**Bi-Monthly Wastewater Report**

**May-June, 2025**

## Pollutant Monitoring

To meet objectives to implement a wastewater monitoring and pollutant control program. the City of Bel Aire has been monitoring the levels of conventional pollutants since August 2023. Conventional pollutants are the pollutants that are found in domestic non-industrial wastewater, and which municipal wastewater plants are designed to remove. The CCUA cost of service agreement (COSA) recommends that strength loading assessments include Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) concentrations from each municipality (Bel Aire and Park City) to determine the pollutant loading strength from each municipality for cost allocation. Samples are collected from two lift stations located at 3800 N Harding and 5859 E 53rd Street N, which all of the wastewater generated in Bel Aire passes through before entering a force main which delivers the wastewater to the Chisholm Creek Utility Authority (CCUA) wastewater treatment facility located in Park City at 53rd St N and Broadway.

Additional nutrient parameters are also monitored to assess impacts to the CCUA wastewater treatment plant, as well as identifying potential sources of the pollutant contributions. These parameters include ammonia, Total Kjeldahl Nitrogen (TKN), and phosphorus.

Tables of the monitored parameters are included in Appendix 1 located at the end of this document. The results are also graphed, and trend lines are included. The tables include monthly average results from each lift station, past year results and expected ranges based on *Metcalf & Eddy Wastewater Engineering: Treatment and Resource Recovery 5th Ed,* and treatment parameter ranges for the CCUA wastewater treatment plant.

*Annual Averages of Pollutants*

| Harding & 37th St Lift Station | | | | | | 53rd St. Lift Station – 5858 E 53rd St N. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | BOD mg/L | TSS mg/L | Ammonia mg/L | TKN mg/L | Phosphorus mg/L | BOD mg/L | TSS mg/L | Ammonia mg/L | TKN mg/L | Phosphorus mg/L |
| 2025 YTD Avg | 334 | 421 | 51 | 53 | 7 | 378 | 565 | 49 | 54 | 7.2 |
| 2024 Average | 381 | 373 | 42 | 60 | 8.0 | 319 | 382 | 41 | 52 | 7.3 |
| 2023 Average | 397 | 491 | 43 | 66 | 8.0 | 360 | 285 | 38 | 54 | 6 |
| Literature Ranges | *100 – 400* | *250-850* | *12- 50* | *30 - 80* | *6- 14* | *100 – 400* | *250-850* | *12- 50* | *30 - 80* | *6- 14* |

The results from the lift station at 53rd Street Total Suspended Solids (TSS) concentrations are elevated. Results continue to improve. This is likely due to the efforts staff have implemented in the collection system which includes increased sewer line cleanings and televising, as well as routinely cleaning the lift station wetwells. The updated annual averages are within expected ranges.

**WASTEWATER FLOWS:**

| | Harding/37th MG | 53rd St MG | Total Bel Aire Flow | CCUA Influent MG | Percent Flow |
|---|---|---|---|---|---|
| ***January*** | 11.64 | 5.156 | 16.796 | 36.3217 | 46.2% |
| ***February*** | 11.393 | 4.953 | 16.346 | 36.883 | 44.3% |
| ***March*** | 12.25 | 5.215 | 17.465 | 37.701 | 46.3% |
| ***April*** | 14.318 | 5.407 | 19.725 | 41.264 | 47.8% |
| ***May*** | 13.346 | 5.796 | 19.142 | 45.42 | 42.1% |
| ***June*** | 20.535 | 6.906 | 27.441 | 63.191 | 43.4% |
| ***Total YTD*** | **83.482** | **33.433** | **116.915** | **260.781** | **44.8%** |

In January, 2025, CCUA completed installation of new wastewater meters. These meters were calibrated at both lift stations. Flows show that the rain events in June result in increased flows, likely due to infiltration from either open manholes or cracked sewer lines. Staff is evaluating this information to reduce infiltration. It should be pointed out that the yearly average contributed by Bel Aire is 44.8%, 1.3% less than the percent that is factored in the original CCUA agreement.

