

AGENDA

WEST PENNSBORO TOWNSHIP MUNICIPAL AUTHORITY

REGULAR MEETING

May 23, 2023

7:30 AM - Call to Order

Pledge of Allegiance

Public Participation

Approval of Minutes

- Joint Meeting - March 27, 2023
- Authority Meeting - March 28, 2023

Old Business

- Delinquent Accounts Update

New Business

Engineer's Report

Supervisor of Operations

Solicitor's Report

Next Scheduled Authority Meeting – July 25, 2023

Adjournment

Minutes of Meeting

West Pennsboro Township Municipal Authority

May 23, 2023

The West Pennsboro Township Municipal Authority met on Tuesday, May 23, 2023, 7:30 AM, at the West Pennsboro Township Municipal Building, 2150 Newville Road, Carlisle, Pennsylvania. The following Authority members were present: Chairman William L. Piper, Vice-Chairman John Bixler, and Secretary Jane F. Burke, James Snyder and D. Mark Lehman.

Also present: Solicitor Mark Allshouse, Nancy Adams of GHD, Director of Operations Wayne E. Myers, and Township Secretary Evelyn Swartz and Administrative Assistant Brooke Mansfield.

Members of the Public: None

CALL TO ORDER

Chairman William Piper called the meeting to order at 7:31 AM, followed by the Pledge of Allegiance.

PUBLIC PARTICIPATION – None

Introduction for Brooke Mansfield – Chairman Piper

APPROVAL OF MINUTES

The Board unanimously **approved** the minutes of the March 27, 2023, Joint Meeting of West Pennsboro Township Municipal Authority and West Pennsboro Township Board of Supervisors on a **Snyder/Burke** motion.

The Board unanimously **approved** the minutes of the March 28, 2023, Meeting of West Pennsboro Township Municipal Authority on a **Burke/Lehman** motion.

OLD BUSINESS

Delinquent Accounts Update

The Board received the Aged Receivables Report. Solicitor Allshouse said that 80 Greason Road was not satisfied so there would be a default judgement filed then a sheriff's sale would be scheduled.

27 Young Drive (Red Oak Estates)

It was noted that 27 Young Drive was connected on 5/18/22. To date the connection fee of \$2,875.00 is still outstanding.

On a **Snyder/Burke** motion, the Board unanimously **directed** Solicitor Allshouse to draft a certified letter to Mr. Adler regarding the outstanding application fee due and future litigation for this delinquent connection. Secretary Swartz said the Township can always hold the Occupancy Permit for this address until all fees are paid in full for this property.

NEW BUSINESS

Lexington Land Development

Nancy Adams said that nothing has been submitted by Lexington Development since the last joint meeting. The Development Agreement would need to be in place of the developer. Chairman

- Member Bixler asked about escrow accounts for the Lexington Development, Secretary Swartz said there are two accounts already in place for this project (Sewer/Water Escrow Accounts), containing around \$5,000.00 each.

ENGINEER'S REPORT

Update to UV Replacement Project

Nancy Adams provided an update for the UV Project, advising the construction is still under way. Grant money is being used for this project.

Member Burke would like an expenditure report from the American Rescue Program, since this is the account being used to pay for the UV Replacement Project.

DIRECTOR OF OPERATIONS

Wayne Myers, Supervisor of Operations, reviewed his report.

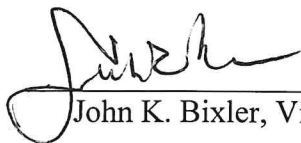
- Mr. Myers advised that Engineer Adams has prepared a letter to the Turnpike regarding their Wastewater Discharge Permit, and they have provided info for the new permit.
- DEP has accepted the Chapter 94 report.
- Mr. Myers reported that the micro-organisms that were killed prior are doing well.
- The 1st application for payment was received from PSI Pumping Inc (for the UV replacement).

SOLICITOR'S REPORT - Nothing

ADJOURNMENT

*On a **Burke/Lehman** motion, and there being no further business to come before the Board, the meeting was adjourned at 8:12 AM.*

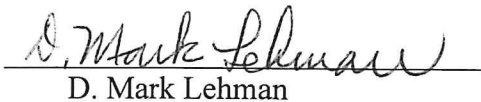
The next Authority meeting is scheduled for July 25, 2023, at 7:30 AM.



John K. Bixler, Vice-Chairman



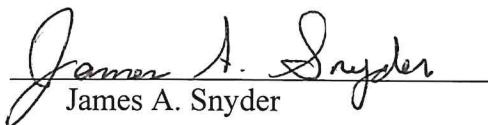
Jane F. Burke, Secretary



D. Mark Lehman



William L. Piper, Chairman



James A. Snyder

**WEST PENNSBORO TOWNSHIP
BOARD OF SUPERVISORS & MUNICIPAL
AUTHORITY JOINT MEETING**

March 27, 2023

Please print and sign your name so that we may properly record your presence at the Board of Supervisors & Municipal Authority Joint Meeting this day March 27, 2023 at the West Pennsboro Township Municipal Building.

1. Karl Smith Karl M. Smith
2. Millard Finckenberg
3. Joshua S. Miller Joshua S. Miller
4. Sen Marinacci Sen Marinacci
5. Justin Doty Limestone Creek
6. Phil Cortland " "
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____



Memorandum

September 20, 2022

To	Wayne Myers, WPTMA	Contact No.	717-585-6355
Copy to	Justin Doty, P.E. FSA Peter Lusardi, P.E. GHD	Email	Nancy.adams@ghd.com
From	Nancy Adams, Project Manager	Project No.	12587256
Project Name	Lexington Land Developers Corp.		
Subject	Water Capacity Evaluation		

1. Introduction

The West Pennsboro Township Municipal Authority (Authority) received a letter dated May 20, 2022 from Frederick, Seibert & Associates, Inc., on behalf of their client Lexington Land Developers Corporation (Lexington), with a request for water capacity to serve a proposed mixed-use residential development located at the northwest corner of the intersection of PA 641 (Newville Rd.) and Meadowbrook Road. The proposed development is located at 1525 and 1617 Newville Road. The project proposes 482 apartment units, 176 townhomes and 157 single family dwellings, for a total of 815 residential units. However, based on updated information provided by Lexington, the development is anticipated to serve a total of 800 units for a total estimated water demand of 184,000 GPD based on 230 GPD/EDU. As it currently stands, the developer anticipates a 20-year build-out of the development with approximately 40 units being connected per year. Construction is not anticipated to start until summer 2025.

