LEHIGH COUNTY AUTHORITY

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

Agendas & Minutes Posted:
www.lehighcountyauthority.org

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BOARD MEETING AGENDA – May 11, 2020

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
3. Approval of Minutes
   - *April 27, 2020 Board meeting minutes*
4. Public Comments
5. Action / Discussion Items:

   FINANCE AND ADMINISTRATION

   WATER

   WASTEWATER
   - *Allentown Division – Kline's Island WWTP: Sodium Hypochlorite System Installation Project - Construction Phase Approval (Approval)* ***(salmon)***
   - *Suburban Division – Western Lehigh Service Area: 2020 Sewer Modeling (Approval)* ***(gray)***
   - *Kline's Island Sewer System – Interim Act 537 Plan (Presentation & Discussion)*
6. Monthly Project Updates / Information Items (1st Board meeting per month) – **May 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. Executive Sessions
13. Adjournment

UPCOMING BOARD MEETINGS

Meetings begin at Noon at LCA's Main Office, unless noted otherwise below.

May 18, 2020	June 8, 2020	June 22, 2020

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
April 27, 2020

The Regular Meeting of the Lehigh County Authority Board of Directors was called to order at 12:03 p.m. on Monday, April 27, 2020, Chairman Brian Nagle presiding. The meeting was held via video and audio advanced communication technology ("ACT"), using the ZOOM internet application, due to the national COVID-19 pandemic emergency. 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 via ACT, using the ZOOM internet application. A Roll Call of Board members present was taken. Chairman Brian Nagle, Linda Rosenfeld, Ted Lyons, Amir Famili, Richard Bohner, Norma Cusick, Jeff Morgan and Kevin Baker were present through ACT for the duration of the meeting. Board member Scott Bieber joined the meeting while it was in progress, as noted below.

Solicitor Michael Gaul was also present via ACT. Authority Staff present via ACT were Liesel Gross, Ed Klein, Chris Moughan, Chuck Volk, John Parsons, Andrew Moore, Phil DePoe, Lisa Miller, Amy Kunkel, Todd Marion, and Susan Sampson.

REVIEW OF AGENDA

Liesel Gross stated there are no changes to the agenda, and noted that the March 2020 Financial report was distributed and posted on the LCA website after the meeting packet was sent. An Executive Session to discuss potential litigation is scheduled after the regular meeting.

APPROVAL OF MINUTES

April 13, 2020 Meeting Minutes

Richard Bohner noted a few grammatical errors. On a motion by Richard Bohner, seconded by Norma Cusick, the Board approved the minutes of the April 13, 2020 Board meeting as corrected (8-0).

PUBLIC COMMENTS

None.

ACTION AND DISCUSSION ITEMS

Arcadia West Division – Water Storage Tank Replacement Design Phase

Amy Kunkel provided an overview of the project, stating the tank was built in 1999 by the Arcadia Development Corporation. An evaluation that was performed by Suez in 2018 determined the tank was at the end of its life. The interior and exterior of the tank were rusting, and required a new coating. Chuck Volk added that the Suez inspection was done with a robotic camera that discovered the corrosion inside the tank. There are also leaks under the tank floor and two holes in the tank walls that have been repaired in the last few years. In 2019, LCA contracted with Entech Engineering to prepare an engineering report for options of repair or replace. It was decided to replace the tank with a new concrete tank.

Amir Famili asked what the life expectancy is of the steel tank. Chuck Volk responded 20 to 30 years. The Arcadia tank is 21 years old, and also showing leaks at the bolt joints. The life expectancy of a concrete tank is 80 years. Norma Cusick questioned the cost of the easements in

the authorization, when the new tank will be placed on an existing easement. Mr. Volk explained there will be a temporary construction easement needed on a small portion of land shared with UGI, which will require approval.

On a motion by Norma Cusick, seconded by Jeff Morgan, the Board approved the Capital Project Authorization for the Design Phase in the amount of $138,100.00, which includes the Professional Services Authorization to Entech Engineering in the amount of $38,100.00 (8-0).

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

Phil DePoe gave an overview of the project for the sewage billing meter QAQC data analytics and the 2021 flow metering that is part of the Interim Act 537 plan. The flow metering data will be used to prepare modeling and identify the capital improvements needed to meet the future sewage capacity needs of the region through 2050. The flow metering will include a mix of approximately 100 temporary meters and the existing approximately 30 sewage billing meters (SBMs). Data delivery and storage procedures, quality assurance, and flow analytics need to be implemented in 2020 for these SBMs. Included in Phase 2 of the project are two tasks. Task 1 will review each signatory's sewage billing meter electronic data delivery platform, develop frequency of data upload, and establish trigger points for evaluation when data falls outside of acceptable variances. A 2-week data collection trial will begin in July. Task 2 will collect data for 30 to 90 days in the fourth quarter of 2020 then analyze the data for quality assurance. A final determination regarding which SBMs can be used for the 2021 flow monitoring program will be done in Task 2. There was some Board discussion.

On a motion by Linda Rosenfeld, seconded by Norma Cusick, the Board approved the Professional Services Authorization to Arcadis in the amount of $75,000.00 (8-0).

Board member Scott Bieber joined the meeting subsequent to the Board's discussion on the Kline's Island Sewer System – Regional Sewer Capacity & Wet-Weather Planning – Sewage Billing Meter QAQC Data Analytics and 2021 Flow Metering Preparation.

MONTHLY FINANCIAL REVIEW

Ed Klein presented the March 2020 report that was sent separately along with a PowerPoint presentation. Mr. Klein reported that the forecast and cash flows are positive, but expects the national COVID-19 pandemic emergency will impact the Authority and has concerns regarding water volume and collection rates. The Board questioned the percent of customers unable to pay their water bills. Mr. Klein stated that these numbers are not yet known. Liesel Gross added that the Authority is tracking this and will report on it at a later date.

MONTHLY SYSTEM OPERATIONS OVERVIEW

John Parsons presented the March 2020 report. Mr. Parsons stated that priority work continues but some routine maintenance activities are being deferred until after the pandemic is over. This practice can be maintained for several more weeks, but if it continues longer than that, certain tasks will require further discussion and planning. Richard Bohner stated the daily average water production for the Lehigh River seems unusually high. John Parsons explained that the numbers reflect a small volume that was used to exercise the system. Jeff Morgan asked whether the termination of the Governor's prohibition on construction activities on Friday will have an impact on LCA construction

projects. Chuck Volk explained that, even though there were some interruptions to projects, he does not expect anything significant. Mr. Parsons concurred. Chairman Nagle asked how the Authority plans to recover lost funds due to the not conducting water shutoffs during the COVID-19 emergency. Liesel Gross explained that this will require time and possibly a different approach to recover lost funds. Amir Famili asked about the Authority's ability to test sewage discharge for COVID-19. Ms. Gross explained that, while studies are being done in other states, there hasn't been anything done locally. Jeff Morgan clarified that all effluent leaving the plants is already being treated. Ms. Gross agreed and noted the studies that have been conducted in other regions have been to test for the virus in the influent to the wastewater treatment plant, and that chlorine disinfection during the treatment process has been proven to be effective in deactivating the virus.

STAFF COMMENTS

Liesel Gross commented that the Kline's Island Sewer System Interim Act 537 Plan was previously distributed to the Board for discussion at either the May or June Board meeting. Hardcopies are also available by request. Ms. Gross also acknowledged that both Scott Bieber and Kevin Baker were in attendance during today's meeting.

SOLICITOR'S COMMENTS

None.

PUBLIC COMMENTS / OTHER COMMENTS

None.

EXECUTIVE SESSION

Chairman Nagle noted that an Executive Session will be held after the regular meeting to discuss matters of potential litigation.

ADJOURNMENT

There being no further business, the Chairman adjourned the meeting at 1:12 p.m.

Richard Bohner
Secretary

MEMORANDUM

Date: May 11, 2020

To: Lehigh County Authority Board of Directors
From: Charles Volk, Chief Capital Works Officer
Subject: Allentown Division – KIWWTP: Sodium Hypochlorite System Installation Project - Construction Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Project Authorization – Construction Phase	$1,154,526
2 (1)	Professional Services Authorization – D'Huy Engineering, Inc.	$79,600
3 (1)	General Contract Award – Walabax Construction, Inc. *(base bid $821,500 + $1,150 alternate to demolish and remove the abandoned scrubber equipment)*	$821,650
4 (1)	Electrical Contract Award – Diefenderfer Electric, Inc. *(base bid only)*	$163,276

(1) Included in the Capital Project Authorization.

