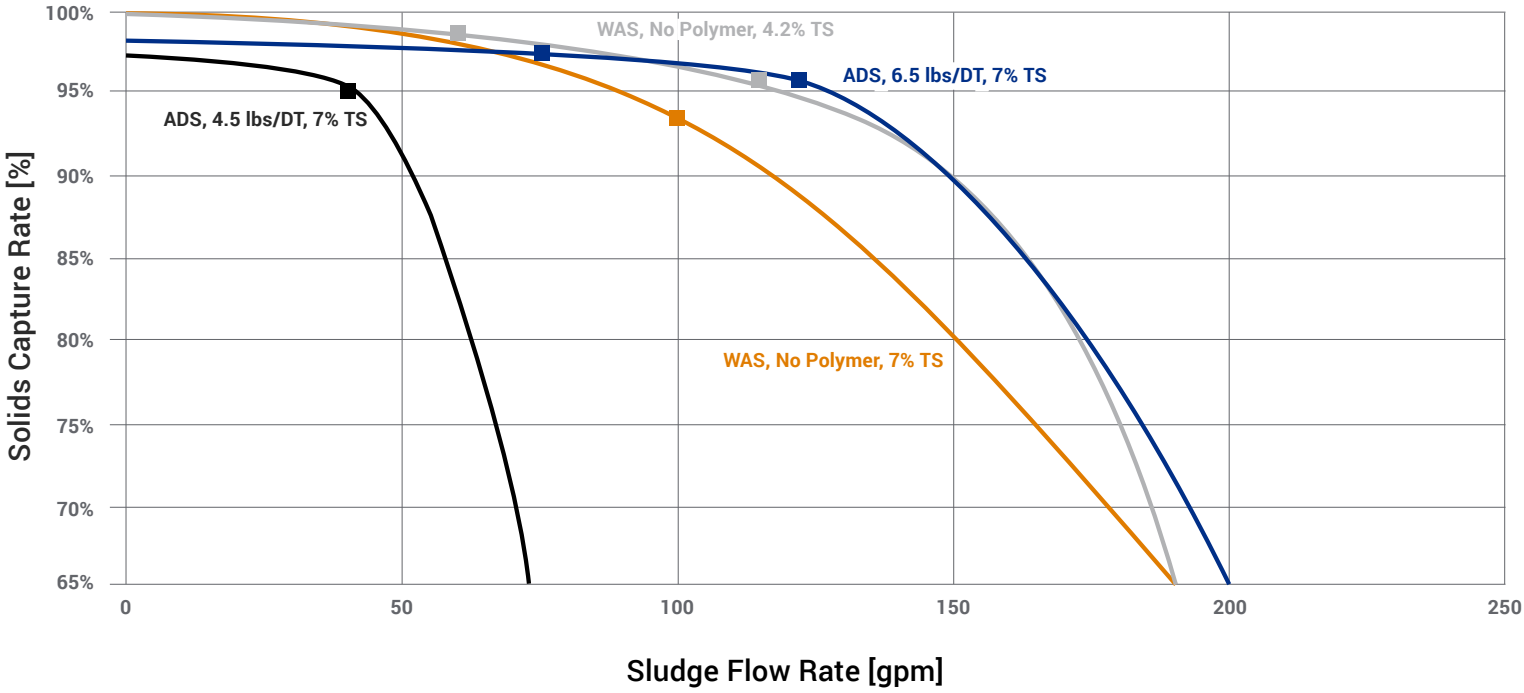
The wastewater utility land applied anaerobically digested sludge (ADS) and did not have an existing sludge thickening solution. The plant changed from rotating biological contactors (RBC) to an activated sludge system to operate a biological nutrient removal (BNR) process. The most cost-effective and reliable solution was to thicken the WAS before digestion because of the low concentration.

OPERATING DATA

Feed @ 0.4-0.7% TS
60 gpm
95% capture
No polymer
0.08-0.12 kW/gpm
4-5% TS TWAS
5-6% TS ADS

RESULTS

- Installed THK had a dual purpose to reduce volume
  - THK thickened the WAS before entering the digester
  - After digestion, the same THK thickened the sludge again before land application
- Increased digester capacity and reduced the heat necessary to maintain the digester temperature
- No polymer used for WAS thickening
- Preprogramming the waste amount into the THK eased the operation; THK shuts off when it meets the target wasting
  - Operator inputs target number of WAS gallons per day
  - THK shuts off when flow meets the quota
- Post-digestion ADS thickening maintained 5-6% TS for land application



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City of Wyoming Clean Water Plant

Location: **Wyoming, Michigan**
Plant Size: **90 MGD**
Installation: **2019 (1) THK350 Sludge Thickener**

Two aging Bird 5100 modified dewatering centrifuges were needed to thicken WAS sludge to a total flow of 240 gpm. Each of the older Bird centrifuges operated at 80 kWh with a flow of 120 gpm. The large, accelerated mass and the relatively low flow rate of each unit were the primary sources for the plant's high power consumption.

