



To: Matt Lindsey, MVRPC
From: Danny Knife, TCA General Manager
Date: 02/14/2025
Re: Tri-Cities Facility Plan Update Proposal

Mr. Lindsey,

Below are Tri-Cities Wastewater Authority's response to Miami Valley Regional Planning Commission's requirements for Facility Plan Updates regarding our Facilities Planning Map modification request.

A. Map as ESRI or GIS (Provided by Judy Holtvogt)

B. Population (Map Attached)

2020 population: 73,149

2050 population projection: 70,254

C. Description of existing and proposed wastewater treatment options for the FPA

There is currently no sewer that connects to the Carriage Trails newly annexed development area. The closest connection is to the Tri-Cities Treatment area, currently serving the original Carriage Trails property immediately south. A Bethel Township / Miami County treatment option was eliminated by Miami County Commissioner decision as described below in H and I.

The proposed area will utilize lift stations to connect into the existing manhole at Senna Street and Carriage Trails. The lift stations will be sized to meet the immediate demands with easy expansion to meet full build out (either via a 2/3 pump configuration or pumps capable of upsizing).

D. Description of plans to provide wastewater treatment to proposed FPA addition

The FPA addition will temporarily connect to existing sewers along Carriage Trails Parkway via a gravity line connection at the Redwood apartment complex, ultimately collecting in the lift Carriage Trails / Brandt Pike lift station on Brandt Pike, at the southeast corner of the Waterstone property. This lift station pumps sanitary sewage west to a point along Carriage Trails Parkway and Senna Street. A drawdown test of the lift station identified it has capacity for temporary addition of 122 homes as per this request.



Future development in the FPA addition will be served by lift station additions that will converge at the same gravity connection point as the first 122 homes. When the new lift stations are constructed, these temporary 122 homes will also be redirected to them, and removed from the Carriage Trails / Brandt Pike lift station.

Anticipated build out within the FPA addition is shown in the chart below. Only 275 homes are scheduled to be connected before the North Regional Plant improvements are completed in 2029. (this includes the initial 122 homes). TCA's 2023 capacity study showed that there is 1MG of hydraulic capacity remaining at the North Regional Treatment Plant. While the proposed upgrades will not be completed by 2029, flow capacity expansion will be online in 2028. TCA's remaining 1MG of average daily flow capacity is sufficient to handle the projected 275 homes by the completion of the treatment plant upgrades in 2029.

<u>YEAR</u>	<u>BUILDING LOTS DEVELOPED</u>	<u>BUILDING LOTS SOLD</u>	<u>INVENTORY</u>	<u>HOMES FINISHED & CONNECTED TO SANITARY SEWER</u>	<u>TOTAL HOMES CONNECTED TO SANITARY BY 2030</u>	<u>TOTAL HOMES CONNECTED TO SANITARY BY 2040</u>
2024	0	0	0	0		
2025	125	20	105	10		
2026	50	45	110	40		
2027	50	70	90	60		
2028	50	80	60	75		
2029	50	90	20	90	275	
2030	100	90	30	90		
2031	100	90	40	90		
2032	100	100	40	90		
2033	100	100	40	100		
2034	100	100	40	100		
2035	100	100	40	100		
2036	100	100	40	100		
2037	100	100	40	120		
2038	100	120	20	120		
2039	100	120	0	120		
2040	100	100	0	120		1425

E. Table of current permit limits, existing plant capacities and projected plant capacities (See Attachments)

TCA received an average flow of 9.18 MGD in 2024 and has a design capacity of 11.2 MGD. TCA is in the process of designing upgrades that will increase flow capacity to 17.3 MGD by the end of 2029. Biological system upgrades included with this project will successfully manage projected increases in hydraulic and organic loadings to the plant in the future.

TCA has been awarded \$7,000,000 in low interest state funded loans for the planning and design of the NRWTP Improvement Project. A construction loan application will be submitted to the OEPA in December 2025.

F. Discussion of how additional population will be served

Additional population will be served by this temporary connection. As build-out occurs a new lift station will be constructed for the eastern portion of the Carriage Trails newly annexed development area. At the point of construction, the new lift station will take the flow from the temporary homes as well as future homes in the development.