PROJECT OVERVIEW:
Chlorine gas has been used continuously at the KIWWTP for both effluent disinfection and sludge thickening process order control for several decades. The chlorination equipment (chlorinators, evaporators and related piping) has reached the end of its useful service life and requires replacement. Handling and storage of chlorine gas presents significant pubic and worker safety issues. Conversion to sodium hypochlorite is listed in the 2018 KIWWTP Master Plan as a near term project to eliminate risks associated with chlorine gas disinfection, and conversion to liquid sodium hypochlorite is recommended.

The project requires that the contractors maintain effluent disinfection and sludge thickening odor control operations continuously during construction via a temporary chlorination system, which will be followed by decommissioning of the existing gas chlorination system. Work includes building an addition to the Intermediate Sludge Thickener (IST) building, gas system demolition and modifications in the existing chlorine building, installation of mixers in the existing chlorine contact tank, and installation of hypochlorite tanks, chemical feed pumps, and associated chlorination equipment.

BASIS OF DESIGN
The production of the chlorine for both chlorination of the plant effluent and control of odors at the gravity thickener tanks is performed at the Chlorination Building located at the east side of the facility. However, the proposed conversion away from gaseous chlorine and demolition of the gas chlorination facilities for the plant effluent eliminates the source of chlorine solution for the gravity thickener tanks. Therefore, this created a need for sodium hypochlorite storage and delivery facilities for the gravity thickener tanks. The concept of pumping a concentrated, highly hazardous substance thousands of feet throughout the facility is not good design practice and

presents an unacceptable safety and environmental hazard. These factors were taken into consideration when components of the new sodium hypochlorite facilities at the Intermediate Sludge Pumping Station were designed.

The effluent chlorination system will be installed in the existing Chlorine Building at the location previously occupied by the gas chlorination system. For the Gravity Thickener odor control system, the tanks and associated equipment will be installed on the existing concrete slab above the subgrade Intermediate Sludge Pumping Station pump room. A new building adjacent to the existing pump station building will be erected on that slab. The building will be fully enclosed with roll-up doors for tank removal. The existing concrete slab at the IST Sludge Pump Station will require structural support columns and beams installed in the pump room below to accommodate additional loading from the hypo tanks.

The dry scrubber equipment and connecting exhaust ductwork to remove and filter an emergency gas chlorine leak located inside the chlorine building will be removed and abandoned under a general contract alternate item. The unit will be removed in-tact and has salvage value.

All components of this project are required in order to meet the project objective of converting the current use of gaseous chlorine to the use of sodium hypochlorite. It is not prudent from any engineering, operational, public health or treatment quality perspectives to divide the project into separate, smaller projects or phase them in any other way – all components of this conversion to sodium hypochlorite are required and must be expertly coordinated in order to provide continuity of service during the project.

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

PROJECT STATUS:
Design work commenced in 2019 and was completed in early 2020. The project was advertised for bid in February 2020, a pre-bid meeting was held on 3/3/2020 at KIWWTP, and bids were received on 4/14/2020.

THIS APPROVAL – CONSTRUCTION PHASE:
The contract time for construction phase is 240 days from Notice to Proceed to substantial completion.

BIDDING SUMMARY:
Bids were opened on 4/14/2020. The project consists of a General Construction (GC) Contract and an Electrical Construction (EC) Contract. Three alternates were included in the general contract for the following items: furnishing and installing two mixers in the chlorine contact tank, demolition of the dry air scrubber in the chlorine building, and concrete containment area coating. One alternate was included in the electrical contract for wiring the mixers. The bid results are summarized below:

GENERAL CONTRACT:

Bidder	Base Bid Results	Bid Total w/ Alternates
Walabax Construction	**$820,500**	**$998,500**
Michael Ronca & Sons	$921,000	$1,117,000
JEV Construction	$967,000	$1,147,000
Blooming Glen Contractors	$1,085,036	$1,275,791

ELECTRICAL CONTRACT:

Bidder	Base Bid Results	Bid Total w/ Alternates
Diefenderfer Electrical	**$163,276**	**$168,746**
GS Developers	$168,694	$171,094
Phillips Bros.	$174,522	$178,722
Eastern Environmental Contractors	$198,800	$203,400
G.R. Noto Electrical Construction	$199,749	$208,649
A.N. Lynch Co.	$205,000	$211,600
BSI	$208,850	$214,850
Blooming Glen Contractors	$258,468	$262,563

The total base bid for both contracts is $983,776. The total of the low bids plus alternates is $1,167,246. The final design Engineer's Estimate for the total of the base bids is $883,500, and for the base bids plus alternates the total estimated project cost is $1,070,000. A factor that may have influenced pricing is uncertainty regarding required provisions and supply chain complications associated with the current pandemic crisis.

The low bidder for the general contract, Walabax Construction Inc. (Walabax), is based in Perkasie, PA and has significant similar experience in water and wastewater facility mechanical construction projects in eastern PA. Walabax is currently the General Contractor for the Wynnewood WWTP Upgrade Project and the project performance has been satisfactory. We have reviewed the project references provided with the bid and Walabax appears well qualified to complete this project. The documents submitted with the bid are complete and in accordance with the bidding requirements. Based upon the review of the bids, we recommend award of the General Construction contract to Walabax, subject to the receipt of the necessary Performance Bonds, Insurance and other required documentation.

The low bidder for the electrical contract is Diefenderfer Electric (Diefenderfer) based in Allentown, PA. The company has significant similar project experience with water and wastewater facility electrical systems, including two projects at KIWWTP (2016 Dewatering MCC Replacement and 2017 Digester Cover Replacement) and one electrical contract in SD. We

have reviewed the project references provided with the bid and Diefenderfer appears well qualified to complete this project. The documents submitted with the bid are complete and in accordance with the bidding requirements. Based upon the review of the bids, we recommend award of the Electrical Construction contract to Diefenderfer, subject to the receipt of the necessary Performance Bonds, Insurance and other required documentation.

To manage the cost of this project, LCA staff is requesting Board authorization of the base bid general contract plus alternate to demolish and remove the abandoned scrubber equipment (priced at $1,150); and, authorization of electrical contract base bid only. In order to facilitate the work, Capital Works will pursue direct procurement of the mixers (alternate price $127,200) and coordinate the installation in the later stages of the project with a local contractor as part of general facility improvements. We will also pursue more economical concrete containment area coating options (that alternate was priced at $49,650).

PROFESSIONAL SERVICES:

D'Huy Engineering has been serving as LCA's design consultant on this project and will provide construction engineering services for the construction phase of the project. Their work will include:

1. Facilitate completion of the Agreement and other elements of the Contract with LCA.
2. Prepare for, attend and facilitate a pre-construction conference.
3. Prepare for and attend two job conference meetings.
4. Review and approve contractor's submittals. 36 discrete shop drawing submittals have been identified in the Contract Documents for this project.
5. Respond to Contractor requests for information (RFIs).
6. Process applications for payment and any necessary change orders.
7. Provide part-time construction observation over an estimated 30-week onsite construction period
8. Prepare punch list, final project close-out and certify final payment to contractors.

PROJECT SCHEDULE:

Based on construction phase authorization on 5/11/2020, the project should be completed in the first quarter of 2021.

FUTURE AUTHORIZATIONS:

Mixer procurement.

CAPITAL PROJECT AUTHORIZATION

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

PROJECT TITLE: **Allentown Division –KIWWTP Sodium Hypochlorite System Installation Project**

PROJECT TYPE:

☒ Construction
☐ Engineering Study
☐ Equipment Purchase

THIS AUTHORIZATION **$ 1,154,526**
TO DATE *(W/ABOVE)* **$ 1,275,011**

DESCRIPTION AND BENEFITS:

The scope of this project consists of the demolition and removal of the gas chlorination system at KIWWTP and the construction of building modifications and equipment installation to provide a sodium hypochlorite system for effluent disinfection and a sodium hypochlorite system for sludge thickening tanks odor control. Implementation of hypochlorite disinfection will eliminate serious health and safety concerns with gas chlorination, and replace gas chlorination equipment identified in the Master Plan to be at the end of its service life.

