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

Agendas & Minutes Posted:
www.lehighcountyauthority.org

LEHIGH COUNTY AUTHORITY

Published: November 7, 2022

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

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

1. Call to Order
   - NOTICE OF MEETING RECORDINGS

     Meetings of Lehigh County Authority's Board of Directors that are held at LCA's Main Office at 1053 Spruce Road, Wescosville, PA, may be recorded for viewing online at lehighcountauthority.org. Recordings of LCA meetings are for public convenience and internal use only and are not considered as minutes for the meeting being recorded, nor are they part of public record. Recordings may be retained or destroyed at LCA's discretion.
   - *Public Participation Sign-In Request*
2. Review of Agenda / Executive Sessions
   - Additions to Agenda (vote required if action will be taken)
3. Approval of Minutes
   - *October 24, 2022 Board meeting minutes*
4. Public Comments
5. Action / Discussion Items:

   FINANCE AND ADMINISTRATION
   - *2023 Water & Wastewater Rate Schedules (Approval)* ***(blue)*** *(digital Board packet, pages 8-30)*

   WATER

   WASTEWATER
   - *Kline's Island WWTP – High-Rate Wet-Weather Treatment Pilot Study (Approval)* ***(tan)*** *(digital Board packet, pages 31-58)*
   - *Suburban Division - Western Lehigh Manhole Rehabilitation Project – Phase 3 (Approval)* ***(goldenrod)*** *(digital Board packet, pages 59-63)*
   - *Allentown Division – Kline's Island WWTP – Substation No. 1 and Switchgear Replacement (Approval)* ***(green)*** *(digital Board packet, pages 64-68)*
6. Monthly Project Updates / Information Items (1st Board meeting per month) (digital Board packet, pages 69-75) **– November 2022 report attached**
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. Board Member Comments
13. Executive Sessions
14. Adjournment

UPCOMING BOARD MEETINGS		
November 28, 2022	December 12, 2022	January 9, 2023

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
October 24, 2022

Notice of Preparation of Authority Meeting Minutes: Authority staff who are in attendance at each Authority Board meeting prepare a draft of the Minutes, which are subsequently distributed to all Board members for review. Board members may offer corrections prior to a vote of the full Board of Directors to approve the Minutes.

The Regular Meeting of the Lehigh County Authority Board of Directors was called to order at 12:02 p.m. on Monday, October 24, 2022, Chairman Brian Nagle presiding. The meeting was hybrid via in-person and video and audio advanced communication technology ("ACT"), using the Zoom internet application, including telephone option. Each Board member and other attendees of the meeting were able to hear each other attendee and be heard by each other attendee. The public could also participate in the meeting in-person or via ACT, using the Zoom internet application, including telephone option. A Roll Call of Board members present was taken. Brian Nagle, Scott Bieber, Richard Bohner, Norma Cusick, Ted Lyons, Linda Rosenfeld, and Jeff Morgan were present for the duration of the meeting.

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

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.

Liesel Gross introduced Albert "AJ" Capuzzi, the Authority's new Director of Engineering & Asset Management. Mr. Capuzzi gave a brief overview of his background in engineering and consulting, and asset management in the water and wastewater industry.

REVIEW OF AGENDA

Liesel Gross announced that there are no changes or additions to the agenda and noted that the September 2022 Financial report was distributed and posted to the website after the Board packet mailing. No Executive Session is planned.

APPROVAL OF MINUTES

October 10, 2022 Meeting Minutes

Richard Bohner noted a grammatical error. On a motion by Scott Bieber, seconded by Ted Lyons, the Board approved the minutes of the October 10, 2022, Board meeting as amended (7-0).

PUBLIC COMMENTS

None.

Suburban Water Rate Study – Preliminary Review

Liesel Gross commented that rate studies for the Suburban Water Division are normally conducted every five years, and the last rate study was completed in 2017, with updates in 2018. Since the last rate study, the cost structure for the Suburban Water System changed significantly due to the increased cost for water purchases from the City of Allentown via the amended water purchase agreement, along with changes in how the Authority pays for recurring system improvements to reduce reliance on borrowing for those projects. The purpose of the water rate study is to ensure the Authority adheres to a "cost of service" model for the Suburban Water system. Due to the wide

range of customer types including very small and very large water users, the Authority's rate study is intended to make sure the costs to operate the system flow through the rate structure appropriately to the customers who use the service.

Ms. Gross introduced David Busch from Keystone Alliance Consulting, who conducted the study and was present to give an overview of the results from the Suburban Water Rate Study. He stated that the goals of a rate study were to ensure the Authority's revenue requirements are met, achieve equity among the different customer classes based on their water usage, and to develop a transition plan to the new rates. He reviewed the calculations completed to show the Authority's current and projected revenue requirements. The proposed water rates for the 2023-2027 study period are determined to generate adequate revenue to meet the current system cost projections, although the rates can be adjusted annually by the Authority as needed. Mr. Busch then reviewed the updated system cost projections with the additional revenue included from the recommended rate adjustments, illustrating that the Authority's revenue requirements will be met. He explained the impact of the rate change for 2023, noting that customers will see different impacts in their water bill depending on usage and meter size.

Liesel Gross explained that the next step is to communicate the rates with the Authority's customers and municipalities. Staff will present the proposed 2023 rates to the Board for adoption at the next meeting in November.

2023 Budget – Final Review and Approval

Liesel Gross announced that today's presentation is the final one for the proposed 2023 Budget, and the Board will be asked to approve the budget. Ed Klein reviewed the budget preparation process and timeline. Changes to the 2023 Budget from the previous review include the addition of the Executive Summary and an increase in the Contract Operating Services budget for the Pretreatment Plant. This expense increase was added to the budget after the Authority received refined cost estimates provided by the contract operator, Jacobs. There was some discussion about this cost change, which will impact several other areas of the Pretreatment Plant budget including revenues and cash reserves. Liesel Gross noted that the 2023 Budget summary provided in the Executive Summary captures the result of these adjustments.

Ms. Gross reviewed the highlights of the 2023 Budget, summarizing the impact of the strategic initiatives and staff changes. She also reviewed the proposed customer rates for 2023 and a rate comparison among other communities in the Lehigh Valley. There was some Board discussion regarding the rate increases and how to compare the rates that Authority customers pay versus the water or sewer rates applied in other communities. Ms. Gross explained that other communities take different approaches to setting rates, and the rate comparison graph does not take into consideration differences in financial strategies of other communities such as the amount of outstanding debt the system holds or how much capital spending is included in the rates.

Ed Klein reviewed the 2023 Budget summary, noting the positive cash flows and achievement of the Authority's debt service coverage ratio goals.

On a motion by Linda Rosenfeld, seconded by Scott Bieber, the Board approved the 2023 Budget as presented (7-0).

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

Brian Nagle - yes
Scott Bieber - yes
Richard Bohner - yes

Norma Cusick - yes
Ted Lyons - yes
Linda Rosenfeld - yes
Jeff Morgan - yes

LCA Strategic Plan – 2022 Quarterly Progress Reporting

Liesel Gross reviewed the Authority's progress on the strategic initiatives during the third quarter of 2022, touching on key points included in the report that was provided to the Board as part of the agenda packet. She noted most of the updates provided in the report are well known to the Board as they are frequently discussed at Board meetings.

She expanded upon the information included in the Employee Engagement and Safety strategy area, as this is an area not often discussed with the Board. An all-employee meeting was held in September, during which feedback was solicited regarding levels of engagement and how to support newer employees. Strong feedback was received from employees expressing a desire for broader exposure across the organization to learn more about the Authority's services and facilities, and how the individual employee's work supports overall organizational strategy. Programs can be developed in-house to support this type of employee engagement enhancement. Regarding safety, Ms. Gross explained that an employee health and safety (EHS) steering committee would be formed during the fourth quarter to provide internal leadership to the Authority's safety program. The EHS steering committee will be led by Ed Klein. Mr. Klein commented that the goal of the committee will be to develop a safety program that benefits the entire organization and to focus on the development of accident investigation protocols and safety metrics that can be shared with the Board.

There was some Board discussion regarding employee engagement and employee vacancies.

Asset Management Roadmap & Strategic Asset Management Plan

Liesel Gross introduced Mark Bottin from Hazen & Sawyer, the firm recommended for the development of the Authority's strategic asset management plan. Ms. Gross gave a brief presentation and background of the project to develop a comprehensive asset management program for the Authority's water and sewer system assets. The initial work covered under the authorization requested today includes developing an implementation roadmap and a strategic asset management plan. The goal of asset management is to increase the level of service provided to customers while lowering the overall risk and lifecycle cost. To achieve these goals, an integrated approach is needed. Considering the high volume of large capital improvement projects that are needed in the years ahead, and the rate impact the Authority's customers will face as a result, having a comprehensive asset management approach in place will be highly beneficial in supporting decisions that will have large financial impacts.

Ms. Gross reviewed the challenges the Authority has faced in developing a comprehensive asset management approach and explained that an internal team has been working since January to assess internal capacity for this project. The staff recommends using a consultant with strong industry experience in asset management to guide the development of the strategic asset management plan. This will fast-track the Authority's progress on this program, which is a key strategy outlined in the 2023-2027 Strategic Plan approved by the Board in December 2021.

There was some Board discussion about the use of asset management to drive decisions, and also to record financial information more accurately regarding asset values and remaining useful life.

Ms. Gross reviewed the consultant selection process, which included extensive team interviews to ensure the selected consultant would meet the technical requirements for the work and provide a strong cultural fit for the organization. She noted the broad cross-organizational employee involvement anticipated for this project, and the importance of communication and change management for the success of the project. The staff team agreed that Hazen & Sawyer's proposal and project team offered the best fit for the Authority's needs. If approved, the project will kick off in November with the roadmap completed by the summer of 2023 and a strategic asset management plan developed by December 2023.

Mark Bottin thanked the Authority for the vote of confidence in Hazen & Sawyer's abilities to assist with this program. He feels that there is a great team assembled, with a high level of collaboration and ability to leverage existing data systems to achieve the Authority's goals. Jeff Morgan commented that he has worked with Hazen & Sawyer on other projects, which have all been positive and successful.

AJ Capuzzi commented that the way the program is laid out is smart and will set the groundwork for the ongoing process of developing the Authority's asset management program.

Solicitor Gaul asked how this program will align with current proposed legislation related to asset management plans for water utilities. Liesel Gross explained some of the details of Senate Bill 597, which would require utilities to have an asset management plan and would require planning for specific assets such as large diameter valves. The Authority would likely be able to comply with this legislation, if passed, using its existing plans.

There was some additional Board discussion regarding the use of asset management software and the way data generated from this program would be used to support financial decisions in the future.

On a motion by Jeff Morgan, seconded by Linda Rosenfeld, the Board approved the Professional Services Authorization to Hazen & Swayer for the Asset Management Roadmap & Strategic Asset Management Plan in the amount of $283,878.00 (7-0)

Jennifer McKenna, City of Allentown Office of Compliance, said that she and Brian Chamberlain are happy that the Authority is embarking on this project. She emphasized that taking care of the assets with regular preventative maintenance will extend the asset life, and that information should be captured as part of this project.

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

Brian Nagle – yes
Scott Bieber – yes
Richard Bohner – yes
Norma Cusick – yes
Ted Lyons – yes
Linda Rosenfeld – yes
Jeff Morgan – yes

MONTHLY FINANCIAL REVIEW

Ed Klein gave a presentation and review of the September 2022 financial statements highlighting the variances between actual expenses and budgeted or forecasted expenses.

MONTHLY SYSTEM OPERATIONS OVERVIEW

Andrew Moore reviewed the highlights of the September 2022 Operations report, noting that water usage is returning to more normal usage following the end of the warmer summer weather. He noted that, with the 3.47 inches of rainfall received in September and subsequent rain events in October, the Department of Environmental Protection has lifted the drought watch for Lehigh County. However, a substantial storm in September placed the Heidelberg wastewater system in bypass mode. One injury occurred where an employee cut his finger. There was an emergency repair at the Water Filtration Plant due to a leak that was found in close proximity to the filter building. There was also an emergency pump replacement in the Clearview Farms Division. A boil water advisory was avoided by maintaining pressure using hauled in water. Chris Moughan reported that the Smart Ball project in the City Division went well, with no issues and no service interruptions. He is waiting on the final report.

STAFF COMMENTS

None.

SOLICITOR'S COMMENTS

None.

PUBLIC COMMENTS / OTHER COMMENTS

None.

BOARD MEMBER COMMENTS

Scott Bieber asked about the map or sketch showing water main replacements to date in the City. Liesel Gross said that Chuck Volk is working on this and staff will provide the requested information to the Board when complete.

EXECUTIVE SESSION

None.

ADJOURNMENT

There being no further business, the Chairman adjourned the meeting at 2:05 p.m.

Richard Bohner
Secretary

Lehigh County Authority

1053 SPRUCE RD * P.O. BOX 3348 * ALLENTOWN, PA 18106-0348
610-398-2503 * email: service@lehighcountyauthority.org
www.lehighcountyauthority.org

MEMORANDUM

TO: LCA Board of Directors
FROM: Liesel Gross, CEO
DATE: November 7, 2022
RE: 2023 Water & Sewer Rates

Attached: Sample Residential Bill Calculations for LCA Service Areas
Lehigh Valley Water & Sewer Rate Comparison
Proposed 2023 Water & Sewer Rate Schedules

Important Reminders

1. Lehigh County Authority is a non-profit, municipal authority. All revenues collected through our water and sewer rates are used for the sole benefit of the system to pay for current expenses or to fund future capital improvements. Our Board of Directors are unpaid volunteers, and LCA has no shareholders to pay.

2. While LCA operates as a single organization, the water and sewer revenues collected from our customers in Suburban communities may not and will not be used to pay for expenses associated with the Allentown Division lease agreement. Likewise, revenues from our customers in Allentown may not and will not be used to pay for expenses associated with our Suburban Division water or sewer operations. This is specified in all LCA bond documents that prohibit the mixing of revenues.

3. Our nation's water and wastewater systems face staggering public investment needs over the next several decades. The American Society of Civil Engineers' 2020 economic study, "The Economic Benefits of Investing in Water Infrastructure: How a Failure to Act Would Affect the U.S. Economic Recovery" found that the annual drinking water and wastewater investment gap will grow to $434 billion by 2029. In LCA's service area, we expect our local need to be well in excess of $200 million over the next 10 years. As a utility and a community, we must be prepared for continued increases to our water and sewer rates to meet these system needs.

4. LCA's mission is to protect public health and the environment by providing high-quality, safe, and reliable water and wastewater services. We take this responsibility very seriously. The decision to raise rates is weighed carefully against the long-term needs of the system so that we can fulfill this mission.

Rate Setting & Review Process

Lehigh County Authority's 2023 water and sewer rates are presented in the attached schedules for the Board of Director's consideration for adoption on November 14, 2022. They have been posted on the LCA website in advance of their proposed adoption and shared with key customers directly in accordance with any existing service agreements. Should any customer or member of the general public

have questions or comments about these rates prior to their effective date of January 1, 2023, we will bring them back to the Board for consideration and to record them publicly for the record.

To assist the Board and the public with reviewing the proposed rates, a summary of the proposed rate changes is shown on the table below, and all changes are highlighted / shaded grey within the rate schedule documents attached. A calculation of the impact to a typical residential customer is also attached to this memo along with a comparison of how LCA's rates compare to other water/sewer utilities in the Lehigh Valley region.

It is important to note that these rates were discussed, reviewed, and preliminarily approved as part of the 2023 Budget process that began in July and was concluded in October. This submission represents formal adoption of the rates that were generated based on 2023 Budget calculations of revenue requirements as well as contractual requirements for rate-setting.

Water Rates

Rate	Page #	Description / Discussion
Suburban Water Volume Charges	1	Proposed changes in the volume rates were calculated by LCA's rate consultant in 2022 using a "cost of service" model designed to distribute actual system costs to customers in accordance with their water usage.
Public Fire Protection	2	Fire hydrant and system charges for public fire service provided by the Authority were evaluated as part of the 2022 water rate study.
Allentown Water Rates	6	The 2023 rates reflect increases based on the terms of the Concession Agreement with the City of Allentown, as amended in the summer of 2020. Such increases include an overall 10.1% increase in general rates, phased in increases to fixed charges, plus an updated calculation of the Capital Cost Recovery Charge per the methodology included in the agreement.

Wastewater Rates

Rate	Page #	Description / Discussion
Suburban Exceptional Strength Charge	5	As calculated in the Western Lehigh Interceptor User Charge Report that was submitted to municipal signatories in October 2022. Rates are calculated by formula in compliance with municipal agreements.
Western Lehigh Interceptor & Little Lehigh Relief Interceptor User Charges	7	As calculated in the Western Lehigh Interceptor User Charge Report that was submitted to municipal signatories in October 2022. Rates are calculated by formula in compliance with municipal agreements.
Line Inspection & Cleaning Services	8	LCA staff recommend removing this section of the rate schedule, as sewer services provided to other entities are charged based on actual labor and equipment costs for such services.

Rate	Page #	Description / Discussion
Allentown Sewer Rates	9	The 2023 rates reflect increases based on the terms of the Concession Agreement with the City of Allentown, as amended in the summer of 2020. Such increases include an overall 10.1% increase in general rates, phased in increases to fixed charges, plus an updated calculation of the Capital Cost Recovery Charge and Administrative Order Fee per the methodology included in the agreement.
Allentown Exceptional Strength Charge	10	As calculated by formula and applied to the City's municipal signatories and in-City customers with high-strength waste discharges.
Allentown Industrial Pretreatment Charges	10	Fees that may apply to individual customers depending on permit parameters, based on actual costs.

