LEHIGH COUNTY AUTHORITY

LCA Main Office:
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Wescosville, PA 18106
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Agendas & Minutes Posted:
www.lehighcountyauthority.org

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BOARD MEETING AGENDA – December 13, 2021 – 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
   - *November 8, 2021 Board meeting minutes*
   - *November 10, 2021 Special Board meeting minutes*
4. Public Comments
5. Action / Discussion Items:

   FINANCE AND ADMINISTRATION
   - *2022 Board Meeting Schedule (Approval)* ***(pink)*** *(digital Board packet, page 11)*
   - *Resolution 12-2021-1 – Customer Facility Fees; Connection Fees; and Suburban Wastewater Tapping Fees (Approval)* ***(blue)*** *(digital Board packet, pages 12-46)*
   - *LCA Strategic Plan (Approval)* ***(white)*** *(digital Board packet, pages 47-70)*

   WATER

   WASTEWATER
   - *Suburban Division – Industrial Pretreatment Plant Master Plan (Approval)* ***(green)*** *(digital Board packet, pages 71-83)*
6. Monthly Project Updates / Information Items (1st Board meeting per month) **– December report attached** (digital Board packet, pages 84-96)
7. Monthly Financial Review (2nd Board meeting per month)

8. Monthly System Operations Overview (2nd Board meeting per month)
9. Staff Comments
10. Solicitor's Comments
11. Public Comments / Other Comments
12. Executive Sessions
13. Adjournment

UPCOMING BOARD MEETINGS		
January 10, 2022	January 24, 2022	February 14, 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
November 8, 2021

The Regular Meeting of the Lehigh County Authority Board of Directors was called to order at 12:00 p.m. on Monday, November 8, 2021, 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, Richard Bohner, Norma Cusick, Ted Lyons, 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.

REVIEW OF AGENDA

Liesel Gross announced that there were no changes to the agenda and no Executive Session is planned. There will, however, be an item under Staff comments.

APPROVAL OF MINUTES

October 25, 2021 Meeting Minutes

On a motion by Richard Bohner, seconded by Amir Famili, the Board approved the minutes of the October 25, 2021 Board meeting as written (7-0).

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.

PUBLIC COMMENTS

None.

ACTION AND DISCUSSION ITEMS

2022 Water & Wastewater Rate Schedules (Approval)

Liesel Gross commented that the proposed 2022 rates were previously discussed during the 2022 Budget process and reminded everyone how a municipal authority, non-profit structure works. She reviewed the impact of the 2020 amendment to the Allentown Water and Sewer Lease Agreement (Lease), which included a series of phased-in rate increases to support necessary capital improvements in the City water and sewer systems. These rates have been incorporated into the 2022 water and sewer rates for the Allentown Division. She also noted the 2020 amendment to the Authority's water purchase agreement with the City, which changed the way the water purchase rate is calculated. In 2022, the cost increase to the Authority's Suburban Water division is approximately $750,000, which is included in the 2022 Suburban Water rate proposal. This cost increase is due primarily to the increased investment in capital upgrades at the water filtration plant.

Jeff Morgan asked about the capital projects that will be paid for through the City of Allentown American Rescue Plan funds, and whether this funding will offset the rates associated with future capital improvements. Liesel Gross explained that any project funding received from the City via its American Rescue Plan funds will offset the capital cost recovery costs that apply to City customers but would not impact Suburban Water rates.

Liesel Gross continued to review the 2022 rate proposal, noting that the Suburban Water Division rate increase also includes funding of $2.4 million for repair and replacement types of projects, which will limit the need to borrow in the future. She reviewed the Suburban Wastewater rate schedule, noting that the Western Lehigh and City signatory rates are developed using formulas included in the intermunicipal agreements. She explained that all rates presented in the schedules were previously reviewed with the Board, and they are presented with no changes from the prior discussions during the 2022 Budget process. She also noted that the City of Allentown has reviewed the Allentown Division water and sewer rates associated with the Lease, and the City has provided its agreement with the Authority's calculations.

Ms. Gross is asking for Board approval of the 2022 water and wastewater rates as presented. She noted that the rate schedules would be updated again in December after the 2022 Tapping Fees are presented for review and approval by Board resolution.

Ted Lyons commented on Allentown Division rates, which need to cover the debt service from the Authority's Lease payment to the City of Allentown, which used the funds to pay the City's pension fund debt. He asked if the Authority didn't have to fund that debt, would the Allentown Division water and sewer rates be more competitive, or are other municipalities doing the same thing and including pension costs or other unrelated expenses into their water and sewer rates. Ms. Gross responded that every community has a different formula for establishing their water and sewer rates, and some communities may be including similar costs in their rate schedules. Amir Famili commented that it's difficult to compare water and sewer rates between various municipalities since it is unknown what is included in the expenses that drive the rates.

Jeff Morgan asked if the City's sewer signatory rates are included in the wastewater rate schedule, and how these rates are determined. Ms. Gross explained that the wastewater signatory rates for the City of Allentown are not included in rate schedule. The 2022 rates are estimated based on the 2022 Budget and the current flows and loads from each municipality. After the end of the year, in early 2023, a true-up calculation will be completed based on actual expenses, flows and loads. This process is outlined in the intermunicipal agreements and is therefore not included in the Authority's rate schedule.

Liesel Gross explained that the 2022 proposed rates were published in advance of the 2022 Budget approval, including notice published in the customer newsletter, issued to large industrial customers and municipalities, and posted on the Authority website for public comment. If any public comments are received prior to the January 1, 2022 effective date of the rates, they will be brought before the Board.

On a motion by Linda Rosenfeld, seconded by Jeff Morgan, the Board approved the proposed 2022 Water and Wastewater Rate Schedules (7-0).

A roll call vote was taken with the following votes cast:

Brian Nagle – yes
Richard Bohner – yes

Norma Cusick – yes
Ted Lyons – yes
Linda Rosenfeld – yes
Jeff Morgan – yes
Amir Famili – yes

Kline's Island Sewer System – Regional Sewer Capacity & Wet-Weather Planning: Rain Derived Inflow and Infiltration (RDII) Analysis (Approval)

Phil DePoe presented details of the roles and responsibilities held by the Authority, City of Allentown, municipalities and various consultants for the development of Kline's Island Sewer System (KISS) Act 537 plan. Some key responsibilities of the municipalities are that they attend monthly meetings and provide sewer flow projections and growth projections for their communities through the 2050 planning horizon. He stated that the municipalities are responsible for implementation and execution of their own infiltration and inflow (I&I) projects. Mr. DePoe also stated that the Authority and the City of Allentown have a strong relationship and communication regarding the planning activities. AECOM has been retained by the Authority to provide technical leadership and assist with financial evaluations and scenario planning. ARRO has already completed the Interim Act 537 Plan and may be retained to complete the final Act 537 Plan, which is due to be submitted to the Pa. Department of Environmental Protection (DEP) in March 2025. Kleinfelder is providing technical engineering analysis and support for the alternatives related to expansion of the Kline's Island Wastewater Treatment Plant. Jacobs is providing technical engineering analysis and support for the alternatives related to the expansion and conversion of the Authority's Pretreatment Plant. Arcadis is serving in two roles within the Act 537 planning process. First, Arcadis is supporting the Western Lehigh sewer signatories in the Authority's Suburban Wastewater division including general planning and engineering support for the municipalities' I&I removal programs. Second, Arcadis is completing the hydraulic modeling and conveyance system alternatives analysis for the entire KISS system.

Mr. DePoe explained that the authorization for the Rain Derived Inflow and Infiltration (RDII) Analysis relates to Arcadis' role in developing the hydraulic model and conveyance system alternatives analysis for the entire KISS system. The RDII analysis will use data from storm events that occurred in the 2021 flow monitoring period to determine the nature and extent of I&I in the municipal signatory sewer collection systems. The Authority will retain Arcadis to provide the RDII analysis of the data, by basin, and inform the municipalities of the findings. These efforts are expected to be complete by March 2022. This analysis will then be used by each municipality to develop their I&I source removal plans for the future. The I&I source removal plans are needed in 2022 to provide data to Arcadis' hydraulic modeling work, so flow reductions from effective system rehabilitation can be included in the alternatives analysis

Chairman Nagle asked how involved DEP is with this portion of the Act 537 Plan, and whether DEP will monitor the municipalities' performance in reducing I&I. Mr. DePoe said DEP is very involved in this project, and quarterly reports are being sent to DEP detailing work completed by each municipality. However, it is unknown whether DEP is monitoring the I&I removal work in detail. Liesel Gross noted that the RDII analysis and each municipality's I&I source removal plans must be completed and submitted as part of the Act 537 Plan, and DEP will be reviewing the plan for completeness in 2025.

Jeff Morgan commented about the I&I language in the agreements and asked how the municipalities are held accountable for removing I&I. Ms. Gross stated that the current agreements do not give the Authority the ability to enforce certain projects to be completed on the municipal level, but more

discussion will be needed over the next two years regarding how to modernize the agreements. Chairman Nagle asked how the Authority plans to reach common ground with the municipalities on these issues. Ms. Gross said it is early in the process and noted that some legal and financial consulting support may be needed to fully develop the necessary approach with the intermunicipal agreements.

There was some discussion regarding the RDII analysis, the need for quality data and benchmarks.

On a motion by Ted Lyons, seconded by Amir Famili, the Board approved the Capital Project Authorization for the RDII Analysis in the amount of $130,000.00 which includes the Professional Services Authorization to Arcadis for the RDII Analysis in the amount of $110,000.00 (7-0)

Suburban Division – Western Lehigh Service Area – Engineering & Program Support (Approval)

Phil DePoe stated that this request is for engineering and program support to the Western Lehigh sewer signatories for work related to the Act 537 Plan development and associated tasks. The support is for tasks not defined in other project specific authorizations. As noted previously, Arcadis provides this support to the Western Lehigh communities and has done so for many years. The last authorization for funding was in February 2020.

On a motion by Jeff Morgan, seconded by Linda Rosenfeld, the Board approved the Capital Project Authorization for the Suburban Division – Western Lehigh Conveyance Engineering and Program Support in the amount of $120,000.00 which includes the Professional Services Authorization to Arcadis for the Suburban Division – Western Lehigh Conveyance Engineering and Program Support in the amount of $100,000.00 (7-0).

MONTHLY PROJECT UPDATES / INFORMATION ITEMS

Liesel Gross reviewed the monthly project report and noted that there are currently no items on the agenda for the second meeting in November. She pointed out that the Authority's 2020 Audit & Financial Statements were completed in April 2021, not September 2021 as noted. Since the audited financial statements have not yet been received from PMRS, the audit report will not be ready for the next meeting in November. Ed Klein said that the Authority has issued all required notices regarding the delay. He noted that the PMRS fund performance has continued to be strong, but PMRS appears to be struggling with their software system administration and employee turnover, which has resulted in this delay.

STAFF COMMENTS

Liesel Gross commented that Allentown City Council voted to allocate approximately $15 million of their American Rescue Plan (ARP) funds for water and sewer projects in the City. The American Rescue Plan Act provides funding directly to municipalities for various specific uses, including investment in water and sewer infrastructure. The ARP funds need to be allocated by 2024 and used by 2026. The funds are intended to benefit the community. Allentown City Council voted to use a portion of the ARP funds for sewer system rehabilitation, water main replacements, and water filter upgrades at the water plant. The funding will offset what the Authority will need to pay for these projects, which will then offset the capital cost recovery charge applied to the City customers' water and sewer bill.

Jennifer McKenna, City of Allentown Office of Compliance, commented that the City will be developing the requirements for the use of these funds, and her office will be working with the Authority staff to ensure the process is transparent.

SOLICITOR'S COMMENTS

None.

PUBLIC COMMENTS / OTHER COMMENTS

Linda Rosenfeld commented that she viewed a recent Lehigh Valley Chamber of Commerce virtual event on the topic of the region's future water and sewer needs, and commended Liesel Gross on her presentation. Ms. Gross thanked Ms. Rosenfeld for attending the meeting. She also reported that Mark Bowen gave a presentation at the Environmental System Researching Institute conference recently in California regarding how to leverage technology and GIS systems in developing a lead service line inventory for water systems. Chairman Nagle commended the staff for their participation in industry events and public presentations of this nature.

Jennifer McKenna, City of Allentown Office of Compliance, commented on statements made earlier in the meeting and in prior meetings about the Allentown pension obligation driving the Authority's debt service expenses due to the structure of the lease. She stated that while the City's pension was a driving force behind the City's original approach to the lease, the Authority's debt is based on its own evaluation of the value of the system via its bid submission to the City. The City would like to move forward with the Authority in a partnership approach. Chairman Nagle agreed with Ms. McKenna and thanked her for her comments.

EXECUTIVE SESSION

None.

ADJOURNMENT

There being no further business, the Chairman adjourned the meeting at 1:14 p.m.

Richard Bohner
Secretary

SPECIAL MEETING MINUTES
November 10, 2021

The Special Meeting of the Lehigh County Authority was called to order at 12:34 p.m. on Wednesday, November 10, 2021, 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 in-person location was the Authority's Pretreatment Plant located at 7676 Industrial Drive, Allentown, PA. A Roll Call of Board members present was taken. Chairman Brian Nagle, Richard Bohner, Norma Cusick, Ted Lyons, Linda Rosenfeld, Jeff Morgan, and Amir Famili were present for the duration of the meeting. Authority Staff member Liesel Gross was also in attendance.

REVIEW OF AGENDA

There are no changes to the agenda. An Executive Session is planned to discuss matters related to personnel.

PUBLIC COMMENTS

None.

ACTION AND DISCUSSION ITEMS

LCA Strategic Plan Workshop

Liesel Gross provided an overview of the topics for discussion in this special session of the Authority's Board of Directors. The purpose of the meeting is to discuss the Authority's future strategic plan, that has been under development for the past several months. To provide the background for the discussion, Ms. Gross will provide an organizational overview, review key organizational documents, and lead a discussion on Board member roles and responsibilities. This discussion will be followed by a review of key strategies being developed for the Authority's new strategic plan, with Board feedback requested regarding the priorities that have been selected.

Ms. Gross reviewed a presentation of Authority background information including the structure under the Pa. Municipality Authorities Act ("the Act") and the history of the organization's Articles of Incorporation. She reviewed the allowable purposes of a municipal authority under the Act, which includes water and sewer system operations along with many other allowable purposes. Linda Rosenfeld asked if the Authority would be allowed to conduct work in any of the areas allowed under the Act such as transportation or parking services. Richard Bohner noted that in the late 1960s and 1970s, the Authority has some responsibility for managing solid waste, which was discontinued after some time. Liesel Gross noted that the Authority's official documents do not specify that the organization will focus on the water and sewer services it currently provides. However, if the Board determined it would be beneficial to pursue other opportunities allowable under the Act, it would be advisable to discuss such a change with the County of Lehigh to ensure alignment with the County's goals. The County of Lehigh formed the Authority in 1966 and the County continues to hold responsibility for appointing the Authority's Board members and for any changes in the Authority's Articles of Incorporation.

Ms. Gross continued the presentation with a summary review of the Board Norms and By-Laws documents, followed by a review of selected responsibilities that have been delegated to the staff by Board resolution. Ted Lyons asked for more information on the duties of each Board officer, and

which of those duties have been delegated to staff. Ms. Gross noted that a detailed analysis was not prepared for this meeting, but could be completed. Chairman Nagle recommended working on the analysis and requested that the staff and solicitor present this information at a future Board meeting. Ms. Gross noted she would work with the Chairman on the schedule and format of these future discussions.

Ms. Gross asked the Board for input on the Authority's overall responsibility to the community, customers, the County of Lehigh, and other stakeholders. The organizational documents reviewed earlier in the meeting outline some transactional requirements, but the Board should discuss other responsibilities and its mission as part of the strategic planning process.

Board discussion followed.

Chairman Nagle noted that the Board has a responsibility to protect the organization financially and from a community relations standpoint. Board members have a responsibility to represent the organization properly. Amir Famili stated that the Board is responsible for setting the direction of the organization, and asked how that is captured in the By-Laws or other documents. Chairman Nagle noted that setting direction for the organization is accomplished by how the Board meetings are conducted, directing staff through Board actions or requests, approving the annual budget and specific project authorizations. The strategic planning process is a key activity that the Board has been involved in this year. He said he anticipates the strategic plan will include goals and priorities related to how the staff will increase its involvement with the community and report on progress to the Board.

Ted Lyons asked if the Board has any specific obligations to the County of Lehigh due to the structure of the organization. Liesel Gross reviewed the Authority Board member appointment process conducted by the County Executive and the annual report provided to the County Board of Commissioners. Through these mechanisms, some feedback is provided to the organization about the County's concerns and goals for the Authority. However, the Board is appointed to make decisions for the Authority. There was some additional discussion about the Authority's involvement with the Board appointment process and how feedback is provided to the County regarding the Authority's needs. Ms. Gross explained that most communication is handled between County staff and Authority staff, and the Authority staff is expected to be the primary spokesperson representing the Authority when information is shared with the County.

Liesel Gross then reviewed the status of the strategic planning process that has been under way for several months. She provided a brief presentation of the proposed new Mission and Vision statements and reviewed the six priority areas that have been selected for the next five years. These priority areas include: Operational Excellence, Financial Stewardship, Regional Collaboration and Leadership, System Capacity and Reliability, Employee Engagement and Safety, and Customer Engagement and Support. She explained that from these six priorities, 21 specific strategies have been developed, which break down further into more than 200 activities that will be scheduled into an implementation plan over the next several years. She noted this is a very detailed plan that is designed to increase employee engagement in the Authority's strategic plan because there are clear ties to work that is completed within every department and every level of the organization.

Ms. Gross explained that because the plan is very detailed and will require significant investment of time and effort to complete, it is important for the Board to provide input on what the most important goals are for the organization. Board discussion followed regarding the top priorities. Board members agreed that the four most important areas for the Authority in the next five years are:

1. Standardizing the Authority's asset management approach
2. Leveraging technology to simplify and improve processes

3. Increase system capacity to meet future community needs
4. Ensure a safe working environment

Chairman Nagle also expressed interest in ensuring the organization's staffing structure is in place to properly support the Authority and its leadership. Ted Lyons agreed and noted that it is important to have the right people in the right seats within the organization to help move these key priorities forward.

EXECUTIVE SESSION

An Executive Session was held at 1:28 p.m. to discuss matters of personnel. The Executive Session ended at 2:48 p.m.

Following the close of the Executive Session, Liesel Gross reviewed concluding questions for the Board regarding the next steps in the Authority's strategic planning process. Board members agreed to move forward with full presentation of the plan at the next Board meeting in December, and requested quarterly reporting to the Board on the key topics included in the plan. Ms. Gross will discuss the schedule and process for reporting these items to the Board with the Chairman.

PUBLIC COMMENTS / OTHER COMMENTS

None.

ADJOURNMENT

There being no further business, the Chairman adjourned the meeting at 2:53 p.m.

_____

Richard H. Bohner
Secretary

LEHIGH COUNTY AUTHORITY BOARD
2022 MEETING SCHEDULE

Meetings of the Lehigh County Authority ("LCA") Board are held on the 2nd & 4th Mondays of each month, except as noted below. All LCA Board meetings begin at Noon, 12:00 p.m. Due to the COVID-19 Pandemic emergency, and until further notice, LCA Board meetings will be held at LCA's Main Office as well as online using the Zoom Meetings internet application, or other video and audio advanced communication technology (ACT). LCA Board meetings are open to the public. Public participation at the meeting is welcomed. Instructions for joining the meeting online or by phone are posted on the LCA website the morning on the day of the meeting, prior to the start of each meeting. Please visit https://www.lehighcountyauthority.org/about/lca-board-meeting-videos/ for specific instructions to join the meeting. The Board's meeting agenda and other meeting materials are also posted on LCA's website. You may also issue comment to LCA via email to LCABoard@Lehighcountyauthority.org in advance of any meeting or view a recording of the meeting at a later time by visiting the LCA website. Comments received prior to a meeting will be read at the Board's meeting and become part of the public record.

Board Meetings

January 10, 24

February 14, 28

March 14, 28

April 11, 25

May 9, 23

June 13, 27

July 11, 25

August 8, 22

September 12, 26

October 10, 24

November 14, 28

December 12

BRIAN NAGLE
Chair

RESOLUTION NO. 12-2021-1

(Duly adopted 13 December 2021)

A RESOLUTION ESTABLISHING THE VARIOUS COMPONENTS OF THE LEHIGH COUNTY AUTHORITY CAPITAL RECOVERY FEES FOR THE CITY DIVISION WATER SYSTEM CONNECTION FEE; THE CUSTOMER FACILITIES FEES FOR THE CITY DIVISION WATER SYSTEM AND THE SUBURBAN DIVISION WATER AND WASTEWATER SYSTEMS; AND THE CAPITAL RECOVERY FEES FOR THE VARIOUS SUBURBAN DIVISION WASTEWATER SYSTEMS.