1.1 Purpose of this Memorandum

This Memorandum is provided to offer a summary of the impact to the Authority's administrative function under various owner/operator scenarios resulting from providing water service to the Lexington development.

1.2 Scope and limitations

This Water Capacity Evaluation examines the administrative means necessary for the Authority to begin managing a water system. As per verbal discussions with North Middleton Authority, it is based on the assumption that North Middleton Authority has adequate capacity to sell to the Authority in order to serve the Lexington development. It is not intended to serve as a basis of design document for the design and construction of proposed water facilities.

2. Current Administrative Structure

The following sections describe the current administrative structures for of each entity that would be involved in providing water service to the Lexington development. The source of supply comes from the Carlisle Borough Municipal Authority's (Carlisle Authority) water system, however WPTMA would be purchasing capacity by way

of North Middleton Authority's (NMA) purchased capacity with the Carlisle Authority. North Middleton Authority owns 500,000 GPD capacity.

2.1 West Pennsboro Township Municipal Authority

In 2009, the Authority adopted *Rates, Rules and Regulations* and *Standard Construction and Material Specifications* for water system facilities even though at the time they did not own or maintain any water facilities. The Authority anticipated owning and/or operating water facilities in the future and wanted to be in a position to ensure those facilities would be installed to the same level of standards as their sewer system.

Currently, the Authority still does not own any water facilities within the Township. There is a single water connection located on the eastern boundary of the West Pennsboro Township-Carlisle Borough municipal boundary that serves a warehouse. This connection is served directly from the Carlisle Authority's water system. Management of this connection, including operation & maintenance and billing of the customer is the responsibility of WPT. West Pennsboro Township staff reads the meter and reports the meter reading to the Carlisle Authority, the Carlisle Authority then bills WPT for the bulk use and West Pennsboro Township in turn bills the customer (the warehouse). This billing method appears to be standard practice for the Carlisle Authority and is agreed to based on the terms of the Intermunicipal Agreement effective January 1, 2014 between West Pennsboro Township and the Carlisle Authority.

2.2 North Middleton Authority

North Middletown Township borders the Lexington property immediately to the east, with a small portion of the subject property within North Middleton Township. The NMA owns 500,000 GPD water capacity within Carlisle Authority's system. Water is transmitted from the source of supply in Carlisle to North Middleton Township through a series of water transmission mains and interconnects with the Carlisle Authority. The NMA owns and operates all water distribution facilities within North Middleton Township and is responsible for billing their own customers. As of the date of this Memo, the NMA is consulting with its solicitor to confirm there is no prohibition to selling water outside the boundaries of North Middleton Township. For the purposes of this evaluation, the alternatives presented herein assume that there are no prohibitions.

2.3 Carlisle Borough Municipal Authority

The Carlisle Authority owns a public water supply system that is used to serve Carlisle Borough and portions of North Middleton Township, South Middleton Township, Middlesex Township and the single connection in West Pennsboro Township. Their system is operated by way of lease-back agreement with the Borough of Carlisle. The Carlisle Authority is responsible for billing it's own customers and includes bulk water billings to municipalities for which water is supplied. By in large, this is accomplished with the use of a master meter located at each interconnect.

3. Administrative Structure Alternatives

To facilitate water service to Lexington, NMA's 12-inch water main located on the north side of Route 641 would be extended westward into West Pennsboro Township. Several options for the ownership and operation of the extended water facilities exist. The following section describes the alternatives and discusses how they impact WPTMA. In each Alternative, it is expected that Lexington will fund the water system extension and distribution system project in its entirety, as it relates to serving all phases of the Lexington development.

3.1 Alternative 1 - WPTMA Owns and Operates Lexington System; Source of Supply from NMA/Carlisle

Upon initial discussions with NMA, their preferred method of managing this watermain extension would be to install a master meter on the 12-inch main near the West Pennsboro Township - North Middleton Township boundary, and WPTMA would become a bulk customer to NMA. This means NMA would bill WPTMA on a monthly or quarterly basis for the total water used, then WPTMA would in turn bill West Pennsboro Township customers. The ownership and maintenance of the system would be the responsibility of the WPTMA and they would also become the holder of a Public Water Supply permit and need to comply with those conditions. Obtaining the Public Water Supply Permit would be the responsibility of Lexington, which once obtained would be transferred to WPTMA. A pre-application meeting with DEP is required to confirm this approach and determine how the permit transfer would be accomplished.

As far as maintenance of the system, WTPMA can utilize its own staff or enter into a third-party agreement with either a private operator or NMA if they are amendable to providing the in-house staffing necessary for this effort.

If utilizing West Pennsboro Township staff, additional staffing effort would include maintenance to the pipe, requirement for a dual-certified operator on staff, reading meters for billing (only applies if meters are without remote-read capabilities), producing bills, collecting payment and addressing delinquent accounts. Billing effort would be similar to what is currently done for sewer. Since the system extension would encompass a distribution system only, minimal day-to-day maintenance to the pipe would be required. Depending on how self-reliant WPTMA wants to be for repairs, WTPMA could enter into an emergency repairs contract where a contractor would be responsible for repairs to larger system issues such as a water main break. This would lessen the need to have spare parts/pipe on hand.