2023 Tapping Fees / Customer Facilities Fees

Any updates to these fees that may be required will be brought to the Board at a later date with required documentation and Resolution.

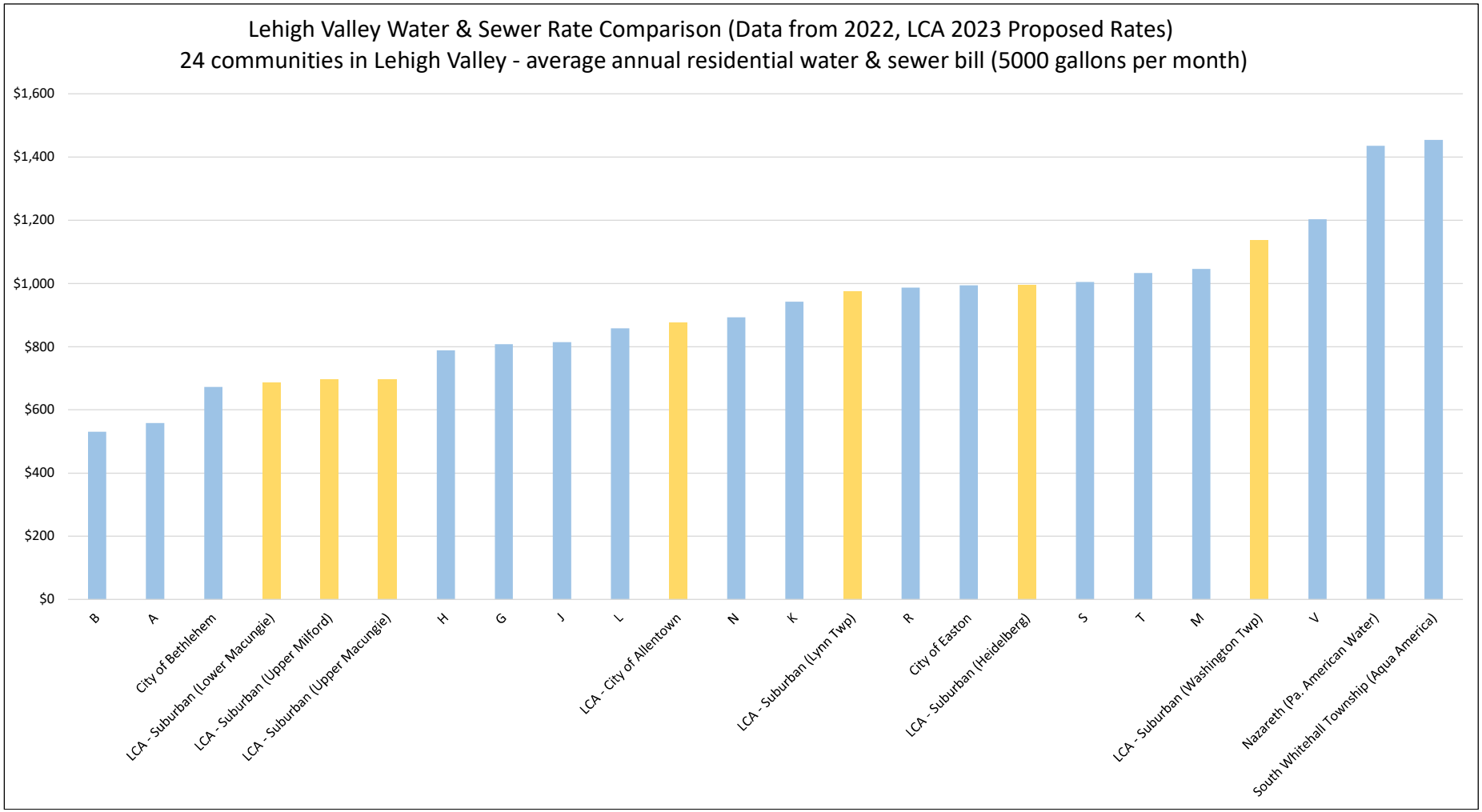
Lehigh County Authority - Proposed 2023 Rates

Bill Sample: Average Residential Customer, 15,000 gallons per quarter

	Lower Macungie Twp*	Upper Milford Twp**	Upper Macungie Twp*	Allentown Division	Lynn Twp**	Heidelberg Heights **	Washington Twp **
Water Fixed Charge	$31.30	$31.30	$31.30	$66.95	$31.30	$31.30	$31.30
Water Volume Charge	$53.70	$53.70	$53.70	$74.29	$53.70	$53.70	$53.70
Quarterly Water Bill	**$85.00**	**$85.00**	**$85.00**	**$141.24**	**$85.00**	**$85.00**	**$85.00**
Sewer Fixed Charge	$62.50	$21.00	$89.00	$23.27	$158.98	$21.00	$124.00
Sewer Flow Charge	$24.00	$67.95	n/a	$54.67	n/a	$142.95	$75.00
Quarterly Sewer Bill	**$86.50**	**$88.95**	**$89.00**	**$77.94**	**$158.98**	**$163.95**	**$199.00**
TOTAL QUATERLY BILL	$171.50	$173.95	$174.00	$219.18	$243.98	$248.95	$284.00
ANNUAL WATER & SEWER BILL	**$686.00**	**$695.80**	**$696.00**	**$876.72**	**$975.92**	**$995.80**	**$1,136.00**

* LCA customers in Lower Macungie and Upper Macunige townships receive sewer service and sewer bills directly from the township.
Rate information reflects the township's most recently published rate schedule.

** No rate changes are proposed for sewer service in Upper Milford, Lynn, Heidelberg or Washington townships.


Lehigh Valley Water & Sewer Rate Comparison (Data from 2022, LCA 2023 Proposed Rates)
24 communities in Lehigh Valley - average annual residential water & sewer bill (5000 gallons per month)
$1,600
$1,400
$1,200
$1,000
$800
$600
$400
$200
$0
B
A
City of Bethlehem
LCA - Suburban (Lower Macungie)
LCA - Suburban (Upper Milford)
LCA - Suburban (Upper Macungie)
H
G
J
L
LCA - City of Allentown
N
K
LCA - Suburban (Lynn Twp)
R
City of Easton
LCA - Suburban (Heidelberg)
S
T
M
LCA - Suburban (Washington Twp)
V
Nazareth (Pa. American Water)
South Whitehall Township (Aqua America)

Updated: January 1, 2023

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WATER RATES AND CHARGES

CENTRAL LEHIGH, NORTH WHITEHALL, WASHINGTON TOWNSHIP, HEIDELBERG HEIGHTS, ARCADIA, PINE LAKES, MILL CREEK, BEVERLY HILLS, CLEARVIEW FARM ESTATES, UPPER MILFORD CENTRAL, EMMAUS CONSECUTIVE, AND MADISON PARK NORTH DIVISIONS

I. Schedule of Water Rates

A. Metered Water Use

Central Lehigh, North Whitehall, Washington Township, Heidelberg Heights, Arcadia, Pine Lakes, Mill Creek, Beverly Hills, Emmaus Consecutive, Madison Park North, Upper Milford Central & Clearview Farm Estates Divisions

(adopted 11/14/2022; effective 1/1/2023)

Current Fixed Charges	
Meter Size	**Fixed Charge**
Quarterly	
5/8" & 3/4" *	$31.30
1"	55.48
Monthly	
1-1/2"	42.04
2"	58.18
3"	105.05
4"	154.00
6"	288.54
8"	448.27
10"	631.04

*Typical residential.

Current Volume Charges						2023
Quarterly Usage (gal.)		**Monthly Usage (gal.)**		**Rate per 1,000 Gal.**		**Rate per 1,000 Gal.**
First	120,000	First	0 - 40,000	$3.26		$3.58
Next	2,880,000	Next	960,000	$3.17		$3.24
Next	24,000,000	Next	8,000,000	$2.75		$2.83
Next	147,000,000	Next	49,000,000	$2.38		$2.63
Over	174,000,000	Over	58,000,000	$2.15		$2.44

Welshtown Road (Washington Township Division)

(adopted 9/19/95; effective 10/1/95)

Volume		Rate per 1,000 Gal.
First	8,000 gal./qtr.	*Minimum Charge/Quarter
All over	8,000 gal./qtr.	$ 5.50
Meter Size		***Minimum Charge/Quarter**
5/8" & 3/4"		$ 60.00
1"		72.00
1-1/4"		84.00
1-1/2"		108.00
2"		133.00
3"		169.00
4"		266.00
6"		459.00

B. Public Fire Protection

(adopted 11/14/2022; effective 1/1/2023)

Each Public Fire Hydrant (O&M Charge)	$10.01/month
Each Inch-Squared Foot (System Charge)	$0.00167/year

2023 Rates:
$10.41/month
$0.00174/year

C. Private Fire Protection

(adopted 7/12/10; effective 7/12/10)

Fire Line Size	Charge per Month
Single Family Residential	$ 5.00
2"	13.61
2-1/2"	21.26
3"	30.62
4"	54.43
6"	122.47
8"	217.72
10"	340.18
12"	489.87

Arcadia West Division – Direct Fire Protection Service

(adopted 5/12/03; effective 5/12/03)

	Charge per Sq. Ft. of Building Space
Monthly	$.00321
Quarterly	.00963

II. Meter Test Fee

(adopted 12/15/14; effective 1/1/15)

Meter Size	Fee
5/8", 3/4", 1"	$50.00
Larger than 1"	Actual Cost if >$50

III. Meter Inspection Fee

(adopted 12/15/14; effective 1/1/15) **$50.00**

IV. Service Order / Site Visit Fees

(adopted 12/15/14; effective 1/1/15)

Business Hours – 7:00 a.m. and 4:45 p.m., Monday through Friday (except holidays)	**$50.00**
After Hours	**$150.00**
Service Termination & Restoration Charge	**$100.00**

V. Site Revisitation Charge

(adopted 12/15/14; effective 1/1/15) **$100.00**

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WATER RATES AND CHARGES (cont'd)

VI. Lien Administration Fee

(adopted 12/13/04; effective 01/1/05)

$56.50 + Current Lehigh County Clerk of Court's Filing Fee

VII. Hydrant Security Device Fee

Central Lehigh Division **$140.00**

(adopted 11/28/16; effective 1/1/17)

VIII. Fire Flow Test Charge

(adopted 12/07/11; effective 01/01/12) **$180.00**

IX. Use of Easement Preparation Fee

(adopted 12/07/11; effective 01/01/12) **$90.00**

X. Backflow Prevention Non-compliance Charge

(adopted 12/07/11; effective 01/01/12) **$50.00**

IX. Tapping, Connection and Customer Facilities Fees

(adopted 8/22/2022; effective 9/1/2022)

Central Lehigh, North Whitehall, Washington Township, Heidelberg Heights, Pine Lakes, Mill Creek, Beverly Hills, Madison Park North, Upper Milford Central & Clearview Farm Estates Divisions

Size of Service Line	Tapping Fee		Connection Fee	Customer Facilities Fee
	Distribution	Capacity		
MFR*	$ 83.35	$ 439.50	Actual Cost	
3/4"	125.03	659.25	See fee schedule	
1"	208.39	1,098.75		
1-1/2"	416.77	2,197.50		
2"	666.84	3,516.01		
3"	1,250.32	6,592.51		
4"	2,083.86	10,987.52		
6"	4,167.72	21,975.03		
8"	6,668.36	35,160.05		
10"	9,585.76	50,542.58		
12"	17,921.21	94,492.64		

Emmaus Consecutive Division

Inquire with Lehigh County Authority. Tapping fee subject to intermunicipal agreement for water capacity provided by Borough of Emmaus.

Arcadia Division

Size of Service Line	Tapping Fee		Connection Fee	Customer Facilities Fee
	Distribution	Capacity		
MFR*	$ 183.37	$ 1,712.28	Actual Cost	
3/4"	275.06	2,568.41	See fee schedule	
1"	458.43	4,280.69		
1-1/2"	916.86	8,561.38		
2"	1,466.97	13,698.21		
3"	2,750.57	25,684.14		
4"	4,584.28	42,806.90		
6"	9,168.55	85,613.79		
8"	14,669.68	136,982.07		
10"	21,087.67	196,911.72		
12"	39,424.77	368,139.30		

Special Purpose Fee		
Fire Service System	$ 0.17	Per Square Foot of Building Space

Notes:

MFR - Applicable to each dwelling unit in a mobile home park or multi-family dwelling with individual service and individually metered.

Connection Fee is based on actual cost of connecting to the Authority water line, extending the service line to the property line, and inspecting the Customer Service Line.

Customer Facilities Fee

(adopted 12/13/2021; effective 1/1/2022)

This fee includes the supply and installation of a water meter and a backflow protection device for residential facilities (meter component). The fee can also include, at the customer's option and based on actual cost, installation of a service line from the property line to the customer's facility by the Authority.

All service lines must have an approved backflow protection device installed. The Authority will furnish a DC (dual check) device for residential facilities.

Meter Size	Meter Fee - With DC Backflow	Meter Fee - With No Backflow
5/8"	$469	$426
5/8" Pit	$484	$441
3/4"	$482	$439
3/4" Pit	$496	$452
1"		$543
1" Pit		$514
1 1/2" Displacement *		$790
1 1/2" Turbine *		$1,136
1 1/2" Compound *		$1,540
2" Displacement *		$1,017
2" Turbine *		$1,171
2" Compound *		$1,751

* LCA will install all meters 1" or smaller. Larger meters may be purchased from LCA at the prices listed above, which includes a $50 inspection fee. If LCA installation of a larger meter is requested, the customer will pay actual costs, on a time and materials basis.

Notes:

Backflow protection devices for commercial/industrial facilities or other facilities with a 1" or larger meter shall be approved by the Authority, and supplied, installed and tested by the applicant. Meters larger than 2" shall be approved by the Authority, supplied and installed by the applicant, and inspected by the Authority at the applicant's expense.

X. Non-Sufficient Funds (NSF) Fee

All Divisions **$25.00**
(adopted 9/24/01, effective 1/1/02)

XI. Service Initiation Fee

All Divisions **$15.00**
(adopted 9/24/01, effective 1/1/02)

CITY OF ALLENTOWN

Adopted 11/14/2022; Effective 1/1/2023

NOTE: Unless expressed specifically in this Schedule of Rates and Charges, customers of the City of Allentown water system are subject to any and all additional charges, fees, penalties and policies stated in Lehigh County Authority's Rules & Regulations for Water Service and its Schedule of Water Rates and Charges duly adopted for its non-City systems.

A. Metered Water Use

Meter Size	2022 Monthly Charge	2023 Monthly Charge	2022 Quarterly Charge	2023 Quarterly Charge
5/8"	n/a	n/a	$60.81	$66.95
3/4"	n/a	n/a	$68.43	$75.35
1"	n/a	n/a	$83.98	$92.46
1 1/2"	$43.88	$48.32	n/a	n/a
2"	$59.27	$65.25	n/a	n/a
3"	$100.20	$110.32	n/a	n/a
4"	$146.49	$161.29	n/a	n/a
6"	$274.67	$302.42	n/a	n/a
8"	$428.67	$471.96	n/a	n/a

Volume	2022 Rate per 1000 Gallons*	2023 Rate per 1000 Gallons*
All Volume	$4.15670	$4.56266

* Volume charge includes cost recovery for any Change of Law and cost passed through from the Delaware River Basin Commission as allowed under the Lease Agreement with the City of Allentown.

B. Capital Cost Recovery Charge

$0.39244 per 1000 gallons

2023 Rate: $0.39028

C. Private Fire Protection

Each Hydrant	**$413.20 per year** (may be billed monthly or quarterly)

2023 Rate: $454.94

D. Tapping Fees

Part 1 – Pre-Concession Rate for Pre-Concession Capital Cost Recovery

$6.77 per gallon

2023 Rate: $7.46

Part 2 – Post-Concession Rate for LCA Capital Cost Recovery

Capacity Part	$0.00851 per gallon
Distribution Part	$0.02551 per gallon

E. Customer Facilities Fees
Adopted 12/13/2021; Effective 1/1/2022

Fees includes the supply and installation of a water meter and associated components.

Meter Size	With LCA Installation*	Without LCA Installation*
5/8"	$304	
3/4"	$367	
1"	$354	
1 1/2"	$646	
2"	$822	
3" Compound		$2,027
3" Turbine		$1,490
4" Compound		$3,353
4" Turbine		$2,673
6" Compound		$5,786
6" Turbine		$4,757
8" Compound		$9,252
8" Turbine		$7,944

* LCA will install all meters 2" or smaller. Larger meters may be purchased from LCA at the prices listed above, which includes a $50 inspection fee. If LCA installation of a larger meter is requested, the customer will pay actual costs, on a time and materials basis.

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

F. Connection Fee

Adopted 12/13/2021; Effective 1/1/2022

Actual cost of connecting to the Authority water line, completed by Authority personnel. Additional fees may apply for service line inspection, plan review, construction permits and/or capital recovery charges. Please contact the Authority's Capital Works department for more information.