OPERATING DATA

Feed @ 0.6-1.2% TS

240 gpm average

95% capture

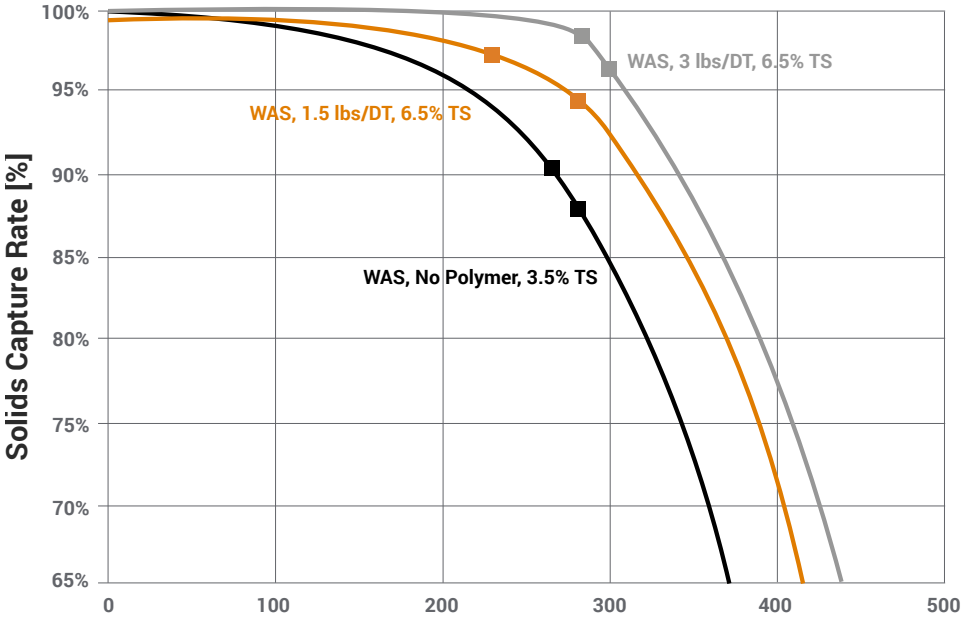
<1 lb/ton polymer, active

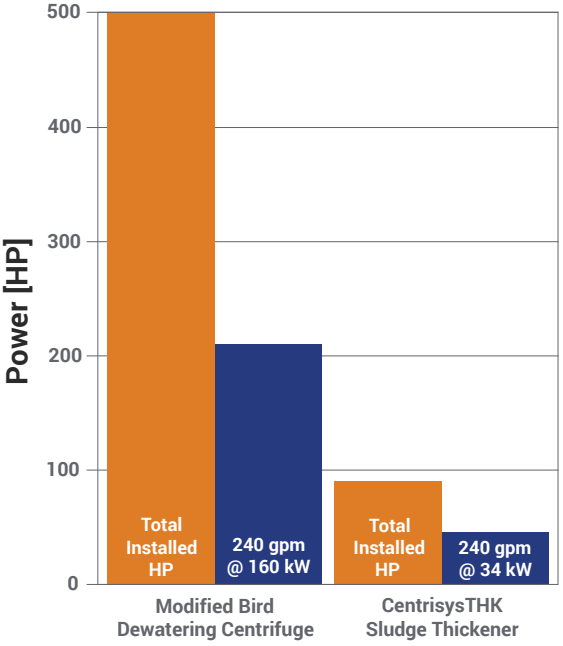
<0.12 kW/gpm

6.5% TS TWAS

RESULTS

- Installation of one THK350 replaced two large Bird 5100 centrifuges
- Awarded an energy reduction grant due to the 75% power reduction, saving up to $88,300/yr ($0.08 kW/h)
- Solids discharge controlled for either off-site or land application via the patented hydro-pneumatic air which further fine tunes the sludge control
  - 3.5-4.5% TS for off-site pumping
  - 5.5-6.5% TS for land application





