LEHIGH COUNTY AUTHORITY

LCA Main Office:
1053 Spruce Road
Wescosville, PA 18106
610-398-2503

Agendas & Minutes Posted:
www.lehighcountyauthority.org

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BOARD MEETING AGENDA – February 14, 2022 – 12:00 p.m.

In-Person or Virtual Meeting Attendance Options Available: Meetings of the LCA Board of Directors will be held at LCA's Main Office as well as online using the Zoom Meetings application, which includes a telephone option. Public participation is welcomed both in-person or virtually. Instructions for joining the meeting online or by phone are posted on the LCA website in the morning on the day of the meeting, prior to the start of each meeting. You may also issue comment to LCA via email to LCABoard@lehighcountyauthority.org in advance of any meeting or view the meeting at a later time by visiting the LCA website. Please visit https://www.lehighcountyauthority.org/about/lca-board-meeting-videos/ for specific instructions to join the meeting if you are attending virtually. If attending in-person at LCA's Main Office, please follow all safety and sanitation protocols posted.

1. Call to Order
   - NOTICE OF MEETING RECORDINGS

     Meetings of Lehigh County Authority's Board of Directors that are held at LCA's Main Office at 1053 Spruce Road, Wescosville, PA, may be recorded for viewing online at lehighcountauthority.org. Recordings of LCA meetings are for public convenience and internal use only and are not considered as minutes for the meeting being recorded, nor are they part of public record. Recordings may be retained or destroyed at LCA's discretion.
   - *Public Participation Sign-In Request*
2. Review of Agenda / Executive Sessions
   - Additions to Agenda (vote required if action will be taken)
3. Approval of Minutes
   - *January 10, 2022 Board meeting minutes*
4. Public Comments
   - *2022 Suburban Water Rates – Public Comments Received **(yellow)** (digital Board packet, pages 6-11)*
5. Action / Discussion Items:

FINANCE AND ADMINISTRATION
- *Nomination of Officers – Appointment of Nominating Committee*

WATER
- *Suburban Division – Central Lehigh and North Whitehall Water Systems – Water Supply Study (Approval) **(salmon)** (digital Board packet, pages 12-21)*

WASTEWATER
- *Suburban Division – Regional Sewer Capacity & Wet-Weather Planning: Engineering & Program Support (Approval) **(gray)** (digital Board packet, pages 22-28)*
- *Suburban Division – Upper Western Lehigh Pump Station and Force Main: Design Phase (Approval) **(goldenrod)** (digital Board packet, pages 29-33)*
- *Allentown Division – Kline's Island WWTP: Sludge Thickener Tank No. 3 Mechanical Upgrade – Construction (Approval) **(purple)** (digital Board packet, pages 34-37)*

6. Monthly Project Updates / Information Items (1st Board meeting per month) **– February report attached** (digital Board packet, pages 38-46)
7. Monthly Financial Review (2nd Board meeting per month)
8. Monthly System Operations Overview (2nd Board meeting per month) **– December report attached** *(digital Board packet, pages 47-65)*
    - *Additional Operational Discussion Items:*
        - *1,4 Dioxane Discharge (attachment)*
        - *Emmaus Consecutive Division – PFAS Contamination (attachment)*
        - *Buss Acres Division – System Update (no attachment)*
9. Staff Comments
10. Solicitor's Comments
11. Public Comments / Other Comments
12. Executive Sessions
13. Adjournment

UPCOMING BOARD MEETINGS		
February 28, 2022	March 14, 2022	March 28, 2022

PUBLIC PARTICIPATION POLICY

In accordance with Authority policy, members of the public shall record their name, address, and discussion item on the sign-in sheet at the start of each meeting; this information shall also be stated when addressing the meeting. During the Public Comment portions of the meeting, members of the public will be allowed 5 minutes to make comments/ask questions regarding non-agenda items, but time may be extended at the discretion of the Chair; comments/questions regarding agenda items may be addressed after the presentation of the agenda item. Members of the public may not request that specific items or language be included in the meeting minutes.

REGULAR MEETING MINUTES
January 10, 2022

The Regular Meeting of the Lehigh County Authority Board of Directors was called to order at 12:01 p.m. on Monday, January 10, 2022. Chairman Brian Nagle presiding. The meeting was hybrid via in-person and video and audio advanced communication technology ("ACT"), using the Zoom internet application, including telephone option. Each Board member and other attendees of the meeting were able to hear each other attendee and be heard by each other attendee. The public could also participate in the meeting in-person or via ACT, using the Zoom internet application, including telephone option. A Roll Call of Board members present was taken. Chairman Brian Nagle, Scott Bieber, Richard Bohner, Norma Cusick, Kevin Baker, Linda Rosenfeld, Jeff Morgan and Amir Famili were present for the duration of the meeting.

Solicitor Michael Gaul of KingSpry was present along with Authority Staff, Liesel Gross, Ed Klein, John Parsons, Chris Moughan, Chuck Volk, Susan Sampson, Andrew Moore, Phil DePoe, Lisa Miller, and Todd Marion.

Chairman Nagle announced that the Board received their electronic and hard copies of the Board packet in advance and asked if anyone did not receive their copy of the packet. A copy of the packet is also available online.

REVIEW OF AGENDA

Liesel Gross announced that there are no changes to the agenda, but she will provide an update on staffing impacts related to the COVID-19 pandemic under Staff Comments. No Executive Session is planned.

APPROVAL OF MINUTES

December 13, 2021 Meeting Minutes

Richard Bohner noted a spelling error. On a motion by Richard Bohner, seconded by Linda Rosenfeld, the Board approved the minutes of the December 13, 2021 Board meeting as corrected (7-0). Jeff Morgan abstained.

PUBLIC COMMENTS

None.

ACTION AND DISCUSSION ITEMS

Allentown Division – Water Filtration Plant & System Master Plan (Approval)

Ted Lyons joined the meeting at 12:14 p.m. during this discussion.

Phil DePoe gave a presentation regarding the Water Filtration Plant Master Plan. The Allentown Concession and Lease Agreement requires the Master Plan be updated every five years. The last Master Plan was completed in 2017, and this project will be an update to the 2017 Plan. To complete this Master Plan update, three tasks will be performed: Task 1 – Condition Assessment; Task 2 – Process Evaluation; and Task 3 – Capital Plan.

Task 1 will establish a baseline for all the water assets by evaluating the performance and physical condition of the assets, estimating their remaining useful life, and assigning a risk score for each asset. A summary of recommended improvements for each asset will be provided for 0-10 years, 10-25 years and 25-50 years.

Task 2 is to identify existing and potential future process limitations and methods to optimize current operations. A comprehensive operational and water quality evaluation was conducted in 2016 and these findings will be reviewed to determine whether there have been significant changes since 2016. The Lead and Copper Rule Revision will be discussed in Task 2.

Task 3 will incorporate results from Task 1 and 2 to develop a prioritized Capital Improvement Plan that will include the preparation of opinions of probable project costs. The three main deliverables for this task include schedule and project costs, project descriptions, and a summary of anticipated permits per project.

Mr. DePoe is asking for authorization to have Arcadis complete the update since they completed the original Master Plan in 2017 and have intimate knowledge of the Water Filtration Plant. After this update, it is recommended to conduct a full Request for Proposal process for the development of the Master Plan that will be due in 2027. The 2022 plan is expected to be compete in July or August of 2022.

Scott Bieber asked if the piping that delivers the water to and from the reservoirs is included in this plan. Mr. DePoe said the piping is not included in the plan and is dealt with separately through the pipeline assessment program that supports the annual water main replacement program. Amir Famili asked how successful the Authority was in implementing the previous Master Plan recommendations. Mr. DePoe explained that the previous Master Plan offered project recommendations that have been followed to a certain degree, although the Authority faced financial constraints within the prior five years that limited its ability to fully implement the projects. Liesel Gross added that the water Master Plan was used extensively, in conjunction with the sewer system Master Plan, to create the project prioritization process that is used in the development of the annual capital plan and budget. Mr. Famili asked if the Authority was surprised with any unexpected costs for the projects that were implemented. Mr. DePoe said there were none. Jeff Morgan asked how the water tanks' condition would be assessed, since gaining access can be difficult. Mr. DePoe explained that the water reservoirs are included in the Master Plan and they are inspected every five years as part of an operating contract with a firm that specializes in this type of under-water inspection.

On a motion by Linda Rosenfeld, seconded by Jeff Morgan, the Board approved the Capital Plan Authorization for preparation of the Water Filtration Plant Master Plan in the amount of $110,000.00 which included the Professional Services Authorization to Arcadis in the amount of $85,000.00 (9-0).

MONTHLY PROJECT UPDATES / INFORMATION ITEMS

Liesel Gross reviewed the report and noted there are no additional agenda items listed for January. Therefore, she will coordinate the potential of cancelling the January 24 meeting with the Chairman. Also, the 2020 Audit and Financial statements have been received from the Pennsylvania Municipal Retirement System and the Authority's audit was completed by the end of the year. The Authority's auditors will be scheduled to present the audit and financial statements to the Board in February. Ms. Gross also noted that the Staff will be working on reformatting the monthly reports to the Board. Chairman Nagle suggested a cover sheet noting which projects have changed from the prior month. Ted Lyons asked how other Authorities' Board reports are formatted, and whether there are best

practices that could be followed. Ms. Gross said that there does not appear to be a standard among the other Authorities' Board reports she has reviewed. The Staff will work on consolidating the information in the current report into a simpler format that is easier to review. Chairman Nagle asked that the Board provide Ms. Gross with any comments or suggestions.

STAFF COMMENTS

Liesel Gross updated the Board on how the Authority workforce has been impacted by the COVID-19 pandemic. She noted that there have been a high number of employee absences due to exposure to the virus, although actual illnesses have been much less, and no severe illnesses. Technology remains in place to allow some employees to work from home, which has helped to deal with some of the absences. To provide additional protection for field service employees, the Authority has re-implemented its prior policy to limit customer service field visits to emergency work only. She notes that most meetings are being moved to a virtual setting to further limit exposure within the workplace.

SOLICITOR'S COMMENTS

None.

PUBLIC COMMENTS / OTHER COMMENTS

None.

EXECUTIVE SESSION

None.

Scott Bieber asked about the project status of Buss Acres regarding the pump station and wells. Chuck Volk said the project is complete. Final restoration is complete, and the upgraded facility has been started up and tested. Closeout is expected within one month.

ADJOURNMENT

There being no further business, the Chairman adjourned the meeting at 12:41 p.m.

Richard Bohner
Secretary

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MEMORANDUM

TO: LCA Board of Directors
FROM: Liesel Gross, CEO
DATE: February 7, 2022
RE: Suburban Division – 2022 Water Rates

Attached: Public Comments Received
LCA Response Letter

During the preparation and presentation of the 2022 Budget, conducted in September and October 2021, significant attention was paid to LCA's Suburban Division water rates. Several key drivers led to the adoption of the 2022 water rates in November 2021, including:

> Cost of Water Purchase: The anticipated cost increase in 2022 for the water purchased from the Allentown system is $754,000. This cost increase is estimated based on the increased capital improvements being completed at the water filtration plant, and the increase in the amount of water purchased from the Allentown system.
>
> Capital Improvements Funding: In 2022, LCA expects to resume necessary annual water main replacements, with an expected cost of $2.4 million. As this work is expected to be continued annually and is not supported by new customer growth, the expense is most suited to be covered by operating revenues. This is in alignment with direction provided by the Board of Directors regarding minimizing or eliminating the use of borrowed funds for routine / annual repair and replacement work.

During budget discussions and through the end of 2021, customers received preliminary notice about the upcoming change in their water rates. Beginning in January 2022, a more detailed rate schedule is being provided to all customers with their first quarter bill.

The average increase across all customer classes is 22 percent, which is significant. Some customers experience a higher or lower increase depending on their usage, meter size and other factors. The average residential customer will see an increase of approximately $75 per year, or a little more than $6 per month, in their LCA water bill.

Since the adoption and publication of LCA's 2022 rate schedule, some customers have been understandably unhappy with the increase. Our customer service staff have handled a modest volume of incoming customer inquiries and complaints, and three written comments have been provided to LCA for consideration. The written comments are attached for Board review. In addition, one formal letter was received by Mr. Larry Bernhard, and LCA's response to this letter is also attached.

At the February 14, 2022 Board meeting, this memo with attached public comment will be placed on the agenda so they will be reflected in the public record.

From: Bill Bogart <howcanitbe123@outlook.com>
Sent: Saturday, November 27, 2021 4:24 PM
To: cityservice <cityservice@lehighcountyauthority.org>
Subject: [External} 2022 Rates

Dear LCA,

I object to the 2022 rate increase!

Suburban rates increase 5% in 2019 and 2020 and in 2021 you increased the Fixed fee 54%!

Now you are increasing the rate almost 100%!!!!

This is over the top.

It seems ever since LCA bought the Allentown Water Dept. we've had nothing but significant increases in water fees.

William Bogart

From: Keith Conklin <conklinkm@hotmail.com>
Sent: Monday, January 24, 2022 11:33 AM
To: Service <service@lehighcountyauthority.org>
Subject: [External} Water Rate Increase - Pls Respond in Timely Manner

1) Regarding the announced water rate increase on 1/1/22, is there any public utility commission or other regulatory body that I can contact to raise issues about the rate increase? Is LCA subject to any reviews by anyone before a rate increase can take place? Are you or are you not considered a public utility? Is there anybody that regulates your conduct?

2) Why are rates changing for some but not all customers. This seems discriminatory. What are the reasons the rate is not increasing for some of your customers? Is it possible I could be considered in this "no rate increase" class?

3) I do not begrudge you a rate increase, but the magnitude of the increase is insane. You are increasing my fixed charge by over 55% and the volume charge by nearly 20% for an expected total increase for my usage of over 40%. This is on top of a rate increase you just implemented last year. This is not prudent management but in my opinion piss-poor management. To need an increase of this magnitude shows very poor planning and mismanagement.

4) CAN WHOMEVER RECEIVES THIS E_MAIL MESSAGE PLEASE GIVE IT TO SOMEONE IN SENIOR MANAGEMENT FOR A RESPONSE!

I deserve a timely answer from a senior management official and not a canned response from someone else way down the management hierarchy. What are my alternatives if I refuse to accept your ridiculous rate increase?

Regards,
Keith Conklin Acct #6447
1711 Laurel Lane
Orefield, PA 18069

January 21, 2022

Lehigh County Authority
1053 Spruce Road
P.O. Box 3210
Allentown, PA 18106

Re: 2022 Water Rate Increases

Dear Authority Supervisors:

As a customer and consumer I am utterly outraged at the last Notice included with my water billing notice.

Without any public input you have seen fit to increase our water rate fixed costs by 56% and our water usage rates by 18% without consideration of the economic times we are in currently with a 7%+ inflation rate caused by a government that cares less for the public it serves.

I fully understand the needs of the Authority to repair, replace and maintain our water supply system. But you do not have to raise rates beyond reasonable costs. I agree that the consumers in Lehigh County have enjoyed reasonable rates for water over the years. But to increase the rates so drastically in one year is totally outrageous.

I am not sure what governmental body oversees the Authority but they need to review these terrible rate increases you are imposing on the public. Therefore, I am sending a copy of this letter to the Lehigh County Board of Commissioners.

As a Senior citizen and longtime resident of Lehigh County there has to be accountability and public input when a division of government wishes to impose such a large increase in taxes or rate changes that go beyond their intended purpose.

I suppose that my complaint will not change the world, but you must realize that we are not all sleeping and not paying attention to what is going on in our world and community.

I appreciate the opportunity to voice my opinion.

Should anyone wish to discuss this matter with me please feel free to communicate by return mail. My mailing address is: 261 Blue Sage Dr., Allentown, PA 18104

Sincerely,

Larry B. Bernhard
Former Commissioner South Whitehall Township

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January 31, 2022

Larry B. Bernhard
261 Blue Sage Drive
Allentown, PA 18104

RE: Lehigh County Authority Water Rates

Dear Mr. Bernhard,

Thank you for your recent letter regarding Lehigh County Authority's water rate increase that went into effect January 1, 2022. We certainly understand that the increase is significant. Your letter will be shared with LCA's Board of Directors and entered into the public record at an upcoming meeting of the Board.