Tap Size	Connection Fee
3/4"	$378
1"	$420
1 1/2"	$614
2"	$775
4" x 4"	$2,532
6" x 4"	$2,560
6" x 6"	$2,957
8" x 4"	$3,383
8" x 6"	$3,464
8" x 8"	$3,657
12" x 4"	$5,539
12" x 6"	$5,631
12" x 8"	$5,842
12" x 12"	$7,215

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WASTEWATER RATES AND CHARGES

UPPER MILFORD TOWNSHIP, WEISENBERG TOWNSHIP, HEIDELBERG HEIGHTS, WYNNEWOOD, SAND SPRING, WASHINGTON TOWNSHIP, LOWHILL TOWNSHIP, LYNN TOWNSHIP, WESTERN LEHIGH INTERCEPTOR & LITTLE LEHIGH RELIEF INTERCEPTOR SYSTEMS

I. Schedule of Wastewater Rates

A. Lowhill Township System

(adopted 06/13/16; effective 06/08/16)

Flow Charge	$/1,000 gals
All Flow	4.53

Fixed Charge per Quarter	$ per Equivalent Dwelling Unit (EDU)
- Multi-Family Residential	10.50
- All Other Accounts	21.00

B. Upper Milford Township System

(adopted 12/10/12; effective 01/01/13)

Flow Charge	$/1,000 gals
All Flow	4.53

Fixed Charge per Quarter	$ per Equivalent Dwelling Unit (EDU)
- Multi-Family Residential	10.50
- All Other Accounts	21.00

C. Weisenberg Township System

(adopted 12/10/12; effective 01/01/13)

Flow Charge	$/1,000 gals
All Flow	4.53

Fixed Charge per Quarter	$ per Equivalent Dwelling Unit (EDU)
- Multi-Family Residential	10.50
- All Other Accounts	21.00

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WASTEWATER RATES AND CHARGES

Western Weisenberg Township System (Arcadia West)
(adopted 12/11/06; effective 01/01/07)

Quarterly Flow Charge	**$/1,000 gals** 58.00
Quarterly Fixed Charge	**$/1000 gals of Allocation per day** 7.55

C. Heidelberg Heights System
(adopted 12/10/12; effective 01/01/13)

Flow Charge	**$/1,000 gals**
All Flow	9.53

Fixed Charge per Quarter	**$ per Equivalent Dwelling Unit (EDU)**
- Multi-Family Residential	10.50
- All Other Accounts	21.00

D. Wynnewood System
(adopted 12/10/12; effective 01/01/13)

Flow Charge	**$/1,000 gals**
All Flow	9.53

Fixed Charge per Quarter	**$ per Equivalent Dwelling Unit (EDU)**
- Multi-Family Residential	10.50
- All Other Accounts	21.00

E. Sand Spring System
(adopted 12/10/12; effective 01/01/13)

Flow Charge	**$/1,000 gals**
All Flow	9.53

Fixed Charge per Quarter	**$ per Equivalent Dwelling Unit (EDU)**
- Multi-Family Residential	10.50
- All Other Accounts	21.00

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WASTEWATER RATES AND CHARGES

F. Wastewater Treatment Plant Direct Customer

(adopted 12/10/12; effective 01/01/13)

Flow Charge	$/1,000 gals
All Flow	4.53

Fixed Charge per Quarter	$21.00*

* Per Equivalent Dwelling Unit (EDU)

G. Washington Township System

(adopted by resolution of Washington Township Board of Supervisors 12/2/08; effective 1/1/09 – Administered by Lehigh County Authority per agreement, as operator, approved 4/13/09; effective 1/1/09. Current rate adopted by LCA 12/10/12; effective 01/01/13). All other Authority administrative fees shall apply to these customers, including those set forth in the Metering Fees and Other Charges categories of this schedule.

Fixed Charge	$/qtr
All customers	$124.00

Flow Charge	$/1,000 gals
All flow	$5.00

H. Lynn Township

(adopted 12/07/11; effective 01/01/12)

Flow Charge	$/1,000 gals
Commercial accounts, flow in excess of 15,000 gallons per quarter	7.20

Fixed Charge per EDU per Quarter	$158.98

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WASTEWATER RATES AND CHARGES

II. Metering Fees

A. Meter Purchase/Installation Fee

(adopted 12/13/2021; effective 1/1/2022)

Meter Size	Purchase & Inspection *
5/8”	$359
5/8” Pit	$375
3/4”	$373
3/4” Pit	$386
1”	$477
1” Pit	$448
1-1/2”	$790
1-1/2” Pit	$1,136
2” Displacement	$1,540
2” Displacement Pit	$1,017
2” Turbine	$1,171
2” Compound	$1,751

* Prices include ECR meter with touchpad, radio read unit and installation wire, plus $50 inspection fee. Plumber shall install all components and call for meter inspection by LCA personnel.

B. Meter Inspection Fee **$50.00**

(adopted 12/15/14; effective 1/1/15)

C. Meter Test Fee

(adopted 12/15/14; effective 1/1/15)

Meter Size	Fee
5/8”, 3/4”, 1”	$50.00
Larger than 1”	Actual Cost if >$50

III. Other Charges

A. Service Order / Site Visit Fee

(adopted 12/15/14; effective 1/1/15)

Business Hours – 7:00 a.m. and 4:45 p.m., Monday through Friday (except holidays) **$50.00**

After Hours **$150.00**

B. Site Revisitation Charge **$100.00**

(adopted 12/15/14; effective 1/1/15)

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WASTEWATER RATES AND CHARGES

C. Lien Administration Fee
(adopted 12/13/04; effective 01/01/05)

$56.50 + Current Lehigh County Clerk of Court's Filing Fee

D. Non-Sufficient Funds (NSF) Fee **$25.00**
(adopted 9/24/01, effective 1/01/02)

E. Service Initiation Fee **$15.00**
(adopted 9/24/01, effective 1/01/02)

F. Sampling and Testing Charges **$182.00/day**
(adopted 11/11/19; effective 1/1/20)
(Commercial & Industrial)

Fats-Oils-Greases Analysis **$43.75/sample**
(adopted 11/9/2020; effective 1/1/2021)

G. Exceptional Strength Charges
(adopted 11/14/2022; effective 1/1/2023)

(Commercial & Industrial)	**2022 Rates $ / pound**	**2023 Rates $ / pound**
BOD	0.33	0.33
TSS	0.25	0.30
TKN	0.38	0.43

H. Use of Easement Preparation Fee **$90.00**
(adopted 12/07/11; effective 01/01/12)

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WASTEWATER RATES AND CHARGES

IV. Capital Recovery Charges

(adopted 6/27/2022; effective 7/1/2022)

System	Tapping Fee $/gallon/day	Tapping Fee $/EDU	Connection Fee	Customer Facilities Fee
Upper Milford System			Actual Cost Trended*	Actual Cost Trended*
Route 29 Service Area				
Contributed Area (includes Western Lehigh fees plus UMiT Capacity & Planning Parts)	21.81	4,973.10		
LCA-Installed Area (includes Contributed Area fees plus UMiT Collection Part)	33.75	7,809.65		
Lower Macungie Twp. Customer	3.10	703.22		
Other Service Areas				
Contributed Area (includes Western Lehigh fees plus UMiT Capacity Part-Other)	15.05	3,366.25		
Non-Contributed Area (includes Contributed Area fees plus UMiT Collection Part)	26.99	6,202.80		
Western Weisenberg Twp System				
LCA Planning Fee	3.19	837.50	Historical Cost plus Financing	
LCA Land Fee	5.31	1,394.03	Actual Cost Trended	
Wastewater Treatment Plant	48.84	12,820.18	Actual Cost Trended	
Wynnewood System				
Capacity	86.46	20,154.63	Actual Cost	Actual Cost
Collection	20.13	4,690.87		
Heidelberg Heights System				
Capacity	33.97	8,131.33	Actual Cost	Actual Cost
Collection	4.31	1,032.78		
Sand Spring System				
Capacity	154.72	36,064.52	Actual Cost	Actual Cost
Collection	4.26	993.17		

*If constructed by Authority; if constructed by property owner, a $90 inspection fee applies.

The capital recovery fees set forth in this schedule do not apply to the Washington Township sewer system since the Washington Township Board of Supervisors establishes such fees and administers capital recovery fees directly.

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WASTEWATER RATES AND CHARGES

WESTERN LEHIGH INTERCEPTOR SYSTEM

I. Schedule of Wastewater Rates

(adopted 11/14/2022; effective 1/1/2023)

LCA Signatories	2022 Rates ($)	2023 Rates ($)
Flow (per 1,000 gallons)	1.16	1.17
BOD (per pound)	0.33	0.33
TSS (per pound)	0.25	0.30
TKN (per pound)	0.38	0.43
Allocation (per 1,000 gallons per day)	0.21	0.21
Emmaus		
Flow (per 1,000 gallons)	0.36	0.39

II. Tapping Fee

(adopted 6/27/2022; effective 7/1/2022)

System	Tapping Fee $/gal/day	Tapping Fee $/EDU	Costing Method
Treatment Allocation	**7.39**	**1,648.99**	**Historical Trended Cost**
Western Lehigh Interceptor	**5.03**	**1,121.76**	

LITTLE LEHIGH RELIEF INTERCEPTOR SYSTEM

I. Schedule of Wastewater Rates

(adopted 11/14/2022; effective 1/1/2023)

	2022 Rates ($)	2023 Rates ($)
LCA Signatories – Phase 1 Flow (per 1,000 gallons)	0.23	0.57
Other Users – Lower Macungie Phase 2 & Brookside Road, Salisbury, and So. Whitehall Townships Flow (per 1,000 gallons)	0.23	0.51
LCA Signatories – Phase 2 Flow (per 1,000 gallons)	0.011	0.013

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WASTEWATER RATES AND CHARGES

II. Tapping Fee

(adopted 6/27/2022; effective 7/1/2022)

System	Tapping Fee $/gal/day	Tapping Fee $/EDU	Costing Method
Little Lehigh Relief Interceptor	**1.93**	**429.93**	**Historical Trended Cost**

~~LINE INSPECTION AND CLEANING SERVICES~~

~~(adopted 7/27/09; effective 8/1/09)~~

This section will be removed 1/1/2023 as service fees are based on actual time and materials.

~~Crew Size~~	~~TV Inspection ($/hr)~~	~~Sewer Cleaning ($/hr)~~	~~Flow Monitoring ($/hr)~~
~~One Technician~~			
~~Regular Rate~~	~~$111~~	~~$116~~	~~$68~~
~~Overtime Rate~~	~~$140~~	~~$144~~	~~$96~~
~~Two Technicians~~			
~~Regular Rate~~	~~$168~~	~~$173~~	~~$125~~
~~Overtime Rate~~	~~$226~~	~~$230~~	~~$182~~
~~Three Technicians~~			
~~Regular Rate~~	~~$226~~	~~$230~~	~~N/A~~
~~Overtime Rate~~	~~$311~~	~~$316~~	~~N/A~~

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WASTEWATER RATES AND CHARGES

CITY OF ALLENTOWN

Adopted 11/14/2022; Effective 1/1/2023

NOTE: Unless expressed specifically in this Schedule of Rates and Charges, customers of the City of Allentown wastewater system are subject to any and all additional charges, fees, penalties and policies stated in Lehigh County Authority's Rules & Regulations for Sewerage Service and its Schedule of Wastewater Rates and Charges duly adopted for its non-City systems.

A. Sewer Usage Charges

Meter Size	2022 Monthly Charge	2023 Monthly Charge	2022 Quarterly Charge	2023 Quarterly Charge
5/8"	n/a	n/a	$21.13	$23.27
3/4"	n/a	n/a	$23.76	$26.16
1"	n/a	n/a	$29.03	$31.96
1 1/2"	$15.11	$16.64	n/a	n/a
2"	$20.37	$22.43	n/a	n/a
3"	$34.51	$38.00	n/a	n/a
4"	$50.30	$55.38	n/a	n/a
6"	$94.27	$103.79	n/a	n/a
8"	$172.95	$190.41	n/a	n/a

Flow Charge	2022 Rate per 1000 Gallons*	2023 Rate per 1000 Gallons*
All flow based on metered water usage**	$2.98318	$3.28408

* Flow charge includes cost recovery for any Change of Law and cost passed through from the Delaware River Basin Commission as allowed under the Lease Agreement with the City of Allentown.

** Unmetered residential accounts will be charged for flow based on an average usage of 180 gallons per day.

B. Capital Cost Recovery Charge

$0.15055 per 1000 gallons

2023 Rate: $0.19343

C. Administrative Order Fee

$0.16241 per 1000 gallons

2023 Rate: $0.16700

Administrative Order Fee is collected to reimburse the City of Allentown for expenses associated with complying with the USEPA Administrative Order to correct / eliminate sanitary sewer system overflows.

D. Tapping Fees

Part 1 – Pre-Concession Rate for Pre-Concession Capital Cost Recovery

$5.16 per gallon

2023 Rate: $5.68

Part 2 – Post-Concession Rate for LCA Capital Cost Recovery

Capacity Part	$0.01538 per gallon
Collection Part	$0.00052 per gallon

LEHIGH COUNTY AUTHORITY
SCHEDULE OF WASTEWATER RATES AND CHARGES

E. Exceptional Strength Charges

(Commercial & Industrial)	2022 Rate $ / pound	2023 Rate $ / pound
BOD	0.298	0.321
TSS	0.262	0.280
TKN	0.392	0.411

F. Industrial Pretreatment Program Fees

Program Charge / Testing Fees	2022 Rate	2023 Rate
Issue Initial Two (2) Year Permit	$1,200.00	$1,200.00
Renewal Fee	$575.00	$575.00
Review of Monitoring Reports Required by Federal Regulations	$275.00	$275.00
Single Occurrence Review	$350.00	$350.00
Site Visitations and Inspection	$130.00	$130.00
Monitoring Reports Preparation	$135.00	$135.00
Placement of Chemical Samplers	$105.00	$105.00
Sample Collection and Preparation	$52.50	$52.50
Biochemical Oxygen Demand	$27.50	$27.50
Cyanide, Total	$36.00	$30.00
Oil & Grease	$43.75	$66.00
pH	$12.50	$12.50
Phenols	$37.50	$36.00
Solids, Total Dissolved	$15.00	$21.50
Solids, Total Suspended	$17.50	$17.50
Solids, Total	$15.00	$15.00
Sulfides	$25.00	$48.00
Total Kjeldahl Nitrogen (TKN)	$28.50	$28.50
Total Petroleum Hydrocarbons	$50.00	$72.00
Total Phosphorous as P	$25.00	$14.50
Cadmium	$15.00	$15.00
Chromium	$15.00	$15.00
Copper	$15.00	$15.00
Lead	$15.00	$15.00
Molybdenum	$15.00	$15.00
Nickel	$15.00	$15.00
Silver	$15.00	$15.00
Selenium	$15.00	$15.00
Zinc	$15.00	$15.00
Mercury	$25.00	$25.00
Cobalt	$15.00	$15.00
Lithium	$15.00	$15.00
SVOA 625	$187.50	$228.00
VOA 1666	$412.00	$432.00
VOA 624	$112.50	$120.00
Diesel Range Organics	$75.00	$75.00
PFAS	$475.00	$343.50

MEMORANDUM

Date: November 14, 2022

To: LCA Board of Directors
Liesel Gross, CEO

From: Phil DePoe, Senior Planning Engineer

Subject: Regional Act 537 Plan Alternatives Analysis – KIWWTP "BioActiflo" Pilot Test Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
A	Capital Project Authorization: Regional Act 537 Plan Alternatives Analysis – KIWWTP BioActiflo Pilot Test Phase	$264,750
1A	Professional Services Authorization (AECOM): BioActiflo Pilot Test Phase – Engineering & Data Analysis	$141,750*
1B	Professional Services Authorization (Veolia): BioActiflo Pilot Test Phase – Pilot Equipment Supplier & Operator	$98,000*

**Included in the Capital Project Authorization*

A. Regional Act 537 Plan Alternatives Analysis – KIWWTP BioActiflo Pilot Test Phase

AUTHORIZATION OVERVIEW:
As part of the ongoing Act 537 efforts, the most recent calibrated modeling efforts conducted by Arcadis indicate the future peak wet-weather flows (during the design storm event in 2050) entering the Kline's Island Wastewater Treatment Plant (KIWWTP) are likely to be in the range of 160-180 million gallons per day (MGD). As Act 537 planning has progressed, strategies to handle peak flows up to 120 MGD have been identified and vetted.

The strategies (and timing) to handle peak flows beyond 120 MGD are not as conclusive. The following options are currently under consideration:

1. Equalization tank(s). This option includes the construction of large equalization basins to hold peak flows above 120 MGD that may enter the KIWWTP during wet-weather events. The sewage held in storage would then be introduced into the treatment process at the plant at a later time when the flows have subsided. This is traditional technology that is well understood and accepted, but is costly to construct and requires significant land at the plant for construction. However, it will remain a viable option to be included in the Act 537 Plan pending the additional evaluations described in this memo.

2. Expansion of a "parallel" treatment option at the KIWWTP. This option has been fully investigated by Kleinfelder to achieve up to 120 MGD peak flow treatment, but may be expandable to treat peak flows above 120 MGD. This option entails utilizing existing trickling filter systems in parallel during peak wet-weather events to achieve full treatment of all sewage flows. During normal operation, the filters are run in sequence. This option is being fully explored by Kleinfelder under separate authorization.

3. High-rate treatment using "BioActiflo" technology. This alternative has been developed by Veolia Water Technologies and provides a method of treating a peak sewage flows at

a high rate utilizing a small footprint for equipment. The BioActiflo system, if selected, would only be utilized for peak wet-weather events that send flows in excess of 120 MGD to the KIWWTP. Bench-scale tests occurred in 2021 to confirm proof of concept. The next step is a full-scale pilot before inclusion in the Act 537 as a potential viable peak wet weather alternative.

This third option – the BioActiflo alternative – is the subject of this authorization, as full-scale pilot testing is required to determine the effectiveness of this technology for the KIWWTP peak flows. The pilot test will also provide data to support the overall evaluation of capital costs, operating and maintenance costs, and operational risks associated with the BioActiflo option. Although BioActiflo is considered to be a newer, innovative treatment method, PA DEP has accepted the system as satisfactory secondary treatment technology in Pennsylvania (New Castle Sanitation Authority). Pilot testing is expected to be required for permit approval, if this alternative is selected.