WHEREAS, Lehigh County Authority ("Authority") is a Pennsylvania municipal authority incorporated by the County of Lehigh in accordance with the Municipality Authorities Act to provide, among other services, wastewater and water services; and

WHEREAS, the Authority owns and/or operates water and wastewater systems throughout the Lehigh Valley of Pennsylvania, which systems are divided between its City of Allentown and Suburban Divisions; and

WHEREAS, the Authority charges certain rates and fees for use of and connection to its systems; and

WHEREAS, the Authority desires to establish its fees in accordance with §5607 of the Municipality Authorities Act, as amended by legislative action in December 2003, setting forth the appropriate fee components; and

WHEREAS, the Authority has calculated the allowable basis for such fees for certain of its wastewater and water systems in accordance with the attached calculations and its summary of the Capital Recovery Fees for the City Division Water System Connection Fee, the Customer Facilities Fees for the City Division Water System and the Suburban Division Water and Wastewater Systems (as Attachment A) and the Suburban Division Wastewater Systems Capital Recovery Fees (as Attachment B), the current version of which, as well as any future changes thereto, is made a part hereof as if included herein; and

NOW THEREFORE, the Lehigh County Authority, pursuant to powers invested in it by the Pennsylvania Municipality Authorities Act, as amended, hereby resolves that:

1. The capital recovery fees for wastewater and water service in various of the Authority's wastewater and water systems as indicated and shown on Attachment A, *LCA Customer Facilities Fees and Connection Fees, Allentown and Suburban Divisions - Water and Wastewater* and Attachment B, *Lehigh County Authority Sewer System Tapping Fee Calculations for Suburban Wastewater Division, December 2021*, attached hereto and made a part hereof, are adopted effective 1 January 2022.

2. The Authority's Schedules of Rates and Charges shall be amended to reflect the fees hereby adopted, which fees shall be effective as of 1 January 2022.

3. All other Authority cost recovery fees, customer facilities fees, connection fees, and tapping fees, not contained in Attachment A or Attachment B hereto, continue in place, and are unaffected hereby.

On motion of_____, seconded by _____, this Resolution was adopted the 13th day of December 2021.

Tally of Votes: Yeas _____ Nays _____

I, Michael A. Gaul, Esquire, of the law firm of King, Spry, Herman Freund & Faul, LLC, Solicitor of Lehigh County Authority, do hereby certify that the foregoing is a true, correct and complete copy of a resolution which was duly adopted by the Authority at a public meeting of the Authority held on 13 December 2021, after notice thereof had been duly given as required by law, at which meeting a quorum was present and voting and which resolution No. 12-2021-1 is now in full force and effect on the date of this certification.

_____

Michael A. Gaul, Esquire Date
King, Spry, Herman Freund & Faul, LLC
Lehigh County Authority Solicitor

Attest:

_____

Lisa J. Miller Date
Executive Administrative Support Specialist

ATTACHMENT A
LCA CUSTOMER FACILITIES FEES AND CONNECTION FEES
ALLENTOWN AND SUBURBAN DIVISIONS - WATER AND WASTEWATER

Suburban Division - Water System - Customer Facilities Fees

Meter Component - With DC Backflow

Meter Size	2022 Supply Cost	2022 Labor Cost	2022 Rate
5/8”	$353	$116	$469
5/8” Pit	$368	$116	$484
3/4”	$366	$116	$482
3/4” Pit	$379	$116	$496

Meter Component - With No Backflow

Meter Size	2022 Supply Cost	2022 Labor Cost	2022 Rate
5/8”	$309	$116	$426
5/8” Pit	$325	$116	$441
3/4”	$323	$116	$439
3/4” Pit	$336	$116	$452
1”	$427	$116	$543
1” Pit	$398	$116	$514
1 1/2” Displacement	$740	$50	$790
1 1/2” Turbine	$1,086	$50	$1,136
1 1/2” Compound	$1,490	$50	$1,540
2” Displacement	$967	$50	$1,017
2” Turbine	$1,121	$50	$1,171
2” Compound	$1,701	$50	$1,751

Suburban Division - Wastewater System - Customer Facilities Fees

Meter Purchase Only (Plumber Install)

Meter Size	2022 Supply Cost	2022 Inspection Fee	2022 Rate
5/8”	$309	$50	$359
5/8” Pit	$325	$50	$375
3/4”	$323	$50	$373
3/4” Pit	$336	$50	$386
1”	$427	$50	$477
1” Pit	$398	$50	$448
1 1/2” Displacement	$740	$50	$790
1 1/2” Turbine	$1,086	$50	$1,136
1 1/2” Compound	$1,490	$50	$1,540
2” Displacement	$967	$50	$1,017
2” Turbine	$1,121	$50	$1,171
2” Compound	$1,701	$50	$1,751

Allentown Division - Water System - Customer Facilities Fees

Meter Size	2022 Meter Price	Components	2022 Labor Cost	2022 Rate
5/8"	$89	$124	$91	$304
3/4"	$152	$124	$91	$367
1"	$140	$123	$91	$354
1 1/2"	$301	$254	$91	$646
2"	$392	$339	$91	$822
3" Compound	$1,745	$232	$50	$2,027
3" Turbine	$1,208	$232	$50	$1,490
4" Compound	$3,031	$272	$50	$3,353
4" Turbine	$2,352	$272	$50	$2,673
6" Compound	$5,380	$357	$50	$5,786
6" Turbine	$4,350	$357	$50	$4,757
8" Compound	$8,690	$511	$50	$9,252
8" Turbine	$7,382	$511	$50	$7,944

Other Components	2022 Price
5/8" Meter Horn	$54.16
3/4" Meter Horn	$58.97
Curb Box - Metal	$84.15

Allentown Division - Water System - Water Connection Fees

Water Taps 3/4 inch - 2 inch

	Corporation	Tail Piece	Saddle Clamp	Employee Wages	Equipment	2022 Rate
Size 3/4 "	$32	$25	$0	$250	$72	$378
Size 1 "	$62	$36	$0	$250	$72	$420
Size 1 1/2"	$143	$83	$66	$250	$72	$614
Size 2 "	$245	$143	$66	$250	$72	$775

Water Sleeve and Valve Connectors

	Valve	Casing	Tapping Fitting	Employee Wages	Equipment	2022 Rate
Size 4"x 4"	$728	$162	$663	$736	$243	$2,532
Size 6"x 4"	$728	$162	$691	$736	$243	$2,560
Size 6" x 6"	$1,029	$162	$788	$736	$243	$2,957
Size 8"x 4"	$1,527	$162	$716	$736	$243	$3,383
Size 8"x 6"	$1,527	$162	$796	$736	$243	$3,464
Size 8"x 8"	$1,527	$162	$989	$736	$243	$3,657
Size 12"x 4"	$920	$162	$3,478	$736	$243	$5,539
Size 12"x 6"	$1,012	$162	$3,478	$736	$243	$5,631
Size 12"x 8"	$1,223	$162	$3,478	$736	$243	$5,842
Size 12"x 12"	$2,596	$162	$3,478	$736	$243	$7,215

Attachment B

LEHIGH COUNTY AUTHORITY

SEWER SYSTEM TAPPING FEE CALCULATIONS FOR SUBURBAN WASTEWATER DIVISION

December 2021

Keystone Alliance Consulting, Inc.

LEHIGH COUNTY AUTHORITY – SUBURBAN WASTEWATER DIVISON
SEWER SYSTEM TAPPING FEE CALCULATIONS

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LEHIGH COUNTY AUTHORITY – SUBURBAN WASTEWATER DIVISON SEWER SYSTEM TAPPING FEE CALCULATIONS

SUMMARY OF FEES CALCULATED FOR ACT 57 TAPPING FEE STUDY

On December 19, 1990, the Pennsylvania State Legislature enacted Act 209 of 1990, which amends the Act of July 31, 1968 (P.L. 805, No. 247). One of the provisions of that law requires municipalities that assess tapping or similar water and sewer fees to comply with the requirements of Act 203 of 1990, which amended Section 4 of the Municipalities Authorities Act. Subsequently, on December 30, 2003, the aforesaid Act 203 was amended by Act 57 of 2003 (hereinafter referred to as the "Act"). The intent of the Act was to clarify certain sections of the aforesaid Act 203. As a result, no municipality is permitted to impose any connection fee, customer facilities fee, tapping fee or any similar fee, except as provided specifically under the Act. The various provisions of the Act are effective on or about June 30, 2005 or immediately upon any revision of a municipality's tapping fee.

Similar to the aforesaid Act 203, the Act provides for the imposition of a tapping fee with three separate components that are designed to allow the Lehigh County Authority (the "Authority") to recover specific capital costs. With the exception of assessments and to some extent reserve capacity fees, these are the only capital charges that an Authority may impose. Water rents and other charges that are intended to recover operation, maintenance, and debt service costs are unaffected by the Act.

The three components of the Authority's tapping fee are (1) connection fee; (2) customer facilities fee; and (3) tapping fee. Parenthetically, it should be noted that the term "tapping fee" refers to a one of the three components of the overall fee as well as the overall fee itself. Generally, the connection fee focuses on the cost of the facilities between the sewer and the property line while the customer facilities fee deals with the cost from the property line to the building. The tapping fee component covers the costs associated with the sewer collection lines and capacity related facilities and may, under certain circumstances, include any projected capital improvement costs approved by the Authority. The tapping fee calculation is comprised of four parts – capacity, collection, special purpose and reimbursement. Each part of the tapping fee may not be applicable to every municipality. In the case of the Lehigh County Authority's tapping fees for the Suburban Wastewater Division, the calculations are broken down by service area and the only pertinent parts are capacity and/or collection. The situations surrounding the imposition of the special purpose and/or reimbursement portions of the tapping fee are not applicable to the Authority at this point in time but may be imposed at a later date, if warranted.

The amounts shown in Table 1 reflect the tapping fees calculated for the Authority in accordance with Act 57 of 2003 and Act 209 of 1990. The Authority is justified in charging these figures or any lesser amount.

LEHIGH COUNTY AUTHORITY – SUBURBAN WASTEWATER DIVISON
SEWER SYSTEM TAPPING FEE CALCULATIONS

SCHEDULE A

CONNECTION FEE COMPONENT

The connection fee recovers the cost of the installation of the service line from the Authority's sewer to the property line or curb stop of the dwelling or building being connected. When the Authority does incur costs associated with the installation of these facilities, the fee may be calculated using either: (1) the actual costs of the particular installation; or (2) the average cost of similar installations or (3) the current/trended value of the average cost. The Authority may require this cost to be borne by the property owner. Costs associated with the connection fee may include materials, rental equipment, labor, inspection, engineering, legal and administration.

The Authority may also require, at its discretion, that an Escrow Account be established to cover any expenditure that the Authority may incur associated with making the connection. The amount of any Escrow can be based upon an estimate of actual costs or based upon a flat fee. In lieu of payment of a connection fee, the Authority may require the construction and dedication of these facilities by the property owner.

The Authority has selected to charge the average cost of similar installation to all customers. The costs of these connections have been calculated by the Authority staff and are shown in the fee schedule.

LEHIGH COUNTY AUTHORITY – SUBURBAN WASTEWATER DIVISON SEWER SYSTEM TAPPING FEE CALCULATIONS

SCHEDULE B

CUSTOMER FACILITY FEE COMPONENT

This fee covers the cost of the facilities from the property line or curb stop to the proposed dwelling or building being connected to the Authority's sewer system.

The developer is responsible for the installation and cost of the service line beyond the curb stop. In the event that the service involves a single property, the installation and cost will be the responsibility of the property owner. However, whether the developer or the property owner installs the service line, the installation of the water meter is the responsibility of the Authority. The cost of the water meter and its installation is borne by the developer or the property owner and is paid to the Authority.

The Authority may be required to provide inspection to insure that the facilities have been installed properly and in conformance with its regulations. Any costs attendant to inspection will be passed onto the property owner.

The Authority has selected to charge the average cost of similar installation to all customers. The costs of these connections have been calculated by the Authority staff and are shown in the fee schedule.

LEHIGH COUNTY AUTHORITY – SUBURBAN WASTEWATER DIVISON SEWER SYSTEM TAPPING FEE CALCULATIONS

SCHEDULE C

TAPPING FEE COMPONENT

The tapping fee is charged to allow the Authority to recover capital costs associated with the original construction and any additions or improvements to the Authority's sewer system as long as these facilities are still used on a regular basis. Facilities funded by others, such as a developer, and dedicated to the Authority are considered contributed capital and therefore not included in the computation of this fee.

All property owners or developers connecting to the Authority's sewer system are subject to a tapping fee, which may consist of up to four parts, which are calculated separately. The capacity part includes costs for the construction of those facilities that are related to the system's capacity, such as, interceptors, pumping stations, and the treatment plant. The collection part covers costs for the installation of collection mains. The remainder of the tapping fee includes the special purpose and the reimbursement parts. These are not applicable to the Lehigh County systems. Accordingly the tapping fee will focus on the capacity and collection parts only.

The Act provides for the determination of the capital costs of the system based on either:

- Original or historical costs of the system plus any capital improvement projects as well as the interest paid to date on any indebtedness associated with the system or
- Original costs trended to current dollars plus any capital improvement projects less any remaining indebtedness (principal only) associated with the system

The net capital costs (either original or trended) are divided by the capacity amount, resulting in the tapping fee per gallon. For Lehigh County sewer systems, the capacity is generally determined by the permitted capacity of the system or component in question. The resultant is the tapping fee per gallon.

The tapping fee calculation under the original cost and the trended original cost methodologies are presented for each component or system. The tapping fee per is disaggregated between the capacity and collection part of the sewer system where applicable. However, in some cases, such as interceptors there is no collection part. In some cases the asset details are shown on a separate exhibit if necessary.

Some of the capital costs incurred by the Authority have been funded by state and federal grants. These costs are, for the purposes of this calculation, considered to be contributed and therefore subtracted from the total capital costs incurred by the

Authority. If necessary, the contribution details are shown on a separate exhibit in some cases.

Debt is either added or subtracted in some aspect from the calculation depending on the methodology. The interest paid on the loans is added to the original cost base while the outstanding principal on the loans is subtracted from the trended original cost base.

The Authority is permitted under the Act to choose the methodology that produces the highest tapping fee, which in the case of all the calculations contained in this report is the trended original cost approach.

The Act references two other aspects to the tapping fee component, specifically the Special Purpose Part and the Reimbursement Part. These are not currently applicable to the Authority's tapping fees. However, if the situation arises, then either or both could be addressed and incorporated into the calculations.

The Special Purpose Part is only applicable to a particular group of customers. The Special Purpose Part is designed to recover the Authority's cost for facilities that service a special purpose or specific area, such as a pump station and transmission main. Fees would be separately calculated for each applicable group and applied to new users as appropriate. The same calculation methodology used for the capacity part and the collection part would apply. At this time, the Authority has not designated any special purpose part.

Where appropriate, a reimbursement component may be included in the tapping fee charged for new connections to facilities constructed by others for which a reimbursement is due to the person/developer constructing the facilities. Generally, this reimbursement will be defined in a written reimbursement agreement between the Authority and the person constructing the facilities. Typically such agreements reimburse the cost of the excess capacity available for use by future connections. At this time the Authority has no agreement(s) with any developer(s) which would require the calculation of a reimbursement part.

Table 1
LEHIGH COUNTY AUTHORITY
SUMMARY OF SUBURBAN WASTEWATER CAPACITY RECOVERY FEES
Updated December 2021

Exhibit	Charge	Per Gallon Existing Charge 1/1/2021	Per Gallon Maximum Charge 1/1/2022	Per Gallon New Charge	Per EDU Existing Charge 1/1/2021	Per EDU Maximum Charge 1/1/2022	Per EDU New Charge	(1) Gallons per EDU	(2) Change %	Costing Method
	Interceptor System:									
A	Western Lehigh Interceptor Capacity	$ 6.43	$ 7.13	$ 7.13	$ 1,432.90	$ 1,590.74	$ 1,590.74	223.0	11.02%	Historical Trended Cost
B	Western Lehigh Interceptor	$ 4.22	$ 4.80	$ 4.80	$ 941.40	$ 1,070.83	$ 1,070.83	223.0	13.75%	Historical Trended Cost
C	Little Lehigh Relief Interceptor	$ 1.59	$ 1.83	$ 1.83	$ 355.25	$ 407.90	$ 407.90	223.0	14.82%	Historical Trended Cost
	Total Western Lehigh Service Area	**$ 12.24**	**$ 13.76**	**$ 13.76**	**$ 2,729.55**	**$ 3,069.47**	**$ 3,069.47**	**223.0**	**12.45%**	
	Upper Milford System									
D1	Capacity	$ 5.70	$ 6.49	$ 6.49	$ 1,338.81	$ 1,523.74	$ 1,523.74	234.9	13.81%	Historical Trended Cost
D1	Collection	$ 8.92	$ 10.77	$ 10.77	$ 2,094.55	$ 2,530.77	$ 2,530.77	234.9	20.83%	Historical Trended Cost
D1	Planning Costs Capacity	$ 0.61	$ 0.67	$ 0.67	$ 142.24	$ 157.90	$ 157.90	234.9	11.01%	Historical Trended Cost
	Lower Macungie									
D2	Capacity	$ 2.69	$ 2.99	$ 2.99	$ 642.59	$ 713.37	$ 713.37	238.5	11.01%	Historical Trended Cost
	MFR Charge	$ 1.62	$ 1.79	$ 1.79	$ 385.55	$ 428.02	$ 428.02		11.03%	
	Heidelberg Heights Wastewater System									
E	Capacity	$ 29.02	$ 32.44	$ 32.44	$ 7,000.44	$ 7,825.31	$ 7,825.31	241.2	11.78%	Historical Trended Cost
E	Collection	$ 3.75	$ 4.16	$ 4.16	$ 904.18	$ 1,003.78	$ 1,003.78	241.2	11.02%	Historical Trended Cost
	Wynnewood Terrace Wastewater System									
F	Capacity	$ 56.26	$ 80.99	$ 80.99	$ 13,569.29	$ 19,535.57	$ 19,535.57	241.2	43.97%	Historical Trended Cost
F	Collection	$ 14.68	$ 18.77	$ 18.77	$ 3,539.82	$ 4,527.03	$ 4,527.03	241.2	27.89%	Historical Trended Cost
	Sand Springs Wastewater System									
G	Capacity	$ 14.63	$ 130.46	$ 130.46	$ 3,529.58	$ 31,466.19	$ 31,466.19	241.2	791.50%	Historical Trended Cost
	MFR Charge	$ 9.51	$ 84.80	$ 84.80	$ 2,294.22	$ 20,453.02	$ 20,453.02		791.50%	
G	Collection	$ 3.70	$ 4.11	$ 4.11	$ 893.01	$ 991.38	$ 991.38	241.2	11.02%	Historical Trended Cost
	MFR Charge	$ 2.41	$ 2.67	$ 2.67	$ 580.46	$ 644.40	$ 644.40		11.02%	
	Western Weisenberg System									
H	LCA Land Fee	$ 4.82	$ 5.06	$ 5.06	$ 1,264.43	$ 1,327.65	$ 1,327.65	262.5	5.00%	Historical Trended Cost
H	LCA Collection Fee	$ 2.77	$ 3.08	$ 3.08	$ 727.75	$ 807.91	$ 807.91	262.5	11.01%	Historical plus Financing Costs
I	W Weisenberg Treatment Plant	$ 42.44	$ 47.11	$ 47.11	$ 11,140.14	$ 12,367.26	$ 12,367.26	262.5	11.02%	Historical Trended Cost

(1) The gallons per EDU figure to calculate the per gallon rate has changed with the 2010 census data

(2) Based on Charge Per EDU

Exhibit A
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Interceptor System: Western Lehigh Interceptor Capacity

A. **Capacity Part**	**Original Cost**	**Trended Cost**
General Pool	$1,152,500	$1,699,235
Salisbury Portion	600,000	797,435
	$1,752,500	$2,496,670
Less: Contributions	-	-
Net Capital	$1,752,500	$2,496,670
Financing Costs for Capacity Part	-	-
Total Cost of Capacity Part	$1,752,500	$2,496,670
Plus: Interest Paid On Debt	-	n/a
Less: Outstanding Debt	n/a	-
Eligible Cost for Capacity Part	$1,752,500	$2,496,670
Total Capacity	350,000	350,000
Capacity Tapping Fee per Gallon	$5.01	$7.13
Gallon per EDU for Capacity Part (1)	223.0	223.0
Capacity Tapping Fee per EDU	$1,116.59	$1,590.74

(1) Total Gallons Per Day Per EDU Per Agreements 223

Exhibit B
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Interceptor System: Western Lehigh Interceptor