When our Board discussed this rate change last year, these discussions were held in a public meeting format, and brief notice provided in our fall 2021 newsletter to allow for public comment prior to the effective date of the new rates. However, I fully understand that you may not have been aware of the opportunity to comment at that time.

LCA acknowledges the rate increase this year is significant on a percentage basis, and we recognize some customers may find the increase burdensome. We are making every effort to pair the increase with information about new programs that are available to support low-income households with their utility bills.

For most residential customers, the increase relates to about $75 per year, or about $6 per month more than what you are used to paying for water service. LCA is proud to offer service at the lowest cost possible, and our rates are among the lowest in the Lehigh Valley. However, as our system has aged, we need to invest more in repair and replacement of our critical water infrastructure, and this increase is necessary to fund those improvements. Still, our rates are far below the region's average, and we are doing all we can to keep costs in check.

By way of background, LCA must operate under the requirements of the Pa. Municipality Authorities Act, and our Board of Directors are charged with ensuring that happens. By sending your letter in to LCA, our Board will receive the benefit of your comments and will take them into consideration for future rate-making decisions.

The primary reason LCA decided to seek this kind of increase this year is to reduce the overall future cost to all customers. Major system rehabilitation is needed, as I mentioned earlier. Our options for paying for these increases are limited. One option is to borrow for all the projects, which increases the cost to all customers over time as interest expenses increase. The other option is to increase rates to pay for the improvements directly. LCA decided to implement this

increase for 2022 as a "hybrid" approach whereby the increased revenue will pay for some of the project costs directly, and we will still need to borrow for additional projects in the future.

In today's economy, with the threat of rising interest rates on the horizon, our financial analysis indicates that this approach makes the most sense for LCA and lowers the overall future cost for all customers. This issue was discussed in detail with our Board in October prior to the adoption of the 2022 rates. I invite you to review the presentation by following the link below, and you'll see the Suburban Water rate review beginning on page 21:
https://www.lehighcountyauthority.org/wp-content/uploads/2021/10/LCA-2022ProposedBudget-101121.pdf

Additional information about LCA's rates is available on our website here:
https://www.lehighcountyauthority.org/customer-service/rates/

While the decision to increase rates this year makes sense financially for the region and all customers in the long run, we understand that the timing is poor considering the economic challenges some customers have felt over the past two years. LCA will take your comments to heart and consider them carefully as we manage the future investments that will be needed to address our aging water infrastructure and the impact on our customers.

Your letter was sincerely appreciated, and I hope this detailed response illustrates that LCA does take your input seriously. If you have additional comments or questions about LCA's water rates, please do not hesitate to contact me at lieselgross@lehighcountyauthority.org or 610-398-2503.

Sincerely,

Liesel M. Gross
Chief Executive Officer

CC: LCA Board of Directors

MEMORANDUM

Date: February 14, 2022

To: LCA Board of Directors
Liesel Gross, CEO

From: Phil DePoe, Senior Planning Engineer

Subject: Suburban Division: Central Lehigh and North Whitehall Systems (Water Supply Study) – Planning Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Plan Authorization: Gannett Fleming – Central Lehigh and North Whitehall Systems (Water Supply Study)	$92,500
1A	Professional Services Authorization: Gannett Fleming – Central Lehigh and North Whitehall Systems (Water Supply Study) – Planning Phase	$77,500*

**Included in the Capital Project Authorization*

1. Suburban Division: Central Lehigh and North Whitehall Systems (Water Supply Study)

AUTHORIZATION OVERVIEW:
In alignment with LCA's recently adopted Strategic Plan, the objective of this Water Supply Study (the "Study") is to identify and evaluate feasible means to address current and long-term water supply needs in the Central Lehigh Division (CLD) and the North Whitehall Division (NWD).

Recently completed planning studies, backed by operational feedback, have identified the need for additional supply in the CLD and NWD systems. The need includes an acute, short-term need to enhance the reliability of supply in the CLD system due to recent and continued growth in system demand, particularly that associated with the potential for large customers to locate in the supply-limited "Upper System" portion of the CLD. This increase in system demand is projected to continue, thus emphasizing the importance of enhancing the reliable supply capacity for CLD. A similar need has been identified in the NWD system, due to the reliance on a single source of supply.

The Study will quantify the water supply needs in CLD and NWD and identify and evaluate alternatives to address these needs. The results of the Study will identify one or more potentially feasible alternatives to meet the needs of CLD and NWD, which then may require some additional detailed study to finalize the optimal approach to meet short- and long-term water supply needs. The Study will also consider storage capacity as it relates to backup and emergency supplies. See attached proposal for further details.

FINANCIAL:
The LCA Suburban Division will fund these 2022 services.

CURRENT STATUS:
LCA engages Gannett Fleming to consult about water related issues in the Central Lehigh Division (and other LCA water systems as needed). This specific approval request represents the

first phase in an ongoing effort to consolidate various independent studies and assessments over the past few decades (since the last Comprehensive Master Plan preparation in 1994).

The project is pending approval of this Planning Phase.

THIS APPROVAL – PLANNING PHASE:
As a primary water consultant of the Authority's Central Lehigh Suburban Division for numerous decades, Gannett Fleming is now again recommended for this latest approval. These services in 2022 include, but are not limited to, the following tasks:

Professional Services:
• Collect and Review Existing Studies and Data
• Establish Demand Projections
• Establish Updated Assessment of Existing Supply Capacity
• Establish Source Water Capacity Needs
• Identify Source Water Alternatives and Conduct Preliminary Feasibility Assessment
• Identify Feasible Alternatives to Meet Source Water Needs
• Develop Report
• Collect and Review Existing Studies and Data

CONSULTANT SELECTION PROCESS:
The proposed consulting engineer has intimate knowledge of both Divisions (CLD and NWD) as well as other LCA water systems. Gannett Fleming developed a comprehensive hydraulic model of the CDL water system in 2011, which has been updated and calibrated over the years and actively used to this date. In 2020, they successfully delivered a study to develop water supply alternatives for potential new industrial customers located in the northwestern portion of the CLD system (known as the "Upper System"). They were also tasked to complete the NWD water model in 2021 (nearing completion). Gannett Fleming also serves as LCA's water consultant for purposes of developing the prioritized water main replacement programs for both Suburban and Allentown divisions.

To deliver this Study in the most cost efficient and timely manner, Gannett Fleming is recommended for this approval.

SCHEDULE:
The final report will be delivered in the third quarter of 2022.

FUTURE AUTHORIZATIONS:
Upon delivery of the final report in the third quarter of 2022, subsequent future phases may include, but are not limited to, the following:

- Comprehensive Master Plan Update (current version is 1994)
    - *CLD and NWD Water Supply Study (this request)*
    - CLD and NWD Water Supply Alternatives Analysis and Selection
    - Water Supply Study for remaining Suburban Division systems
    - Comprehensive Storage Assessment
    - Pipeline Capacity Assessment
    - Operations and Management Assessment
    - Comprehensive Well and Pump Station Assessment

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Office: (717) 763-7211
Fax: (717) 763-1140
www.gannettfleming.com

February 3, 2022

Mr. John Parsons, Chief Operations Officer
Lehigh County Authority

Re: **Central Lehigh and North Whitehall Systems**
Water Supply Study
Engineering Services Proposal

Dear John:

As requested, we are providing this Engineering Services Proposal to complete a Water Supply Study (the Study) for the Central Lehigh Division (CLD) and North Whitehall Division (NWD) water systems for the Lehigh County Authority (LCA). In alignment with LCA's Strategic Plan, the objective of the Study is to identify and evaluate feasible means to address current and long-term water supply needs in the CLD and NWD.

Background

Recently completed planning studies, backed by operational feedback, have identified the need for additional supply in the CLD and NWD systems. The need includes an acute, short-term need to enhance the reliability of supply in the CLD system due to recent and continued growth in system demand, particularly that associated with large customers. This increase in system demand is projected to continue, thus emphasizing the importance of enhancing the reliable supply capacity for CLD. A similar need has been identified in the NWD system, due to the reliance on a single source of supply.

The Study will quantify the source water needs in CLD and NWD and identify and evaluate alternatives to address these needs. The results of the Study will identify one or more potentially feasible alternatives to meet the source water needs of CLD and NWD, which then may require some additional detailed study to finalize the optimal approach to meet short- and long-term source water needs.

Phase 1 Scope of Services

1. Collect and Review Existing Studies and Data pertaining to source water issues and needs in CLD and NWD.

   Several studies have been completed that address the source water needs in the CLA and NWD that can be used to expedite the effort for the Study. In particular, the 2020 Upper System Evaluation completed by Gannett Fleming identified demand projections and supply needs and associated recommendations to meet the notable demand growth in the Upper System associated with new large users and development. The following is a list of known studies and evaluations that will be considered as part of the source water assessment:
   - 2021 WL-14 Aquifer Test Plan Comment Summary; Arro
   - 2020 DRBC Docket for CLD
   - 2020 Upper System Evaluation, Gannett Fleming
   - 2020 Well Study Report – Wells 2, 3, I2R; Buchart Horn
   - 2016 Building Condition Assessments for Water and Wastewater Facilities, DEI
   - 2009 Allentown-LCA Water Supply Agreement
   - 1999 Water Management Plans

   Note that any past studies, mems, etc. that are deemed relevant to the findings of the Study will be included in the Appendix of the resulting report for reference.

2. Establish Demand Projections.

   Establishing reasonable demand projections is a critical initial step in planning source water needs. Demand projections will focus on anticipated growth, generally over a 10- to 20-year period, considering 5-year increments to establish short- and long-term needs in CLD and NWD. Additionally, high-level, build-out estimates of demands in CLD and NWD will be established for consideration when evaluating and comparing the source water alternatives.

   Demand projections for the CLD Upper system, including build-out estimates, were established as part of the 2020 Upper System Evaluation. A brief review of these demands will be completed considering new information. However, it is assumed these demands are still valid. The following process will be used to establish demand projections for the CLD Lower System and the NWD System:
   - LCA will provide information related to known or anticipated new large users or increased demands for existing large users, including bulk sales.
   - LCA will provide available planning information related to growth based on Sewage Facility and Municipal Wasteload Management, service requests, and other readily available information. Information will include equivalent dwelling unit (EDU) estimates and planning horizon.
   - Unit demand estimates for the planned growth will be established based on industry standards, similar to those used for the 2020 Upper System Evaluation.

- Estimates for average and maximum day demands will be established considering the planned and known growth in 5-year increments.
- Build-out estimates will be established considering available municipal and county population projections and applying per capita estimates based on historical demand information to be provided by LCA. LCA will provide feedback on potential service territory growth to be considered for build-out, including Bucks County, west to Kutztown. The demand will be spatially allocated with consideration of available zoning and land use information and feedback from LCA.

3. Establish Updated Assessment of Existing Supply Capacity in CLD and NWD.

   Past studies and evaluations have addressed the capacities and status of existing wells in CLD and NWD. However, the status and capacity of certain wells has been questioned during these efforts. The purpose of this task will be to finalize the status and existing capacity of CLD and NWD wells. This will be completed through review of provided condition assessments, a workshop-type meeting with LCA operations staff, and subsequent requests for information to LCA, and will address the following:
   - Active/inactive status
   - Issues with inactive wells and understanding of ability/needs to redevelop
   - Capacity of all active wells and those that can be redeveloped; consideration will be given to permitted, design, and current operating capacities

4. Establish Source Water Capacity Needs.

   Based on the demand projections and existing supply capacities established in Tasks 2 and 3, source water capacity needs will be established for the short- and long-term needs. Needs will consider reliability and capacity in accordance with PA DEP Standards. Information from LCA's risk management plans will be considered when establishing reliability needs. Storage will also be considered when establishing reliability needs. Estimates of build-out source water needs will also be established for use in evaluating alternatives.

5. Identify Source Water Alternatives and Conduct Preliminary Assessment to Establish Feasibility.

   Alternatives will be established to meet the needs identified in Task 4 through discussion with LCA and consideration of knowledge of existing supply options in the Lehigh Valley. A preliminary assessment of each alternative will then be conducted to assess pros/cons and potential feasibility as a viable means to address the source water needs, considering the following:
   - Preliminary estimate of potential additional capacity
   - Constructability, considering stakeholders, permitting, etc.
   - Preliminary opinion of capital investment magnitude
   - Operational concept and reliability benefit

The alternatives to be considered will include the following:

- Maximize use of existing CLD and NWD wells, considering rehabilitation of inactive wells including Wells 3, 4, and 7 (it is currently assumed this alternative is likely not feasible)
  - Consider capital and operating needs including treatment needs
- Development of new wells in CLD and NWD
  - Consider results of 2021 WL-14 Aquifer Test Plan Comment Summary
  - Conduct high level assessment of potential yield of new wells in existing service territory conserving geology and existing supplies.
- Additional supply capacity and/or connection from Allentown Division
  - Consider additional interconnection
  - Assess impact on Allentown Division operations and potential constraints of existing Water Supply Agreement
- Establish additional interconnections with adjacent systems:
  - Consider connections with Emmaus, Alburtis, Macungie, S Whitehall, Salisbury, and Northampton Borough Municipal Authority based on high level assessment of excess supply, capital need, and interest/cooperation
  - Consider ability to interconnect existing Suburban Division Systems including CLD, NWD, Upper Milford, and Arcadia based on capital need and supply capacity
- Assess Fogelsville Quarry as potential source
  - Perform high level assessment of yield and assess potential interest/cooperation
- Evaluate use of dewatering pumping at LCA PTP

6. Identify Feasible Alternatives to Meet Source Water Needs

   A workshop will be held with LCA to review the results of Task 5 and identify a short-list of feasible alternatives to meet the identified short- and long-term source water needs. Capacity, cost, constructability, operations, and flexibility/expandability to meet build-out needs will be considered.

7. Develop Report and Present Results

   A report documenting the results of the Study will be developed and presented to LCA. The report will document each of the tasks described above with the objective of providing a recommended short-list of potentially feasible source water alternatives to meet the identified needs. The report will include recommendation on follow-up to further review the feasible alternatives in order to identify the optimal means to address the short- and long-term source water needs for CLD and NWD.

   The findings of the Study will also be presented to the LCA Board of Directors. The presentation will focus upon the source water needs and feasible alternatives that will be pursued to address those needs.

Potential Follow-up Studies (not included in current scope of services):

LCA last completed a comprehensive Master Plan of the Suburban Division in 1994, as developed by Gannett Fleming. This plan was used to guide investments in the system to maintain safe and reliable service to its customers. As noted, LCA has completed numerous planning studies and assessments focusing on various areas and aspects of the Suburban Division since the completion of the 1994 Master Plan. These studies and assessments have been used by LCA to guide the capital investments that have supported the continuous growth of the Suburban Division customer base. However, these studies and assessments have generally been completed independently. As such, LCA may wish to implement a comprehensive update to future planning of all infrastructure in all Suburban Division systems.

The following provides potential tasks/studies to be completed in subsequent phases of comprehensive Suburban Division planning, and in conjunction with ongoing Suburban Division Asset Management efforts. Scope of services for the subsequent phases can be refined and a proposal provide to LCA, as requested.

1. CLD and NWD Source Water Selection
    - Detailed evaluation on the feasible alternatives identified with the CLD and NWD Source Water Assessment.
    - Source Optimization/Operating Concept Assessment, considering the following:
        - Integrated CLD and Allentown Division operations
        - Periodic conveyance of excess supply from CLD to AD
        - Shantz Spring direct supply to CLD
        - Merger of operating pressure zones
2. Source Water Assessment for Remaining Suburban Division systems
3. Comprehensive Storage Assessment, including capacity, condition, and reliability
4. Pipeline Capacity Assessment:
    - Assess pressure and flows for current and future conditions including fire flows
    - Consider infrastructure needs for established growth areas
5. Operations and Management Assessment, including benchmark assessment against best practices
6. Comprehensive Well and Pump Station Assessment, including condition, capacity, and reliability
7. Financing Approach to Implement Recommendations, considering rate impacts and financing alternatives

Proposed Cost and Schedule

The estimated cost to complete the described Scope of Services for the Study is $77,500 based on an estimated effort of 625 manhours. It is estimated the Study report can be completed within seven (7) months of receiving notice to proceed. Services will be completed in accordance with the attached standard terms and conditions, which are in place for ongoing work between Gannett Fleming and LCA. Gannett Fleming's effort will be billed on a cost-plus basis. Gannett Fleming will not exceed the estimated cost of $77,500 without prior authorization from LCA.