See attached proposals for further details.

FINANCIAL:
The LCA Allentown Division will fund these 2023 services.

CURRENT STATUS:
Two separate bench-scale tests conducted last year by AECOM (and then a third party by Veolia for conformation) showed qualitatively that using KIWWTP trickling filter slough instead of Return Activated Sludge (RAS) can perform soluble BOD removal in the biological contact of the BioActiflo system. However, piloting is needed to more quantitatively develop basis of design information for a full-scale facility.

THIS APPROVAL:
This pilot test requires the authorization of two professional services: one for AECOM (engineering and data analysis support) and one for Veolia (pilot equipment supplier and operator) These services include, but are not limited to, the following:

AECOM Professional Services
• Pilot Test Plan Development
• Piloting Preparation Coordination
• Pilot Operation and Sampling
• Data Analysis
• Meetings and Final Report

VEOLIA Professional Services
• Pilot operator working typical first shift hours
• Round trip freight
• Rental cost for pilot equipment
• Summary of operational results

CONSULTANT SELECTION PROCESS:
AECOM was retained by LCA during the 2013-2016 timeframe to investigate wastewater treatment capacity options for the Western Lehigh service area. In late 2019, they were once again retained to provide a status update on prior planning efforts. And in August 2020, AECOM was authorized as Program Manager for the entire Act 537 planning process. Due to their intimate

knowledge acquired through prior (recent) bench-scale testing efforts, LCA recommends AECOM be retained once again for this current phase of the Regional Act 537 Plan development.

This high-rate treatment system of BioActiflo is proprietary to Veolia.

SCHEDULE:
Assuming authorization is granted at the November 14, 2022 Board meeting, the pilot unit is estimated to be ready by March 2023. Upon delivery to the KIWWTP in late March 2023, the pilot test will range from six to eight weeks in duration (April and May of 2023). Data analysis and final report preparation will then follow in June and July of 2023.

Due to the limited availability of the equipment needed for the pilot test and Veolia's advance scheduling protocol, authorization is required as soon as possible so the schedule above can be achieved.

It is also noteworthy that the Preliminary Screening of Alternatives (PSOA) work recently authorized by LCA's Board will be concluding in Spring 2023, and pilot test data of the BioActiflo option is needed at that time to determine if it will be included in the Final Alternatives Analysis that will commence immediately following the PSOA work.

FUTURE AUTHORIZATIONS:
None anticipated to further vet this peak wet weather treatment alternative.

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.:	AD-S-27	**BUDGET FUND:**	Allentown Div\Wastewater\Capital
PROJECT TITLE:	Regional Act 537 Plan Alternatives Analysis: KIWWTP - BIOACTIFLO Treatment System	**PROJECT TYPE:**	
		☐	Construction
		☒	Engineering Study
THIS AUTHORIZATION:	**$264,750**	☐	Equipment Purchase
TO DATE (W/ ABOVE)	**$295,250**	☐	**Amendment**

DESCRIPTION AND BENEFITS:

As part of the ongoing Act 537 efforts, the most recent calibrated modeling efforts conducted by Arcadis indicate the future peak flows (during the design storm event in 2050) are likely in the range of 160-180 MGD. As Act 537 planning has progressed, strategies to handle peak flows up to 120 MGD have been identified and vetted. The strategies (and timing) to handle peak flows beyond 120 MGD are not as conclusive. One potential strategy that needs further vetting is a high-rate treatment system developed by Veolia Water Technologies known as "BioActiflo." Bench-scale tests occurred in 2021 to confirm proof of concept. The next step is a full-scale pilot before inclusion in the Act 537 as a viable peak wet weather alternative strategy.

Prior Authorizations: In early 2021, AECOM was authorized to perform bench-scale testing to simulate the high-rate treatment system using KIWWTP collected samples. Two separate bench-scale tests occurred (one in April 2021 and another in October 2021). Veolia also performed laboratory testing in November 2021. All three tests confirmed proof of concept.

This Authorization: A six-to-eight-week pilot test (Spring 2023) performed by the equipment manufacturer (Veolia), with engineering assistance from the Act 537 Program Manager (AECOM). See attached for further details.

Authorization Status:

Requested This Authorization: Pilot Test Phase	
Design Phase	
Staff	**$15,000**
Contractor (Vendor)	**$98,000**
Engineering Consultant	**$141,750**
Contingency	**$10,000**
Total This Authorization	**$264,750**

Prior Authorizations	$30,500
Subtotal (Prior + This Authorization)	**$295,250**
Future Authorizations (2023 and beyond)	*None*

REVIEW AND APPROVALS:

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

Lehigh County Authority

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

PROFESSIONAL SERVICES AUTHORIZATION
AMENDMENT NO. 1

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

Date: November 14, 2022
Requested By: Phil DePoe

Approvals
Department Head: _____
Chief Executive Officer: _____

Regional Act 537 Plan Alternatives Analysis: Kline's Island Wastewater Treatment Plant (KIWWTP) - BIOACTIFLO Treatment System (Pilot Test Phase)

As part of their role as LCA's Act 537 program manager, AECOM has provided engineering and bench-scale testing services to evaluate the treatability of wet-weather wastewater events at the KIWWTP using a high-rate treatment process. This process, known as BIOACTIFLO, is a well proven system in conventional activated sludge facilities, but needs to be pilot tested for efficacy in a trickling filter-based facility like KIWWTP. The system is only being assessed as a potential alternative to the future (peak flows above 120 MGD; exact timing inconclusive) construction of equalization storage tanks (or the "stretching" of the parallel operation mode) at KIWWTP. The tasks included with this proposal include, but are not limited to, the following:

Professional Services (1)
1. Pilot Test Plan Development
2. Piloting Preparation Coordination
3. Pilot Operation and Sampling
4. Data Analysis
5. Meetings and Final Report
6. Project Management

(1) For Pilot Testing Phase Only.

Please reference the cover Memo for additional information.

Prior Planning (Bench-Scale Test) Phase: $30,500

This Authorization: $141,750

Total Cost Estimate (not to be exceeded without further authorization): $172,250

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:** _____

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: VEOLIA WATER TECHNOLOGIES
4001 Weston Parkway
Cary, NC 27513

Date: November 14, 2022

Requested By: Phil DePoe

Approvals

Department Head: _____

Chief Executive Officer: _____

Regional Act 537 Plan Alternatives Analysis: Kline's Island Wastewater Treatment Plant (KIWWTP) - BIOACTIFLO Treatment System (Pilot Test Phase)

As part of the ongoing Act 537 efforts, the most recent calibrated modeling efforts conducted by Arcadis indicate the future peak flows (during the design storm event in 2050) are likely in the range of 160-180 MGD. As Act 537 planning has progressed, strategies to handle peak flows up to 120 MGD have been identified and vetted. The strategies (and timing) to handle peak flows beyond 120 MGD are not as conclusive. One potential strategy that needs further vetting is a high-rate treatment system developed by Veolia Water Technologies known as "BioActiflo." Bench-scale tests occurred in 2021 to confirm proof of concept. The next step is a full-scale pilot before inclusion in the Act 537 as a viable peak wet weather alternative strategy. The equipment and services included with this pilot study include, but are not limited to, the following:

Professional Services *(1)*
1. Pilot operator working typical first shift hours
2. Round trip freight
3. Rental cost for pilot equipment
4. Summary of operational results

(1) For Pilot Testing Phase Only.

Please reference the cover Memo for additional information.

Pilot Testing Phase (Veolia):

Total Cost Estimate (not to be exceeded without further authorization): *$98,000*

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:** _____

AECOM
Built to deliver a better world

AECOM
625 West Ridge Pike
Suite E-100
Conshohocken, PA 19428
www.aecom.com

610-234-5402 tel

November 2, 2022
(sent via e-mail)

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

Re: Proposal to Conduct Piloting of BIOACTIFLO™ Treatment System at Kline's Island Wastewater Treatment Plant

Dear Ms. Gross:

AECOM is pleased to provide this proposal for engineering and pilot testing services to evaluate the treatability of wet weather wastewater at the Kline's Island Wastewater Treatment Plant (KIWWTP) in Allentown, PA, using the Veolia BIOACTIFLO™ (BIOACTIFLO) process to reduce soluble Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS). This system is a high-rate treatment process that includes an initial biological treatment step in an aerated reactor / contact tank, followed by a high-efficiency clarification process which includes ballasted flocculation (a 'seed' of microsand along with coagulant and polymer), rapid mix and flocculation, followed by Lamella sedimentation and recirculation of the microsand with a hydrocyclone.

Based on the most recent calibrated modeling efforts conducted by Arcadis, the future wet weather peak flows for the design storm event to KIWWTP are likely to be in the range of 160-180 MGD even with adjustments for inflow/infiltration reduction estimated for cost-effective source reduction approaches. The facility will encounter peak flows extending above any present wet weather strategies including parallel trickling filter operations (limited to 150 MGD or less) and will need to be mitigated with either high-rate treatment or equalization storage. Based on the anticipated nature of the final wet weather hydrograph to the KIWWTP, we expect a broad hydrograph that will make equalization storage of that large volume potentially more costly than initially understood. Previous estimates to provide a comparable level of EQ indicated a savings using BioActiflo of greater than $20 million. This is the financial driver for conducting the piloting. Proceeding with piloting will validate the BioActiflo facility design parameters, confirm the financial incentive, and instill the confidence to base peak wet weather flow management decisions on the technology. Previous bench studies have shown "proof of concept".

The BIOACTIFLO Treatment system is being assessed as a potential alternative to accommodate wet-weather flows ranging upward to 60 Million Gallons Per Day (MGD). In conjunction with the proposed projects to increase the current hydraulic capacity at KIWWTP to 100 MGD, and provisions for parallel trickling filter operation which could yield 120+ MGD, adding BIOACTIFLO will further increase the wet weather capacity to 180 MGD, matching the peak flow to the KIWWTP. This approach could be broken down into 2 to 3 phases to correspond with increasing peak flow rates anticipated at KIWWTP over

time based on conveyance system improvement schedules. With phasing, the capital cost outlay would be stretched out over the planning period accordingly.

BACKGROUND

The LCA leases and operates the KIWWTP, which is owned by the City of Allentown. The primary 'liquid' treatment train includes the following key components:

- Headworks / Pump Station
- Auxiliary Pumping Station
- Aerated Grit Chambers
- Primary Settling Tanks and Odor Control System
- Primary Sludge Pumping Station
- Intermediate Pumping Station
- Plastic Media Trickling Filters (PMTF) (and Odor Control System)
- Intermediate Settling Tanks
  - Flow Distribution Chamber
  - Settling Tanks – Clarifiers
  - Sludge Pumping Station
- Rock Media Trickling Filters
- Final Settling Tanks
- Final Sludge Pumping Stations
- Chorine Contact Tanks
- Effluent Pump Station and Outfall

The solids treatment process includes the following key components:

- Thickening Tanks / Covers and Odor Control Systems
- Sludge Transfer and Feed Pumps
- Polymer System
- Elutriation Tanks
- Anaerobic Digesters
- Belt Filter Press

KIWWTP has a recently corrected the hydraulic capacity of the plant to 44.6 MGD, with a current peak flow capacity of ~87 MGD. After a separate project to increase this peak capacity to 100 MGD, and the afore-mentioned parallel trickling filter operations project to increase peak capacity to 120 MGD, a longer range Phase two project will be required to further increase the hydraulic capacity to handle the anticipated wet-weather flows that extend beyond. The capital cost savings to add a future 40 MGD of additional BIOACTIFLO capacity rather than EQ capacity was previously estimated at $24-27M in potential savings over the prior EQ capacity needs. Latest feedback from the refined ARCADIS model suggests that these savings may be conservatively low.

The Pennsylvania Department of Environmental Protection (PADEP) has accepted the BIOACTIFLO system as satisfactory secondary treatment technology since it includes the initial biological treatment step, whereas 'blending' or bypassing wet weather peak flows to 'blend' with the secondary treated flow

from the liquid treatment system is not considered acceptable. This approval was gained by AECOM for the New Castle Sanitation Authority and is presently under construction. PaDEP regulations require the use of “significant biological treatment” (hence BioActiflo instead of Actiflo), defined as achieving a 65% BOD removal. The PaDEP regulations also have a second standard of achieving a final cBOD concentration of 40 mg/L or less on a weekly average basis.

The BIOACTIFLO system has been well proven in conventional activated sludge facilities, but has not been applied to a trickling filter-based facility like KIWWTP. For an activated sludge facility, the BIOACTIFLO system is configured so that Return Activated Sludge (RAS) is mixed with screened wet-weather wastewater at a pre-set ratio and directed to the initial biological contact tank to achieve a Mixed Liquor Suspended Solids (MLSS) concentration of approximately 1,000 mg/L. With a minimum contact time of 20 to 30 minutes, effluent BOD concentrations less than 30 mg/L can typically be achieved. The ACTIFLO™ clarification process with the microsand seed then achieves rapid settling with a reduced system footprint.

In two separate bench-scale tests conducted last year by AECOM and then a third by Veolia for confirmation showed qualitatively that using KIWWTP trickling filter slough instead of RAS can perform soluble BOD removal in the biological contact tank of the BIOACTIFLO system; however, piloting is needed to more quantitatively develop basis of design information for a full scale facilty. In order to obtain this design data and to use as the basis for PADEP permit application and approval, AECOM is proposing to conduct a pilot at the KIWWTP. The pilot would involve using gravity-thickened slough from the trickling filters mixed with wet-weather influent flow. Since high-volume wet-weather flow may not be reliably available for the pilot, the pilot would include provisions to mix unchlorinated, low BOD KIWWTP effluent from the biotowers with KIWWTP influent to obtain representative wet weather influent characteristics. This synthetic wet weather influent would then be mixed with the trickling filter slough to achieve the target reactor MLSS concentrations. Typically with RAS, satisfactory total and soluble BOD reductions are achievable mixing wet weather influent with RAS to achieve a 1,000 mg/L mixed liquor suspended solids (MLSS) concentration with 20 to 30 minute contact times; however, bench studies using KIWWTP slough indicated that a pre-aeration step prior to the contacting step would likely be required. To accomplish this, a step-feed configuration is envisioned. A portion of wet weather influent would be mixed with slough to achieve a 3,000 – 4,000 mg/L MLSS in a pre-aeration step. The 3,000 to 4,000 mg/l MLSS would be further diluted with the remainer of the wet weather flow to achieve the 1,000 mg/L MLSS concentration required for the contacting step. The pilot facility would be configured to achieve this step-feed arrangement.

PILOTING ARRANGEMENTS

Veolia, the vendor of BIOACTIFLO, has a mobile piloting facility that they rent out for the purpose of BIOACTIFLO piloting. They have agreed to modify their pilot facility to provide for evaluating the step-feed pre-aeration configuration described above and make the pilot facility available for 6-8 weeks of piloting in the second quarter of 2023. They would need about two months of lead time for modifications to their pilot facility prior to shipping to the KIWWTP for this purpose; but this proposal is being submitted to LCA at this time to secure a Spring 2023 position in Veolia’s piloting queue. Demand for the pilot facility is high and Veolia operates on a “first come – first served” basis. Their proposal is attached as

Attachment 1 for reference and execution directly by LCA. Their proposal includes shipping, commissioning and decommissioning, and operating labor 5 days per week.

Per the proposal, LCA is to provide screened, degritted influent, unchlorinated bio-tower effluent for dilution to simulate wet weather wastewater strength, thickened slough (from the gravity thickener), utilities (power and water), and access to drains for the effluent and lab sink. LCA would also provide a forklift to tranfer the pilot skids from their transport trucks to the piloting site. These needs have been reviewed with KIWWTP staff with no objections.

AECOM participated in a site walk with LCA administrative and plant staff to select a location for the pilot to provide access to the various hook-ups while minimizing the potential for interfering with plant operations. A configuration sketch for the piloting equipment is attached as Attachment IIA; and a location sketch is attached as Attachment IIB. The layout involves:

- Positioning the piloting equipment on the east side of the facility, just south of a substation;
- Hose lengths in excess of 200 ft. to make liquid stream connections. Veolia's pilot facility proposal asks for the client to provide lengths in excess of 50 feet; however, Veolia has agreed to supply these additional lengths at no additional charge;
- LCA supplying power from the adjacent substation;
- LCA supplying thickened slough from the gravity thickener using totes.

The following sections outline AECOM's proposed scope-of-work, budget and schedule to execute this project.

SCOPE OF SERVICES

AECOM's proposed scope of work consists of the following tasks:

- Task 1: Piloting Test Plan Development
- Task 2: Piloting Preparation Coordination (Veolia, Plant Staff & 3rd Party Laboratory)
- Task 3: Pilot Operation and Sampling
- Task 4: Data Analysis
- Task 5: Meetings and Final Report
- Task 6: Project Management

Task 1 – Piloting Test Plan Development

In conjunction with Veolia and in collaboration with LCA and the City of Allentown (COA), AECOM will develop a plan (Pilot Test Plan or Plan) for assessessing the response of soluble BOD (sBOD) removal to pre-aeration and contacting times. The test plan will include on-line monitoring, sample collection, and analytical tests.

AECOM proposes to evaluate the total and sBOD reduction of the KIWWTP wastewater in the reactors under a range of contact times (20 minutes to 40 minutes) by varying concentration and tank size (via flow rate changes). Additionally, AECOM will evaluate the impact of pre-aeration on the gravity-thickened sludge from KIWWTP, under different scenarios or pre-aeration times and concentrations (30 minutes to 2 hours and 3,000-5,000 mg/L).