A. **Capacity Part**	**Exhibit Reference**	**Original Cost**	**Trended Cost**
Original Interceptor	B - 1	$5,215,326	$37,626,866
Phase II, Stage 1	B - 1	884,097	2,328,985
Phase II, Stage 2	B - 1	6,069,549	13,065,331
Phase II, Stage 4	B - 1	3,315,228	5,515,120
Flow Equaliz. Basin	B - 1	5,495,586	7,763,535
Iron Run PS & Force Main	B - 1	30,022	35,461
Wastewater Treatment Capacity	B - 1	601,763	806,401
WLI - WW Capacity Prg Dev	B - 1	898,830	1,136,075
Interceptor Conn	B - 1	1,823	2,386
Flow Monitoring Network	B - 1	419	548
Spring Creek PS Improvements	B - 1	574,566	671,592
Meter Stat. No. 5 Improvements	B - 1	172,176	218,158
Trexlertown Wastewater Storage Facility	B - 1	125,063	141,682
		$23,384,447	$69,312,141
Less: Contributions		2,536,420	18,299,438
Net Capital		$20,848,027	$51,012,703
Financing Costs for Capacity Part		-	-
Total Cost of Capacity Part		$20,848,027	$51,012,703
Plus: Interest Paid On Debt		5,539,339	n/a
Less: Outstanding Debt		n/a	2,690,721
Eligible Cost for Capacity Part		$26,387,367	$48,321,982
Total Capacity		10,063,000	10,063,000
Capacity Tapping Fee per Gallon		$2.62	$4.80
Gallon per EDU for Capacity Part (1)		223.0	223.0
Capacity Tapping Fee per EDU		$584.75	$1,070.83

(1) Total Gallons Per Day Per EDU Per Agreements: 223

Exhibit B - 1
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Interceptor System: Western Lehigh Interceptor
Capacity Assets

Expenditure	Placed in Service		Original Cost	Cost Index Original	Cost Index Current	Trended Current Replacement Cost
Original Interceptor						
Interceptor	Jan	1972	$5,215,326	1753	12647	$37,626,866
Phase II, Stage 1						
Interceptor	May	1991	$884,097	4801	12647	$2,328,985
Phase II, Stage 2						
Interceptor	Jan	1998	$2,449,063	5852	12647	$5,292,906
PS Structure	Jan	1998	2,044,224	5852	12647	4,417,969
Pump & Elect	Jan	1998	1,506,462	5852	12647	3,255,760
Land	Jan	1998	44,915			44,915
Metering	Jan	1998	24,885	5852	12647	53,782
Phase II, Stage 4						
Interceptor	Sep	2005	$3,247,728	7540	12647	$5,447,620
Land	Sep	2005	67,500			67,500
Flow Equaliz. Basin						
	Dec	2010	$5,488,588	8952	12647	$7,753,890
	Jan	2012	6,998	9176	12647	9,645
Iron Run PS & Force Main						
Prior to	Jan	2012	~~$1,086,546~~	Excluded - Previously counted		
	Jan	2012	1,782	9176	12647	$2,456
	Jan	2013	200	9437	12647	268
	Jan	2014	106	9664	12647	138
	Jan	2015	209	9972	12647	266
	Jan	2017	3,172	10542	12647	3,806
	Jan	2018	23,986	10878	12647	27,888
	Jan	2019	566	11206	12647	639
Wastewater Treatment Capacity						
	Jan	2012	$350	9176	12647	$483
	Jan	2013	600,369	9437	12647	804,581
	Jan	2014	298	9664	12647	390
	Jan	2015	747	9972	12647	947
WLI - WW Capacity Prg Dev						
Prior to	Jan	2012	~~$546,637~~	Excluded - Previously counted		
	Jan	2012	66,774	9176	12647	$92,035
	Jan	2013	246,735	9437	12647	330,661
	Jan	2014	213,732	9664	12647	279,712
	Jan	2015	91,472	9972	12647	116,012
	Jan	2016	41,663	10133	12647	52,004
	Jan	2017	216	10542	12647	259
	Jan	2019	49,312	11206	12647	55,655
	Jan	2020	188,927	11392	12647	209,737

Exhibit B - 1
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Interceptor System: Western Lehigh Interceptor
Capacity Assets

Expenditure	Placed in Service	Original Cost	Cost Index Original	Cost Index Current	Trended Current Replacement Cost
Signatory I&I Program					
	Prior to Jan 2012	~~$2,291,652~~	Excluded - Repairs		
	Jan 2012	~~438,574~~	Excluded - Repairs		
	Jan 2013	~~400,188~~	Excluded - Repairs		
	Jan 2014	~~467,300~~	Excluded - Repairs		
	Jan 2015	~~324,637~~	Excluded - Repairs		
	Jan 2016	~~296,267~~	Excluded - Repairs		
	Jan 2017	~~491,531~~	Excluded - Repairs		
	Jan 2018	~~438,574~~	Excluded - Repairs		
	Jan 2019	~~630,016~~	Excluded - Repairs		
	Jan 2020	~~601,479~~	Excluded - Repairs		
Interceptor Conn					
	Jan 2014	$1,823	9664	12647	$2,386
Flow Monitoring Network					
	Jan 2014	$419	9664	12647	$548
Spring Creek PS Improvements					
	Jan 2014	$528	9664	12647	$690
	Jan 2015	413	9972	12647	524
	Jan 2016	49,537	10133	12647	61,832
	Jan 2017	75,841	10542	12647	90,987
	Jan 2018	343,731	10878	12647	399,639
	Jan 2019	102,233	11206	12647	115,385
	Jan 2020	2,283	11392	12647	2,535
Meter Stat. No. 5 Improvements					
	Jan 2015	$161,709	9972	12647	$205,094
	Jan 2016	10,466	10133	12647	13,064
Test & Seal - Cycle 1					
	Jan 2016	~~$534,283~~	Excluded - Repairs		
	Jan 2017	~~498,251~~	Excluded - Repairs		
	Jan 2018	~~45,209~~	Excluded - Repairs		
	Jan 2019	~~64,871~~	Excluded - Repairs		
	Jan 2020	~~27,065~~	Excluded - Repairs		
Spring Creek Force Main AARV Rep					
	Jan 2017	~~$12,751~~	Excluded - Repairs		
	Jan 2018	~~15,665~~	Excluded - Repairs		
	Jan 2019	~~22,929~~	Excluded - Repairs		
	Jan 2020	~~12,014~~	Excluded - Repairs		
High Flow Emergency Response					
	Jan 2018	~~$96,725~~	Excluded - Maintenance		
	Jan 2019	~~1,929,162~~	Excluded - Maintenance		
	Jan 2020	~~8,455~~	Excluded - Maintenance		
Trexlertown Wastewater Storage Facility					
	Jan 2018	$34,858	10878	12647	$40,528
	Jan 2019	54,778	11206	12647	61,825
	Jan 2020	35,427	11392	12647	39,329

Exhibit B - 1
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Interceptor System: Western Lehigh Interceptor
Capacity Assets

Expenditure	Placed in Service	Original Cost	Cost Index Original	Cost Index Current	Trended Current Replacement Cost
Rehab - Cycle 1					
	Jan 2019	~~$2,147~~	Excluded - Maintenance		
	Jan 2020	~~279,080~~	Excluded - Maintenance		
Act 537 - CRB Tool					
	Jan 2020	~~$60,260~~	Excluded - Pending Project Completion		
Act 537 - Jacobs PTP					
	Jan 2020	~~$99,070~~	Excluded - Pending Project Completion		
Act 537 - AECOM PTP Phase 2					
	Jan 2020	~~$108,613~~	Excluded - Pending Project Completion		
		$23,384,447			**$69,312,141**

Exhibit C
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Little Lehigh Relief Interceptor

A. **Capacity Part**	**Original Cost**	**Trended Cost**
Project Costs - Dec. 1986	$4,750,332	$13,808,083
Park PS Improvements Ph1 - Prior to 2012	34,670	47,785
Park PS Improvements Ph1 - 2012	102,160	140,808
Park PS SCADA Gen - Prior to 2012	34,421	47,443
Park PS SCADA Gen - 2012	11,326	15,611
Park PS Improvements Ph1 - 2013	21,619	28,973
Park PS SCADA Gen - 2013	6,189	8,295
Park PS Improvements Ph1 - 2014	74	97
Park PS SCADA Gen - 2014	140,634	184,049
Park PS Improvements Ph1 - 2015	973	1,235
Park PS SCADA Gen - 2015	72,378	91,796
Park PS Improvements Ph1 - 2016	98,867	123,405
Park PS Force Main Upgrade - 2016	101	126
Park PS Improvements Ph1 - 2017	283,576	340,208
Park PS Force Main Upgrade - 2017	2,402	2,882
Park PS Force Main Extension - 2017	7,087	8,502
Park PS Improvements Ph1 - 2018	380,094	441,916
Park PS Force Main Upgrade - 2018	19,225	22,352
Park PS Force Main Extension - 2018	710	826
Park PS Improvements Ph1 - 2019	3,590,626	4,052,548
Park PS Force Main Upgrade - 2019	12,092	13,648
Park PS SCADA Gen - 2020	2,079	2,308
Park PS Improvements Ph1 - 2020	478,040	530,698
Park PS Force Main Upgrade - 2020	64,833	71,974
Park PS Force Main Extension - 2020	886	983
	$10,115,396	$19,986,550
Less: Contributions	583,221	1,695,284
Net Capital	$9,532,175	$18,291,266
Financing Costs for Capacity Part	-	-
Total Cost of Capacity Part	$9,532,175	$18,291,266
Plus: Interest Paid On Debt	4,890,657	n/a
Less: Outstanding Debt	n/a	-
Eligible Cost for Capacity Part	$14,422,833	$18,291,266
Total Capacity	10,000,000	10,000,000
Capacity Tapping Fee per Gallon	$1.44	$1.83
Gallon per EDU for Capacity Part (1)	223.0	223.0
Capacity Tapping Fee per EDU	$321.63	$407.90

(1) Total Gallons Per Day Per EDU Per Agreements 223

Exhibit D1
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Upper Milford Township

A. Capacity Part	Exhibit Reference	Original Cost	Trended Cost
Rt. 29 Project Cost & Capitalized Interest	D1 - 1	$987,650	$2,704,878
		$987,650	$2,704,878
Less: Contributions		-	-
Net Capital		$987,650	$2,704,878
Financing Costs for Capacity Part		-	-
Total Cost of Capacity Part		$987,650	$2,704,878
Plus: Interest Paid On Debt		49,624	n/a
Less: Outstanding Debt		n/a	196,642
Eligible Cost for Capacity Part		$1,037,274	$2,508,236
Total Capacity		386,669	386,669
Capacity Tapping Fee per Gallon		$2.68	$6.49
Gallon per EDU for Capacity Part (1)		234.9	234.9
Capacity Tapping Fee per EDU		$630.14	$1,523.74

Exhibit D1
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Upper Milford Township

B. Collection Part	Exhibit Reference	Original Cost	Trended Cost
Rt. 29 Project Cost & Capitalized Interest	D1 - 1	$658,434	$1,803,254
South 7th Street - Ph - 1	D1 - 1	204,222	302,124
South 7th Street - Ph - 2	D1 - 1	233,261	330,712
Ramer Heights Project & Capitalized Interest	D1 - 1	148,811	372,022
Vera Cruz Project	D1 - 1	4,284,326	5,903,902
Additional Project Costs	D1 - 1	133,888	160,711
		$5,662,942	$8,872,725
Less: Contributions	D1 - 2	2,688,249	3,650,962
Net Capital		$2,974,693	$5,221,763
Financing Costs for Collection Part		-	-
Total Cost of Collection Part		$2,974,693	$5,221,763
Plus: Interest Paid On Debt		266,453	n/a
Less: Outstanding Debt		n/a	1,055,855
Eligible Cost for Capacity Part		$3,241,146	$4,165,908
Total Capacity		386,669	386,669
Collection Tapping Fee per Gallon		$8.38	$10.77
Gallon per EDU for Capacity Part (1)		234.9	234.9
Collection Tapping Fee per EDU		$1,968.98	$2,530.77

Exhibit D1
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Upper Milford Township

C. **Capacity Part - Planning Costs**	**Exhibit Reference**	**Original Cost**	**Trended Cost**
Planning Costs		$186,279	$256,861
		$186,279	$256,861
Less: Contributions		-	-
Net Capital		$186,279	$256,861
Financing Costs for Capacity Part		1,184	3,063
Total Cost of Capacity Part		$187,463	$259,924
Plus: Interest Paid On Debt		29,122	n/a
Less: Outstanding Debt		n/a	-
Eligible Cost for Capacity Part		$216,585	$259,924
Total Capacity		386,669	386,669
Capacity Tapping Fee per Gallon		$0.56	$0.67
Gallon per EDU for Capacity Part (1)		234.9	234.9
Capacity Tapping Fee per EDU		$131.57	$157.90

(1) Average Household Size Per 2010 Census for Upper Milford	2.61
Gallons Per Capita Per Day Allowed Per Act 57 of 2003	90
Total Gallons Per Day Per EDU	234.9

Exhibit D1 - 1
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Upper Milford Township

Capacity Assets

Expenditure	Placed in Service	Original Cost	Cost Index Original	Cost Index Current	Trended Current Replacement Cost
Rt. 29 Project Cost & Capitalized Interest					
Interceptor	Aug 1989	$987,650	4618	12647.32	$2,704,878
		$987,650			**$2,704,878**

Collection Assets

Expenditure	Placed in Service	Original Cost	Cost Index Original	Cost Index Current	Trended Current Replacement Cost
Rt. 29 Project Cost & Capitalized Interest					
Collector	Aug 1989	$658,434	4618	12647.32	$1,803,254
Ramer Heights Project & Capitalized Interest					
Collector	Dec 1992	$148,811	5059	12647.32	$372,022
South 7th Street - Ph - 1					
Collector	Jan 2009	$204,222	8549	12647.32	$302,124
South 7th Street - Ph - 2					
Collector	Oct 2010	$233,261	8921	12647.32	$330,712
Vera Cruz Project					
Prior to	Jan 2012	$2,495,282	9176	12647.32	$3,439,258
	Jan 2012	1,765,192	9176	12647.32	2,432,972
	Jan 2013	18,891	9437	12647.32	25,316
	Jan 2014	1,572	9664	12647.32	2,057
	Jan 2015	3,390	9972	12647.32	4,300

Exhibit D1 - 1
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Upper Milford Township

Capacity Assets

Expenditure	Placed in Service	Original Cost	Cost Index Original	Cost Index Current	Trended Current Replacement Cost
Additional Project Costs					
South 7th Street Extension	Jan 2012	$458	9176	12647.32	$631
South 7th Street Extension - Ph - 2	Jan 2012	2,701	9176	12647.32	3,722
Weaver - 4751 Mill Road	Jan 2012	1,650	9176	12647.32	2,274
Weaver - 4751 Mill Road	Jan 2013	8,555	9437	12647.32	11,464
Fields at Indian Creek	Jan 2014	2,048	9664	12647.32	2,681
Weaver - 4751 Mill Road	Jan 2015	150	9972	12647.32	191
Fields at Indian Creek	Jan 2015	4,433	9972	12647.32	5,622
Fields at Indian Creek	Jan 2016	25,037	10133	12647.32	31,250
Fields at Indian Creek	Jan 2017	12,829	10542	12647.32	15,391
Kohler Tract - Sewer	Jan 2017	442	10542	12647.32	530
New Tripoli Bank - Buckeye	Jan 2017	809	10542	12647.32	970
Fields at Indian Creek	Jan 2018	266	10878	12647.32	309
Kohler Tract - Sewer	Jan 2018	39,264	10878	12647.32	45,650
New Tripoli Bank - Buckeye	Jan 2018	226	10878	12647.32	263
Fields at Indian Creek - Ph 3	Jan 2018	6,536	10878	12647.32	7,600
Weaver - 4251 Chestnut Street	Jan 2018	874	10878	12647.32	1,016
Fields at Indian Creek	Jan 2019	48	11206	12647.32	54
Kohler Tract - Sewer	Jan 2019	13,193	11206	12647.32	14,890
Fields at Indian Creek - Ph 3	Jan 2019	1,233	11206	12647.32	1,391
Weaver - 4251 Chestnut Street	Jan 2019	349	11206	12647.32	394
Fields at Indian Creek - Ph 4	Jan 2019	6,401	11206	12647.32	7,224
Kohler Tract - Sewer	Jan 2020	924	11392	12647.32	1,025
Fields at Indian Creek - Ph 3	Jan 2019	901	11206	12647.32	1,017
Fields at Indian Creek - Ph 4	Jan 2019	4,563	11206	12647.32	5,150
		$5,662,942			**$8,872,725**

Exhibit D1 - 2
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Upper Milford Township

Contributions - Collection

Expenditure	Placed in Service	Original Cost	Cost Index Original	Cost Index Current	Trended Current Replacement Cost
South 7th Street - Ph - 1					
Federal Grant	Jan 2009	$172,100	8549	12647.32	$254,603
South 7th Street - Ph - 2					
Federal Grant	Oct 2010	$206,649	8921	12647.32	$292,982
Vera Cruz Project Costs thru 4/30/14					
Federal Grant	Dec 2012	$1,309,500	9412	12647.32	$1,759,633
State Grant	Dec 2012	1,000,000	9412	12647.32	1,343,744
		$2,688,249			**$3,650,962**

Exhibit D2
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Lower Macungie Connections to UMiT Interceptor

A. **Capacity Part**		**Original Cost**	**Trended Cost**
Rt. 29 Project Cost	$1,646,084		
% of Project applicable to LMT Interceptor	24.79%	$408,064	$1,117,566
		$408,064	$1,117,566
Less: Contributions		-	-
Net Capital		$408,064	$1,117,566
Financing Costs for Capacity Part		-	-
Total Cost of Capacity Part		$408,064	$1,117,566
Plus: Interest Paid On Debt		-	n/a
Less: Outstanding Debt		n/a	-
Eligible Cost for Capacity Part		$408,064	$1,117,566
Total Capacity		373,632	373,632
Capacity Tapping Fee per Gallon		$1.09	$2.99
Gallon per EDU for Capacity Part (1)		238.5	238.5
Capacity Tapping Fee per EDU		$260.48	$713.37

(1) Average Household Size Per 2010 Census for Lower Macungie Twp	2.65
Gallons Per Capita Per Day Allowed Per Act 57 of 2003	90
Total Gallons Per Day Per EDU	238.5

Exhibit E
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Heidelberg Heights System

A. Capacity Part	**Original Cost**	**Trended Cost**
Project Costs	$785,141	$1,591,845
WWTP Upgrades - 2017	85,762	102,889
WWTP Upgrades - 2018	17,879	20,787
WWTP Upgrades - 2019	192,887	217,702
WWTP Upgrades - 2020	12,044	13,371
	$1,093,714	$1,946,594
Less: Contributions	-	-
Net Capital	$1,093,714	$1,946,594
Financing Costs for Capacity Part	-	-
Total Cost of Capacity Part	$1,093,714	$1,946,594
Plus: Interest Paid On Debt	-	n/a
Less: Outstanding Debt	n/a	-
Eligible Cost for Capacity Part	$1,093,714	$1,946,594
Total Capacity	60,000	60,000
Capacity Tapping Fee per Gallon	$18.23	$32.44
Gallon per EDU for Capacity Part (1)	241.2	241.2
Capacity Tapping Fee per EDU	$4,396.73	$7,825.31

Exhibit E
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Heidelberg Heights System

B. Collection Part		**Original Cost**	**Trended Cost**
Project Costs		$123,157	$249,696
I&I Removal Project - 2016	Excluded - Repairs	~~57,099~~	
I&I Removal Project - 2017	Excluded - Repairs	~~1,729~~	
I&I Removal Project - 2018	Excluded - Repairs	~~352,619~~	
I&I Removal Project - 2019	Excluded - Repairs	~~385,652~~	
I&I Removal Project - 2020	Excluded - Repairs	~~221,028~~	
		$123,157	$249,696
Less: Contributions		-	-
Net Capital		$123,157	$249,696
Financing Costs for Collection Part		-	-
Total Cost of Collection Part		$123,157	$249,696
Plus: Interest Paid On Debt		-	n/a
Less: Outstanding Debt		n/a	-
Eligible Cost for Capacity Part		$123,157	$249,696
Total Capacity		60,000	60,000
Collection Tapping Fee per Gallon		$2.05	$4.16
Gallon per EDU for Capacity Part (1)		241.2	241.2
Collection Tapping Fee per EDU		$495.09	$1,003.78

(1) Average Household Size Per 2010 Census for Heidelberg Township	2.68
Gallons Per Capita Per Day Allowed Per Act 57 of 2003	90
Total Gallons Per Day Per EDU	241.2

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Exhibit F
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Wynnewood System