Previous Authorizations	
Design and Bid Phase	$120,485

REQUESTED THIS AUTHORIZATION	
Construction Phase	
General Construction Contract Base Bid + Srubber demo alternate – Walabax Constrction, Inc.	**$821,650**
Electrical Construction Contract Base Bid - Diefenderfer Electric, Inc.	**$163,276**
Professional Services:	
Construction Administration/Engineering – D'Huy Engineering	**$79,600**
Staff	**$40,000**
Contingency	**$50,000**
Total This Authorization	**$1,154,526**

Total Estimated Project	$1,405,011

REVIEW AND APPROVALS:

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

Lehigh County Authority

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

PROFESSIONAL SERVICES AUTHORIZATION

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

Date: May 11, 2020
Requested By: Charles Volk, P.E.

Approvals
Department Head: _____
Chief Executive Officer: _____

Allentown Division – KIWWTP Sodium Hypochlorite System Installation, Construction Phase

D'Huy Engineering, Inc. will perform construction administration and engineering support the Sodium Hypochlorite System Installation project. Professional services will include the following:

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

(1) Reference the cover Memo for additional information.

Cost Estimate (not to be exceeded without further authorization): ***$79,600***

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

(For Authority Use Only)

Authorization Completion:

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

MEMORANDUM

Date: May 11, 2020

To: LCA Board of Directors
Liesel Gross, CEO

From: Phil DePoe, Interim Senior Planning Engineer

Subject: Suburban Division – Western Lehigh Service Area: 2020 Western Lehigh Interceptor Sewer Modeling

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Professional Services Authorization – Arcadis	$89,000

AUTHORIZATION OVERVIEW

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

FINANCIAL

The LCA Suburban Division will fund these 2020 services.

CURRENT STATUS

Pending Board approval of these services.

THIS APPROVAL – 2020 WESTERN LEHIGH INTERCEPTOR SEWER MODELING

Lehigh County Authority (LCA) intends to retain the services of an engineering consulting firm to provide the hydraulic sewer modeling efforts for the Western Lehigh Interceptor. These services will include the following five tasks:

Professional Services
• Alternate Sizing, Alignment, and Hydraulic Basis of Design for Trexlertown Interceptor
• Determine Impact of 2019 "new normal" conditions on Alternative 10 Scope and Costs
• Evaluate Residential Flow Segregation and PTP Bypass
• Evaluate Pretreatment Plant (PTP) Direct Discharge
• Evaluate PTP and SCPS Direct Discharge

A description of the five modeling tasks is as follows:

- Task 1: Alternate Sizing, Alignment, and Hydraulic Basis of Design for Trexlertown Interceptor

    - Approximately 25 model simulations are needed to determine the optimal near term and long term solution to best relieve daily surcharge levels between the PTP and Spring Creek Road and provide storm surge capacity during rainfall events
- Task 2: Determine Impact of 2019 "new normal" conditions on "Alternative 10" Scope and Costs
    - Evaluate the impact of the May 2019 wet-weather flow regime characteristics to determine what additional improvements are needed to meet the objectives outlined in the long-term capital improvements plan selected by the region in 2014 (known as "Alternative 10"). Note that this alternative included an upfront period of intensive sewer system rehab to remove inflow & infiltration, followed by downstream interceptor upgrades between the PTP and the Kline's Island WWTP.
- Task 3: Evaluate Residential Flow Segregation and PTP Bypass
    - Develop three to five scenarios for residential flow separation and prepare construction cost estimates and projected PTP flow reductions for each scenario
- Task 4: Determine the Impact of rerouting the PTP flows to a new direct NPDES discharge
    - Evaluate the benefit of fully treating and directly discharging the current dry-day PTP flows as a means to reduce flow within the Western Lehigh Interceptor
- Task 5: Determine the Impact of maximizing the use of the PTP for direct discharge
    - Evaluate the benefit of fully treating and directly discharging a maximized volume of dry-day and wet-weather flows from the PTP to a new location as a means to reduce flow within the Western Lehigh Interceptor

CONSULTANT SELECTION PROCESS

Arcadis has been LCA's engineering consultant for annual ongoing sewer program support services. Prior hydraulic modeling and related work has been completed by Arcadis since at least 2008.

SCHEDULE

Arcadis will complete Task 1 by the end of June of 2020. These results will help drive the design decisions for the proposed Trexlertown Storage facility. Tasks 2-5 will be completed by November of 2020.

FUTURE AUTHORIZATIONS

Subsequent KISS system sewer modeling efforts will occur in mid-2022 through early 2023. These modeling efforts will utilize the 2021 metering program data to generate long term planning alternatives in alignment with the March 2025 Act 537 deadline.

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. 35

Professional: ARCADIS U.S., INC.
1128 Walnut Street, 4th Floor
Philadelphia, PA 19107

Date: May 11, 2020
Requested By: Phil DePoe
Approvals
Department Head: _____
Chief Executive Officer: _____

Suburban Division – Western Lehigh Service Area: 2020 Sewer Modeling
The Western Lehigh Sewer Partnership (WLSP) hydraulic model has been calibrated using 2019 flow meter and rainfall data and is available to support long-term Act 537 planning for the Western Lehigh Interceptor (WLI). Five separate modeling tasks will be performed in order to facilitate broader Kline's Island Sewer System (KISS) planning need discussions. The results of this 2020 modeling will help to inform further future modeling decisions and alternative analyses that will occur during the full KISS model calibration period in 2022. The specific tasks are as follows:

Professional Services (1)
1. Alternate Sizing, Alignment, and Hydraulic Basis of Design for Trexlertown Interceptor
2. Determine Impact of 2019 "new normal conditions" on Alternative 10 Scope and Costs
3. Evaluate Residential Flow Segregation and PTP Bypass
4. Evaluate PTP Direct Discharge
5. Evaluate PTP and SCPS Direct Discharge

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

Available from Prior Approval: *$53,000 (via previous authorizations)*
This Approval: *$89,000*

New Amended Amount (not to be exceeded without further authorization): *$142,000*

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:** _____

Arcadis U.S., Inc.
1128 Walnut St., 4th Floor
Philadelphia
Pennsylvania 19107
Tel 215.931.4372
www.arcadis-us.com

Mr. Philip DePoe
Interim Senior Planning Engineer
Lehigh County Authority
1053 Spruce Road
Allentown, PA 18106-0348

Subject:
2020 Western Lehigh Interceptor Planning Scope and Budget

Date:
4/29/2020

Contact:
Anthony J. Dill

Phone:
215.931.4372

Email:
Anthony.Dill@arcadis.com

Our ref:
10385658

Dear Mr. DePoe:

The Western Lehigh Sewer Partnership (WLSP) hydraulic model has been calibrated using 2019 flow meter and rainfall data (2019 WLSP model) and is available to support long-term planning for the Wester Lehigh Interceptor (WLI) and inform Act 537 issues on the broader Kline's Island Sewer System (KISS) prior to completion of the full KISS model expansion and calibration planned in 2021-2022. Lehigh County Authority (LCA) has requested the following be accomplished:

1. Evaluate dry and wet weather flow characteristics in various alternative sizing and alignment scenarios and provide hydraulic basis of design for the Trexlertown Interceptor parallel to the existing Western Lehigh Interceptor from the Gun Club to Spring Creek Road.
2. Determine the impact of 2019 "wet conditions" on the original Alternative 10 scope and costs to evaluate the financial impact of designing capacity improvements to the "new normal".
3. Determine the benefit of segregating portions of the residential flows upstream of the industrial pretreatment plant (PTP) and allowing them to bypass the PTP to preserve hydraulic capacity for industrial treatment.
4. Determine the impact on downstream flows of rerouting the PTP to a direct discharge.
5. Determine the impact on downstream flows of rerouting Spring Creek Pump Station (SCPS) to the PTP and rerouting the combined treated PTP flow to direct discharge locations.

PROPOSED SCOPE OF SERVICES

Task 1 – Alternative Sizing, Alignment, and Hydraulic Basis of Design for Trexlertown Interceptor

The original planned hydraulic capacity of the WLI was reached 35 years ago, triggering the construction of the Spring Creek Pump Station for the most hydraulically restricted section of the WLI. The next section to reach original hydraulic capacity was the section from Trexlertown Road through Ancient Oaks, triggering the construction of the first parallel interceptor through Ancient Oaks along Spring Creek Road. The latest section to reach hydraulic capacity is the stretch from the Gun Club to Spring Creek Road. Higher than average seasonal rainfall between August 2018 and July 2019 triggered constant extreme surcharge in this section, multiple day dry weather SSOs, loss of regular service for several customers situated near this stretch of the WLI, and wet weather SSOs. LCA has retained HDR to design a parallel relief interceptor and storage system that:

1. Eliminates dry weather service interruptions and SSOs
2. Provides for wet weather flow capacity during a 10-year design event at 2050 planning horizon
3. Improves wet weather performance of system prior to completion of the full Act 537 improvements implementation (2025 flows) without increase peak wet weather peak flow rates leaving the LCA sewer system into the City of Allentown sewer system

Arcadis will use the 2019 WLSP model to evaluate the impact of various alignments, diameters, and grade lines for a parallel pipeline between approximately U-70 and L-300. The purpose of this work is to demonstrate how to best relieve daily surcharge levels between the Pretreatment Plant and Spring Creek Road and provide storm surge capacity during rainfall events without increasing peak flow rates at the discharge points of the LCA system into the City sewer system.