We look forward to the opportunity to continue to work jointly with LCA and build upon an already successful relationship. If you have any questions on our proposal or require additional information, please contact me at 717-649-3662.

Sincerely,

GANNETT FLEMING, INC.
Environmental Resources Division

Michael T. Brown, P.E.
Vice President

Cc: P. DePoe, LCA

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.:	SD-W-55	**BUDGET FUND:**	Suburban Div\Water\Capital
PROJECT TITLE:	Central Lehigh and North Whitehall Systems – Water Supply Study	**PROJECT TYPE:**	
		☐	Construction
		☒	Engineering Study
THIS AUTHORIZATION:	**$92,500**	☐	Equipment Purchase
TO DATE (W/ ABOVE)	**$92,500**	☐	**Amendment**

DESCRIPTION AND BENEFITS:

In alignment with LCA's recently adopted Strategic Plan, the objective of this Water Supply Study (the "Study") is to identify and evaluate feasible means to address current and long-term water supply needs in the Central Lehigh Division (CLD) and the North Whitehall Division (NWD). Recently completed planning studies (backed by operational feedback) have identified the need for additional supply in the CLD and NWD systems. This Study will quantify the source water needs in CLD and NWD and identify and evaluate alternatives to address these needs.

Prior Authorizations: Numerous planning studies have been completed since the last comprehensive Master Plan of the Suburban Division in 1994. Gannett Fleming (GF) also developed the current water model of the Central Lehigh Division System in 2011. GF is currently developing the North Whitehall Division System's water model and will be operational in 2022.

This Authorization: Central Lehigh and North Whitehall Systems – Water Supply Study. See attached Board Memo for further project details.

Authorization Status:

Requested This Authorization	
Design Phase	
Staff	**$10,000**
Contractor	**$0**
Engineering Consultant	**$77,500**
Contingency	**$5,000**
Total This Authorization	**$92,500**

Prior Authorizations	N/A
Subtotal (This Authorization)	**$92,500**
Future Authorizations (2023 and beyond)	*TBD*

REVIEW AND APPROVALS:

Project Manager	Date	Chief Executive Officer	Date
Chief Capital Works Officer	Date	Chairman	Date

Lehigh County Authority

1053 Spruce Street * P.O. Box 3348 * Allentown, PA 18106-0348
(610)398-2503 * FAX (610)398-8413 * Email: service@lehighcountyauthority.org

PROFESSIONAL SERVICES AUTHORIZATION

Professional: GANNETT FLEMING, INC.
P.O. Box 67100
Harrisburg, PA 17106-7100

Date: February 14, 2022
Requested By: Phil DePoe

Approvals
Department Head: _____
Chief Executive Officer: _____

Suburban Division: Central Lehigh and North Whitehall Systems (Water Supply Study) - Planning Phase

In alignment with LCA's recently adopted Strategic Plan, the objective of this Water Supply Study (the "Study") is to identify and evaluate feasible means to address current and long-term water supply needs in the Central Lehigh Division (CLD) and the North Whitehall Division (NWD). Recently completed planning studies (backed by operational feedback) have identified the need for additional supply in the CLD and NWD systems. This Study will quantify the source water needs in CLD and NWD and identify and evaluate alternatives to address these needs.

The scope of services include, but are not limited to, the following:

Professional Services *(1)*
1. Collect and Review Existing Studies and Data
2. Establish Demand Projections
3. Establish Updated Assessment of Existing Supply Capacity
4. Establish Source Water Capacity Needs
5. Identify Source Water Alternatives and Conduct Preliminary Feasibility Assessment
6. Identify Feasible Alternatives to Meet Source Water Needs
7. Develop Report

(1) Please reference the cover Memo for additional information.

This Approval: *$77,500*
Approval Amount (not to be exceeded without further authorization): *$77,500*

Time Table and Completion Deadline: As required to meet various critical deadlines as set forth in the proposal.

(For Authority Use Only)

Authorization Completion:

Approval: _____ **Actual Cost:** _____ **Date:** _____

MEMORANDUM

Date: February 14, 2022

To: LCA Board of Directors
Liesel Gross, CEO

From: Phil DePoe, Senior Planning Engineer

Subject: Regional Act 537 Plan Program Management: Planning Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Plan Authorization: AECOM – Regional Act 537 Plan Program Management	$115,000
1A	Professional Services Authorization: AECOM – Regional Act 537 Plan Program Management	$100,000*

**Included in the Capital Project Authorization*

1. Regional Act 537 Plan Program Management

AUTHORIZATION OVERVIEW:
To begin the process of developing the long-term Regional Act 537 Plan, the evaluation of the LCA Pretreatment Plant (PTP) Alternatives was identified as an immediate need to assist with completing the full alternatives analysis to be completed by March 2025. AECOM began this initial effort in late 2019 and was fully authorized in August 2020. Work has progressed since August of 2020 and an additional authorization request is now needed to continue the Act 537 Plan Program Management planning efforts. This general Program Manager effort will cover a work scope that is continuously changing as more regulatory and technical facts are determined. An emphasis on continuing to fully vet the PTP direct discharge option is also a major driver for this request.

FINANCIAL:
The LCA Suburban Division will fund these 2022 services.

CURRENT STATUS:
In late 2019, AECOM was re-engaged to review the current Act 537 planning status. In August 2020, AECOM was authorized (along with major assistance from Jacobs) to perform a detailed Pretreatment Plant direct discharge analysis for Act 537 planning. This analysis is still ongoing as the regulatory and technical facts continue to come into clearer focus. A decision is needed by the end of this year on whether the PTP direct discharge option will be a viable Act 537 Plan alternative.

The continuation of the Program Management services are pending approval of this authorization.

THIS APPROVAL – PLANNING PHASE:
AECOM serves as the Program Manager for the Regional Act 537 Plan development and this authorization will continue their current role. These services include, but are not limited to, the following:

Professional Services
• On-going general program management support

• General coordination with LCA and other Act 537 Plan consultants
• Attendance at monthly KISS meetings and other miscellaneous planning meetings
• Further develop the Act 537 Plan schedule in Microsoft Project
• Refine regulatory uncertainties
• Updating prior cost estimates
• Updating prior technical memorandums

CONSULTANT SELECTION PROCESS:

AECOM was retained by LCA during the 2013-2016 Act 537 era timeframe to investigate wastewater treatment capacity options for the Western Lehigh service area. In late 2019, they were once again retained to compile a status update on recent planning efforts. And in August 2020, AECOM was authorized as Program Manager to perform a detailed analysis on the PTP direct discharge option (along with many other items). Due to their intimate knowledge acquired through the prior planning process, LCA recommends AECOM be retained once again for this current phase of the Regional Act 537 Plan development.

SCHEDULE:

This authorization is a continuation of their Regional Act 537 Plan Program Management services. This Act 537 planning work is mandated by PA DEP to be submitted by March 2025.

FUTURE AUTHORIZATIONS:

Future authorizations are anticipated in 2023 and beyond, spanning throughout the remainder of the Regional Act 537 planning process.

AECOM
625 West Ridge Pike, Suite E-100
Conshohocken, PA 19428

610.832.3500 tel
610.832.3501 fax

February 2, 2022

Ms. Liesel M. Gross
Chief Executive Officer
Lehigh County Authority
1053 Spruce Street
Allentown, PA 18106-0348

RE: **Lehigh County Authority Act 537 Support Proposal, Phase 3 Amendment**

Dear Ms. Gross,

AECOM Technical Services, Inc. (AECOM) appreciates the opportunity to provide this proposal to Lehigh County Authority (the "Authority", or "LCA") for continuing our support of the ACT 537 planning effort as described herein. The prior Phase ran through October 2021 and we have been continuing our support of LCA with the Program based on your direction. As such, we are requesting additional budget to continue our support as Program Manager based on the additions in scope to the prior Professional Services Authorization titled: ***Regional Act 537 Plan Alternatives Analysis: Pretreatment Plant Upgrade Option - Planning Phase (signed August 24, 2020).***

As this work progresses and as additional information is better understood from the previously completed work under this scope, new meaningful tasks have been requested by LCA to further this effort. AECOM will continue to collaborate with the LCA and your other consultant partners and act as the overall Act 537 Program Manager to facilitate efforts, provide coordination, and provide critical technical insight for specific components to meet LCA's program goals. The following section identifies the details of the anticipated proposed scope of work. We recognize that priorities shift as new information is made available and AECOM will continue to work closely with LCA and communicate regularly to monitor progress and any alterations to the currently defined scope of work to focus our efforts and budget where LCA feels most necessary.

1.0 Scope of Work

The following sections outline AECOM's anticipated additional scope elements, assumptions, schedule, and proposed budget to provide general on-going program management support.

- Review process simulations for alternate effluent goals under an industrial pre-treatment direct discharge scenario to find cost-effective scenarios.
- Oversight of Jacobs Master Planning and definition of base case and direct discharge scenarios. Assist with another round of refinement.
- Attendance at monthly KISS meetings (5 in total).
- Develop schedule in Microsoft Project to illustrate critical path components of submitting the ACT 537 plan based on the interdependencies of tasks.
- Refine regulatory uncertainties related to direct discharge and implications to KIWWTP effluent permitting. Support discussions with DRBC and PADEP around direct discharge and effluent trading through an Intermunicipal Agreement (IMA). Preparation and attendance at two DRBC virtual meetings associated with a de-rate of flow through KIWWTP with an IPPDD scenario and implications to both outfalls.

- Request model simulations and review results with ARCADIS.
- Assist with identification of project elimination vs. just reduction in scale for proposed improvements to attain more significant cost savings.
- Additional review of alternate wet weather treatment scenarios at Kline's Island to reduce overall costs including running the two trickling filters in parallel (as developed by Kleinfelder).
- Review of impacts to Kline's Island permitting (PADEP and DRBC) and meetings with the City of Allentown to discuss impacts associated with the Intermunicipal Load Transfer from KIWWTP to PTP in future scenarios.
- Continued coordination with Kleinfelder and City of Allentown regarding IMA implications related to dry weather flows / loads and wet weather flow scenarios.

Deliverables for this task will include:

1. Technical Memo summarizing DRBC input on direct discharge and nutrient trading impacts.
2. Microsoft Project Schedule detailing the overall progression of ACT 537 Planning needs.
3. Refinement of wet weather scenarios for communication to KISS partners.
4. Preparation of anticipated KIWWTP NPDES permits and future flow / load calculations based on regulatory input on alternatives considered.

2.0 Assumptions

The proposal has been based on the following assumptions:

1. Local travel will be based on mileage from AECOM's Conshohocken Office to LCA's offices or facilities. No air travel or overnight stays are included.
2. Virtual meetings will be used in lieu of in-person meetings whenever feasible.

3.0 Schedule and Budget Estimate

AECOM is continuing services on this project and has already been in active consultation with the Authority staff through studies, meetings and conference calls in order to be responsive to LCA's questions and needs, avoid delays and enable initial planning and insight on the project objectives.

A proposed Phase 3 amendment budget to complete the additional requested scope of anticipated services is indicated below:

Item	Estimated Hours	Estimated Budget
Total (Labor)	620	$ 99,450

Item	Estimated Budget
Labor	$ 99,450
ODCs	$ 550
TOTAL	$ 100,000

AECOM proposes to conduct this project on a Time and Materials basis in accordance with the Engineering Services Agreement between Lehigh County Authority and AECOM Technical Services, dated February 21, 2020.

Once again, we appreciate the opportunity to provide this proposal to you and look forward to assisting the Authority with this important project. Please reply that we are authorized to proceed in accordance with this proposal for our records. If you have any questions or need additional information, please contact me at 302-379-0267or chris.curran@aecom.com.

Sincerely,

Christopher Curran, PE
VP, Project Director

Cc: Mr. Philip DePoe, PE

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.:	SD-S-3	**BUDGET FUND:**	Suburban Div\Wastewater\Capital
PROJECT TITLE:	Regional Act 537 Plan Program Management – Planning Phase	**PROJECT TYPE:**	
		☐	Construction
		☒	Engineering Study
THIS AUTHORIZATION:	**$115,000**	☐	Equipment Purchase
TO DATE (W/ ABOVE)	**$441,576**	☐	**Amendment**

DESCRIPTION AND BENEFITS:

To begin the process of developing the long-term Regional Act 537 Plan, the evaluation of the LCA Pretreatment Plant (PTP) Alternatives was identified as an immediate need to assist with completing the full alternatives analysis to be completed by March 2025. AECOM began this initial effort in late 2019 and was fully authorized in August 2020. Work has progressed since August of 2020 and an additional authorization request is now needed to continue the Act 537 Program Manager planning efforts. This general Program Manager effort will cover a work scope that is continuously changing as more regulatory and technical facts are determined. An emphasis on continuing to fully vet the PTP direct discharge option is also a major driver for this request.

Prior Authorizations: In late 2019, AECOM was re-engaged to review the current Act 537 planning status. In August 2020, AECOM was authorized (along with major assistance from Jacobs) to perform a detailed Pretreatment Plant direct discharge analysis for Act 537 planning.

This Authorization: Act 537 Program Management Support Amendment. See attached Board Memo for further project details.

Authorization Status:

Requested This Authorization	
Design Phase	
Staff	**$10,000**
Contractor	**$0**
Engineering Consultant	**$100,000**
Contingency	**$5,000**
Total This Authorization	**$115,000**

Prior Authorizations	$326,576
Subtotal (Prior + This Authorization)	**$441,576**
Future Authorizations (2023 and beyond)	*TBD*

REVIEW AND APPROVALS:

Project Manager	Date	Chief Executive Officer	Date
Chief Capital Works Officer	Date	Chairman	Date

Lehigh County Authority

1053 Spruce Street * P.O. Box 3348 * Allentown, PA 18106-0348
(610)398-2503 * FAX (610)398-8413 * Email: service@lehighcountyauthority.org

PROFESSIONAL SERVICES AUTHORIZATION
AMENDMENT NO. 4

Professional: AECOM
625 West Ridge Pike, Suite E-100
Conshohocken, PA 19428

Date: February 14, 2022
Requested By: Phil DePoe

Approvals
Department Head: _____
Chief Executive Officer: _____

Suburban Division: Regional Act 537 Plan Program Management (Pretreatment Plant Upgrade Option) - Planning Phase

To begin the process of developing the long-term Regional Act 537 Plan, the evaluation of the LCA Pretreatment Plant (PTP) Alternatives was identified as an immediate need to assist with completing the full alternatives analysis to be completed by March 2025. AECOM began this initial effort in late 2019 and was fully authorized in August 2020. Work has progressed since August of 2020 and an additional authorization request is now needed to continue the Act 537 Plan Program Management planning efforts. This general Program Manager effort will cover a work scope that is continuously changing as more regulatory and technical facts are determined. An emphasis on continuing to fully vet the PTP direct discharge option is also a major driver for this request.

This additional scope of services include, but are not limited to, the following:

Professional Services (1)
1. On-going general program management support
2. General coordination with LCA and other 537 consultants
3. Attendance at monthly KISS meetings and other miscellaneous planning meetings
4. Further develop 537 schedule in Microsoft Project
5. Refine regulatory uncertainties
6. Updating prior cost estimates
7. Updating prior technical memorandums

(1) Please reference the cover Memo for additional information.

Prior Program Manager Approvals: *$326,576 (2019-2021)*
This Approval: *$100,000*

Approval Amount (not to be exceeded without further authorization): *$426,576*

Time Table and Completion Deadline: As required to meet various critical deadlines as set forth in the proposal.