A. Capacity Part	**Original Cost**	**Trended Cost**
Acquisition Costs	$247,393	$467,343
System Improvements - Prior to 2012	3,990	5,500
System Improvements - 2012	32,645	44,995
System Improvements - 2013	55,264	74,061
System Improvements - 2014	67,642	88,523
WWTP Improvements - 2015	21,241	26,939
WWTP Improvements - 2016	5,080	6,341
WWTP Improvements - 2017	85,467	102,535
WWTP Improvements - 2018	80,619	93,732
WWTP Improvements - 2019	2,362,497	2,666,424
WWTP Improvements - 2020	1,155,877	1,283,200
	$4,117,716	$4,859,595
Less: Contributions	-	-
Net Capital	$4,117,716	$4,859,595
Financing Costs for Capacity Part	-	-
Total Cost of Capacity Part	$4,117,716	$4,859,595
Plus: Interest Paid On Debt	-	n/a
Less: Outstanding Debt	n/a	-
Eligible Cost for Capacity Part	$4,117,716	$4,859,595
Total Capacity	60,000	60,000
Capacity Tapping Fee per Gallon	$68.63	$80.99
Gallon per EDU for Capacity Part (1)	241.2	241.2
Capacity Tapping Fee per EDU	$16,553.22	$19,535.57

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Exhibit F
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Wynnewood System

B. Collection Part		**Original Cost**	**Trended Cost**
Acquisition Costs		$406,318	$767,563
Riverside Prof Cntr Additions - 2012		132	182
Riverside Prof Cntr Additions - 2013		1,476	1,978
Wynnewood I&I Project - 2013	Excluded - Repairs	~~24,096~~	
Wynnewood I&I Project - 2014	Excluded - Repairs	~~17,020~~	
Wynnewood I&I Project - 2019	Excluded - Repairs	~~5,120~~	
Wynnewood I&I Project - 2020	Excluded - Repairs	~~28,413~~	
Main, PS & Force Main - 2015		645,390	818,541
Main, PS & Force Main - 2016		102,876	128,409
Main, PS & Force Main - 2017		691	829
Main, PS & Force Main - 2020		569	631
		$1,157,452	$1,718,133
Less: Contributions		-	-
Net Capital		$1,157,452	$1,718,133
Financing Costs for Collection Part		-	-
Total Cost of Collection Part		$1,157,452	$1,718,133
Plus: Interest Paid On Debt		43,083	n/a
Less: Outstanding Debt		n/a	592,007
Eligible Cost for Capacity Part		$1,200,536	$1,126,126
Total Capacity		60,000	60,000
Collection Tapping Fee per Gallon		$20.01	$18.77
Gallon per EDU for Capacity Part (1)		241.2	241.2
Collection Tapping Fee per EDU		$4,826.15	$4,527.03

(1) Average Household Size Per 2010 Census for North Whitehall Township	2.68
Gallons Per Capita Per Day Allowed Per Act 57 of 2003	90
Total Gallons Per Day Per EDU	241.2

Exhibit G
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Sand Spring Wastewater System

A. **Capacity Part**	**Original Cost**	**Trended Cost**
Acquisition Costs	$88,048	$152,607
System Improvements - 2005	6,358	10,933
WWTP Improvements - 2015	20,683	26,233
WWTP Improvements - 2016	14,546	18,157
WWTP Improvements - 2017	95,588	114,677
WWTP Improvements - 2018	54,764	63,672
WWTP Improvements - 2019	161,528	182,308
WWTP Improvements - 2020	3,600,767	3,997,403
	$4,042,283	$4,565,989
Less: Contributions	-	-
Net Capital	$4,042,283	$4,565,989
Financing Costs for Capacity Part	-	-
Total Cost of Capacity Part	$4,042,283	$4,565,989
Plus: Interest Paid On Debt	-	n/a
Less: Outstanding Debt	n/a	-
Eligible Cost for Capacity Part	$4,042,283	$4,565,989
Total Capacity	35,000	35,000
Capacity Tapping Fee per Gallon	$115.49	$130.46
Gallon per EDU for Capacity Part (1)	241.2	241.2
Capacity Tapping Fee per EDU	$27,857.10	$31,466.19

Exhibit G
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Sand Spring Wastewater System

B. Collection Part	**Original Cost**	**Trended Cost**
Acquisition Costs	$58,452	$101,311
System Improvements - 2010	5,980	8,733
System Improvements - 2012	3,256	4,488
System Improvements - 2013	21,882	29,325
	$89,570	$143,857
Less: Contributions	-	-
Net Capital	$89,570	$143,857
Financing Costs for Collection Part	-	-
Total Cost of Collection Part	$89,570	$143,857
Plus: Interest Paid On Debt	-	n/a
Less: Outstanding Debt	n/a	-
Eligible Cost for Capacity Part	$89,570	$143,857
Total Capacity	35,000	35,000
Collection Tapping Fee per Gallon	$2.56	$4.11
Gallon per EDU for Capacity Part (1)	241.2	241.2
Collection Tapping Fee per EDU	$617.27	$991.38

(1) Average Household Size Per 2010 Census for North Whitehall Township	2.68
Gallons Per Capita Per Day Allowed Per Act 57 of 2003	90
Total Gallons Per Day Per EDU	241.2

Exhibit H
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Western Weisenberg Wastewater System

A. **Land**	**Original Cost**	**Inflation Factor (2)**	**Trended Cost**
LCA Costs for Western Weisenberg System	$82,800	1.710339	$141,616
Less: Contributions			-
Net Capital			$141,616
Financing Costs for Capacity Part			-
Total Cost of Capacity Part			$141,616
Plus: Interest Paid On Debt			n/a
Less: Outstanding Debt			-
Eligible Cost for Capacity Part			$141,616
Prorated Share of Design Capacity			28,000
Capacity Tapping Fee per Gallon			$5.06
Gallon per EDU for Capacity Part (1)			262.5
Capacity Tapping Fee per EDU			$1,327.65

B. **Collection Part**	**Original Cost**	**Trending Factor (3)**	**Trended Cost**
LCA Costs for Western Weisenberg System	$19,548	1.889352	$36,933
Less: Contributions			-
Net Capital			$36,933
Financing Costs for Collection Part			-
Total Cost of Collection Part			$36,933
Plus: Interest Paid On Debt			n/a
Less: Outstanding Debt			-
Eligible Cost for Capacity Part			$36,933
Prorated Share of Design Capacity			12,000
Collection Tapping Fee per Gallon			$3.08
Gallon per EDU for Capacity Part (1)			262.5
Collection Tapping Fee per EDU			$807.91

(1) By agreement with Western Weisenberg , an EDU is equal to 262.5 gallons.
(2) LCA Land fee is inflated by Agreement.
(3) LCA Collection system is inflated by the ENR index.

ENR Index 6/03	6,694
ENR Index 10/21	12,647

Exhibit I
Lehigh County Authority - Suburban Wastewater Division
Lehigh County, Pennsylvania
Calculation of Sewer Tapping Fee
Western Weisenberg Treatment Plant

A. **Capacity Part**	**Original Cost**	**Trended Cost**
W. Weisenberg Treatment Plant Estimated Cost (1)	$3,247,214	
Portion attributable to New Customers	43.7%	
Total Attributable to New Customers	$1,417,652	$1,855,288
New Propane Tank	1,071	1,189
Less: Contributions		-
Net Capital		$1,856,477
Financing Costs for Capacity Part		-
Total Cost of Capacity Part		$1,856,477
Plus: Interest Paid On Debt		n/a
Less: Outstanding Debt		822,924
Eligible Cost for Capacity Part		$1,033,554
Prorated Share of Design Capacity		17,463
Capacity Tapping Fee per Gallon		$59.19
2014 Original Fee		$36.00
2020 Existing Fee		$42.44
2021 Recommended fee per gallon (1)		$47.11

(1) The unrecovered capital costs will be captured through ongoing user fees.
The Plant fee per gallon is increased by the change in the ENR index since project completion in 2014.

Note: These fees exclude existing Western Weisenberg customers and the West Hills Business Center, which is constructing the plant and contributing towards the plant.

Plant Allocation:	Total Allocation (gpd)	LCA Share
Western Weisenberg	10,537	-
Western Weisenberg - Remaining Commercial	1,463	1,463
West Hills Business Ctr	12,000	-
Weisenberg Elementary School	8,000	8,000
Bandit Truck Stop	3,000	3,000
Unallocated	5,000	5,000
	40,000	17,463
		43.7%

Lehigh County Authority

FINAL DRAFT

Strategic Plan

2027

Contents

A MESSAGE FROM THE
CEO & Board Chair

As a historic pandemic gripped the world's attention since early 2020, a renewed focus emerged for Lehigh County Authority (LCA). It has never been more apparent what a vital role public water and sewer services play in protecting public health. The economic, political, and public health crises brought on by the pandemic thrust water into the limelight as an essential service that communities must protect.

In this context, LCA's strategic planning initiative took on a different tone and was completed with a sense of urgency and energy. To fulfill the important responsibilities we bear, LCA must look ahead. Our plans and strategies must be designed to ensure the community's need for safe and reliable service can be sustainably met, no matter what new challenge awaits us in the future.

There were other factors driving LCA forward in this process too. Over the past decade, the organization has undergone massive transformation into a larger, regional service provider. We face new challenges today that were not previously on our near-term radar: aging infrastructure, climate change, workforce turnover, rapidly rising costs, and customer affordability, to name a few. The strategic plan we have developed tackles these tough issues and lays out our priorities for the next five years or more.

Going into the strategic planning process, a few important goals were identified:

- Recognize LCA's evolution & the changing world around us
- Understand our new role in meeting the community's needs
- Clarify our mission and vision for the future
- Inspire our employees
- Help the community understand who we are
- Define the resources needed to achieve our goals

The plan outlined in the following pages will keep focus on our goals, and we are excited to see how LCA will evolve again as we implement the strategies and priorities that we have set out for ourselves. We had a lot of help along the way in developing this plan – our leadership team, employees, Board of Directors, and many external stakeholders. We truly appreciate your input!

LCA is honored to serve the community and fulfill the mission to protect public health and the environment by providing high-quality, safe, and reliable water and wastewater services.

Liesel Gross
CEO

Brian Nagle
LCA Board Chair

Introduction

Strategic Planning Process

Lehigh County Authority (LCA) initiated a strategic plan update in 2021, using a process designed to ensure:

- A shared vision of the outcomes that the utility sought to create, because organizations driven by clear purposes and shared values have a greater capacity to succeed than those that are not.
- A collective understanding of the available resources, the operating context, and the principles upon which priorities and strategies are based.
- Acceptance of the direction and urgency of the strategic plan, which will be integrated into the way the utility is operated on a day-to-day basis.

To achieve these conditions for success, LCA's strategic planning process involved input from a broad group of internal and external stakeholders. Major elements of the engagement process included:

- Interviews and work sessions with LCA's Board of Directors and the Board's strategy committee
- Interviews and work sessions with the CEO and leadership team
- Two employee focus groups and an employee survey with more than 90 respondents
- Interviews with key stakeholders, including Lehigh County, the City of Allentown, Salisbury Township, Upper Macungie Township, Lower Macungie Township, the Lehigh Valley Economic Development Corporation, PENNVEST, and two large commercial customers

This input was used to develop the utility's six priority areas, and the associated strategy and outcome measures for implementation over the next five years.

About LCA

The Lehigh County Authority is a public water and wastewater utility that provides retail and wholesale service to about 200,000 people in the Lehigh Valley. Founded in 1966 by the County of Lehigh. LCA is governed by a nine-member Board of Directors and regulated by the Pennsylvania Municipality Authorities Act.

LCA operates 14 water systems that serve 14 municipalities across two counties, including the City of Allentown. While the Allentown System is the largest of the group, serving approximately 33,000 properties, the City retains ownership of the system. LCA operates the system under a 50-year lease that began in 2013. The Central System is the largest owned and operated by LCA, serving approximately 18,500 properties in Upper and Lower Macungie townships and surrounding areas. Water is sourced from wells, springs, the Little Lehigh Creek, and the Lehigh River.

LCA's Western Lehigh Interceptor system provides wastewater transportation service for seven municipalities. Through this system, all wastewater is transported to the City of Allentown's Kline's Island Wastewater Treatment Plant, which is permitted to treat up to 40 million gallons of wastewater per day. The Kline's Island plant provides regional wastewater treatment service for 15 municipalities, including the Western Lehigh systems, and LCA operates the facility through a lease agreement with the City of Allentown. LCA also operates small wastewater treatment plants in Heidelberg, Weisenberg, Lynn and North Whitehall townships, where collection systems are too distant from the Kline's Island system to be interconnected. LCA's industrial wastewater pretreatment plant serves industrial properties in the Fogelsville area.

Environmental Scan

LCA's current operating environment was documented through the following:

- Analysis of community demographics, key trends and other external influences
- The organization's aspirations, strengths, critical issues, and opportunities

TREND NO. 1

Population

LCA is experiencing both residential and industrial customer growth within the service area, especially in Western Lehigh County and Upper Macungie Township, which grew at 7.1% and 31.4% over the last ten years respectively. The City of Allentown and South Whitehall have also experienced considerable growth. The population of the service area is becoming more diverse, and almost half the residents in some parts of the service area speak a language other than English according to the US Census Bureau. Residential population growth is expected to slow down in many parts of LCA's service area, and local municipalities are reaching a point where the existing infrastructure limits additional development.

From a commercial customer standpoint, the area along the I-78 corridor is known for food and beverage companies (especially bottled water, beer, juice, and other bottled beverages), which are water-intensive and require substantial wastewater capacity. Although the food and beverage industry is a major employer now, there's potential for other types of manufacturing to expand, based on the area's workforce. As growth has continued, the available land for industrial use has decreased and zoning changes may be needed to make best use of existing resources for this type of development.

Potential Responses

- Become a more significant part of the conversation in planning for growth. Currently, LCA provides service when and where needed, but has a relatively limited role as part of the long-term planning process with municipalities.
- Address issues with system capacity for water and especially wastewater. LCA has begun to address long-term capacity issues with the Act 537 Plan development process, which is scheduled for completion in 2025.
- Evaluate whether acquiring or consolidating systems would help manage growth and capacity constraints.

TREND NO. 2

Operating Environment

As LCA has grown, engagement with the Pennsylvania Department of Environmental Protection (DEP) has increased. This has encouraged collaboration with different municipalities in the County. LCA's relationships with Lehigh County and the City of Allentown are positive, but the Act 537 Plan will put pressure on intermunicipal agreements, which are complex and currently longstanding.

The region will receive funding from the American Rescue Plan Act and other potential future federal funding sources for infrastructure, and LCA will prioritize engagement with Lehigh County and municipalities to best address regional needs.

LCA expects additional regulations for drinking water and wastewater contaminants. Cost recovery related to addressing those regulations may be a challenge, as will cost recovery related to mitigating and adapting to climate change. The majority of streams within LCA's service area are considered impaired, which impacts permitting requirements for LCA.

Potential Responses

- Support a regional approach for decision-making and meeting infrastructure needs, including updating agreements with municipalities.
- Continue to plan for wet weather, inclusive of capital planning and risk and resiliency projects.
- Prepare to leverage funding from the federal government, WIFIA, or sources that want "shovel ready" projects.

TREND NO. 3

Workforce

From a recruitment standpoint, LCA struggles to find skilled workers for some operational roles. Recently, the organization has experienced higher-than-normal turnover due to retirements and a competitive job market, requiring significance resources to be spent on recruitment. Over time, the role of technology within the industry has increased and LCA has a greater need for related skillsets than it has previously. Additionally, the workforce's location is geographically limiting, because staff need to respond in emergencies and cannot be a long commute away. The workforce may also increasingly prefer flexible work arrangements, especially after the COVID-19 pandemic. Since LCA is a 24/7 operation, recruiting for staff willing to commit to the work will be a key issue.

Many employees are at or near retirement eligibility. There is a need for succession planning to capture knowledge before it leaves the organization, and LCA has union constraints related to training for replacement positions. However, LCA has younger employees who are looking to fill leadership roles as retirements occur. A dedicated and energetic workforce exists today, ready to address tomorrow's challenges.

Potential Responses

- Build the culture and regional presence of LCA so that is has a strong reputation as an employer.
- Begin engaging with community colleges and high schools to share opportunities at LCA and demonstrate the diversity of career paths available within the water industry.
- Develop and provide more training and education for employees that can be delivered by LCA staff.
- Develop a mentorship program to help with succession planning and engagement.
- Share job opportunities within the organization more widely and create a leadership program to prepare staff for internal opportunities.

TREND NO. 4

Technology

While LCA has historically invested heavily in technology and security over time, some customers have asked for more self-service options, while others are content with LCA's current offerings. LCA does not currently have the tools available to meet increased customer demands around self-service, but the organization's vision for technology upgrades includes customer convenience options.

Staff have opportunities to improve adoption and training on technology, but some technical barriers exist. LCA's staff focus on continuous improvement will help identify and implement new technology. This work can help create creating a culture of innovation and performance management that can build LCA's reputation in the industry and region.

Potential Responses

- Ensure leadership buy-in for the technology changes and become change agents by making more training available for staff
- Focus on defining the skillsets needed and update job descriptions and recruitment strategies to hire for those skills.

TREND NO. 5

Customer and Stakeholder Expectations

The service provided by LCA is widely acknowledged to be excellent and LCA is one of the lowest priced suppliers in the area. Engagement has also increased in the last few years, as LCA has grown and become more visible due to the Lease with the City of Allentown. Water and wastewater rates will also increase, and customers will want to understand what they receive for the additional cost.

LCA has aging infrastructure, which over time will lead to more breakdowns and increased customer impacts. Customer expectations are anticipated to increase for LCA, particularly related to options for customers to pay and communication with LCA about service issues. Customers and staff will expect improved response times for emergencies, service issues and calls or complaints.

The Lehigh Valley region will continue to grow and develop. To ensure LCA is able to provide sufficient treatment capacity for this growth, LCA will need to collaborate and engage with municipalities and stakeholders.

Potential Responses

- Share positive aspects of LCA's operation to increase customer and stakeholder understanding
- Continue upgrading the system, and as that is being done, communicate the story of and need for the work, as well as the cost of the upgrades.
- Communicate openly and consistently about services.
- Prioritize technology solutions that enhance the customer experience.

TREND NO. 6

Financial Considerations

LCA is regulated under the Pennsylvania Municipality Authorities Act and has only partial control over the rate-setting process, which requires approval and engagement with municipalities. This has led to different rate structures for different parts of the system. Affordability issues are increasing, based on demographic trends in the service area

There is an increased pressure on capital spending programs to make up for deferred maintenance over time. LCA sees some potential related to expanding its service area. As economic development in the area continues, the demand for water will grow and LCA will need to balance capital spending to support the replacement of aging infrastructure with the need to develop capacity for future customers.

Potential Responses

- Work with local economic development agencies to align and balance development goals with LCA's capacity.
- Increase long-term sewer capacity and in the short-term ensure the pretreatment plant can accept increased loads, based on projected development
- Balance capital needs and funding and monitor the ratio of projects funded with cash and debt service.
- Look at opportunities for increased or non-rate revenue (e.g., perform maintenance or operations for neighboring municipalities on a contract basis).
- Improve forecasting and financial management tools and work to tie data/systems together to better leverage technology.

TREND NO. 7

Increased Risk Profile

Extreme weather is increasingly frequent, including severe flooding and heavy rains. In 2016-2017 the region experienced a drought and the Little Lehigh dried out in some areas. Then, in 2018-2019, the region experienced a prolonged period of wet weather that brought widespread flooding and sewer system overflows throughout the service area. LCA also has risks related to aging infrastructure, which is a maintenance challenge today and requires a long-term capital-intensive replacement program for the foreseeable future. Development has caused an increase in impervious surface area, which in turn increases the likelihood of flooding and decreased groundwater recharge.

The COVID-19 pandemic has caused a slow-down in customer payments and higher delinquency rates. Business continuity with organizational turnover may present a challenge and relationships with municipalities may change as current leaders retire.

Potential Responses

- Continue positive technology security work to mitigate cyberthreats.
- Partner with local, state and federal funding programs to develop customer assistance programs that address affordability issues.
- Implement asset management programming.
- Continue LCA's historically strong employee safety program.

Aspirations
Strengths
Critical Issues
Opportunities

As part of the strategic planning process, LCA gathered input from Board Directors, staff, and stakeholders on the organization's aspirations, strengths, critical issues, and opportunities. This input provided valuable context for the strategic planning process by helping establish the framework of where LCA is today and the direction it should take into the future.