G. Discussion of how pertinent critical water resources will be protected

Construction of the temporary connection will utilize as much existing infrastructure as possible, making a connection at the nearest manhole. As such, the disturbances to critical water resources will be minimized.

The new lift stations and force mains proposed as part of this project will utilize Horizontal Directional Drilling to minimize ground disturbances. The lift stations will be put in with development and follow all required SWPPP plans and requirements of the EPA.

H. Discussion of agreement or conflict with plans of contiguous FPAs (See commentary following I.)

I. Documentation of public participation in update

The Facilities Planning Area was most recently updated to designate the current area of proposed amendment “Bethel” as shown on the May 2, 2022 update of the Facility Planning Areas for Miami, Greene Clark, Darke and Preble Counties.

This “Bethel” update was reportedly done with the Carriage Trails annexation in mind, as at that time it was both Bethel Township’s as well as Miami County’s (the Designated Management Agent) intent to service the area. This intended service was a key point of argument against Carriage Trails from both Bethel Township as well as Miami County during the annexation process.

Carriage Trails, the Developer has been under obligation by a 2009 Development Agreement with the City of Huber Heights, that if the area in question, specifically described in the Development Agreement, “is proposed for development, Developer will file any necessary petitions with City to annex such real property into the City and will not seek the provision of utility services for such area from any other political subdivision”.

This contractual obligation had caused the Developer, in cooperation with Huber Heights, to provide sanitary stubs to the abutting boundary and anticipate in the design and planning, sanitary service for the annexation area, by Huber Heights.

The Developer’s original annexation petition was denied by the Miami County Commissioners, for among other reasons, the Developer’s assumption that Huber Heights would be providing sanitary service, noted by the Miami County Commissioners



as being within the Clark County Sewer District and under Miami County DMA control. The Developer's second annexation petition assumed sanitary service by Miami County, and the Developer even had a number of meetings with the Miami County Sanitary Engineering Office staff.

During these Miami County Sanitary Engineering meetings, the Developer was provided with copies of a recently completed "Brandt Sanitary Sewer System Preliminary Engineering Study" completed for Miami County Sanitary Engineering by Strand Associates. Since the study included the specific area of annexation, and the Developer had been told nothing to the contrary to date, the Developer assumed Miami County was sticking to its argument of right to sanitary service.

After some time of back-and-forth without a formal commitment from Miami County despite the Developer's requests, on October 25, 2024, through counsel, the Developer was informed that Miami County would not be providing sanitary sewer service to Carriage Trails but would participate in discussions regarding amendment to the FPA, requested herein.

A copy of the Miami County Commissioner's denial letter is attached, along with Huber Heights Resolution No 2024-R-7363, the "Service Letter" provided during the Developer's annexation process.

The proposed FPA amendment has been discussed at the last two TCA public Board Meetings. Public outreach for TCA's Plant Improvement Project has been presented numerous times around the Dayton Area over the last several years. This has included City Council Meetings, local service club meetings, and articles in several local publications.