## Strength Charges

Multiplying the lift station BOD and TSS milligrams/Liter (mg/L) concentrations by the flow in million gallons (MG) with the conversion factor of 8.34 provides the total pollutant loading in pounds contributed to the CCUA wastewater plant by Bel Aire. Per the Bel Aire sixth supplemental agreement with CCUA, extra strength charges will be calculated by subtracting the plant design factor of 239 mg/l from both BOD and TSS concentrations, converting the difference to pounds and then multiplying the total pounds by $ 0.30 for BOD and $0.25 for TSS.

For example:

***FORMULAS***

***Total Pounds = (BOD or TSS result)x (Monthly Flow in MG) x (8.34 CF)***

***BOD CHG = Total Pounds (mg/L-239) x $0.30***

***TSS CHG = Total Pounds (mg/L-239) x 0.25***

*Table 3: Estimated Pollutant Loadings and Extra Strength charges 2025 YTD*

| | |
|---|---|
| Total BOD Pounds | 319162 |
| Total TSS pounds | 436762 |
| Extra Strength Charges to date | $76,915.77 |

Concern has been expressed by CCUA board members regarding the high strength charges. The cost per pound used to calculate high strength was what Wichita uses for their industrial customers. These charges were used as a proxy to assist with allocation. The actual loading contributions from each municipality's lift station results will be used and actual CCUA treatment costs will be allocated based on the pollutant loadings from each city. Burns & McDonnell is evaluating methods to better understand how this model should work so charges are distributed equitably.

## Pretreatment Program Activities

In December 2023, the City adopted *Chapter 14, Article 7; Sanitary Sewer Conveyance System Compliance* into the City Code of Ordinances. This article sets forth uniform requirements for Users of the Sanitary Sewer Conveyance System for the City of Bel Aire and enables the City to comply with all applicable State and Federal laws, including the Clean Water Act (33 United States Code [U.S.C.] section 1251 et seq.) and the General Pretreatment Regulations (Title 40 of the Code of Federal Regulations [CFR] Part 403).

The City has implemented procedures to ensure that users comply with the requirements set forth in the Article. This includes receiving and documenting industrial waste surveys from users, facility inspections, and encouraging facilities to implement industry specific best management practices (BMP) to minimize discharges of prohibited pollutants.

To date the following pretreatment activities have been performed:

| | 2024 | 2025 |
|---|---|---|
| Industrial Waste Surveys Sent Out | 6 | 28 |
| Industrial Waste Surveys Received | 5 | 6 |
| Inspections Performed | 2 | 4 |

While second quarter activities did not focus on the above activities, as staff apply resources to address seasonal activities such as storm events, mowing, tree and brush removal, plans are to follow up on these activities during the fourth quarter.

## COLLECTION SYSTEM ACTIVITIES

The interceptor that runs parallel to 53rd street North between Prestwick and the 53rd Street Lift Station is showing signs of significant corrosion at 14 manhole locations. Staff is currently seeking alternatives for replacement and or rehabilitation of the manhole vaults. Odor complaints have been received from residents that live near the 53rd Street Lift Station. The corrosion and odor complaints are a result of the presence of hydrogen sulfide in the sanitary sewer. Hydrogen sulfide is often generated from low flow velocities in the sewer line. As retention time increases, oxygen consumption increases, thus favoring the bacterial production of hydrogen sulfide.