Aspirations focus on the expectations and hopes of stakeholders. LCA's most compelling aspirations are:

- Become a regional leader in the Lehigh Valley
- Proactively engage the community and municipalities
- Continuous improvement/agile problem-solving approach
- Develop and empower employees
- Proactive infrastructure management
- Exceptional internal communication and engagement

Strengths are the areas within the organization that it builds upon to achieve success. When prioritized, they included these strengths:

- Dedicated, skilled employees
- Quality service provided to customers
- Organizational adaptability
- Infrastructure planning and focus on meeting region's economic development needs
- Financial and operational excellence

Critical Issues help the organization identify the most significant issues that will impact operations over the next five years. Critical issues identified by LCA staff and stakeholders included:

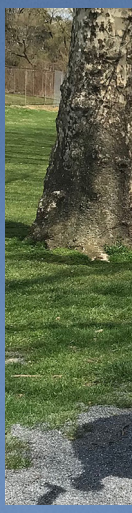
- Wastewater capacity challenges
- Recruiting and training new employees and leaders
- Aging infrastructure
- Integration of city and suburban divisions of LCA
- Improving technology systems and adoption of modernized processes

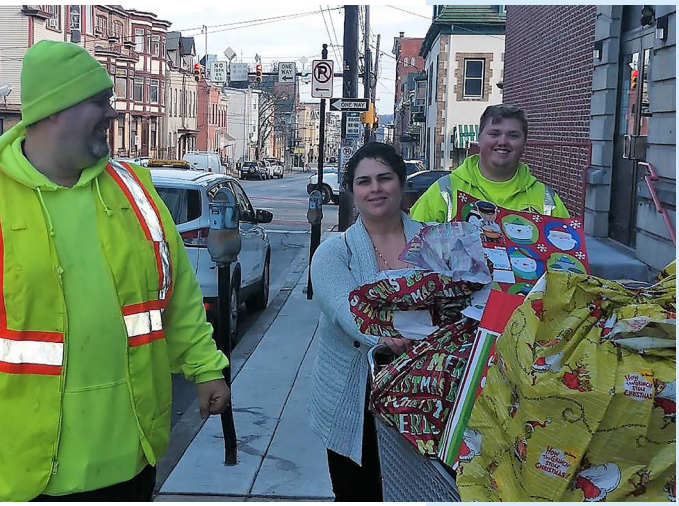
Opportunities help the organization identify strategies and approaches to meet future needs. LCA's future opportunities include:

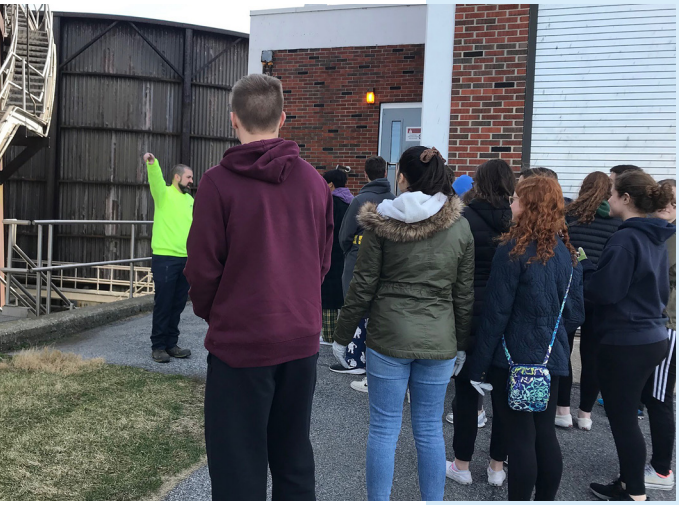
- Outreach and education about the work of LCA
- Managing and planning for population and industrial growth
- Developing and training employees
- Developing regional approaches for water and sewer service
- Increasing the use of technology and becoming more efficient

Strategic Framework

This strategic framework, based on an extensive strategic planning process, considers both LCA's present circumstances and its future goals, and will serve as a blueprint for decision-making moving forward. It contains a vision, mission statement, values, and priorities that address LCA's current challenges and help ensure continued success in operations and the management of resources and assets.







Vision:

To be a trusted and engaged community partner, advancing the vitality of our region through exceptional water and wastewater services.

Our Mission:

To protect public health and the environment by providing high-quality, safe, and reliable water and wastewater services.

Values:

Values articulate LCA's deeply held beliefs, norms, and qualities, which drive day-to-day activities. LCA has created a Value Statement, shown below.

Service: We take pride in our role as public servants. We focus on serving our customers and each other.

Engagement: We enjoy learning, exploring new ideas, solving problems, and embracing changes that support continuous improvement

Dedication: We give our best effort every day and seek ways to contribute to achieving LCA's goals.

Positivity: We face challenges with optimism and foster trust, teamwork, and collaboration.

Excellence: We strive to make LCA the best utility it can be.

Priorities

Priorities represent the most important issues that must be addressed to achieve LCA's desired future. LCA's priorities were driven primarily by the factors that are most critical to the organization's future success.

Measures and Strategies

Measures define accomplishment for each Priority, and Strategies are key resource allocations that should be made over the next five years. These critical elements of the strategic plan, as well as the Vision, Mission and Values, are presented in the strategic framework in this document.

Operational Excellence

To proactively ensure safe and reliable service delivery, regulatory compliance, and resilient operations through streamlined processes, best practices, and data-driven decision-making

STRATEGIES:

1. Establish and implement plans to meet or exceed all regulatory requirements.
2. Participate in the legislative and regulatory review process to prepare for new regulations and ensure LCA's interests are considered.
3. Develop approaches to enhance organizational resiliency, especially in the areas of cyber security, emergency preparedness, system redundancy, and climate change.
4. Leverage technology, industry best practices, and continuous improvement initiatives to ensure efficient and effective operations and internal practices.

MEASURES:

- Number of permit violations
- Number of boil advisories
- Average time to address service disruptions

Financial Stewardship

To cost-effectively serve our community, now and in the future, by managing funds effectively and responsibly to support debt commitments, operational needs, and asset management

STRATEGIES:

1. Sustainably support LCA's water and wastewater systems through responsible financial management.
2. Develop decision-making criteria for supporting growth opportunities.
3. Establish rates that balance affordability with achieving required revenue targets that support the financial needs of LCA.

MEASURES:

- Capital coverage ratio
- Collections program performance
- CIP program performance (on time, on budget)

System Capacity and Reliability

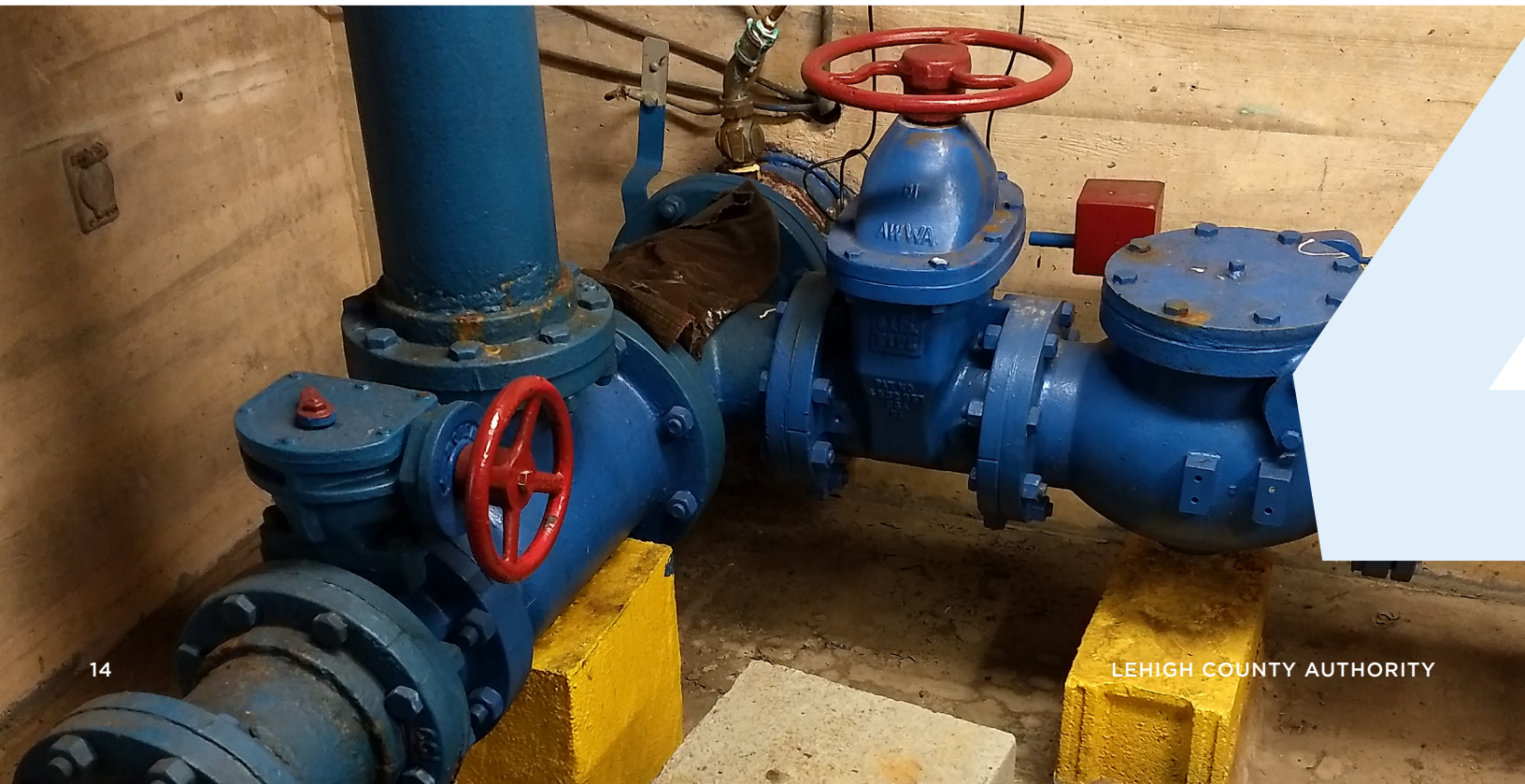
To dependably meet current and future community needs and achieve optimal levels of service by effectively managing assets and implementing projects to ensure sufficient system capacity

STRATEGIES:

1. Increase our systems' capacity to address economic development needs in our region.
2. Define and establish plans to meet LCA's targeted levels of service.
3. Standardize and implement a comprehensive asset management program to ensure infrastructure reliability, guide investment, and support data-driven decision-making.

MEASURES:

- Percentage completion toward developing LCA's asset management program
- Percentage completion toward developing a regional Act 537 Plan
- Planned vs. unplanned maintenance



Customer Engagement and Support

To create an exceptional customer experience and build trust and understanding of LCA's essential services

STRATEGIES:

1. Enhance customer engagement and experience through process improvements and adoption of new technology.
2. Improve our responsiveness to customers' needs.
3. Grow customer awareness and support for LCA's goals and direction.

MEASURES:

- Percentage change in call volume
- Customer service complaints per 1000 accounts

Regional Collaboration and Leadership

To help our region to thrive by growing community confidence in LCA, advancing collaborative efforts, and demonstrating operational excellence

STRATEGIES:

1. Collaborate with municipalities, stakeholders, and community groups to increase our understanding of the region's goals and strengthen the role LCA plays in supporting them.
2. Advance LCA's position in the region as the leading resource on water- and wastewater-related issues.
3. Support environmental sustainability and water equity initiatives through partnerships, education, and policy.

MEASURES:

- Progress reporting on strategies & milestones

Employee Engagement and Safety

To build a safe, cohesive, and engaging workplace in which employees feel personally connected to their work, each other, and LCA's commitment to excellence

STRATEGIES:

1. Ensure a safe working environment for all employees.
2. Standardize and enhance our approaches to succession planning, knowledge management, and performance management.
3. Expand opportunities for employee and leadership development, technical training, and certification.
4. Openly explore the diversity, equity, and inclusion issues that are important to LCA and our employees.
5. Engage employees in LCA's work through collaboration, communication, and cooperation.

MEASURES:

- Employee safety incident rate
- Full-time employee voluntary & total turnover rate

STRATEGIC FRAMEWORK

VISION

To be a trusted and engaged community partner, advancing the vitality of our region through exceptional water and wastewater services.

MISSION

To protect public health and the environment by providing high-quality, safe, and reliable water and wastewater services.

VALUES

Service
Engagement
Dedication
Positivity
Excellence

PRIORITIES

Operational Excellence

To proactively ensure safe and reliable service delivery, regulatory compliance, and resilient operations through streamlined processes, best practices, and data-driven decision-making

Financial Stewardship

To cost-effectively serve our community, now and in the future, by managing funds effectively and responsibly to support debt commitments, operational needs, and asset management

Regional Collaboration and Leadership

To help our region to thrive by growing community confidence in LCA, advancing collaborative efforts, and demonstrating operational excellence

System Capacity and Reliability

To dependably meet current and future community needs and achieve optimal levels of service by effectively managing assets and implementing projects to ensure sufficient system capacity

Customer Engagement and Support

To create an exceptional customer experience and build trust and understanding of LCA's essential services

Employee Engagement and Safety

To build a safe, cohesive, and engaging workplace in which employees feel personally connected to their work, each other, and LCA's commitment to excellence

Lehigh County Authority

STRATEGIES	MEASURES
1. Establish and implement plans to meet or exceed all regulatory requirements 2. Participate in the legislative and regulatory review process to prepare for new regulations and ensure LCA's interests are considered. 3. Develop strategies to enhance organizational resiliency, especially in the areas of cyber security, emergency preparedness, system redundancy, and climate change. 4. Leverage technology, industry best practices, and continuous improvement initiatives to ensure efficient and effective operations and internal practices.	• Number of permit violations • Number of boil advisories • Average time to address service disruptions
5. Sustainably support LCA's water and wastewater systems through responsible financial management. 6. Develop decision-making criteria for supporting growth opportunities. 7. Establish rates that balance affordability with achieving required revenue targets that support the financial needs of LCA.	• Capital coverage ratio • Collections program performance • CIP program performance (on time, on budget)
8. Collaborate with municipalities, stakeholders, and community groups to increase our understanding of the region's goals and strengthen the role LCA plays in supporting them. 9. Advance LCA's position in the region as the leading resource on water- and wastewater-related issues. 10. Support environmental sustainability and water equity initiatives through partnerships, education, and policy.	• Progress reporting on strategies & milestones
11. Increase our systems' capacity to address economic development needs in our region. 12. Define and establish plans to meet LCA's targeted levels of service. 13. Standardize and implement a comprehensive asset management program to ensure infrastructure reliability, guide investment, and support data-driven decision-making.	• Percentage completion toward developing LCA's asset management program • Percentage completion toward developing a regional Act 537 Plan • Planned vs. unplanned maintenance
14. Enhance customer engagement and experience through process improvements and adoption of new technology. 15. Improve our responsiveness to customers' needs. 16. Grow customer awareness and support for LCA's goals and direction.	• Percentage change in call volume • Customer service complaints per 1,000 accounts
17. Ensure a safe working environment for all employees. 18. Standardize and enhance our approaches to succession planning, knowledge management, and performance management. 19. Expand opportunities for employee and leadership development, technical training, and certification. 20. Openly explore the diversity, equity, and inclusion issues that are important to LCA and our employees. 21. Engage employees in LCA's work through collaboration, communication, and cooperation.	• Employee safety incident rate • Full-time employee voluntary & total turnover rate

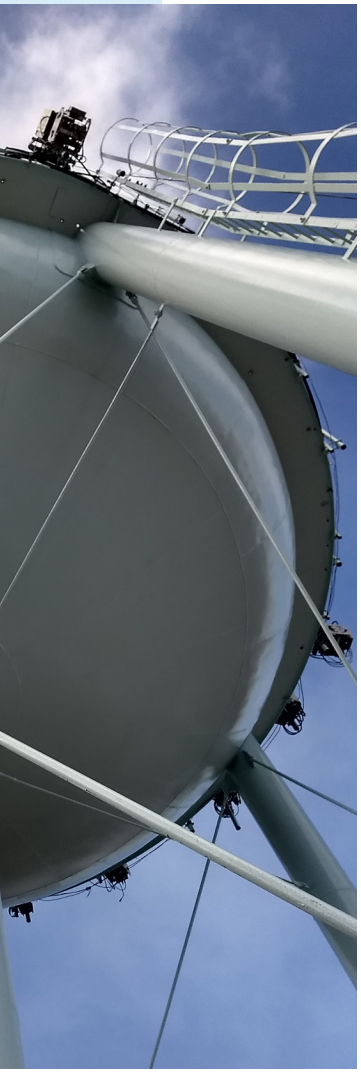
Communications

Through this strategic plan, LCA has committed to improving internal and external communication and collaboration. Effective communication is critical not only for the successful implementation of the plan, but also for LCA's overall success.

Communication, which surfaced as an opportunity area during the stakeholder engagement process, will be important to all strategic priorities. Communications could be enhanced through several efforts, including:

- Collaborating with municipalities, stakeholders, and community groups
- Increasing brand awareness
- Engaging employees in LCA's work through collaboration, communication, and cooperation
- Increasing the use of multi-disciplinary teams to manage issues and projects
- Improving LCA's responsiveness to customers' needs
- Building customer awareness and support for LCA's goals and direction

Enhanced communications will be a major initiative throughout the organization to ensure that all teams and individuals are working towards LCA's vision and mission.



Implementation

The priorities, measures, and strategies contain a series of initiatives and projects that, when implemented, will move LCA toward its desired outcomes. However, it is important to note that for the desired results to be achieved, the strategies must be effectively implemented.

Therefore, careful attention and focus on strategy implementation is essential for achieving strategic success. Elements of the implementation process for LCA include:

- Leveraging internal subject matter expertise: Continuing to use key staff members and small teams that are knowledgeable, energized and committed to the implementation of the strategies for different priorities to:
  - » Draft implementation plans for each strategy that will include:
    - – Tasks necessary for implementation
    - – Assigned individuals or groups
    - – Due dates for key tasks
    - – Resources required
  - » Monitor and share implementation progress
  - » Report on implementation progress to organizational leadership and the Board of Directors
  - » Review and update implementation tasks on at least an annual basis

Organizational Overview

14 Water Systems

8 Sewer Systems

20 Municipalities Served

25.1 Million Gallons per Day (MGD) of Water Produced

32.48 MGD
Wastewater Treated

168 Awesome Employees

200,000
Total Population Served

55,000 Properties Served - Customer
Allentown: 33,400
Suburban: 21,600

Average Annual Water Bill (2021)
Suburban: $246/year
Allentown: $447/year

Average Annual Sewer Bill (2021)
Suburban: $356/year
Allentown: $252/year

2021 Budget Highlights
Operating Revenues – $77M
Operating Expenses – $42M
Capital Improvements – $17M
Debt Service Expense – $18M

Our Infrastructure

8 Treatment Plants
Water: 1 Allentown
Sewer: 1 Allentown, 6 Suburban

15 Storage Tanks
Allentown: 7
Suburban: 8

30 Pump Stations
Allentown: 7
Suburban: 23

662 Miles of Water Mains
Allentown: 318
Suburban: 344

403 Miles of Sewer Mains
Suburban: $356/year
Allentown: $252/year

3,709 Fire Hydrants
Allentown: 1,907
Suburban: 1,802

21 Wells
(Suburban Only)

15,804 Valves
Allentown: 8,733
Suburban: 7,071

162 Air Release Valves
Allentown: 81
Suburban: 81

8,997 Manholes
Allentown: 7,198
Suburban: 1,799

Lehigh County Authority

MEMORANDUM

Date: December 13, 2021

To: LCA Board of Directors
Liesel Gross, CEO

From: Phil DePoe, Senior Planning Engineer

Subject: Suburban Division: LCA Pretreatment Plant (PTP) Master Plan – Planning Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Plan Authorization: Jacobs – PTP Master Plan	$191,700
1A	Professional Services Authorization: Jacobs – PTP Master Plan	$166,700*

**Included in the Capital Project Authorization*

1. Suburban Division: LCA PTP Master Plan

AUTHORIZATION OVERVIEW:
As part of the ongoing Act 537 planning process underway, LCA has identified the need to undertake a master plan for the PTP. This Master Plan will be a roadmap for the implementation of short and long-term improvements to the PTP, identifying the renewals, replacements, and capital improvements necessary to keep the PTP fully operational and in compliance for the next several decades. The Master Plan will also identify improvements to accommodate growth in brewery (Boston Beer Company/BBC) loads greater than BBC's present allocation as well as the projected growth in non-BBC flows and loads in Upper Macungie Township (UMT). The identified improvements will be accompanied with cost estimates and a recommended schedule for implementation.

In preparing the Master Plan, Jacobs will build on their Act 537 analysis of the hydraulic and treatment capabilities of the PTP as well as capital improvements for plant upgrades and their associated cost estimates. Recommendations for repairs, replacements, and capital improvements will also be based on the condition assessment work the Jacobs O&M group is presently completing.

See attached proposal for further details.