Respectfully,

Danny Knife, TCA General Manager

Parameters	Limit Type	Limits and Units	Loading (kg/day)	Sample Frequency	Sample Type	Monitoring Months
Water Temperature	-	-	-	1 per Day	Continuous	All
DO	Daily Minimum	5.0 mg/L	-	1 per Day	Continuous	All
TSS	Weekly Average	27 mg/L	1,146	3 per Week	24-hour Composite	All
TSS	Monthly Average	18 mg/L	763	3 per Week	24-hour Composite	All
Oil and Grease, Hexane Extr Method	Daily Maximum	10 mg/L	-	1 to 2 Weeks	Grab	All
Nitrogen, NH ₃	Weekly Average	2.3 mg/L	96	5 per Week	24-hour Composite	Summer
Nitrogen, NH ₃	Monthly Average	1.5 mg/L	63.6	5 per Week	24-hour Composite	Summer
Nitrogen, NH ₃	Weekly Average	3.8 mg/L	159	5 per Week	24-hour Composite	Winter
Nitrogen, NH ₃	Monthly Average	2.5 mg/L	106	5 per Week	24-hour Composite	Winter
Nitrogen Kjeldahl, Total	-	-	-	1 to 2 Weeks	24-hour Composite	All
Nitrite Plus Nitrate, Total	-	-	-	1 to 2 Weeks	24-hour Composite	All
Phosphorus (P), Total	-	-	-	2 per Week	24-hour Composite	All
Orthophosphate, Dissolved	-	-	-	1 per Month	Grab	All
Nickel, Total Recoverable	-	-	-	1 per Quarter	24-hour Composite	Quarterly
Zinc, Total Recoverable	-	-	-	1 per Quarter	24-hour Composite	Quarterly
Cadmium, Total Recoverable	-	-	-	1 per Quarter	24-hour Composite	Quarterly
Lead, Total Recoverable	-	-	-	1 per Quarter	24-hour Composite	Quarterly
Chromium, Total Recoverable	-	-	-	1 per Quarter	24-hour Composite	Quarterly
Copper, Total Recoverable	-	-	-	1 to 2 Weeks	24-hour Composite	All
Chromium, Dissolved Hexavalent	-	-	-	1 per Quarter	Grab	Quarterly
<i>E. coli</i>	Weekly Average	284#/100 ml	-	1 per Day	Grab	Summer
<i>E. coli</i>	Monthly Average	126#/100 ml	-	1 per Day	Grab	Summer
Indeno(123cd)pyrene	-	-	-	1 to 2 Weeks	24-hour Composite	All
Bis(2ethylhexyl) Phthalate	-	-	-	1 to 2 Weeks	Composite	All
Flow Rate	-	-	-	1 per Day	Continuous	All
Chlorine, Total Residual	Daily Maximum	0.037 mg/L	-	1 per Day	Multiple Grab	Summer
Mercury, Total (Low Level)	-	-	-	1 to 2 Weeks	Grab	All
Cyanide, Free (Low Level)	-	-	-	1 per Quarter	Grab	Quarterly
Acute Toxicity, Ceriodaphnia dubia	-	-	-	1 per Year	24-hour Composite	June
Chronic Toxicity, Ceriodaphnia dubia	-	-	-	1 per Year	24-hour Composite	June
Acute Toxicity, Pimephales promelas	-	-	-	1 per Year	24-hour Composite	June
Chronic Toxicity, Pimephales promelas	-	-	-	1 per Year	24-hour Composite	June
pH, Maximum	Daily Maximum	9.0 S.U.	-	1 per Day	Continuous	All
pH, Minimum	Daily Minimum	6.0 S.U.	-	1 per Day	Continuous	All
Residue, Total Filterable	-	-	-	1 to 2 Weeks	24-hour Composite	All
CBOD ₅ day	Weekly Average	18 mg/L	763	3 per Week	24-hour Composite	All
CBOD ₅ day	Monthly Average	12 mg/L	509	3 per Week	24-hour Composite	All

CBOD₅= five-day carbonaceous biochemical oxygen demand
DO=dissolved oxygen
kg/day=kilograms per day

mg/L=milligrams per liter
S.U.=standard units

Table 2.05-1 NRWWTP Final Effluent NPDES Permit Limits

3.01 POPULATION AND GROWTH PROJECTIONS

Growth is anticipated in the three communities served by TCA. Therefore, it is important to quantify the impact that growth will have on future flow and loading conditions to identify capacity needs. This section details residential, commercial, and industrial growth projections and defines the design conditions to serve future growth through the design year of 2050. Future effluent permit limits are also identified.

A. Population Projections

The current total population of the three cities that TCA serves is approximately 69,000 people based on data provided by the United States Census Bureau. Tipp City, Huber Heights, and Vandalia provided growth projections to TCA with a projected build-out by the year 2040. By 2040, the total population that TCA will serve will increase to approximately 85,000 people, which is a growth of more than 22 percent and an average growth rate of 5.3 percent annually. There are portions of Vandalia and Huber Heights that discharge sanitary flow to other utilities; therefore, the population growth may not be within the TCA service area.