(For Authority Use Only)

Authorization Completion:

Approval: _____ **Actual Cost:** _____ **Date:** _____

MEMORANDUM

Date: February 14, 2022

To: Authority Board
From: Amy Kunkel, Chuck Volk
Subject: Suburban Division – Upper Western Lehigh Pump Station and Force Main - Design Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Project Authorization – Design Phase	$468,600
2	Professional Services Authorization – Entech Engineering (1), (2)	$248,600

(1) Included in the Capital Project Authorization.
(2) Does not include Construction phase related engineering services.

PROJECT OVERVIEW:
The Kline's Island Sewer System Interim Act 537 Plan was approved by DEP in June 2021 and included construction of interim improvements in the Trexlertown area until a long-term solution is developed as part of completion and submission of a regional Act 537 Plan in March 2025. The Trexlertown Special Study (TSS) was prepared in late 2021 to evaluate improvement alternatives to temporarily resolve the capacity deficiencies. The alternative recommended in the study consisted of a 2.5 million gallons per day (MGD) capacity pump station located near LCA's Industrial Pre-Treatment Plant (PTP) and 1.52 miles of 18" diameter force main (size to be verified by consultant) connecting to the Upper Macungie Trunk Line (UMTL) at MH PH3034A, located north of Rt 222 and west of Grange Rd. in the Township park area.

The purpose of the pump station and force main will be to divert dry day flow from the Western Lehigh Interceptor (downstream of the LCA PTP) to a sanitary trunk line owned by Upper Macungie Township. The existing Township trunk line runs south from Grange Road under Rt 222 and ties into the Western Lehigh Interceptor (WLI) just upstream of the Spring Creek Pump Station. The proposed pump station, to be located adjacent to the LCA PTP, will convey up to 2.5 MGD of treated effluent from the plant via force main to the Upper Macungie Trunk Line manhole, thereby bypassing the Trexlertown and Ancient Oaks areas of the Western Lehigh Interceptor that have capacity limitations (the "bottleneck" sections). The force main will partially utilize the route of the previously designed Iron Run Force Main. A level sensor in one of the Township's downstream manholes (TBD) will be used to shut the proposed pump station down during high flow events to avoid surcharging and SSOs in the Township line.

FUNDING:
This Project will be funded by the LCA Suburban Division

BUDGET AMENDMENT
Not required for this approval

PROJECT STATUS:
Pending Board approval of the Design Phase.

THIS APPROVAL-DESIGN PHASE
Lehigh County Authority (LCA) intends to retain the services of an engineering consulting firm to provide design related services. Approval for construction related engineering services will be requested with the Construction Phase authorization. The following table summarizes the professional services to be performed:

Professional Services *(1)*
1. Attend kickoff meeting.
2. Design of new pump station and force main.
3. Assist with easement acquisitions.
4. Complete state and local permit applications and administer submissions.
5. Prepare construction bid documents (plans and specifications).
6. Provide bid phase services.

1. For Design and Bid Phase.

CONSULTANT SELECTION PROCESS:
Three engineering firms, Entech Engineering, Inc., Whitman, Requardt, and Associates, LLP, and HDR Engineering, Inc. were invited to submit proposals for the project in January 2022. The firms were selected based on prior LCA project performance and/or general expertise with wastewater conveyance facilities. The consultants were allowed access to the site to assess site conditions and ask questions related to the design work. Proposals were received on January 31, 2022, the results of which follow:

Consultant	**Cost** *(1)*
Entech Engineering, Inc.	$248,600
WRA, LLP	$376,191
HDR Engineering, Inc.	$480,328

(1) Total Proposal Cost

Based upon our review of all aspects of both the Technical and Cost Proposals submitted by the three firms, we recommend award of the Design Phase services to Entech Engineering. Their proposal is on scope and represents what we believe is the best overall value for the Authority. Entech Engineering will perform the services outlined in their proposal.

***ENTECH ENGINEERING* -COMPANY INFORMATION & REFERENCE CHECK:**
Established in 1981, Entech Engineering is a multi-disciplinary engineering consulting firm headquartered in Reading, PA, with additional satellite offices across PA.. With more than 120 professional and support staff, Entech has sufficient personnel in the required disciplines to guarantee continuity and continued progress on all disciplines this contract requires. Entech has completed numerous sewage pump station designs for various Authorities in Pennsylvania. They are also the design engineer for the Wynnewood and Sand Springs Wastewater Treatment Plant Replacement projects (both completed) and the Arcadia West Water Storage Tank (substantially complete).

PROJECT SCHEDULE:
At this juncture the construction portion of this project is anticipated to be bid in June of 2023 with completion of construction by the first quarter of 2025.

FUTURE AUTHORIZATIONS- CONSTRUCTION PHASE:
After the construction contract(s) bids are received, a Capital Project Authorization (CPA) Amendment will be presented to the Board for approval of the Construction Phase; and will include construction contract award(s), professional services amendment for construction related services, staff costs and other related components.

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.:	SD-S-22-1	**BUDGET FUND:**	Suburban Div\Sewer\Capital
PROJECT TITLE:	Upper Western Lehigh Pump Station and Force Main	**PROJECT TYPE:**	
		☒	Construction
		☐	Engineering Study
THIS AUTHORIZATION:	**$468,600**	☐	Equipment Purchase
TO DATE (W/ ABOVE)	**$468,600**	☐	Amendment

DESCRIPTION AND BENEFITS:

This Project is for the design of the Upper Western Lehigh Pump Station and Force Main. The project is intended to relieve dry day surcharging in the Trexlertown area of the Western Lehigh Interceptor. The design includes construction of a 2.5 MGD pump station including site work and related mechanical and electrical work, and the construction of a sanitary sewer force main. Entech Engineering will be used for the engineering consulting services. The project is anticipated to be bid ready by June of 2023.

Reference the attached Memorandum for additional information.

Previous Authorizations	
None	

REQUESTED THIS AUTHORIZATION	
Design Phase	
Staff	**$50,000**
Engineering Consultant – Entech Engineering	**$248,600**
Easements	**$100,000**
Legal	**$30,000**
Contingency	**$40,000**
Total This Authorization	**$468,600**

Future Authorization	
Construction Phase	$4,500,000

Total Estimated Project	*$4,968,600*

REVIEW AND APPROVALS:

Project Manager	Date	Chief Executive Officer	Date
Chief Capital Works Officer	Date	Chairman	Date

Lehigh County Authority

1053 Spruce Road * P.O. Box 3348 * Allentown, PA 18106-0348
(610)398-2503 * FAX (610)398-8413

PROFESSIONAL SERVICES AUTHORIZATION

Professional: Entech Engineering, Inc.
201 Penn Street
PO Box 32
Reading, PA 19603

Date: February 14, 2022
Requested By: Amy Kunkel
Approvals
Department Head: _____
Chief Executive Officer: _____

Suburban Division- Upper Western Lehigh Pump Station and Force Main

Previous Authorizations- None

This Authorization – Design Phase: $248,600

Entech Engineering, Inc will provide design engineering related services for the aforementioned project.

Professional Services
1. Attend kick off meeting
2. Design of new sewage pump station and force main
3. Complete state and local permit applications and administer submissions
4. Prepare construction bid documents (plans and specifications)
5. Provide bid phase services

Cost Estimate (not to be exceeded without further authorization): **$ 248,600**

Time Table and Completion Deadline: As required to meet design timeline requirements

(For Authority Use Only)

Authorization Completion:

Approval: _____ **Actual Cost:** _____ **Date:** _____

MEMORANDUM

Date: February 14, 2022

To: Lehigh County Authority Board of Directors
From: Charles Volk, Chief Capital Works Officer
Subject: Allentown Division – KIWWTP Thickener Tank #3 Mechanical Upgrade - Construction Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Project Authorization – Construction Phase	$594,000
2 (1)	Professional Services Authorization – D'Huy Engineering, Inc.	$38,000
3 (1)	General Contract Award – JEV Construction LLC	$511,000

(1) Included in the Capital Project Authorization.

PROJECT BACKGROUND:
Thickener Tank #3 at KIWWTP is used to thicken sludge from the intermediate and final settling tanks prior to being conveyed to the primary digesters. The tank has been in service since 1984 without a significant upgrade. The tank's mechanical equipment, consisting of drive unit, stilling well, influent piping, weirs, and access bridge have reached the end of their useful life. This project consists of the mechanical rehabilitation of Sludge Thickener Tank No. 3, including rehabilitation of the dome cover. This project is identified in the KIWWTP Master Plan as a "near term" project, and is being performed as part of annual General Improvements.

PROJECT SCOPE
This project consists of a complete mechanical refurbishment of Thickener Tank #3. Demolition of existing mechanical equipment is to be performed, and work is to include the following items: furnish and install new center drive mechanism including explosion proof motor and gear box, influent column, feed well, drive cage, and sludge collector rake (submerged components are to be stainless steel); replace underground connecting piping; replace existing fan for odor control unit; replace existing steel walkway with FRP components and grating; furnish and install new FRP weir plates; furnish and install new conduit and wiring form outside junction box to center drive unit including explosion proof push button switches; and removal, storage, cleaning, painting, and reassembly of the fiberglass dome cover.

FINANCIAL:
This Project will be funded by the LCA Allentown Division.

PROJECT STATUS:
D'Huy Engineering completed design in late 2021, the project was advertised for bid in December 2021, a pre-bid meeting at the plant site was held on 1/6/22, and bids were opened on 1/25/22.

THIS APPROVAL – CONSTRUCTION PHASE

BIDDING SUMMARY:

Bids were opened on 1/25/22. The project consists of a single General Construction Contract. The bid results are summarized below:

Bidder	Base Bid Results
JEV Construction LLC	$511,000
Eastern Environmental Contractors, Inc.	$569,600
Blooming Glen Contractors	$598,495
JP Environmental LLC	$683,200
Pact Two LLC	$772,800
Zimmerman Environmental	$892,732
GMH Associates of America, Inc.	$1,558,662

The 2022 budget amount allocated for this project is approximately $500,000 under the KIWWTP General Improvements (annual projects). The low bidder, JEV Construction LLC (JEV) based in Clinton, NJ, has significant experience in water and wastewater facility mechanical upgrade projects in eastern PA and New Jersey. JEV was the General Contractor for the Arcadia West Wastewater Treatment Plant Upgrade/Replacement Project (2013) and the follow-up Cold Weather Improvements Project at the same facility (2016), and the General Contractor for SD Asset Management Facilities Upgrade Project (2017). The contractor is well qualified for this work. The documents submitted with the bid are complete and in accordance with the bidding requirements. Based upon the review of the bids, we recommend award of the Contract to JEV, subject to the receipt of the necessary Performance Bonds, Insurance and other required documentation.

PROFESSIONAL SERVICES:

D'Huy Engineering has been our design consultant on this project and will provide construction engineering services for the project. Their work will include:

1. Conduct pre-construction conference; issue meeting minutes.
2. Prepare for and conduct job conference meetings.
3. Review and approve contractor's submittals.
4. Respond to Contractor requests for information (RFIs).
5. Review applications for payment and draft any necessary change orders.
6. Conduct site visits to review progress and issues raised during construction.
7. Conduct substantial and final completion inspections.
8. Prepare punch list, final project close-out and certify final payment to contractors.

PROJECT SCHEDULE:

The contract time for construction phase is 240 days from Notice to Proceed to substantial completion. Assuming construction phase authorization of the 2/14/22 board meeting, construction is anticipated to conclude by the end of the year.

FUTURE AUTHORIZATIONS: none

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.: AD-S-A **BUDGET FUND:** Allentown Div\Wastewater\Capital

PROJECT TITLE: **Allentown Division –KIWWTP Thickener Tank No. 3 Mechanical Upgrade Project**

PROJECT TYPE:

- ☒ Construction
- ☐ Engineering Study
- ☐ Equipment Purchase

THIS AUTHORIZATION **$581,000**
TO DATE *(W/ABOVE)* **$627,500**

DESCRIPTION AND BENEFITS:

The scope of this project consists of the mechanical refurbishment of Thickener Tank #3 at KIWWTP. The tank has been in 24/7 service since 1984 without a significant upgrade. The tank's mechanical equipment, consisting of drive unit, stilling well, influent piping, weirs, access bridge and dome cover have reached the end of their useful life. This project consists of the replacement of these mechanical components and related upgrade work.

Previous Authorizations	
Design and Bid Phase	$33,500

REQUESTED THIS AUTHORIZATION	
Construction Phase	
General Construction Contract – JEV Construction LLC	**$511,000**
Professional Services:	
Construction Administration/Engineering – D'Huy Engineering	**$38,000**
Staff	**$20,000**
Contingency	**$25,000**
Total This Authorization	**$594,000**

Total Estimated Project	$627,500

REVIEW AND APPROVALS:

Project Manager	Date	Chief Executive Officer	Date
Chief Capital Works Officer	Date	Chairman	Date

Lehigh County Authority

1053 Spruce Street * P.O. Box 3348 * Allentown, PA 18106-0348
(610)398-2503 * FAX (610)398-8413 * Email: service@lehighcountyauthority.org

PROFESSIONAL SERVICES AUTHORIZATION

Professional: D;HUY ENGINEERINJG, INC.
One East Broad St., Suite 310
Bethlehem, PA 18018

Date: February 14, 2022
Requested By: Charles Volk, P.E.

Approvals
Department Head: _____
Chief Executive Officer: _____

Allentown Division – KIWWTP Thickener Tank No. 3 Mechanical Upgrade - Construction Phase

D'Huy Engineering, Inc. will perform construction administration and engineering support for the KIWWTP Thickener Tank No. 3 Mechanical Upgrade Project. Professional services will include the following:

Professional Services [(1)]
1. Pre-construction meeting coordination, attendance and follow-up
2. Prepare for and attend job progress meetings
3. Review and approve contractor submittals
4. Respond to Requests for Information (RFI) from contractor
5. Process payment applications
6. Process change orders as required
7. Provide part time construction inspection
8. Perform substantial completion inspection & punchlist preparation
9. Contract closeout administration

(1) Reference the cover Memo for additional information.

Cost Estimate (not to be exceeded without further authorization): ***$38,000***

Time Table and Completion Deadline: As required to meet deadlines as set forth in the construction contract.

(For Authority Use Only)

Authorization Completion:

Approval: _____ **Actual Cost:** _____ **Date:** _____

Lehigh County Authority – Monthly Report to Board of Directors

Upcoming Board Agenda Items & Project Updates – February 2022

Published: February 7, 2022

PART 1 – Upcoming Agenda Items – Action & Discussion Items

FINANCE & ADMINISTRATION

2020 Audit & Financial Statements	**n/a**	**Acceptance**	**2/28/2022**

Completion of the Authority's 2020 Audited Financial Statements was delayed due to the delayed completion of the Pennsylvania Municipal Retirement System (PMRS) financial audit. PMRS completed their audit in December 2021, and the Authority's audit was subsequently completed and filed with the appropriate agencies by the end of 2021. Auditors will present the Authority's 2020 Audited Financial Statements to the Board of Directors for acceptance.

Board of Directors – Election of Officers	**n/a**	**Election Vote**	**2/28/2022**

The Board of Directors will nominate and elect officers for 2022 at the February 28, 2022 Board meeting.

Monthly Financial Review	**n/a**	**Discussion**	**2/28/2022**

December 2021 monthly financial report will be presented.

SYSTEM OPERATIONS

Special Monthly Operations Report	**n/a**	**Discussion**	**2/14/2022**

December 2021 monthly operations report will be presented including review of special topics of interest: Sand Springs WWTP notice of violation; 1,4 Dioxane discharge, Emmaus Consecutive Division PFAS contamination; and an update on the Buss Acres Division.

Monthly Operations Report	**n/a**	**Discussion**	**2/28/2022**

January 2022 monthly operations report will be presented.

WATER PROJECTS

Central Lehigh and North Whitehall Systems – Water Supply Study	**Suburban Division**	**Approval**	**2/14/2022**

This project involves the preparation of a water supply study (the "Study") to identify and evaluate feasible means to address current and long-term water supply needs in the Central Lehigh Division (CLD) and North Whitehall Division (NWD). Recently completed planning studies have identified the need for additional supply in these two systems. Authorization will be requested at the February 14, 2022 Board meeting and the Study will be completed by the third quarter of 2022. From this study, additional engineering work will be initiated to develop water supply projects that enhance the region's water system resiliency and redundancy. This water supply study will serve as the backbone for the future development of a comprehensive Master Plan update for the entire LCA Suburban Division Water System. The project will be funded by the LCA Suburban Division.