The feasibility study consists of the following steps:

1. The 2019 WLSP model will be modified to include various new parallel pipe configurations. The connection(s) between the new pipe and existing pipe will be modeled such that the new pipe is filled and drained as capacity in the downstream WLI becomes available. We will model the following configurations:

a. 24”/27” diameter new pipe offset from the existing WLI with the invert of the new pipe set to the invert of the existing pipe along its entire length. (i.e. the Trexlertown interceptor project)
b. 72” diameter new pipe offset from the existing WLI with the invert of the new pipe set to the invert of the existing pipe along its entire length.
c. New 72” pipe offset from the existing WLI with the invert of the new pipe set at the invert elevation of L-300 and the new pipe upstream diameter and depth to maximize storage capacity.
d. New 72” pipe run down Trexlertown Road with the invert of the new pipe set at the invert elevation of L-300 and the new pipe upstream diameter and depth to maximize storage capacity.
e. As an alternative to the parallel pipe, the 2019 WLSP model will be modified to include an aboveground storage tank at MH U-5. The tank will be initially sized at 3 MG to assess feasibility. Pumps will be used to fill the tank, which will drain by gravity. The model will include operating logic for the tank that includes Pump #1 on when water level in U-57 reaches 5 feet below rim, Pump #2 on when the level reaches 4 feet below rim and Pump #3 on when the level reaches 3 feet below rim. The tank drain valve will open when the level in L-296 drops to 1 foot above the crown of the pipe and the flow rate from the tank modulated to maintain this level.

2. After the above runs are complete, up to 21 additional runs requested by HDR/LCA shown below will also be run:
    a. 3 MG storage tank at MH U-84
    b. 3 MG storage tank at MH U-65
    c. 3 MG storage tank at MH U-5
    d. 3 MG storage tank at MH L-308
    e. 3 MG storage tank at MH L-301
    f. 3 MG storage tank at MH L-289
    g. 3 MG storage tank at MH L-287
    h. Parallel gravity sewer from Manhole U-71 to Manhole L-297 along existing alignment with diameter to be determined by LCA/Arcadis/HDR team combined with tank alternatives a-g above. (7 additional runs)
    i. New gravity sewer from Manhole U-71 to Manhole L-297 following route along Trexlertown Road with diameter to be determined by

LCA/Arcadis/HDR team combined with tank alternatives a-g above. (7 additional runs)

3. Evaluate each scenario under modified May 2019 flow conditions to evaluate peak flow impacts and new pipe/tank drainage period. Recorded rainfall data for February 2019 through April 2019 will be used to produce the appropriate antecedent groundwater conditions. The analysis will use modified rainfall data from May 2019 where rainfall recorded May 3rd through May 8th 2019 is replaced with rainfall data from the 10-year design storm that occurred September 14th through September 19th 1999. The remainder of the May 2019 recorded rainfall will be used unmodified.
4. Prepare a PowerPoint presentation to be presented to LCA and HDR. The presentation will include model output tables and graphs of hydraulic grade line.
5. Prepare a final presentation of the results incorporating LCA's feedback.

ASSUMPTIONS

The following assumptions have been made regarding this task:

1. Alignment of new sewers will be made on a basic conceptual level without investigation of potential conflicting utilities or geotechnical issues.
2. Cost estimates are not included.
3. No field work is included.

Task 2 – Determine the impact of 2019 "new normal conditions" on the Alternative 10 scope and costs.

Design alternatives analyses were conducted using the 2014 KISS model. That analysis identified design alternative 10, which included a combination of I&I source reductions, gravity interceptor capacity improvements, and pump station capacity improvement, as the preferred design alternative. Arcadis will evaluate the impact of the flow regime characteristic of the May 2019 conditions on Alternative 10 to determine what additional improvements are needed to meet these more challenging conditions.

The evaluation consists of the following steps:

1. Adjust the 2019 WLSP model wastewater loading to represent 2040 flow projections to match those of the original Alternative 10 analysis.

2. Adjust the model baseflow loading to represent a reduction in infiltration anticipated from the yet to be completed WLSP I&I source reduction work. Use the same factors used in the original alternatives analysis.
3. Incorporate the gravity and pump station capacity improvements called for in alternative 10 into the 2019 model.
4. Create a modified rainfall profile using the 2019 TFE rain gauge data replacing the May 3-8, 2019 rainfall data with the September 15-17, 1999 rainfall data to represent the 10-year design storm used in the original analysis occurring during wetter antecedent conditions.
5. Run simulations using the updated model and rainfall profile, confirm the original Alternative 10 does not meet LOS goals for dry and wet weather, and modify the gravity and/or pump station capacity improvements so that the LOS goals are met.
6. Create an updated figure and cost estimate for the modified alternative 10.
7. Prepare a PowerPoint presentation to be presented to LCA and the WLSP. The presentation will include model output tables and graphs of hydraulic grade line.
8. Prepare a final presentation of the results incorporating WLSP and LCA feedback.

ASSUMPTIONS

The following assumptions have been made regarding this task:

1. The same I&I source removal factors that were used to develop Alternative 10 originally will be used for this analysis without regard for source removal work conducted prior to the 2019 recalibration metering period.
2. The 2040 flow projections used to develop Alternative 10 originally will be used for this analysis without updates based on the revised 537 plan.
3. Cost estimates will be preliminary in nature appropriate for a feasibility study.
4. No field work is included.

Task 3 – Residential Flow Segregation and PTP Bypass

The PTP treats a combination of residential and industrial flows and discharges the flow back into the WLI for conveyance to the Kline's Island Wastewater Treatment Plant. Future flows to the PTP are expected to exceed the PTP's hydraulic capacity. Hydraulic loadings during the 2018-2019 period exceeded the dry weather capacity of the WLI. The PTP is best suited for treating high strength industrial wastewaters,

with only marginal benefits to treating domestic strength wastewaters. To avoid or minimize the need to expand the PTP, separating residential/commercial and/or some lower strength industrial flows may provide great benefit.

The feasibility study consists of the following steps:

1. Identify which parcels discharge industrial wastewater vs residential wastewater into the sewer system.
2. Collaborate with Keystone Engineers (consulting engineers for Upper Macungie Township) and LCA to identify industries that can be separated from residential parcels to divert residential flow from the PTP. In some cases, this may take the form of directly connecting an industrial flow to the PTP. It is assumed that up to five clusters of residential parcels will be identified for bypassing the PTP, which accounts for most residential flows upstream of the PTP. For each cluster, estimate the amount and quality of average dry weather and wet weather flow to be diverted around the PTP. For this preliminary analysis, flows will be based on a spreadsheet analysis of per capita wastewater flow and wet-weather peaking factor using the 2019 KISS model characteristics of flow.
3. Develop 3-5 scenarios for residential flow separation and prepare construction cost estimates and projected PTP flow reductions for each scenario.
4. Prepare a PowerPoint presentation to be presented to LCA and WLSP.
5. Prepare a final presentation of the feasibility study results incorporating LCA's feedback.

ASSUMPTIONS

The following assumptions have been made regarding this task:

1. Alignment of new sewers will be made on a basic conceptual level without investigation of potential conflicting utilities or geotechnical issues.
2. Cost estimates will be preliminary in nature appropriate for a feasibility study.
3. LCA's existing GIS contains all of the sewer infrastructure and parcel information needed for the analysis. No field work or digitizing of additional sewer infrastructure into GIS is included.

Task 4 – Determine the impact of rerouting the PTP to a direct NPDES discharge.

Direct discharge of treated effluent from the LCA PTP to Jordan Creek or Little Lehigh River has been considered in the past. For a variety of reasons, LCA would like to consider this option again. To that end, we propose to evaluate the benefit of directly discharging LCA PTP flow as a means to reduce flow within the WLI. The benefit will be quantified as a reduction in cost to implementing the capacity improvements of Alternative 10.

