LEHIGH COUNTY AUTHORITY

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

Agendas & Minutes Posted:
www.lehighcountyauthority.org

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BOARD MEETING AGENDA – June 25, 2018

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
   - *June 11, 2018 Board meeting minutes*
4. Public Comments
5. Action / Discussion Items:

   FINANCE AND ADMINISTRATION

   WATER

   WASTEWATER
   - *Suburban Division – SCARP **(pink)***
6. Monthly Project Updates / Information Items (1st Board meeting per month)
7. Monthly Financial Review (2nd Board meeting per month) **– May 2018 report attached**
8. Monthly System Operations Overview (2nd Board meeting per month) **– May 2018 report attached**
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.

July 9, 2018	July 23, 2018	August 13, 2018

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
June 11, 2018

The Regular Meeting of the Lehigh County Authority was called to order at 12:00 p.m. on Monday, June 11, 2018, Chairman Brian Nagle presiding. Other Members present at the commencement of the meeting were: Linda Rosenfeld, Jeff Morgan, Richard Bohner, Norma Cusick and Ted Lyons. Authority Staff present were Liesel Gross, Ed Klein, Pat Mandes, Brad Landon, Chuck Volk, Chris Moughan, Susan Sampson, John Parsons, Phil DePoe and Lisa Miller.

REVIEW OF AGENDA

Chairman Nagle announced that today's Board meeting is being videotaped and streaming live and recordings will be posted to the Authority's website.

Liesel Gross noted there is an item to be added to the agenda under Water for information and discussion relating to a development on Alburtis Road in Lower Macungie Township. There will also be an executive session regarding potential litigation at the end of the regular meeting.

APPROVAL OF MINUTES

May 21, 2018 Regular Meeting Minutes

Richard Bohner noted two minor corrections to the Minutes of May 21, 2018.

On a motion by Richard Bohner, seconded by Ted Lyons, the Board approved the Minutes of May 21, 2018 meeting as corrected (5-0). Norma Cusick abstained.

PUBLIC COMMENTS

None.

ACTION AND DISCUSSION ITEMS

Liesel Gross shared information with the Board about a proposed land development plan in Lower Macungie Township on Alburtis and Orchard roads. It was brought to the Authority's attention that a company is proposing a truck storage and loading area, with the potential to install a bridge and fuel station, for Mack Trucks to transport trucks to other areas. The plan is proposing to make modifications to the 100-year floodplain of the Swabia Creek, and this area is within the Zone 2 Source Water Protection area for the Little Lehigh Creek source of water for the Allentown Division water system. A PowerPoint presentation showing maps of the area was reviewed.

Ms. Gross noted that Al Guiseppe from Spotts Stevens and McCoy (SSM) had reviewed the proposed development plan and provided a letter to the Authority detailing his concerns and noted that until we have more information as to the changes the developer wants to make to the floodplain, the Authority should object to the plan. The staff would like to present the letter from SSM along with additional concerns to the Lower Macungie Township staff as to the effects the plan will have on the water supply. Some discussion followed. The Lower Macungie Township zoning hearing board will hear information regarding the proposal at their June 26, 2018 meeting for approval of a special exception to change the floodplain.

Mike Siegel, a resident of the township and member of the township's environmental advisory council, said this development is a threat to the region's water supply stating the developer wants to

fill portions of the floodplain. Mr. Siegel provided additional information on the company that is proposing the land development plan and site.

Following additional discussion, the Board agreed with the staff's plan to send a letter to Lower Macungie Township stating the Authority's concerns and objection to the proposed plan.

Allentown Division – Kline's Island WWTP: Primary No. 2 Digester Miscellaneous Improvements

Phil DePoe gave an overview of the project scope that includes the installation of a roof-mounted scumbuster and related control panel, replacement of internal gas piping, replacement of other internal piping, addition of a new external stairway access to the digester building roof, and the installation of level sensor target plate.

Mr. DePoe is asking for approval of the Capital Project Authorization for the Construction Phase in the amount of $216,848.00 which includes the Professional Services Authorization to GHD Inc. in the amount of $14,862.00 and the General Contract Award to GM McCrossin, Inc. in the amount of $176,986.00.

On a motion by Linda Rosenfeld, seconded by Norma Cusick, the Board approved the Capital Project Authorization for the Construction Phase in the amount of $216,848.00 which includes the Professional Services Authorization to GHD Inc. in the amount of $14,862.00 and the General Contract Award to GM McCrossin, Inc. in the amount of $176,986.00 (6-0).

MONTHLY PROJECT UPDATES / INFORMATION ITEMS

Liesel Gross pointed out some items that will be on the agenda for upcoming meetings such as refinancing of the 2013C bond, approval of revised tapping fees, and the 2017 Audit and financial statements. Ms. Gross also called attention to the discussion item under Wastewater regarding the Suburban Division - SCARP. The Environmental Protection Agency (EPA) has asked for a joint submission by August 1, 2018 from all parties named in the Administrative Order (AO) to eliminate sanitary sewer overflows. EPA requested a Regional Flow Management Strategy which would include an operations and maintenance plan, inflow and infiltration reduction plans, flow modeling, and full cooperation of all parties. The fourteen municipalities named in the AO have been working cooperatively on this submission, which will be discussed at the June 25, 2018 Board meeting.

STAFF COMMENTS

None.

Richard Bohner commented on receiving the rate increase notice as a City Division customer and wanted to know how many calls the Authority received following distribution of the notice. Liesel Gross said that monthly billing notices were sent to all Allentown customers after the May 21, 2018 Board meeting and vote on this issue. Sue Sampson reported that less than a half dozen calls were received.

SOLICITOR'S COMMENTS

None.

PUBLIC COMMENTS / OTHER COMMENTS

None.

Chairman Nagle called a recess at 12:34 p.m. The meeting reconvened at 12:39 p.m.

EXECUTIVE SESSION

An Executive Session was held at 12:39 p.m. to discuss potential litigation. The Executive Session ended at 1:50 p.m.

ADJOURNMENT

There being no further business, the Chairman adjourned the meeting at 1:50 p.m.

Richard H. Bohner
Secretary

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MEMORANDUM

Date: June 18, 2018

To: LCA Board of Directors

From: Pat Mandes, Chief Compliance Officer
Liesel Gross, Chief Executive Office

Re: USEPA Administrative Order to Eliminate Sanitary Sewer Overflows
Submission of Regional Flow Management Strategy by August 1, 2018

In 2009, the US Environmental Protection Agency (EPA) issued an Administrative Order (AO) to the City of Allentown and all municipalities served by the Kline's Island Wastewater Treatment Plant to eliminate sanitary sewer overflows (SSOs). The original compliance deadline of December 31, 2014 was extended to December 31, 2017. This deadline was further extended to August 1, 2018 following additional discussion between the municipalities and the EPA and Pa. Department of Environmental Protection (DEP). This memo provides a brief background of the issue and the actions taken by LCA, the City and other responding municipalities leading up to this submission deadline.

At the June 25, 2018 Lehigh County Authority (LCA) Board meeting, we expect to review the documents that have been developed to date for the August 1st submission.

Background

Over the past 10 years, Lehigh County Authority and its municipal signatories – who formed a formal partnership called the Western Lehigh Sewerage Partnership (WLSP) in 2009 – have been systematically working toward addressing the dry- and wet-weather hydraulic restrictions in the system through flow modeling, inflow and infiltration (I&I) remediation work, conveyance capacity planning, and the construction of a flow equalization basin. The City and its other municipal signatories were working independently on similar activities until 2015 when more collaborative efforts were initiated.

Over the course of the past three years, the City, its signatories and the WLSP have been working to combine plans and programs into a more regional approach to addressing the SSOs in the Kline's Island Sewer System. Efforts to establish formal agreements regarding new cost-sharing methods for capital improvements were not successful, but the collaboration generally raised awareness of the need for all respondents to work together to establish shared goals and approaches.

As part of LCA's ongoing work with the WLSP, several presentations and reports were provided to the LCA Board, Lehigh County Commissioners, municipal boards/councils and other organizations about the work planned for the WLSP service area to address the problems. Solutions presented included two

phases of I&I source reduction within the municipal sewer collection systems, system rehab effectiveness metering and modeling, regional system upgrades (interceptors and pump stations), and significant capital investments to address conveyance capacity requirements to address both current wet-weather flows and future new development flows.

In November 2017, following meetings and correspondence with regulators, the City received a letter from EPA stating that the capital improvements it had been contemplating for the wastewater treatment plant – namely, the construction of blending facilities to treat peak flows delivered to the plant during severe rain events – would not constitute a long-term solution. In particular, EPA noted the progress made in the region to date to reduce SSOs, and asked for a plan to be submitted that focused on collection system rehabilitation and flow monitoring.

A subsequent meeting with all parties including EPA and DEP in March 2018 revealed that the AO may be terminated if the City, LCA, WLSP and other City signatories would work together to develop a regional flow management strategy. EPA requested the following critical elements be included in a joint submission by August 1, 2018:

- Collection System Operation and Maintenance (O&M)
- System Characterization
- I & I Removal
- Flow monitoring

Regional Flow Management Strategy

In response to EPA's request for a regional flow management strategy that focuses on the elements listed above, the fourteen municipalities named in the AO have worked collaboratively over the past three months to develop the following submission package, which will be finalized by August 1, 2018:

- Joint cover letter to EPA from the City of Allentown and LCA, as owner and operator of the Kline's Island Wastewater Treatment Plant and regional facilities

- Submission letter from each municipality indicating their commitment to participate in the regional flow management strategy

- Regional Flow Management Strategy (draft is attached for LCA Board review)

- Each municipality's O&M Plans (see Note 1 below)

- Each municipality's I&I Source Reduction Plan (see Note 2 below)

NOTE 1: LCA's O&M Plan will be available at the LCA Board meeting on June 25, 2018 and will include operations and maintenance details for the regional infrastructure (Western Lehigh Interceptor and

associated pump stations and relief interceptors) along with the sewer collections systems we own and operate in Upper Milford, Lowhill and Weisenberg townships.

NOTE 2: The I&I Source Reduction Plan for the WLSP is still under development, but will be a single submission for LCA and all of the WLSP partner municipalities. We will review this at the LCA Board meeting on June 25, 2018. The WLSP plan will contain details on the I&I rehabilitation work planned by Upper Macungie, Lower Macungie, Upper Milford, Weisenberg and Lowhill townships and the boroughs of Alburtis and Macungie, along with LCA's plans for conveyance capacity projects that are required to address both current wet-weather flows and future new development flows in the WLSP service area.

What's Next?

Following review of this work with LCA's Board, and other municipal reviews that may be conducted, each municipality will finalize all necessary components including their O&M plans and I&I Source Reduction Plans. LCA will compile all documents for delivery to EPA and DEP by August 1, 2018.

We expect EPA will review the Regional Flow Management Strategy and all the related municipal plans in the months that follow the submission. If this submission meets EPA's expectations, the regulators have indicated that the AO will be terminated and the enforcement of the program would revert to DEP's regulatory oversight process.

It is worth noting that while this program may satisfy EPA's AO requirements, subject to their review and feedback, the WLSP service area remains under the terms of DEP action requiring a formal connection management program and corrective action plan, which we have been calling the "SCARP" (Sewer Capacity Assurance and Rehabilitation Program). As a result, regardless of EPA's potential action to terminate the AO, LCA and the WLSP municipalities will continue to work collaboratively to address DEP's concerns and to plan for the future new connections that will occur in our service area. We expect to actively engage DEP in a dialog about how the SCARP and associated connection management plan will work moving forward. In particular, DEP will be asked to provide feedback and guidance on how the WLSP initiatives work in concert with infrastructure needs in other parts of the Kline's Island Sewer System that are not covered by the WLSP SCARP and connection management plan. This feedback will be required to guide regional Act 537 planning work, permit applications for new facilities, and the continued review of sewage planning modules in all portions of the Kline's Island Sewer System.

DRAFT

Kline's Island Sewer System Regional Flow Management Strategy

City of Allentown
Lehigh County Authority
South Whitehall Township
Coplay-Whitehall Sewer Authority
Salisbury Township
Borough of Emmaus
Hanover Township (Lehigh County)
Lower Macungie Township
Borough of Alburtis
Borough of Macungie
Upper Macungie Township
Lowhill Township
Weisenburg Township
Upper Milford Township

August 1, 2018

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Tables

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Appendices

Acronym List

AO	Administrative Order
CCTV	Closed Circuit Television
COA	City of Allentown
CWSA	Coplay Whitehall Sewer Authority
FEB	Flow Equalization Basin
I/I	Inflow and Infiltration
KISS	Kline's Island Sewer System
KIWWTP	Kline's Island Wastewater Treatment Plant
LCA	Lehigh County Authority
LF	Linear Feet
LMT	Lower Macungie Township
MGD	Million Gallons per Day
NWT	North Whitehall Township
O&M	Operations and Maintenance
PADEP	Pennsylvania Department of Environmental Protection
PTP	Pre Treatment Plant
PVC	Poly Vinyl Chloride Pipe
RCP	Reinforced Concrete Pipe
RDII	Rainfall Derived Inflow and Infiltration
SCARP	Sewer Capacity Assurance and Rehabilitation Program
SCPS	Spring Creek Pump Station
SRP	Source Reduction Program
SSES	Sanitary Sewer Evaluation Study
SSO	Sanitary Sewer Overflow
SWT	South Whitehall Township
UMT	Upper Macungie Township
UMiT	Upper Milford Township
USEPA	United States Environmental Protection Agency
VCP	Vitrified Clay Pipe
WLI	Western Lehigh Interceptor
WLSP	Western Lehigh Sewerage Partnership
WWTP	Wastewater Treatment Plant

1. Overview

1.1. Background

For purposes of this document, the City of Allentown (COA), Lehigh County Authority (LCA), and each party's respective municipal signatories, all of whom are named in the Administrative Orders addressed by this submission, are referred to as a "Signatory" or collectively as "Signatories."

In addition, LCA and its municipal signatories in 2009 entered into memorandum of understanding to form the Western Lehigh Sewerage Partnership (WLSP) to address these matters cooperatively where possible. Members of the WLSP are LCA, Upper Macungie, Lower Macungie, Upper Milford, Weisenberg and Lowhill townships, and the boroughs of Alburtis and Macungie. Some portions of this document and appendices refer to the WLSP's past or planned work to represent the collective work of the partnership.

Flow issues in the primary components of the Kline's Island Sewer System (KISS) and activation of the Kline's Island Wastewater Treatment Plant (KIWWTP) high flow bypass outfall (Outfall 003) led to USEPA to issue two Administrative Orders (2007 and 2009) and the Pennsylvania Department of Environmental Protection (PADEP) to cause implementation of a connection management program in portions of the system in 2009. Progress related to these three actions have been regularly reported to both agencies since 2010, both in written annual/semi-annual reports and in regular meetings. Signatories have offered several independent strategies and plans to USEPA and PADEP, several of which were received positively by the regulators. Consistent with the 2009 Administrative Order's requirement for cooperative management of flows, USEPA and PADEP have requested a Regional Flow Management Strategy developed in collaboration among the Signatories that guides the development and implementation of each Signatory's individual sewer I/I reduction plan.