WASTEWATER PROJECTS

Regional Sewer Capacity & Wet-Weather Planning: Engineering & Program Support	Suburban Division	Approval	2/14/2022

As defined at the November 8, 2021 Board meeting, consultants were assigned various roles for the region's Act 537 planning process. As program manager, AECOM is assisting LCA in numerous engineering and coordination tasks to help achieve the region's current DEP deadline for submission. This request is an extension of ongoing engineering and program support that AECOM provided in 2013-2016 and 2019-2021. Authorization approval of Professional Services Authorization for Act 537 Plan Program Management support in 2022 will be requested at the February 14, 2022 Board meeting. The request will be funded by the LCA Suburban Division.

Upper Western Lehigh Pump Station and Force Main	Suburban Division	Approval	2/14/2022

Per the DEP-approved Interim 537 Plan, action is required to alleviate the current sanitary sewer interceptor system bottleneck in the Trexlertown area. The Upper Western Lehigh Pump Station and Force Main is the recommended alternative identified in the Special Act 537 Study being prepared as part of the Trexlertown Area Capacity Solution Alternatives project. The selection of this alternative is also supported by both Upper and Lower Macungie townships. Design phase initiation is needed in order to meet the compliance timeline in the Interim Act 537 Plan. Design phase authorization for Engineering Design services will be requested at the February 14, 2022 Board meeting.

Kline's Island WWTP: Sludge Thickener Tank No. 3 Mechanical Upgrade	Allentown Division	Approval	2/14/2022

Thickener Tank #3 is used to thicken sludge from the intermediate and final settling tanks prior to being conveyed to the primary digesters. The tank has been in service since 1984 without a significant upgrade. The tank's mechanical equipment, consisting of drive unit, stilling well, influent piping, weirs, access bridge and dome cover have reached the end of their useful life. This project consists of the mechanical rehabilitation of Sludge Thickener Tank No. 3, including rehabilitation of the dome cover. This project is identified in the KIWWTP Master Plan as a "near term" project and is being performed as part of annual General Improvements. Design was completed in late 2021, bid phase commenced in December 2021, and bids were opened late January 2022. Construction phase authorization will be requested at the February 14, 2022 Board meeting.

Kline's Island Sewer System – Regional Sewer Capacity & Wet-Weather Planning – Regional Act 537 Plan Preparation	City of Allentown (AO)	Approval	2/28/2022

All municipalities flowing into the Kline's Island Wastewater Treatment Plan completed an Interim Act 537 Plan ("Interim Plan") in September 2020. This Interim Plan primarily consisted of projecting new connections to the regional sewer system from 2021 through 2025 and outlining steps to be taken during this timeframe to prepare a full Regional (Long-Term) Act 537 Plan ("Regional Plan"). This two-step planning process has been developed to allow all municipalities to work cooperatively toward a regional plan to meet future sewer capacity needs of the region, and to provide proper regulatory oversight and control of new connections to the system while the Interim Plan is in force from 2021 to 2025. To begin the process of compiling the Regional Act 537 Plan (due in March 2025), approval of a consultant's Professional Service proposal is requested at the February 28, 2022 Board meeting. Costs associated with the development of this Regional Act 537 Plan will be paid by the City of Allentown and reimbursed through existing intermunicipal agreements and by City customers through the use of the Administrative Order Fee.

FINANCE & ADMINISTRATION

No updates.

SYSTEM OPERATIONS

No updates.

WATER PROJECTS – SUBURBAN DIVISION

Far View Farms Pump Station Demolition	**Suburban Division**	**NEW**	**Design Phase**

This project involves the demolition of the pump station, wells and underground storage tanks that once served the Far View Farms development. The Kohler Tract pumping station is now providing domestic service as well as fire protection from the Central Lehigh Division to these developments. D'Huy Engineering is preparing specifications for bidding the demolition work. Bids will be opened in March, and the Board will be requested to approve the demolition phase of the project. The land will be sold following completion of the project.

Water Main Replacement Program Cycle 6	**Suburban Division**	**NEW**	**Design Phase**

The project is for the annual replacement of 1 mile of aged and/or failing water mains in multiple locations throughout the Suburban Division, based on the design engineer's risk prioritization protocol. The design engineer (Gannett Fleming) has begun prioritization of the Cycle 6 main replacements with an anticipation of construction phase Authorization at the May 2022 Board meeting.

Fixed Base Meter Reading Stations	**Suburban Division**	**Update**	**Planning Phase**

The project focuses on securing land development and zoning approvals to construct eight fixed base water meter reading stations located throughout the Suburban Division water service area. The land development and zoning approvals will allow for the future construction of the stations as part a program to transition to a centralized advanced metering infrastructure system which will provide more consistent, timely and accurate billing to the customers. LCA will conduct additional investigatory work to refine construction costs and identify all zoning restrictions and limitations with the prospective tower sites, and present that information to the Board at a future date. A temporary base station will be erected in two locations within the Central Lehigh Division in early February and March as a pilot study to demonstrate the capabilities of Advanced Metering Infrastructure.

Arcadia West Water Storage Tank Replacement	Suburban Division	Update	Design Phase

The Arcadia West water storage tank has had several leaks in recent years and the coating system has reached the end of its useful life. A condition assessment study was done in 2019 which determined that the most cost-effective solution is to replace the aging tank with a new concrete tank. This project is for the replacement of the existing steel tank with a new tank of the same size, demolition of the existing tank, and miscellaneous yard piping and site work. Entech Engineering completed design in March 2021, the project was advertised for bid in late March 2021, and bids were opened on April 22, 2021. A Notice of Award was issued to the contractor following approval at the May 10, 2021 LCA Board meeting and the Notice to Proceed was issued in June 2021. Construction began in mid-August and is approximately 85% complete. The new tank is in operation and demolition of the old tank will occur in the spring of 2022.

Upper System Pump Station and Main Extension	Suburban Division	Update	Design Phase

Based on current and future demand for water service in the Upper System portion of the Central Lehigh Division, LCA's water system engineer, Gannett Fleming, has run various scenarios in the hydraulic model to simulate the impacts of this expected growth. The preferred alternative to increase water capacity and system resiliency in the Upper System is a system extension under Interstate-78 just west of Fogelsville and a new water booster station, which will supplement existing well supplies and pumping capacity in this area of the water system. Due to the potential near-term requirements of an industrial development slated to be constructed within the next two years in this area, the design phase of the project was approved at the 7/26/2021 Board meeting and was proceeding. However, the development project prompting the need for additional water supply in this area was terminated in January 2022. The Authority will proceed up to substantial mechanical design completion of the pump station (DEP permit level) to ensure plans are available at the time when the project may be resumed. The Authority will solicit proposals for engineering design services for the installation of a capped waterline crossing under I-78 while the PennDOT highway occupancy permit remains valid. A request will be made for the Board to approve the construction phase of the capped I-78 waterline crossing after bids are received this summer. The plan is to pause the project after that point.

WATER PROJECTS – ALLENTOWN DIVISION

Water Main Replacement Program Cycle 6	Allentown Division	NEW	Design Phase

The project is for the annual replacement of aged and/or failing cast iron water mains in multiple locations throughout the City, in accordance with the new amended lease requirements (one mile per year), based on the design engineer's risk prioritization protocol. As of December 2021, LCA has received conceptual plan approval from the City and began the process of negotiations of a cost sharing agreement for road surface restoration just as conducted in the Cycle 5 program. LCA anticipates formally submitting substantially complete plans and specifications to the City for approval by early March 2022.

Water Main Replacement Program Cycle 5	Allentown Division	Update	Project Closeout

The project is for the annual replacement of aged and/or failing cast iron water mains in multiple locations throughout the City, in accordance with the new amended lease requirements (one mile per year), based on the design engineer's risk prioritization protocol. The design engineer (Gannett Fleming) halted work on Cycle 5 in 2019 following City Compliance office acceptance of the Cycle 5 main replacement prioritization, pending available funding. LCA restarted Cycle 5 design phase for construction in 2021 of a water main replacement project. As of November 2020, LCA began the process of negotiations for cost sharing agreement with the City for road surface restoration. In December 2020 LCA formally submitted the substantially complete plans and specifications to the City for approval, and City comments were reviewed on January 19, 2021. The project was advertised for bid on March 1, 2021, pre-bid meeting was held on March 17, 2021, and bids opened on March 31, 2021. The Board authorized the construction phase of this project at the April 12, 2021 LCA Board meeting. Construction work, punch list completion and road restoration agreement with COA all have been completed as of December 2, 2021. LCA anticipates final payment to our contractor by mid-February 2022, after which the project will be closed out.

WASTEWATER PROJECTS – KLINE'S ISLAND SEWER SYSTEM (KISS) ACT 537 PLANNING

Trexlertown Area Capacity Solution Alternative	Suburban Division	Update	Planning Phase

As part of the Interim Act 537 Plan that was approved by DEP in June 2021, a conveyance capacity "bottleneck" was identified in the Trexlertown area of the Western Lehigh Interceptor, and this area was assigned a high priority due to occurrence of sanitary sewer overflows and basement backups in the vicinity. A parallel interceptor was originally conceived to run approximately from Cetronia Rd to Spring Creek Rd. An alternative concept also studied to focus on providing storage capacity in the system for this area, due to concerns about downstream hydraulic impacts. These two alternatives were studied by HDR as authorized by the Board in 2019, with results indicating downstream impacts and long construction timelines due to location in environmentally sensitive areas. A third alternative was developed which includes bypass pumping from a location at the Industrial Pretreatment Plant to a location in the Upper Macungie Township interceptor which has capacity for the additional flows, thereby relieving this bottleneck. This third alternative has been modeled successfully by Arcadis showing minimal downstream impact and a significant reduction of overflows in the Trexlertown area. An overview of these alternatives was provided to the Board in June 2021. Upon successful Special Study Act 537 Planning completion, a Part 2 permit will be submitted to DEP. Board authorization requests for planning, permitting, and design services are included under Action Items above. The Special Study Act 537 Study will be submitted to both Upper and Lower Macungie townships' planning commissions by the end of February 2022. A submission to DEP is expected by the Summer of 2022. In future Board reports, this item will be removed and replaced with the project entitled "Upper Western Lehigh Pump Station and Force Main."

Western Lehigh Service Area: Revenue Planning Tool	Suburban Division	Update	Planning Phase

As part of the long-term Act 537 planning process, a revenue planning tool is required to help predict the impact of proposed system modifications in the Western Lehigh Service Area. This tool will simulate financial impacts based on current and future flows and loads and utilizing the terms of existing inter-municipal agreements. For the alternatives being evaluated by LCA's engineering consultants for potential upgrade of the Pretreatment Plant to full treatment, the revenue planning tool will simulate changes in future flows and loads and general financial analyses to assist with decision-making regarding these alternatives. Prior phases of this work were completed in 2019 and 2020 to review the assumptions and parameters required to develop the financial model. Authorization for Phase 2 (development of the actual revenue planning tool) was approved at the 12/14/2020 Board Meeting. Final tool delivery occurred in July 2021 with additional staff evaluation of the results occurring in August. A summary of this work was provided to the Board in September. Two specific scenarios (base case and PTP upgrade option) are continuing to be modeled.

KISS System Modeling – 2021 Flow Data QA/QC	City of Allentown (AO)	Update	Planning Phase

As part of the Interim Act 537 Plan, the municipalities served by the Kline's Island Sewer System have committed to completing a sewage flow metering and modeling project beginning in 2021. The flow metering data will be used to prepare sewer modeling and identify the capital improvements needed to meet the future sewage capacity needs of the region through 2050. The flow metering program will include a mix of temporary meters (~63), existing sewage billing meters (~24), and various permanent, non-billing Signatory meters (~11). Flow metering services will be provided by Flow Assessment Services, as previously authorized in 2020. To ensure the data collected from the nine-month monitoring period are accurate and to ensure the validity of the resulting hydraulic model, a rigorous quality assurance and quality control program must be implemented. Approval of a consulting engineer's proposal for this work was granted at the January 25, 2021 Board meeting. Costs associated with these services will be paid by the City of Allentown and reimbursed through existing intermunicipal agreements and by City customers through the use of the Administrative Order Fee. The 2021 flow characterization program concluded on October 29, 2021. The fourth and final round of QA/QC was recently completed and model calibration is underway.

Kline's Island WWTP – Wet Weather Treatment Options	City of Allentown (AO)	Update	Planning Phase

As part of the final Act 537 Plan that is due to DEP by March 2025, three separate alternatives are being evaluated to address current and future wet weather events at the Kline's Island WWTP. One original alternative involves equalization tanks to store wet weather flow; a second new alternative involves internal plumbing modifications to temporarily re-route flow to ensure secondary treatment for all wet weather flow; and a third new alternative involves the construction of a high-rate wet weather treatment system known as "BioActiflo." Three rounds of bench scale testing for BioActiflo occurred in 2021 for proof-of-concept validation. The next step is a full-scale pilot facility. An authorization request for this pilot facility is expected in the third quarter of 2022.

WASTEWATER PROJECTS – SUBURBAN DIVISION

Western Lehigh Manhole Rehabilitation Project – Phase 3	Suburban Division	NEW	Design Phase

This project involves the rehabilitation of key manholes in the Western Lehigh Interceptor service area. The project includes flood-proofing, interior pipe connection grouting, exterior concrete work and sealing of manholes, particularly those manholes in close proximity to the floodway, which experience floodwater inundation. The purpose of the project is to eliminate floodwater inflow into the system. The project scope for Phases 1 & 2 included 100 manholes that were rehabilitated over the past 2 years. Design of Phase 3 of this project is set to commence investigation efforts by early March 2022 with an anticipated start of construction by mid Spring 2022.

WASTEWATER PROJECTS – ALLENTOWN DIVISION

Kline's Island WWTP: Sodium Hypochlorite System Installation Project	Allentown Division	Project Closeout	Project Closeout

This project involves the replacement of the existing gaseous chlorination system at the Kline's Island Wastewater Treatment Plant (KIWWTP). The use of gaseous chlorine for effluent disinfection, while reliable, is outdated and creates significant public health and employee safety risks. In addition, the existing equipment has reached the end of its useful life. The 2018 KIWWTP Master Plan recommended abandoning gaseous chlorine and switching to (liquid) sodium hypochlorite. The design commenced in March of 2019 and was completed in early 2020. The project was advertised for bid in February 2020, construction phase was authorized at the 6/8/2020 meeting and the contractor mobilized in late summer 2020. The project was anticipated to be completed by the end of 2021. However, final demolition of the gaseous chlorine system was paused pending completion of a Computational Fluid Dynamics (CFD) modeling of the chlorine contact tank to identify short-term improvements to improve mixing and optimize dosage rates of the new hypochlorite solution, and subsequent pursuit of a Dechlorination System Pilot Program, as described in a related project in this report. The project will be closed out and the remaining work will be completed under a separate KIWWTP Dechlorination System Installation Project.

Kline's Island WWTP: Decholorination System Pilot Program	Allentown Division	NEW	Preliminary Design

Preliminary results from a Computational Fluid Dynamics (CFD) modeling program indicate that dechlorination of disinfected plant effluent will assist with balancing fecal coliform kill and seasonal residual chlorine effluent limits, which has been a challenge with plant operations, particularly during monthly tank cleaning. Plant operations staff are currently utilizing the new hypochlorite disinfection installed in 2020 and 2021; however, they have recommended delay of demolition of the old gaseous chlorination system (under the sodium hypochlorite project) until a permanent dechlorination system is in place. This is further necessitated by stricter residual chlorine effluent limits proposed in the draft KIWWTP NPDES permit, which is anticipated to become effective in a few years following DEP approval of the long-term Act 537 Plan. DEP was consulted concerning performing a full-scale temporary dechlorination system pilot program to test the effectiveness of chemical addition in removing free and combined chlorine residuals from the plant effluent, and the pilot program was approved to proceed. Sodium Bisulfite will be used, which is a common chemical utilized at many WWTPs to achieve dechlorination. Installation of the temporary bisulfite system for full-scale pilot testing is anticipated to be completed by late winter and will run for about 4 months. Final design and DEP permitting of a permanent dechlorination system will follow completion of a successful pilot program. Demolition of the gaseous chlorine system will follow installation of the permanent dechlorination system.

