

Lehigh County Authority

System Operations Review - October 2018

Presented: November 12, 2018

<u>Critical Activities</u>	<u>System</u>	<u>Description</u>	<u>Oct-18</u>	<u>2018-to-Date</u>	<u>2017 Totals</u>	<u>Permit</u>
			<u>Daily Avg (MGD)</u>	<u>Daily Avg (MGD)</u>	<u>Daily Avg (MGD)</u>	<u>Daily Max (MGD)</u>
Water Production	Allentown	Total	21.78	21.53	21.16	39.0
		Schantz Spring	8.05	6.69	6.39	9.0
		Crystal Spring	3.81	3.87	3.89	4.0
		Little Lehigh Creek	9.92	10.95	10.84	30.0
		Lehigh River	0.00	0.03	0.03	28.0
	Central Lehigh	Total	9.33	9.64	9.29	19.04 MGD Avg
		Feed from Allentown	7.27	6.73	6.94	7.0 MGD Avg 10.5 MGD Max
		Well Production (CLD)	2.06	2.91	2.35	8.54 MGD Avg
		Sum of all (12) other Suburban Water Systems	0.17	0.18	0.18	1.71 Sum of all wells
Wastewater Treatment		Kline's Island	34.35	34.73	30.78	40.0
		Pretreatment Plant	5.22	5.22	4.35	5.75 (design capacity)
		Sum of all (5) other Suburban WW Systems	0.18	0.19	0.16	0.36
			<u>Oct-18</u>	<u>2018-to-Date</u>	<u>2017 Totals</u>	<u>2016 Totals</u>
Precipitation Totals (inches)			3.25	50.99	50.18	36.82
Compliance Reports Submitted to Allentown			28	249	291	269
Notices of Violation (NOVs)		(Allentown + Suburban)	1	1	3	3
Sanitary Sewer Overflows (SSOs)/Bypasses		(Allentown + Suburban)	1	56	22	16
Main Breaks Repaired		Allentown	0	27	19	19
		Suburban	0	21	12	11
Customer Service Phone Inquiries		(Allentown + Suburban)	2,236	22,971	27,313	28,099
Water Shutoffs for Non-Payment		(Allentown + Suburban)	154	1,706	1,577	1,685
Injury Accidents		(Allentown + Suburban)	1	11	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: Work has begun on replacing the #2 substation at the KIWWTP.

Description of NOVs and/or SSOs: There was one (1) bypass during the month of October, occurring at the Heidelberg Heights WWTP. The bypass ran from 10/12/2018 to 10/14/2018, and resulted from 2.1" of localized rain. The NOV was received from PaDEP for all of the SSOs that occurred in August. City and Suburban were both included on the same notification. The NOV and LCA's response to the NOV are attached to this report.

Other Highlights: The Allentown Water Plant recently completed its fall cleaning of the (8) 675 sq ft flocculation basins, (4) 1,880 sq ft plate settler sedimentation basins, and (2) 1,220 sq ft thickening tanks. This process is done twice per year and typically takes about (2) weeks to complete. The flocculation tanks were not designed with sump pumps so we need to manually lower 8 HP pumps weighing ~350 pounds each into the basins. Actual depths of sludge aren't recorded but typical sludge depths during cleanouts are: 4-6' in the flocculation basins, 3-5' in the sedimentation basins, and 3-4' in the thickening tanks. During a normal cleanout, approximately (30) 5000-gallon tanker loads of sludge are transferred to the WWTP for dewatering and disposal.

October 2, 2018

NOTICE OF VIOLATION

CERTIFIED MAIL NO. 7013 1710 0001 8227 7955

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

Attention: Robert Kerchusky, Wastewater Service Manager

RE: Sewage
Kline's Island Wastewater Treatment Plant (WWTP)
NPDES Permit No. PA0026000
City of Allentown, Lehigh County

Dear Mr. Kerchusky:

On August 4th, 2018 the Department was notified by the Lehigh County Authority (LCA) that due to heavy rains, a portion of the influent was being discharged directly to the Little Lehigh River through utilization of unpermitted Outfall 003. This sanitary sewer overflow (SSO) occurred from 4:30 a.m. August 4th, 2018 to 6:30 p.m. August 4th, 2018 and was estimated to have discharged 9,220,441 gallons of untreated waste water.