The USEPA has identified the following as critical components of the Regional Flow Management Strategy:

- Collection System Operation and Maintenance
- System Characterization
- Inflow and Infiltration Removal
- Flow Monitoring

1.2. Purpose and Use

This Regional Flow Management Strategy is intended to guide the development and implementation of Signatories' individual sewer I/I reduction plans so that they provide results that support the achievement of both municipal and regional goals for sewer system performance. This Strategy reflects broad-based commitments of action, collaboration, and cooperation.

Each Signatory has prepared and included in the Appendices its own I/I Reduction Plan and Operation and Maintenance Plan.

Each Signatory will provide information to LCA (as the operator of the KIWWTP and most of the primary conveyance components of the KISS) to prepare any required regular and/or special progress reports as may be requested in the future by USEPA or PADEP.

2. Physical Inventory and Attributes

The KISS service area is shown in Figure 2-1. The KISS consists of 933 miles of sewer pipe from 14 municipal entities as shown in Table 2-1.

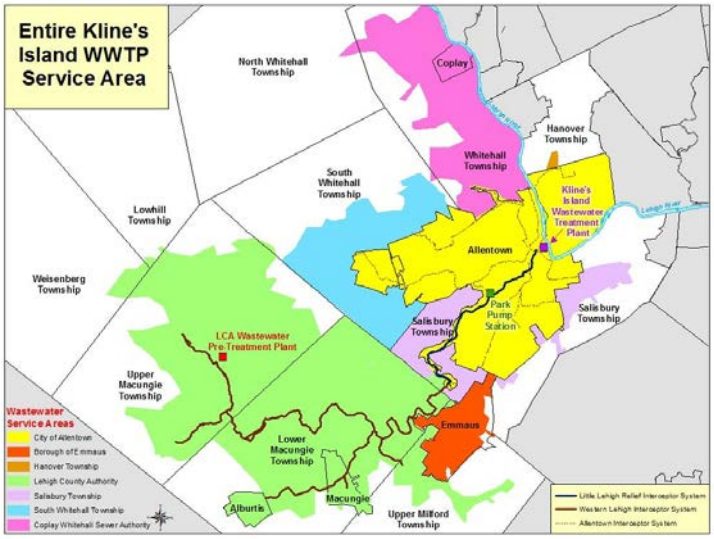


Figure 2-1 - KISS Service Area

Table 2-1 - Sewer Mileage per Signatory

SIGNATORY	Total Miles of Sewer	Percentage of Total
Allentown	**285**	**30.55%**
Coplay Whitehall	**125**	**13.40%**
Lower Macungie	**123**	**13.18%**
South Whitehall	**118**	**12.65%**
Upper Macungie	**117**	**12.54%**
Salisbury	**69**	**7.40%**
Emmaus	**45**	**4.82%**
LCA	**18**	**1.93%**
Macungie	**11**	**1.18%**
Alburtis	**8**	**0.86%**
Upper Milford	**8**	**0.86%**
Weisenburg	**4**	**0.43%**
Hanover	**1.8**	**0.19%**
Lowhill	**0.2**	**0.02%**

2.1. City of Allentown

The COA's KIWWTP and its tributary collection system has been in operation since 1929 protecting water quality and public health within the Lehigh Valley.

Beginning in the late 1950s and continuing through the late 1960s, COA entered into service agreements with surrounding municipalities and authorities for conveyance of wastewater through COA-owned trunk sewers and for treatment of wastewater at the KIWWTP. The first signatory agreement was executed with the Borough of Emmaus in 1959. Signatory agreements were subsequently executed with Coplay-Whitehall Sewer Authority, Salisbury Township and South Whitehall Township in 1965, and in 1969 a signatory agreement was executed with LCA. Due to the need to treat flow from the signatories together with growth within the city, the KIWWTP was expanded to an average flow capacity of 28.5 mgd in 1968 and to 40 mgd in 1978, which is the current average flow capacity of the KIWWTP. The corresponding peak flow capacity of the KIWWTP is 87 mgd.

The KIWWTP is comprised of the following major components: influent screens, main and auxiliary influent pumps, aerated grit chambers, primary clarifiers, intermediate pump station, plastic media trickling filters, intermediate clarifiers, rock media trickling filters, final clarifiers, chlorine contact tank and chlorine feed system, effluent pumping system, sludge pumping, sludge thickening, anaerobic digestion, sludge dewatering, and odor control facilities.

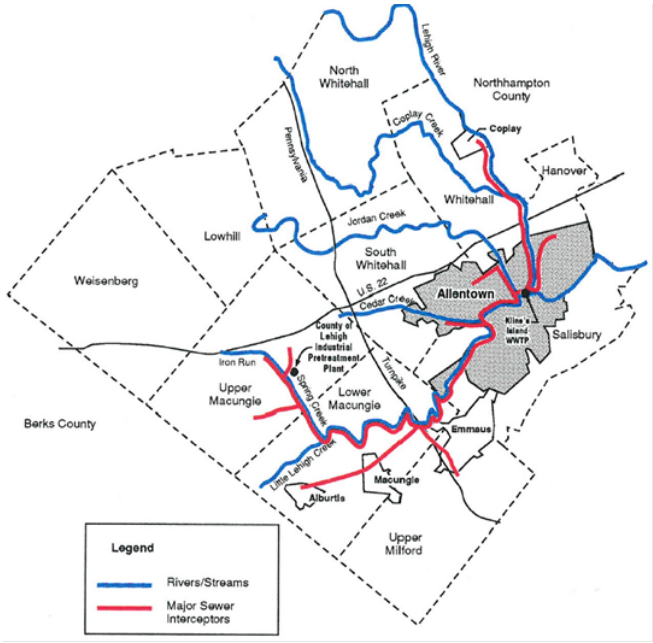
At the time the original signatory agreements were executed, wastewater was conveyed to the KIWWTP by a total of seven COA-owned trunk sewers:

- Lehigh River Trunk Sewer
- Front Street-Union Street Trunk Sewer
- Jordon Creek Trunk Sewer
- Little Lehigh Creek Trunk Sewer
- Emmaus Trunk Sewer
- Trout Creek Trunk Sewer
- District No. 29 Trunk Sewer

As a condition of the construction grant obtained in the mid-1970s to expand the KIWWTP's capacity from 28.5 mgd to 40 mgd, COA and the Signatories were required to perform Sewer System Evaluation Surveys (SSESs). As part of COA's SSES

performed during the period, the hydraulic conveyance capacity of each trunk sewer was calculated and compared to the estimated capacity required for the year 2025. Based on this analysis, the sewer signatories subsequently constructed the following relief sewers which are owned and operated by the signatories:

- LCA Little Lehigh Creek Relief Sewer
- South Whitehall Relief Sewer
- Salisbury Relief Sewer
- Coplay-Whitehall Lehigh Sewer
- Coplay-Whitehall Jordan Sewer



The collection system currently consists of: (1) 285 miles of COA-owned sewer pipe, of which 242 miles is 4 to 10-inches in diameter, 22 miles is 12 to 21-inches in diameter and 21 miles is 24 inches and larger in diameter; (2) 7,199 COA-owned manholes and 382 privately owned manholes; and (3) 33,359 connections to COA-owned sewers and 18 connections to privately owned sanitary sewers. The table below presents a detailed breakdown of sanitary sewers by diameter and length

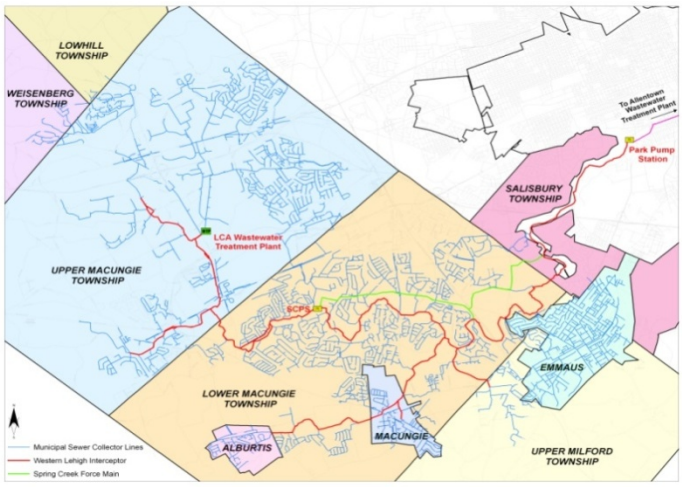
Table 2-2 - COA Sewer Inventory

Sewer Diameter (inches)	Sewer Length (feet)	Sewer Diameter (inches)	Sewer Length (feet)
4	10	21	11,566
6	1,745	24	53,805
8	1,155,844	27	10,026
10	117,748	30	9,891
12	34,165	33	2,017
14	1,517	36	28,613
15	31,579	39	1,922
16	703	42	4,977
18	34,613	54	245
20	2,577	60	936

Sewer pipe type includes reinforced concrete, vitrified clay, polyvinyl chloride (schedule 40, SDR 26 and SDR 35), cast iron, ductile iron, terra cotta, and reinforced poured in place concrete with tile floor.

2.2. Lehigh County Authority

In 1972, Lehigh County and LCA placed into service a sanitary sewer interceptor system in western Lehigh County to convey wastewater from the Boroughs of Alburtis and Macungie and the Townships of Upper and Lower Macungie to Allentown's Allentown/Emmaus Interceptor. Today, the system additionally serves portions of the Townships of Weisenberg, Upper Milford, and Lowhill, and portions of the Borough of Emmaus. The interceptor system, known as the Western Lehigh Interceptor (WLI), consists of 18 miles of gravity sewers ranging in size from 8-inch to 36-inch diameter pipe, one relief pumping station and force main (Spring Creek Road Pump Station), and five meter stations. Wastewater from the WLI discharges into the Allentown/Emmaus Interceptor at Keck's Bridge. The Allentown/Emmaus Interceptor flows from Keck's Bridge to its downstream confluence with the Cedar Creek Interceptor and Little Lehigh Interceptor. The Little Lehigh Interceptor begins at this confluence and serves as the final conveyance step in the transport of wastewater to KIWWTP. The Allentown/Emmaus Interceptor, Cedar Creek Interceptor, and Little Lehigh Interceptor are owned by Allentown.



In 1981, Allentown compelled LCA to remove a portion of LCA's peak wet weather flows from Allentown's Little Lehigh Interceptor. LCA built and now operates and maintains relief facilities along the Little Lehigh Creek to address intermittent hydraulic overloading of the Little Lehigh Interceptor: Park Pump Station and Force Main, and the Keck's Bridge Relief Interceptor between Keck's Bridge and Park Pump Station. The Park Pump Station and Force Main were placed in operation in the fall of 1983 to supplement capacity in the Little Lehigh Interceptor and pump it through a force main to a location approximately 1000 linear feet (lf) upstream of the KIWWTP. In August 1986, LCA completed construction of the Keck's Bridge Relief Interceptor to relieve overflows during storm events in existing interceptors in the Keck's Bridge area and to allow for future development in LCA service areas. The capacity of Park Pump Station was increased in 1986 to accommodate additional flows from the Keck's Bridge Relief Interceptor.

In 1998, the Spring Creek Pump Station (SCPS) began operation. This relief pumping system includes 2,500 feet of 20-inch diameter force main and 11,900 feet of 24-inch

diameter force main which bypass approximately 24,000 linear feet of the WLI in Lower Macungie Township. The pump station is designed to pump up to 7 MGD during peak flow periods typically associated with severe rain events.

In 2005, the SCPS force main was extended through the installation of 19,250 LF of 24-inch force main from Millrace Road to connect with the 42-inch Little Lehigh Relief Interceptor near the intersection of Devonshire Road and Keystone Avenue (approximately 2,000 feet downstream of Keck's Bridge. This extension relieved hydraulic loading on that section of the WLI between manholes L-66 and L-1.

LCA also operates a pretreatment plant (PTP) in Upper Macungie Township that treats the industrial wastewater from the Fogelsville industrial corridor in the upper quarter of the LCA service area as well as the residential wastewaters from the areas upstream of the pretreatment plant.

In 2009, LCA built a 3 MG Flow Equalization Basin (FEB) immediately upstream of the PTP to capture and hold increased flows during significant rain events. Since then, this concrete above ground tank has been responsible for most of the improvement in wet weather performance in LCA's WLI and in Allentown's Little Lehigh and Jordan Creek Interceptors.

2.3. South Whitehall Township

The sanitary sewer system is operated under the jurisdiction of the Township Board of Commissioners.

The oldest portions of the sewage collection system date to the mid-1930s. Sewer pipe materials include Vitrified Clay Pipe (VCP), concrete, cast iron, ductile iron, and PVC. The system serves approximately 6,700 customers and includes nearly 118 miles of sanitary sewer pipe ranging in size from 6 to 30-inches in diameter. All sewage flows through the system by gravity – the Township does not own or operate any sewage pumping stations. The system is currently arranged into six (6) sub-basins, and each is metered for billing purposes, as well as to monitor inflow and infiltration. All flow from the Township (except for one drainage area that flows through the Coplay-Whitehall Sewer Authority system) is transported directly to the City of Allentown sewage collection system for ultimate treatment at the Kline's Island WWTP.

The sanitary sewer collection system is maintained by the Township Public Works Department. Employees routinely flush and televise the sewer mains looking for defects, grease, and root blockages. When a problem is discovered, the crew uses a pressurized water jet flusher to eliminate the grease and blocks, and debris is vacuumed for later disposal. When defects in pipes or manholes are identified, they are prioritized for repair

depending on severity. Township staff is available on a 24-hour basis each day of the week to respond to any emergency situation in the sewage collection system.

2.4. Coplay-Whitehall Sewer Authority

The Coplay Whitehall Sewer Authority (CWSA) is a Pennsylvania Municipal Authority created in 1963 by Whitehall Township and the Borough of Coplay under the Pennsylvania Municipal Authorities Act of 1945, as amended. The sole purpose for the CWSA's creation is to provide public sanitary sewer service to the customers (currently 13,850) located within the Whitehall Township / Coplay Borough service area. The CWSA's system is a collection and conveyance system which by Inter-municipal Agreements connects to the City of Allentown's conveyance system for treatment of its effluent at the KIWWTP. The Authority is governed by a 7 member Board, 4 members appointed by Whitehall Township and 3 members appointed by Coplay Borough.