In order to maximize testing time, typical KIWWTP wet-weather influent water quality (specifically, influent TSS and BOD concentrations) will be simulated by blending BOD-depleted, unchlorinated Biotower effluent with screened, de-gritted influent; i.e., Primary Clarifier influent. Influent TSS and BOD concentrations, along with Gravity-thickened sludge concentrations and Biotower effluent concentrations, will be used to establish the ratio of the mixed influent for the reactors to achieve targeted MLSS concentrations of 1,000 mg/L to simulate the BIOACTIFLO^{TM} contacting system.

The Plan will present tests and analyses to be conducted during the piloting (i.e., initial TSS concentrations) and those that will be sent out to a third-party laboratory for analyses (i.e., total and soluble BOD, cBOD, and final TSS). Any analytical testing requested by LCA and not presented in the test plan will be an additional charge or covered under an existing contract that LCA has with a third party lab. The current analytical allowance in our budget is $26,000.

The draft Plan will be submitted to LCA for review and comment. AECOM will set up a conference call to address questions and review comments prior to finalizing the plan for execution in Task 3.

Task 2 – Piloting Preparation Coordination (Veolia, Plant Staff & 3rd Party Laboratory)

AECOM will coordinate between Veolia and KIWWTP staff to be prepared for arrival of the piloting equipment, demobilization and commissioning. As part of commissioning, AECOM will also coordinate with KIWWTP for the conveying of screened, degritted influent (from the Primary Clarifier Distrubution Box) and Biotower effluent to the pilot unit, and return of BioActiflo effluent to the Biotower sump using hoses provided by Veolia; and collection and transport of gravity-thickened trickling filter slough in totes. (Note that for the previous bench testing, manual screening was included to avoid plugging the small scale bench equipment – this will not be necessary for the pilot.)

Task 3 – Pilot Operation and Sampling

Veolia will be providing a technician to operate the pilot facility five days per week, 8 hours per day for the 6 to 8 week duration of the pilot. AECOM will provide personnel to observe operation on weekly basis, record data, assist with sampling and analysis including transport to off-site labs, and coordinate with KIWWTP staff.

Influent and effluent samples for up to eight discrete tests will be also be sent out for third-party laboratory analyses of total and soluble cBOD/BOD, along with effluent TSS samples, as noted above.

The piloting is expected to require 6 to 8 weeks including set-up, commissioning, execution, tear-down and de-mobilization.

Task 4 – Data Analysis

Once analytical data are available, AECOM will compile the data, review the results, and prepare a PowerPoint presentation for discussion of findings during a conference call with LCA. AECOM will then prepare a draft report with the findings, BioActiflo equipment sizing, and a revised cost estimate with the addition of expected operating costs and submit to LCA for review. AECOM will arrange for a conference call to address questions and comments prior to submitting the final report.

Task 5 – Meetings and Final Report

AECOM will hold the following meetings with LCA:

- Kick-off to cover administrative aspects
- Draft Pilot Test Plan Review
- Mid-course Review of testing and Test Plan revisions
- Draft findings review
- Draft Final Report review

These meetings will be held virtually, unless a certain meeting (or meetings) are mutually agreed to be held in person.

Task 6 – Project Management

AECOM will provide project management including QC, project team coordination, client communications, and billings.

SCHEDULE

AECOM is prepared to commence work on this project upon receipt of written authorization from LCA to proceed. AECOM will schedule a project kick-off conference call within one (1) week of authorization.

AECOM estimates that the Piloting Test Plan and Piloting Preparations including modifications to the pilot facility by Veolia (Tasks 1 and 2) can be completed within approximately 8 weeks of the project kickoff. Assuming authorization and Notice To Proceed (NTP) in late November, piloting equipment delivery is expected in late March, with testing during the months of April and May. Data analysis and Final Report preparation would then follow in June and into July, with the draft Final Report review meeting in late July.

It is not clear what the impact of the variants of the coronavirus COVID-19 ("Coronavirus") will have on the schedule. This health emergency has the potential of impacting multiple facets of the Project including, without limitation, labor, personnel, and the tasks associated with the scope of work outlined in this quotation, all of which have the potential to adversely impact the critical path of the Project schedule. These potential, unusual, and unavoidable delays are outside of the control of AECOM or Veolia and cannot be anticipated or determined in advance. AECOM will endeavor to follow CDC guidelines for safe interaction with LCA staff. AECOM will be prepared to hold the meetings discussed above virtually. In the event that such conditions do impact the work, AECOM will notify LCA in accordance with the contract terms.

PROJECT COST

AECOM estimates the following costs for each task proposed above:

- **Task 1**: Piloting Test Plan Development – **$11,650**

- **Task 2**: Piloting Preparation Coordination (Veolia, Plant Staff & 3rd Party Laboratory) – **$14,100**
- **Task 3**: Pilot Operation and Sampling -- **$72,600** (includes analytical and travel costs)
- **Task 4**: Data Analysis -- **$12,900**
- **Task 5**: Meetings and Final Report – **$21,800**
- **Task 6**: Project Management – **$8,700**
- **Veolia Pilot Rental (Contracted Directly by LCA with Veolia and not included in AECOM's proposed budget – $98,000)** (This includes freight to/from KIWWTP and 8 weeks of on-site time; the pilot unit can be released after 6 weeks for a $17,000 reduction in cost.)

AECOM proposes to execute the proposed scope of work for the above Tasks on a time and material basis with a proposed budget of **$141,750 (excluding the Veolia pilot equipment costs of $98,000)**. AECOM will invoice according to the Standard Agreement for Professional Services between AECOM Technical Services Inc. and LCA dated 2/21/2020.

ASSUMPTIONS

1. LCA will contract directly with Veolia for the pilot equipment and operation of the pilot equipment.
2. Estimated budgets can be transferred between tasks.
3. Additional analytical characterization requested by LCA will be completed by LCA or contracted to AECOM under a change order. These costs are not included in the cost estimate.
4. All project team meetings will be via conference call (5 calls, 1-hour per call).
5. LCA will provide the necessary wastewater / slough samples to support the piloting test effort described in the Plan.
6. Veolia will supply, start-up and operate the pilot.
7. The proposed work will be performed under the existing Standard Agreement for Professional Services between AECOM Technical Services Inc. and LCA dated 2/21/2020.

AECOM appreciates the opportunity to provide these professional services to LCA and considers our partnering relationship to be vital to the overall success of this project.

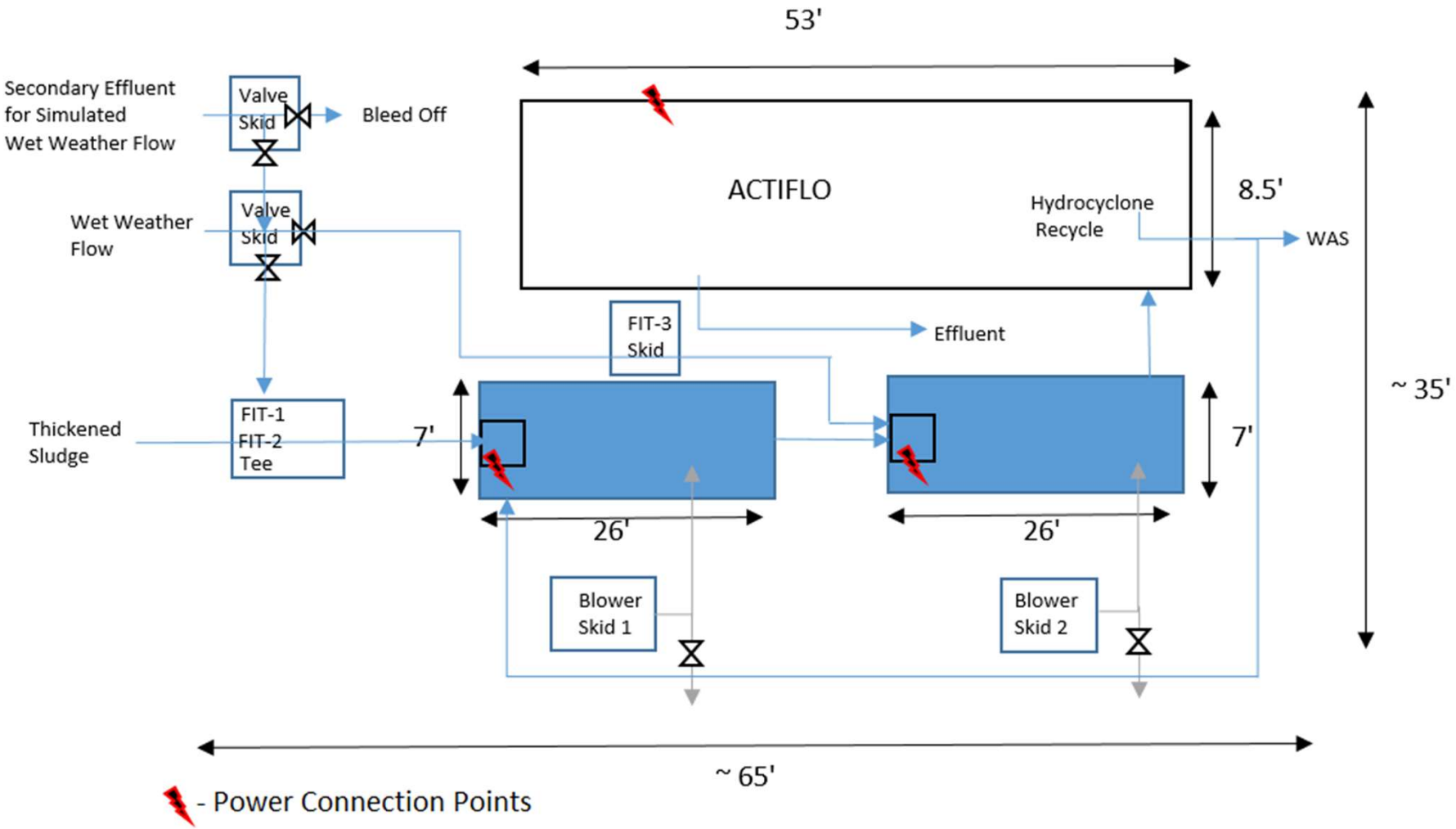
We trust that this proposal meets your needs. If you have any questions/comments on its content, please feel free to contact Chris Curran at 302-379-0267. In order to authorize AECOM to conduct the scope of work presented above please issue a written Professional Services Authorization.

Sincerely,

Joella Posey, P.E.
Project Manager
AECOM
T: 610.234.0661
M: 610.316.5423
E: joella.posey@aecom.com

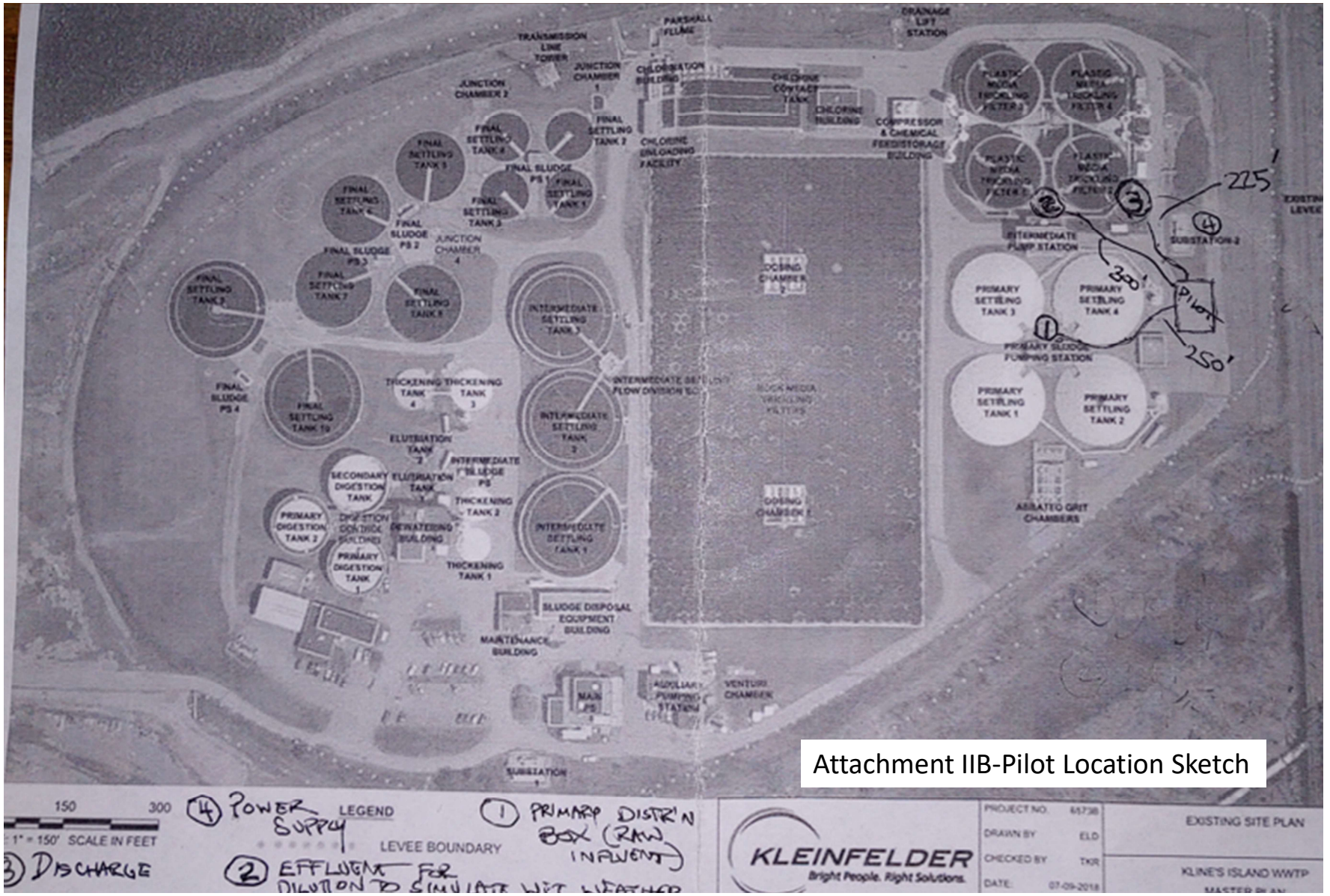
Christopher Curran, P.E.
VP, Project Director - Water
AECOM
T: 610.234.0404
M: 302.379.0267
E: chris.curran@aecom.com

cc: Philip M. DePoe, P.E / LCA; Andrew D. Moore, LCA



Attachment IIA-Pilot Configuration Sketch

KIWWTP BIOACTIFLO™ PILOT LOCATION



August 24, 2022

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

Re: BIOACTIFLO™ Pilot Study Proposal – Allentown PA

Dear Mr. Gross,

Please find the following pilot proposal and data package for BIOACTIFLO™ testing at the City of Allentown's Kline's Island Wastewater Treatment Plant. This proposal summarizes set-up requirements for our pilot unit and includes an agreement for the cost of pilot testing.

As per the attached documents, the cost for BIOACTIFLO™ pilot testing is $12,000 per week. This cost includes pilot engineers to operate the pilot unit and rental cost of the equipment. The cost of round trip freight will be an additional $9,000. The total cost for a six (6) week BIOACTIFLO™ pilot will be $81,000. The BIOACTIFLO pilot equipment needs some upgrades and modifications to operate in the proposed two biological contact tank configuration and a portion of these up front costs have been accounted for in the weekly rate. Pre-pilot jar testing would also be covered in this cost and the procedure for collecting and sending samples has been added as an attachment. This proposal excludes third party analytical lab fees and additional equipment needed for operations not listed in Attachment A. If additional weeks are anticipated or needed, please add $8,500 for each additional week. As noted in the proposal it is the customer's responsibility to supply a crane to unload and load the steel solids contact tanks. It is also the customer's responsibility to provide a submersible pump and pipe/hose to supply secondary effluent to the pilot to simulate wet weather influent characteristics.

The proposed testing period for the pilot study is TBD with the pilot unit estimated to be ready by March 2023. Pilot equipment preparations are expected to take approximately 8-12 weeks and Kruger will need at least a short written notice that the pilot project will move forward in order to begin the work, along with a signed agreement. Please sign page 2 and 12 of the proposal and return the attached agreement along with the Customer's Sales Tax Exemption Certificate (if applicable) to confirm the pilot testing and schedule the testing period. If you have any questions on this proposal or data package, or other requirements for preparation, please do not hesitate to contact our Regional Sales Manager, Wayne Emery (412) 414-5061, or myself.

Sincerely,

Mitch Johnson
Pilot Group Manager, Kruger
VEOLIA WATER TECHNOLOGIES
office : +1 919 653-5079 / cell : +1 919 323-9369 / fax : +1 919 677-0082
Kruger / 4001 Weston Pkwy / Cary, NC 27513 / USA
mitch.johnson@veolia.com

ATTACHMENT A

BIOACTIFLO®
Technical Proposal

For

AECOM
Allentown, PA

August 24, 2022

Veolia Water Technologies, Inc. dba Kruger
4001 Weston Parkway ● Cary, NC 27513 USA
Tel: 919-677-8310 ● Fax: 919-677-0082
www.veoliawatertech.com

I) INTRODUCTION

A BIOACTIFLO™ demonstration unit will be used to conduct the pilot testing at the Allentown Kline's Island WWTP. The purpose of the pilot study will be to investigate performance, provide operational data, and develop treatment experience with the BIOACTIFLO™ process.

II) THE ACTIFLO® PROCESS

ACTIFLO® is a high rate clarification process that combines two water treatment technologies: ballasted flocculation and plate settling. Microsand in the system promotes flocculation and acts as a weighted structure to produce a very dense floc with a high settling velocity.

