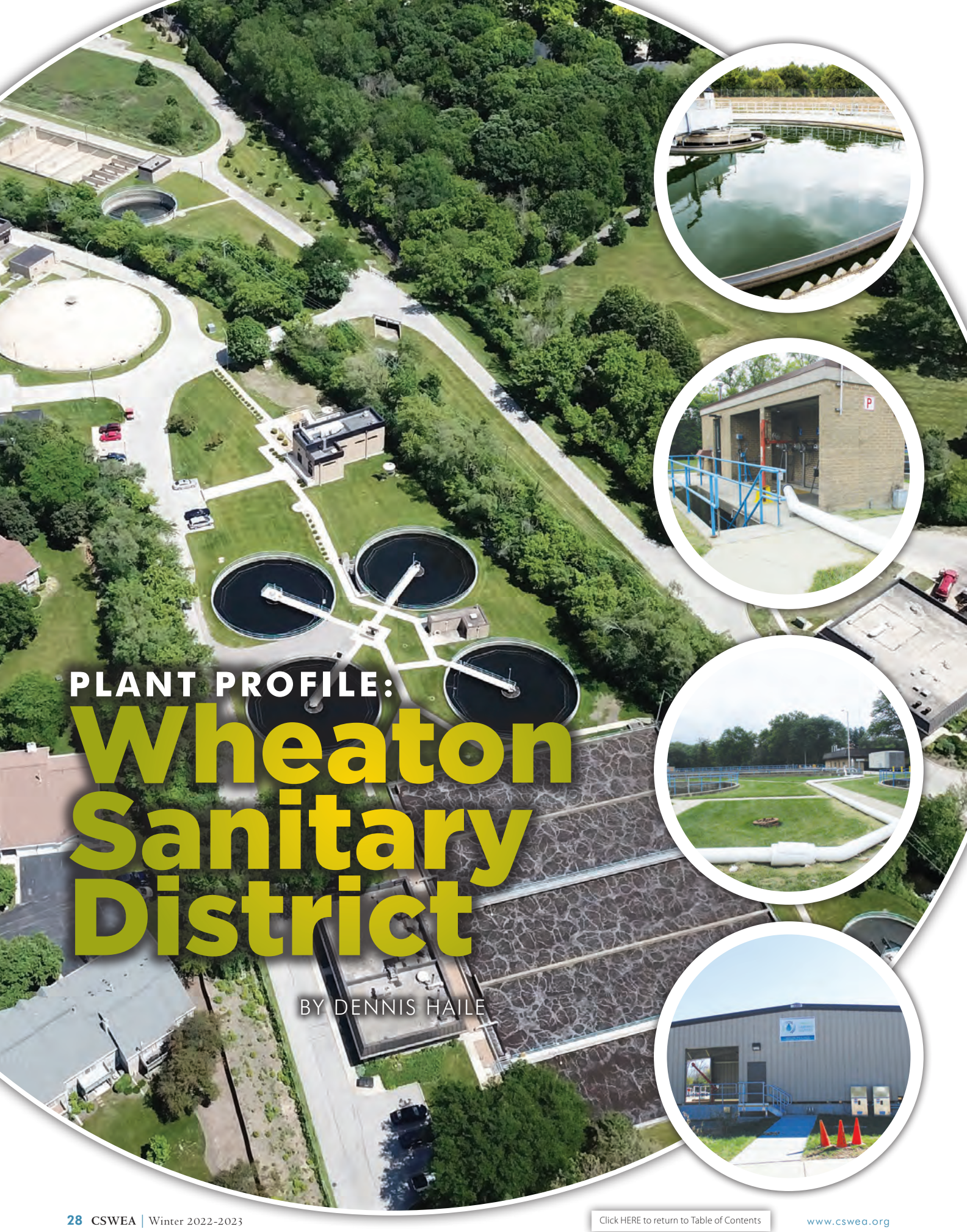

PLANT PROFILE: Wheaton Sanitary District

BY DENNIS HAILE

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Sitting 25 miles west of Chicago, Wheaton Sanitary District (WSD) is located on a beautiful 35-acre site on Shaffner Road in Wheaton, IL. The plant was established in 1925 and has been in operation since 1926, now receiving flow from most of Wheaton, southern Carol Stream, and part of Glen Ellyn, Winfield, and unincorporated DuPage County. WSD services a population of around 57,000 people and treats 5-9 MGD a day.

Over the years, the plant has seen several upgrades. In the late 1970s, WSD was upgraded to include a single-stage Nitrification Activated Sludge System. The activated sludge plant originally consisted of three aeration basins and two aerobic digesters. However, in 2001 and 2010, the aerobic digesters were converted into aeration basins. Not only did this improve day-to-day operations, it also expanded the designed average flow to 8.9 MGD and a designed max flow of 19.1, with a peak instantaneous flow of 45 mgd. After grit removal, any flows over 19.1 MGD can be diverted to repurposed primary tanks and to an excess flow holding pond to be slowly reintroduced to the plant when conditions improve. If flows exceed 30 MGD a portion of the flow can be diverted straight to our 003 tank for primary treatment and disinfection.