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

CURRENT STATUS:
The consulting engineer has recently completed numerous planning documents related to Act 537 Planning. The results from this authorization will be incorporated into the final Regional Act 537 Plan.

THIS APPROVAL:
Jacobs is serving as the Technical Lead for the Reginal Act 537 Plan's PTP Upgrade Option. Following upon successful completion of that Act 537 analysis, Jacobs is now recommended for this approval. These Master Plan services include, but are not limited to, the following tasks:

Professional Services:
• Flow and Load Projection Refinement
• Regulatory Review
• PTP Capacity Evaluation, Improvement Recommendations, and Cost Estimates
• Renewal and Replacement Needs and Cost Estimates
• Combined Heat and Power (CHP)
• Coordination and Meetings
• Master Plan Preparation and Presentation

CONSULTANT SELECTION PROCESS:
Jacobs is the current PTP operator, maintains proprietary modeling software of the facility, and recently completed numerous reports related to Act 537 Planning. Their intimate knowledge of the PTP and their expert engineering staff makes their involvement critical to this Master Plan.

SCHEDULE:
The final report will be delivered in June 2022, followed by a presentation to LCA Upper Management and the LCA Board of Directors.

FUTURE AUTHORIZATIONS:
An update to this Master Plan will tentatively occur every five years.

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Philip M. DePoe, PE
Senior Planning Engineer
Lehigh County Authority
1053 Spruce Rd
Allentown, PA 18106

December 2, 2021

Subject: Pretreatment Plant Master Plan – Scope of Work and Fee Proposal

Dear Phil,

The Lehigh County Authority (LCA) is seeking Jacobs' assistance to prepare a Master Plan for the Pretreatment Plant (PTP) located in Allentown, PA. The Master Plan will be a roadmap for the implementation of short and long-term improvements to the PTP, identifying the renewals, replacements, and capital improvements necessary to keep the PTP fully operational and in compliance for the next several decades. The Master Plan will also identify improvements to accommodate growth in brewery (Boston Beer Company/BBC) loads greater than BBC's present allocation as well as the projected growth in non-BBC flows and loads in Upper Macungie Township (UMT). The identified improvements will be accompanied with cost estimates and a recommended schedule for implementation.

In preparing the Master Plan, Jacobs will build on our Act 537 analysis of the hydraulic and treatment capabilities of the PTP as well as capital improvements for plant upgrades and their associated costs. We will use relevant elements of the Act 537 work as a basis for achieving the most efficient means to accommodate the anticipated future growth in UMT and above-allocation growth in BBC's flow and loads. Recommendations for repairs, replacements, and capital improvements will also be based on the condition assessment work the Jacobs O&M group is presently completing, which includes an in-depth evaluation of the pure oxygen generation system.

Development of the Master Plan will be coordinated with LCA's Act 537 planning process: for example, near-term recommendations will not conflict with improvements that would be required if the PTP were converted to a direct to surface water discharge facility. Additionally, Jacobs will identify where potential synergies can be achieved by grouping improvements together, this may include advantages in constructability, operational improvements, and cost savings.

The Master Plan will be prepared in collaborative manner with LCA staff and the Jacobs O&M group providing their operational insight and input on the prioritization of PTP needs. The Master Plan will have an approximate overall planning period of 30-years. Flow and load projections will be determined for 10-year increments to align with LCA's Act 537 planning process, the decades will be broken-down into the following periods: 2020-2030, 2031-2040, and 2041-2050. However, Capital Planning forecast periods will be more refined in the first decade of the overall planning period to provide the information needed for making sound near-term decisions, the capital planning time periods will be: 0-5 years (2020-2025), 6-10 years (2026-2030), 11-25 years (2031-2045), and 26 years and beyond (2046 and beyond).

Scope of Work

Task 1- Flow and Load Projection Refinement

An understanding of the PTP's present-day flows and organic loads as well as projections for future flows and loads are important and integral elements of the PTP Master Plan. Jacobs will use the flow and load baseline data we prepared for our recent Task Order to provide Act 537 support to LCA (Act 537) as a basis for the Master Plan; this ensures continuity between the Master Plan and Act 537 planning. For Act 537 Jacobs reviewed PTP flow and load data from January 2016 through September 2020, from that review we derived the ACT 537 PTP baseline flows and loads. We'll use the baseline flow and load data to form the basis of our initial evaluation of the PTP where improvements needed to maintain the PTP's present-day operating status as well as the PTP's original design conditions will be identified. This approach provides information that will define "the floor" of the Master Plan; these are the improvements needed to keep the PTP operational without consideration for future growth.

For Act 537, flow projections for Upper Macungie Township (UMT) for the planning years of 2020-2030, 2031-2040, and 2041-2050 were provided to Jacobs by LCA. The UMT flow projections were prepared on a parcel-by-parcel basis. The projected flow from each parcel was provided in gallons per day (gpd) and the type of future development on the parcel (e.g., residential, commercial, and light industry) was also provided. Jacobs used these flow projections for our work on Act 537 and we'll use the same information for the Master Plan flow projections. For Act 537 Jacobs correlated future flows with information on loads by flow type; this is a sound approach and the data that was developed will be maintained for the Master Plan. For each planning period Jacobs will summarize the future annual average flows and future design flows (maximum month average day condition), as well as the average annual and design waste loads.

The BBC brewery is the largest load contributor to the PTP; therefore, changes in BBC flows and loads will have an outsized impact on the PTP. Future projections for BBC flows and loads were defined and incorporated into our Act 537 work. Jacobs will maintain those projections for the Master Plan. We'll coordinate with LCA to define the planning period when the future BBC flows and loads are assumed to materially contribute to the PTP influent, necessitating capital improvements. For the Master Plan floor condition BBC flows and loads will be maintained at their present levels. BBC flows and loads used to define the floor condition will be noted and will also be compared with the limits identified in the recently renewed contract with LCA.

As part of LCA's Western Lehigh Interceptor sewer modeling efforts, residential flow segregation and PTP bypass will be evaluated by LCA and LCA's modeling consultant. The evaluation intends to look at the feasibility, associated construction costs, and projections for flow reduction to the PTP for three to five scenarios. Jacobs will incorporate the anticipated flow and load reductions from the residential flow segregation exercise into the Master Plan.

LCA and UMT maintain agreements with commercial and industrial customers whose effluent is treated at the PTP. Jacobs will summarize the existing agreements by user, user's allocation of the PTP capacity, and user's actual discharge flow and loads. This will provide insight into whether individual users are discharging above, at, or below their allocation. In addition, it will provide insight into how these customers act in the aggregate and how the total allocation of PTP capacity and actual capacity usage compare with the PTP's rated capacity. The PTP's capacity must be large enough to accommodate these users at their capacity limits, in addition to the flows and loads from all other users.

In addition to the above determination of average and design flows and loads for each of the planning periods, it's also important to identify how wet weather events impact the PTP and what future considerations for wet weather flow at the PTP, if any, may need to be implemented. Jacobs will request LCA and LCA's modeling consultant to provide planning-level predictions for design-level wet weather events for each of the planning periods. Planning-level predictions should include relevant historic data on wet weather events including Infiltration/Inflow (I/I), climate change predictions of impacts on wet

weather events, as well as predictions of wet weather mitigation or I/I reduction programs that may be ongoing or planned.

The work for Task 1 will result in the definition of present-day conditions, as well as the identification of dry and wet weather flow and load projections for each planning period. Design flows and design waste loads will also be established for each period. We'll use these design criteria to perform our Master Planning analysis of the PTP's ability to treat the projected flows and loads in each period and define capital improvements that may be needed to increase the PTP's hydraulic or treatment capacity.

Assumptions:

1. Planning periods will remain as identified herein.
2. LCA and LCA's modeling consultant will provide planning-level predictions for design-level wet weather events for each of the planning periods. Information for instantaneous peak flow, peak hour, and average day for LCA's design storm condition 5yr, 10yr, or 25yr will be provided.
3. LCA and LCA's modeling consultant will provide results of the Residential Flow Segregation study for each of the planning periods.
4. Boston Beer Company flow and load projections will remain as developed for the Act 537 work.
5. LCA will provide a list of all commercial and industrial customers that have an allocation of PTP capacity, via agreements or contract with UMT or LCA. LCA will provide 12 months of flow and load data for each customer.
6. Determination of the hydraulic capacity of the conveyance system to convey flows (existing, future, or wet weather) to the PTP and to convey treated effluent from the PTP to the Western Lehigh Interceptor is not included in the scope of work.
7. The PTP will continue its operation as a pretreatment plant with PTP effluent limits of 25 mg/L for BOD and 25 mg/L for TSS (25/25) and final treatment of the PTP effluent at the Kline's Island WWTP.
8. There will be one virtual meeting with LCA to review the flow and load projections.

Deliverables:

1. Task 1 Meeting Summary
2. Draft - Master Plan Section – Flow and Organic Load projections for the planning periods.
3. Final - Master Plan Section – Flow and Organic Load projections for the planning periods.

Task 2- Regulatory Review

Although the PTP is not a PADEP-permitted facility with regard to effluent standards, residuals disposal does fall within PADEP's regulatory purview. Also, the PTP maintains a PADEP air quality permit.

Jacobs will review PADEP's residual waste regulations and will summarize future regulatory changes identified by PADEP that could potentially impact disposal of the PTP's residual waste.

Jacobs will review PADEP's air quality regulations and will summarize future regulatory changes identified by PADEP that could potentially impact the PTP's air permit.

Assumptions:

1. LCA will research the PTP effluent limits of 25 mg/L for BOD and 25 mg/L for TSS (25/25) and provide text for insertion into the Master Plan.
2. Regulatory review will not analyze enacted or potential future regulations that may impact the Kline's Island WWTP's effluent permit, and in-turn the PTP's effluent quality.
3. Regulatory review will not encompass the PTP's Industrial Pretreatment Program (IPP).

Deliverables:

1. Draft – Master Plan Section – Regulatory Review.
2. Final - Master Plan Section – Regulatory Review.

Task 3- PTP Capacity Evaluation, Improvement Recommendations, and Cost Estimates

Based on the projected design flows and loads from Task 1 Jacobs will evaluate the treatment capacity of the PTP for each planning period. To analyze treatment capacity, we'll use the process modeling we developed for our work on Act 537. Treatment capacity evaluation will identify where treatment unit processes or unit process equipment may be undersized or inadequate to maintain the required effluent limits for each planning period's design conditions. If there are treatment unit processes or unit process equipment that are undersized or inadequate, we'll use modeling and engineering assessments to determine the improvements required to ensure PTP treatment capacity and performance is adequate to meet the 25/25 discharge limits. In addition, we'll also verify the hydraulic capacity of the PTP equipment and conveyance for each planning period. Necessary pumping and hydraulic capacity improvements will be identified. Additionally, the capacity of the cryogenic plant which supplies pure oxygen to the high-rate treatment process will be evaluated for each planning period.

For Task 3 Jacobs will build on our Act 537 support to LCA. For our Act 537 work Jacobs developed concepts and cost estimates for improvements to the PTP that account for growth in UMT flow and loads and an increase in BBC flow and loads while maintaining effluent limits at 25/25. With that analysis complete, there is merit to analyzing a future PTP scenario where the projections for growth of flows and loads from UMT are considered and the impact on the PTP is determined. However, in this scenario BBC flows and loads will be kept at either their present-day levels, or at the allocation limit identified in LCA's contract with BBC. The analysis will be performed for each planning decade. This analysis will complement the completed Act 537 work and will provide LCA with information to analyze permutations of future "what if" scenarios for capacity-related improvements to the PTP.

The evaluation for this task will also include any positive or negative impacts on the existing equalization storage facilities due to future flows and loads. The need for additional or expanded equalization storage facilities will be evaluated.

In addition, Jacobs will analyze the performance capabilities of the PTP biosolids treatment train which consists of belt filter presses, gravity belt thickeners, and digesters Analysis of the biosolids treatment train will be performed using the whole-plant process modeling that's used to perform the liquid train process modeling. If the analysis identifies deficiencies in the biosolids treatment train, we'll make recommendations for capital and operational improvements. The capacity of the biosolids facilities will be evaluated for each planning period.

Jacobs will review the capacity of the existing electrical infrastructure at the PTP to determine if any newly identified power requirements can be supplied from it, or if an expansion is needed. Recommendations for electrical improvements and expansion, if needed, will be identified. Jacobs will also review the existing dual electric utility (PP&L) feeds to the PTP. Utility power feed review will include commentary on whether the utility feeds can be considered to be not only separate, but fully redundant in their source of supply at their point of origin, which is assumed to be PP&L's substation. In addition, recommendations for on-site backup power will be provided.

Jacobs will develop a conceptual site layout for recommended PTP improvements using the unit process footprints developed during the capacity evaluation. The layouts will consider conflicts from existing infrastructure and note the extent of any major demolition that may be required. The site layout work will show how PTP improvements can be situated on land presently owned by LCA. We'll also identify if improvements may be better situated on adjacent land presently owned by others. If this is the case, we'll note potential advantages of locating the improvements on adjacent land, which LCA would have to purchase.

For each planning period we'll develop an implementation plan to identify the schedule of needed facility improvements and their associated costs. Jacobs will prepare planning-level cost estimates for the improvements required to increase the PTP's treatment capacity and/or hydraulic capacity. Cost estimates will be Concept-Level (Class 5); these estimates are expected to have an accuracy range of +100% / -50% at a project definition level of 0% - 2%. Cost estimates will be coordinated with the proposed timeline for the improvements. Jacobs will prepare all cost estimates using its proprietary

Conceptual Parametric Estimating System (CPES). CPES uses a parametric approach to develop cost estimates using a cost database that is based on past constructed projects and up-to-date material and labor costs.

Assumptions:

1. PTP capacity evaluations and improvement recommendations will be planning level. A Facility Plan or Engineer's Report (which are more refined than a Master Plan) will be required to identify and refine the details of the improvements that are selected for implementation, including an in-depth review of environmental and other regulations, approvals, permit requirements and development of detailed project costs.
2. Jacobs will reference the design criteria in the August 2017 Pre-Draft version of the PADEP Domestic Wastewater Facilities Manual which appears to be based on the most recent edition of the Recommended Standards for Wastewater Facilities, 2014 edition (10-State Standards). We will not reference the 1997 version of the PADEP Manual, because it appears that it's being phased-out. Because the PTP is not a PADEP-permitted facility for its treatment efficiency or discharge limits we'll identify where we believe strict adherence to the design guidance in the PADEP Manual has the potential for material impacts on capital improvements and we may identify an alternative recommendation.
3. Jacobs' review of the existing dual electric utility (PP&L) feeds to the PTP is predicated on PP&L providing relevant information, upon request from Jacobs.
4. Site layouts will be conceptual and based on our estimates of process equipment or building "footprints".
5. Jacobs Act 537 "As-Is" Scenario Technical Memorandum identifies the PTP improvements and costs associated with future growth in both BBC and UMT flow and loads. The information in the TM may be referenced in the Master Plan and will not need to be revised or updated.
6. Additional scenario modeling or modified assumptions not already included in this scope of work may require additional fees to complete the work, depending on the complexity of the changes requested, and are not included in this proposal.
7. There will be one 1-hour virtual task kick-off meeting with LCA to review the scope of this Task and to address questions and assumptions. This will take place prior to starting work on the Task.
8. There will be one 2-hour virtual meeting with LCA to review the initial results of the PTP capacity evaluation, improvement recommendations, and cost estimates.

Deliverables:

1. Virtual Task kick-off meeting summary.
2. Virtual PTP capacity evaluation, improvement recommendations, and cost estimate meeting summary
3. Draft - TM – PTP Capacity Evaluation, Improvement Recommendations, and Cost Estimates.
4. Final - TM – PTP Capacity Evaluation, Improvement Recommendations, and Cost Estimates.

Task 4- Renewal and Replacement Needs and Cost Estimates

Jacobs O&M group performs a plant-wide condition assessment (CA) of PTP assets once every 5-years. The CA work is nearing completion and recommendations in the CA report will be used as the basis to define the renewal and replacement needs at the PTP for the Master Plan. The CA work the O&M group is performing will also include an in-depth evaluation of the pure oxygen generation system, this is planned for Q1-2022. The results from the pure-ox system assessment will also be integrated into the Master Plan.

It is noted that the O&M group as part of their asset management (AM) activities at the PTP give assets unique ID's which are used in the Computerized Maintenance Management System (CMMS). The CMMS is used to track work orders and repair and replacement costs. Coordination of asset tracking at the PTP with LCA's migration toward an AM program, may be of future interest to LCA; however, will not be part of the Master Plan.

Using the results of the CA we'll develop projections for renewal and replacement needs for each capital planning period. We'll account for the prioritization and rankings identified in the CA report, and we'll assign improvements to the period when they become necessary to maintain the PTP's required performance. We'll also identify additional improvements to the PTP that were not part of the condition assessment; however, may be recommended because of obsolescence or exceedance of useful life.

Additionally, Jacobs will review the PTP to identify projects that will increase or enhance resiliency and redundancy at the PTP. The goal of this exercise is to develop a list of potential vulnerabilities and develop ideas and recommendations for improvements to enhance resiliency and redundancy, that would not necessarily be captured in a condition assessment review or plant capacity expansion analysis.

After the initial identification of the renewal and replacement needs is complete, and before the cost estimating work begins, Jacobs will conduct a virtual workshop with LCA and the PTP O&M group to review the draft Project List. Projects that have the potential to provide an increase in efficiency and/or a good return on investment (ROI) will be identified, and the basis of recommending the project will be discussed. The Project List will be updated based on the outcome of the meeting. With the Project List updated, development of cost estimates will begin.

Jacobs will prepare budgetary cost estimates for the improvements on the Project List. Cost estimates will be Budgetary-Level (Class 4); these estimates are expected to have an accuracy range of +50% / -30% at a project definition level of 1% - 15%.

We'll develop a project implementation plan, identifying the recommended facility improvements and their associated costs. Improvements will be aligned with their associated capital planning period. The information will be presented in summary table form for easy reference.

This task will also identify which projects, and their associated costs, are needed to restore and maintain the PTP's present-day operating status as well as the PTP's original design conditions without consideration for future growth; this will define "the floor" of the Master Plan.

Assumptions:

1. Budgetary Cost Estimates (Class 4) will be developed for the renewal and replacement improvements identified in the condition assessment report. These estimates are expected to have an accuracy range of +50% / -30% at a project definition level of 1% - 15%.
2. Concept-Level Cost Estimates (Class 5) will be developed for redundancy and resiliency improvements; these estimates are expected to have an accuracy range of +100% / -50% at a project definition level of 0% - 2%.
3. There will be one 2-hour virtual meeting with LCA to review the Project List of improvements, including recommendations to increase or enhance resiliency and redundancy at the PTP.

Deliverable:

1. Draft - TM – CIP Schedule and Project Costs
2. Final - TM – CIP Schedule and Project Costs

Task 5- On-Site Cogeneration / Combined Heat and Power (CHP)

The objective of this task is to assess, under current loading conditions, the PTP's anaerobic digestion and biogas recovery facility to identify the feasibility of incorporating of a new gas-to-energy facility that has the potential to provide an economic advantage to LCA.

Jacobs will review historical biogas generation rates and compare against model-predicted rates and quality to validate the model is calibrated for biogas production. In addition, existing drawings of the digestion system will be reviewed to identify major equipment sizing that will be used to calculate estimated heating needs that will be compared against the historical biogas usage for heating (versus flaring). Records of any natural gas used for digester heating will also be reviewed and summarized.

Next, the predicted biogas production from the process model will be used to estimate CHP unit sizing assuming an internal combustion engine (ICE) is utilized. The heating needs of the anaerobic digesters will be reviewed against the energy available from the biogas and waste heat from the CHP system.

Jacobs will prepare a budgetary cost estimate for the installation of the combined heat and power system improvements. Cost estimates will be Conceptual-Level (Class 5); these estimates are expected to have an accuracy range of +100% / -50% at a project definition level of 0% - 2%. Estimated Operation and maintenance costs for the CHP system, as well as an estimate of utility power cost reductions, will also be provided. We will create a life cycle evaluation of the CHP system and provide a projection of the number of years for a capital investment "payback".

Jacobs will contact the power utility, PP&L, to verify constraints or charges that relate to the proposed installation of a CHP system; including the ability, or inability, to "net-meter", which is the ability to transfer surplus power back to the grid.

Assumptions:

1. Only minor adjustments, such as adjusting bioavailable carbon content of an incoming waste, to the existing process model are required for validation. No supplemental sampling of the wastes would be required.
2. Model validation is defined as +/- 15% from the plant data.
3. Historical sampling of the biogas quality from 2008, 2010, and 2012 are still valid and no additional testing is required.
4. Plant drawings are available of recent anaerobic digestion upgrades to validate digester, equipment, and biogas conveyance sizing as well as heating requirements.
5. Historical plant data on biogas generation and flaring is available.
6. If the condition of the existing biogas piping is not known, it will be assumed that the condition of the piping is adequate unless otherwise directed.
7. Current PP&L electric tariffs will be used for the electrical generation rates.