Sanitary Sewer Collection System: I&I Source Reduction Program Plan (Year 2 and 3)	City of Allentown (AO)	Update	Construction Phase

This project includes the design of the City of Allentown's I&I Source Reduction Program Plan. In 2014, Video Pipe Services complete various CCTV inspections throughout twenty Primary and Secondary Basins. All pipe segments that called for complete pipe replacement have already been repaired. The remaining source reduction activities within the twenty Basins have been organized into a 5-Year Plan, with each year focusing on a different geographic region of the City's sewer collection system. Design has been approved for all five years, with the first project completed in 2020 and the last project finishing in 2023 (the Year 5 project has been incorporated into the Year 3 and Year 4 projects). Board approval for the Year 2 construction phase was granted at the March 22, 2021 Meeting. Construction began in May 2021 and was completed in late January 2022. Authorization for the Year 3 project will be requested at a March 2022 Board Meeting. This project is considered an AO expense under terms of the Lease and is City funded.

PART 3 – Open Project List – No Updates

FINANCE & ADMINISTRATION

No open projects.

SYSTEM OPERATIONS

Watershed Monitoring Program	Suburban Division	No Change	Ongoing
Lynn Township Corrective Action Plan	Suburban Division	No Change	Ongoing
Heidelberg Heights Consent Order & Agreement	Suburban Division	No Change	Ongoing
36" DI Water Main Condition Assessment	Allentown Division	No Change	Ongoing

WATER PROJECTS – SUBURBAN DIVISION

Buss Acres Pump Station Replacement	Suburban Division	No Change	Project Closeout

WATER PROJECTS – ALLENTOWN DIVISION

Water Filtration Plant: High Lift Pump VFD Replacements	Allentown Division	No Change	Construction Phase
Water Filtration Plant: 2021 Indenture Upgrades	Allentown Division	No Change	Construction Phase
Water Filtration Plant & System Master Plan	Allentown Division	No Change	Planning Phase

WASTEWATER PROJECTS – KLINE'S ISLAND SEWER SYSTEM (KISS) ACT 537 PLANNING

Regional 537 Plan Alternatives Analysis: Pretreatment Plant Upgrade Option	Suburban Division	No Change	Planning Phase
Western Lehigh Service Area: 2020 Sewer Modeling	Suburban Division	No Change	Planning Phase
Western Lehigh Service Area - Engineering & Program Support	Suburban Division	No Change	Planning Phase
Industrial Pretreatment Plant Master Plan	Suburban Division	No Change	Planning Phase
KISS System Modeling - Sewage Billing Meter QAQC Data Analytics and 2021 Flow Metering Preparation	City of Allentown (AO)	No Change	Planning Phase
KISS System Modeling - 2021 Model Expansion and Calibration	City of Allentown (AO)	No Change	Planning Phase
Kline's Island WWTP: Phase 1 AO Design Improvements	City of Allentown (AO)	No Change	On Hold

Kline's Island WWTP: Max Monthly Flow Capacity Evaluation	City of Allentown (AO)	No Change	Planning Phase
KISS System Modeling - Rain Derived Inflow and Infiltration (RDII) Analysis	Allentown Division	No Change	Planning Phase

WASTEWATER PROJECTS – SUBURBAN DIVISION

Park Pump Station Phase 2 Upgrade	Suburban Division	No Change	Design Phase
Heidelberg Heights 2021 and 2022 Sanitary Sewer Replacement Project	Suburban Division	No Change	Construction Phase

WASTEWATER PROJECTS – ALLLENTOWN DIVISION

Kline's Island WWTP: Solids Process Boiler and HVAC System Upgrade Project	Allentown Division	No Change	Design Phase
Kline's Island WWTP: Main and Auxiliary Pump Station Improvements	Allentown Division	No Change	Preliminary Design
Kline's Island WWTP: Intermediate Pump Station Improvements	Allentown Division	No Change	Preliminary Design
Sanitary Sewer Collection System: Rain Derived Inflow and Infiltration (RDII) Analysis	Allentown Division	No Change	Planning Phase
Kline's Island WWTP: 2021 Indenture Upgrades	Allentown Division	No Change	Construction Phase
Lehigh Street (Rte. 145) Water and Sewer Main Relocation Project	Allentown Division	No Change	Construction Phase

Lehigh County Authority

System Operations Review - December 2021

Presented: January 2022

Critical Activities	System	Description	Dec-21	2021 Totals	2020 Totals	Permit
			Daily Avg (MGD)	Daily Avg (MGD)	Daily Avg (MGD)	Daily Max (MGD)
Water Production	Allentown	Total	20.72	22.00	21.37	39.0
		Schantz Spring	6.82	7.29	7.31	9.0
		Crystal Spring	3.74	3.75	3.80	4.0
		Little Lehigh Creek	9.31	10.84	10.17	30.0
		Lehigh River	0.85	0.11	0.09	28.0
	Central Lehigh	Total	9.81	10.98	10.24	19.04 MGD Avg
		Feed from Allentown	6.50	7.29	6.71	7.0 MGD Avg 10.5 MGD Max
		Well Production (CLD)	3.31	3.69	3.53	8.54 MGD Avg
		Sum of all (12) other Suburban Water Systems	0.13	0.13	0.15	1.71 Sum of all wells
Wastewater Treatment		Kline's Island	27.65	32.27	32.27	40.0
		Pretreatment Plant	4.27	5.17	4.94	5.75 (design capacity)
		Sum of all (5) other Suburban WW Systems	0.16	0.21	0.21	0.36

		Dec-21	2021 Totals	2020 Totals	2019 Totals
Precipitation Totals (inches)		1.29	44.7	49.57	60.66
Compliance Reports Submitted to Allentown		17	280	275	278
Notices of Violation (NOVs)	(Allentown + Suburban)	1	3	2	1
Sanitary Sewer Overflows (SSOs)/Bypasses	(Allentown + Suburban)	3	26	44	37
Main Breaks Repaired	Allentown	1	20	19	20
	Suburban	2	14	17	12
Customer Service Phone Inquiries	(Allentown + Suburban)	731	15,857	16,772	22,992
Water Shutoffs for Non-Payment	(Allentown + Suburban)	167	1,773	280	1,956
Injury Accidents	(Allentown + Suburban)	2	8	10	10
Emergency Declarations	Allentown	0	0	(4)@$750,058	(2)@ $152,053
	Suburban	0	(1) @ $48,000	(1)@$110,000	(1) @ $19,335

Significant Repairs/Upgrades: The (38) manhole remediation project in Upper Milford Township was completed. The manholes were all lined to help prevent further decay.

Description of NOVs and/or SSOs: There were three (3) SSOs that occurred during December, 2021. LCA also received one NOV during that same timeframe. One SSO occurred in Allentown and resulted from a grease blockage. One SSO occurred in Suburban and resulted from a grease and rag buildup. Lynn Township WWTP also experienced an SSO when a high level float switch became stuck in one of the holding tanks. Sand Spring WWTP received an NOV from PaDEP, dated 12/9/2021, for monitoring and reporting violations having occurred since September, 2018. Both the NOV and LCA's response back to PaDEP pertaining to the NOV are included in this packet.

Other Highlights: LCA received the final report dated 12/22/2021 from Jim Shelton (Arcadis) pertaining to the Condition Assessment of the Park Pump Station Force Main. The recommendations suggested the project be repeated within 10 years, or prior to the 50th anniversary of the PPS being put on line.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

December 9, 2021

NOTICE OF VIOLATION

Delivered via email

Lehigh County Authority
P.O. Box 3348
1053 Spruce Street
Allentown, PA 18106

Attention: Andrew Moore, Compliance Manager

RE: Sewage
Sand Spring Wastewater Treatment Plant (WWTP)
NPDES Permit No. PA0034029
North Whitehall Township, Lehigh County

Dear Mr. Moore,

A review of the Department of Environmental Protection's ("Department") records has indicated that Lehigh County Authority has not been in compliance with the monitoring and reporting requirements for the Sand Spring Wastewater Treatment Plant, set forth in NPDES Permit No. PA0034029.

Review of Lehigh County Authority's monthly Discharge Monitoring Reports ("DMRs") for the Sand Spring Wastewater Treatment Plant WWTP has indicated a pattern of effluent violations with respect to the limitations set forth in NPDES Permit No. PA0034029. Specifically, the violations are as follows:

Monitoring Period	Parameter	Permit Limit	Reported Value
September 2018	Total Suspended Solids *Monthly Average*	2.9 lbs/day	3.0 lbs/day
October 2018	Total Residual Chlorine *Monthly Average*	1.2 mg/L	1.4 mg/L
November 2018	Total Residual Chlorine *Monthly Average*	1.2 mg/L	1.4 mg/L
July 2019	$CBOD_5$ *Monthly Average*	2.9 lbs/day	3.0 lbs/day
January 2020	Total Suspended Solids *Weekly Average*	4.4 lbs/day	5.6 lbs/day
	Total Suspended Solids *Weekly Average*	15.0 mg/L	35 mg/L

September 2020	Total Suspended Solids *Monthly Average*	10.0 mg/L	11.1 mg/L
	Total Suspended Solids *Weekly Average*	15.0 mg/l	19 mg/L
October 2020	$CBOD_5$ *Monthly Average*	10.0 mg/L	10.5 mg/L
January 2021	Total Suspended Solids *Monthly Average*	10.0 mg/L	14 mg/L
	Total Suspended Solids *Weekly Average*	15.0 mg/L	21 mg/L
May 2021	Ammonia-Nitrogen *Monthly Average*	3.0 mg/L	13.11 mg/L
	Ammonia-Nitrogen *Monthly Average*	0.9 lbs/day	4 lbs/day
June 2021	$CBOD_5$ *Weekly Average*	15.0 mg/L	23 mg/L
	$CBOD_5$ *Weekly Average*	4.4 lbs/day	8.2 lbs/day
	Ammonia-Nitrogen *Monthly Average*	0.36 lbs/day	0.70 lbs/day
July 2021	$CBOD_5$ *Weekly Average*	4.4 lbs/day	5.4 lbs/day
	$CBOD_5$ *Weekly Average*	15.0 mg/L	20 mg/L
	Ammonia-Nitrogen *Monthly Average*	0.36 lbs/day	0.5 lbs/day
August 2021	Ammonia-Nitrogen *Monthly Average*	3.0 mg/L	7.75 mg/L
	Ammonia-Nitrogen *Monthly Average*	0.36 lbs/day	1.6 lbs/day
September 2021	Ammonia-Nitrogen *Monthly Average*	3.0 mg/L	3.483mg/L
	Ammonia-Nitrogen *Monthly Average*	0.36 lbs/day	1.2 lbs/day
	Total Phosphorus *Monthly Average*	0.57 lbs/day	1.21 lbs/day
October 2021	Ammonia-Nitrogen *Monthly Average*	3.0 mg/L	3.31mg/L
	Ammonia-Nitrogen *Monthly Average*	0.36 lbs/day	1.1 lbs/day

Further review has indicated samples were not collected at the proper frequency. NPDES Permit No. PA0034029, Part A.I.A. establishes the minimum number of sampling events required to determine compliance. The following samples were not collected as required:

Monitoring Period	**Parameter**	**Required Frequency**	**Reported Frequency**
July 2019	Fecal coliform	2/month	1/month
	$CBOD_5$	2/month	1/month
	Ammonia-Nitrogen	2/month	1/month
	Total Phosphorus	2/month	1/month
	Total Zinc	1/month	None Collected

Lehigh County Authority has notified the Department of an overflow that occurred at the Sand Spring WWTP. NPDES Permit No. PA0034029, Part B.I.F. states the permittee shall take all reasonable steps to minimize or prevent any discharge, sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment. According to reports submitted by Lehigh County Authority, the following overflows occurred within the treatment plant:

Date	**Location**
12/2/20	Aeration Tank

The discharge described above is not authorized by NPDES Permit No. PA0034029 and, therefore is a violation of Section 201 of the Clean Stream Law as well as NPDES Permit No. PA0034029 itself.

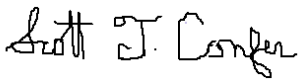
Please be advised that failure to comply with the terms and conditions of your NPDES Permit is a violation of said Permit and the Clean Streams Law of Pennsylvania, Act of June 22, 1937, P.L. 1987, as amended, 35 P.S. Section 691.1 et seq. ("The Clean Streams Law") and subjects Lehigh County Authority to appropriate enforcement action including, but not limited to, civil penalty assessment.

The Department requests that you respond in writing to this notice within 15 days of its receipt. Said response should indicate the cause of the above-described non-compliance and the steps that will be or have been taken, in order to ensure future compliance.

This Notice of Violation is neither an order nor any other final action of the Department. It neither imposes nor waives any enforcement action available to the Department under any of its statutes. If the Department determines that an enforcement action is appropriate, you will be notified of the action.

If you have any questions concerning this correspondence, you may contact me at 610-861-2135.

Sincerely,



Scott T. Confer
Water Quality Specialist
Clean Water Program

cc: North Whitehall Township

LEHIGH COUNTY AUTHORITY 1053 SPRUCE ROAD * P.O. BOX 3348 * ALLENTOWN, PA 18106-0348
610-398-2503 * FAX 610-398-8413 * www.lehighcountyauthority.org
email: AndrewMoore@lehighcountyauthority.org

December 22, 2021

Mr. Scott Confer
Water Quality Specialist
Pennsylvania Department of Environmental Protection
Bethlehem District Office
4530 Bath Pike
Bethlehem, PA 18017-9044

Re: Sand Spring Wastewater Treatment Plant (WWTP)
NPDES Permit No. PA0034029
North Whitehall Township, Lehigh County

Dear Mr. Confer:

The Lehigh County Authority (LCA) is in receipt of the Notice of Violation electronically delivered on December 9, 2021. The following is the required response to the sanitary sewer overflow and permit exceedances that occurred between September 2018 and October 2021.

Plant Background

The Sand Spring WWTP was constructed in 1972 by the developer to serve the Sand Spring development, located in the Schnecksville area in North Whitehall Township. Sewer service is provided to approximately 248 apartment units, 9 commercial properties, and an elementary school. Lehigh County Authority (LCA) acquired the system in 2005. At times the plant was having difficulties meeting its permitted limits and was reaching the end of its useful life. Design phase was authorized in February 2017 and DEP approval of the Water Quality Management Permit was finalized in late 2018. Construction was initiated in late 2020 and the plant was completed and brought online in May 2021. The plant operates under NPDES Permit No. PA0034029.

Decommissioned Plant

The prior Sand Spring WWTP was reaching the end of its useful life, which resulted in multiple plant malfunctions. The permit exceedances from September 2018 to January 2021 were the result of equipment faults, specifically the blower system. The total suspended solids (TSS) exceedances were caused by inadequate aeration due to blower deficiencies. The lack of proper aeration contributed to sludge with deficient settling capabilities, ultimately passing through the effluent discharge.

In October and November 2018, the plant exceeded the monthly total chlorine residual limit. The hypochlorite feed pumps were set at the lowest setting, but the dechlorination tablets were ineffective at removing enough chlorine residual to meet the permit limits. To rectify this issue, additional dechlorination tablets were placed in outfall pipe to assist in chlorine removal.

The carbonaceous biological demand ($CBOD_5$) exceedance in July 2019 was an error in reporting. The reported value was 3.0 lbs/day. The actual value for the month was 0.6 lbs/day. The correction will be made on the daily effluent monitoring report and will be resubmitted.