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University of Florida

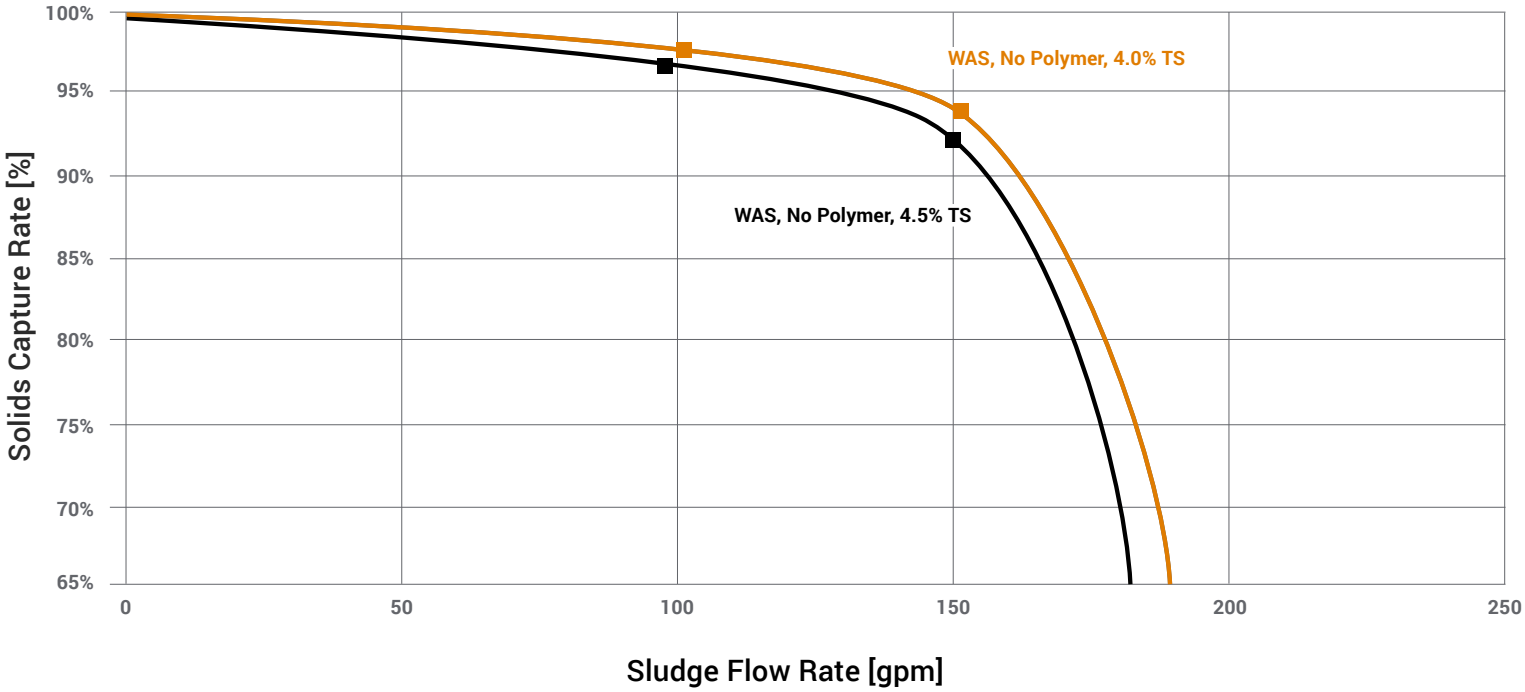
Location: **Gainesville, Florida**
Plant Size: **3.1 MGD**
Installation: **2018 (1) THK200 Sludge Thickener**

University of Florida's Water Reclamation Facility gravity thickened WAS to 2% TS and then trucked the TWAS off-site. The plant could not exceed 4.5% TS TWAS or a 50% transportation surcharge was added to the transportation fees. The Centrisys THK reliably doubled the TWAS concentration.

OPERATING DATA
Feed @ 1.1% TS
100 gpm
97% capture
No polymer
0.1 kW/gpm
3.8-4.2% TS TWAS

RESULTS

- TWAS concentration doubled from 2% to 4%; resulted in half the truckload amounts
  - Eliminated the 50% transportation surcharge
- Maintained a narrow 3.8-4.2% TS TWAS
  - Adjustable nozzles and the hydro-pneumatic air adjustment controls allowed consistent output even with seasonal fluctuation
- No polymer used
  - Eliminated need for an installed dosing system
  - Minimal operator supervision
- High recovery reduced the downstream of the sand filters



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Steven M. Clouse San Antonio Water System (SAWS)