Table 3.01-1 shows the population growth every 5 years up to the design year of 2050. It is noted that build-out is anticipated by approximately 2040; therefore, the year 2040 and 2050 population projections are identical.

City	Current Population	2025	2030	2035	2040	2050
Tipp City	10,424	11,942	12,619	14,052	14,622	14,622
Huber Heights	43,321	45,417	47,207	49,096	50,466	50,466
Vandalia	14,999	15,052	19,209	19,210	19,210	19,210
Total	68,744	72,411	79,035	82,358	84,298	84,298

Table 3.01-1 Population Projections for the NRWWTP Service Area

B. Commercial and Light Industrial Growth Projections

Tipp City, Huber Heights, and Vandalia identified projected commercial and light industrial growth within the next 15 years. Tipp City and Vandalia are projected to have an increase of approximately 1.1 and 1.9 MGD in commercial and light industrial flows, respectively, by 2050. Huber Heights will have a smaller increase of approximately 178,000 gallons per day (gpd) by 2050. Commercial and light industrial flow projections were provided by the three cities.

C. Other Industrial Growth Projections

TCA’s member communities expect to experience significant industrial growth within the next 15 years. The WWTP serves three significant industrial users (SIU) that contribute to the wastewater influent: Abbott Nutrition (Abbott), Meijer Dairy (Meijer), and White Castle. Abbott is projected to have a

240,000 gpd increase in flow and loadings within the next 10 years, and another increase of 260,000 gpd in flow that is not anticipated to significantly increase loadings within the next 15 years. An additional 306,000 gpd of additional industrial flow and loadings is projected for new industries.

3.02 PROJECTED FLOWS AND LOADINGS

A. Projected Influent Wastewater Flow

The projected flows for TCA were broken down into five categories: Residential, Commercial and Light Industrial, General Industry, Abbott (flow only), and Abbott (flows with loadings). Residential growth was calculated by taking the number of households and assuming 400 gpd per household, with the number of households provided by each city. The commercial and light industrial and general industrial flow growth was provided by each city. The Abbott flow projections were provided by Abbott based on projected upgrades to its facility. TCA’s total average flow is projected to increase by 6.8 MGD by 2040. Table 3.02-1 shows the breakdown of wastewater flow for each category up to the year 2050.

Flow Breakdown (gpd)	2025	2030	2035	2040	2050
Household Growth	1,602	2,956	1,290	6,720	6,720
Total Residential Flow Increase	641,000	1,824,000	2,340,000	2,800,000	2,800,000
Total Commercial and Light Industrial Increase	935,000	2,473,000	2,766,000	3,155,000	3,155,000
Total General Industry Increase	77,000	193,000	307,000	307,000	307,000
Total SIU with Loadings Increase	-	240,000	240,000	240,000	240,000
Total SIU–Flow Only Increase	-	-	260,000	260,000	260,000
Total Flow Increase	1,653,000	4,730,000	5,913,000	6,762,000	6,762,000
Total Flow*	12,153,000	15,230,000	16,413,000	17,262,000	17,262,000

*The current average flow to the NRWWTP is 10.5 MGD.

Table 3.02-1 Projected Wastewater Flow Increases for the NRWWTP Service Area

The current wastewater flow data is derived from TCA’s average and maximum flow from January 2019 to May 2023. Peaking factors were calculated by dividing the maximum flow by the average flow. These peaking factors were applied to the average loading values to determine the future peak design loadings to the NRWWTP. Table 3.02-2 summarizes the peaking factors based on the January 2019 through May 2023 data, which were applied to the average values to determine maximum month, maximum week, and maximum day loading projections. The design future peak hourly flow was estimated by using the PC SWIMM modeling data provided by TCA. Table 3.02-2 shows the peaking factors to estimate maximum flow, and Table 3.02-3 presents the increase in maximum flow from 2025 to 2050.