Deliverables:

1. Draft - TM – CHP Improvement Recommendations and Cost Estimates.
2. Final - TM – CHP Improvement Recommendations and Cost Estimates.

Task 6- Coordination and Meetings

Jacobs will provide knowledgeable and engaged project staff for coordination and meetings appropriate to support the LCA for this Task. The following coordination efforts and meetings are assumed:

- Jacobs will prepare for and conduct a project kick-off meeting with LCA. Attendance will be by 3 Jacobs staff.
- Jacobs' project manager will provide LCA with monthly status updates on the work.

Assumptions:

1. Jacobs will prepare agendas prior to each meeting and meeting minutes after each meeting.
2. Task-specific meetings are identified within the individual task scope of work write-up and are not repeated here.

Task 7- Master Plan Preparation and Presentation

The objective of this task is to provide LCA with a Master Plan that's a comprehensive reference document that will become a useful planning tool. The Master Plan will include sections covering background and objectives, approach to the development of the master plan, capital improvement plan overview, project descriptions by planning year period, and additional recommendations.

Jacobs will submit a draft Master Plan for LCA review. LCA's comments on the draft Master Plan can be provided verbally during the recommended workshop meeting or in written form. Prior to making final edits on the draft Master Plan Jacobs will review with LCA, LCA's comments and our responses; this will ensure we develop consensus on the edits to the Master Plan. Jacobs will address all comments and provide LCA with a Final Master Plan.

Assumptions:

1. There will be one iteration of comments from LCA on the draft Master Plan.
2. LCA will provide comments on the draft Master Plan to Jacobs within 3 weeks of receipt of the draft Master Plan.
3. There will be one 2-hour workshop meeting with LCA to review the draft Master Plan.
4. Jacobs will prepare for and attend one Final Master Plan presentation meeting with LCA. Attendance will be by 2 Jacobs staff in-person and 2 Jacobs staff attending virtually.

Deliverables:

1. Master Plan – Draft
2. Workshop Summary
3. Written Response to Comments
4. Master Plan - Final

Schedule

The following 6-month schedule is assumed for this project.

Project Notice to Proceed	January, 2022
Kickoff Meeting	January, 2022
Task 1- Flow and Load Projection Refinement	January – February, 2022
Task 2 – Regulatory Review	February 2022
Task 3 – PTP Capacity Evaluation, Improvement Recommendations, and Cost Estimates	February – April 2022
Task 4 - Renewal and Replacement Needs and Cost Estimates	April – May 2022
Task 5 – Combined Heat and Power (CHP)	February – April 2022
Task 6 - Coordination and Meetings	January - June 2022
Task 7- Master Plan Preparation and Presentation	May – June 2022

Fee

The total not to exceed fee for the proposed scope of work is $166,700. Jacobs fee breakdown is provided in the following table.

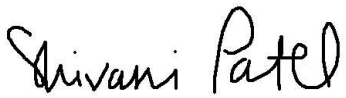
JACOBS

Project Task	Labor Hours	Labor Cost	Other Direct Costs and Allowances	Task Totals
1. Flow and Load Projection Refinement	38	$6,205	$0	$6,205
2. Regulatory Review	28	$5,274	$0	$5,274
3. PTP Capacity Evaluation, Improvement Recommendations, and Cost Estimates	282	$47,418	$0	$47,418
4. Renewal and Replacement Needs and Cost Estimates	270	$53,120	$155	$53,275
5. Combined Heat and Power (CHP)	119	$21,200	$0	$21,200
6. Coordination and Meetings	48	$11,726	$0	$11,726
7. Master Plan Preparation and Presentation	130	$21,602	$0	$21,602
Project Total	**915**	**$166,545**	**$155**	**$166,700**

We propose this project being Task Order 3 under the existing September 23, 2019 Master Services Agreement with LCA.

We appreciate the opportunity to propose on this important project and look forward to moving forward at your convenience. If you should have any questions, please do not hesitate to contact me at 215. 327.0848, joe.nattress@jacobs.com, or our proposed project manager John Tobia, at 908.581.3739, john.tobia@jacobs.com.

Sincerely,



Joseph M. Nattress, P.E.

Vice President

Shivani Patel, P.E.

Geographic Manager of Projects

Attachments:

a) Task Order No. 3 Form

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.:	SD-S-3	**BUDGET FUND:**	Suburban Div\Wastewater\Capital
PROJECT TITLE:	LCA Pretreatment Plant (PTP) Master Plan	**PROJECT TYPE:**	
		☐	Construction
		☒	Engineering Study
THIS AUTHORIZATION:	**$191,700**	☐	Equipment Purchase
TO DATE (W/ ABOVE)	**$191,700**	☐	**Amendment**

DESCRIPTION AND BENEFITS:

As part of the ongoing Act 537 planning process underway, LCA has identified the need to undertake a master plan for the PTP. This Master Plan will be a roadmap for the implementation of short and long-term improvements to the PTP, identifying the renewals, replacements, and capital improvements necessary to keep the PTP fully operational and in compliance for the next several decades. The Master Plan will also identify improvements to accommodate growth in brewery (Boston Beer Company/BBC) loads greater than BBC's present allocation as well as the projected growth in non-BBC flows and loads in Upper Macungie Township (UMT). The identified improvements will be accompanied with cost estimates and a recommended schedule for implementation.

Prior Authorization: None.

This Authorization: PTP Master Plan development.

See attached Board Memo for further project details.

Authorization Status:

Requested This Authorization	
Design Phase	
Staff	**$20,000**
Contractor	**$0**
Engineering Consultant	**$166,700**
Contingency	**$5,000**
Total This Authorization	**$191,700**

Prior Authorization	$0
Subtotal	**$191,700**
Future Authorizations (2027)	*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: JACOBS
412 Mt. Kemble Ave., Suite 100
Morristown, NJ 07960-1936

Date: December 13, 2021
Requested By: Phil DePoe

Approvals
Department Head: _____
Chief Executive Officer: _____

Suburban Division: LCA Pretreatment Plant (PTP) Master Plan - Planning Phase

As part of the ongoing Act 537 planning process underway, LCA has identified the need to complete a master plan for the PTP. This Master Plan will be a roadmap for the implementation of short and long-term improvements to the PTP, identifying the renewals, replacements, and capital improvements necessary to keep the PTP fully operational and in compliance for the next several decades. The Master Plan will also identify improvements to accommodate growth in brewery (Boston Beer Company/BBC) loads greater than BBC's present allocation as well as the projected growth in non-BBC flows and loads in Upper Macungie Township (UMT).

The identified improvements will be accompanied with cost estimates and a recommended schedule for implementation. In preparing the Master Plan, Jacobs will build on their Act 537 analysis of the hydraulic and treatment capabilities of the PTP as well as capital improvements for plant upgrades and their associated cost estimates. Recommendations for repairs, replacements, and capital improvements will also be based on the condition assessment work the Jacobs O&M group is presently completing.

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

Professional Services (1)
1. Flow and Load Projection Refinement
2. Regulatory Review
3. PTP Capacity Evaluation, Improvement Recommendations, and Cost Estimates
4. Renewal and Replacement Needs and Cost Estimates
5. Combined Heat and Power (CHP)
6. Coordination and Meetings
7. Master Plan Preparation and Presentation

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

This Approval: *$166,700*
Approval Amount (not to be exceeded without further authorization): *$166,700*

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:** _____

FINANCE & ADMINISTRATION

ACTION ITEMS

1. *2022 Board Meeting Dates* – December 13, 2021

The proposed Board meeting schedule for 2022 is presented for Board approval so the schedule can be advertised and posted to the Authority's website.

2. *Resolution 12-2021-1 – Customer Facility Fees; Connection Fees; and Suburban Wastewater Tapping Fees* – December 13, 2021

Resolution No. 12-2021-1 is presented for Board consideration to update certain tapping fees, customer facilities and connection fees. The Suburban Wastewater Tapping Fees are updated annually with the assistance of LCA's rate consultant and apply to all new sewer connections in the Suburban Division. The 2022 Customer Facilities Fees and Connection Fees reflect actual costs for LCA purchase and installation of required metering equipment and other installation details for each connection size for water and sewer service.

3. *LCA Strategic Plan – Update & Approval* – December 13, 2021

Since April 2021, LCA has been working on preparing an updated Strategic Plan and incorporating feedback from employees, key stakeholders, and the Board of Directors. The work has been facilitated by Raftelis and included development of updated mission and vision statements, along with strategic priorities, measures, and implementation plans. Board review and approval of the plan will be requested at the December 13, 2021 meeting.

4. *2020 Audit & Financial Statements* – Schedule TBD

The 2020 Audited Financial Statements have been delayed due to the delayed completion of the Pennsylvania Municipal Retirement System (PMRS) financial audit. PMRS reports their 2020 audit will be completed in early 2022. A notice of delay has been sent to the appropriate parties. The LCA statements were completed by April 30, 2021. Upon receipt of the PMRS audit report, staff will present the financial statements to the Board for review and acceptance.

DISCUSSION ITEMS

INFORMATION ITEMS

1. *Recently Purchased Investments – Certificates of Deposit (CDs)*

CERTIFICATES OF DEPOSIT						
28-Oct-21						
			Gross	Date of	Date	Net Rate
Fund	Bank	Location	Amount	Purchase	Due	%
Cons Wtr (2)	Synchrony Bank	Draper, UT	249,000.00	10/15/21	10/16/23	0.400

Cons Wtr (2)	Consolidated Water (2)
LLRI CR	Little Lehigh Relief Interceptor Capital Reserves
Cons LL2 (314)	Consolidated Little Lehigh Relief Interceptor 2
WW Capac	Wastewater Capacity
2010 Wtr Cons A	2010 Water Construction, Series A Bond
Wtr R&R	Renewal and Replacement

2. *Developments*

Water system construction is occurring in the following developments:

5420 Crackersport Road, 1 commercial lot, UMT
8323/8449 Congdon Hill Drive, 2 industrial lots with warehouses, LMT
Fields at Indian Creek, Phases 4 & 5, 86 residential units (sfd), water and sewer, UMilT & Emmaus
Kohler Tract, 123 residential lots (sfa), water and sewer, UMilT
Lehigh Hills, Lot 5 Phase 2, 240 residential units (sfd.), UMT
Lehigh Hills Townhouses, 24 townhouse units (sfa), UMT
Mountain View Estates, 27 residential units (sfd), LMT
Sauerkraut Lane Extension – Roadway & water line extension, LMT
Shepherds Corner, 1 commercial lot, LMT
West Hills Business Center – Lot H, 1 commercial lot, Weisenburg T

Water system plans are being reviewed for the following developments:
749 Route 100, 1 industrial lot with warehouse, UMT
3369 Rt 100 Neighborhood Hospital & Medical Offices, 1 commercial lot, LMT - New
5329-5347-5357 Hamilton Blvd., 1 commercial lot, LMT
ABE Doors & Windows Redevelopment, I commercial lot, LMT
Advanced Health Care of Allentown, 1 commercial lot, LMT - New
ATAS International, 1 industrial lot, UMT
Fields at Brookside, water main relocation, LMT - New
Estates at Maple Ridge, 30 residential units (sfd), UMilT
Fallbrooke Residential Subdivision, 90 sf residential units, UMT - New
Glenlivet Drive West Extension & Subdivision, 52 residential units (sfd), UMT
Green Hills Commerce Center III, 1 commercial lot, UMT
Guardian Self-Storage, 1 commercial lot, LMT - New
Laurel Field, Phase 5, 25 townhouses, UMT
Madison Village at Penn's View, 66 manufactured homes, 1 lot, water and sewer, LynnT
Mertztown Residential Subdivision, 264 sf units & 136 townhouse units, LMT
Mosser Road Subdivision, 10 sf units, UMT
Parkland Crossing (formerly 1224 Weilers Rd Twins), 144 townhouse units, UMT
Readington Farms – 1 industrial lot, UMT
Ridings at Parkland – Phase 2, 38 residential units (sfd), NWT
Self-Storage Facility – Cedarbrook Road – 1 Commercial Lot, LMT
Schoeneck Road, Lot 1, 1 lot, warehouse, LMT
Sheetz – Cetronia Road, 1 commercial lot, UMT
Spring Creek Properties, Lot 12, 1 lot, warehouse, LMT
The Annex at Fields at Indian Creek, 22 S.F. residential units, Emmaus Borough
Towneplace Suites by Marriott, 91-room hotel, UMT
Towns At Schaefer Run, 128 townhouse unit (sfd), UMT

Sewage Facilities Planning Modules Reviewed in Prior Month:
Allentown Sheetz, Allentown, 2,500 gpd.
ABE Doors Redevelopment, LMT, 8,278 gpd.

WATER

ACTION ITEMS

1. *Allentown Division – Water Filtration Plant & System Master Plan* – January TBD

This project involves the preparation of a Master Plan for the Allentown Water Filtration Plant, water storage tanks, water storage reservoirs, pressure booster stations, raw water springs, and surface water intakes. The Master Plan will involve several key sections including, but not limited to: full-scale condition assessments, treatment process optimization, and development of short term/long term capital plans. The Master Plan is a requirement included within the Allentown Water & Sewer Lease, to be updated every five years throughout the life of the lease. The first Master Plan was prepared in 2017. Board authorization will be requested at a January 2022 Board Meeting – as the next Master Plan is due in 2022. The project will be funded by the LCA Allentown Division.

DISCUSSION ITEMS

INFORMATION ITEMS

1. *Allentown Division – Water Filtration Plant: High Lift Pump VFD Replacements*

The High Service Pumping System (HSPS) at the WFP is the primary means of conveying treated water into the distribution system. The HSPS has experienced regular failures from aging electrical components in recent years. The July 2017 Allentown Water Master Plan categorizes the pump variable frequency drives (VFDs) in very poor condition and notes that the VFDs are no longer supported by the manufacturer. This project will replace two of the existing VFDs and add a third VFD to the constant speed pump. Design phase was completed in late 2020. LCA submitted a funding application and supporting documentation to PennVEST in early November 2020, which was approved in January 2021. Construction phase of the project was approved at the 3/22/2021 Board meeting. In May 2021, PennVEST granted consent to proceed with construction prior to closing on the loan, which will follow completion of construction in 2022. Notices to Proceed was issued for both contracts in May 2021 and construction phase is in progress. The general contractor will mobilize on site in December 2021, and the electrical contractor's mobilization has been pushed back to March 2021, due to manufacturer delays for the VFD equipment. Construction is anticipated to be completed by early Summer 2022.

2. *Suburban Division – Upper Milford-CLD Interconnection Project (Kohler Tract)*

The project features the installation of a new booster pumping station and water main extension to interconnect the Central Lehigh Division (CLD) with the Upper Milford Division (UMD) allowing the abandonment of the UMD water supply facilities, and to provide water service to the proposed 123-lot Kohler Tract subdivision in Upper Milford Township. Costs are being shared between the LCA Suburban Division and the developer of the Kohler Tract (Jasper Ridge). Pumping station bids were opened on 4/25/2019. Board approval for the construction phase of the project was granted at the 5/13/2019 meeting. The station went on-line on 11/19/2020. The contractors are addressing the remaining punch list items. **(No Change)**

3. *Suburban Division – Watershed Monitoring Program*

The project involves construction of a surface water flow-monitoring network for the Little Lehigh Creek. The work is in response to the Watershed Monitoring Plan that was developed and reported to LCA by Al Guiseppe (SSM, Inc.) in 2017. Project update meetings with SSM and USGS will be conducted periodically. **(No Change)**

4. *Suburban Division – Buss Acres Pump Station Replacement Construction*

The project consists of the consolidation and replacement of two well stations with a single new pump station and a new water storage tank to replace two antiquated hydropneumatic pump stations. The new station will be a variable frequency drive controlled double pumping system

with full SCADA control. The design will include radon reduction elements and accommodate the future installation of additional radon removal equipment, to be implemented upon DEP's mandate of a regulatory limit. The project is at the end of the construction phase. The new station, the finished water reservoir and both the Gary and Laurie wells are online. The contractors were issued Certificates of Substantial Completion in September. Change order and punch list items are being addressed.

5. ***Allentown Division – 36" DI Water Main Condition Assessment***

Water distribution system consultant Gannett Fleming, Inc is working with Pure Technologies to develop a condition assessment project focusing on the 36" ductile iron transmission line that feeds the north end of Allentown and Huckleberry Ridge Reservoir. This line has had two recent major failures and it would be beneficial to determine if there is a root cause for these failures that can be corrected to prevent further damage and water loss. The work was performed on December 14-15, 2020. Final report was received. Exploratory excavations and one pipe segment replacement were done on the 36" line (10/18/2021) and the 30" line (10/19/2021). Both segments are currently being analyzed by Pure Technologies. **(No Change)**

6. ***Suburban Division – Fixed Base Meter Reading Stations***

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 the Central Lehigh Division in December as a pilot study to demonstrate the capabilities of Advanced Metering Infrastructure.

7. ***Allentown Division – Water Main Replacement Program Cycle 5***

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 commenced with anticipated completion by the end of 2021. **(No Change)**

8. ***Allentown Division – Water Filtration Plant: 2021 Indenture Upgrades – Construction Phase***

As a condition of the financing of LCA's up-front concession payment to the City, LCA entered into a Trust Indenture with the Manufacturers and Traders Trust Company that requires the preparation of an annual Consulting Engineer's Report (Report). The Report, which is prepared each year by Arcadis, documents the condition of the water and wastewater facilities (KIWWTP and WFP) based on physical inspections by the engineer, identifies repairs and upgrades required, and reflects progress made in addressing deficiencies. This project consists of addressing structural deficiencies at the Water Filtration Plant, with work located at various concrete structures in exterior areas. D'Huy Engineering completed design in February 2021, the project was advertised for bid in late March 2021, and bids were opened on April 22, 2021.

Award of bids and construction phase authorization was granted at the May 10, 2021 LCA Board meeting. Construction has commenced and will be substantially completed by the end of 2021. **(No Change)**

9. ***Suburban Division – Arcadia West Water Storage Tank Replacement – Construction 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 75% complete. The new tank is expected to be in operation by the end of the year. Demolition of the old tank will occur in the spring of 2022.

10. ***Suburban Division – Upper System Pump Station and Main Extension – 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 near-term requirements of an industrial development slated to be constructed within the next two years in this area, the project will need to move forward immediately. Design phase was approved at the 7/26/2021 Board meeting. **(No Change)**

11. ***Suburban Division – Suburban Water Supply Study***

This project involves the preparation of a preliminary water supply study for the Suburban Water systems in 2022. The study will review supply capacity requirements to meet current and future demands, and evaluate existing water sources, storage, and interconnections to ensure long-term supply needs can be met. This study will be completed by the end of 2022, and Board authorization will be requested in the near future. 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 future development of a Master Plan for the entire LCA Suburban Water System. The project will be funded by the LCA Suburban Division. **(No Change)**

WASTEWATER

ACTION ITEMS

1. *Suburban Division – Industrial Pretreatment Plant Master Plan* – December 13, 2021

This project involves the preparation of a Master Plan for the LCA Industrial Pretreatment Plant, the first of its kind for this facility. The Master Plan will involve several key sections including, but not limited to: full-scale condition assessments, treatment process optimization, and development of short term/long term capital plans. The Master Plan will be incorporated into the ongoing final Act 537 Plan that is due to DEP by March 2025. As part of the Act 537 planning process that is currently underway, a detailed upgrade analysis was recently completed by the plant operator (Jacobs). That analysis will also be incorporated into this proposed Master Plan. Board authorization will be requested on December 13, 2021. The project will be funded by the LCA Suburban Division.

DISCUSSION ITEMS

INFORMATION ITEMS

1. *Regional Act 537 Plan Alternatives Analysis: Pretreatment Plant Upgrade Option*

To begin the process of developing the long-term Regional Act 537 Plan, the evaluation of the LCA Pretreatment Plant Alternatives was identified as an immediate need to assist with completing the full alternatives analysis to be completed within the next five years. The alternative to upgrade the Pretreatment Plant to full treatment was previously evaluated in the 2011-2016 timeframe. Additional study is required to fully evaluate the facility's capacity to treat current and future dry-day, wet-weather, and peak flows. The Board approved professional services authorizations for this work in August 2020. Internal presentations occurred in August 2021 and a summary of results was provided to the Board in September 2021. A draft, preliminary report was delivered in October 2021. In order to maintain the Act 537 planning schedule, various recommendations from the Report will be requested in 2022.

2. *Suburban Division – Western Lehigh Service Area: Revenue Planning Tool*

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 will be modeled in December.