The feasibility study consists of the following steps:

1. Using the 2019 WLSP model as modified in Task 2 and the Alternative 10 design or the modified Alternative 10 design per Task 2, create a means of directly discharging the PTP effluent. The PTP will not be expanded as part of this evaluation.
2. Run simulations using the 10-year design storm with the 2019 rainfall data and evaluate the results.
3. Modify the gravity and/or pump station capacity improvements of alternative 10 to reduce the cost of the capacity improvements while meeting the LOS goals.
4. Prepare a PowerPoint presentation to be presented to LCA. The presentation will include model output tables and graphs of hydraulic grade line.
5. Prepare a final presentation of the feasibility study results incorporating LCA's feedback.

ASSUMPTIONS

The following assumptions have been made regarding this task:

1. FEB and PTP capacities and operating parameters will remain the same as they are currently designed and operated.
2. All flow that is treated by the PTP will be directly discharged.
3. The PTP bypass structure will still operate in the normal fashion.
4. Cost estimates will be preliminary in nature appropriate for a feasibility study.
5. Cost estimates will not include the cost associated with upgrading the PTP to allow for direct discharge.

Task 5 – Determine the impact of rerouting the PTP plus Spring Creek Pump Station to direct discharge locations.

In addition to the flows currently flowing to the PTP, if the sewage flow that is pumped by the SCPS were redirected to an expanded PTP and directly discharged, the reduction in flows in the WLI would reduce the required WLI and KIWWTP capacity improvements. Arcadis will evaluate the benefit of directly discharging LCA PTP flow and SCPS flow as a means to reduce flow within the WLI. The benefit will be quantified as a reduction in cost to implementing the capacity improvements listed in Alternative 10.

The feasibility study consists of the following steps:

1. Using the KISS model as modified in Task 2 and the Alternative 10 design or the modified Alternative 10 design per Task 2, create a means of directly discharging the PTP effluent and further modify the hydraulic model so that all sewage flow that passes through the SCPS effluent chamber is directly discharged. SCPS will not be expanded as part of this evaluation. The PTP capacity will be expanded to treat all flow conveyed to it but not costed as part of this evaluation.
2. Run simulations using the 10-year design storm with 2019 rainfall data and evaluate the results.
3. Modify the gravity and/or pump station capacity improvements of alternative 10 to reduce the cost of the capacity improvements while meeting the LOS goals.
4. Prepare a PowerPoint presentation to be presented to LCA. The presentation will include model output tables and graphs of hydraulic grade line.
5. Prepare a final presentation of the feasibility study results incorporating LCA's feedback.

ASSUMPTIONS

The following assumptions have been made regarding this task:

1. All flow that is conveyed to the PTP will be directly discharged.
2. All flow that reaches the SCPS influent chamber will be directed to the PTP with flow bypassing the SCPS by gravity as currently happens.
3. The PTP bypass structure will be removed with all flow reaching the PTP conveyed to direct discharge.
4. Cost estimates will be preliminary in nature appropriate for a feasibility study.

5. Cost estimates will not include the cost associated with upgrading the PTP to allow for direct discharge.

DELIVERABLES AND SCHEDULE

No reports will be developed during this work. All work products will be presented in workshops in the form of PowerPoint presentations, tables, graphs, and maps.

For the purposes of this scope and budget, we have assumed workshops at LCA to review the draft feasibility study are conducted as part of regularly scheduled Act 537 planning meetings. The final study will be prepared to incorporate comments from LCA. We anticipate completion of this work by November 2020.

BUDGET

As shown in the table below, we estimate that the cost of these services will be $142,000. Note that $20,000 remains for our Inline Storage project and we anticipate $33,000 remaining in our Model Recalibration project. So, the net request for this authorization is **$89,000.** We propose to complete these services on a time and materials basis in accordance with the Agreement between LCA and Malcolm Pirnie, Inc., dated June 17, 1997, and the current Summary of Standard Charges for Lehigh County Authority. We will not exceed this budget without prior authorization from LCA. Payment for services will be based upon the actual labor and expenses incurred.

Task #	Description	Budget
1	Alternative Sizing, Alignment, and Hydraulic Basis of Design for Trexlertown Interceptor	$22,500
2	Determine Impact of 2019 “new normal conditions” on Alternative 10 Scope and Costs	$63,000
3	Evaluate Residential Flow Segregation and PTP Bypass	$19,500
4	Evaluate PTP Direct Discharge	$18,500
5	Evaluate PTP and SCPS Direct Discharge	$18,500
	Total	$142,000

Please contact me with your authorization to proceed if this scope and budget are acceptable to you. If you have any questions please do not hesitate to call me at 215-931-4372 or 610-761-3253 (mobile).

Sincerely,

Arcadis U.S., Inc.

Tony Dill, PE, BCEE
Program Manager – Buried Infrastructure Team

Cc: Jim Shelton, Arcadis

FINANCE & ADMINISTRATION

ACTION ITEMS

DISCUSSION ITEMS

1. *2019 Audit & Financial Statements* – June meeting TBD

The 2019 Audited Financial Statements and accompanying Operating Data Tables have been delayed due to the COVID-19 pandemic and will not be completed by the April 30, 2020 deadline. Notice of delay has been sent to appropriate parties. The statements are expected to be completed by May 30, 2020. In June, staff will present the financial statements to the Board for review and acceptance.

INFORMATION ITEMS

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

CERTIFICATES OF DEPOSIT

28-Apr-20

Fund	Bank	Location	Gross Amount	Date of Purchase	Date Due	Net Rate %
LLRI CR	PSDLAF Flex Pool		400,000.00	3/31/20	5/20/20	0.1
Cons Wtr (2)	PSDLAF Flex Pool		155,000.00	3/31/20	5/20/20	0.1
Cons LL2 (314)	PSDLAF Flex Pool		245,000.00	3/31/20	5/20/20	0.1
WW Capac	PSDLAF Flex Pool		600,000.00	3/31/20	5/20/20	0.1
Wtr R&R	PSDLAF Flex Pool		1,000,000.00	3/31/20	5/20/20	0.1

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

2. *Developments*

Water system construction is occurring in the following developments:

5354 Hamilton Blvd., 1 commercial lot, LMT
8615/8783 Congdon Hill Drive, 2 industrial lots with warehouses, LMT
Fields at Indian Creek, Phases 4 & 5, 86 residential units (sfd), water and sewer, UMilT & Emmaus
Kohler Tract, 123 residential lots (sfa), water and sewer, UMilT
Ridings at Parkland, 53 residential units (sfd), NWT-NEW

Water system plans are being reviewed for the following developments:

749 Route 100, 1 industrial lot with warehouse, UMT

1047 Cetronia Road, 8 unit apartment building, UMT
1224 Weilers Road Townhouses, 144 townhouse units (sfa), UMT
5329-5347-5357 Hamilton Blvd., 1 commercial lot, LMT
5374/5392 Hamilton Blvd., 1 commercial lot, LMT
5420 Crackersport Road, 1 commercial lot, UMT
8323/8449 Congdon Hill Drive, 2 industrial lots with warehouses, LMT
ATAS International, 1 industrial lot, UMT
Cedarbrook Road Industrial Park, 2 industrial lots, LMT
Estates at Maple Ridge, 30 residential units (sfd), UMilT
Jaindl Commercial Park North, 1 commercial lot, LMT
Laurel Field, Phase 5, 25 townhouses, UMT
Madison Village at Penn's View, 66 manufactured homes, 1 lot, water and sewer, LynnT
Mill Creek Hotel, 1 commercial lot with 205 room hotel & restaurant, UMT
Mountain View Estates, 27 residential units (sfd), LMT
Ridings at Parkland – Phase 2, 38 residential units (sfd), NWT
Schoeneck Road, Lot 1, 1 lot warehouse, LMT
Shepherds Corner, 1 commercial lot, LMT
Towneplace Suites by Marriott, 91-room hotel, UMT

Sewage Planning Modules Reviewed in Prior Month:
Eagle View Townes, Whitehall, 8,170 gpd.
Indian Creek Village, Lot 3, LMT, 446 gpd.