3.2 Alternative 2 – NMA Owns and Operates Lexington System

A second option is for NMA to maintain ownership and operational responsibilities of the extension, including the system located in West Pennsboro Township. In this case, a master meter would not be required (however they may still want one installed) and NMA would be responsible for billing customers served by the extension just as they bill their current customers. Likewise, operation, maintenance, and repair of this system would be the responsibility of NMA. Their current Public Water Supply permit would be amended to include this system expansion. Since NMA already has in place the administrative and operational functions necessary for operating a water system, the economies of scale makes this alternative a more economical choice and would require minimal involvement from WPTMA, other than coordination of land development approval with NMA's water system approvals. From a management perspective, NMA has indicated they are not interested in this option.

3.3 Alternative 3 – Water System is Privately Owned

A third option for Lexington's water system extension is for it to remain private. While it is unknown if a Home-Owner's Association (HOA) is planned, it is questionable whether DEP would allow a HOA to be a Public Water Supply permit holder. Another private ownership option would be for a larger, public water supply company (such as PA American Water) whose main business is to own, manage and operate public water supply systems, to own the system. The private water company would be the permit holder and responsible for operation and maintenance of the system, as well as billing customers. They would use their certified operators to maintain the system. Lexington would be responsible for seeking out and retaining a private water company to take the system, and West Pennsboro would be largely absent from that process.

Lexington should have a pre-application meeting with DEP to determine which privately-owned option would be feasible from a regulatory standpoint.

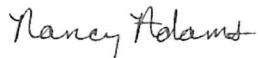
4. Summary and Steps Forward

Each of the three alternatives presented will require PA DEP's approval of either an amendment to an existing public water supply permit and/or issuance of a new public water supply permit. It is recommended that Lexington coordinate a pre-application with PA DEP to review the options and understand the permit requirements of each alternative. It is recommended that representation from WPTMA be present during the pre-application meeting.

Of great importance to the WPTMA is being able to offer a fair user rate for the service provided and ensuring the water system that serves the Township's residents is constructed with integrity and operated in a cost-effective manner. Each alternative will require some level of investment from WPTMA, with Alternative 3 representing the least and Alternative 1 requiring the most. However, Lexington will be responsible for a significant portion, if not all, of the capital required for construction of the water system.

As a next step, the WPTMA should consider the alternatives presented and decide which one to pursue considering the role WPTMA wants to play in the development of the Township. Water service to Lexington's development has the potential to serve as a trigger for additional development along the Route 641 corridor, currently zoned with a mix of Commercial (C), High-Density Residential (R2) and Mixed Use (MU). This should be considered so that capacity for future development can be accounted for now and incorporated into the design of the water system. Capital costs associated with improvements that go above and beyond what would be required to serve Lexington's development would be the responsibility of WTPMA and detailed in a developer's agreement between Lexington and WPTMA.