Staffed with 16 full-time employees in administration, maintenance, and operations, team effort is a huge factor in maintaining the quality and efficiency of the plant. Recent upgrades to Wheaton Sanitary District include new fine screens in the preliminary treatment building that were installed in 2016. As well, a new intermediate pump building with four new Archimedes screw pumps was constructed from July of 2015 to August of 2016. In 2019 the eight tertiary sand filters were replaced with five Kruger disc-filters to improve tertiary treatment. Then, in 2020, the chlorine contact tank was retrofitted into two Trojan UV channels for disinfection. Not only did this make routine operations easier and more efficient, it also eliminated certain chemicals from being discharged into Springbrook Creek. The plant is currently in the middle of a biological Phosphorus removal pilot project. This project uses return activated sludge fermentation for biological phosphorus removal, and all tank and piping modifications were performed by the maintenance staff at a reduced cost for the district.

Today, Wheaton Sanitary District is a four-stage treatment facility consisting of preliminary, primary, secondary, and tertiary treatment, and maintains approximately 67 miles of sewer mains, with an additional 120 miles owned and maintained by our service communities. WSD also currently sends samples to Wastewater Scan in San Francisco three times a week to monitor COVID-19 levels in wastewater.

Flow enters WSD through one of three interceptor sewer lines. The Southside, a 48-inch interceptor that was rehabilitated from 2009 through 2012. The Northside interceptor ranges in size from 24 to 60 inches in diameter. The district started a rehabilitation project of the northside interceptor in 2021 and is expecting completion in 2023. The arrowhead interceptor is an 18-inch interceptor sewer main.

WSD also owns and maintains two lift stations to help convey wastewater to the plant. As wastewater enters the plant, it is conveyed by one of four Archimedes screw pumps into the preliminary treatment building. Each screw pump is rated to pump 15 million gallons per day. From there, the wastewater flows through one of four fine screens to remove larger debris from the flow stream. The screens work automatically by influent and effluent level differential. The fine screen has improved in debris removal and has been an asset to downstream treatment. Continuing on, the water enters one of two aerated grit chambers for the removal of heavier solids that would be abrasive to downstream equipment. It is after this process and composite sampling that a portion of the flow can be diverted in high flow situations to our excess flow tanks and sent to the pond, entering the four primary settling tanks, where approximately 3500 lbs. of primary biosolids are pumped daily to two anerobic digesters. Primary effluent is then conveyed to the intermediate pump building to be pumped to our four remaining aeration basins along with return activated sludge. Presently, we are trying to maintain a mixed liquor suspended solids concentration of around 2000 mgl and a return sludge suspended solids concentration of around 7000 mgl. We try to maintain these levels to maximize RASS Fermentation. The mixed liquor flows through a main diversion structure where it flows to the four secondary clarifiers. Solids are removed from the bottom of the tank by adjusting telescoping valves to control flow. From here, we are pumping 400 gallons per minute to the fermentation tank and wasting approximately 90,000 gallons per day. The remainder is returned to the aeration basins. The fermented RASS flows back to the intermediate building and is pumped to the aeration tanks for phosphorus removal. The waste activated sludge is pumped to a gravity thickener tank to be thickened before pumping to the digesters. When digestion is complete, WSD dewaters the bio-solids in one of two centrifuges to 27% solids, before being hauled to our storage building. Three to four times a year we have the biosolids hauled and land applied to area farm fields. The secondary effluent then flows to the disc-filter building to filter any remaining solids out of the effluent. The final step is disinfection, where the effluent flows through the UV disinfection channels. WSD is on a seasonal disinfection schedule disinfecting May through October.

One of the concerns WSD has encountered is the proximity of residential properties. Every effort is made to always keep all odors and noise to a minimum. WSD is also very diligent at keeping costs to a minimum to keep our user rates low.

The resolute staff at Wheaton Sanitary District take great pride in achieving an exceptional effluent quality, earning gold awards from The National Association of Clean Water Agencies in 2014, 2015, 2018, 2019, 2020, 2021, and silver awards in 2016 and 2017. Other recent awards include:

- The 2022 GFOA certificate of achievement for excellence in financial planning for fiscal year ending April 30, 2021
- CSWEA's 2022 Treatment Facility Operations Award (Illinois)
- WEF's 2019 Outstanding Lab Analyst Award
- 2016 Clean Water Award
- WEF's 2016 William B Hatfield Award.
- The Illinois Association of Water Pollution Control Operators' 2014 Outstanding Wastewater Treatment Plant Operator of the Year.

Wheaton Sanitary District's staff is always looking for improved methods for the treatment of wastewater, while keeping user rates reasonable for the district's stakeholders. CS