WATER

ACTION ITEM

DISCUSSION ITEMS

INFORMATION ITEMS

1. ***Allentown Division – Hamilton Street Cedar Creek Bridge Water Main Relocation Project***

As part of the Pennsylvania Rapid Bridge Replacement Program, the replacement of the Cedar Creek Bridge on Hamilton Street has required the relocation of approximately 500 linear feet of water main. The design phase was approved at the December 2016 Board meeting and the construction phase at the January 2018 meeting. As of February 22, 2018, the contractor completed a majority of the relocation work for LCA's facilities; however, they were pulled off the site due to construction conflicts. As of March 22, 2019 the original LCA water line relocation scope of work was completed, however an additional relocation of a LCA sanitary sewer line was added to the original scope and agreement as of April 15, 2019 with an anticipated completion of April 26, 2019. LCA anticipates submitting all final paper work to the state for reimbursement in the very near future when the project has reached 100% completion. As of November 27, 2019 the project is still under construction due to delays caused by environmental timelines to preserve the high quality clear water fishery. It is anticipated that this work will be reimbursed 100% by the state and that the construction related activities. As of February 2020, the LCA utility relocation portion of this project is 100% complete; total project is approximately 75% complete. **(No Change)**

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

The project is for the replacement of 2-miles of aged and/or failing cast iron water main in multiple locations throughout the City, in accordance with the lease requirement, and using our engineer's risk prioritization protocol. The design engineer (Gannett Fleming) halted work on Cycle 5 following main replacement prioritization identification and preliminary project scoping until funds become available. Construction is not anticipated in 2020. **(No Change)**

3. ***Allentown Division – Water Filtration Plant: SCADA System Replacement***

The project consists of the replacement of the existing SCADA System at the Water Filtration Plant. The purchase and installation of new servers, new control panel cabinets, new cabling, and new programming software will encompass this project. Board approval to purchase this equipment was granted at the August 27, 2018 Board Meeting. Replacement will be completed by early 2020. Construction is 95% complete. This project will be funded by LCA Allentown Division**. On hold temporarily based on current situation. NO CHANGE**

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

The Water Filtration Plan (WFP) supplies water to residential and commercial customers in the City of Allentown, as well as wholesale water to surrounding communities. One of the critical elements at the WFP is the High Service Pumping System (HSPS), which is the primary means of conveying treated water into the distribution system. The HSPS has experienced regular failures of aging electrical components. The July 2017 Allentown Water Master Plan categorizes the pump variable frequency drives (VFDs) in very poor condition and notes that the VFDs are no longer supported by the manufacturer. This project will replace two of the existing VFDs and add a third VFD. This project is currently unfunded, but may be supported through a PENNVEST loan pending ongoing discussion with the City of Allentown. Board approval was granted at the 8/12/19 Meeting for the design phase of this project to ensure loan application timelines can be met - in the event an agreement can be reached. Contract drawings representing 90% design

were received in mid-November. Since an agreement was not reached by the 2/5/20 PennVEST application deadline, the project is on hold. The next PennVEST application deadline is 5/6/20. **(No Change)**

5. ***Allentown Division – Water Filtration Plant: Raw Water Pump Room Painting Construction Phase***

Since 2015, the piping and appurtenances of the high lift pump station (Phase 1) and the filter gallery (Phase 2) have been painted. It is the intent of Phase 3 to paint the piping and associated appurtenances in and around the raw water pump room, as the coatings are in poor condition. The project was advertised for bid in late December and bids were received mid-January. Construction phase Board approval was approved at the 2/10/20 Board meeting. The pre-construction meeting was held on 2/12/20, construction began in March and is currently on hold due to pandemic related concerns. Construction is anticipated to resume once restrictions are eased with should be completed by early summer 2020**. (No Change)**

6. ***Suburban Division – Asset Management Upgrade Project***

This third phase of Suburban Division Asset Management upgrade program will replace components that were deferred due to budget limitations in 2019. Design phase commenced in Q4 of 2019, and the project will be bid in late Spring 2020. The upgrade locations were determined from asset management data collected by LCA's engineer consultant and from internal interviews conducted by Capital Works with senior Operations staff, and based on risk consequence ratings**.** This year's project will consist of roof replacements at several SD facilities. **(No Change)**

7. ***Suburban Division – CLD Auxiliary Pump Station Project***

The project consists of installation of a new booster pumping station with SCADA and water main extension to pump water from the Lower Pressure System to the Upper Pressure System. The LCA Suburban Division will fund the project. Bids for the project were received on 6/29/18. Board approval for the construction phase of the project was granted at the 7/23/18 meeting. A preconstruction meeting was held on 8/28/19. Construction will be substantially completed in February 2020. Current status is addressing punch list items not completed during start-up testing – construction is 99% complete. **(No Change)**

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

The project will feature the installation of a new booster pumping station and water main extension to interconnect the Central Lehigh Division (CLD) with the Upper Milford Division (UMD) allowing the abandonment of the UMD water supply facilities, and to provide water service to the proposed 123-lot Kohler Tract subdivision in Upper Milford Township. Costs are being shared between the LCA Suburban Division and the developer of the Kohler Tract. Pumping station bids were opened on 4/25/19. Board approval for the construction phase of the project was granted at the 5/13/19 meeting and a preconstruction meeting was held on 6/25/19. The NPDES permit was finally issued on 3/9/20 and a premobilization teleconference was held on 3/19/20. Upper Milford Township has issued the building permits. The contractor has begun mobilization onto the site. Construction is anticipated to be completed in October of 2020 – construction is 0% complete.

9. ***Suburban Division – Watershed Monitoring Program***

The project will include setting up a surface water flow-monitoring network for the Little Lehigh Creek. The work is in response to the Watershed Monitoring Plan that was developed and reported to LCA by Al Guiseppe (SSM, Inc.) in 2017. In 2018, USGS selected the Delaware River Basin to pilot the National Next Generation Integrated Water Observing System (NGWOS). The Little Lehigh Watershed was picked as a targeted area of the NGWOS Project and

additional surface water and ground water monitoring stations will be developed. USGS and LCA met on 11/19/2019 to discuss the proposed monitoring stations and the program in general. A follow up meeting was held on 12/16/2019. USGS and LCA have now found all three GW monitoring wells, LE860, LE 861 and LE862, who's usage had all been discontinued decades ago and their locations were presently unknown. USGS is now checking the viability of using them again. USGS has now completed the installation of (3) new SW Gauging Stations in the Little Lehigh Watershed and all (3) are collecting data. Additional SW flow monitoring stations are within the installation process. All six (6) Fybr sites are currently collecting flow data and the calibration process is expected to last several months. **(No Change)**

10. *Suburban Division - Additional (Redundant) Water Supply - Small Satellite Divisions*

This Project is focusing on the development of an additional well for **t**he Madison Park North system. An engineer has been retained to assist with the development of a second well for Madison Park North. An agreement is in place with an adjoining property owner to Madison Park North to drill a test well on their property, in coordination with DEP guidelines. The "step drawdown test" was performed on 3/26/19 and indicated that the test well is a viable backup source to Well 1. A Pre-Drilling and Aquifer Test Plan was conditionally approved by DEP in late September of 2019. The reconstruction of the test well was completed in mid-January of 2020. The next item to be completed will be a 72 hour sustained pump test, scheduled for this spring. If the test is successful, we will need to obtain approval from the Agricultural Lands Condemnation Approval Board prior to permitting and construction of the new well facilities. Permanent facilities design is 0% complete. Work has been temporarily suspended due to the Covid-19 virus. When work resumes the site will be surveyed for design of a preliminary site plan.

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

The project consists of the consolidation and replacement of two well stations with a single new pump station and a new water storage tank to replace two antiquated hydropneumatic pump stations. The new station will be a variable frequency drive controlled double pumping system with full SCADA control. The design will include radon reduction elements and also accommodate the future installation of additional radon removal equipment, to be implemented upon DEP's mandate of a regulatory limit. The project is in construction phase. The Notice to Proceed was issued to the contractors on 9/24/19. Construction began in February 2020 and is approximately 5% complete. Work had been suspended due to the Covid-19 virus but is expected to resume in the second week of May.

12. *Suburban Division – Water Meter Reading Equipment Upgrade*

LCA's capital program includes the replacement of 20,000 transceiver units, and 10,000 units will be replaced in 2019 with the remaining to be replaced in 2020 under separate authorization. The new units have a 20-year battery life and are compatible with the new meter reading software purchased in 2017. This project will replace 100% of the remaining old style radio units over a two-year period. Construction phase services for the first round of 10,000 units was approved at the 5/13/19 Board meeting. Construction began in July 2019 and a change order was issued to the contractor for the installation of the remaining transceiver units that were originally scheduled for replacement in 2020, in order to expedite the completion of the work under the program and take advantage of favorable contract unit pricing. The project is substantially complete. Work has been suspended due to the Covid-19 virus.as soon as restrictions are lifted, the contractor will return to install remaining radios and replace any radios that are not working properly.