Regards



Nancy Adams
Project Manager

NOT APPROVED FOR CONSTRUCTION

1617 NEWVILLE ROAD
WEST PENNSYLVANIA TOWNSHIP
CAMBERLAND COUNTY, PENNSYLVANIA

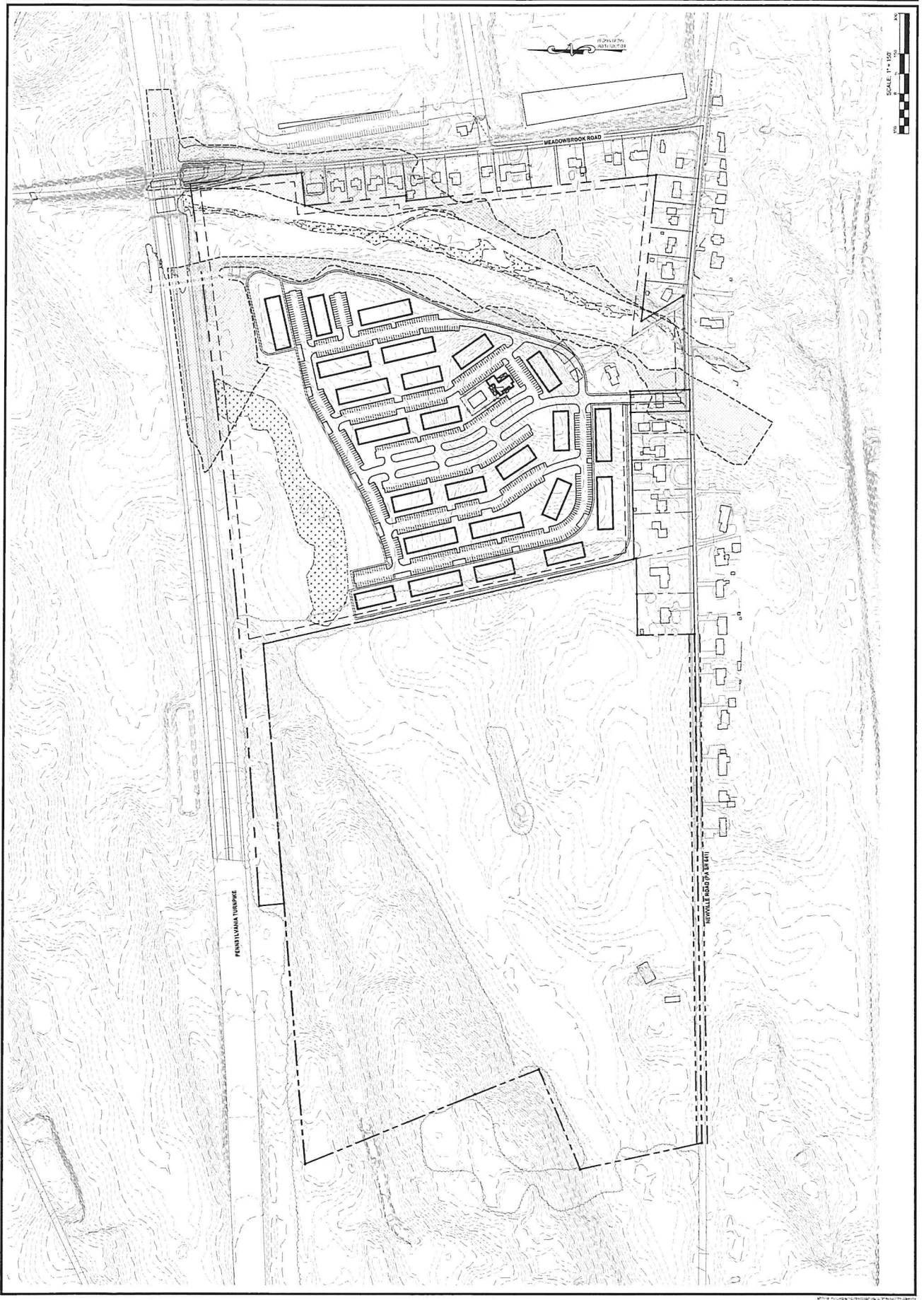


FREDERICK GEBERT & ASSOCIATES, INC.
1000 W. MARKET STREET, SUITE 200
HARRISBURG, PA 17104
TEL: 717.634.1111
WWW.FGASOCIATES.COM

PROJECT NO. 2020001
DATE 11/15/2020
DRAWN BY J. HARRIS
CHECKED BY J. HARRIS
SCALE 1" = 100'

CONTEXT
PLAN

C-101
SHEET 01 OF 01





Technical Memorandum

September 20, 2022

To	Wayne Myers, WPTMA	Contact No.	717-585-6355
Copy to	WPTMA Board Members Justin Doty, P.E. FSA Howard Butler, P.E. GHD	Email	Nancy.adams@ghd.com
From	Nancy Adams, Project Manager	Project No.	12587256
Project Name	Lexington Land Developers Corp.		
Subject	Sewer Capacity Evaluation		

1. Introduction

The West Pennsboro Township Municipal Authority (Authority) received a letter dated May 20, 2022 from Frederick, Seibert & Associates, Inc., on behalf of their client Lexington Land Developers Corporation (Lexington), with a request for sewer capacity to serve a proposed mixed-use residential development located at the northwest corner of the intersection of PA 641 (Newville Rd.) and Meadowbrook Road, comprising lots at 1525 and 1617 Newville Road. The project proposes 482 apartment units, 176 townhomes and 157 single family dwellings, for a total of 815 residential units. However, based on updated information provided by Lexington, the development is anticipated to serve a total of 800 residential units. The developer projects a 20-year build-out of the development with approximately 40 units being connected per year. Construction is not anticipated to start until summer 2025, with connections beginning in 2026.

For this capacity evaluation and to be consistent with current conditions in the Authority's sewer system, a hydraulic and organic loading rate of 165 GPD/EDU and 0.45 lbs BOD/day/EDU, respectively, is used for estimating projected loads. Therefore, this study evaluates if sufficient capacity is available to accommodate 132,000 GPD and 360 lbs BOD/day additional load from 800 EDUs.¹ Under current conditions, the capacity at the Authority's wastewater treatment plant (WWTP) is not sufficient to accept the requested flow from this development.

1.1 Purpose of this Memorandum

This Technical Memorandum is provided as a preliminary assessment of capacity availability within the Authority's sewer system and is being performed under our agreement with the Authority. It is provided to offer a high-level overview of the expansion needs of the Authority's wastewater treatment facility and/or collection system, however this information should not be relied upon for design purposes.

1.2 Scope and limitations

This Sewer Capacity Evaluation examines current hydraulic and organic loading conditions at the Authority's wastewater treatment plant and collection system to determine available capacity under current conditions. It

¹ The developer estimated a flow contribution based on 230 GPD/EDU, however this evaluation uses actual flow data based on current conditions at the WWTP to estimate total flow from this development.

also projects future hydraulic and organic loads based on information provided by Lexington and the Authority. This evaluation compares future capacity needs to existing conditions to determine wastewater treatment and/or conveyance expansion requirements to treat and convey the projected flows. This evaluation does not guarantee capacity will be available for Lexington when they are ready to make connections. If Lexington wants to guarantee capacity, Lexington would be required to enter into a reservation agreement with the Authority.

2. Current and Projected Conditions

The current configuration of the Authority’s WWTP includes a single treatment lagoon, which has provided sufficient capacity for the Plainfield service area, allowing a handful of connections to be added each year since it was brought online in 2004. It was anticipated that the WWTP would need to be expanded to accommodate future growth as the original design of the WWTP included provisions to be expanded to a two-lagoon system, allowing that transition to be as cost-effective as possible. Additionally, the Township’s Act 537 Plan allows for an expansion and notes that the trigger to expand the WWTP would be developer-driven. The development proposed by Lexington is the driving force behind this capacity evaluation.

2.1 Influent Flow and Characteristics

Wastewater treatment plant influent data from July 2019 through June 2022 are summarized in Tables 1 and 2. Based on the conditions noted, the WWTP is 43% hydraulically loaded and 36% organically loaded.

Table 1. Current hydraulic loading comparison with design flows.

Flow Condition	7/2019 – 6/2022 (MGD)	Design (MGD)
Average Daily Flow (ADF)	0.036	0.0835
Maximum Monthly Flow (MMF) ²	0.055	0.10
Peak Daily Flow (PDF)	0.066	N/A
Peak Hourly Flow (PHF)	0.10 ³	0.432
MMF:ADF	1.53	1.2
PHF:AAF	2.8	5.2

Influent sampling for Total Nitrogen (TN) and Total Phosphorus (TP) is being conducted now. The nutrient loadings are expected to be minor compared to the hydraulic and organic load discussions, however this will be confirmed upon receipt of the sample results.

2.2 Service Area Projections

Table 3 provides a summary of the current and 5-year projected EDUs discharging to the Authority’s WWTP, including Lexington. For this evaluation, it is assumed that Lexington’s connections will begin in 2026.

² Maximum Monthly flow reported in July 2018; significant, consecutive days of rain.

³ Peak flow noted on circular flow chart recorded on 6/27/22.