Location: **San Antonio, Texas**
Plant Size: **80 MGD**
Installation: **2019 (2) THK600 Sludge Thickeners**

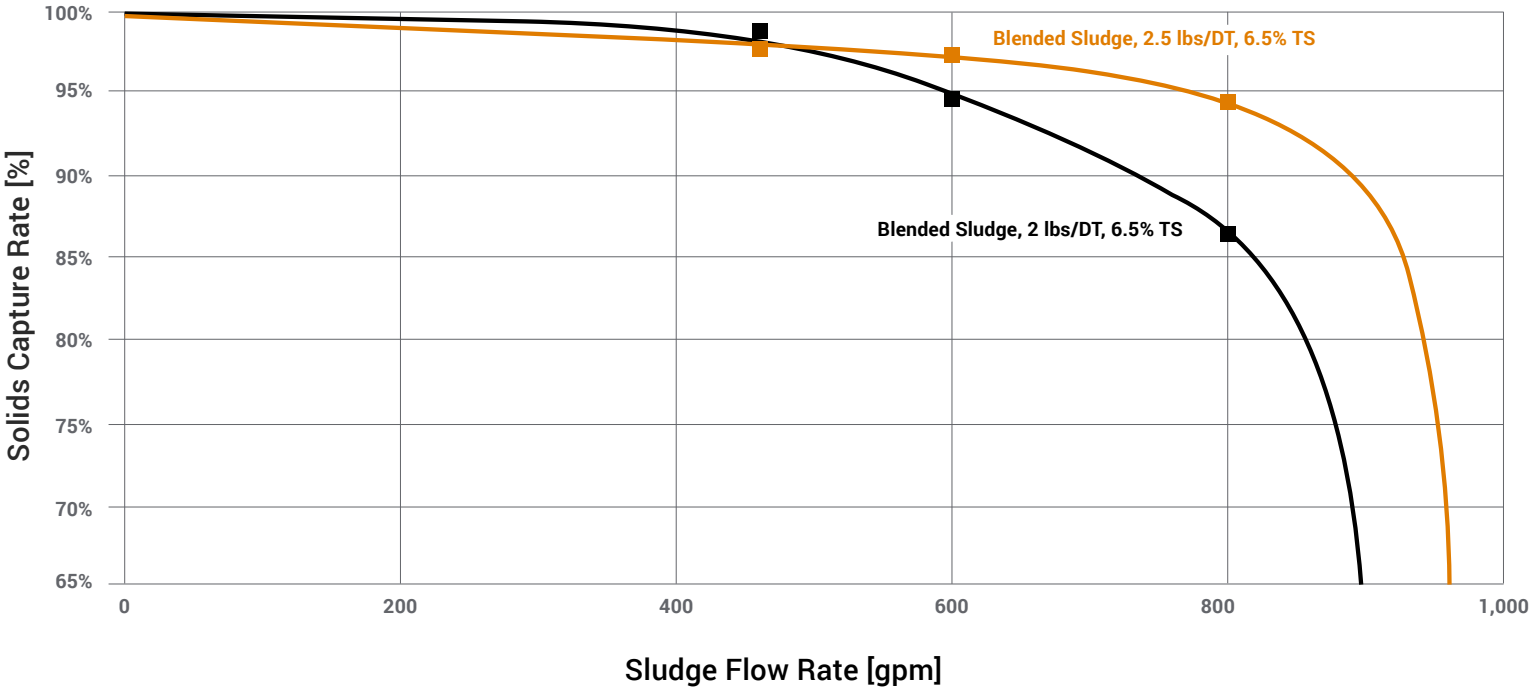
SAWS had four aging GBTs that could not handle the increasing flows. The sludge feed was a blend of WAS and primary sludge from two plants — SM Clouse and Leon Creek. The THKs ability to reduce polymer consumption by 50% was a key factor for the equipment choice.

OPERATING DATA

Feed @ 1.0-1.3% TS
800 gpm average
95% capture
2.0-2.7 lbs/ton polymer, active
0.09-0.11 kW/gpm
6.5% TS TWAS

RESULTS

- Reduced polymer usage depending on seasonal usage, a savings of $100,000 to $400,000/yr
- Eliminated the need for continuous wash water by replacing the GBTs with THKs
- Enclosed THK system increased hygienic operation and safety for operators



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Sharjah Municipality Drainage Department

Location: **Sharjah, United Arab Emirates**
Plant Size: **79.25 MGD**
Installation: **2020 (1) THK600 Sludge Thickener**
2023 (1) THK600 Sludge Thickener