Coagulant, such as alum or ferric chloride, is introduced into the influent raw water to destabilize the colloids. With the addition of polymer as flocculent aid, the destabilized particles are attached to microsand in the system by polyelectrolyte bridging. Clarified water is collected in troughs located above the settling plates, while the settled microsand/sludge slurry is continuously pumped to hydrocyclones. Sludge and microsand particles are separated by the centrifugal force in the hydrocyclones. The lighter sludge is discharged while the heavier sand is injected by gravity into the system.

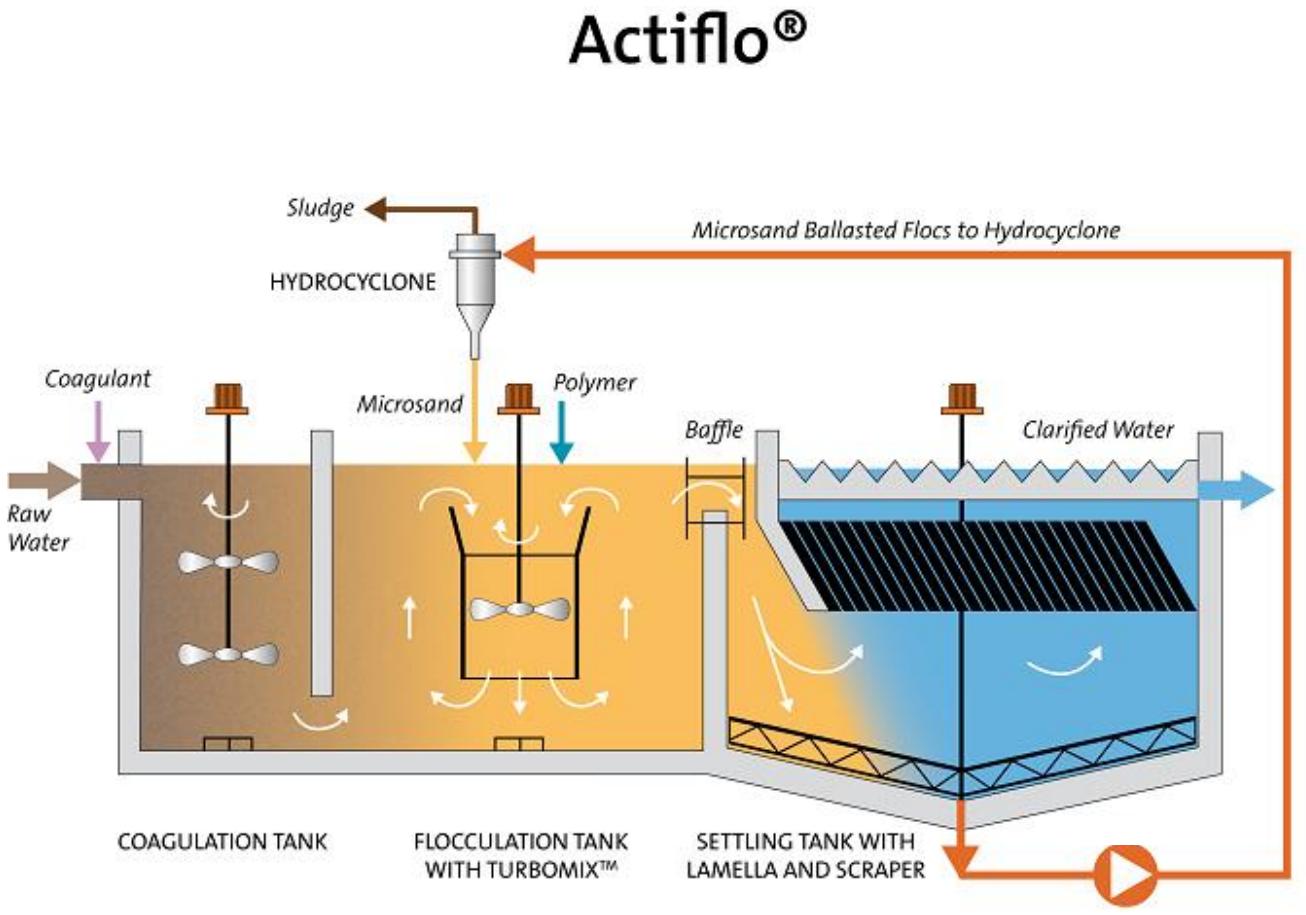


Figure 1: The ACTIFLO® Process

III) THE BIOACTIFLO™ PROCESS

The BIOACTIFLO™ process consists of an aerated contact basin followed by the standard ACTIFLO® process (Figure 1). The contact basin is a zone where raw screened influent wastewater or primary influent is mixed with RAS. The combined influent plus mixed liquor is conveyed to the ACTIFLO® process where it is treated via ballasted flocculation and lamella tube settling that is the standard ACTIFLO® process. Below is a flow diagram of the BIOACTIFLO™ process. Below in Figure 4 is a PID drawing showing the setup proposed for this study with an additional solids contact tank.

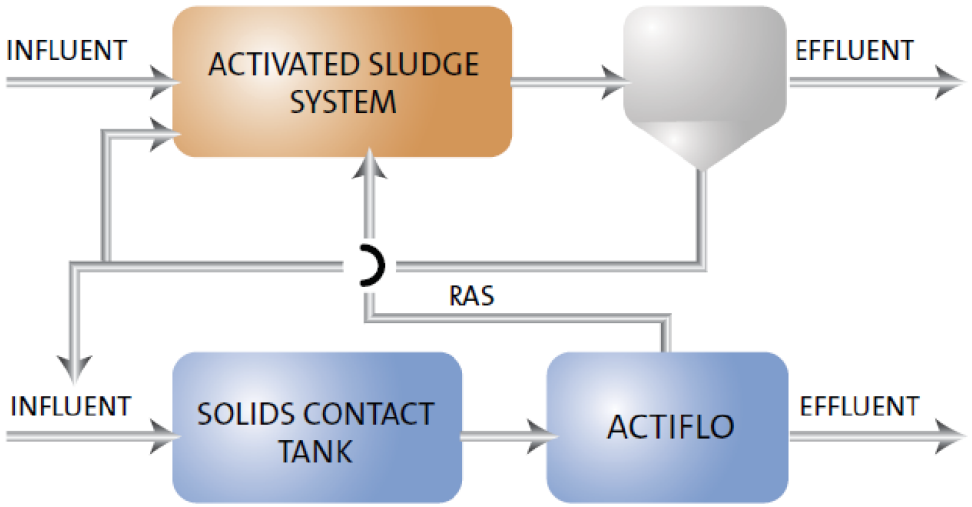


Figure 2: The BIOACTIFLO™ process schematic

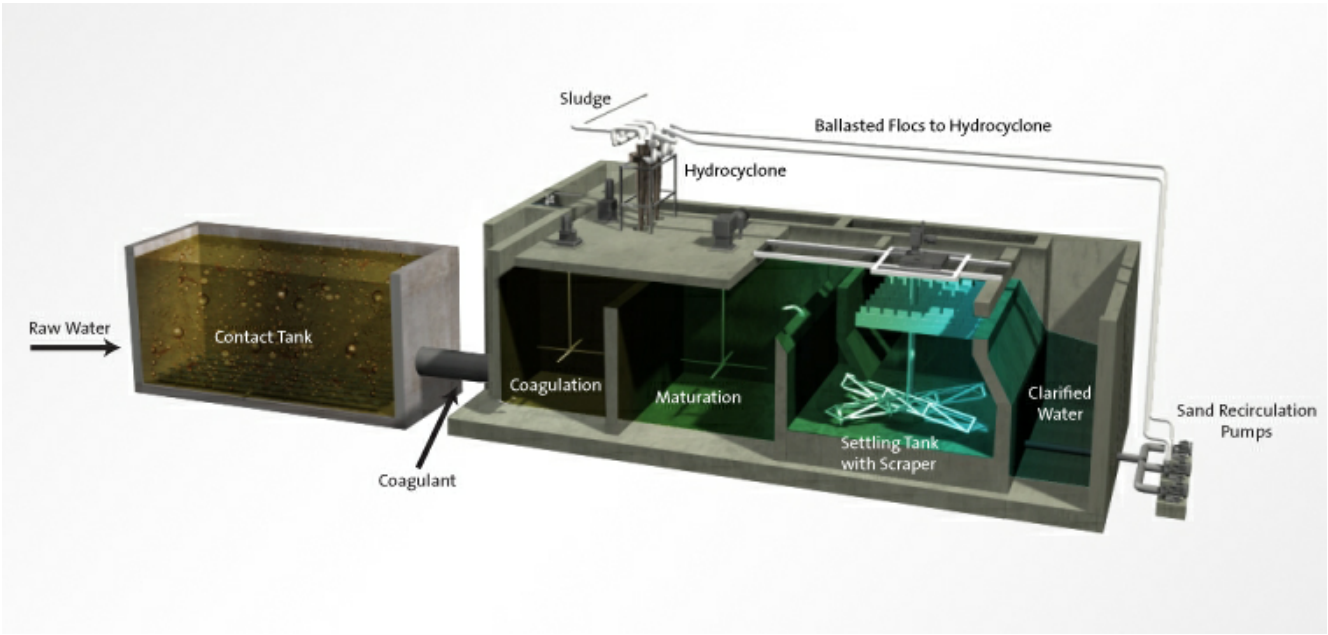


Figure 3: The BIOACTIFLO™ process

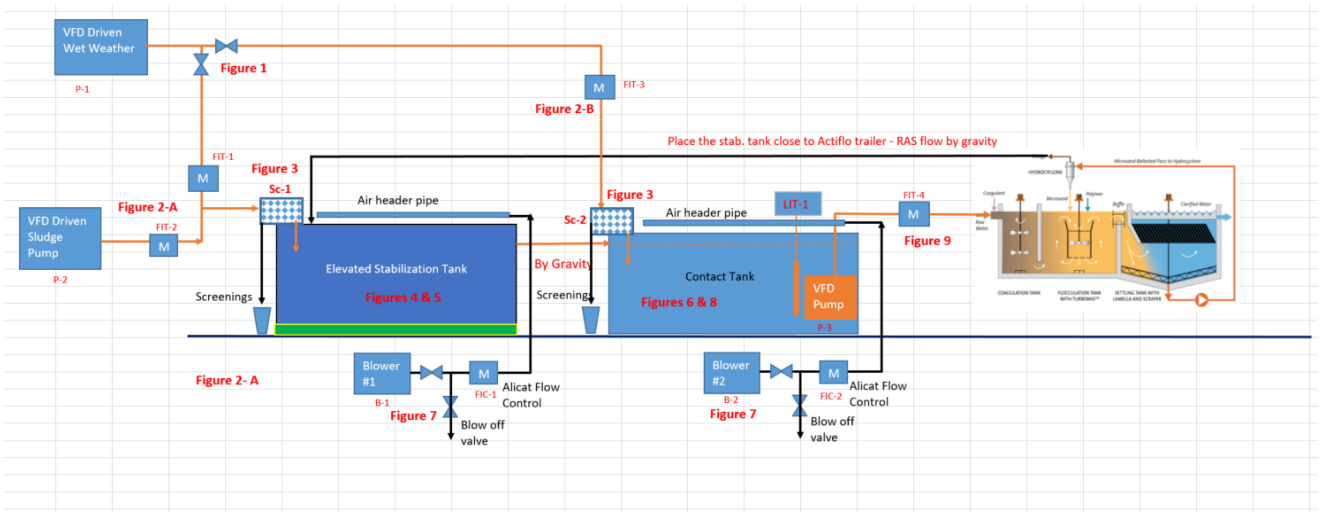


Figure 4: Allentown BIOACTIFLO Pilot Proposed Configuration

IV) THE BIOACTIFLO® PILOT UNIT SPECIFICATIONS

a) Equipment – Pilot Trailer

The BIOACTIFLO® pilot unit contains the following equipment:

- One (1) submersible raw water feed pump with VFD control
- Two (2) coagulation tanks equipped with two (2) coagulation tank mixers
- One (1) maturation tank equipped with one (1) maturation tank mixer and one (1) draft tube
- One (1) manual set of basket strainers
- One (1) tube/plate settling module
- One (1) rubber-lined sand recirculation pump
- One (1) hydrocyclone (U-3)
- One (1) magnetic flow meter for continuous monitoring of raw water flow
- One (1) magnetic flow meter for continuous monitoring of sand recirculation rate
- Two (2) pH meters for raw water pH and coagulated water pH
- Two (2) turbidimeters in-line for raw and settled water turbidities (Make: Hach)
- Two (2) dry/emulsion polymer makeup tanks, with mixers
- Two (2), variable speed, polymer feed pumps
- One (1) coagulant chemical storage tank
- One (1), variable speed, coagulant feed pump
- One (1) pH adjustment chemical storage tank, with mixer
- One (1), variable speed, pH adjustment feed pump
- One (1) MCC
- One (1) PLC based control panel

b) Equipment – Solids Contact Tanks (2)

Each Solids Contact Tank contains the following equipment:

- One (1) submersible raw wastewater feed pump with VFD control
- One (1) submersible RAS feed pump with VFD control
- Two (2) magnetic flow meters for continuous monitoring of raw wastewater and RAS flow
- One (1) rotating drum screen (3 mm)
- One (1) aeration blower
- One (1) 5500 gallon solids contact tank equipped with medium bubble diffused aeration grids
- One (1) D.O. probe for continuous monitoring of the mixed liquor dissolved oxygen
- One (1) TSS probe for continuous monitoring of the mixed liquor concentration
- One (1) MCC
- One (1) control panel

c) Technical Specifications

- **Trailer Dimensions:**

  Dimensions: 53.0’ in length by 8.5’ in width by 13.5’ in height
  Weight: 35,000 lbs (empty); 60,000 lbs (full)

- **Solids Contact Tank Dimensions:**

  Dimensions: 26.0’ in length by 7.3’ in width by 7.0’ in height
  Weight: 12,000 lbs (empty); 57,000 lbs (full)

- **Capacity:**

  Nominal Flow: 202 gpm @ 32 gpm/ft^2
  Maximum Flow: up to 310 gpm @ 50 gpm/ft^2

- **Hydraulic Connections:**

  PRIMARY PUMP:

  Kruger Provides:
  - One (1) 4”, 10 HP influent submersible pump controlled by VFD
  - 100 feet of 4” camlock discharge hose.
  - The pump weighs ~ 400 lbs. and has a 70 foot power cord that is plugs into a control panel located on the solids contact tank.
  - The pump is 3’ D x 3’ H

  Client Provides:
  - Equipment (backhoe, bobcat, forklift, etc.) to remove the raw water submersible pump from the back of the pilot unit and place it in the influent water source (post screen and degrit).
  - If the influent water source is greater than 50 feet away from the solids contact tank (including depth of primary influent water basin) additional flexible hose with 4” male camlock and female camlock fittings must be supplied.

  RAS PUMP:

  Kruger Provides:
  - One (1) 3”, 2 hp submersible pump with 100 feet of camlock hose. The pump weighs ~ 100 lbs and has a 100 foot 14/4 SOOW power cord connected to the pump.

  Client Provides:
  - Equipment (backhoe, bobcat, forklift, etc.) to remove the RAS feed submersible pump from the back of the pilot unit and place it at the RAS source.
  - If the RAS source is greater than 100 feet away from the solids contact tank pilot unit (including depth of RAS basin) additional flexible hose with 3” male camlock and female camlock fittings must be supplied.
  - If the electrical cable must be extended more than 50 ft, then cable the next size larger (i.e. 12/4 SOOW) must be used due to the total distance.

  BIOACTIFLO INFLUENT:

Kruger Provides:

- One (1) 4", 10 HP influent submersible pump, VFD controlled
- 50 feet of 4" camlock discharge hose.
- The pump weighs ~ 400 lbs. and has a 70 foot power cord that is plugs into a control panel located on the solids contact tank.
- The pilot unit has one 4" female camlock raw water inlet connection (located on driver's side of trailer towards the front)

Client Provides:

- Equipment (backhoe, bobcat, forklift, etc.) to remove the BIOACTIFLO influent submersible pump from the back of the pilot unit and place it in the solids contact tank.
- If the solids contact tank is greater than 50 feet away from the BIOACTIFLO trailer additional flexible hose with 4" male camlock and female camlock fittings must be supplied.

ACTIFLO® PROCESS SLUDGE:

Kruger Provides:

- 50 feet of 4" hose with male and female camlock connections.
- One (1) 4" female camlock discharge connection (located on driver's side of trailer towards the rear). The pilot unit process sludge is approximately 20 gpm at 0.1 – 0.5% solids. The process sludge is gravity discharged with approximately 5 feet of head.

Client Provides:

- Additional 4" rigid hose (if needed) to run the sludge from the pilot unit to the sludge discharge site.
- Since the process sludge is gravity discharged it may need to be pumped to the sludge discharge site. If this is the case the client will need to supply a catch container and trash/sludge pump with float system.

ACTIFLO® EFFLUENT:

Kruger Provides:

- 50 feet of 6" hose with male and female camlock connections.
- One (1) 6" female camlock connection (located on driver's side of trailer over the rear axle).
- The pilot unit process settled water discharge is approximately 200 gpm with approximately 10 feet of head.

Client Provides:

- Additional 6" rigid hose (if needed).
- The process settled water is gravity discharged and may need to be pumped to the discharge site. If this is the case the client will need to supply a catch container and discharge pump with a float system capable of handling the peak flow needed for the test.

SERVICE WATER:

Kruger Provides:

- One (1) garden hose connection (located on driver's side of trailer towards the front) and 100' of garden hose.
- The service water will supply water to the office sink and polymer batch system.

Client Provides:

- Pressurized potable water and a connection.