Flow (MGD)	Peaking Factor
Maximum Month	1.85
Maximum Week	2.29
Maximum Day	2.5
Peak Hourly	2.89*

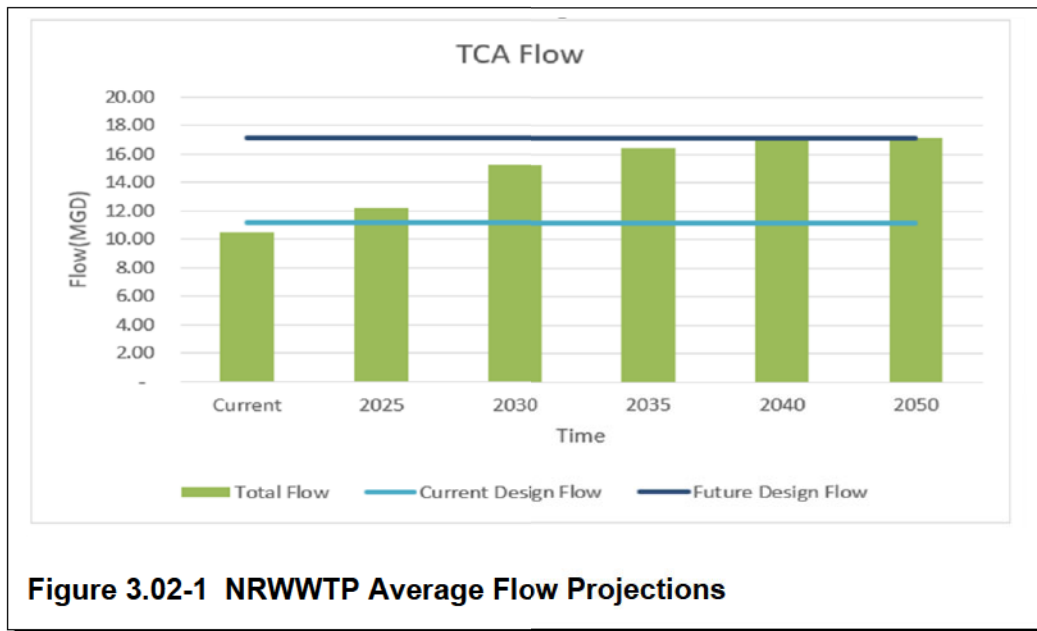
*The future peak hourly flow was determined by modeling.

Table 3.02-2 Peaking Factors to Estimate Maximum Flow

Flow (MGD)	Current	2025	2030	2035	2040	2050
Average	10.5	12.15	15.23	16.41	17.30	17.30
Maximum Month	19.4	22.45	28.13	30.32	31.96	31.96
Maximum Week	24.0	27.78	34.81	37.52	39.54	39.54
Maximum Day	31.4	30.38	38.07	41.02	43.25	43.25
Peak Hourly	41.2	41.2	44.02	47.44	50.0	50.0

Table 3.02-3 Projected Maximum Flow for the NRWWTP

Figure 3.02-1 shows the total projected flows for TCA up to the year 2050. The existing average flows are based on TCA’s average influent flow data from January 2019 to May 2023. The existing average influent flow during this time period was 10.5 MGD, which is close to the current design average flow of 11.2 MGD. However, with the anticipated growth of the three communities, the total average influent flows are expected to exceed the nominal design capacity in the near future and increase approximately 50 percent to a future design average flow of 17.3 MGD.



B. Projected Influent Wastewater Loadings

The current loading data summarizes TCA’s average loadings from January 2019 to May 2023, as shown in Table 2.03-2. As mentioned in Section 2, there is no historical influent data for ammonia (NH₃), total Kjeldahl nitrogen (TKN), and TP. Therefore, the values for NH₃ and Total P were based on the values used in the 2022 *WWTP Planning and Alternatives Study* completed by Strand. To calculate the future average loadings, the flow projections were applied to each category (Residential, Commercial and Light Industrial, General Industry, and Abbott) to calculate the loading growth for the design year of 2050. For the Residential category, a loading per capita was calculated by dividing the annual average loading by the current population. Table 3.02-4 shows these loadings per capita.