The CWSA's original system was constructed during 1965 and 1966 and for the most part consists of 8-inch diameter vitrified clay (VCP) collection mains and reinforced concrete pipe (RCP) interceptors. Since completion of the original system in 1966, there have been system additions constructed by the CWSA through Act 537 Plans, and main extensions by Developers that were then turned over to the CWSA for future maintenance and repair as required. CWSA's system currently includes 3,311 manholes, 1 pumping station, and 124.80 miles of pipe ranging in size from 6-inch to 36-inch in diameter. Sewer pipe type includes vitrified clay, reinforced concrete, polyvinyl chloride (schedule 40, SDR 35 and SDR 26,) cast iron, ductile iron and reinforced concrete cylinder pipe.

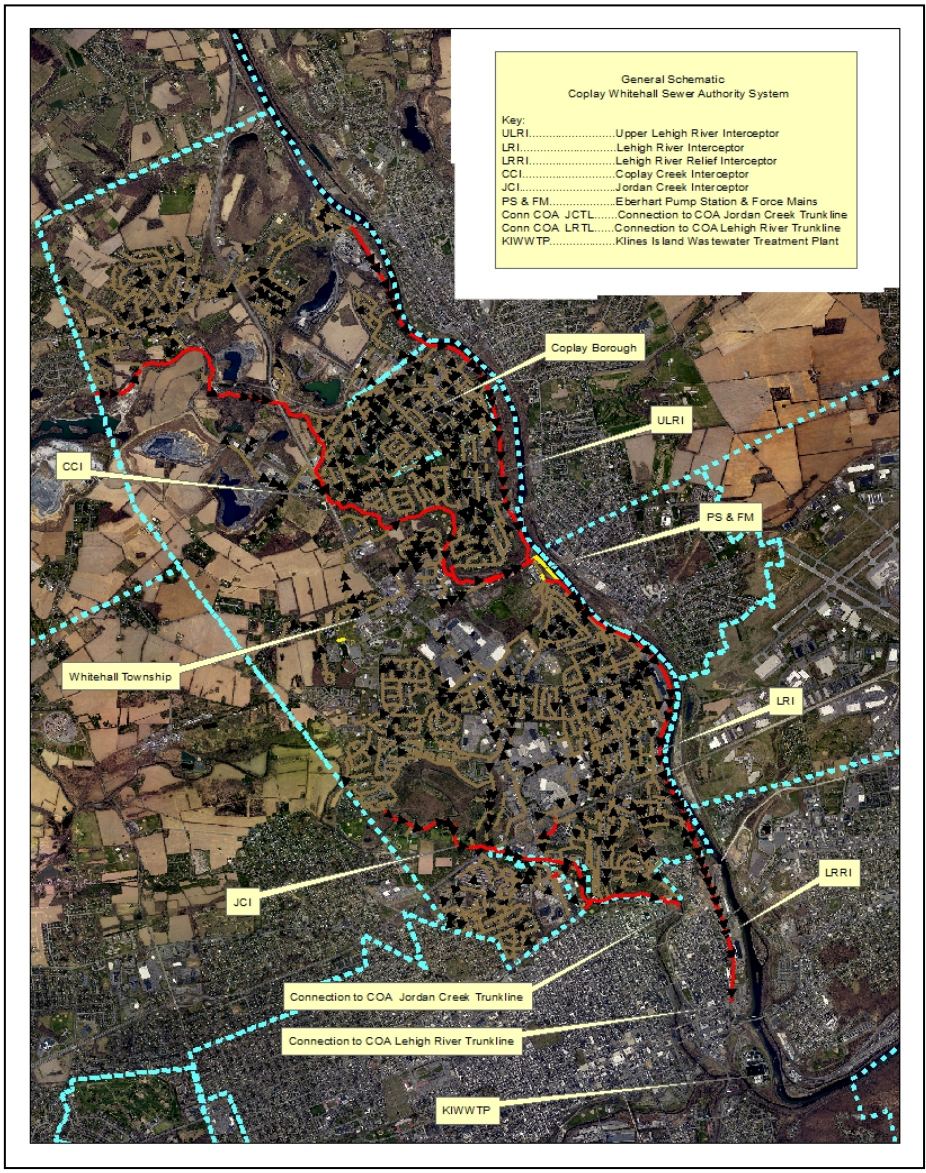


Figure 2-2 - CWSA Service Area

Table 2-3 - CWSA Sewer Inventory

Pipe Diameter (inches)	Pipe Length (Feet)	Pipe Length (Miles)
6	345	0.065
8	551,105	104.376
10	18,610	3.525
12	7,925	1.501
15	3,113	0.590
16	4,938	0.935
18	31,974	6.056
20	4,388	0.831
24	8,695	1.647
27	9,415	1.783
30	14,353	2.718
36	4,082	0.773
Total	658,943	124.800

In addition to the typical 8-inch VCP and PVC collector mains, the CWSA's system includes the following key conveyance components:

- Jordan Creek Interceptor & Metering Station
- Coplay Creek Interceptor
- Lehigh River Interceptor & Metering Station consisting of different sections as follows:
    - Lehigh River Relief Interceptor
    - Lehigh River Interceptor
    - Upper Lehigh River Interceptor
- Eberhart Pump Station & Force Main

The CWSA has entered into Inter-Municipal Agreements with neighboring South Whitehall Township (SWT) and North Whitehall Township (NWT), which provide for the connection to CWSA's system for conveyance of effluent originating from sections of each of these Townships through the CWSA system for treatment at the KIWWTP. SWT

and NWT each have two connections to the CWSA System. SWT connects to CWSA at the SWT's Jonathan and Quail Metering Stations and then utilize CWSA's Jordan Creek Interceptor. NWT connects to the CWSA System at the Quarry and Omrod Metering Stations and then discharge to CWSA's Coplay Creek Interceptor.

The Eberhart Pump Station is located midway along the Lehigh River Interceptor. The Coplay Creek Interceptor and Upper Lehigh River Interceptor flows are tributary to the Eberhart Pump Station, and these flows are then pumped and discharged to the Lehigh River and Lehigh River Relief Interceptor and connect to the COA's Lehigh River Trunk line and ultimately to the KIWWTP. The second CWSA connection to the COA is through the CWSA's Jordan Creek Interceptor to the COA's Jordan Creek Trunkline. The CWSA does not utilize any section of the Western Lehigh Interceptor or any other facilities owned by others that service the western portion of Lehigh County.

2.5. Salisbury Township

The Township of Salisbury is a first-class Township located in the south-central part of Lehigh County and is separated into two unconnected parcels due to annexation in the early 1900's. The Township has a population of approximately 13,501 based on the latest census and covers 11.3 square miles. The Township is generally characterized as a residential community with selected areas designated for commercial and industrial development. The remaining areas are reserved for parks, recreation or public use.

The Township of Salisbury owns, operates and maintains a sanitary sewer collection system under direct control of the Township elected five-member Board of Commissioners. The Township's sanitary sewer system serves approximately 4,381customers and is comprised of approximately 358,912 linear feet of gravity sewer pipe ranging in size from 8-inch to 18-inch in diameter. The sewer system utilizes two sewage pump stations and approximately 4,681 linear feet of 4", 6" and 8" force main to transport flow from low lying areas to the gravity mains, as well as, 335 linear feet of 1-1/2-inch low pressure sewer main. The majority of the developed areas of the Township are served by public sewer service. Most of the Township's sewage is treated KIWWTP.

2.6. Borough of Emmaus

The Borough of Emmaus is governed by a seven member Borough Council. The Borough covers approximately 2.9 square miles and is located in the south-central portion of Lehigh County. The Borough's municipal neighbors include the City of Allentown and the Townships of Lower Macungie, Salisbury, and Upper Milford. The Borough's population is 11,211, as of the 2010 census. Land use in the Borough of Emmaus is

mostly residential, although it does include a significant number of retail/commercial businesses and industrial uses, along with park and conservation areas. There is limited open land area in the Borough available for new development, but there are many opportunities for modernizing and/or re-purposing of existing developed property.

The Emmaus sewer system currently serves approximately 3,958 residential, 280 commercial, 51 industrial, and 15 municipal connections. The sanitary sewer system is owned by the Borough and operated by the Public Works Department under a full time Borough Manager and a full time Public Works Director.

The Emmaus sewer system consists of approximately 45 miles of 8-inch to 15-inch gravity collector sewers and approximately 5 miles of 18-inch to 24-inch gravity interceptor sewers. The system includes approximately 1,045 manholes. The original 1961 sewer lines were constructed with 5-foot sections of gasket joint vitrified clay pipe (VCP) and 4-foot diameter precast concrete manholes. Beginning in the 1970s, pipe extensions were constructed using 18-foot sections of polyvinyl chloride (PVC) gasket joint pipe.

There are two small areas of the Borough that are served by low pressure sewer systems. In these areas, grinder pumps, owned by the individual customers, discharge their flow to the gravity collector sewer system via small diameter low pressure lines. There are no publicly owned pump stations in the Emmaus sanitary sewer system.

There is a Borough-owned sewage meter station located at the downstream end of each of four primary gravity flow basins. Due to geographical constraints, wastewater from a small number of Borough customers does not flow through the master sewer meters but drains directly to downstream systems owned by Salisbury Township, Lehigh County Authority, or the City of Allentown. Similarly, flow from several properties in the surrounding townships is transported through the Borough system to downstream interceptors. The accounting of these flows for inter-municipal transportation and treatment billing is handled administratively.

2.7. Borough of Alburtis

The Borough of Alburtis is governed by a seven member Borough Council. The Borough covers approximately 0.7 square mile and is located in the southwestern portion of Lehigh County. It is surrounded by Lower Macungie Township. The population is approximately 2,300 based on current census data. The Borough is characterized generally as a residential community although it does support retail commercial business and industrial districts. A general breakdown of land use based on zoning districts indicates residential development accounts for about 75% of the land use while

commercial and industrial accounts for about 20% of the land use. The remaining 5% is used for community facilities and parks.

The Borough of Alburtis sanitary sewer system is owned by the Borough of Alburtis. The collector system comprises approximately 8.04 miles of sanitary sewer pipe. The sewer system serves approximately 60% of the Borough and contains 42,480 linear feet of 8-inch through 12-inch sewer main and 220 manholes and one wastewater pumping station. The initial sanitary sewer system was constructed between 1968 and 1972. Extensions to the public sewer system were added primarily by development growth over the years accounting for its present size. Currently the Borough system customer base consists of 929 residential, 26 commercial and 1 Industrial customer.

The Borough sewer system drains to the Alburtis-Macungie Trunkline into the WLI to KIWWTP.

2.8. Borough of Macungie

The Borough of Macungie is governed by a seven member Borough Council. The Borough covers approximately 1.0 square mile and is located in the southwestern portion of Lehigh County. It is primarily surrounded by Lower Macungie Township except on the south side where it borders Upper Milford Township. The population of the Borough is 3,074 based on the 2010 census. The Borough is characterized generally as a residential community although it does support retail commercial business and industrial districts. A general breakdown of the Borough land use based on zoning districts indicates residential development accounts for about 75% of the land use while commercial and industrial accounts for about 18% of the land use. The remaining 7% is used for community facilities and parks.

The Borough of Macungie sanitary sewer system is owned and operated by the Borough. The collector system comprises approximately 11.4 miles of sanitary sewer pipe. The sewer system contains 60,330 linear feet of 8-inch through 10-inch sewer main and 315 manholes. The initial sanitary sewer system construction began in 1968 and was completed in 1972. Extensions to the public sewer system were added primarily by development growth over the years accounting for its present size. Currently the Borough system customer base consists of 1654 residential, 83 commercial and 3 Industrial customers.

The Borough sewer system drains to the Alburtis-Macungie Trunkline into the WLI to KIWWTP.

2.9. Lower Macungie Township

Lower Macungie Township (LMT) is a first class township governed by a five member Board of Commissioners. LMT covers 22.46 square miles and is located in the southwestern portion of Lehigh County. The population, based on current information available, is 31,964. LMT is characterized as a residential suburban community. A general breakdown of LMT land use based on zoning districts indicates residential development accounts for about 34% of the land use while commercial and industrial development makes up about 19%. The remaining 48% is divided among agriculture and public uses or is undeveloped.

The LMT sanitary sewer system is owned and operated by Lower Macungie. The collector system comprises approximately 126 miles of sanitary sewer pipe. The sanitary sewer system based on the current Act 537 boundary serves approximately 78% of LMT and contains approximately 666,800 linear feet of 8-inch through 16-inch sewer main and 3,500 manholes. There are no pumping stations in the LMT sewer system. The original sanitary sewer system was constructed in 1968 and completed in 1972. Extensions to the public sewer system were added over the years by various LMT sponsored projects as well as through development growth which accounts for its present size. Currently the LMT system customer base consists of 8,971 residential and 24 commercial/industrial customers.

Most of the LMT sewer system drains, through a number of connection points, into the WLI to KIWWTP. There are several connection points in the LMT system that drain to either the South Whitehall Township or Salisbury Township sanitary sewer systems.

2.10. Upper Macungie Township

Upper Macungie Township (UMT) is a second class Township governed by a three member Board of Supervisors. UMT covers 26.24 square miles and is located in the western portion of Lehigh County. The population, based on current information available, is approximately 23,884. A general breakdown of the land use within UMT shows that residential development accounts for about 23% of its land use while commercial and industrial development make up about 31% with the remaining 46% of the land divided among agriculture and public uses or is undeveloped.

The UMT sanitary sewer system is owned and operated by Upper Macungie Township. Note that the former Upper Macungie Township Authority (UMTA) was an operating authority which owned and operated the UMT sewer system at the time of issuance of the Administrative Order, but was subsequently dissolved in 2016. The collector system comprises approximately 157 miles of sewer pipe and includes six wastewater pumping stations. The sanitary sewer system based on the Act 537 boundary serves approximately

64% of UMT and contains approximately 829,000 linear feet of sewer pipe, 3,200 manholes, and six pumping stations and appurtenances. The original sanitary sewer system was installed in 1968 and was completed in 1972. Extensions to the public sewer system were added over the years by various UMT/UMTA projects as well as through development growth in UMT which accounts for its present size. Currently the UMT system customer base consists of 6,498 residential, 373 commercial and 8 industrial customers.

Most of the UMT sewer system drains, through two connection points, into the WLI to KIWWTP.

2.11. Lowhill Township

Lowhill Township is located the northwestern section of Lehigh County, adjoining Weisenberg and Upper Macungie Townships. In June of 2016, the sanitary sewer system in Lowhill Township was acquired by LCA, who now owns and operates the system. A service agreement has been executed with Upper Macungie Township Authority to allow the flow of wastewater through their system to the WLI. The Lowhill Township system consists of 3,052 feet of 8-inch PVC gravity pipeline and 587 feet of 2-inch PVC force main through which 43 connections discharge into the Upper Macungie Township collector system and ultimately into the LCA WLI system.