Similarly, the Department was notified by LCA on August 13th, 2018 regarding utilization of unpermitted Outfall 003 which occurred from 4:35 p.m. August 13th, 2018 to 9:10 p.m. August 13th, 2018 and was estimated to have discharged 1,025,174 gallons of untreated waste water.

The Department was again notified by LCA on August 22nd, 2018 regarding utilization of unpermitted Outfall 003. This SSO occurred from 12:22 a.m. August 22nd, 2018 to 2:30 a.m. August 22nd, 2018 and was estimated to have discharged 340,651 gallons of untreated waste water to the Little Lehigh River.

On August 5th, 2018 the Department was made aware of a SSO located in Upper Macungie Township. LCA reported that the SSO was the result of a significant rain event that occurred over a long period which caused manhole U-59 to surcharge an unknown volume of waste water from August 4th, 2018 to August 27th, 2018.

Similarly, LCA reported that SSO's had occurred at the following locations:

<u>Manhole</u>	<u>Reported</u>	<u>SSO Started</u>	<u>SSO Ended</u>
L-83	August 5, 2018 @ 8:09 a.m.	August 4, 2018	August 5, 2018
L-129	August 15, 2018 @ 11:58 a.m.	Unknown	Unknown
L-130	August 15, 2018 @ 11:58 a.m.	Unknown	Unknown
B-4	August 5, 2018 @ 8:09 a.m.	August 4 2018	August 5, 2018
B-9	August 22, 2018 @ 9:55 a.m.	August 22, 2019	August 22, 2018
B-13	August 5, 2018 @ 8:09 a.m.	August 4, 2018	August 5, 2018
B-13	August 9, 2018 @ 10:15 a.m.	August 9, 2018	August 10, 2018
B-13	August 22, 2018 @ 9:55 a.m.	August 22, 2018	August 22, 2018
U-31A	August 5, 2018 @ 8:09 a.m.	August 4, 2018	August 5, 2018
U-56	August 5, 2018 @ 8:09 a.m.	August 4, 2018	August 5, 2018
U-56	August 14, 2018 @ 5:05 a.m.	August 14, 2018	August 29, 2018
U-58	August 5, 2018 @ 8:09 a.m.	August 4, 2018	August 29, 2018
U-59	August 5, 2018 @ 8:09 a.m.	August 4, 2018	August 27, 2018
U-63	August 14, 2018 @ 5:05 a.m.	August 14, 2018	August 15, 2018
U-64	August 14, 2018 @ 5:05 a.m.	August 14, 2018	August 15, 2018

Please be advised that the sanitary sewer overflows described herein are not authorized by NPDES Permit No. PA0026000 and are, therefore, violations of Sections 201 and 202 of the Clean Streams Law of Pennsylvania, Act of June 22, 1937, P.L. 1987, as amended, 35 P.S. Section 691.1 et seq. ("The Clean Streams Law") and subjects Lehigh County Authority to appropriate enforcement action including, but not limited to, civil penalty assessment.

The Department requests that the Lehigh County Authority respond in writing to this Notice within 15 days of its receipt explaining the cause of the above-described non-compliance as well as the steps taken to insure future compliance. Said response should indicate the cause of the SSO's as well as the steps that will be taken to eliminate such violations in the future.

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

If you have any questions concerning this correspondence, you may contact me at 610.861.2135.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott T. Confer", is written over the printed name.

Scott T. Confer
Water Quality Specialist
Clean Water Program

cc: City of Allentown
R. Crane. EPA



LEHIGH COUNTY AUTHORITY

1053 SPRUCE STREET • P.O. BOX 3348 • ALLENTOWN, PA 18106-0348

610-398-2503 • FAX 610-398-8413

email: service@lehighcountyauthority.org

October 19, 2018

Mr. Scott Confer
Water Quality Specialist
Clean Water Program
Commonwealth of Pennsylvania
Department of Environmental Protection
4530 Bath Pike
Bethlehem, PA 18017

RE: Notice of Violation, October 2, 2018

Dear Mr. Confer,

This letter is in response to the Pa. Department of Environmental Protection (DEP) October 2, 2018 Notice of Violation regarding the bypasses at the Kline's Island Wastewater Treatment Plant (KIWWTP), NPDES Permit No. PA0026000, owned by the City of Allentown and operated by Lehigh County Authority, and the sanitary sewer overflows (SSOs) in the Western Lehigh Interceptor system owned and operated by LCA, during the month of August 2018. This letter supplements the information already shared with DEP via the bypass and SSO reports for this time period, and provides additional information regarding the environmental and operational conditions that led to bypasses and SSOs, and the steps that will be taken to rectify the situation.