LABORATORY SINK AND CHEMICAL TANK DRAIN:

Kruger Provides:

- 50 feet of 2" hose with male and female camlock connections.
- One (1) 2" male camlock connection (located on the driver's side of the trailer towards the front).
- The pilot unit laboratory sink and chemical drain water discharge is intermittent flow with approximately 4 feet of head.

Client Provides:

- Additional 2" rigid hose (if needed).
- The laboratory sink and chemical drain is gravity discharged and may need to be pumped to the discharge site. If this is the case the client will need to supply a catch container and discharge pump.

- **Foundation Preparation:**

Client Provides:

- A level surface, which will support the BIOACTIFLO® trailer of 53.0' in length by 8.5' in width by 13.5' in height and 60,000 lbs (the weight of the pilot unit when filled with water). Pieces of 2" x 10" or 2" x 12" will be needed for trailer leveling.
- A level surface which will support both of the solids contact tanks of 26.0' in length by 7.3' in width by 7.0' in height and 57,000 lbs (the weight of the solids contact tanks when filled with water).

- **Electrical:**

Kruger Provides:

- 70-foot, 480 Volt, 100 Amp electrical supply cable for the BIOACTIFLO® trailer
- 70-foot, 480 Volt, 60 Amp* electrical supply cable for the solids contact tanks. **NOTE this number may be revised after electrical panel upgrades related to the equipment modifications that would be completed prior to piloting*
- The cables consist of three (3) 3f wires and a ground.
- The electrical cable connection to the pilot trailer and solids contact tank is a quick connect Hubbell plug

Client Provides:

- Two separate 480 volt power feeds. A 480-volt, 60 Amp* service is needed for the Solids Contact tank. A 480 volt, 100 Amp service is needed for the BIOACTIFLO® trailer. An electrician who will hard wire the cable to the supply is also required and any additional cable that is needed to reach the power supply.

- **Miscellaneous:**

  - The customer is responsible for supplying a crane for offloading and loading both of the 12,000 lb. steel solids contact tanks upon arrival and at the end of the project.

  - The customer is responsible for providing a submersible pump and pipe/hose to supply secondary effluent flow to the pilot unit if needed for simulating wet weather influent characteristics.

  - One or two personnel may be requested intermittently on the first two days and the last day to assist with connecting and disconnecting hose.

  - Two (2) container/dumpsters (~ 4' x 4') will be required to catch the screened solids at the solids contact tank drumscreens. The containers may need to be dumped periodically.

d) Equipment and Services Provided by Kruger

- One BIOACTIFLO demonstration unit with two (2) Solids Contact tanks, ancillary equipment and instruments as per Section IV a and b.
- BIOACTIFLO pilot operator(s) working typical first shift hours, 40 hours per week including setup and decommissioning (excluding weekends and holidays).
- All polymers (floc. aids) needed
- Microsand (silica sand)
- A summary of operational results approximately 30 days after receiving all data at the completion of pilot testing.

e) Equipment and Services Provided by Client

- All sampling and payment of in-house and outside independent laboratories analysis.
- 12,000 lb. Crane rental to unload/load two (2) Solids Contact tanks.
- Three submersible pumps are available from Kruger but require special equipment such as a forklift, to remove the pumps from the demonstration unit and lower into the water source.
- Secondary effluent submersible pump (if needed for simulating wet weather influent)
- Sludge discharge pipe (if additional is needed).
- Effluent water pipe (if additional is needed).
- Two (2) container/dumpsters with a drain to catch screened solids.
- Complete responsibility for, and ownership of, all effluents and sludge disposal from the BIOACTIFLO pilot unit.
- Utilities: potable water and two 480V electrical supplies.

- All coagulants and any pH adjustment chemicals required for testing
- An electrician to connect the pilot trailer and contact tank power to the supply
- Clean, level and accessible site
- Any additional equipment which may be required during the pilot testing period which is not installed in the BIOACTIFLO demonstration unit.
- Manpower and assistance required hooking up and disassembling the pilot unit.
- Operation manpower over the weekends, if necessary.
- A vehicle to move the pilot unit trailer if it is necessary to relocate testing sites during the study

f) Protocol, Data and Visitation

- Both the client/engineer and Kruger must agree upon pilot study protocol prior to the start of the pilot study.
- Kruger reserves the right to all data collected (including BIOACTIFLO running conditions and laboratory samples) by the client/engineer or Kruger. All data shall be shared between the client/engineer and Kruger at the time that the data is collected or available.
- Kruger reserves the right to use any collected data in their marketing program.
- Kruger reserves the right to bring visitors to the pilot unit throughout the course of the pilot study.

V) Recommended Lab Analysis & Schedule Outline

It is recommended that the Client/Engineer perform the following lab analysis on collected grab samples. A more detailed sampling and analysis plan and protocol will be provided for review and discussion prior to the pilot study.

Influent Wastewater and Clarified Effluent:

- TSS
- BOD_5
- Sol BOD_5
- COD
- TP/OP

Kruger will need a rush turnaround on analytical samples collected during the optimization phase. Please verify detection limits with outside analytical labs to ensure they are in the range for your application.

Pilot Schedule Outline

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Pilot Unit Arrival & Setup			Setup/ Optimization	
Week 2	Optimization				
Week 3	Optimization / Extended Runs				
Week 4	Extended Runs				
Week 5	Extended Runs				
Week 6	Extended Runs			Pilot Decommission	

Veolia Water Technologies, Inc. dba Kruger
4001 Weston Parkway ● Cary, NC 27513 USA
Tel: 919-677-8310 ● Fax: 919-677-0082
www.veoliawatertech.com

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**

MEMORANDUM

Date: November 14, 2022

To: Lehigh County Authority Board of Directors

From: Jason Peters, Capital Works Project Coordinator

Subject: Suburban Division – Western Lehigh Interceptor Manhole Rehabilitation Project (Phase 3)

MOTIONS /APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Project Authorization – Construction Phase	$197,975
2 *	Contract Award (construction): General Construction – Scheuermann Excavating, Inc.	$157,475
3 *	Professional Services Authorization: Construction Inspection – Keystone Consulting Engineers	$22,500

(*) Included in the Capital Project Authorization

PROJECT BACKGROUND:

Per Act 537 requirements and the Regional Flow Management Strategy (RFMS) program, Lehigh County Authority (LCA) and its municipal signatories are required to reduce infiltration and inflow (I & I) into the Western Lehigh Interceptor (WLI) system and eliminate sanitary sewer overflows (SSOs). The RFMS commits LCA to reducing excess wet weather flows into the WLI, and this project will help in achieving that objective. This work is a part of a multi-phase manhole rehabilitation along the WLI to upgrade and seal manholes.

PROJECT OVERVIEW:

An annual inspection update of the WLI manholes was performed by Keystone Consulting Engineers in early 2022. The findings follow the past year's flooding events throughout our signatory municipalities, and numerous deficiencies were observed including:

- Offset or loose frames and covers
- Damaged frames and covers
- Damaged/cracked/missing exterior concrete

- Manhole covers inundated with floodwater during and after significant storm events

The scope of manhole rehabilitation work as part of this project includes the following:

- Raise manhole tops to at or above the floodplain elevation (up to 2' elevation adjustment) and repair concrete– 7 each
- Install new water-tight frames and covers – 55 each

The work to be performed as part of this project should have a continued positive impact on reducing infiltration and inflow into manholes and help mitigate sanitary sewer overflows in the Western Lehigh Interceptor. Incidentally, our 2022 field inspection identified that prior rehabilitation projects (completed in 2020 and 2021) continue to provide effective infiltration and inflow mitigation during peak storm events for the Western Lehigh Interceptor.

FINANCIAL:
The Project will be funded by the LCA Suburban Division.

PROJECT STATUS
Design was completed in late Summer, the project was advertised for bid October 5, 2022 and bids were opened on October 28, 2022. The bids were reviewed by Capital Works staff and Keystone Consulting Engineers.

THIS APPROVAL: Construction Phase

BIDS
Six contractors submitted a bid for this project; results are summarized as follows in Table 1 below:

Table 1 – Bid Results	
Construction Phase	
Contractor	**Total Bid Amount**
Scheuermann Excavating, Inc.	**$157,475**
PIM Corporation	$178,925
Performance Pipelining	$208,000
Pioneer Construction, Co., Inc.	$277,785
Joao & Bradley Construction Co., Inc.	$289,800
Wexcon, Inc.	$375,270

Reference checks for, Scheuermann Excavating, Inc. (based in Whitehall PA) have identified no issues. Scheuermann Excavating, Inc. successfully performed the Western Lehigh Interceptor Manhole Rehabilitation Phase 2 Project for LCA and is currently utilized by LCA's Suburban Operations Department for emergency repairs. Therefore, Capital Works recommends awarding the WLI Manhole Rehabilitation Project Phase 3 to Scheuermann Excavating, Inc., subject to the receipt of the necessary Performance Bonds, Insurance and other required documentation.

MATERIAL PROCUREMENT: N/A

PROFESSIONAL SERVICES :
Capital Works will perform the day to day construction management and administration duties. Keystone Consulting Engineers will provide the following construction phase services:

- Provide part time inspection services
- Prepare daily inspection reports

- Verify daily job quantities
- Document installation (post construction photos)
- Attend progress meetings as required
- Prepare and verify punchlist completion

SCHEDULE

Assuming approval at the November 14, 2022 Board meeting, the work is anticipated to begin in December and will be completed by late January 2023.

FUTURE AUTHORIZATIONS

It is anticipated that a fourth phase of manhole rehabilitation further downstream along the WLI will be bid and constructed next year.

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.:	SD-S-3	**BUDGET FUND:**	Suburban Div\Wastewater\Capital
PROJECT TITLE:	Suburban Division – Western Lehigh Interceptor Manhole Rehabilitation Project (Phase 3)	**PROJECT TYPE:**	
		☒	Construction
		☐	Engineering Study
THIS AUTHORIZATION:	**$197,975**	☐	Equipment Purchase
TO DATE (W/ ABOVE)	**$222,475**	☐	Amendment

DESCRIPTION AND BENEFITS:

WLI Manhole Rehabilitation Project (Phase 3):
This project is part of the continuing efforts to reduce inflow and infiltration and mitigate SSOs in the Western Lehigh Interceptor service area and involves performing flood-proofing and leak repairs at key deficient manholes along the WLI. The rehabilitation work proposed in this project includes the following:

- Raise manhole tops to at or above the floodplain elevation (up to 2' elevation adjustment)
- Install new water-tight bolt down frames and covers

The work to be performed in this project will have a positive impact on reducing infiltration and inflow leakage from manholes in the Western Lehigh Interceptor.

Previous Authorizations	
Design Phase (Phase 3)	$24,500

REQUESTED THIS AUTHORIZATION	
Construction Phase	
Construction Contract – Scheuermann Excavating, inc.	$157,475
Construction Inspection Services – Keystone Consulting Engineers	$22,500
Staff	$8,000
Contingency	$10,000
Total This Authorization	**$197,975**

Future Authorization	
Phase 4 WLI manhole rehabilitation project	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: KEYSTONE CONSULTING ENGINEERS, INC.
5012 Medical Center Circle
Allentown, PA 18106

Date: November 14, 2022

Requested By: Charles Volk

Approvals

Department Head: _____

Chief Executive Officer: _____

Description of Services:

WLI Manhole Rehabilitation Project Phase 3: Construction Inspection Services

Keystone Consulting Engineers, Inc. will perform construction phase engineering services for the construction of the WLI Manhole Rehabilitation Project Phase 3, in accordance with their proposal dated September 16, 2022. The scope of services includes the following:

Professional Services
1. Attend pre-construction conference
2. Perform part time construction inspection & verification
3. Provide daily inspection reports
4. Maintain post construction photo documentation
5. Review payment applications & change order requests
6. Perform substantial & final completion inspections

Cost Estimate (not to be exceeded without further authorization): $22,500

Timetable and Completion Deadline: Assumes work will be substantially complete by late January 2023.

(For Authority Use Only)

Authorization Completion:

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

MEMORANDUM

Date: November 14, 2022

To: Lehigh County Authority Board of Directors
From: Charles Volk, CCWO and Bryan Geissel, Project Manager
Subject: Allentown Division - Kline's Island WWTP Electrical Substation No. 1 & Primary Switchgear Replacement – Design Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Project Authorization – Design Phase	$181,275
2	Professional Services Authorization – Keystone Engineering Group (1), (2)	$151,275

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

PROJECT OVERVIEW

The Kline's Island Wastewater Treatment Plant's electrical service is supplied by one of two 12.4 kV power transmission line feeds from the electric utility PP&L. The 12.4 kV transmission lines enter Substation No. 1 and connect to the 12.4 kV Switchgear, which distributes the 12.4 kV to the 480V Substation No. 1 and to the 480V Substation No. 2. The 480V Substation No. 1 & 2 then distribute the power to various MCC's and loads throughout the WWTP. Substation No. 1 and has reached the end of its useful life and is not adequate to accommodate a future increase in equipment loads from planned capacity improvements projects. The switchgear is an old technology "air-magnetic circuit breaker" that was phased out in favor of "vacuum breaker" type switchgear in the early 1980s. Due to the critical function of the 12.4 kV Switchgear and the fact that it has been in service for approximately 45 years, it is recommended for replacement. The replacement of Substation No. 2 was completed in 2019.

RECOMMENDED ALTERNATIVE

In 2016 LCA authorized Keystone Engineering Group (Keystone) to perform an evaluation of the electrical system feeders and main distribution system at KIWWTP. The report evaluated present and future loads for Substations No. 1 and No. 2 and included replacement recommendations. A prior technical study was performed in 2015 by Metcalf & Eddy to evaluate substation loading and replacement options. The recommended alternative for this project includes the following scope of improvements:

- New 12.4 kV, 1,200-amp Switchgear with modern vacuum breaker technology and automatic transfer capability, to be located just south of the existing switchgear to be demolished. New Switchgear will be elevated to facilitate underground penetrations for future plant upgrades.
- New 12.4 kV Switchgear will have automatic transfer capacity between the two 12.4 kV PPL transmission lines and be equipped with 2 spare circuit breakers to feed a third substation if needed for future projects.
- New 12.4 kV Switchgear be replaced first – before Substation No. 1. The construction of the new switchgear will be performed while the existing switchgear remains in service.

- Coordinate with PP&L during the new Switchgear replacement.
- Install new 480 Volt, 4,000-amp Substation No. 1. New Substation will be 3,000 KVA walk-in type with forced ventilation cooling.

The above recommendations will be designed to accommodate projected electrical loads from future upgrades associated with an increase in plant hydraulic capacity.

FINANCIAL

The City has reviewed and approved this project as a Major Capital Improvement, thereby allowing the cost to be recovered via a capital cost recovery charge in the LCA Allentown Division.

PROJECT STATUS

A preliminary engineering/basis of design study was completed by Keystone in late Summer 2022 and submitted to the City Compliance Office in accordance with Major Capital Improvement (MCI) Project protocol on 9/23/22. LCA received comments from the City on 10/13/22 and 10/20/22, which were addressed by LCA and the city issued an MCI approval letter dated 10/21/22. Pending Board approval, design is anticipated to be completed in early Spring 2023.

THIS APPROVAL - DESIGN PHASE

Lehigh County Authority (LCA) intends to retain the services of Keystone Engineering Group for engineering design services. Approval for construction phase engineering services will be requested at a later date. The following table summarizes the professional services to be performed under this approval:

Professional Services *(1)*
1. Perform coordination with PP&L and EPP Renewable Energy as required
2. Attend progress and coordination meetings with LCA personnel, and perform site investigations as required
3. Review current and projected electrical loads to confirm proposed equipment sizing; perform load calculations
4. Design development, including replacement switchgear foundation, new equipment layout, construction phasing and temporary equipment considerations, and upgrading co-generation system interface
5. Construction document development and prepare bid documents
6. Prepare construction cost estimates at 60%, 90% and final design completion
7. Provide bid phase services, including pre-bid meeting attendance, respond to bidder RFIs, issue addenda, bid review

(1) For design and bid phases only; refer to attached Keystone proposal dated 10/7/22

ENGINEERING CONSULTANT

LCA retained Keystone in 2016 to prepare a report to evaluate the replacement options for the switchgear and substations. In 2017 LCA retained the services of Keystone for the design of the upgrades as recommended in the electrical study. Keystone was later retained to provide construction phase services for Substation No. 2 replacement. Keystone provided excellent support services throughout the Substation No. 2 replacement, and the project was successfully completed in 2019. Keystone is familiar with the critical construction sequencing elements and temporary equipment requirements that must be integrated into the design documents in order to

minimize facility downtime. Keystone is deemed most qualified based on their prior project experience with Substation No. 2 replacement, knowledge of the plant, strength of design team, and fair pricing. Therefore, LCA is recommending Keystone for this design approval.

PROJECT SCHEDULE

The project is anticipated to begin design immediately upon LCA Board approval. Design is anticipated to be completed by the end of March 2023 with bid phase to follow.

FUTURE AUTHORIZATIONS – CONSTRUCTION PHASE

Upon Board authorization of Keystone's proposal for design and bid phase, construction phase authorization is anticipated to be requested in mid-2023.

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.: AD-S-5 **BUDGET FUND:** Allentown Div\Wastewater\Capital

PROJECT TITLE: Allentown Division – WWTP Electrical Substation No. 1 and Switchgear Replacement: Design Phase

PROJECT TYPE:

- ☐ Construction
- ☒ Engineering Design
- ☐ Equipment Purchase
- ☐ Amendment No. 1

THIS AUTHORIZATION: **$181,275**
TO DATE (W/ ABOVE) **$191,275**

DESCRIPTION AND BENEFITS:

The Kline's Island Wastewater Treatment Plant's electrical service is supplied by one of two 12.4 kV power transmission line feeds from the electric utility PP&L. The 12.4 kV transmission lines enter Substation No. 1 and connect to the 12.4 kV switchgear, which distributes the 12.4 kV to the 480V Substation No. 1 and to the 480V Substation No. 2. The 480V Substation No. 1 & 2 distribute the power to various MCC's and loads throughout the WWTP. The equipment was originally installed in 1977, has reached the end of its useful life, and needs to be replaced. Substation No. 2 was replaced in 2019.