2.12. Weisenberg Township

Weisenberg Township is located in the northwestern section of Lehigh County, adjoining Lowhill and Upper Macungie Township. The sanitary sewer system in Weisenberg Township is owned and operated by LCA. In an agreement dated April 19, 1990, Weisenberg Township designated LCA as the operating agent for the Pointe West and Pennsylvania State University wastewater systems in the Township. Also in an agreement with Upper Macungie Township dated April 19, 1990, Upper Macungie Township agreed to accept the wastewater from the Pointe West Development. The agreement provided for repair and/or elimination of I/I by Weisenberg Township.

In an agreement dated April 22, 2002, the Township conveyed ownership of the wastewater systems to the LCA.

There are 149 customers being served in Weisenberg Township with a system consisting of almost 21,000 feet of pipeline which discharge flows through Upper Macungie Township and the WLI to KIWWTP. Over 97% of the system is 8-inch pipe and 3% is

2-inch force main. The system is 99% PVC and 1% DIP. No new connections are expected within Weisenberg Township.

2.13. Upper Milford Township

Upper Milford Township (UMiT) is located in southern Lehigh County, adjoining Emmaus Borough, Lower Macungie Township and the Borough of Macungie. The sanitary sewer system in UMiT is owned and operated by LCA pursuant to a sewer service agreement dated January 1, 1982. UMiT designates the areas of the UMiT where sewer service will be provided and approves the allocation granted.

Currently, there are over 800 customers being served in the UMiT sewer system consisting of over 70,000 feet of pipe, including 29,000 lf of low pressure pipe installed to serve the Vera Cruz area of the Township. Over 55% of the system is 8-inch pipe, 45% is either 2-inch force main, low pressure force main, or 10-inch. The system is 95% PVC and the remainder is DIP. The majority of the system was constructed in the 1980s with the low pressure system constructed in 2012 and 2013. The system consists of collection systems discharging into the Emmaus Borough system, into the Lower Macungie Township system and into the WLI to KIWWTP.

2.14. Hanover Township

Hanover Township, Lehigh County is a Home Rule Township governed by a five member Board of Supervisors. The Township covers 4.25 square miles and is located in the northeastern portion of Lehigh County. The population, based on current information available, is approximately 1,571. A general breakdown of the land use within Hanover Township, Lehigh County shows that the Lehigh Valley International Airport covers 52% of the Township, and the remainder is predominantly commercial and industrial. The residential portion is minimal and houses 426 residential units with one apartment complex with 240 units.

The Township sewer system connected to the KISS services the southern portion of the Township and discharges to the COA sewer system through one metering station located at 700 Lloyd Street, Allentown PA.

The Hanover Township, Lehigh County sanitary sewer system is owned and operated solely by Hanover Township, Lehigh County and is administered by the Council of Hanover Township, Lehigh County. The collector system comprises approximately 1.8 miles of sewer pipe and includes one metering station. The sanitary sewer system based on the Act 537 boundary serves approximately 30% of Hanover Township, Lehigh

County and contains approximately 9,448 linear feet of sewer pipe. This area of the Hanover Township, Lehigh County sewer system drains, through one connection point, into the City of Allentown conveyance system, which in turn flows through City wastewater treatment facility. The flows through the one metering point are approx. 45,000 gallons per day.

There have been no extensions to the public sewer system over the recent years, which accounts for its present size. Hanover Township does expect future projects that will require an extension of the system which would provide more flow through the system. Currently the Hanover Township, Lehigh County system customer base consists of 15 residential, 240 apartment units and 22 commercial customers.

3. System Flow Characterization

3.1. Past Flow Characterizations

Flow and rainfall data were collected in Allentown in 2008 and used to calibrate a hydraulic planning model of the City of Allentown sewer system.

Flow and rainfall data were collected by the WLSP in 2009 and used to calibrate a hydraulic planning model of the WLSP sewer system. Figure 3-1 displays the locations of the gravity flow monitors and rain gauges, as well as the pump stations and municipalities' boundaries.

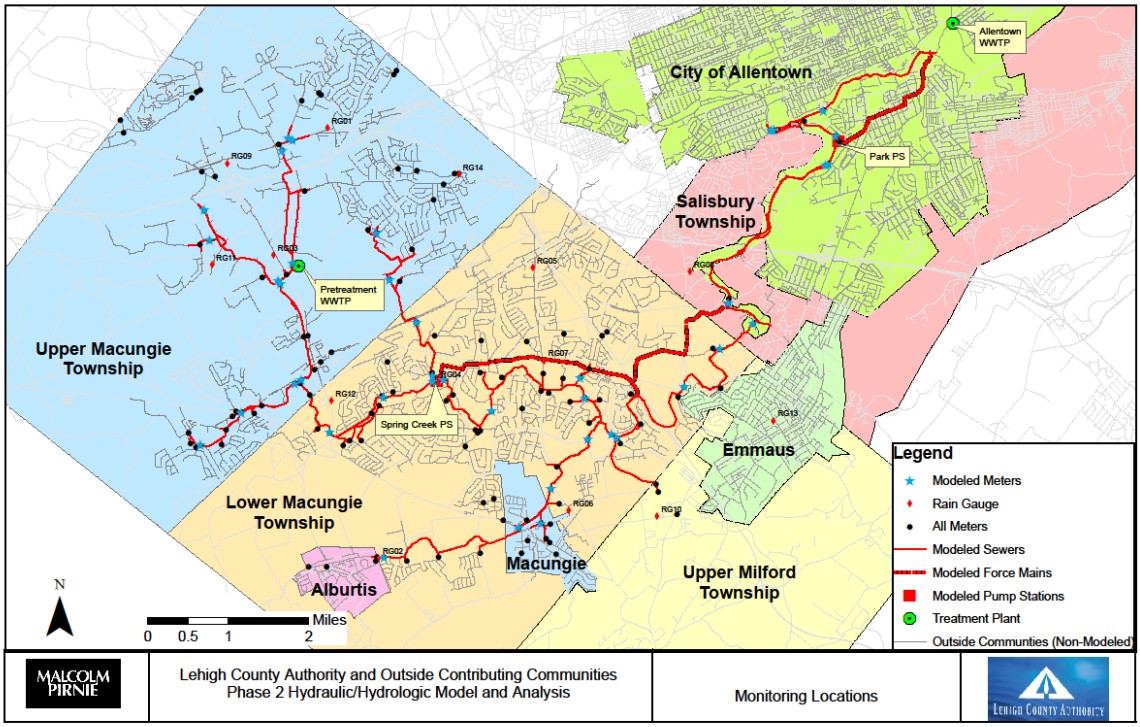


Figure 3-1: Monitoring Locations for the WLSP's Sanitary Sewer System

In 2014, the WLSP planning-level model was combined with the Allentown hydraulic model to create a single hydraulic model called the Kline's Island Sewer System (KISS) Model. This model confirmed that portions of the primary conveyance components were experiencing high hydraulic grade lines in conveying dry-day flows and, accordingly, had limited ability to convey significant peak wet-weather flows. It should be noted that while this modeling work was completed in 2014, it used data gathered in 2008 and 2009, which must be updated to reflect updated system conditions since that time. See Section 3.4 for more details on Flow Characterization Updates planned as part of this strategy.

3.2. I/I Reduction Since 2009

All Signatories have conducted I/I identification and reduction activities since 2009. These have been detailed in the semiannual reports to USEPA. As EPA stated in their letter of November 2, 2017, the "ongoing efforts to reduce inflow and infiltration (I/I) and to generally upgrade and maintain the infrastructure in the area served by Kline's Island have been effective."

3.3. Permanent Flow Monitoring (Sewer Billing Meters)

There are 33 permanent meters at the municipal boundaries that have historically been used for billing purposes. These sewer billing meters (SBM) are owned and operated by the individual Signatories. These meters provide jurisdictional level monitoring of dry-day and wet-weather sewage flows for the City and its Signatories which will be used for system characterization, ongoing flow management, RDII analysis, and model recalibration efforts. These meters use a wide variety of metering technologies and data capture systems, and some meter stations may need to be updated. Cooperative efforts are underway to ensure SBM accuracy and develop protocols for installation upgrades, data capture, reporting for billing purpose, and for reporting for wet-weather events that produce flows at the KIWWTP greater than 60 MGD.

3.4. Flow Characterization Updates

Additional development flows have been added to the KISS by all Signatories since the last system flow characterization in 2008. Additionally, source reduction and capacity improvements that improve levels of protection and reduce the frequency of SSOs have also been undertaken. An updated flow characterization of the primary KISS components is necessary to understand the current average dry day and peak wet weather flow demands on the primary regional conveyance components of the KISS. The primary KISS components are:

- LCA FEB
- Western Lehigh Interceptor
- Spring Creek Pump Station
- Park Pump Station
- Allentown Emmaus Interceptor
- Little Lehigh Relief Interceptor
- Little Lehigh Interceptor
- Jordan Creek Parallel Interceptor
- Main KIWWTP Lift Station
- Cedar Creek Interceptor
- South Whitehall Relief Interceptor

- Jordan Creek Trunk Sewer
- Lehigh River Trunk Sewer
- District 29 Trunk Sewer
- Trout Creek Trunk Line
- Salisbury Relief Sewer

This flow characterization work will:

- Quantify the dry- and wet-day impacts of new development flows added since 2008
- Quantify the dry- and wet-day effectiveness of the I/I reduction work conducted since 2008
- Quantify the dry- and wet-day effectiveness of capacity improvements made since 2008

To accomplish this, a program of flow monitoring, rainfall monitoring, future flow projections, and dynamic hydraulic modeling will be conducted. Much of the metering needed for this work can be provided by the Signatories' SBMs provided they are capable of meeting the data quality objectives. This monitoring and modeling work is expected to take 18 months to complete, with the majority of this time dedicated to flow data collection to recalibrate the KISS Model. This completion time frame assumes adequate rainfall and antecedent precipitation conditions will occur during this time period.

This Flow Characterization Update will be conducted as soon as possible, but will begin no sooner than 2019 to allow for the prioritized SBM evaluations and upgrades described in Section 3.3 to be completed. If any SBMs are unable to be upgraded in time for this Flow Characterization Update to begin, temporary flow meters will be used to capture flows at the jurisdictional level.

A similar flow characterization update as described above will also be undertaken at some future date to be determined based on the success of the SRPs and other I/I remediation efforts, future flows, possible SSOs, and other factors. This future flow characterization update will provide information critical to the determination of need, size, and extent of future capital improvements needed at KIWWTP or the conveyance system.

3.5. Anticipated Growth and Impact on Dry and Wet Weather Flows

Flow projections will be added to the KISS Model to evaluate depth of dry and wet weather flows within the various primary conveyance components of the KISS. Concurrent with the flow metering and modeling, sewage growth forecasts for all areas served by the KISS will be conducted by each of the Signatories in conjunction with modeling efforts.

4. Operations and Maintenance Programs

Each of the Signatories has developed an Operations and Maintenance (O&M) Plan for its individual sewer system. These O&M Plans ensure that the I/I Source Reduction Plans are integrated with supporting operation and maintenance strategies to maximize the life cycle of critical assets and to minimize maintenance-related overflows. The goal of these O&M Plans is to:

- Maintain the intended hydraulic level of protection and level of service in the sewers.
- Mitigate the impact of sanitary sewer overflows when they do occur.
- Achieve these goals in the most economically efficient and sustainable manner possible.

The O&M program components vary between Signatories because of differences in sewer inventory. Where applicable, the O&M Plans cover:

- Pump stations and force mains
- Gravity sewers
- Laterals
- Lower pressure sewers

Within each O&M Plan section, the following topics are generally covered:

- Purpose
- Overview
- Goals and Performance Measures
- Preventative Maintenance
- Reactive Maintenance
- SOPs
- Equipment and Spare Parts
- Staffing
- Information Management

The individual Signatory O&M Plans are in the Appendices.

5. Inflow and Infiltration Source Reduction Programs

Each of the Signatories has developed an Inflow and Infiltration Source Reduction Plan (SRP) for its individual sewer system. The goal of these SRPs is to:

- Define excessive inflow and infiltration
- Identify and locate sources of excessive inflow and infiltration
- Reduce sources of excessive inflow and infiltration in sewer collection systems through rehabilitation of sewer mains, taps, laterals, cleanouts, manholes, and manhole covers/frames
- Reduce sources of excessive inflow and infiltration by eliminating private property clearwater connections and reducing leakage in upper laterals
- Achieve these goals in the most economically efficient and sustainable manner possible.

SRP projects vary between Signatories because of differences in sewer inventory, leakage sources, and preferred rehabilitation and programmatic approaches. Within each SRP Plan is listed each Signatory's anticipated SRP projects, along with anticipated purpose, scope, cost, schedule, and effectiveness, where known.

The individual Signatory SRPs are in the Appendices.

6. Progress Reporting

6.1. Annual Progress Reports

Each Signatory will report its activities and progress individually to LCA by March 1st for compilation into the annual PADEP Chapter 94 report.

Appendix A: CITY OF ALLENTOWN O&M PLAN

Appendix B: LCA, LOWHILL, WIESENBURG, AND UPPER MILFORD O&M PLAN

Appendix C: SOUTH WHITEHALL TOWNSHIP O&M PLAN

Appendix D: COPLAY-WHITEHALL SEWER AUTHORITY O&M PLAN

Appendix E: SALISBURY TOWNSHIP O&M PLAN

Appendix F: BOROUGH OF EMMAUS O&M PLAN

Appendix G: BOROUGH OF ALBURTIS O&M PLAN

Appendix H: BOROUGH OF MACUNGIE O&M PLAN

Appendix I: UPPER MACUNGIE TOWNSHIP O&M PLAN

Appendix J: LOWER MACUNGIE TOWNSHIP O&M PLAN

Appendix K: HANOVER TOWNSHIP O&M PLAN

Appendix L: CITY OF ALLENTOWN I/I SOURCE REDUCTION PLAN

Appendix M: WESTERN LEHIGH SEWER PARTNERSHIP SEWER CAPACITY AND REHABILITATION PROGRAM IMPLEMENTATION PLAN

Appendix N: SOUTH WHITEHALL TOWNSHIP I/I SOURCE REDUCTION PLAN

Appendix O: COPLAY-WHITEHALL SEWER AUTHORITY I/I SOURCE REDUCTION PLAN

Appendix P: SALISBURY TOWNSHIP I/I SOURCE REDUCTION PLAN

Appendix Q: BOROUGH OF EMMAUS I/I SOURCE REDUCTION PLAN

Appendix R: HANOVER TOWNSHIP I/I SOURCE REDUCTION PLAN

LEHIGH COUNTY AUTHORITY

FINANCIAL REPORT – MAY 2018

SUMMARY

MONTH				YEAR-TO-DATE			FULL YEAR		
Actual	Forecast	FC Var	MAY 2018	Actual	Forecast	FC Var	Forecast	Budget	Variance
			Income Statement						
126,935	30,357	96,578	Suburban Water	58,637	(45,143)	103,780	(303,499)	(305,584)	2,085
271,073	197,125	73,948	Suburban Wastewater	1,534	(89,229)	90,763	890,202	883,715	6,487
(767,005)	(802,973)	35,968	City Division	(1,733,129)	(1,787,441)	54,312	(8,374,568)	(7,267,990)	(1,106,578)
(368,998)	(575,492)	206,494	Total LCA	(1,672,958)	(1,921,813)	248,855	(7,787,864)	(6,689,859)	(1,098,005)
			Cash Flow Statement						
(607,974)	(831,305)	223,332	Suburban Water	1,237,651	233,903	1,003,748	881,946	(4,392,584)	5,274,530
111,504	(199,419)	310,923	Suburban Wastewater	2,001,649	1,500,222	501,427	5,295,164	(2,751,285)	8,046,449
1,119,368	236,423	882,945	City Division	5,420,442	4,303,583	1,116,859	(3,032,716)	(5,085,490)	2,052,774
622,898	(794,302)	1,417,200	Total LCA	8,659,742	6,037,707	2,622,035	3,144,394	(12,229,359)	15,373,753
			Debt Service Coverage Ratio						
2.21	1.69	0.52	Suburban Water	1.40	1.32	0.08	1.35	1.24	0.11
12.58	10.66	1.92	Suburban Wastewater	7.61	7.13	0.48	9.07	8.95	0.12
1.15	1.03	0.12	City Division	1.47	1.43	0.04	1.27	1.25	0.02

NET INCOME

Month

Suburban Water and Suburban Wastewater are reporting a profit for the month. City Division is reporting a loss. However, compared to forecast, the net income for all three funds is better.