It is worth noting that the initial storm event that kicked off the extraordinary weather pattern described in this letter occurred on August 4, 2018, just days after LCA, the City of Allentown and the 14 other municipalities that contribute sewage to these facilities submitted a Regional Flow Management Strategy (RFMS) to the U.S. Environmental Protection Agency to describe the collaborative works that are planned to address ongoing management of sewer flows during wet-weather events. A complete copy of the RFMS was also submitted to DEP at that time. In the event that you have not seen a copy of this submission, the complete package is available on LCA's website at this link: lehighcountyauthority.org/your-wastewater/sewer-system-overflows/

The RFMS includes planned work to address proper management of peak wet-weather flows in the entire Kline's Island Sewer System through the following key elements:

- System characterization
- Flow monitoring
- Collection system operation & maintenance
- Inflow & infiltration (I&I) removal

Information about how the region plans to address these key elements was specifically requested by the USEPA to be included in the RFMS submission to be responsive to an Administrative Order by the agency to eliminate bypasses at KIWWTP and SSOs in the system. The region met the submission deadline of August 1, 2018; however, to date, we have not received a response from USEPA indicating whether the RFMS is an acceptable plan to address the issues.

Every drop matters. Every customer counts.

While we await regulatory response on our submission, the affected municipalities continue to work toward implementation of the RFMS. A regional meeting to review system performance in these August 2018 storms has been scheduled for later this month. All municipal signatories have been engaged in efforts to review their sewage billing meters for accuracy, and to develop wet-weather flow reporting protocols so we are sharing system performance data regionally with all municipal partners. Several communities have borrowed funds and/or received small system grants to begin working on the next phase of their sewer collection system rehabilitation work.

While the notice of violation (NOV) was addressed to LCA as the operator of the systems, it is important to note that this is a regional system and the approach to addressing such occurrences must be viewed regionally. This information is provided to address DEP's request for a description of the steps that will be taken to eliminate such bypasses and SSOs in the future.

We would welcome the opportunity to review the RFMS with you to provide additional detail about the work planned by LCA, the City of Allentown, and all of our regional municipal partners whose sewer system maintenance and I&I reduction plans are a necessary part of the overall solution.

Environmental Factors

The primary cause of the bypasses and SSOs that are the subject of the NOV was the extraordinary weather conditions that the Lehigh Valley encountered during the month of August 2018. The National Weather Service recorded 12.21 inches of precipitation for Allentown at the Lehigh Valley International Airport for the month, which was 331% of normal, and second highest on record for the month of August. A persistent Bermuda High weather pattern developed off the east coast of the U.S., pumping tropical moisture up the eastern seaboard and blocking the movement of passing low pressure systems resulting in reoccurring heavy rains falling on the Lehigh Valley. Notably, 14 out of the first 22 days of August experienced measurable precipitation.

Some specific details from each storm:

- The storm that produced the August 4th peak flow event dropped 3.29 inches of rain over a 17-hour period, including almost 2 inches during the 4-hour period leading up to the initial bypass.
- On August 13th a second significant wet-weather event provided 2.63 inches of rain over a 13-hour period.
- The evening of August 21, 2018 heavy rains again fell on LCA's sewer service area with the National Weather Service reporting 2.43 inches of rainfall accumulation in only a 3-hour period.

The resultant small stream flooding and street closures in the City of Allentown and throughout the Authority's service area were evidence of the significance of these three wet-weather events. The elevated waterways, including most local streams that were out of their banks, placed additional hydraulic pressure on pipe joints and manholes constructed along the water's edge.

An additional contributing environmental factor was the Valley's groundwater elevation. As recorded by the USGS Observation Well number LE 644 in Lehigh County, based on the 28-year statistical daily median value, the groundwater level in Lehigh County was substantially above normal (up to 20 feet above normal) during the month of August. This is indicative of the high antecedent soil moisture levels that existed during the period which resulted in the undesirable collection system response to the storms. Each successive significant wet-weather event, only 9-days apart, resulted in further progression of the groundwater into unfavorable conditions. The increased sanitary sewer system base flows resulting from the elevated ground water level made each consecutive storm more difficult to handle.