In YTD 2025, staff performed the following activities:

- Met with an engineering firm to develop a scope of work and fee to perform a condition assessment and recommend corrective measures for the impacted manhole vaults
- Began using Odalog to monitor hydrogen sulfide levels at various locations
- The Odalog measurements taken to date have shown excessive levels of the odor and corrosion causing compound, hydrogen sulfide (H2S) in the sanitary sewer line immediately downstream of the Rock Road Lift Station Force Main connection. This is the sanitary sewer line that is showing signs of corrosion at the manholes and enters the lift station at 53rd Street North, which has received odor complaints in the past.
- On May 6, 2025, staff met with a chemical odor control provider to collect H2S data from the sanitary sewer lines and discuss corrective measures. The report is attached and includes 3 alternatives for a pilot study. Once the pilot study is complete, the City can determine the best alternative for a service contract, or if the data does not show improvement, elect not to go forward.
- Implemented a CCTV sewer inspection or sewer televising program

➢ A specialized, waterproof camera is inserted into the sewer pipe, typically through a manhole or cleanout
➢ The camera, mounted on a remotely controlled robot crawler, navigates through the pipe, transmitting live video footage to a monitor.
➢ The video footage is recorded, and the operator notes the precise location of any issues using a footage counter. The camera's pan and tilt capabilities allow for a comprehensive view of the pipe's interior.
➢ A detailed report is generated, including the video footage, images, and notes on the sewer line's condition

The benefits of sewer televising includes early detection of potential issues such as root intrusion, structural defects, and buildup of solids (rags and grit) and/or grease that could result in a line blockage. It is a proactive approach reducing the need for excavation and other resources utilized in removing blockages, in addition to providing visual data for planning and executing sewer line maintenance and repairs. To date, the City has televised 1039 feet of sanitary sewer lines, and cleaned 8,441 feet of sewer lines.

| Activities Performed in 2025 | Feet/ Number of lift stations |
|---|---|
| **Televised Sanitary Sewer Lines** | 1200 |
| **Cleaned Sewer Lines** | 9500 |
| **Lift Station Wetwells cleaned** | 3 |

## Supplementary Activities

Other activities performed in 2024/25 related to wastewater program management include:
➢ Development of a comprehensive Cost of Services strategy for CCUA that was agreed upon by both Bel Aire and Park City and approved by the CCUA Board
➢ Installation and calibration of wastewater meters at both lift stations

## Conclusion

The implementation of a pretreatment program, sewer televising, odor monitoring, and a wastewater flow meter and sampling program allows the city to better allocate resources, determine the financial needs for sanitary sewer services, and protect the collection system serving Bel Aire ratepayers. The city is commended for its progress in achieving these objectives.
Here's a recap of each component:

- **Pretreatment Program:** This program aims to prevent pollutants from entering the wastewater system from commercial and industrial users. By reducing the amount of pollutants entering the system, the city can reduce the burden on the wastewater treatment plant, improve the efficiency of treatment, and protect the environment.
- **Sewer Televising:** This involves using a specialized camera system to inspect the interior of sewer lines. This non-invasive method allows for the early detection of issues such as cracks, root intrusion, blockages, and structural defects. Early detection prevents costly repairs and ensures the smooth operation of the sewer system.

- **Odor Monitoring:** This involves using sensors or other technologies to detect and measure the intensity of odors emanating from the wastewater system. This helps identify sources of odors, assess their impact on the surrounding community, and implement effective odor control strategies.
- **Wastewater Flow Meter and Sampling Program:** Flow meters measure the volume of wastewater flowing through the system. This data is crucial for determining the capacity of the system, optimizing treatment processes, and ensuring compliance with environmental regulations. The sampling program collects wastewater samples at the two main lift stations serving Bel Aire to analyze the quality of the wastewater and identify potential pollutants. Automatic samplers are used to ensure accurate and representative samples. This data is used to assess the effectiveness of treatment, identify areas for improvement, and ultimately used for the CCUA annual true-up between Bel Aire and Park City for the cost of services analysis.