Year-to-Date

Suburban Water and Suburban Wastewater are showing profits through May. City Division is reporting a loss for the year so far. The good news is that the net income for all three funds is better than forecast.

Full Year

The full year forecast reflects a favorable variance to budget for Suburban Water and Suburban Wastewater. The full year forecast for the City Division is unfavorable to budget.

CASH FLOWS

Month

Suburban Water is reporting a cash deficit for the month. Suburban Wastewater and City Division are reporting cash flow surplus for the month. The cash flows for all three funds are better than forecast.

Year-to-Date

For the year so far, all three funds are reporting surplus cash flows and all three funds have cash flows better than forecast.

Full Year

The forecasted cash flows for the year are at surplus for Suburban Water and Suburban Wastewater. City Division is forecasting a deficit for the full year. However, the full year forecasted cash flows for all three funds are favorable to budget.

DEBT SERVICE COVERAGE RATIO

Year-to-Date

All three funds have ratios that are better than internal target and all three funds are better than budget.

Full Year

Forecast for the year shows all funds with debt service coverage ratios that are higher than internal target and higher than budget.

SUBURBAN WATER

MONTH				YEAR-TO-DATE			FULL YEAR		
Actual	Forecast	Variance	MAY 2018	Actual	Forecast	Variance	Forecast	Budget	Variance
			Income Statement						
762,612	754,381	8,231	Operating Revenues	3,768,634	3,719,004	49,630	9,739,128	9,733,000	6,128
(632,948)	(687,659)	54,711	Operating (Expenses)	(3,282,528)	(3,320,856)	38,328	(9,302,780)	(8,929,584)	(373,196)
129,664	66,722	62,943	Operating Income	486,106	398,148	87,958	436,348	803,416	(367,068)
93,469	81,000	12,469	Non-Operating Revenues	171,374	157,095	14,279	754,095	746,000	8,095
27,779	-	27,779	Project Reimbursement	27,779	-	27,779	23,000	23,000	-
-	-	-	Non-Operating Expenses	-	-	-	-	-	-
(414)	-	(414)	Capex Expensed	(1,254)	(434)	(820)	(434)	-	(434)
250,498	147,722	102,776	Income Before Interest & Contributions	684,005	554,810	129,195	1,213,009	1,572,416	(359,407)
9,327	10,000	(673)	Interest Income	45,269	61,557	(16,288)	126,557	125,000	1,557
(132,890)	(127,365)	(5,525)	Interest Expense	(670,637)	(661,510)	(9,127)	(1,643,065)	(2,003,000)	359,935
-	-	-	Capital Contributions	-	-	-	-	-	-
126,935	30,357	96,578	NET INCOME	58,637	(45,143)	103,780	(303,499)	(305,584)	2,085
			Cash Flow Statement (Indirect)						
126,935	30,357	96,578	Net Income	58,637	(45,143)	103,780	(303,499)	(305,584)	2,085
245,832	245,833	(1)	Add: Depreciation & Amortization	1,229,160	1,229,162	(2)	2,949,997	2,950,000	(3)
(0)	-	(0)	Add: Non-Cash Interest Expense	-	(0)	0	-	-	-
414	-	414	Add: Capex Charged to Expense	1,254	434	820	434	-	434
(83,856)	(111,530)	27,674	Principal Payments	(704,580)	(733,110)	28,530	(1,518,820)	(1,741,000)	222,180
(285,965)	(285,965)	-	Non-Cash Working Capital Changes	(146,533)	(146,533)	-	-	-	-
-	-	-	Investments Converting To Cash	2,022,010	2,022,010	-	6,000,000	4,000,000	2,000,000
-	-	-	New Borrowing	-	-	-	-	-	-
(611,334)	(710,000)	98,666	Capital Expenditures	(1,222,297)	(2,092,917)	870,620	(6,246,167)	(9,296,000)	3,049,833
(607,974)	(831,305)	223,332	NET FUND CASH FLOWS	1,237,651	233,903	1,003,748	881,946	(4,392,584)	5,274,530

NET INCOME

Month

Net income for the month was positive and was better than forecast due, mainly, to lower operating expenses and higher capital recovery revenues. Operating revenues were only a little better than forecast. Operating expenses were lower than forecast with lower general & administrative costs resulting from a workers' comp rebate and lower purchased services. Capital recovery revenues were up to forecast from higher project reimbursements.

Year-to-Date

YTD net income is positive and is favorable to forecast on higher operating revenues, lower operating expenses, and higher capital recovery revenues. Operating revenues were up from higher residential revenues with a slight offset from lower industrial. Operating expenses were favorable due to lower general & administrative expenses as a result of the workers' comp rebate. Capital recovery revenues were up due to higher project reimbursement.

Full Year

Net income for the year is forecasted to negative but is slightly favorable to budget. Not forecasting any big changes to operating revenues as that is up only a bit to budget. Operating expenses are up due to an adjustment to the costs of purchased water. Interest expenses were forecasted down to agree to debt schedules, budget for the year was on the high side. Actually, the lower interest expense just about offset the impact of the purchased water adjustment.

CASH FLOWS

Month

Cash flow was a deficit for the month but was favorable to forecast due to higher cash from operations, higher capital recovery revenues and lower capital spending.

Year-to-Date

Cash flow YTD is a surplus that is favorable to forecast higher cash generated from operations, higher capital recovery revenues and lower capital spending.

Full Year

Cash flow forecasted for the year is a surplus that is significantly favorable to budget on higher investments maturing into cash and lower capital spending. Forecast has a reduction in capital spending of $3.0m.

SUBURBAN WASTEWATER

MONTH				YEAR-TO-DATE			FULL YEAR		
Actual	Forecast	Variance	MAY 2018	Actual	Forecast	Variance	Forecast	Budget	Variance
			Income Statement						
1,601,953	1,621,821	(19,868)	Operating Revenues	7,353,215	7,364,351	(11,136)	19,169,817	19,197,000	(27,183)
(1,506,666)	(1,531,896)	25,230	Operating (Expenses)	(7,654,991)	(7,650,346)	(4,645)	(18,855,381)	(18,908,285)	52,904
95,287	89,925	5,362	Operating Income	(301,776)	(285,995)	(15,781)	314,436	288,715	25,721
111,828	45,000	66,828	Non-Operating Revenues	306,373	202,820	103,553	1,084,820	1,107,000	(22,180)
-	-	-	Project Reimbursement	-	-	-	-	-	-
-	-	-	Non-Operating Expenses	-	-	-	-	-	-
(2,399)	-	(2,399)	Capex Expensed	(2,399)	-	(2,399)	(301,000)	(301,000)	-
204,716	134,925	69,792	Income Before Interest Expense	2,198	(83,175)	85,373	1,098,256	1,094,715	3,541
83,309	80,200	3,109	Interest Income	84,316	81,123	3,193	5,123	5,000	123
(16,953)	(18,000)	1,047	Interest Expense	(84,980)	(87,176)	2,196	(213,176)	(216,000)	2,824
-	-	-	Capital Contributions	-	-	-	-	-	-
271,073	197,125	73,948	NET INCOME	1,534	(89,229)	90,763	890,202	883,715	6,487
			Cash Flow Statement (Indirect)						
271,073	197,125	73,948	Net Income	1,534	(89,229)	90,763	890,202	883,715	6,487
397,865	398,000	(135)	Add: Depreciation & Amortization	1,989,325	1,989,595	(270)	4,775,595	4,776,000	(405)
2,541	-	2,541	Add: Non-Cash Interest Expense	12,759	7,717	5,042	7,717	-	7,717
2,399	-	2,399	Add: Capex Charged to Expense	2,399	-	2,399	301,000	301,000	-
(40,295)	(39,500)	(795)	Principal Payments	(200,764)	(199,245)	(1,519)	(475,745)	(474,000)	(1,745)
(407,844)	(407,844)	-	Non-Cash Working Capital Changes	(411,511)	(411,511)	-	-	-	-
-	-	-	Investments Converting To Cash	980,000	980,000	-	3,480,000	3,480,000	-
-	-	-	New Borrowing	-	-	-	-	-	-
(114,235)	(347,200)	232,965	Capital Expenditures	(372,093)	(777,105)	405,012	(3,683,605)	(11,718,000)	8,034,395
111,504	(199,419)	310,923	NET FUND CASH FLOWS	2,001,649	1,500,222	501,427	5,295,164	(2,751,285)	8,046,449

NET INCOME

Month

Net income for the month was positive and better than forecast due to lower operating expenses and higher capital recovery revenues. Operating revenues were down a little to forecast with most of that variance due to lower Wastewater Treatment Plant Revenues. Operating expenses were lower due to lower purchased services and Capital Recovery fees were up from higher tapping fees.

Year-to-Date

Year-to-date net income is positive and favorable to forecast due to the higher non-operating revenues. Operating revenues are up down slightly to forecast on lower Wastewater Treatment Plant Revenues. Operating expenses are off only a bit to forecast. Capital Recovery revenues are up due to higher tapping fees.

Full Year

Forecast net income for the year is slightly favorable to budget. Are not forecasting any major changes. Forecasting operating revenues to be down slightly as well as slight reduction in non-operating revenues but forecast ting will me more than offset by lower operating expenses.

CASH FLOWS

Month

Cash flow for the month was a surplus and was favorable to forecast due to higher tapping fees and lower capital spending.

Year-to-Date

YTD cash flow is a surplus and favorable to forecast due to higher tapping fees and lower capital spending.

Full Year

Forecasted cash flow for the year are a surplus and significantly higher than budget due to lower capital spending. Forecasted capital spending is reduced by $8.0m from budget.

CITY DIVISION

MONTH				YEAR-TO-DATE			FULL YEAR		
Actual	Forecast	Variance	MAY 2018	Actual	Forecast	Variance	Forecast	Budget	Variance
			Income Statement						
2,465,225	2,435,694	29,531	Operating Revenues	14,256,686	14,229,849	26,837	33,851,388	33,569,000	282,388
(1,746,615)	(1,784,667)	38,052	Operating (Expenses)	(8,868,895)	(8,952,276)	83,381	(22,393,941)	(22,401,990)	8,049
718,611	651,027	67,584	Operating Income	5,387,791	5,277,573	110,218	11,457,447	11,167,010	290,437
41,593	16,000	25,593	Non-Operating Revenues	192,446	157,259	35,187	443,259	452,000	(8,741)
-	-	-	Project Reimbursement	-	-	-	2,480,000	2,480,000	-
-	-	-	Non-Operating Expenses	-	-	-	-	-	-
(187,956)	(100,000)	(87,956)	Capex Expensed	(558,936)	(438,638)	(120,298)	(4,638,638)	(4,980,000)	341,362
572,248	567,027	5,221	Income Before Interest Expense	5,021,301	4,996,194	25,107	9,742,067	9,119,010	623,057
63,481	30,000	33,481	Interest Income	259,240	224,567	34,673	404,567	348,000	56,567
(1,402,734)	(1,400,000)	(2,734)	Interest Expense	(7,013,670)	(7,008,202)	(5,468)	(18,521,202)	(16,735,000)	(1,786,202)
-	-	-	Capital Contributions	-	-	-	-	-	-
(767,005)	(802,973)	35,968	NET INCOME	(1,733,129)	(1,787,441)	54,312	(8,374,568)	(7,267,990)	(1,106,578)
			Cash Flow Statement (Indirect)						
(767,005)	(802,973)	35,968	Net Income	(1,733,129)	(1,787,441)	54,312	(8,374,568)	(7,267,990)	(1,106,578)
466,667	466,667	-	Add: Depreciation & Amortization	2,333,335	2,333,335	-	5,600,000	5,600,000	-
1,402,734	1,400,000	2,734	Add: Non-Cash Interest Expense	7,013,670	7,008,202	5,468	4,773,202	2,987,000	1,786,202
187,956	100,000	87,956	Add: Capex Charged to Expense	558,936	438,638	120,298	4,638,638	4,980,000	(341,362)
-	-	-	Principal Payments	-	-	-	-	-	-
-	-	-	Cash Outlays on Lease & Lease Reserve	(255,780)	(255,780)	-	(515,560)	(512,000)	(3,560)
161,229	161,229	-	Non-Cash Working Capital Changes	(1,177,003)	(1,177,003)	-	-	-	-
-	-	-	Investments Converting To Cash	-	-	-	-	-	-
-	-	-	New Borrowing	-	-	-	1,100,000	1,720,000	(620,000)
(332,213)	(1,088,500)	756,287	Capital Expenditures	(1,319,587)	(2,256,368)	936,781	(10,254,428)	(12,592,500)	2,338,072
1,119,368	236,423	882,945	NET FUND CASH FLOWS	5,420,442	4,303,583	1,116,859	(3,032,716)	(5,085,490)	2,052,774

NET INCOME

Month

Net income for the month was negative but was favorable to forecast due to higher operating revenues, lower operating expenses, and higher interest income with a partial unfavorable offset from higher expensed capital project spending. Operating revenues were up due higher wastewater revenues particularly from higher industrial pre-treatment revenues and higher leachate program revenues. Operating expenses were favorable due to lower purchased services.

Year-to-Date

YTD net income is a loss but is also favorable to forecast on lower spending on services and higher interest income.

Full Year

Forecast for the year is a loss and is unfavorable to budget on higher interest expenses. Operating income was up from higher operating revenues and a small reduction in operating expenses, but the majority of the increase to loss is from higher interest expense on higher accretion. The forecast was based upon values experienced in 2017 that we did not have visibility on during budget development. This interest is not actual debt service as it is non-cash.

