CASE STUDY

TYSON FOODS

SITUATION

- The Company's regional wastewater treatment plant used mechanical and jet aeration equipment for biological treatment and nutrient removal.
  - 12 Blowers and associated pumps + 4 surface aerators (2,100 total HP) consumed ~13.7 Giga-Watt hours per year at a cost of more than $800,000 annually.

COMPLICATION

- Treatment facility operating near capacity; little-to-no emergency capacity in reserve.
- Jet aeration equipment in disrepair, requiring replacement.
- To replace the original equipment with same, the facility must be taken off-line for approximately seven days to drain the basin, replace the equipment, and refill the basin.

RESOLUTION

- **Phase 1:** Replaced two failed blowers with two SDOX® units without disrupting operations. Superior SDOX® performance enabled six additional blowers, associated pumps and four surface aerators to be idled over the course of the year as workers became familiar and confident with the SDOX® equipment. (See figure 1.)
- **Phase 2:** Complete replacement of remaining jet aeration equipment and surface aerators with four additional SDOX® units (in-process, September 2020).

BENEFITS

- Retrofit of the side-stream SDOX® eliminated the plant downtime required by conventional, jet aeration equipment—saving $ millions/day during retrofit.
- Reduced energy use by ~75% (1,650 HP), saving more than $646,000 in annual energy costs.
- Increased treatment capacity.
- Reduced net-cost of consumables (energy savings less oxygen costs) by ~$263,000 per year.
- Reduced operational risk, providing redundant treatment capacity on reserve—more than 70% of the plant's steady-state oxygenation requirements.

- Enhanced health and safety.
  - Virtually eliminated electrical maintenance activities within the treatment basin.
  - Virtually eliminated the production of aerosols associated with conventional aeration.

- ~75% reduction greenhouse gas emissions.
- Enhanced sustainability of the product supply chain and ratings in product sustainability indices—such as Walmart's product scorecard, resonating with the retailer's culture of thrift and Walmart's efforts to foster "everyday low prices from true everyday low costs"—a reference to the retailer's sustainability efforts to minimize negative externalities, such as greenhouse gas emissions, while delivering on the brand promise of "Save Money. Live Better."

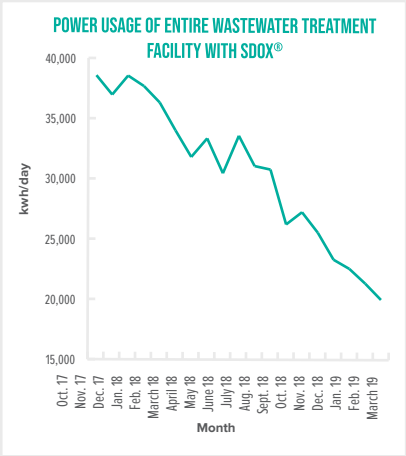

Figure 1: The figure to the left illustrates the trend in energy use for the entire facility as Tyson wastewater treatment operators became more familiar with the SDOX® equipment and progressively shut down the pre-existing,mechanical aeration equipment.

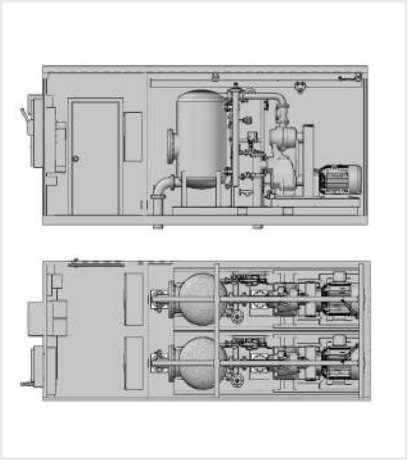

Figure 2: Phase 2—implemented approximately one year after the installation of the first SDOX® systems —included the installation of two, Dual SDOX® 600 systems. The fully functional, containerized systems—packaged in a robust, 20-ft ISO shipping container—each contain two, skid-mounted BlueInGreen gas-dissolution systems and the balance of equipment, including: pumps, motors, variable frequency drives, control panels with PLC and HMI, optional DO, ORP or pH feedback control loops, associated piping and valves, and all electrical distribution, transformers, lighting, ventilation and climate controls.

ECONOMIC/OPERATIONAL

- Increased capacity
- Improved treatment
- Superior process control
- Reduced maintenance costs
- Reduced energy costs
- Reduced operating- + brand-risk
- Operational continuity
  - Retrofit without interrupting operations
  - Perform most maintenance outside the basin without heavy equipment

SOCIAL/COMMUNITY

- Enhanced worker health + safety
  - Reduce/eliminate electrical maintenance within the basin
  - Eliminate exposure to aerosols generated using conventional aeration

ENVIRONMENTAL

- Reduced energy use + greenhouse gas emissions