# Appendix 1 Sampling Data Tables and Graphs

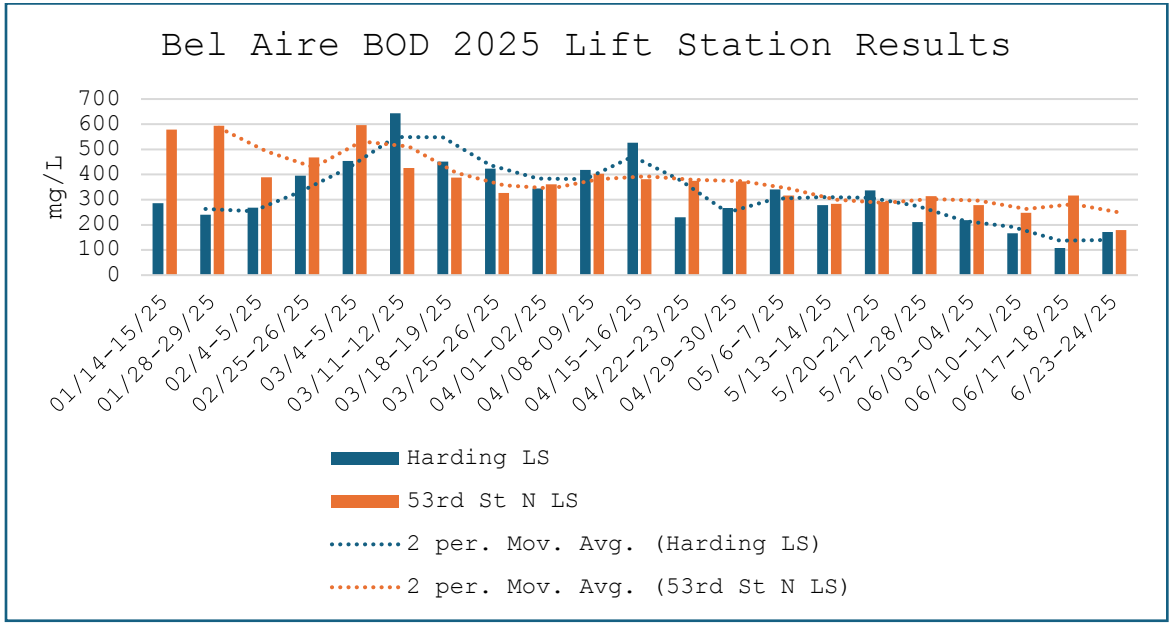
*First Quarter 2025 Lift Station Monitoring Results*