CASH FLOWS

Month

Cash flows for the month were at a surplus and favorable to forecast due to higher cash generated from operations and lower capital spending.

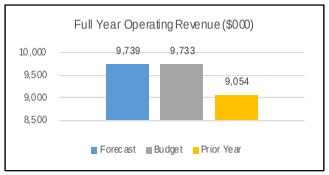
Year-to-Date

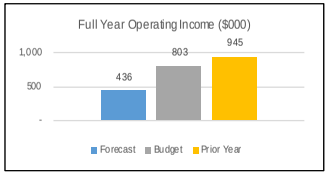
YTD cash flows are at a surplus and better than forecast on higher cash generated by operations and lower capital spending.

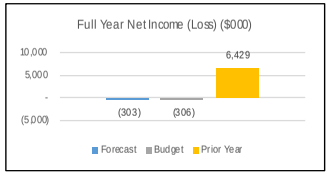
Full Year

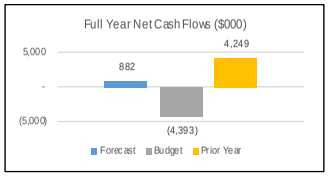
Full year cash flows are forecasted to be at a deficit but are favorable to forecast on lower capital spending. The capital spending was reduced by $2.3m from budget and that is most of the change in cash flows forecasted compared to budget.

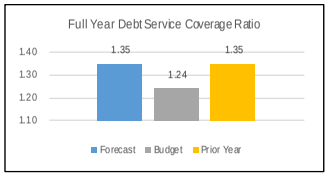
DASHBOARD - SUBURBAN WATER
MAY 2018

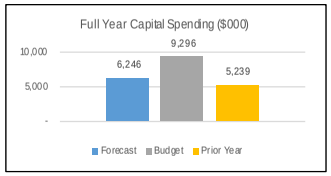




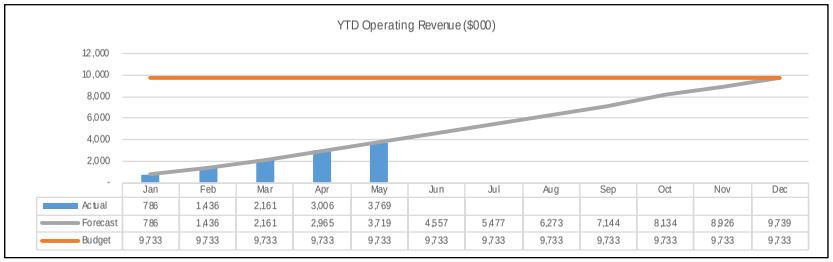




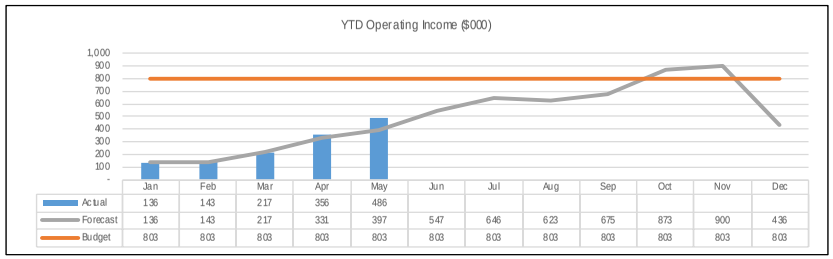




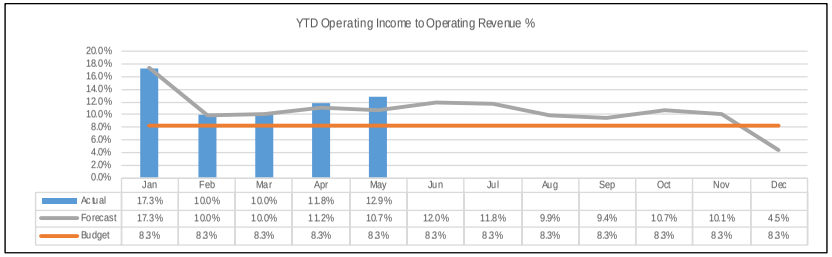
FULL YEAR COMPARATIVE ($000)	Forecast	Budget	Prior Yr
Operating Revenues	9,739	9,733	9,054
Less: Operating Expenses	9,303	8,930	8,109
Operating Income	436	803	945
Other income (expenses)	(739)	(1,109)	5,484
Net Income	(303)	(306)	6,429
Debt Service Coverage Ratio	1.35	1.24	1.35
Net Cash Flows	882	(4,393)	4,249



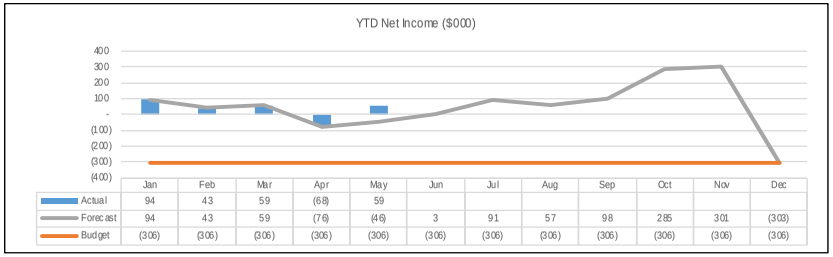
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	786	1,436	2,161	3,006	3,769							
Forecast	786	1,436	2,161	2,965	3,719	4,557	5,477	6,273	7,144	8,134	8,926	9,739
Budget	9,733	9,733	9,733	9,733	9,733	9,733	9,733	9,733	9,733	9,733	9,733	9,733



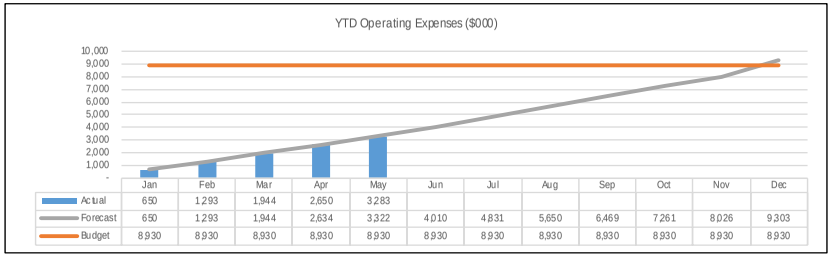
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	136	143	217	356	486							
Forecast	136	143	217	331	397	547	646	623	675	873	900	436
Budget	803	803	803	803	803	803	803	803	803	803	803	803



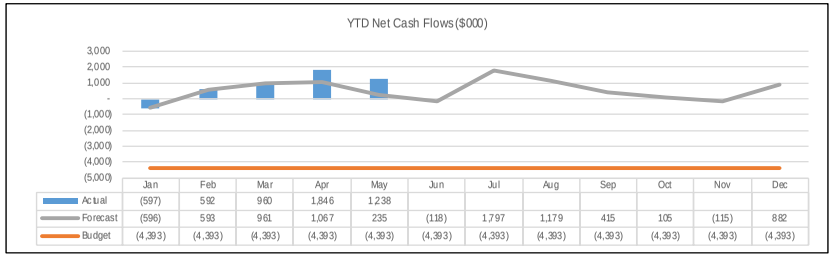
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	17.3%	10.0%	10.0%	11.8%	12.9%							
Forecast	17.3%	10.0%	10.0%	11.2%	10.7%	12.0%	11.8%	9.9%	9.4%	10.7%	10.1%	4.5%
Budget	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	94	43	59	(68)	59							
Forecast	94	43	59	(76)	(46)	3	91	57	98	285	301	(303)
Budget	(306)	(306)	(306)	(306)	(306)	(306)	(306)	(306)	(306)	(306)	(306)	(306)

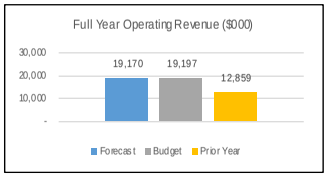


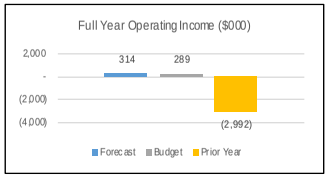
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	650	1,293	1,944	2,650	3,283							
Forecast	650	1,293	1,944	2,634	3,322	4,010	4,831	5,650	6,469	7,261	8,026	9,303
Budget	8,930	8,930	8,930	8,930	8,930	8,930	8,930	8,930	8,930	8,930	8,930	8,930

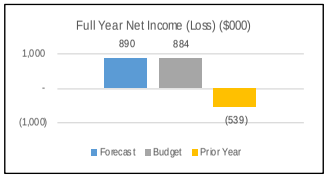


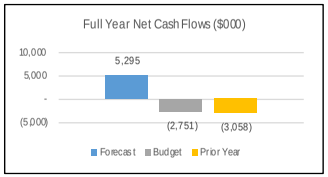
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	(597)	592	960	1,846	1,238							
Forecast	(596)	593	961	1,067	235	(118)	1,797	1,179	415	105	(115)	882
Budget	(4,393)	(4,393)	(4,393)	(4,393)	(4,393)	(4,393)	(4,393)	(4,393)	(4,393)	(4,393)	(4,393)	(4,393)

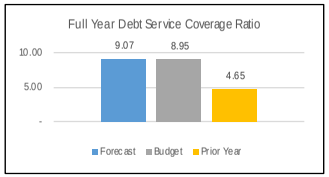
DASHBOARD - SUBURBAN WASTEWATER
MAY 2018

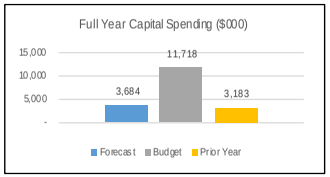




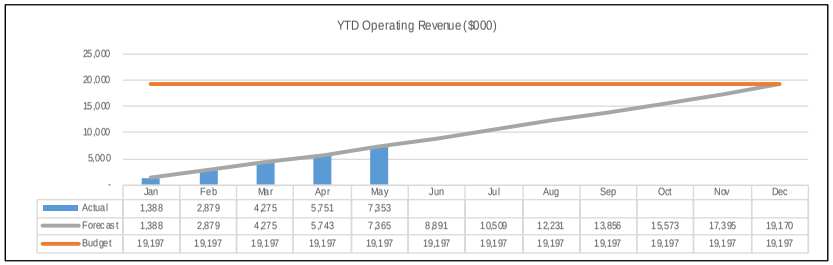




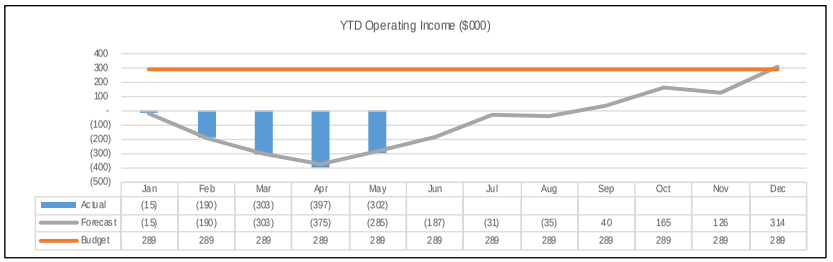




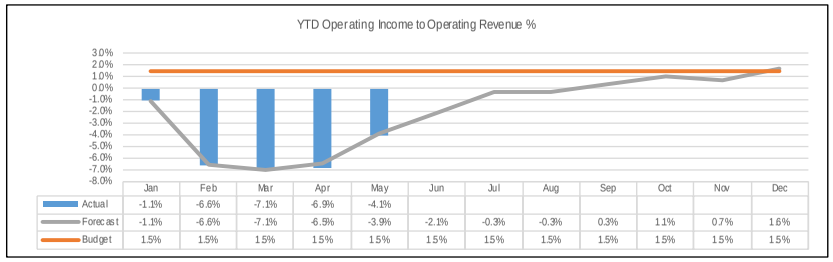
FULL YEAR COMPARATIVE ($000)	Forecast	Budget	Prior Yr
Operating Revenues	19,170	19,197	12,859
Less: Operating Expenses	18,856	18,908	15,851
Operating Income	314	289	(2,992)
Other income (expenses)	576	595	2,453
Net Income	890	884	(539)
Debt Service Coverage Ratio	9.07	8.95	4.65
Net Cash Flows	5,295	(2,751)	(3,058)



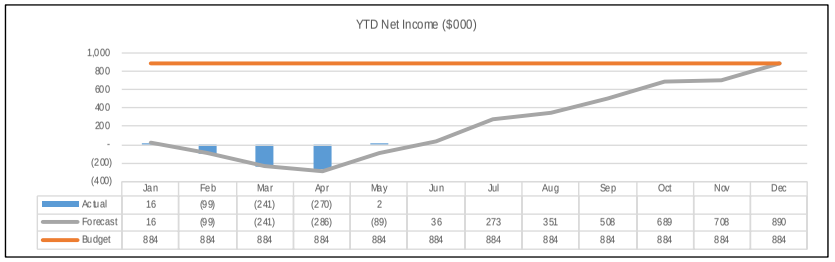
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	1,388	2,879	4,275	5,751	7,353							
Forecast	1,388	2,879	4,275	5,743	7,365	8,891	10,509	12,231	13,856	15,573	17,395	19,170
Budget	19,197	19,197	19,197	19,197	19,197	19,197	19,197	19,197	19,197	19,197	19,197	19,197



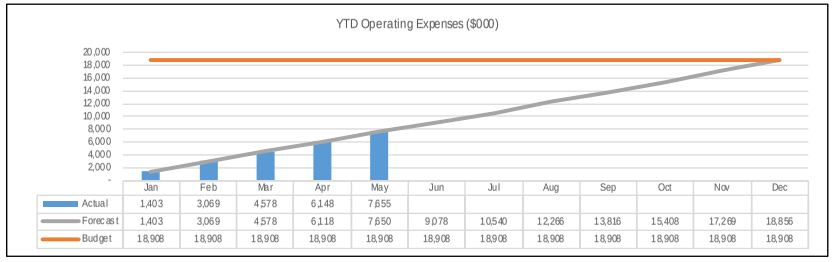
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	(15)	(190)	(303)	(397)	(302)							
Forecast	(15)	(190)	(303)	(375)	(285)	(187)	(31)	(35)	40	165	126	314
Budget	289	289	289	289	289	289	289	289	289	289	289	289