Table 2. Average influent characteristics compared to WWTP design under average daily flow conditions.

Parameter	Current		Design	
	mg/L	lbs/d	mg/L	lbs/d
BOD ₅	274	76	250	208.5
TSS	262	75	250	208.5

Table 3. Current and 5-Year Projected Wastewater Treatment Plant Service Area population in EDUs.

Service Area	Equivalent Dwelling Units (EDUs)					
	Current	2023	2024	2025	2026	2027
Plainfield	193	198	203	208	213	218
Lexington	0	0	0	0	40	80
PA Turnpike	30	30	30	30	30	30
Total	223	228	233	238	283	328

Table 4 presents a comparison of planning values for hydraulic and organic loading values obtained from the Township's Act 537 Plan, actual data based on information obtained from the Authority, and the PA DEP Domestic Wastewater Facilities Manual (PA DEP Manual).

Table 4. Wastewater facilities planning value comparison.

Parameter	Unit	Act 537	Actual ⁴	PA DEP Design Manual
Hydraulic Loading	GPD/EDU	150	147	244
Organic Loading	lbs BOD/Day/EDU	0.35	0.39 ⁵	0.54

Based on a review of this information, hydraulic and organic loading values of **165 GPD/EDU** and **0.45 lbs BOD/day/EDU**, respectively, are selected for projecting future loads to the wastewater treatment. These values account for an approximate 10% safety factor greater than actual loading values.

2.3 Projected Loadings

Based on the information presented in Sections 2.1 and 2.2, the following summarizes the remaining capacity of the Authority's WWTP under two scenarios. Scenario 1 represents the capacity available under the current design with one treatment lagoon. Scenario 2 represents the capacity that would become available with an

⁴ PA DEP's Manual recommends using actual hydraulic and organic loading data when upgrading an existing facility.

⁵ These values were determined based on domestic/commercial dischargers only; the PA Turnpike's service plaza was not included since it slightly skews the data based on the high-strength nature of the wastewater.

expansion that adds a second treatment lagoon and related equipment. Table 5 presents Scenario 1 and Table 6 presents Scenario 2.

Table 5. Scenario 1 - Remaining hydraulic capacity based on current single lagoon WWTP configuration.

Parameter	Hydraulic		Organic	
Annual Average Design	0.0835	MGD	N/A	Lbs BOD/day
Max Month Design	0.10	MGD	208.5	Lbs BOD/day
Current Annual Average ⁶	0.036	MGD	76	Lbs BOD/day
Current Max Month ⁷	0.055	MGD	142	Lbs BOD/day
Remaining Capacity	0.0475	MGD	133	Lbs BOD/day
Load/EDU	165	GPD/EDU	0.45	Lbs BOD/day/EDU
Remaining EDU Capacity ⁸	285	EDUs	290	EDUs

Table 6. Scenario 2 – Remaining hydraulic and organic capacity based on 2-lagoon WWTP configuration.

Parameter	Hydraulic		Organic	
Annual Average Design	0.167	MGD	350	Lbs BOD/day ⁹
Max Month Design (Permit)	0.20	MGD	417	Lbs BOD/day
Current Annual Average	0.036	MGD	76	Lbs BOD/day
Current Max Month	0.055	MGD	142	Lbs BOD/day
Remaining Capacity (Avg)	0.131	MGD	274	Lbs BOD/day
Average Load/EDU	165	GPD/EDU	0.45	Lbs BOD/day/EDU
Remaining EDU Capacity ⁸	790	EDUs	605	EDUs

The most limiting “Remaining EDU Capacity” noted in Tables 5 and 6 is considered in the following discussion.

2.3.1 Scenario 1: Single Lagoon Configuration

The limiting capacity under Scenario 1 is the hydraulic capacity. There is approximately 0.0475 MGD capacity available for connections. At 165 GPD/EDU, this equates to 285 EDUs. The Authority projects five connections per year for the foreseeable future. Assuming connections from Lexington will not occur until 2026, the Authority will have connected 20 EDUs between 2022 and 2025, leaving capacity for 265 EDUs. Lexington

⁶ Based on July 2019 – June 2022 operating data.

⁷ The maximum month hydraulic and organic loads were experienced in July 2018 and March 2018, respectively.

⁸ Figures are rounded down to the nearest five.

⁹ Calculated value based on influent design of 250 mg/L BOD and average annual flow of 0.167 MGD.

estimates 40 connections per year until build-out. Combining their connections with the Authority's miscellaneous five connections per year, 45 connections per year are projected beginning in 2026. Based on 265 remaining EDUs, 45 connections per year can be accommodated for eight years until the Design Maximum Monthly flow of 0.10 is exceeded (see discussion under Section 2.4 pertaining to Chapter 94.)

2.3.2 Scenario 2: Two-Lagoon Configuration

If expanding to a two-lagoon WWTP, the limiting capacity transitions to its organic capacity. With two lagoons, there is approximately 274 lbs BOD/day remaining capacity available for connections under current conditions. At 0.45 lbs BOD/day/EDU, this equates to 605 EDUs. The Authority projects five connections per year for the foreseeable future. Assuming connections from Lexington will not occur until 2026, the Authority will have connected 20 EDUs between now and 2026, leaving a capacity of 585 EDUs. Lexington estimates 40 connections per year until build-out. Combining their connections with the Authority's miscellaneous five connections per year, 45 connections per year are projected beginning in 2026. Based on 585 remaining EDUs available, 45 connections per year can be accommodated for 13 years until the Design Maximum Monthly BOD₅ load of 417 lbs BOD/day is exceeded (see discussion under Section 2.4 pertaining to Chapter 94.)

2.4 Chapter 94 Municipal Wasteload Management

Title 25 of the PA Code, Chapter 94 Municipal Wasteload Management is the mechanism used by PA DEP to monitor capacity needs of permitted wastewater facilities. Each year, the Authority is required to submit a Ch. 94 Municipal Wasteload Management Report (Ch. 94 Report) which presents current and 5-year projected hydraulic and organic loading conditions for permitted sewer facilities. When the report shows an existing, or projects a future hydraulic or organic overload condition, planning to address the overload condition is required and connection limitations can be enforced.