	Current Population	Annual Average* (lb/day)	Loading per Capita (lb/day/capita)
CBOD	68,744	12,440	0.18
TSS	68,744	12,770	0.18
NH ₃	68,744	1,280	0.02
TKN	68,744	3,506	0.05
TP	68,744	416	0.006

*The annual average based on data presented in Table 2.03-2.

lb/day=pounds per day

lb/day/capita=pounds per capita day

Table 3.02-4 Residential Loading per Capita

For the Commercial and Light Industrial, General Industrial, and Abbott loadings, concentrations were calculated based on the type of industry and applied to the flow projections to determine the future loadings in each category. The Commercial and Light Industry concentrations were based on the Residential concentrations with the assumption that the loadings would be approximately the same for residential and commercial. The General Industry concentrations were based on historical concentrations (2019 to 2021) provided by two industries in the area (Meijer and White Castle). The Abbott concentrations were based on historical average concentrations (2019 to 2021) provided by Abbott. Table 3.02-5 shows the concentrations for the Commercial and Light Industrial, General Industrial, and Abbott categories.

	Commercial and Light Industry (mg/L)	General Industry (mg/L) (historical averages)	Abbott (mg/L) (historical averages)
CBOD	148	192	214
TSS	148	114	322
NH ₃	16	25	25
TKN	42	40	40
TP	5	8	25

Table 3.02-5 Loading Concentrations for Commercial and Light Industry, General Industry, and Abbott Categories

The per capita Residential loadings in Table 3.02-4 and the concentrations from Table 3.02-5 were used to calculate the growth in loadings to the year 2050. The growth in loadings for each pollutant was added

to the current annual average loadings to determine the future annual average loadings. Table 3.02-6 shows the current average loadings, the growth in loadings, and the future annual average loadings.

	Annual Average (lb/day)	Growth in Loadings (lb/day)	Future Annual Average (lb/day)
CBOD	12,440	7,900	20,400
TSS	12,770	7,900	20,700
NH ₃	1,280	950	2,230
TKN	3,506	2,154	5,660
TP	416	364	780

Table 3.02-6 Future Design Average Loading Projections

Peaking factors were calculated similar to flow by dividing the maximum loadings for each pollutant by the average loading, with the exception of NH₃, TKN, and TP. As mentioned in Section 2, there is no historical influent data for NH₃, TKN, and TP. Therefore, the peaking factors for CBOD were applied to NH₃, TKN, and TP to determine the maximum loadings for these pollutants. The peaking factors were applied to the future annual average loading values to determine the future peak design loadings to the NRWWTP. Table 3.02-7 summarizes the peaking factors based on the January 2019 through May 2023 data. The peaking factors were then applied to the annual average values to determine maximum month, maximum week, and maximum day loading projections. A summary of the projected average influent wastewater loadings is shown in Table 3.02-8. Sampling will be performed again in Spring 2024 for these pollutants. Adjustments will be made as appropriate based on the sampling results.

	Maximum Month	Maximum Week	Maximum Day
CBOD	1.54	1.81	2.38
TSS	1.65	2.07	3.39
NH ₃	1.54*	1.81*	2.38*
TKN	1.54*	1.81*	2.38*
TP	1.54*	1.81*	2.38*

*Peaking factors are based on CBOD.

Table 3.02-7 Peaking Factors

Pollutant (lb/day)	Average	Maximum Month	Maximum Week	Maximum Day
CBOD	20,400	31,380	36,970	48,460
TSS	20,700	34,130	42,850	70,190
NH ₃	2,230	3,430	4,040	5,310
TKN	5,660	8,720	10,240	13,470
TP	780	1,200	1,410	1,850

Table 3.02-8 NRWWTP Influent Loading Projections

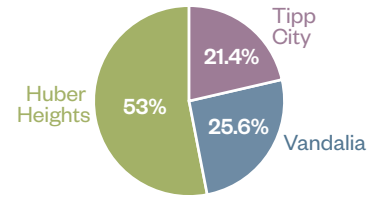
Tri-Cities North Regional WWTP — Draft Capacity Evaluation