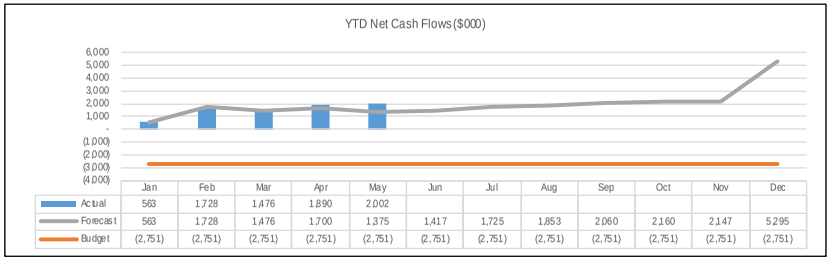
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	-1.1%	-6.6%	-7.1%	-6.9%	-4.1%							
Forecast	-1.1%	-6.6%	-7.1%	-6.5%	-3.9%	-2.1%	-0.3%	-0.3%	0.3%	1.1%	0.7%	1.6%
Budget	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	16	(99)	(241)	(270)	2							
Forecast	16	(99)	(241)	(286)	(89)	36	273	351	508	689	708	890
Budget	884	884	884	884	884	884	884	884	884	884	884	884

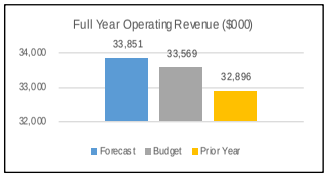


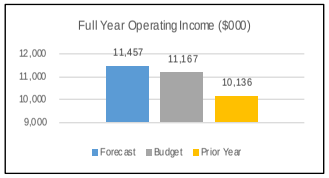
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	1,403	3,069	4,578	6,148	7,655							
Forecast	1,403	3,069	4,578	6,118	7,650	9,078	10,540	12,266	13,816	15,408	17,269	18,856
Budget	18,908	18,908	18,908	18,908	18,908	18,908	18,908	18,908	18,908	18,908	18,908	18,908

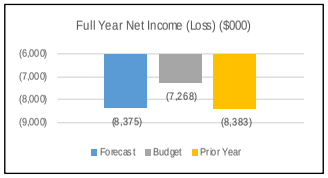


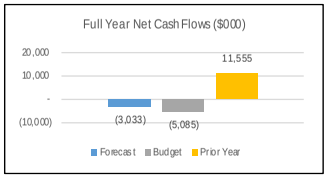
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	563	1,728	1,476	1,890	2,002							
Forecast	563	1,728	1,476	1,700	1,375	1,417	1,725	1,853	2,060	2,160	2,147	5,295
Budget	(2,751)	(2,751)	(2,751)	(2,751)	(2,751)	(2,751)	(2,751)	(2,751)	(2,751)	(2,751)	(2,751)	(2,751)

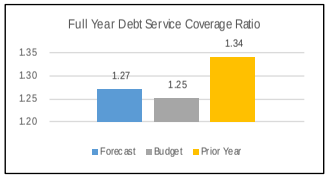
DASHBOARD - CITY DIVISION
MAY 2018

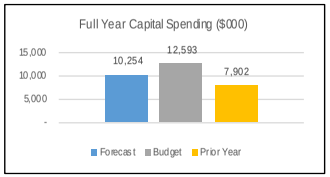




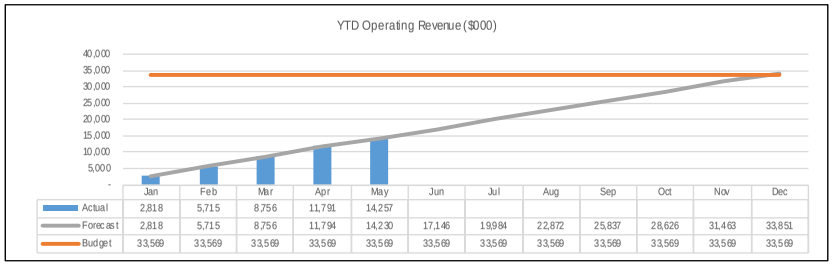




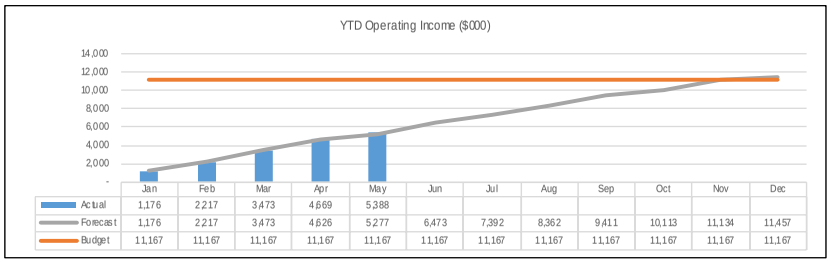




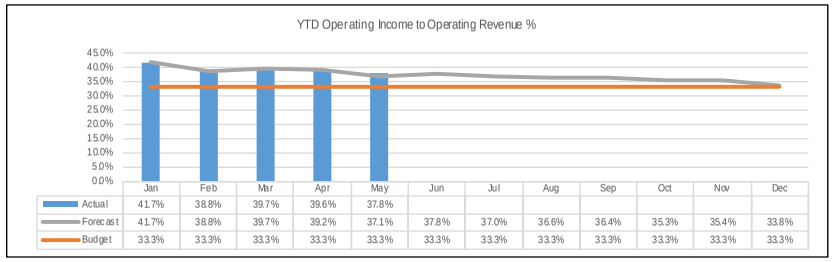
FULL YEAR COMPARATIVE ($000)	Forecast	Budget	Prior Yr
Operating Revenues	33,851	33,569	32,896
Less: Operating Expenses	22,394	22,402	22,760
Operating Income	11,457	11,167	10,136
Other income (expenses)	(19,832)	(18,435)	(18,519)
Net Income	(8,375)	(7,268)	(8,383)
Debt Service Coverage Ratio	1.27	1.25	1.34
Net Cash Flows	(3,033)	(5,085)	11,555



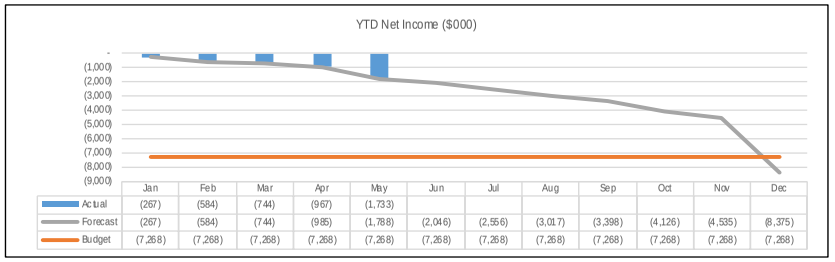
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	2,818	5,715	8,756	11,791	14,257							
Forecast	2,818	5,715	8,756	11,794	14,230	17,146	19,984	22,872	25,837	28,626	31,463	33,851
Budget	33,569	33,569	33,569	33,569	33,569	33,569	33,569	33,569	33,569	33,569	33,569	33,569



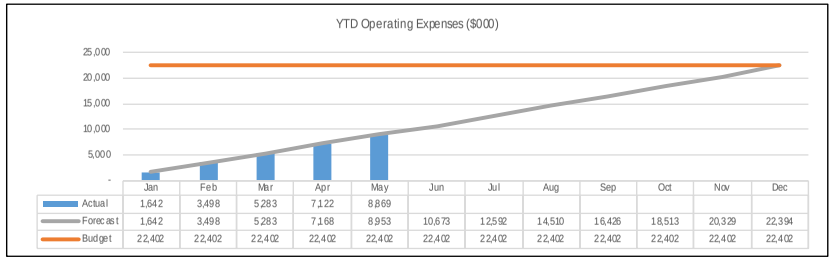
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	1,176	2,217	3,473	4,669	5,388							
Forecast	1,176	2,217	3,473	4,626	5,277	6,473	7,392	8,362	9,411	10,113	11,134	11,457
Budget	11,167	11,167	11,167	11,167	11,167	11,167	11,167	11,167	11,167	11,167	11,167	11,167



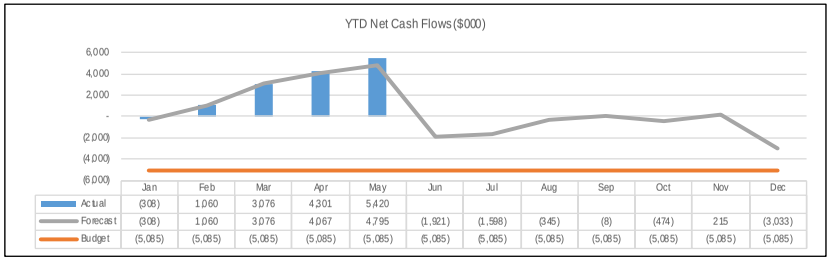
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	41.7%	38.8%	39.7%	39.6%	37.8%							
Forecast	41.7%	38.8%	39.7%	39.2%	37.1%	37.8%	37.0%	36.6%	36.4%	35.3%	35.4%	33.8%
Budget	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	(267)	(584)	(744)	(967)	(1,733)							
Forecast	(267)	(584)	(744)	(985)	(1,788)	(2,046)	(2,556)	(3,017)	(3,398)	(4,126)	(4,535)	(8,375)
Budget	(7,268)	(7,268)	(7,268)	(7,268)	(7,268)	(7,268)	(7,268)	(7,268)	(7,268)	(7,268)	(7,268)	(7,268)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	1,642	3,498	5,283	7,122	8,869							
Forecast	1,642	3,498	5,283	7,168	8,953	10,673	12,592	14,510	16,426	18,513	20,329	22,394
Budget	22,402	22,402	22,402	22,402	22,402	22,402	22,402	22,402	22,402	22,402	22,402	22,402



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	(308)	1,060	3,076	4,301	5,420							
Forecast	(308)	1,060	3,076	4,067	4,795	(1,921)	(1,598)	(345)	(8)	(474)	215	(3,033)
Budget	(5,085)	(5,085)	(5,085)	(5,085)	(5,085)	(5,085)	(5,085)	(5,085)	(5,085)	(5,085)	(5,085)	(5,085)

LEHIGH COUNTY AUTHORITY
FINANCIAL STATEMENTS - SUBURBAN WATER
MAY 2018

MONTH				YEAR-TO-DATE			FULL YEAR		
Actual	Forecast	Variance	MAY 2018	Actual	Forecast	Variance	Forecast	Budget	Variance
			Income Statement						
762,612	754,381	8,231	Operating Revenues	3,768,634	3,719,004	49,630	9,739,128	9,733,000	6,128
(632,948)	(687,659)	54,711	Operating (Expenses)	(3,282,528)	(3,320,856)	38,328	(9,302,780)	(8,929,584)	(373,196)
129,664	66,722	62,943	Operating Income	486,106	398,148	87,958	436,348	803,416	(367,068)
93,469	81,000	12,469	Non-Operating Revenues	171,374	157,095	14,279	754,095	746,000	8,095
27,779	-	27,779	Project Reimbursement	27,779	-	27,779	23,000	23,000	-
-	-	-	Non-Operating Expenses	-	-	-	-	-	-
(414)	-	(414)	Capex Expensed	(1,254)	(434)	(820)	(434)	-	(434)
250,498	147,722	102,776	Income Before Interest & Contributions	684,005	554,810	129,195	1,213,009	1,572,416	(359,407)
9,327	10,000	(673)	Interest Income	45,269	61,557	(16,288)	126,557	125,000	1,557
(132,890)	(127,365)	(5,525)	Interest Expense	(670,637)	(661,510)	(9,127)	(1,643,065)	(2,003,000)	359,935
-	-	-	Capital Contributions	-	-	-	-	-	-
126,935	30,357	96,578	NET INCOME	58,637	(45,143)	103,780	(303,499)	(305,584)	2,085
			Cash Flow Statement (Indirect)						
126,935	30,357	96,578	Net Income	58,637	(45,143)	103,780	(303,499)	(305,584)	2,085
245,832	245,833	(1)	Add: Depreciation & Amortization	1,229,160	1,229,162	(2)	2,949,997	2,950,000	(3)
(0)	-	(0)	Add: Non-Cash Interest Expense	-	(0)	0	-	-	-
414	-	414	Add: Capex Charged to Expense	1,254	434	820	434	-	434
(83,856)	(111,530)	27,674	Principal Payments	(704,580)	(733,110)	28,530	(1,518,820)	(1,741,000)	222,180
(285,965)	(285,965)	-	Non-Cash Working Capital Changes	(146,533)	(146,533)	-	-	-	-
-	-	-	Investments Converting To Cash	2,022,010	2,022,010	-	6,000,000	4,000,000	2,000,000
-	-	-	New Borrowing	-	-	-	-	-	-
(611,334)	(710,000)	98,666	Capital Expenditures	(1,222,297)	(2,092,917)	870,620	(6,246,167)	(9,296,000)	3,049,833
(607,974)	(831,305)	223,332	NET FUND CASH FLOWS	1,237,651	233,903	1,003,748	881,946	(4,392,584)	5,274,530
			Debt Service Coverage Ratio						
478,292	403,555	74,737	Total Cash Available For Debt Service	1,931,909	1,845,962	85,947	4,266,997	4,624,416	(357,419)
216,746	238,895	(22,149)	Debt Service	1,375,217	1,394,620	(19,403)	3,161,885	3,744,000	(582,115)
2.21	1.69	0.52	DSCR	1.40	1.32	0.08	1.35	1.24	0.11
			Cash Flow Statement (Direct)						
762,612	754,381	8,231	Operating Revenues	3,768,634	3,719,004	49,630	9,739,128	9,733,000	6,128
(387,116)	(441,826)	54,710	Operating Expenses (ex D&A)	(2,053,368)	(2,091,694)	38,326	(6,352,783)	(5,979,584)	(373,199)
9,327	10,000	(673)	Interest Income	45,269	61,557	(16,288)	126,557	125,000	1,557
384,823	322,555	62,269	Cash Available For Debt Service	1,760,535	1,688,867	71,668	3,512,902	3,878,416	(365,514)
(132,890)	(127,365)	(5,525)	Interest Payments	(670,637)	(661,510)	(9,127)	(1,643,065)	(2,003,000)	359,935
(83,856)	(111,530)	27,674	Principal Payments	(704,580)	(733,110)	28,530	(1,518,820)	(1,741,000)	222,180
168,078	83,660	84,418	Net Cash Available After Debt Service	385,318	294,247	91,071	351,017	134,416	216,601
93,469	81,000	12,469	Non-Operating Revenues	171,374	157,095	14,279	754,095	746,000	8,095
27,779	-	27,779	Project Reimbursement	27,779	-	27,779	23,000	23,000	-
-	-	-	Non-Operating Expenses	-	-	-	-	-	-
(285,965)	(285,965)	-	Non-Cash Working Capital Changes	(146,533)	(146,533)	-	-	-	-
3,360	(121,305)	124,666	Net Cash Available For Capital	437,938	304,810	133,128	1,128,112	903,416	224,696
-	-	-	Capital Contributions	-	-	-	-	-	-
-	-	-	Investments Converting To Cash	2,022,010	2,022,010	-	6,000,000	4,000,000	2,000,000
-	-	-	New Borrowing	-	-	-	-	-	-
(611,334)	(710,000)	98,666	Capital Expenditures	(1,222,297)	(2,092,917)	870,620	(6,246,167)	(9,296,000)	3,049,833
(607,974)	(831,305)	223,332	NET FUND CASH FLOWS	1,237,651	233,903	1,003,748	881,946	(4,392,584)	5,274,530