Mechanical Factors

Mechanical factors impacting the volume of discharge from the Outfall 003, the bypass located at the headworks of the KIWWTP, during the three events stemmed from pump problems experienced at the Intermediate Pumping Station (IPS). During the August 4th event, the Variable Frequency Drives (VFDs) that power two of the Primary Effluent Pumps located at the IPS overheated during the height of peak flows, requiring a reduction in raw sewage pumping at the headworks of the KIWWTP. Failure to do so would have resulted in the Primary Effluent Wet Well overflowing onto the grounds of the facility.

The operations staff responded to 39 alarms at this pump station throughout the night and during the following day. Notwithstanding the staff's close monitoring and vigilance, the wet well came within 6 inches of overtopping the wall during this event, which illustrates that the operational performance of the plant was optimized to the degree possible under such conditions. The impact of the raw sewage pumping reduction was additional untreated wastewater being bypassed from Outfall 003 to the Little Lehigh Creek. It was later determined that failed cooling fans in the VFDs were the probable cause for the VFD overheating, and the cooling fans were replaced.

During the subsequent storms on August 13th and August 22nd, no significant mechanical issues impacted the plant performance, other than normal wear and tear on aging equipment. LCA's capital improvements program provides for the annual refurbishment of one or two of the ten Primary Effluent Pumps located at the IPS, as funding allows.

Use of Storage for Flow Equalization

LCA's ability to shave peak flows during wet-weather events was enhanced significantly in 2010 with the completion of the 3 million gallon flow equalization basin located at the LCA Industrial Pretreatment Plant in Fogelsville. The basin was fully utilized during the August 2018 storm events. In addition, one of the 0.9 million gallon air decks at the Pretreatment Plant was available and filled to capacity in order to help attenuate peak flows during this time.

However, due to the extraordinary back-to-back-to-back storm events we experienced and the already-overloaded regional sewer system, we faced significant challenges in draining these storage facilities in between each storm, reducing their effectiveness with each future storm. As weather conditions have improved, the stored waste has been subsequently drained to free up storage capacity for future wet-weather events.

Western Lehigh Interceptor SSOs

As described in the RFMS submission discussed above, and specifically in the Western Lehigh Sewerage Partnership's (WLSP) implementation outline (Appendix M to the RFMS), the section of the Western Lehigh Interceptor in the Trexlertown area is particularly overloaded and in need of attention. It is in this area that LCA experienced the prolonged SSOs described in the NOV.

The WLSP is made up of LCA and all municipal signatories whose sewer collection systems are tributary to the Western Lehigh Interceptor (WLI). This includes Upper Macungie, Lower Macungie, Upper Milford, Lowhill and Weisenberg townships and boroughs of Alburtis and Macungie. In the WLSP alternatives analysis, we identified the 2-mile section of the WLI from just north of Hamilton Boulevard through to Spring Creek Road as being currently within 0.5 million gallons per day of its dry-weather capacity and over its wet-weather level of protection goals. In the proposed project the WLSP wishes to undertake, this section will be paralleled with a new Trexlertown Interceptor that will consist of approximately 2 miles of 24-inch and 27-inch centrifugally cast fiberglass reinforced polymer mortar pipe. The cost for easements, engineering, construction, and construction oversight for this project is estimated at \$13 million, and LCA anticipates beginning an alignment evaluation and easement acquisition in 2019.

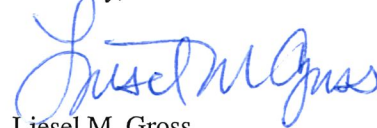
This project will address both dry-day and wet-weather flows and will eliminate the SSOs in this area, such as those experienced in August 2018.

Concluding Remarks

LCA appreciates the opportunity to review the information about sewer system performance with DEP in this response letter. We believe the information illustrates that we share the department's concerns about bypasses and SSOs in the Kline's Island Sewer System. These concerns are shared by LCA, the City of Allentown and all of our municipal partners who are working collaboratively to address sewer system performance during wet-weather events on a holistic and regional basis.

Should you have follow-up questions or wish to meet to review this information in more detail, we would welcome the opportunity to do so.

Sincerely,



Liesel M. Gross
Chief Executive Officer

cc: City of Allentown
Rebecca Crane, USEPA