Attachments 1a and 1b provide modified Chapter 94 projection tables used to estimate the need for an expansion to the WWTP based on projected connections discussed for Scenarios 1 and 2. Each Scenario assumes five connections per year from 2022-2025, then 45 connections per year beginning in 2026. From a hydraulic standpoint, the Authority's 2028 Chapter 94 Report would project a hydraulic overload condition occurring in 2033 and from an organic standpoint, WTPMA's 2024 Chapter 94 Report would project an organic overload condition occurring in 2029. In this case, the organic capacity is the limiting condition and required planning and design of a WWTP expansion would begin in early 2025.

Projecting further out to the build-out of Lexington's development (2046), expanding the facility by adding a second treatment lagoon would be insufficient to accommodate all 800 EDUs. Contrastingly, the current single-lagoon configuration should be sufficient to accommodate Plainfield's five miscellaneous connections per year for the 20-year planning period, assuming there is no other growth in the Township beyond five EDUs/year.

2.5 Nutrient Capacity

The Authority's WWTP is classified as a Phase 5 facility under Pennsylvania's Phase 3 Chesapeake Bay Watershed Implementation Plan. Phase 5 facilities are those with design annual average flows ≥ 0.002 MGD and < 0.20 MGD; the Authority's design annual average flow is 0.0835 MGD. As a Phase 5 facility, cap loads for Total Nitrogen (TN) and Total Phosphorus (TP) are not issued to the permittee of the WWTP, rather a monitor and report requirement for TN and TP is included in the NPDES permit. The possible WWTP expansion discussed in this report would increase the design annual average flow to 0.167 MGD, which is still within the flow metrics to be considered a Phase 5 facility. Therefore, it is not anticipated that nutrient capacity issues will arise if the WWTP is expanded via addition of a second lagoon. This should be confirmed by DEP if and when the WWTP expansion is planned.

3. Conveyance Capacity

Lexington proposes to construct a pump station and associated forcemain to convey wastewater from the proposed development to the terminal end of the Authority's collection and conveyance system located at MH 28. This manhole is located on the north side of Route 641 approximately 800 feet east of the intersection of Park Road and Route 641. Sewer capacity tributary to the connection point was evaluated to ensure adequate capacity is available to accommodate the projected flows from Lexington. Collection sewers along the flow path from MH-28 to the wastewater treatment plant range in size from 8-inch to 10-inch. Record drawings were used to populate the table in Attachment 2 which shows the capacity of the lines from MH 28 to the WWTP based on the pipe flowing full and a Manning's "n" of 0.013 for PVC pipe. The limiting capacity of the conveyance system is 0.55 MGD, located within the section of sewer main between MH-27 and MH-26. Based on the projected flow from Lexington, and the limited current and future connections to this section of sewer, sufficient conveyance capacity exists to accommodate build-out flows from Lexington's development.

4. Conclusions and Recommendations

The Township's Act 537 Plan notes the eventual need to expand the WWTP based on development pressure within the Township, and the original design of the WWTP includes provisions for a future expansion by adding a second lagoon.

Lexington requested sewer capacity for a proposed development of 800 residential units. The capacity of the WWTP, as it is currently designed, can accommodate roughly 200 EDUs before requiring an expansion. If the WWTP were expanded by adding a second lagoon, the number of EDUs that could be accommodated increases to roughly 605. Even at the expanded capacity, a capacity short-fall exists for the full build-out of the Lexington development. Some additional capacity may be available within the existing WWTP and could be permitted through the execution of a paper rerate to the WWTP, however this would require an engineering analysis of current operational performance of the WWTP and it is not anticipated to be substantially greater than the current design.

Given the large number of EDUs associated with this development and long timeframe for build-out, a phasing plan is an important component to the capacity evaluation and impacts the timing of a WWTP expansion, if necessary. We recommend the developer provide additional details relative to the project's phasing as we continue to monitor capacity availability.

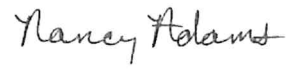
Since the capacity needs identified by Lexington require an expansion to the WWTP, any capital improvements made to the WWTP to achieve the expanded flow would primarily be the responsibility of Lexington, and the terms of which would be outlined in a developer's agreement between Lexington and the Authority.

Regarding sewage conveyance facilities, the existing facilities detailed under Section 3 and Attachment 2 have sufficient capacity to convey the total flow of 132,000 GPD from the subject development. The design and construction of the collection and conveyance system extension necessary to serve the Lexington development is the responsibility of the developer. The Authority's role will be to review and approve the design before the project can proceed through Land Development approval. This is consistent with the process required for any development in the Township that requires sewer service from the Authority.

We recommend that the Authority does not provide capacity availability certification for the requested capacity associated with 800 EDUs (132,000 GPD). While there is some capacity available, it is not enough for the volume and loads being requested. We recommend the developer provide a revised request for capacity based on anticipated phasing of the development and the information provided in this evaluation. Based on the revised request, including specific milestones for each proposed phase, the Authority and GHD would be better able to review and potentially approve the request. If at any point the capacity being requested exceeds the current remaining capacity or creates a 5-year projected hydraulic or organic overload per Chapter 94 Municipal Wasteload Management regulations, steps should be taken to begin planning for a WWTP

expansion. Entering into a developer's agreement that outlines the anticipated costs and cost share between the Authority and Lexington would be part of this process.

Regards

A handwritten signature in cursive script that reads "Nancy Adams".