WASTEWATER

ACTION ITEMS

1. *Allentown Division – Kline's Island WWTP: Sodium Hypochlorite System Installation Project - Construction Phase Approval* – May 11, 2020

This project involves the replacement of the existing gaseous chlorination system at the Kline's Island Wastewater Treatment Plant (KIWWTP). The use of gaseous chlorine for sewage disinfection, while reliable, is outdated and creates significant public health and employee safety risks. In addition, the existing equipment has reached the end of its useful life. The 2018 KIWWTP Master Plan recommended abandoning gaseous chlorine and switching to (liquid) sodium hypochlorite. The design started in March of 2019 and was completed in early 2020. The project was advertised for bid in February 2020. Construction phase authorization will be requested at the 5/18/2020 Board meeting and the project is anticipated to be completed the first quarter of 2021. The project will be funded by the LCA Allentown Division.

2. *Suburban Division – Western Lehigh Service Area: 2020 Sewer Modeling* – May 11, 2020

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

DISCUSSION ITEMS

1. *Kline's Island Sewer System – Interim Act 537 Plan* – May 11, 2020

Following several months of discussion with the Pennsylvania Department of Environmental Protection (PA-DEP), all municipalities flowing into the Kline's Island Wastewater Treatment Plant have agreed to complete an Interim Act 537 Plan ("Interim Plan") by September 2020. This Interim Plan will primarily consist of projecting new connections to the regional sewer system from 2021 through 2025 and outlining steps to be taken during this timeframe to prepare a full Regional (Long-Term) Act 537 Plan ("Regional Plan"). This two-step planning process has been developed to allow all municipalities to work cooperatively toward a Regional Plan to meet future sewer capacity needs of the region, and to provide proper regulatory oversight and control of new connections to the system while the Interim Plan is in force from 2021 to 2025. To begin the process of compiling the Interim Plan, a consulting engineer has been retained, and approval of their full Professional Service proposal was granted at the February 10, 2020 Board meeting. This presentation will provide an overview of the Interim Plan and the next steps moving forward in the plan approval process. The Interim Plan is available for viewing by following this link: https://lehighcountyauthority.org/wp-content/uploads/KISS-Interim-Act-537-Report-Planning-Commission-Submission-03-16-2020.pdf

INFORMATION ITEMS

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

This project includes the design of the AO improvements at the wastewater treatment plant. This conceptual design concept was approved by the City and the relevant final deliverables were

received by LCA. The City then directed LCA to proceed with the final design of improvements related to the blending alternative. Board approval for the Professional Services Authorization with Kleinfelder East, Inc. was granted at the September 11, 2017 Board Meeting. The project is identified as Administrative Order Work and will be funded by the City. The 30% design drawings and specifications have been received. The City directed to "pause" the design phase of the project. The City has now directed LCA to keep this project on indefinite hold. **(No Change)**

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

DEP has noted that the KIWWTP has been performing at a high level and meeting its permitted effluent quality limits during a period of prolonged wet weather since early 2018. This study will provide the basis for confirming the plant's maximum monthly average that can be sustained during prolonged periods of wet weather – while remaining in full compliance with effluent quality requirements of the plant's permit. Approval of the study was granted at the 8/26/19 Board Meeting. The study was completed in mid-October 2019 and a Part II Permit was sent to DEP on 10/18/19. The permit will be resubmitted in late 2020 or early 2021 upon action by DEP on the Interim Act 537 Plan (to be submitted in September 2020). Therefore, the original permit submission is 100% completed – awaiting Revision #1. This project is considered an AO expense under terms of the Lease and is City funded. **(No Change)**

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

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

4. *Allentown Division – Sanitary Sewer Collection System: I&I Source Reduction Program Plan (Year 1)*

This project includes the design of the City of Allentown's I&I Source Reduction Program Plan. In 2014, Video Pipe Services complete various CCTV inspections throughout twenty Primary and Secondary Basins. All pipe segments that called for complete pipe replacement have already been repaired. The remaining source reduction activities within the twenty Basins have been organized into a 5-Year Plan, with each year focusing on a different geographic region of the City's sewer collection system. Design has been approved for all five years, with the first project commencing in 2020 and the last project finishing in 2024. Board approval for the construction phase of the "Year 1 Project" was granted at the March 9, 2020 Board Meeting. This project is proceeding in early May 2020 and will be finished by the of June 2020. This project is considered an AO expense under terms of the Lease and is City funded.

5. *Kline's Island Sewer System – Regional Sewer Capacity & Wet-Weather Planning – Interim Act 537 Plan Preparation*

Following several months of discussion with the Pennsylvania Department of Environmental Protection (PA-DEP), all municipalities flowing into the Kline's Island Wastewater Treatment Plan have agreed to complete an Interim Act 537 Plan ("Interim Plan") by September 2020. This Interim Plan will primarily consist of projecting new connections to the regional sewer system from 2021 through 2025 and outlining steps to be taken during this timeframe to prepare a full Regional (Long-Term) Act 537 Plan ("Regional Plan"). This two-step planning process has been

developed to allow all municipalities to work cooperatively toward a Regional Plan to meet future sewer capacity needs of the region, and to provide proper regulatory oversight and control of new connections to the system while the Interim Plan is in force from 2021 to 2025. To begin the process of compiling the Interim Plan, a consulting engineer has been preliminarily retained, and approval of their full Professional Service proposal was granted at the February 10, 2020 Board meeting. Costs associated with the development of the Interim Plan will be paid by the City of Allentown and reimbursed through existing intermunicipal agreements and by City customers through the use of the Administrative Order Fee. As of late April 2020, the Interim 537 Draft is 100% completed and was delivered to sixteen planning commissions on 3/16/2020. Planning commission meetings are occurring and public advertisement will occur on 6/1/20.

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

As part of the Interim Act 537 Plan, the municipalities served by the Kline's Island Sewer System have committed to completing a flow metering and modeling project beginning in 2021. The flow metering data will be used to prepare modeling and identify the capital improvements needed to meet the future sewage capacity needs of the region through 2050. The flow metering will include a mix of temporary meters and the existing sewage billing meters. Data delivery and storage procedures, quality assurance, and flow analytics need implemented in 2020 for these sewage billing meters. Without this meter development program, the data cannot be used from these meters. Therefore, to prepare for 2021 flow metering, a consulting engineer has been preliminarily retained, and approval of their full Professional Service proposal was granted at the April 27, 2020 Board meeting. Costs associated with the development of the QAQC data analytics and the 2021 flow metering preparation will be paid by the City of Allentown and reimbursed through existing intermunicipal agreements and by City customers through the use of the Administrative Order Fee.

7. *Suburban Division – Western Lehigh Service Area – 2020 Flow Metering Program*

Future flow metering work is anticipated over the next several years for both the Western Lehigh service area as well as the entire regional Kline's Island Sewer System. In 2020, the Western Lehigh group will conduct flow metering for a period of eight months to gather additional data on inflow and infiltration and the impact of prior rehabilitation work. It is anticipated that more extensive flow metering will be required in 2021 and 2022 to develop a Regional Plan. Approval of a Professional Services Authorization and three-year contract with Flow Assessment Services was granted at the February 10, 2020 Board meeting. Also on February 10, 2020, the Board approved a Professional Services Authorization for Arcadis to provide quality assurance and data analysis services for the 2020 flow monitoring program. As of late April 2020, all temporary flow meters and rain gauges for the 2020 program have been installed (data collection is 30% completed). The initial QA/QC of the data has commenced.