NRWWTP Design Capacity

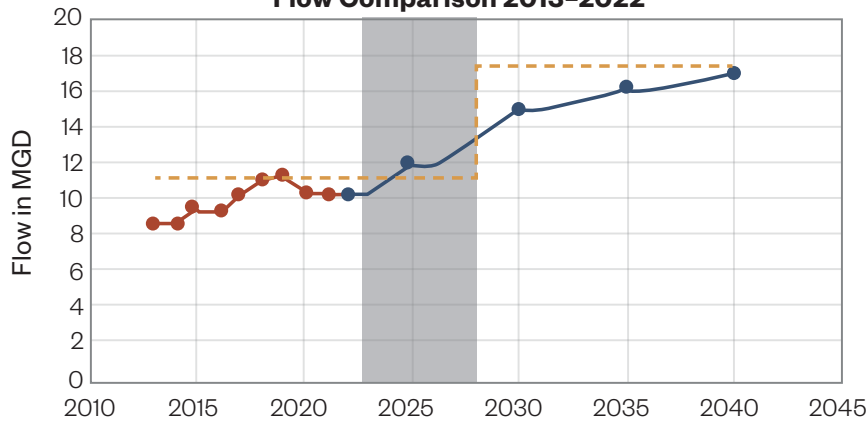
Parameter	NRWWTP Current Process Capacity	Available Capacity after 2022 Loads + Reserved SIUs Capacity	
		Flow and Load Available	Percentage Available
AA Flow (mgd)	11.2	1	9%
BOD ppd	14,500	2,688	19%
TSS ppd	14,500	1,621	11%
NH3 ppd	1,820	560	31%

2013–2022 Average Community Percent Flow Contributions



There is significant loading capacity based on the comparison of current loads to the plant design capacity, but there are process limitations at the plant that reduce performance and reliability. Comparison of the projected influent loads to the current plant processing capacity are shown below.

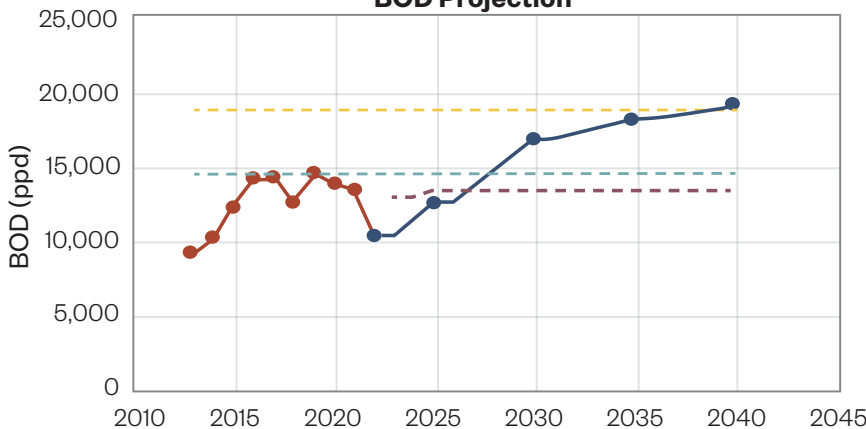
Flow Comparison 2013–2022



- Historical Effluent Flow
- Design Flow
- Flow Projection (2022 as Base)
- Plant Upgrade Design and Construction