Nancy Adams
Project Manager

Attachment 1a
Chapter 94 Municipal Wasteload Management
Hydraulic Projection Analysis

Scenario 1: Scenario 2:

1 Lagoon	2 Lagoons
0.0835	0.167
0.10	0.20
165 GPD/EDU	
1.14 (Per 2021 Ch. 94 5-Year Avg)	

Flow Info
AA Design Flow, MGD
MM Design Flow, MGD

Flow per EDU
MM:AA Ratio

Flow Metric	2021	2022	2023	2024	2025	2026	2027	2028*	2029	2030	2031
AA Flow, MGD	0.0360	0.0368	0.0377	0.0385	0.0393	0.0401	0.0476	0.0550	0.0624	0.0698	0.0773
Add'l EDUs	5	5	5	5	5	45	45	45	45	45	45
Add'l Flow, MGD	0.0008	0.0008	0.0008	0.0008	0.0008	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074
Total AA Flow, MGD	0.0368	0.0377	0.0385	0.0393	0.0401	0.0476	0.0550	0.0624	0.0698	0.0773	0.0847
MM Flow (1.14 Ratio)	0.0410	0.0420	0.0429	0.0439	0.0448	0.0457	0.0542	0.0627	0.0711	0.0796	0.0881

Flow Metric	2032	2033**	2034	2035	2036	2037	2038	2039	2040*	2041	2042
AA Flow, MGD	0.0847	0.0921	0.0995	0.1070	0.1144	0.1218	0.1292	0.1367	0.1441	0.1515	0.1589
Add'l EDUs	45	45	45	45	45	45	45	45	45	45	45
Add'l Flow, MGD	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074
Total AA Flow, MGD	0.0921	0.0995	0.1070	0.1144	0.1218	0.1292	0.1367	0.1441	0.1515	0.1589	0.1664
MM Flow (1.14 Ratio)	0.0965	0.1050	0.1135	0.1219	0.1304	0.1389	0.1473	0.1558	0.1642	0.1727	0.1812

Flow Metric	2043	2044	2045	2046
AA Flow, MGD	0.1664	0.1738	0.1812	0.1886
Add'l EDUs	45	45	45	45
Add'l Flow, MGD	0.0074	0.0074	0.0074	0.0074
Total AA Flow, MGD	0.1738	0.1812	0.1886	0.1961
MM Flow (1.14 Ratio)	0.1896	0.1981	0.2066	0.2150

*2028 Ch. 94 Report would project Hydraulic Overload by 2033 for Scenario 1 (Single Lagoon).

**2040 Ch. 94 Report would project Hydraulic Overload by 2045 for Scenario 2 (Two Lagoons).

Orange indicates year Ch. 94 Report will project an overload for Scenarios 1 and 2.

Red indicates overload for Scenarios 1 (Single Lagoon) and 2 (Two Lagoons).

Attachment 1b
Chapter 94 Municipal Wasteload Management
Organic Projection Analysis

Scenario 1: Scenario 2:
1 Lagoon 2 Lagoons

208.5 417

BOD₅ Info
MM Design, lbs BOD/day

BOD/EDU 0.45 lbs BOD/day/EDU

MM:AA Ratio 1.5 (Per 2021 Ch. 94 5-Year Avg)

BOD Load Metrics	2021	2022	2023	2024*	2025	2026	2027	2028	2029**	2030	2031**
AA BOD, lbs BOD/day	76	78	81	83	85	87	108	128	148	168	189
Add'l EDUs	5	5	5	5	5	45	45	45	45	45	45
Add'l BOD, lbs BOD/day	2.25	2.25	2.25	2.25	2.25	20.25	20.25	20.25	20.25	20.25	20.25
Total AA BOD, lbs BOD/day	78.3	80.5	82.8	85.0	87.3	107.5	127.8	148.0	168.3	188.5	208.8
MM BOD (1.5 Ratio)	114	117	121	124	128	131	161	192	222	252	283

BOD Load Metrics	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
AA BOD, lbs BOD/day	209	229	249	270	290	310	330	351	371	391	411
Add'l EDUs	45	45	45	45	45	45	45	45	45	45	45
Add'l BOD, lbs BOD/day	20.25	20.25	20.25	20.25	20.25	20.25	20.25	20.25	20.25	20.25	20.25
Total AA BOD, lbs BOD/day	229.0	249.3	269.5	289.8	310.0	330.3	350.5	370.8	391.0	411.3	431.5
MM BOD (1.5 Ratio)	313	344	374	404	435	465	495	526	556	587	617

BOD Load Metrics	2043	2044	2045	2046
AA BOD, lbs BOD/day	432	452	472	492
Add'l EDUs	45	45	45	45
Add'l BOD, lbs BOD/day	20.25	20.25	20.25	20.25
Total AA BOD, lbs BOD/day	451.8	472.0	492.3	512.5
MM BOD (1.5 Ratio)	647	678	708	738

*2024 Ch. 94 Report projects an Organic Overload by 2029 for Scenario 1 (Single Lagoon).

**2031 Ch. 94 Report projects an Organic Overload by 2036 for Scenario 2 (Two lagoons).

Orange indicates year Ch. 94 Report will project an overload for Scenarios 1 and 2.