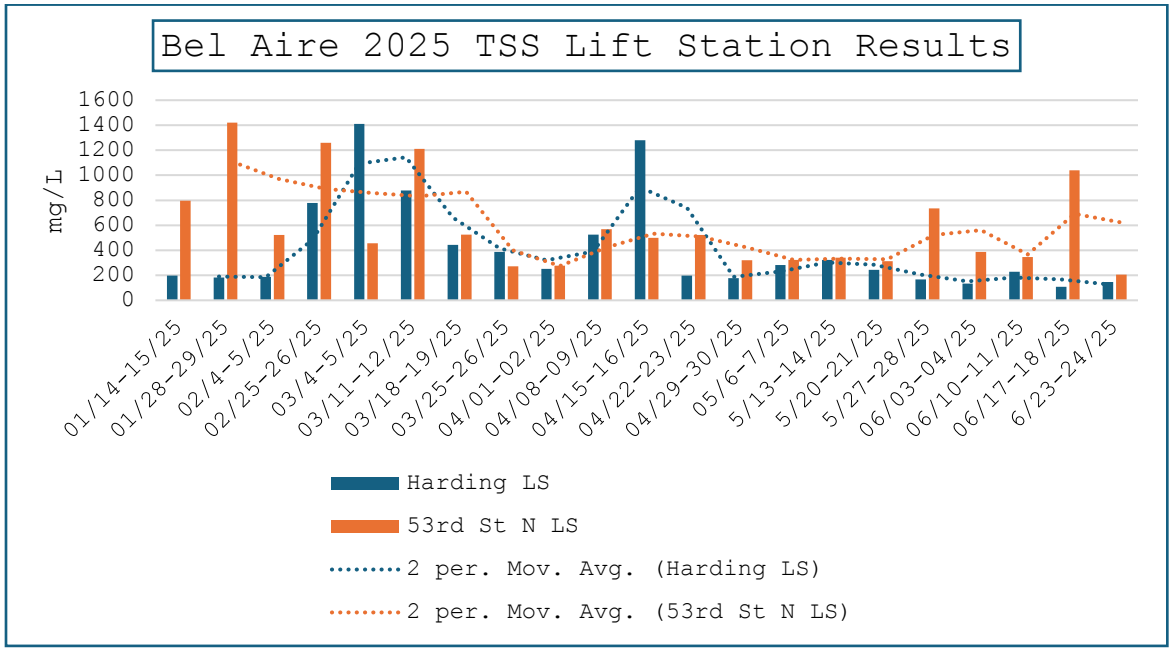
| Harding & 37th St Lift Station | | | | | | | 53rd St. North Lift Station | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date | BOD mg/L | TSS mg/L | NH3-N mg/L | TKN mg/L | PO4 mg/L | Monthly Flow MG | BOD mg/L | TSS mg/L | NH3-N mg/L | TKN mg/L | PO4 mg/L | Monthly Flow MG |
| 01/14-15/25 | 286 | 197 | 39.1 | 48.8 | 5.5 | | 578 | 796 | 48 | 69.9 | 8.5 | |
| 01/28-29/25 | 240 | 181 | 49.8 | 73.2 | 8.2 | | 594 | 1420 | 34.2 | 62.2 | 9.3 | |
| **January Avg** | **263** | **189** | **44.4** | **61** | **6.8** | **11.64** | **586** | **1108** | **41.1** | **66** | **8.9** | **5.156** |
| 02/4-5/25 | 268 | 188 | 55.4 | 56 | 7.2 | | 389 | 522 | 49.6 | 77.5 | 8.2 | |
| 02/25-26/25 | 396 | 778 | 32 | 45.6 | 5.9 | | 468 | 1260 | 40.8 | 51.2 | 6.7 | |
| **February Avg** | **332** | **483** | **43.7** | **50.8** | **6.55** | **11.39** | **429** | **891** | **45.2** | **64.3** | **7.45** | **4.953** |
| 03/4-5/25 | 454 | 1410 | 55 | 66.4 | 7.5 | | 596 | 455 | 39.6 | 50.1 | 7.1 | |
| 03/11-12/25 | 644 | 877 | 37.8 | 55.4 | 7.5 | | 426 | 1210 | 42.5 | 60.2 | 8 | |
| 03/18-19/25 | 451 | 442 | 42.1 | 50.1 | 7.2 | | 388 | 526 | 43.7 | 56.8 | 8.9 | |
| 03/25-26/25 | 424 | 387 | 52 | 55.7 | 6.8 | | 327 | 271 | 43.6 | 47.5 | 6.4 | |
| **March Avg** | **493** | **779** | **46.7** | **56.9** | **7.25** | **12.25** | **434** | **615.5** | **42.35** | **53.65** | **7.6** | **5.215** |
| ***1st Qtr. Avg*** | ***363*** | ***484*** | ***45*** | ***56*** | ***6.9*** | | ***483*** | ***872*** | ***43*** | ***61*** | ***8*** | |
| ***CCUA Targets*** | ***229-334*** | ***221-440*** | ***30-50.1*** | ***45-73*** | ***6-8*** | | ***229-334*** | ***221-440*** | ***30-50.1*** | ***45-73*** | ***6-8*** | |
| **Literature Ranges** | ***100-400*** | ***250-850*** | ***12-50*** | ***30-80*** | ***6 - 14*** | | ***100-400*** | ***250-850*** | ***12-50*** | ***30-80*** | ***6 - 14*** | |