Flow expected to exceed design conditions in 2024

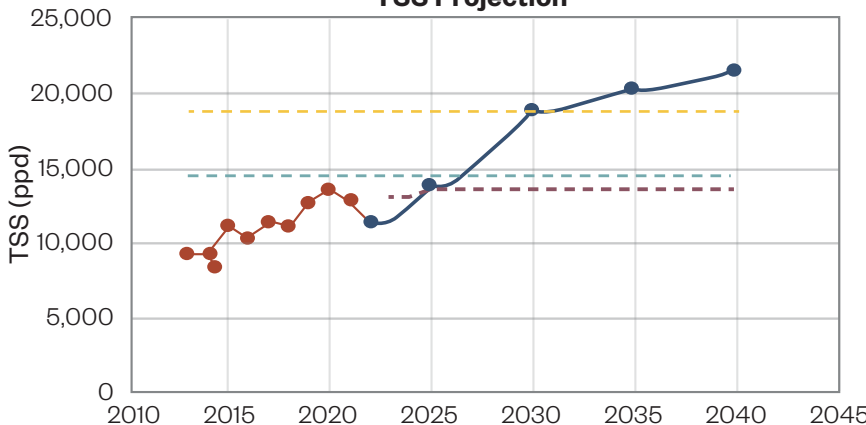
BOD Projection



- Historical BOD Load
- BOD Projection (2022 Base)
- Original Design BOD Capacity
- Plant Capacity — BOD Load
- Plant Capacity adjusted for Reserved SIUs Allocation — BOD Load

BOD Load expected to exceed current BOD loading capacity in 2028

TSS Projection



- Historical TSS Load
- TSS Load Projection (2022 Base)
- Original Design TSS Capacity
- Plant Capacity — TSS Load
- Plant Capacity adjusted for Reserved SIUs Allocation — TSS Load

TSS Load expected to exceed current BOD loading capacity in 2027



Bricker Graydon LLP
2 East Mulberry Street
Lebanon, OH 45036
513.870.6700 Office
www.brickergraydon.com

Amelia Blankenship
Of Counsel
513 870 6579 Direct Phone
ablankenship@brickergraydon.com

October 25, 2024

Sent via email and regular mail

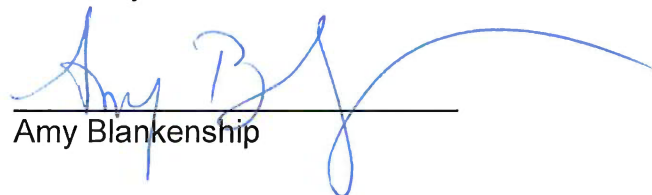
Joseph R. Miller
Vorys
52 East Gay Street
P.O. Box 1008
Columbus, OH 43216
jrmiller@vorys.com

Re: Sanitary Sewer Service to Carriage Trails II

Mr. Miller:

I am writing to you on behalf of Michael Clarey, Miami County Administrator. Mr. Clarey asked I respond to your letter dated October 16, 2024. You are correct in your statement that Miami County will not be providing sanitary sewer service to the Carriage Trails II development in Huber Heights. The County will participate in discussions regarding amendments to the Facility Planning Area to accommodate sanitary sewer service to the planned Carriage Trails II development.

Sincerely,



Amy Blankenship


cc: Michael Clarey, Miami County Administrator


Legend

 Proposed Revision to Tri-Cities FPA

Facility Plan Areas

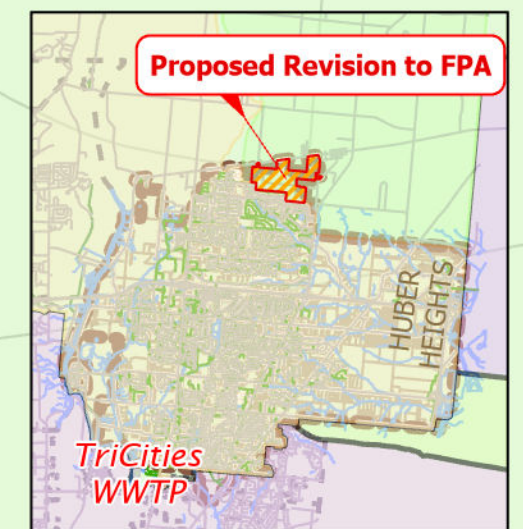
 BETHEL

 TRI-CITIES

 Huber Heights Corporation

 TriCities Wastewater Treatment Plant

 Existing Sanitary Sewer




Proposed Revision to FPA

Bethel Facility Planning Area

Tri-Cities Facility Planning Area

HUBER HEIGHTS

 CITY OF HUBER HEIGHTS
PROPOSED FPA REVISION
Date : 2/7/2025 