New Plant

The newly constructed plant went online in May 2021. Since start up, the plant has experienced multiple $CBOD_5$ and ammonia-nitrogen permit exceedances. The underlying reasoning behind these violations is high influent flows. In the summer of 2021, the influent bar screen was malfunctioning and using excessive amounts of wash water. In August 2021, a newly constructed warehouse was connected to the system. A flow meter to measure their discharge has been installed but is not yet operational due to supply chain issues. However, it is suspected that their discharge is exceeding their allocation. The high flows caused by these situations have been causing the sequencing batch reactors (SBRs) to operate in wet weather mode. Wet weather mode shortens the cycles, which has caused inadequate aeration in the react stages of the SBRs. While we have been able to meet our $CBOD_5$ permit limits, inadequate aeration is apparent through the presence of soluble $CBOD_5$.

In September 2021, the plant experienced a total phosphorus monthly average loading exceedance. While the effluent concentration was well below the permitted limit, the high effluent flows resulted in a loading exceedance.

LCA is investigating the cause of the high flows to the WWTP. A meeting has been scheduled with the warehouse to gather additional information. Once the wastewater meter is operational, additional data can be gathered to determine the root cause. If the flows from the warehouse are determined to be the cause of the high flows, additional actions will be taken to mitigate the issue. Once the high flows are resolved, the plant is expected to be in compliance with all permitted limits.

Reporting

In July 2019, a daily effluent monitoring reported results with improper frequencies and missing analytical results. This occurred during a transitional period of effective NPDES permits for the new plant. Staff have been retrained on the proper process and the importance of proper sampling frequencies and submittals.

SSO

On December 2, 2020, an SSO was reported from the aeration tank of the now-decommissioned WWTP. Approximately 20 gallons of mixed liquor was discharged on the ground next to the tank. The cause of this was a broken aeration drop connector, which blew liquid out of the tank and on the ground. The repair was completed upon discovery and was ultimately corrected by replacing the failing plant.

Summary

Many of the violations outlined in this Notice of Violation are attributed to aging and malfunctioning equipment and outdated processes that have been addressed through a complete replacement of the Sand Spring WWTP. The new plant was placed into service in May 2021 and LCA expects to see a significant improvement in plant performance as a result. Plant start-up issues are currently being investigated and are expected to resolve the issues with plant performance.

Lehigh County Authority is committed to our regulatory responsibilities, and we always strive for full compliance. If you have any questions, please do not hesitate to call me at 610-437-7681.

Sincerely,

Andrew Moore
Director of Plant Operations

Cc: Liesel Gross, LCA
John Parsons, LCA

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MEMORANDUM

TO: LCA Board of Directors
FROM: Liesel Gross, CEO
Andrew Moore, Director of Plant Operations
DATE: February 7, 2022
RE: 1,4 Dioxane Discharge from LCA Wastewater System

Attached: Fact Sheet, Agency for Toxic Substances and Disease Registry

This memo provides background information on an incident that occurred in 2021 regarding the discharge of 1,4 Dioxane from Lehigh County Authority's wastewater system. It is important to note that 1,4 Dioxane is currently not regulated by either the U.S. Environmental Protection Agency (EPA) or the Pa. Department of Environmental Protection (DEP). Additional information on 1,4 Dioxane is provided in the attached fact sheet prepared by the Agency for Toxic Substances and Disease Registry.

Incident Review

In February 2020, the New Jersey American Water Company notified the Delaware River Basin Commission (DRBC) of the detection of 1,4 Dioxane at their water system intake along the Delaware River. In efforts to locate the source, boat runs were conducted to collect samples throughout the Delaware River. This work tracked a source to the Lehigh River in late 2020. Additional sampling was conducted in the Lehigh River, which indicated the source was near Allentown.

On April 27, 2021, DEP conducted a sampling event at the Kline's Island Wastewater Treatment Plant (KIWWTP). The samples collected were requested by the DRBC, but LCA was not informed of what was being analyzed and the request did not appear to be out of the ordinary in any way. However, in late May 2021, DEP notified LCA that the unregulated chemical 1,4 Dioxane was detected in the KIWWTP effluent from this sampling event, at a concentration of 0.317 milligrams per liter (mg/L). A meeting with DEP and DRBC was scheduled for June 30, 2021 to review the situation.

In the intervening month after learning of the situation, but prior to the scheduled meeting, LCA undertook its own investigation to determine the source of the 1,4 Dioxane discharge. Because the chemical is unregulated, LCA had no previous wastewater data available, but pursued several different points of investigation.

- We began by researching sampling protocols and preservation requirements for wastewater samples to be tested for 1,4 Dioxane. Based on this information, we determined a sample drawn from the LCA Pretreatment Plant (PTP) on May 6, 2021 was still available, met the preservation requirements, and could be tested. Lab analysis indicated this sample contained 1,4 Dioxane at a concentration of 0.474 mg/L. This confirmed that the PTP had received waste containing this chemical, which would narrow the investigation.

- An additional LCA PTP effluent sample was collected on May 27, 2021 and resulted in a concentration of 1.860 mg/L, confirming the source was coming from the LCA PTP.

- The KIWWTP effluent was also sampled and resulted in an effluent concertation of 0.296 mg/L.

Based on this data, the conclusion was drawn that 1,4 Dioxane was being discharged into the PTP, passing through the PTP and traveling to the KIWWTP where downstream dilution was occurring to lower the overall concentration of 1,4 Dioxane in the KIWWTP effluent being discharged to the Lehigh River.

To narrow down the likely source of 1,4 Dioxane in the PTP effluent, LCA took the following steps:

- Research was conducted on the types of industries that are most likely to have this chemical present in their waste stream. This information was then cross-checked against all industrial users with active discharge permits with LCA.

- In early June 2021, multiple samples were collected from hauled waste streams of interest, based on their permits and suspected makeup of their discharges to the PTP.

- One industry sampled was Coim USA, Inc. The sample collected on June 1, 2021 was from a discharge to the PTP of approximately 6,300 gallons of hauled waste containing a 1,4 Dioxane concentration of 6,740 mg/L.

- These lab results were received on June 18, 2021, and Coim USA, Inc. was immediately suspended from discharging to the LCA via a letter dated the same day.

- Following the suspension of Coim USA's permit, the LCA PTP effluent was sampled on July 8, 2021, showing a 1,4 Dioxane concentration of 0.024 mg/L.

The immediate elimination of nearly all 1,4 Dioxane in the PTP effluent following Coim USA's permit suspension indicates the primary source of the discharge had been identified and eliminated from the waste stream. It is important to note that low levels of 1,4 Dioxane in wastewater are to be expected due to the broad array of household products that contain this chemical.

On June 30, 2021, LCA met with representatives from DEP and DRBC as scheduled to discuss the presence of 1,4 Dioxane in LCA's effluent at KIWWTP (by way of the PTP). LCA informed the agencies of the actions taken during the prior month since LCA was informed of the issue. A sampling program was developed to confirm the reduction of 1,4 Dioxane in LCA's wastewater effluent.

On August 11, 2021, LCA was contacted by New Jersey's DEP regarding Coim USA. LCA provided multiple documents including applications, manifests, lab results, correspondence, and permits relating to Coim USA, per their request. LCA is not aware of additional actions that may be taken by any regulatory agency regarding Coim USA.

On August 12, 2021, the PA DEP collected a sample for 1,4 Dioxane at the KIWWTP effluent, although results have not been made available to LCA. Additional samples were collected by LCA on September 28, 2021, with results showing a concentration of 1,4 Dioxane of <0.003 mg/L (considered to be non-detectable).

Samples results continued to be non-detectable for the remainder of 2021. Sampling for 1,4 Dioxane at the LCA PTP and KIWWTP effluent will continue quarterly moving forward.

Overview of LCA's Waste Hauler Program

Shortly after the PTP was built by the County of Lehigh in 1990, a waste hauler program was developed to allow liquid waste from haulers to be trucked in and discharged into the plant. The program was intended to optimize the use of existing capacity in this facility, which was designed to treat high-strength waste.

When LCA assumed operational responsibility for the PTP in 2006, the program was continued, and refined over the years to meet new regulatory requirements. The program was most recently updated in 2018 to align the hauler permitting process with LCA's industrial waste program run from the KIWWTP. The program requires all haulers and waste streams to be permitted and monitored at discrete times throughout the year. LCA's industrial waste program includes monitoring for 130 regulated contaminants.

In 2021, more than 58 million gallons (MG) of hauled waste were accepted at the PTP, as follows:

Industrial Waste	14 MG
Landfill Leachate	6 MG
WWTP Plant Sludges	13 MG
Hauled Septage	26 MG

The waste hauler program provides approximately $2.8 million of revenue to the PTP operation, which offsets capital improvement costs and lowers rates to all users of the system. The program provides valuable public service benefit by providing effective treatment of these challenging waste streams in a manner that meets all current regulatory requirements.

Questions & Discussion

The incident described in this memo illustrates the risks associated with LCA's waste hauler program, as well as challenges associated with the current regulatory framework for emerging contaminants. LCA's Board of Directors may wish to discuss the following questions, or other topics, at its upcoming meeting on February 14, 2022:

- Besides suspending Coim USA's permit, should LCA take any additional action?
- Should the waste hauler program be modified in any way to better address risks?
- How should LCA adjust its compliance program with respect to unregulated contaminants?

1,4-Dioxane - ToxFAQs™

CAS # 123-91-1

This fact sheet answers the most frequently asked health questions (FAQs) about 1,4-dioxane. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to 1,4-dioxane occurs from breathing contaminated air, ingestion of contaminated food and drinking water, and dermal contact with products such as cosmetics that may contain small amounts of 1,4-dioxane. Exposure to high levels of 1,4-dioxane in the air can result in nasal cavity, liver, and kidney damage. Ingestion or dermal contact with high levels of 1,4-dioxane can result in liver and kidney damage. 1,4-Dioxane has been found in at least 31 of 1,689 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is 1,4-dioxane?

1,4-Dioxane is a clear liquid that easily dissolves in water. It is used primarily as a solvent in the manufacture of chemicals and as a laboratory reagent. 1,4-Dioxane is a trace contaminant of some chemicals used in cosmetics, detergents, and shampoos. However, manufacturers now reduce 1,4-dioxane from these chemicals to low levels before these chemicals are made into products used in the home.

What happens to 1,4-dioxane when it enters the environment?

- 1,4-Dioxane can be released into the air, water, and soil at places where it is produced or used as a solvent.
- In air, 1,4-dioxane rapidly breaks down into different compounds.
- In water, 1,4-dioxane is stable and does not break down.
- In soil, 1,4-dioxane does not stick to soil particles, so it can move from soil into groundwater.
- Fish and plants will not accumulate 1,4-dioxane in their tissues.

How might I be exposed to 1,4-dioxane?

- Breathing air, drinking water, or eating foods that contain 1,4-dioxane. During showering, bathing, or laundering, 1,4-dioxane in tap water may volatilize and you can be exposed to 1,4-dioxane vapors.
- Your skin may contact 1,4-dioxane when you use cosmetics, detergents, bubble baths, and shampoos containing 1,4-dioxane.

How can 1,4-dioxane affect my health?

Few studies are available that provide information about the effects of 1,4-dioxane in humans. Exposure to very high levels of 1,4-dioxane can result in liver and kidney damage and death. Eye and nose irritation was reported by people inhaling low levels of 1,4-dioxane vapors for short periods (minutes to hours).

Studies in animals have shown that breathing vapors of 1,4-dioxane affects mainly the nasal cavity, liver, and kidneys. Ingesting 1,4-dioxane or having skin contact with 1,4-dioxane also affects the liver and kidneys.

How likely is 1,4-dioxane to cause cancer?

The limited number of studies available does not show whether 1,4-dioxane causes cancer in humans. Laboratory rats that breathed vapors of 1,4-dioxane during most of their lives developed cancer inside the nose and abdominal cavity. Laboratory rats and mice that drank water containing 1,4-dioxane during most of their lives developed liver cancer; the rats also developed cancer inside the nose. Scientists are debating the degree to which the findings in rats and mice apply to exposure situations commonly encountered by people.

The (DHHS) U.S. Department of Health and Human Services considers 1,4-dioxane as reasonably anticipated to be a human carcinogen.

1,4-Dioxane

CAS # 123-91-1

How can 1,4-dioxane affect children?

There are no studies of children exposed to 1,4-dioxane. However, children might experience health problems similar to those in adults if they were exposed to high concentrations of 1,4-dioxane.

Scientists do not know whether exposure of pregnant women to 1,4-dioxane can harm the unborn child.

How can families reduce the risk of exposure to 1,4-dioxane?

1,4-Dioxane may be a contaminant in cosmetics, detergents, bath products, shampoos, and some pharmaceuticals. 1,4-Dioxane is not intentionally added, but may occur as an unintentional byproduct in some ingredients that may be listed on the product label, including: PEG, polyethylene, polyethylene glycol, polyethoxyethylene,-eth or -oxynol . Many products on the market today (foods, pharmaceuticals, cosmetic products, detergents, etc.) contain 1,4-dioxane in very small amounts. However, some cosmetics, detergents, and shampoos may contain 1,4-dioxane at levels higher than recommended by the FDA for other products. Families wishing to avoid cosmetics containing the ingredients listed above may do so by reviewing the ingredient statement that is required to appear on the outer container label of cosmetics offered for retail sale.

1,4-Dioxane has been detected in some drinking water supplies. Bottled water may be less likely to be contaminated with 1,4-dioxane, and consumers should contact the bottler with specific questions on potential contaminants.

Is there a medical test to determine whether I've been exposed to 1,4-dioxane?

1,4-Dioxane and its breakdown products can be measured in your blood and urine, and positive results indicate you have been exposed to 1,4-dioxane. These tests do not predict whether exposure to 1,4-dioxane will produce harmful health effects. The tests are not routinely available at your doctor's office because they require special equipment, but the doctor can collect the samples and send them to a special laboratory. The tests need to be conducted within days after the exposure because 1,4-dioxane and its breakdown products leave the body fairly rapidly.

Has the federal government made recommendations to protect human health?

EPA has determined that exposure to 1,4-dioxane in drinking water at concentrations of 4 milligrams per liter (4 mg/L) for one day or 0.4 mg/L for 10 days is not expected to cause any adverse effects in children.

The Occupational Safety and Health Administration (OSHA) has set a limit for of 100 parts 1,4-dioxane per 1 million parts of air (100 ppm) in the workplace.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. Toxicological Profile for 1,4-Dioxane. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

LEHIGH COUNTY AUTHORITY 1053 SPRUCE ROAD * P.O. BOX 3348 * ALLENTOWN, PA 18106-0348
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MEMORANDUM

TO: LCA Board of Directors
FROM: Liesel Gross, CEO
DATE: February 7, 2022
RE: Emmaus Consecutive Division – PFAS Contamination

Attached: Public Notice – January 10, 2022
Memo to Borough of Emmaus – January 25, 2022

In December 2021, Lehigh County Authority learned that two drinking water supply wells in the Borough of Emmaus had test results indicating levels of Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) (collectively known as "PFAS") above the Lifetime Health Advisory level established by the U.S. Environmental Protection Agency (EPA). Contaminants in the PFAS category are currently not regulated, although there has been significant study and concern raised about PFAS in drinking water over the years. Additional information on PFAS has been prepared by the Agency for Toxic Substances and Disease Registry and is available here: https://www.atsdr.cdc.gov/pfas/index.html.

Due to the current unregulated status of PFAS, no specific action is required to address the issue beyond public notice. However, the Borough is actively seeking a solution to ensure public health is not at risk.

This issue is a concern to LCA due to the configuration of our Emmaus Consecutive Division, in which LCA purchases water from the Borough to supply drinking water to 417 homes located outside the Borough boundaries. These customers live in various locations in Upper Milford, Lower Macungie and Salisbury townships. Upon receipt of the notice from the Borough of Emmaus about the PFAS concern, LCA issued the attached public notice to its 417 Emmaus Consecutive Division customers.

In addition to notifying our customers, LCA began discussions with the Borough about its plans to address the water supply. Through these discussions, we learned that the Borough has taken one well offline so that it is no longer supplying water from this source to the Borough residents and LCA customers. The Borough has investigated the source of the PFAS contamination and linked it back to a leak of fire-fighting foam stored at its fire department training facility. The Borough is investigating solutions to address the water quality issue, including treatment options and alternative supply options.