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

The Park Pump Station and Force Main line were constructed in 1980 to provide wet weather relief to the Little Lehigh Creek Interceptor, which conveys wastewater from ten municipalities from outlying areas to the Kline's Island Wastewater Treatment Plant (KIWWTP). The force main consists of 8,715 linear feet of prestressed concrete cylinder pipe (PCCP) of various sizes (2,615' of 24"; 2,695' of 30"; and 3,405' of 36"), and connects with the 54" sanitary sewer interceptor that runs to KIWWTP. PCCP is particularly sensitive to deterioration due to hydrogen sulfide gas from wastewater, and corrosion of exposed reinforcing steel can result in structural degradation and pipe failure. An internal investigation of the pipe is required to assess the condition of the PCCP pipe and identify damage areas, in order to determine the locations and extent of rehabilitation needed to restore the level of service, prolong service life, and mitigate the risk of failure. Capital Works is planning a limited manned inspection of the force

main pipe at 5 air release valve (ARV) locations, 100 feet in both directions from the ARV manhole, which will be used as the initial evaluation of the representative condition of the pipe. Using this data, the need for performing a complete pipeline condition assessment will be determined, possibly utilizing a new electromagnetic technology for performing an internal pipe condition assessment that entails minimal interruption of operation of the pump station and force main. Commencement of this work will follow the return of "normal" dry weather flows, and also following the completion of the Park Pump Station upgrade construction. **(No Change)**

9. *Suburban Division – Park Pump Station Upgrade*

The Park Pump Station is to be upgraded to address mitigate risk of failure, restore station capacity, and prolong the service life of this critical facility. Design was completed in December 2017. The Park Pump Station Upgrade was advertised for bid in December 2017, pre-bid meeting was held on 1/4/2018, and bids were opened 2/1/2018. Construction phase was authorized at the 2/12/2018 Board meeting. Notice to proceed for the construction contracts was issued dated 3/26/2018. A pre-construction meeting was conducted in early April 2018, and construction was substantially completed in January 2020**.** Start-up and performance testing of the new mechanical and electrical equipment was successfully performed in January 2020, and the project is approximately 99% complete. Final project completion, final restoration and contract closeout will be completed early Summer 2020**. (No Change)**

10. *Suburban Division – Wynnewood WWTP Upgrade Project*

Wynnewood Terrace WWTP was constructed in 1980 by the developer to serve the Wynnewood Terrace subdivision, located in the Laury's Station area in North Whitehall Township. Sewer service is provided to approximately 217 residential and 2 commercial properties. LCA acquired the system in 2003.

The plant, while meeting effluent limits, has reached the end of its useful life. The plant is constructed of in-ground steel tanks that are in poor condition, with areas of corrosion and loss of structural integrity. The mechanical and electrical systems are also at the end of their service life and in need of replacement. The proposed project includes replacement of the existing treatment facility in entirety with new technology and concrete tanks appropriate for the wastewater flows and loading characteristics. The new facility shall meet the effluent limits criteria established in the respective DEP and DRBC permits, including new or additional limits that may be imposed during the permitting process. Design phase was authorized in February 2017 and was concluded in late Summer 2018. The DEP Part 2 Water Quality Management Permit was received in March 2018. The project was advertised for bid in August 2018, bids were opened in September 2018, and bids were authorized for award at the October 22, 2018 Board meeting. Construction work mobilized in early 2019 and is anticipated to finish in Spring 2020. Construction is approximately 85% complete. **(No Change)**

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

Excessive inflow and infiltration (I&I) and high wet-weather flows into the Lynn Township sewer system has been ongoing and increasingly challenging to address. As noted in LCA's monthly operations reports, treatment plant bypasses and sanitary sewer overflows have occurred in this system and must be addressed. On 6/4/19 a meeting was held with DEP, Lynn Township and LCA representatives as a result of a hydraulic overload at the wastewater treatment plant, based on 2018 Chapter 94 Report monthly plant flows. At the meeting, DEP directed LCA to submit an amendment to the pre-existing Corrective Action Plan (originally submitted by Lynn Township Sewer Authority) to include an updated system condition assessment and an outline of steps to be taken to mitigate I/I flows and maintain NPDES permit compliance. The Corrective Action Plan (CAP) includes structural and non-structural initiatives and involves coordination with the host municipality. The framework for the CAP was shared with the Board in February 2019. A meeting was held at Lynn Township with DEP in June 2019 to discuss the Lynn Township CAP

and Township sewer planning/growth issues, and DEP directed LCA to submit a CAP Amendment by the end of summer 2019. The CAP Amendment contained an updated sewer system condition assessment and a corrective plan to further mitigate I/I flows. Updated CCTV work of the entire system was substantially completed in August 2019, and the inspection data was summarized in the CAP Amendment and is being used to scope a capital repair project. The Lynn Township Board of Supervisors adopted a sewer system rules and regulations ordinance on 9/12/19, which gives LCA the authority to inspect private laterals and facilities for illegal connections and perform follow-up enforcement. A meeting with DEP and Lynn Township representatives was held on 1/15/20 to discuss the CAP Amendment and plan moving forward. A letter is forthcoming from DEP to grant 55 EDUs of sewer allocation relief in 2020. **(No Change)**

12. *Suburban Division - Heidelberg Heights Corrective Action Plan*

On 2/11/19, DEP submitted a notice of violation to LCA regarding bypasses and permit exceedances at the Heidelberg Heights wastewater treatment plant. As discussed with the LCA Board during several meetings in 2018, this small satellite system has been challenged by high groundwater levels and significant infiltration and inflow (I&I) of clear water into the sewer system during rain events. LCA staff met with DEP officials on March 6, 2019 to discuss the problems and, as a result, LCA prepared a comprehensive Corrective Action Plan (CAP) and submitted DEP on 5/5/19. A draft of the plan was attached for Board review at the 4/22/19 Board meeting. The final CAP was submitted to DEP on 4/29/19. The Heidelberg Heights Board of Supervisors approved the advertisement for adoption of a sewer system rules and regulations ordinance on 9/19/19, which gives LCA the authority to inspect private laterals and facilities for illegal connections and perform follow-up enforcement. The ordinance was adopted by the township the in October 2019**. (No Change)**

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

The Sand Spring WWTP was constructed in 1972 by the developer to serve the Sand Spring development, located in the Schnecksville area in North Whitehall Township. Sewer service is provided to approximately 248 apartment units, 8 commercial properties, and an elementary school. Lehigh County Authority (LCA) acquired the system in 2005.

The plant, while meeting effluent limits, has reached the end of its useful life. The plant is constructed of in-ground steel tanks that are in poor condition, with areas of corrosion and loss of structural integrity. The mechanical and electrical systems are also at the end of their service life and in need of replacement. The proposed project includes replacement of the existing treatment facility in entirety with new technology and concrete tanks appropriate for the wastewater flows and loading characteristics. The new facility shall meet the effluent limits criteria established in the respective DEP and DRBC permits, including new or additional limits that may be imposed during the permitting process. Design phase was authorized in February 2017 and final design was delayed due to DEP Part 2 Water Quality Management and NPDES permitting issues. DEP approval of the Water Quality Management Permit was received in late December 2018, the design was finalized in late Spring 2019, and the project was advertised for bid in July 2019. Bids were opened on 8/13/19 and construction phase authorization was approved at the 8/26/19 Board meeting. A pre-construction meeting was held on 11/1/19 following execution of contract documents. Conditional Use approval and land development waiver were granted by North Whitehall Township in Spring 2020. Construction mobilization for site work occurred in late winter 2020 and construction is proceeding. **(No Change)**

14. *Suburban Division - Trexlertown Wastewater Storage Facility*

As part of the Western Lehigh service area's Sewer Capacity Assurance & Rehabilitation Program (SCARP), a conveyance capacity "bottleneck" was identified in the Trexlertown area of

the Western Lehigh Interceptor, and this area was assigned a high priority due to occurrence of sanitary sewer overflows and basement backups in the vicinity. A parallel interceptor was originally conceived to run approximately from Cetronia Rd to Spring Creek Rd. The concept was modified to focus on providing storage capacity in the system for this area, due to concerns about downstream hydraulic impacts. This project is an interim solution to address local impacts of the system bottleneck, and will become part of the future long-term solution to alleviate regional conveyance capacity challenges. A pre-design feasibility study is being performed to evaluate various engineering alternatives, including an "in-line" parallel storage tank, conventional concrete tank (flow equalization basin), or other options. Award of the pre-design feasibility study to HDR was authorized at the 10/21/2019 Board meeting. The study is on hold until modeling data is received from Arcadis. **(No Change)**

15. ***Suburban Division – Western Lehigh Manhole Rehabilitation Project***

A project to rehabilitate key manholes in the Western Lehigh Interceptor service area was scoped in late 2019/early 2020. The project includes flood-proofing, interior pipe connection grouting, exterior concrete work and sealing of manholes, particularly those manholes that are in close proximity to the floodway. The purpose of the project is to eliminate wet weather floodwater inundation and inflow into the system. The project scope includes approximately 50 manholes to be rehabilitated in 2020 as part of a phased manhole rehabilitation program. The project was advertised for bid in April 2020,bids will be opened on 5/12/20, and construction phase authorization is to be requested at the 6/8/20 board meeting. Construction will be completed by the end of 2020.