LEHIGH COUNTY AUTHORITY
FINANCIAL STATEMENTS - SUBURBAN WASTEWATER
MAY 2018

MONTH				YEAR-TO-DATE			FULL YEAR		
Actual	Forecast	Variance	MAY 2018	Actual	Forecast	Variance	Forecast	Budget	Variance
			Income Statement						
1,601,953	1,621,821	(19,868)	Operating Revenues	7,353,215	7,364,351	(11,136)	19,169,817	19,197,000	(27,183)
(1,506,666)	(1,531,896)	25,230	Operating (Expenses)	(7,654,991)	(7,650,346)	(4,645)	(18,855,381)	(18,908,285)	52,904
95,287	89,925	5,362	Operating Income	(301,776)	(285,995)	(15,781)	314,436	288,715	25,721
111,828	45,000	66,828	Non-Operating Revenues	306,373	202,820	103,553	1,084,820	1,107,000	(22,180)
-	-	-	Project Reimbursement	-	-	-	-	-	-
-	-	-	Non-Operating Expenses	-	-	-	-	-	-
(2,399)	-	(2,399)	Capex Expensed	(2,399)	-	(2,399)	(301,000)	(301,000)	-
204,716	134,925	69,792	Income Before Interest Expense	2,198	(83,175)	85,373	1,098,256	1,094,715	3,541
83,309	80,200	3,109	Interest Income	84,316	81,123	3,193	5,123	5,000	123
(16,953)	(18,000)	1,047	Interest Expense	(84,980)	(87,176)	2,196	(213,176)	(216,000)	2,824
-	-	-	Capital Contributions	-	-	-	-	-	-
271,073	197,125	73,948	NET INCOME	1,534	(89,229)	90,763	890,202	883,715	6,487
			Cash Flow Statement (Indirect)						
271,073	197,125	73,948	Net Income	1,534	(89,229)	90,763	890,202	883,715	6,487
397,865	398,000	(135)	Add: Depreciation & Amortization	1,989,325	1,989,595	(270)	4,775,595	4,776,000	(405)
2,541	-	2,541	Add: Non-Cash Interest Expense	12,759	7,717	5,042	7,717	-	7,717
2,399	-	2,399	Add: Capex Charged to Expense	2,399	-	2,399	301,000	301,000	-
(40,295)	(39,500)	(795)	Principal Payments	(200,764)	(199,245)	(1,519)	(475,745)	(474,000)	(1,745)
(407,844)	(407,844)	-	Non-Cash Working Capital Changes	(411,511)	(411,511)	-	-	-	-
-	-	-	Investments Converting To Cash	980,000	980,000	-	3,480,000	3,480,000	-
-	-	-	New Borrowing	-	-	-	-	-	-
(114,235)	(347,200)	232,965	Capital Expenditures	(372,093)	(777,105)	405,012	(3,683,605)	(11,718,000)	8,034,395
111,504	(199,419)	310,923	NET FUND CASH FLOWS	2,001,649	1,500,222	501,427	5,295,164	(2,751,285)	8,046,449
			DEBT SERVICE COVERAGE RATIO						
688,289	613,125	75,165	Total Cash Available For Debt Service	2,078,238	1,987,542	90,696	6,179,974	6,176,715	3,259
54,707	57,500	(2,793)	Debt Service	272,985	278,705	(5,720)	681,205	690,000	(8,795)
12.58	10.66	1.92	DSCR	7.61	7.13	0.48	9.07	8.95	0.12
			Cash Flow Statement (Direct)						
1,601,953	1,621,821	(19,868)	Operating Revenues	7,353,215	7,364,351	(11,136)	19,169,817	19,197,000	(27,183)
(1,108,801)	(1,133,896)	25,095	Operating Expenses (ex D&A)	(5,665,666)	(5,660,751)	(4,915)	(14,079,786)	(14,132,285)	52,499
83,309	80,200	3,109	Interest Income	84,316	81,123	3,193	5,123	5,000	123
576,461	568,125	8,337	Cash Available For Debt Service	1,771,865	1,784,723	(12,858)	5,095,154	5,069,715	25,439
(14,412)	(18,000)	3,588	Interest Payments	(72,221)	(79,459)	7,238	(205,459)	(216,000)	10,541
(40,295)	(39,500)	(795)	Principal Payments	(200,764)	(199,245)	(1,519)	(475,745)	(474,000)	(1,745)
521,754	510,625	11,130	Net Cash Available After Debt Service	1,498,880	1,506,018	(7,138)	4,413,949	4,379,715	34,234
111,828	45,000	66,828	Non-Operating Revenues	306,373	202,820	103,553	1,084,820	1,107,000	(22,180)
-	-	-	Project Reimbursement	-	-	-	-	-	-
-	-	-	Non-Operating Expenses	-	-	-	-	-	-
(407,844)	(407,844)	-	Non-Cash Working Capital Changes	(411,511)	(411,511)	-	-	-	-
225,739	147,781	77,958	Net Cash Available For Capital	1,393,742	1,297,327	96,415	5,498,769	5,486,715	12,054
-	-	-	Capital Contributions	-	-	-	-	-	-
-	-	-	Investments Converting To Cash	980,000	980,000	-	3,480,000	3,480,000	-
-	-	-	New Borrowing	-	-	-	-	-	-
(114,235)	(347,200)	232,965	Capital Expenditures	(372,093)	(777,105)	405,012	(3,683,605)	(11,718,000)	8,034,395
111,504	(199,419)	310,923	NET FUND CASH FLOWS	2,001,649	1,500,222	501,427	5,295,164	(2,751,285)	8,046,449

LEHIGH COUNTY AUTHORITY

FINANCIAL STATEMENTS - CITY DIVISION

MAY 2018

MONTH				YEAR-TO-DATE			FULL YEAR		
Actual	Forecast	Variance	MAY 2018	Actual	Forecast	Variance	Forecast	Budget	Variance
			Income Statement						
2,465,225	2,435,694	29,531	Operating Revenues	14,256,686	14,229,849	26,837	33,851,388	33,569,000	282,388
(1,746,615)	(1,784,667)	38,052	Operating (Expenses)	(8,868,895)	(8,952,276)	83,381	(22,393,941)	(22,401,990)	8,049
718,611	651,027	67,584	Operating Income	5,387,791	5,277,573	110,218	11,457,447	11,167,010	290,437
41,593	16,000	25,593	Non-Operating Revenues	192,446	157,259	35,187	443,259	452,000	(8,741)
-	-	-	Project Reimbursement	-	-	-	2,480,000	2,480,000	-
-	-	-	Non-Operating Expenses	-	-	-	-	-	-
(187,956)	(100,000)	(87,956)	Capex Expensed	(558,936)	(438,638)	(120,298)	(4,638,638)	(4,980,000)	341,362
572,248	567,027	5,221	Income Before Interest Expense	5,021,301	4,996,194	25,107	9,742,067	9,119,010	623,057
63,481	30,000	33,481	Interest Income	259,240	224,567	34,673	404,567	348,000	56,567
(1,402,734)	(1,400,000)	(2,734)	Interest Expense	(7,013,670)	(7,008,202)	(5,468)	(18,521,202)	(16,735,000)	(1,786,202)
-	-	-	Capital Contributions	-	-	-	-	-	-
(767,005)	(802,973)	35,968	NET INCOME	(1,733,129)	(1,787,441)	54,312	(8,374,568)	(7,267,990)	(1,106,578)
			Cash Flow Statement (Indirect)						
(767,005)	(802,973)	35,968	Net Income	(1,733,129)	(1,787,441)	54,312	(8,374,568)	(7,267,990)	(1,106,578)
466,667	466,667	-	Add: Depreciation & Amortization	2,333,335	2,333,335	-	5,600,000	5,600,000	-
1,402,734	1,400,000	2,734	Add: Non-Cash Interest Expense	7,013,670	7,008,202	5,468	4,773,202	2,987,000	1,786,202
187,956	100,000	87,956	Add: Capex Charged to Expense	558,936	438,638	120,298	4,638,638	4,980,000	(341,362)
-	-	-	Principal Payments	-	-	-	-	-	-
-	-	-	Cash Outlays on Lease & Lease Reserve	(255,780)	(255,780)	-	(515,560)	(512,000)	(3,560)
161,229	161,229	-	Non-Cash Working Capital Changes	(1,177,003)	(1,177,003)	-	-	-	-
-	-	-	Investments Converting To Cash	-	-	-	-	-	-
-	-	-	New Borrowing	-	-	-	1,100,000	1,720,000	(620,000)
(332,213)	(1,088,500)	756,287	Capital Expenditures	(1,319,587)	(2,256,368)	936,781	(10,254,428)	(12,592,500)	2,338,072
1,119,368	236,423	882,945	NET FUND CASH FLOWS	5,420,442	4,303,583	1,116,859	(3,032,716)	(5,085,490)	2,052,774
			DEBT SERVICE COVERAGE RATIO						
1,251,368	1,121,064	130,304	Net Cash Available For Debt Service	7,988,211	7,786,463	201,748	17,464,592	17,129,856	334,736
1,087,310	1,087,310	-	Debt Service	5,436,550	5,436,550	0	13,748,000	13,748,000	-
1.15	1.03	0.12	DSCR	1.47	1.43	0.04	1.27	1.25	0.02
			Cash Flow Statement (Direct)						
2,465,225	2,435,694	29,531	Operating Revenues	14,256,686	14,229,849	26,837	33,851,388	33,569,000	282,388
(1,279,948)	(1,318,000)	38,052	Operating Expenses (ex D&A)	(6,535,560)	(6,618,941)	83,381	(16,793,941)	(16,801,990)	8,049
63,481	30,000	33,481	Interest Income	259,240	224,567	34,673	404,567	348,000	56,567
1,248,759	1,147,694	101,065	Cash Available For Debt Service	7,980,366	7,835,475	144,891	17,462,013	17,115,010	347,003
-	-	-	Interest Payments	-	-	-	(13,748,000)	(13,748,000)	-
-	-	-	Principal Payments	-	-	-	-	-	-
1,248,759	1,147,694	101,065	Net Cash Available After Debt Service	7,980,366	7,835,475	144,891	3,714,013	3,367,010	347,003
41,593	16,000	25,593	Non-Operating Revenues	192,446	157,259	35,187	443,259	452,000	(8,741)
-	-	-	Project Reimbursement	-	-	-	2,480,000	2,480,000	-
-	-	-	Non-Operating Expenses	-	-	-	-	-	-
-	-	-	Cash Outlays on Lease & Lease Reserve	(255,780)	(255,780)	-	(515,560)	(512,000)	(3,560)
161,229	161,229	-	Non-Cash Working Capital Changes	(1,177,003)	(1,177,003)	-	-	-	-
1,451,581	1,324,923	126,658	Net Cash Available For Capital	6,740,029	6,559,951	180,078	6,121,712	5,787,010	334,702
-	-	-	Capital Contributions	-	-	-	-	-	-
-	-	-	Investments Converting To Cash	-	-	-	-	-	-
-	-	-	New Borrowing	-	-	-	1,100,000	1,720,000	(620,000)
(332,213)	(1,088,500)	756,287	Capital Expenditures	(1,319,587)	(2,256,368)	936,781	(10,254,428)	(12,592,500)	2,338,072
1,119,368	236,423	882,945	NET FUND CASH FLOWS	5,420,442	4,303,583	1,116,859	(3,032,716)	(5,085,490)	2,052,774

Lehigh County Authority

System Operations Review - May 2018

Presented: June 25, 2018

Critical Activities	System	Description	May-18	2018-to-Date	2017 Totals	Permit
			Daily Avg (MGD)	Daily Avg (MGD)	Daily Avg (MGD)	Daily Max (MGD)
Water Production	Allentown	Total	21.76	20.70	21.16	39.0
		Schantz Spring	7.29	5.78	6.39	9.0
		Crystal Spring	3.91	3.89	3.89	4.0
		Little Lehigh Creek	10.46	10.98	10.84	30.0
		Lehigh River	0.09	0.05	0.03	28.0
	Central Lehigh	Total	10.23	9.27	9.29	19.04 MGD Avg
		Feed from Allentown	7.14	6.26	6.94	7.0 MGD Avg 10.5 MGD Max
		Well Production (CLD)	3.09	3.00	2.35	8.54 MGD Avg
		Sum of all (12) other Suburban Water Systems	0.18	0.19	0.18	1.71 Sum of all wells
Wastewater Treatment		Kline's Island	33.98	33.88	30.78	40.0
		Pretreatment Plant	4.83	4.69	4.35	5.75 (design capacity)
		Sum of all (5) other Suburban WW Systems	0.21	0.19	0.16	0.36

		May-18	2018-to-Date	2017 Totals	2016 Totals
Precipitation Totals (inches)		4.89	20.48	50.18	36.82
Compliance Reports Submitted to Allentown		18	137	291	269
Notices of Violation (NOVs)	(Allentown + Suburban)	0	0	3	3
Sanitary Sewer Overflows (SSOs)/Bypasses	(Allentown + Suburban)	2	11	22	16
Main Breaks Repaired	Allentown	0	19	19	19
	Suburban	2	12	12	11
Customer Service Phone Inquiries	(Allentown + Suburban)	2,177	12,062	27,313	28,099
Water Shutoffs for Non-Payment	(Allentown + Suburban)	146	800	1,577	1,685
Injury Accidents	(Allentown + Suburban)	3	6	8	10
Emergency Declarations	Allentown	0	(4) @ $52,719	(2) @ $51,235	(2) @ $87,079
	Suburban	0	(1) @ $21,197	(1) @ $72,554	(1) @ $33,495

Significant Repairs: Park Pump Station Pump #3 is down and a new suction ring is to be delivered by the end of June. A temporary pump has been installed to act as the third pump until all of the repairs are completed. The entire station is to be rehabilitated by the end of 2019, and upgrades will include (3) totally new pumps in addition to an assortment of electrical and structural improvements.

Description of NOVs and/or SSOs: There was one (1) bypass at Heidelberg Heights that lasted from 5/19/18 - 5/25/18. There was (1) city SSO on the 300 Block of Union Street, occuring on 5/14/18. An 8" line had a blockage of grease and flushable wipes. There were (0) NOVs received during May, 2018.

Other Highlights: Primary Digester #2 at Kline's Island WWTP is currently in the process of being emptied and cleaned. Several mechanical upgrades will also be part of the project which is expected to be completed by the end of September. Reservoir 3 was taken out of service during April so the interior could be prepped and painted. The 1,000,000 gallon storage tank remediation project is now complete and the tank is back in service.