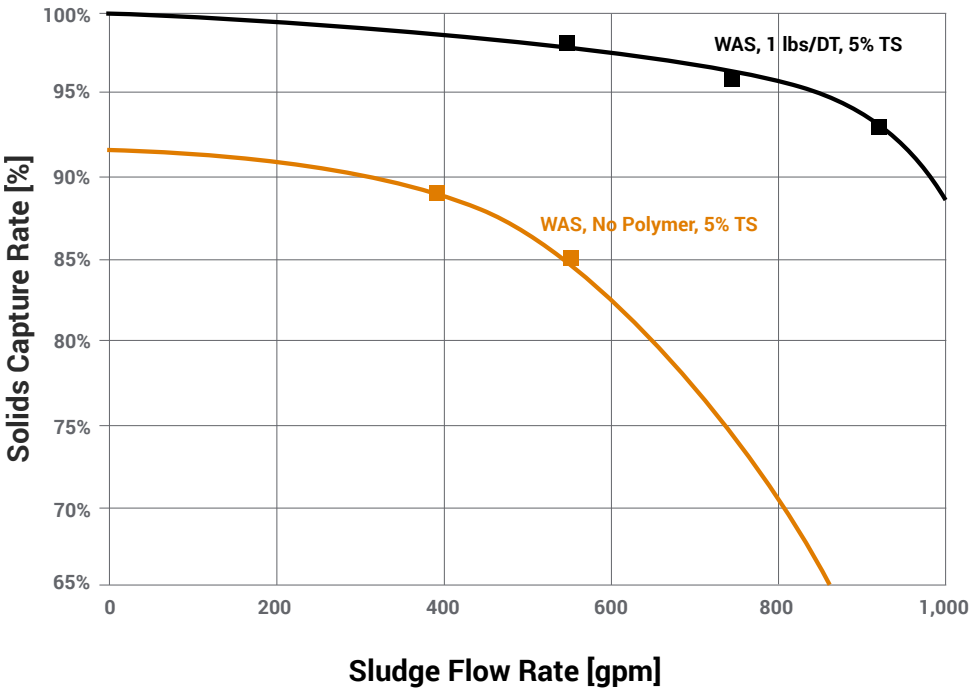
The city of Sharjah is undergoing a phase of rapid growth. The plant commissioned a sludge thickening equipment upgrade to handle an increase in the plant's capacity as the two aging GBTs could not handle the increasing flows. The Centrisys THK was chosen because of its ability to significantly reduce polymer consumption and process water and requires minimal operator attention.

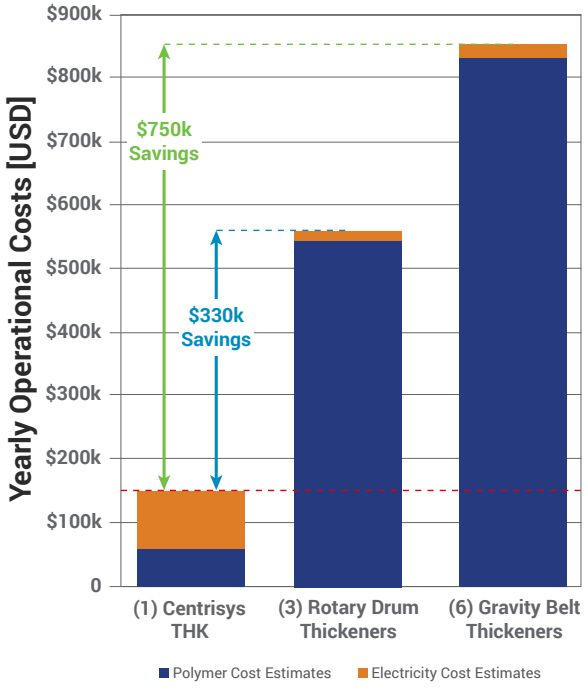
OPERATING DATA

Feed @ 0.5-1.0% TS
990 gpm design
95% capture
0-1 lbs/ton polymer
0.09-0.11 kW/gpm
5% TS TWAS

RESULTS

- (1) THK600 matched the throughput of (3) RDTs using less than 1/5th of the polymer
- (1) THK600 used less than 5% (1/20th) of the polymer required for (6) GBTs and had a higher TS output
- The THK reduces the plant's carbon footprint
- The 2023 THK600 installation will replace (6) GBTs
- The THK can operate without polymer; the RDTs and GBTs require polymer to operate
- The THK does not require continuous wash water compared to the RDTs and GBTs





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