3. *Suburban Division – Western Lehigh Service Area: 2020 Sewer Modeling*

The Western Lehigh Sewer Partnership (WLSP) hydraulic model has been calibrated using 2019 flow meter and rainfall data and is available to support long-term Act 537 planning for the Western Lehigh Interceptor (WLI). Five separate modeling tasks will be performed in order to facilitate broader Kline's Island Sewer System (KISS) planning need discussions. The results of this 2020 modeling will help to inform further future modeling decisions and alternative analyses that will occur during the full KISS model calibration period in 2022. A consulting engineer has been retained and full authorization was granted at the 5/11/2020 Board meeting. A presentation

was presented to the Board at the 8/10/20 Board Meeting. Various modeling alternatives related to the Western Lehigh Service Area for the final Act 537 Plan are still ongoing. The project is funded by the LCA Suburban Division.

4. *Suburban Division – Western Lehigh Manhole Rehabilitation Project – Phase 2 Construction 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 Phase 1 included 50 manholes that were rehabilitated in 2020 as part of a phased manhole rehabilitation program. The Phase 1 project construction was completed in early 2021. Phase 2 of the WLI Manhole Rehabilitation Project, which includes a similar scope with manholes moving downstream in the WLI drainage basin, was advertised for bid in June 2021, with the construction phase authorized at the 7/26/2021 Board meeting. Construction began in fall 2021 and will conclude by the end of the year. **(No Change)**

5. *Suburban Division – Western Lehigh Service Area – Engineering & Program Support*

The municipalities in the Western Lehigh Service Area will continue to work on inflow and infiltration source removal as part of the approved Interim Act 537 Plan. Ongoing engineering support is required to facilitate continued progress and coordination among the Western Lehigh municipalities. In addition, LCA and its Western Lehigh municipalities will be participating in the Regional Act 537 Plan development and will require engineering support to compile data on current and future sewer flows and assess conveyance system requirements. This is an extension of ongoing engineering and program support that Arcadis has provided for many years. The Board granted a Professional Services Authorization for program support in 2022 at the November 8, 2021 Board meeting. **(No Change)**

6. *Suburban Division - Trexlertown Area Capacity Solution Alternative*

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 Act 537 Planning completion, a Part 2 permit will be submitted to DEP. Board authorization requests for planning, permitting, and design services are forthcoming in early 2022. The Special Act 537 Study will be submitted to both Upper and Lower Macungie townships’ planning commissions in early 2022 as well.

7. *Suburban Division – Park Pump Station Force Main Rehabilitation*

The Park Pump Station and Force Main line were constructed in 1980 to provide wet weather relief to the Little Lehigh Creek Interceptor, which conveys wastewater from ten municipalities from outlying areas to the Kline’s Island Wastewater Treatment Plant (KIWWTP). The force

main consists of 8,715 linear feet of prestressed concrete cylinder pipe (PCCP) of various sizes (2,615' of 24"; 2,695' of 30"; and 3,405' of 36") and connects with the 54" sanitary sewer interceptor that runs to KIWWTP. PCCP is particularly sensitive to deterioration due to hydrogen sulfide gas from wastewater, and corrosion of exposed reinforcing steel can result in structural degradation and pipe failure. An internal investigation of the pipe is required to assess the condition of the PCCP pipe and identify damage areas, in order to determine the locations and extent of rehabilitation needed to restore the level of service, prolong service life, and mitigate the risk of failure. On April 10, 2021, LCA conducted a limited manned inspection of the force main pipe at 3 air release valve (ARV) locations, 100 feet in both directions from the ARV manhole, which will be used as the initial evaluation of the representative condition of the pipe. On October 23, 2021, a second manned entry was performed at two (2) additional air valves. A report on this evaluation will be provided by the consultant. **(No Change)**

8. ***Suburban Division – Park Pump Station Phase 2 Upgrade - Design Phase***

The Park Pump Station Phase 1 Upgrade was completed in early 2020, and consisted of new pumps, new pump control center with variable frequency drives, new automatic transfer switch, new wet well level control system, upgraded HVAC system, roof replacement, new pump removal access hatch, new pump hoist system, and associated mechanical and instrumentation equipment. The existing 40-year-old generator does not have the capacity to handle the full loads of the upgraded station at 100% design flow and is at the end of its useful life. The Phase 2 Upgrade project consists of replacement of the original station backup generator system. The designer of record for the Phase 1 Upgrade was Whitman, Requardt & Associates, LLP (WRA). As WRA is already very familiar with the power systems and controls at the station, Capital Works requested a design phase proposal from the firm for the Phase 2 project. Authorization for design phase was granted at the 3/22/2021 Board meeting. Design is anticipated to be substantially completed by early 2022. **(No Change)**

9. ***Suburban Division – Sand Spring WWTP Upgrade Project Construction***

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, 8 commercial properties, and an elementary school. Lehigh County Authority (LCA) acquired the system in 2005. The project includes replacement of the existing deteriorating treatment facility in entirety with new technology and concrete tanks appropriate for the wastewater flows and loading characteristics. The new facility shall meet the effluent limits criteria established in the respective DEP and DRBC permits, including new or additional limits that may be imposed during the permitting process. Design phase was authorized in February 2017 and final design was delayed due to DEP Part 2 Water Quality Management and NPDES permitting issues. DEP approval of the Water Quality Management Permit was received in late December 2018, the design was finalized in Spring 2019. Construction phase authorization was approved at the 8/26/2019 Board meeting. Conditional Use approval and land development waiver were granted by North Whitehall Township in Spring 2020. Substantial completion and start-up of the new facility occurred in May 2021 and the project will be closed out by the end of the year. **(No Change)**

10. ***Suburban Division - Lynn Township Corrective Action Plan***

Excessive inflow and infiltration (I&I) and high wet-weather flows into the Lynn Township sewer system has been ongoing and increasingly challenging to address. As noted in LCA's monthly operations reports, treatment plant bypasses and sanitary sewer overflows have occurred in this system and must be addressed. A meeting was held at Lynn Township with DEP and township representatives in June 2019 to discuss the Lynn Township Corrective Action Plan and Township sewer planning/growth issues, and DEP directed LCA to submit a CAP Amendment by the end of summer 2019. The CAP Amendment contained an updated sewer system condition assessment and a corrective plan to further mitigate I/I flows. Updated CCTV work of the entire system was substantially completed in August 2019, and the inspection data was summarized in

the CAP Amendment and is being used to scope a capital repair project. The Lynn Township Board of Supervisors adopted a sewer system rules and regulations ordinance on 9/12/19, which gives LCA the authority to inspect private laterals and facilities for illegal connections and perform follow-up enforcement. A meeting with DEP and Lynn Township representatives was held on 1/15/20 to discuss the CAP Amendment and plan moving forward. DEP sent a letter to LCA dated 6/8/20 granting 55 EDUs of sewer allocation relief for new connections to the system**. (No Change)**

11. ***Suburban Division - Heidelberg Heights Consent Order & Agreement***

On 2/11/2019, DEP submitted a notice of violation to LCA regarding bypasses and permit exceedances at the Heidelberg Heights wastewater treatment plant. The system has been challenged by high groundwater levels and significant infiltration and inflow (I&I) of clear water into the sewer system during rain events. LCA staff developed a Corrective Action Plan (CAP) which was submitted DEP in April 2019. The Heidelberg Township Board of Supervisors adopted an updated sewer system rules and regulations ordinance in October 2019, which gives LCA the authority to inspect private laterals and facilities for unauthorized connections and perform follow-up enforcement. A Consent Order & Agreement (CO&A) was approved by DEP and LCA in June 2020, which incorporates the projects and schedule outlined in LCA's CAP. The first annual report was submitted to DEP per the CO&A requirements in late March 2021. A public outreach program was initiated in October 2021 regarding upcoming inspections of private side sewer facilities, to commence in 2022. **(No Change)**

12. ***Suburban Division – Heidelberg Heights 2021 and 2022 Sanitary Sewer Replacement Project***

In accordance with the Consent Order and Agreement (CO&A) executed by LCA and DEP, LCA is required to complete annual inflow and infiltration mitigation projects to eliminate hydraulic overloads and bypass events at the Heidelberg Heights wastewater treatment plant. The CO&A requires that all original vitrified clay sewer main and lateral pipe be replaced within five years. The 2021 sewer replacement project bids were opened on 3/31/2021. Only two bids were received, both of which significantly exceeded the engineer's estimate. The Board approved rejection of bids at the 4/26/2021 Board meeting. The project scope was expanded to include the 2022 required sewer main replacement (Phase 2), in order to gain economy of scale and attract more bidders. The expanded project was advertised for bid on 8/24/2021, and bids were opened on 9/15/2021. Construction phase authorization was granted at the 9/27/2021 Board meeting. Phase 1 of the project will be completed by the end of 2021, and Phase 2 will be completed in Spring 2022. **(No Change)**

13. ***Kline's Island Sewer System – Regional Sewer Capacity & Wet-Weather Planning – Sewage Billing Meter QAQC Data Analytics and 2021 Flow Metering Preparation***

As part of the Interim Act 537 Plan, the municipalities served by the Kline's Island Sewer System have committed to completing a flow metering and modeling project beginning in 2021. The flow metering data will be used to prepare modeling and identify the capital improvements needed to meet the future sewage capacity needs of the region through 2050. The flow metering will include a mix of temporary meters and the existing sewage billing meters. Data delivery and storage procedures, quality assurance, and flow analytics were implemented in 2020 for these sewage billing meters. Without this meter development program, the data cannot be used from these billing meters. A consulting engineer's professional service proposal was granted at the April 27, 2020 Board meeting. Costs associated with the development of the QA/QC data analytics and the 2021 flow metering preparation 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. As of late November 2021, the main flow metering program has concluded. In 2022, a focus will shift onto the long-term goals of the existing sewer billing meters.

14. *Kline's Island Sewer System – Regional Sewer Capacity & Wet-Weather Planning: 2021 Model Expansion and Calibration*

The prior KISS sewer model from 2014 included only the City of Allentown and LCA/Western Lehigh municipalities. The primary goal of this work is to expand the sanitary sewer model into the surrounding Signatories (Coplay, Whitehall, North Whitehall, Hanover, South Whitehall, Salisbury, and Emmaus). Calibration of this expanded model to current flow characteristics will aid in the identification and evaluation of regional alternatives for solutions to both treatment and conveyance through the year 2050 Act 537 planning horizon (the LCA/Western Lehigh portion of this model calibration work was completed in 2019 and 2020). The end result of this proposed work will provide one comprehensive, calibrated sewer model for the entire KISS system using 2021 temporary meter flow data and rainfall data. On February 22, 2021, Board approval was granted for this next phase of Act 537 planning efforts. The model is anticipated to be complete by June 2022. Upon completion of the modeling calibration, a preliminary screening of alternatives will occur in the second half of 2022.

15. *Kline's Island Sewer System – Regional Sewer Capacity & Wet-Weather Planning: Rain Derived Inflow and Infiltration (RDII) Analysis*

The main goal of this work (Signatory Systems only) is to conduct an RDII analysis of storm events during the flow monitoring period to determine the nature and extent of infiltration and inflow (I&I) leakage. Using hydrograph interpretation, this will help Signatories focus their rehabilitation work through Sanitary Sewer Evaluation Survey (SSES) investigations toward the sources contributing the leakage. Using this analysis, it can be identified where and what type of SSES work should be completed to allow successful targeted source reduction projects. Data from approximately 53 temporary flow meters and multiple rain gauges from the 2021 flow metering program will be used for this analysis. The analysis itself will begin in late 2021 and will be concluded by March of 2022. Board authorization for this Signatory RDII Analysis was granted at the November 8, 2021 Meeting. The Board authorization of the City's RDII analysis was previously approved on February 22, 2021.

16. *Allentown Division – Sanitary Sewer Collection System: Rain Derived Inflow and Infiltration (RDII) Analysis*

The main goal of this work (City System only) is to conduct an RDII analysis of storm events during the flow monitoring period to determine the nature and extent of infiltration and inflow (I&I) leakage, and to use hydrograph interpretation to help the City focus their rehabilitation work (both secondary Sanitary Sewer Evaluation Survey (SSES) investigations and rehabilitation efforts) toward the sources contributing the leakage. It will also be determined where the flow meters should be installed for the next monitoring period and where SSES future work should be completed. Data from approximately 43 temporary flow meters and five rain gauges from the 2021 flow metering program will be used for this analysis. The analysis itself will begin in late 2021 and will be concluded by March of 2022. On February 22, 2021, Board approval was granted for this project. Board authorization of a RDII analysis for the remaining 1981 Signatories was granted at the November 8, 2021 Meeting.

17. *Kline's Island Sewer System – Act 537 Planning: 2021 Flow Data QA/QC*

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 majority of the 2021 flow characterization program concluded on October 29, 2021 (only three temporary meters remain in the ground). The third round of QA/QC was recently completed and only the fourth round will be concluded before January.

18. ***Allentown Division – Sanitary Sewer Collection System: I&I Source Reduction Program Plan (Year 2)***

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 will be completed by December 2021. This project is considered an AO expense under terms of the Lease and is City funded.

19. ***Allentown Division – Kline's Island WWTP: Phase 1 AO Design Improvements***

This project includes the design of the AO improvements at the wastewater treatment plant. This conceptual design concept was approved by the City and the relevant final deliverables were received by LCA. The City then directed LCA to proceed with the final design of improvements related to the blending alternative. Board approval for the Professional Services Authorization with Kleinfelder was granted at the September 11, 2017 Board Meeting. The project is identified as Administrative Order Work and will be funded by the City. The 30% design drawings and specifications have been received. The City then directed to "pause" the design phase of the project. The City has now directed LCA to keep this project on indefinite hold, pending submission of the final Act 537 Plan in March 2025.

20. ***Allentown Division – Kline's Island WWTP: Max Monthly Flow Capacity Evaluation***

DEP has noted that the KIWWTP has been performing at a high level and meeting its permitted effluent quality limits during a period of prolonged wet weather in 2018 and 2019. This study provided the basis for confirming the plant's maximum monthly average that can be sustained during prolonged periods of wet weather – while remaining in full compliance with effluent quality requirements of the plant's permit. Approval of the study was granted at the 8/26/2019 Board Meeting. The study was completed in mid-October 2019 and a Part II Permit was sent to DEP on 10/18/2019, seeking a re-rate of the KIWWTP's hydraulic design capacity. Upon receipt of the Interim Act 537 Plan approval from DEP on 6/25/2021, the permit submission was slightly modified to correspond with a 44.6 MGD hydraulic re-rate in accordance with discussion with DEP. On December 1, 2021, the Part II Permit for the hydraulic design capacity of 44.6 MGD was received. This project is considered an AO expense under terms of the Lease and is City funded.

21. ***Allentown Division – Kline's Island WWTP: Sodium Hypochlorite System Installation Project – Construction Phase***

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 modeling of the chlorine contact tank to identify short-term improvements to improve mixing and optimize dosage rates of the new hypochlorite solution.

22. *Allentown Division – Kline's Island WWTP: 2021 Indenture Upgrades - Construction Phase*

As a condition of the financing of LCA's up-front concession payment to the City, LCA entered into a Trust Indenture with the Manufacturers and Traders Trust Company that requires the preparation of an annual Consulting Engineer's Report (Report). The Report, which is prepared each year by Arcadis, documents the condition of the water and wastewater facilities (KIWWTP and WFP) based on physical inspections by the engineer, identifies repairs and upgrades required, and reflects progress made in addressing deficiencies. This project consists of addressing structural deficiencies at KIWWTP, with work located at the Main Pump Station, Auxiliary Pump Station, Effluent Pump Station, and Plastic Media Trickling Filters. Work includes masonry repointing and restoration, door and window lintel replacement, concrete crack repair and resurfacing, and pipe painting. D'Huy Engineering completed design in February 2021, the project was advertised for bid in mid-March 2021, and bids were opened on April 19, 2021. Award of bids and construction phase authorization was approved at the May 10, 2021 LCA Board meeting. Construction is anticipated to be completed by the end of 2021. **(No Change)**

23. *Allentown Division – Kline's Island WWTP: Solids Process Boiler and HVAC System Upgrade Project - Design Phase*

The solids process boiler system is more than 25 years old and provides critical heat to the anaerobic digesters and solids dewatering and processing buildings. The equipment has reached the end of its service life, and replacement of the equipment is identified as a near-term (0 – 5 years) project priority in the KIWWTP Master Plan. This project includes replacement of the boilers and associated solids processing HVAC equipment. A preliminary engineering Basis of Design Report was prepared by GHD Engineering and submitted to the City Office of Compliance in January 2021. The City granted approval of the report in a letter dated 3/22/21 and the project is classified as a Major Capital Improvement. Approval of design phase engineering was granted at the 5/24/21 LCA Board meeting and design is proceeding and is anticipated to be substantially completed in Q1 of 2022. **(No Change)**

24. *Allentown Division – Lehigh Street (Rte. 145) Water and Sewer Main Relocation Project*

As part of the Pennsylvania Rapid Bridge Replacement Program, the proposed replacement of the Lehigh Street Bridge near the intersection with MLK Boulevard has required the relocation of existing City water and sewer lines that are located within the PennDOT right of way. Because the bridge is owned by Lehigh County and not the Commonwealth, the normal PennDOT relocation reimbursement schedules do not apply. Therefore, the County and LCA have executed an agreement on cost reimbursement on similar terms. LCA's engineer is working on behalf of LCA on a final sewer relocation design that minimizes the extent of the relocation. There will be less water infrastructure relocation work required since the existing water main is attached under the bridge and will be reattached after the new bridge is constructed. Construction will commence in late 2021**. (No Change)**

25. *Kline's Island Sewer System – Act 537 Planning: Wet Weather Treatment Options*

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 alternative involves equalization tanks to store wet weather flow; a second alternative involves internal plumbing modifications to temporarily re-route flow to ensure secondary treatment for all wet weather flow; and a third alternative involves the construction of a high-rate wet weather treatment system known as BioActiflo. Three rounds of bench scale testing for BioActiflo have occurred 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 first quarter of 2022.

26. ***Allentown Division – Kline's Island WWTP: Sludge Thickener Tank No. 3 Mechanical Upgrade – Design Phase***

This project consists of the refurbishment and replacement of mechanical component of Sludge Thickener Tank No. 3. The steel mechanical components are severely corroded and at the end of their service life and require replacement. The components to be replaced include the drive unit, stilling well, influent piping, weirs, access bridge and miscellaneous piping and conduits. 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 phase is in progress and the project is anticipated to proceed to bid phase in early 2022.

27. ***Allentown Division – Kline's Island WWTP: Main and Auxiliary Pump Station Improvements - Preliminary Design Phase***

This project consists of mechanical and electrical upgrades of the Main and Auxiliary Pump Stations, and is listed in the KIWWTP Master Plan as a "near term" project. The Main Pump Station is a critical element of the plant that conveys screened influent wastewater to the aerated grit chambers and primary clarifiers. The four (4) existing pumps are more than 50 years old and at the end of their service life. In addition to pump replacement, new Variable Frequency Drives (VFDs) will be installed along with associated piping and valves. Replacement of the pumps will reduce risk and long-term maintenance costs, and maximize wet weather pumping capacity.

The Auxiliary Pump Station functions with the Main Pump Station to convey screened influent wastewater to the aerated grit chambers and primary clarifiers. The pump impellers, motors and VFDs are presently undersized and require replacement in order to maximize wet weather pumping capacity and extend service life and station reliability. The pump station check valves and suction and discharge isolation valves are also approaching the end of their service life and require replacement to maintain satisfactory pump station operation.

The project is currently in preliminary design phase (Kleinfelder Engineering) and the Conceptual Design is anticipated to be submitted to the City for Major Capital Improvement consideration in Q1 of 2022.

28. ***Allentown Division – Kline's Island WWTP: Intermediate Pump Station Improvements – Preliminary Design Phase***

The Intermediate Pump Station (IPS) consists of two separate pump stations: a primary effluent pump station (conveys effluent from primary clarifiers to plastic media trickling filters) and a plastic media trickling filter (PMTF) effluent pump station (conveys effluent from the PMTFs to the intermediate settling tanks). This project, also listed in the KIWWTP Master Plan, consists of mechanical and electrical upgrades of the Intermediate Pump Station primary effluent station. The existing five (5) primary effluent pumps are nearing the end of their service life, and overheating of the electrical system components has been problematic during high flow events, which is caused by the existing pumps operating within their capacity service factor. The project includes the replacement of all five (5) primary effluent pumps with upsized pumps and motors, and replacement of three (3) VFDs consistent with the current configuration (2 pumps to remain constant speed). The IPS improvements will improve station reliability, eliminate emergency maintenance operations due to overheating of equipment, and enhance facility wet weather pumping capacity.

The project is currently in preliminary design phase (Kleinfelder Engineering) and the Conceptual Design is anticipated to be submitted to the City for Major Capital Improvement consideration in Q1 of 2022.