To support the Borough's investigation, LCA conducted a preliminary review of possible interconnections with LCA systems in the vicinity of the Borough. A copy of LCA's preliminary findings is attached, and discussions are ongoing.

What is an EPA Lifetime Health Advisory?
EPA develops health advisories to provide information on contaminants that can cause human health effects when they are found in drinking water. EPA's advisories are non-enforceable and non-regulatory. A "Lifetime Health Advisory" is used to describe health risks to individuals who consume two liters of water per day, every day, for a period of 70 years.

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EMMAUS CONSECUTIVE DIVISION CUSTOMERS
IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

ENVIRONMENTAL PROTECTION AGENCY (EPA)
LIFETIME HEALTH ADVISORY EXCEEDANCE

ESTE INFORME CONTIENE INFORMACIÓN IMPORTANTE ACERCA DE SU AGUA POTABLE. HAGA QUE ALGUIEN LO TRADUZCA PARA USTED, O HABLE CON ALGUIEN QUE LO ENTIENDA.

Water Purchased from the Borough of Emmaus Has Levels of Perfluorooctane sulfonate (PFOS)/ Perfluorooctanoic acid (PFOA) Above EPA Lifetime Health Advisory Levels.

Lehigh County Authority (LCA) purchases all water for Emmaus Consecutive Division customers from the Borough of Emmaus, and it is important for you to be aware of this water quality issue. LCA recently learned that on October 21, 2021, the Borough received testing results that showed two of five wells in their system exceeded the EPA Lifetime Health Advisory Level of 70 parts per trillion (70 ng/L) for PFOS/PFOA. The Borough is responsible for all water quality testing of their wells.

What are PFOS and PFOA?

PFOS and PFOA are man-made chemicals that are part of a larger group referred to as perfluoroalkyl substances (PFAS). Because these chemicals have been used in consumer products, such as non-stick cookware, stain resistant coatings used on carpet and upholstery, water resistant clothing and cleaning products, most people have been exposed to them. PFOS is also a chemical used in firefighting foam.

According to their notice, PFOS/PFOA were found at both Well # 1 and Well # 2 within Emmaus Borough. According to notification from the Borough, Well # 1 tested at a slightly elevated level of 111 ng/L per tests conducted by the Borough. Well # 2 tested at 456.4 ng/L per tests conducted by PA Department of Environmental Protection (PA DEP) and at 700 ng/L per tests conducted by the Borough.

What happened? What was done?

The Borough of Emmaus has investigated the problem and discovered the source of the PFOS and PFOA at the Fire Training Facility located near Well # 2, and they are taking action to address the problem.

Well # 2, which was producing the high levels of PFOS and PFOA, was taken off-line and will not be used to supply water to the public until a new treatment system able to remove them is in place. This a new problem discovered late in 2021. Earlier tests conducted by the Borough in 2020 showed no evidence of PFOS or PFOA at these higher levels.

What does this mean?

This is not an immediate risk. If it had been, you would have been notified immediately. However, exposure to PFOS and PFOA over certain levels may result in adverse health effects, including developmental effects to fetuses during pregnancy or to breastfed infants (e.g. low birth weight, accelerated puberty, skeletal variations), cancer (e.g. testicular, kidney), liver effects (e.g. tissue

damage), immune effects (e.g. antibody production and immunity), thyroid effects and other effects (e.g. cholesterol changes) The EPA calculates health advisory levels to offer a margin of protection against adverse health effects to the most sensitive populations: fetuses during pregnancy and breastfed infants.

What should I do?

Talk to your doctor if you have health concerns related to this information. You do not need to use an alternative (e.g., bottled) water supply, per PA DEP.

What is LCA doing?

LCA will work with the Borough to be sure you receive information about your water quality as this situation is being addressed.

> ***Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.***

For more information, please contact the LCA Customer Care Team at 610-398-1444 or email us at service@lehighcountyauthority.org.

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email: service@lehighcountyauthority.org

MEMORANDUM

Date: January 25, 2022

To: Shane Pepe, Borough Manager, Borough of Emmaus
From: Liesel Gross, CEO, Lehigh County Authority
Re: Water Supply Options for Borough of Emmaus

Background

It was recently discovered that the Borough of Emmaus water supply had experienced high levels of PFOA/PFOS due to a contamination incident. This incident affects two of the Borough's five water supply sources, and notice was issued to Borough residents as well as 417 Lehigh County Authority (LCA) water customers who receive water purchased from the Borough system. The Borough's notice indicated a filtration system would be placed in service to address the issue.

LCA's water system is extensive, and some water infrastructure exists in close proximity to the Borough. As a result of this incident, our staff has conducted a very preliminary review of opportunities to supply water to the Borough from the LCA system. This information is being provided as a courtesy for your consideration, and we invite you to contact us if you'd like to explore these options further.

Please rest assured that if the Borough has definitively determined that the filtration option is the best course to meet the Borough's and LCA's customer needs, we trust in your judgement and simply request open communication about the project as it moves forward.

The following two sections of this memo were provided to me directly by LCA's staff engineers.

Water Modeling

Several locations were investigated for an interconnection where the LCA systems abut the Emmaus system. To support this investigation, the following information was obtained from DEP's Drinking Water Reporting System website for the Emmaus Borough public water system: average production - 1,490,933 gpd, maximum production - 2,423,200 gpd, storage capacity - 2,560,000 gal. Additionally, the main Emmaus system has an HGL (hydraulic grade line) of approximately 646.5'. It was assumed that the interconnection should be sized to supply the average day demand of 1.5 mgd (1042 gpm). The maximum day and emergency (fire) flows would come from storage.

LCA's water system hydraulic model was run to examine locations for a possible interconnection. The following table summarizes our findings.

Location	System	Comments
Fernor St & 31st St SW	LCA Allentown Division - 28th St Zone	Existing pump station requires 860 gpm+ additional capacity, main extension with meter pit. HGL appears very similar in both systems.
31st St SW & Lehigh St	LCA Allentown Division - Main Zone	Requires new pump station with 140' pump head and main extension.

Location	System	Comments
31st St SW & W Emmaus Ave	LCA Allentown Division - Main Zone	Similar requirements as 31st St SW & Lehigh St.
Olympic Dr & Indian Creek Rd	LCA Suburban Division	Requires new pump station with 80' pump head and main extension with creek crossing.
Lower Macungie Rd & Macungie Rd	LCA Suburban Division	Requires new pump station with 57' pump head and main extension with creek crossing and Turnpike crossing.

The attached maps show the locations investigated.

Findings

It appears the existing pump station in the Allentown Division's 28th St Zone cannot serve Emmaus without a major upgrade or a complete replacement of the station, which may be cost-prohibitive.

The remaining two options for service from the LCA's Allentown system are connections to a 12" waterline in 31 St SW. Although there are newer mains at Lehigh St, a connection near W Emmaus Ave is much closer to the Borough. Note that City approval would be needed for an interconnection, whether temporary or permanent.

Connection to LCA's Suburban Division involves larger pumps, as well as potentially longer main extensions with a creek crossing.

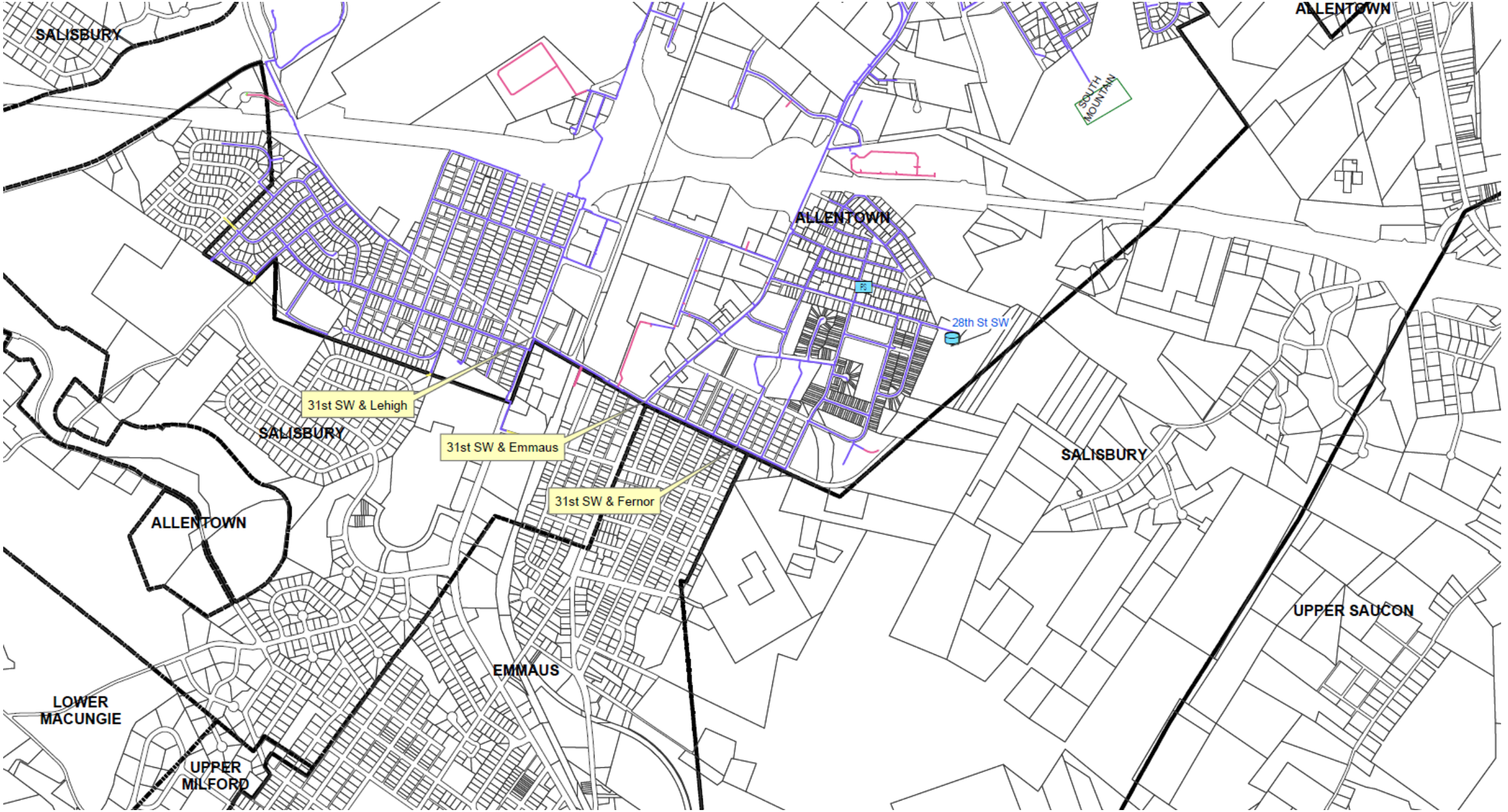
While a connection to LCA's Allentown Division appears to be potentially more cost-effective, this is not a detailed evaluation. No detailed site investigations were performed, and any location selected for the interconnection would be subject to all state and local zoning and building permit requirements. Sufficient land, whether fee simple or easement, must be obtained for the pump station.

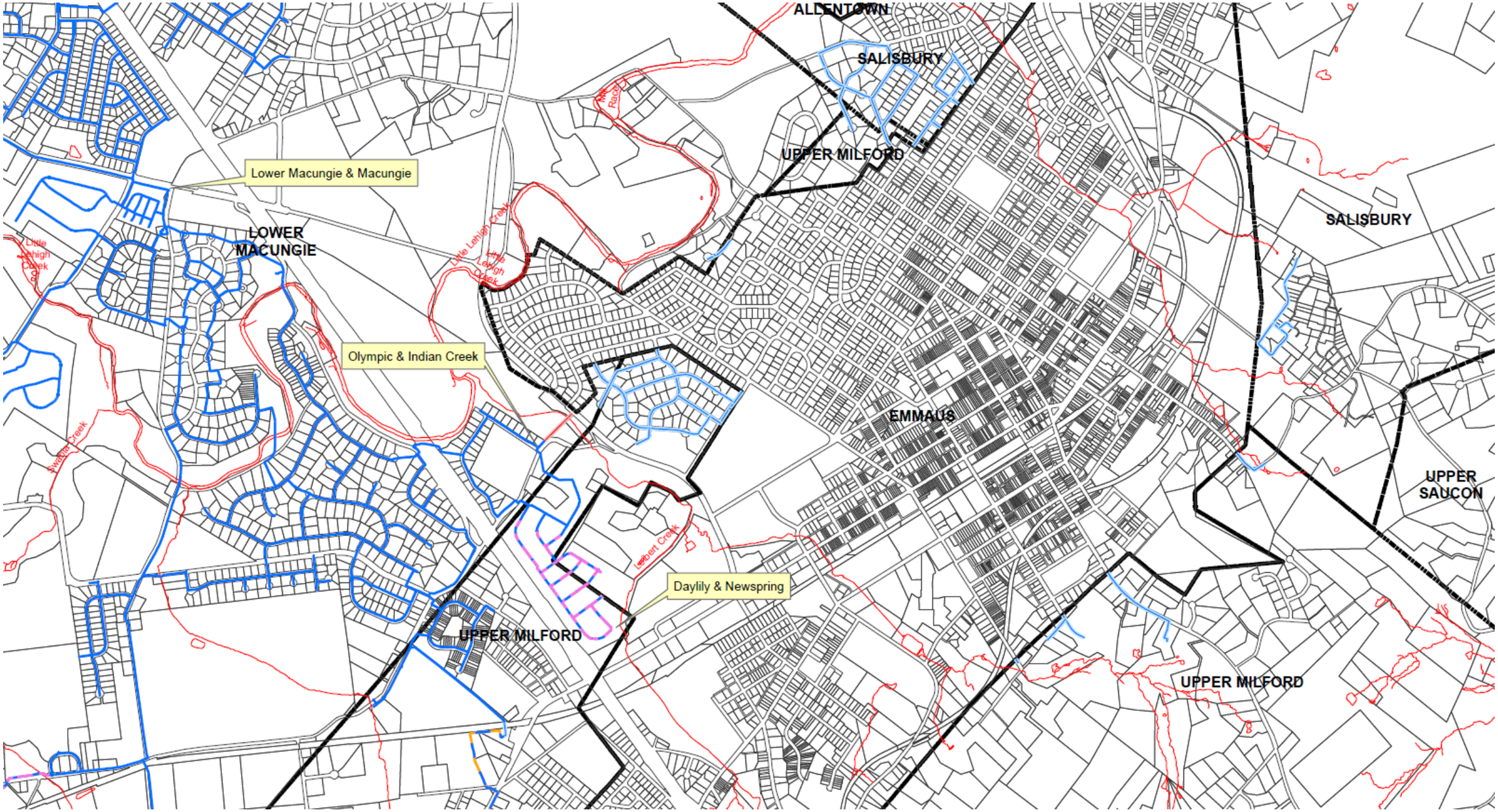
Providing a partial supply through more than one interconnection requires additional investment and was not further considered as sufficient supply is available from any of the locations investigated.

A high-level cost estimate can be provided upon request if any of the conceptual options described in this memo are of interest to the Borough.

Conclusion

I am hopeful the information shared in this memo is helpful and illustrates LCA's commitment to collaborating with the Borough in any way that supports our shared goals of providing high quality service to our community. If you'd like to discuss this topic, or any other ways that LCA can better support the Borough's goals related to water or sewer service, please contact me!


SALISBURY
ALLENTOWN
SOUTH MOUNTAIN
ALLENTOWN
28th St SW
31st SW & Lehigh
SALISBURY
31st SW & Emmaus
31st SW & Fernor
SALISBURY
ALLENTOWN
UPPER SAUCON
EMMAUS
LOWER MACUNGIE
UPPER MILFORD


ALLENTOWN
SALISBURY
UPPER MILFORD
Lower Macungie & Macungie
LOWER MACUNGIE
Little Lehigh Creek
Olympic & Indian Creek
EMMAUS
SALISBURY
UPPER SAUCON
Swabia Creek
Daylily & Newspring
UPPER MILFORD
UPPER MILFORD