*Second Quarter 2025 Lift Station Monitoring Results*

| Harding & 37th St Lift Station | | | | | | | 53rd St. North Lift Station | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date | BOD mg/L | TSS mg/L | NH3-N mg/L | TKN mg/L | PO4 mg/L | Monthly Flow MG | BOD mg/L | TSS mg/L | NH3-N mg/L | TKN mg/L | PO4 mg/L | Monthly Flow MG |
| 04/01-02/25 | 345 | 252 | 46.6 | 51.7 | 6.5 | | 361 | 278 | 54 | 60.7 | 7.6 | |
| 04/08-09/25 | 418 | 526 | 44.6 | 57.8 | 8.4 | | 403 | 568 | 44 | 49.6 | 7 | |
| 04/15-16/25 | 526 | 1280 | 60 | 78.5 | 13.3 | | 382 | 499 | 47.3 | 60.8 | 9.7 | |
| 04/22-23/25 | 230 | 198 | 51 | 54.8 | 10.7 | | 375 | 522 | 42.8 | 52.9 | 9.5 | |
| 04/29-30/25 | 267 | 177 | 54 | 55.9 | 7 | | 372 | 321 | 43.2 | 61.6 | 7.9 | |
| **April Average** | **357** | **437** | **51** | **59.7** | **9.2** | **14.32** | **379** | **438** | **46** | **57** | **8.1** | **5.407** |
| 05/06-07/25 | 341 | 283 | 173 | 48.7 | 8.5 | | 317 | 323 | 175 | 52.8 | 7.9 | |
| 05/13-14/25 | 279 | 323 | ND | 60.5 | 7.1 | | 284 | 341 | 41.2 | 46.1 | 5.5 | |
| 05/20-21/25 | 337 | 244 | 59 | 69.3 | 8.7 | | 291 | 313 | 47.2 | 53.3 | 6.6 | |
| 05/27-28/25 | 211 | 167 | 35.2 | 40.3 | 5.3 | | 314 | 714 | 30.9 | 44.6 | 6 | |
| **May Average** | **292** | **254** | **89** | **54.7** | **7.4** | **13.46** | **302** | **428** | **74** | **49** | **6.5** | **5.796** |
| 06/03-04/25 | 218 | 134 | 10.2 | 18.2 | 2.6 | | 278 | 388 | 26.2 | 43.2 | 5.5 | |
| 06/10-11/25 | 166 | 228 | 30.8 | 35.6 | 5.9 | | 248 | 345 | 37.1 | 40.4 | 6.6 | |
| 06/17-18/25 | 108 | 108 | 10.7 | 17.9 | 2.5 | | 317 | 1040 | 26.8 | 45.5 | 7.1 | |
| 06/23-24/25 | 171 | 147 | 38.5 | 39.8 | 0.95 | | 179 | 205 | 42.2 | 42.7 | 1 | |
| **June Average** | **166** | **154** | **22.5** | **27.9** | **3** | **20.54** | **256** | **494** | **33** | **43** | **5** | **6.906** |
| ***2nd Qtr. Avg*** | ***272*** | ***235*** | ***54*** | ***47*** | ***6.5*** | | ***312*** | ***453*** | ***51*** | ***50*** | ***6.5*** | |
| ***CCUA Targets*** | ***229-334*** | ***221-440*** | ***30-50.1*** | ***45-73*** | ***6-8*** | | ***229-334*** | ***221-440*** | ***30-50.1*** | ***45-73*** | ***6-8*** | |
| **Literature Ranges** | ***100-400*** | ***250-850*** | ***12-50*** | ***30-80*** | ***6 - 14*** | | ***100-400*** | ***250-850*** | ***12-50*** | ***30-80*** | ***6 - 14*** | |

2025 YTD Pollutant Trends



2025 Pollutant Trend Charts