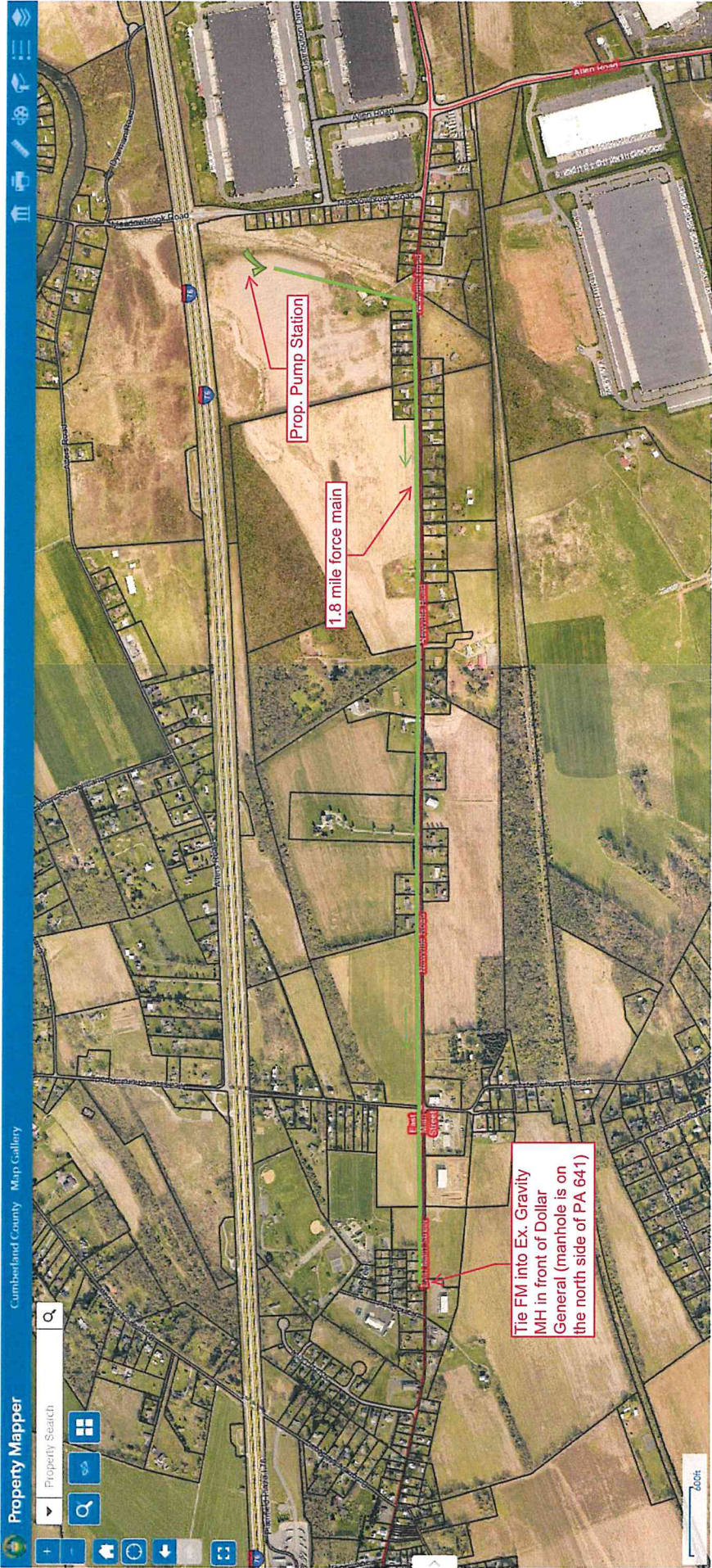
Red indicates overload for Scenarios 1 (Single Lagoon) and 2 (Two Lagoons).

**Attachment 2
Conveyance Capacity Evaluation**

Up MH	Down MH	Up Invert (ft)	Down Invert (ft)	Length (ft)	Slope (ft/ft)	Diameter (in)	Depth (in)	Q ¹ (mgd)
MH-28	MH-27	511.01	509.92	207.0	0.005	8.0	8.0	0.568
MH-27	MH-26	509.79	508.53	254.0	0.005	8.0	8.0	0.552
MH-26	MH-25	508.43	507.25	305.0	0.004	10.0	10.0	0.883
MH-25	MH-24	507.15	506.24	212.0	0.004	10.0	10.0	0.930
MH-24	MH-23	506.10	505.16	205.5	0.005	10.0	10.0	0.960
MH-23	MH-22	505.11	503.91	306.0	0.004	10.0	10.0	0.889
MH-22	MH-21	503.84	503.52	84.0	0.004	10.0	10.0	0.876
MH-21	MH-20 (Drop)	503.42	502.30	314.0	0.004	10.0	10.0	0.848
MH-20 (Drop)	MH-19	498.80	497.40	348.0	0.004	10.0	10.0	0.901
MH-19	MH-18	497.35	496.64	151.0	0.005	10.0	10.0	0.974
MH-18	MH-17	496.54	496.05	145.0	0.003	10.0	10.0	0.825
MH-17	MH-16	495.93	494.58	330.0	0.004	10.0	10.0	0.908
MH-16	MH-15A	494.48	493.92	139.0	0.004	10.0	10.0	0.901
MH-15A	MH-15	493.82	493.54	44.5	0.006	10.0	10.0	1.126
MH-15	MH-14	493.42	492.28	272.0	0.004	10.0	10.0	0.919
MH-14	MH-12	492.18	490.89	323.0	0.004	10.0	10.0	0.897
MH-12	MH-11	490.84	489.85	250.5	0.004	10.0	10.0	0.893
MH-11	MH-10	489.75	488.68	274.0	0.004	10.0	10.0	0.887
MH-10	MH-9	488.52	487.46	278.0	0.004	10.0	10.0	0.877
MH-9	MH-8	487.42	485.10	402.0	0.006	10.0	10.0	1.079

¹ Assumes Manning's "n" of 0.013 for PVC pipe.

Up MH	Down MH	Up Invert (ft)	Down Invert (ft)	Length (ft)	Slope (ft/ft)	Diameter (in)	Depth (in)	Q ¹ (mgd)
MH-8	MH-7	485.00	483.45	384.0	0.004	10.0	10.0	0.902
MH-7	MH-6	483.35	480.70	311.0	0.009	10.0	10.0	1.311
MH-6	MH-5	480.60	479.27	299.5	0.004	10.0	10.0	0.946
MH-5	MH-4	479.17	478.16	149.0	0.007	10.0	10.0	1.169
MH-4	MH-3	478.05	467.53	322.5	0.033	10.0	10.0	2.564
MH-3	MH-2	467.43	466.12	251.0	0.005	10.0	10.0	1.026
MH-2	WWTP	465.05	464.47	136.0	0.004	10.0	10.0	0.927



Prop. Pump Station

1.8 mile force main

Tie FM into Ex. Gravity MH in front of Dollar General (manhole is on the north side of PA 641)

0 100ft