Keystone Engineering Group will be used for the engineering design services. Bid level plans and specifications are anticipated to be ready by the end of March 2023.

Please see attached Board Memo for further project details.

Authorization Status:

Requested This Authorization	
Design Phase	
Staff	$20,000
Engineering Consultant	$151,275
Contingencies	$10,000
Total This Authorization	**$181,275**

Future Authorizations	
Construction Phase	**TBD**

Total Estimated Project	**$7,000,000**

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: KEYSTONE ENGINEERING GROUP, INC.
590 Lancaster Ave, Suite 200
Frazer, PA 19355

Date: November 14, 2022

Requested By: Charles Volk, P.E.

Approvals
Department Head: _____
Chief Executive Officer: _____

Allentown Division – KIWWTP Substation No. 1 and Switchgear Replacement Project: Final Design Engineering Services

Keystone Engineering will perform final design and bid phase engineering services for the KIWWTP Substation No. 1 and Switchgear Replacement Project. The following professional services are included in this authorization:

Professional Services [(1)]
1. Perform coordination with PP&L and EPP Renewable Energy as required
2. Attend progress and coordination meetings with LCA personnel, and perform site investigations as required
3. Review current and projected electrical loads to confirm proposed equipment sizing; perform load calculations
4. Design development, including replacement primary switchgear foundation, new equipment layout, construction phasing and temporary equipment considerations, and upgrading co-generation system interface
5. Construction document development and prepare bid documents
6. Prepare construction cost estimates at 60%, 90% and final design completion
7. Provide bid phase services, including pre-bid meeting attendance, respond to bidder RFIs, issue addenda, bid review

(1) For design and bid phases only; refer to attached Keystone proposal dated 10/21/22

Preliminary Design Phase:
Cost Estimate (not to be exceeded without further authorization): ***$151,275***

Time Table and Completion Deadline: Bid-ready plans anticipated to be completed by early spring 2023.

(For Authority Use Only)

Authorization Completion:
Approval: _____ **Actual Cost:** _____ **Date:** _____

Lehigh County Authority – Monthly Report to Board of Directors

Upcoming Board Agenda Items & Project Updates – November 2022

Published: November 7, 2022

PART 1 – Upcoming Agenda Items – Action & Discussion Items

FINANCE & ADMINISTRATION

Project Title: 2023 Water & Wastewater Rate Schedules
Division / Funding: All Divisions
Board Action Date: 11/14/2022
Status or Action Desired: Approval
Project Phase: n/a

Project Notes: Following completion of the 2023 Budget process, a complete package of water and wastewater rate updates is presented to the Board for consideration and adoption. The Suburban Water rates shown in proposed rate schedules are a result of the budget process and recent cost-of-service study. The City Division water and sewer rates reflect terms of the Concession Lease Agreement. Board approval for the updated rate schedule is requested at the November 14, 2022 meeting to allow for proper notification to customers prior the January 1, 2023 effective date.
Staff Responsibility: Liesel Gross

Project Title: Monthly Financial Review
Division / Funding: n/a
Board Action Date: 11/28/2022
Status or Action Desired: Discussion
Project Phase: n/a

Project Notes: October 2022 monthly financial report will be presented. Staff Responsibility: Ed Klein

SYSTEM OPERATIONS

Project Title: Monthly Operations Report
Division / Funding: n/a
Board Action Date: 11/28/2022
Status or Action Desired: Discussion
Project Phase: n/a

Project Notes: October 2022 monthly operations report will be presented. Staff Responsibility: Andrew Moore & Chris Moughan

WASTEWATER PROJECTS – KISS ACT 537

Project Title: Kline's Island WWTP - High-Rate Wet-Weather Treatment Pilot Study
Division / Funding: Allentown Division
Board Action Date: 11/14/2022
Status or Action Desired: Approval
Project Phase: Planning Phase

Project Notes: 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 construction of flow equalization tanks to store wet-weather flow. The second alternative involves constructing internal plumbing modifications and control systems to temporarily run plant treatment systems in parallel (vs. sequentially) during wet-weather scenarios. These first two alternatives are well understood and can be evaluated and costs estimated without further testing. The third alternative involves the construction of a high-rate wet-weather treatment system known as "BioActiflo," which is expected to be similar or lower in cost to other options being explored. Due to this being a newer technology, three rounds of bench scale testing for BioActiflo occurred in 2021 for proof-of-concept validation. The next step to determine if BioActiflo is a viable alternative is a full-scale pilot project, which would be required for permitting in the future if this option is selected. An authorization request for this pilot will be made at the November 14, 2022 Board meeting. Staff Responsibility: Phil DePoe

Project Title: Sanitary Sewer Collection System: City of Allentown Manhole Inspections
Division / Funding: Allentown Division
Board Action Date: 12/12/2022
Status or Action Desired: Approval
Project Phase: Planning Phase

Project Notes: As part of the Act 537 planning process, a rainfall derived inflow and infiltration (RDII) analysis was performed in the first quarter of 2022 for the City of Allentown system. Using the temporary meters in place during 2021, the RDII clearly shows the overall system suffers from inflow problems. The existing manholes do have inflow dishes and some have been previously inspected, but due to the critical nature of Act 537 planning all the manholes need to be inspected. The inspections and subsequent rehabilitation work will be phased over the next ten years. The Phase 1 inspection is anticipated to occur in 2023, Phase 2 inspection (and Phase 1 rehab work) is anticipated to occur in 2024, and so on and so forth. Board authorization for the Phase 1 inspection work is requested at the December 12, 2022 meeting. Staff Responsibility: Phil DePoe

Project Title: Sanitary Sewer Collection System: City of Allentown Interceptor Inspections
Division / Funding: City of Allentown (AO)
Board Action Date: 12/12/2022
Status or Action Desired: Approval
Project Phase: Planning Phase

Project Notes: As part of the Act 537 planning process, the condition of each interceptor needs to be discussed. For the City interceptor system, the condition of each interceptor is not currently known. Since 100 percent of all system sewage flows through one of more of the City's main interceptors, the condition of each must be known since all are anticipated to be used through the 2050 planning horizon. This interceptor inspection work will identify any needed rehabilitation, repairs, or modifications needed to suit any purposes as may be determined by the 537 Plan. Board authorization for this interceptor inspection work is requested at the December 12, 2022 meeting. Staff Responsibility: Phil DePoe

Project Title: Regional Sewer Capacity & Wet-Weather Planning: Engineering & Program Support
Division / Funding: Suburban Division — Board Action Date: 12/12/2022
Status or Action Desired: Discussion — Project Phase: Planning Phase

Project Notes: As defined at the November 8, 2021 Board meeting, consultants were assigned various roles for the region's Act 537 planning process. As program manager, AECOM is assisting LCA in numerous engineering and coordination tasks to help achieve the region's current DEP deadline for submission. These periodic authorization requests are an extension of ongoing engineering and program support that AECOM provided in 2013-2016 and 2019-2021. In addition to coordinating and evaluating the efforts of other consultants, AECOM will also focus on continued analysis of the Pretreatment Plant upgrade option (preliminary report was delivered in October 2021), regulatory review of the alternatives, and continued financial analysis through the cost-revenue benefit tool. Authorization approval of Professional Services Authorization for Act 537 Plan Program Management support in 2022 was granted at the February 14, 2022 Board meeting. A second authorization in 2022 was granted at the 6/27/2022 Board meeting to bring further clarity to the 537 planning process. At this meeting, AECOM was in attendance to provide a brief look at the planning efforts to date and provided a preview of the future planning efforts through September 2024. AECOM will provide an additional update at the December 12, 2022 meeting. Staff Responsibility: Phil DePoe

WASTEWATER PROJECTS – SUBURBAN DIVISION

Project Title: Western Lehigh Manhole Rehabilitation Project - Phase 3
Division / Funding: Suburban Division — Board Action Date: 11/14/2022
Status or Action Desired: Approval — Project Phase: Construction Phase

Project Notes: This project involves the rehabilitation of key manholes in the Western Lehigh Interceptor Service Area. The project includes flood-proofing and exterior concrete work and sealing of manholes, particularly those manholes in close proximity to the floodway, which experience floodwater inundation. The purpose of the project is to eliminate floodwater inflow into the system. The project scope for Phases 1 & 2 included 100 manholes that were rehabilitated over the past 2 years. Design of Phase 3 of this project commenced with investigation efforts in March 2022 with an anticipated construction phase Board authorization at the November 14, 2022 meeting. Staff Responsibility: Jason Peters

WASTEWATER PROJECTS – ALLENTOWN DIVISION

Project Title: Kline's Island WWTP: Substation No. 1 and Switchgear Replacement
Division / Funding: Allentown Division — Board Action Date: 11/14/2022
Status or Action Desired: Approval — Project Phase: Design Phase

Project Notes: Substation No. 1 and the Primary Switchgear are over 40 years old and at the end of their useful life. This project will replace Substation No. 1 with a new 480v, 3,000KVA walk-in type enclosure and replace the switchgear with new vacuum breaker technology equipment with automatic transfer capabilty designed to accomodate future plant upgrade loads. The preliminary engineering/basis of design was submitted to the City of Allentown as part of Major Capital Improvement approval process, with approval received in October 2022. Design phase approval is to be requested at the 11/14/22 Board meeting. Staff Responsibility: Bryan Geissel

FINANCE & ADMINISTRATION

Project Title: 2021 Audit & Financial Statements
Division / Funding: n/a
Board Action Date: n/a
Status or Action Desired: No Change
Project Phase: n/a

Project Notes: The 2021 Audited Financial Statements have been delayed due to the delayed completion of the Pennsylvania Municipal Retirement System (PMRS) financial audit. A notice of delay has been sent to the appropriate parties. The LCA statements are complete and will be presented to the Board for review and acceptance upon receipt of the PMRS audit information. Staff Responsibility: Ed Klein

WASTEWATER PROJECTS – KISS ACT 537

Project Title: Upper Western Lehigh Pump Station and Force Main
Division / Funding: Suburban Division
Board Action Date: n/a
Status or Action Desired: No Change
Project Phase: Design Phase

Project Notes: Per the DEP-approved Interim 537 Plan, action is required to alleviate the current sanitary sewer interceptor system bottleneck in the Trexlertown area. The Upper Western Lehigh Pump Station and Force Main is the recommended alternative identified in the Special Act 537 Study being prepared as part of the Trexlertown Area Capacity Solution Alternatives project. The selection of this alternative is also supported by both Upper and Lower Macungie townships. Design phase initiation is needed in order to meet the compliance timeline in the Interim Act 537 Plan. Design phase authorization for Engineering Design services was granted at the February 14, 2022 Board meeting. A design kickoff meeting was held on March 29, 2022. Design is approximately 50% complete, and permit applications are expected to be completed by January 2023 after achieving 60% design. Staff Responsibility: Amy Kunkel

PART 3 – Open Project List – No Updates

Project Category	Project Title	Division / Funding	Project Phase	Staff Responsibility
Finance & Administration	LCA Strategic Plan - 2022 Quarterly Progress Reporting	All Divisions	n/a	Liesel Gross
Finance & Administration	Asset Management Roadmap & Strategic Asset Management Plan (SAMP)	All Divisions	Planning Phase	Albert Capuzzi
Finance & Administration	LCA Munis ERP System Planning & Re-Implementation	All Divisions	Planning Phase	Brooke Neve
System Operations	Large Diameter Valve Prioritization Program	Allentown Division	Planning Phase	Chris Moughan
System Operations	Suburban Water Facilities - SCADA System Upgrade	Suburban Division	Construction Phase	Chris Moughan
System Operations	Watershed Monitoring Program	Suburban Division	Ongoing	Andrew Moore
Water - Suburban	Water Main Replacement Program Cycle 6	Suburban Division	Construction Phase	Jason Peters
Water - Suburban	I-78 Water Main Crossing	Suburban Division	Construction Phase	Ed Hoyle
Water - Suburban	Fixed Base Meter Reading Stations	Suburban Division	Planning Phase	Amy Kunkel
Water - Suburban	2022 Commercial Meter Replacement Project	Suburban Division	Construction Phase	Amy Kunkel
Water - Suburban	Far View Farms Pump Station Demolition	Suburban Division	Project Closeout	Ed Hoyle
Water - Suburban	Upper System Pump Station and Main Extension	Suburban Division	Design Phase	Ed Hoyle
Water - Suburban	Central Lehigh and North Whitehall Systems – Water Supply Study	Suburban Division	Planning Phase	Phil DePoe
Water - Allentown	Lead Service Line Replacement Program Planning	Allentown Division	Planning Phase	Andrew Moore
Water - Allentown	Water Filtration Plant & System Master Plan	Allentown Division	Planning Phase	Phil DePoe

Project Category	Project Title	Division / Funding	Project Phase	Staff Responsibility
Water - Allentown	Water Main Replacement Program Cycles 7 & 8	Allentown Division	Design	Jason Peters
Water - Allentown	Water Main Replacement Program Cycle 6	Allentown Division	Construction Phase	Jason Peters
Water - Allentown	SmartBall Inspection - 30" and 36" Transmission Main - East Side	Allentown Division	Planning Phase	Chris Moughan
Water - Allentown	Water Filtration Plant: Filter Upgrade Project	Allentown Division	Design Phase	Chuck Volk
Water - Allentown	Water Filtration Plant: 2022 Indenture Upgrades	Allentown Division	Construction Phase	Bryan Geissel
Water - Allentown	Water Filtration Plant: High Lift Pump VFD Replacements	Allentown Division	Construction Phase	Chuck Volk
Sewer - Act 537	KISS System Modeling - Capacity Problem Definition	City of Allentown (AO)	Project Closeout	Phil DePoe
Sewer - Act 537	Regional Sewer Capacity & Wet-Weather Planning - Regional Act 537 Plan Preparation	City of Allentown (AO)	Planning Phase	Phil DePoe
Sewer - Act 537	Kline's Island WWTP: Phase 1 AO Design Improvements	City of Allentown (AO)	On Hold	Phil DePoe
Sewer - Act 537	KISS System Modeling - Sewage Billing Meter QA/QC Data Analytics and 2021 Flow Metering Preparation	City of Allentown (AO)	Planning Phase	Phil DePoe
Sewer - Act 537	KISS System Modeling - Preliminary Screening of Alternatives (PSOA)	City of Allentown (AO)	Planning Phase	Phil DePoe
Sewer - Act 537	Resolution 6-2022-1: Trexlertown Act 537 Special Study	Suburban Division	Planning Phase	Phil DePoe
Sewer - Act 537	Western Lehigh Service Area - Engineering & Program Support	Suburban Division	Planning Phase	Phil DePoe
Sewer - Act 537	Industrial Pretreatment Plant Master Plan	Suburban Division	Planning Phase	Phil DePoe
Sewer - Suburban	Heidelberg Heights 2021 and 2022 Sanitary Sewer Replacement Project	Suburban Division	Construction Phase	Jason Peters
Sewer - Suburban	Heidelberg Heights Wastewater Treatment Plant - Mechanical Screen Project	Suburban Division	Design Phase	Chuck Volk

Project Category	Project Title	Division / Funding	Project Phase	Staff Responsibility
Sewer - Suburban	Heidelberg Heights Sanitary Sewer Consent Order & Agreement	Suburban Division	Planning Phase	Chuck Volk
Sewer - Suburban	Lynn Township Corrective Action Plan	Suburban Division	Ongoing	Jason Peters
Sewer - Suburban	Park Pump Station Phase 2 Upgrade	Suburban Division	Construction Phase	Chuck Volk
Sewer - Allentown	Kline's Island WWTP: Substation No. 1 and Switchgear Replacement	Allentown Division	Preliminary Design	Chuck Volk
Sewer - Allentown	Kline's Island WWTP: Effluent Disinfection and Dechlorination System Improvements	Allentown Division	Construction Phase	Bryan Geissel
Sewer - Allentown	Kline's Island WWTP: Solids Process Boiler and HVAC System Upgrade Project	Allentown Division	Construction Phase	Bryan Geissel
Sewer - Allentown	Kline's Island WWTP: Wet Weather Capacity Enhancements	Allentown Division	Preliminary Design	Bryan Geissel
Sewer - Allentown	Kline's Island WWTP: 2022 Indenture Upgrades	Allentown Division	Construction Phase	Bryan Geissel
Sewer - Allentown	KIWWTP Primary Digester No. 1 Cleaning	Allentown Division	Construction Phase	Bryan Geissel
Sewer - Allentown	Kline's Island WWTP: Sludge Thickener Tank No. 3 Mechanical Upgrade	Allentown Division	Construction Phase	Bryan Geissel
Sewer - Allentown	Kline's Island WWTP: Main and Auxiliary Pump Station Improvements	Allentown Division	Preliminary Design	Chuck Volk
Sewer - Allentown	Kline's Island WWTP: Intermediate Pump Station Improvements	Allentown Division	Preliminary Design	Chuck Volk
Sewer - Allentown	Lehigh Street (Rte. 145) Water and Sewer Main Relocation Project	Allentown Division	Construction Phase	Jason Peters
Sewer - Allentown	Sanitary Sewer Collection System: I&I Source Reduction Program Plan (Year 3 and 4)	City of Allentown (AO)	Construction Phase	Phil DePoe