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

Agendas & Minutes Posted:
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LEHIGH COUNTY AUTHORITY

Published: March 17, 2025

BOARD MEETING AGENDA – March 24, 2025 – 12:00 p.m.

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

1. Call to Order
   - NOTICE OF MEETING RECORDINGS

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

   February 24, 2025 Board Meeting minutes
4. Public Comments
5. Action / Discussion Items:

   FINANCE AND ADMINISTRATION

   WATER
   - *Lehigh River Pump Station Upgrades (Approval) (**yellow**) (digital Board packet, pages 7-80)*

   WASTEWATER
6. Monthly Project Updates / Information Items (1st Board meeting per month)
7. Monthly Financial Review (2nd Board meeting per month) **February 2025 report to be submitted in April**
8. Monthly System Operations Overview (2nd Board meeting per month) (*digital Board packet, pages 81-91*) – **February 2025 report attached**
9. Staff Comments
10. Solicitor's Comments

11. Public Comments / Other Comments
12. Board Member Comments
13. Executive Sessions
14. Adjournment

UPCOMING BOARD MEETINGS		
April 14, 2025	April 28, 2025	May 12, 2025

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
February 24, 2025

The Regular Meeting of the Lehigh County Authority Board of Directors was called to order at 12:00 p.m. on Monday, February 24, 2025, Chairman Brian Nagle presiding. The meeting was hybrid via in-person and video and audio advanced communication technology ("ACT"), using the Zoom internet application, including telephone option. Each Board member and other attendees of the meeting were able to hear each other attendee and be heard by each other attendee. The public could also participate in the meeting in-person or via ACT, using the Zoom internet application, including telephone option. A Roll Call of Board members present was taken. Brian Nagle, Amir Famili, Ted Lyons, Jeff Morgan, Norma Cusick, Linda Rosenfeld and Sean Ziller were present for Roll Call and remained for the duration of the meeting. Kevin Baker entered the meeting at 12:24 p.m. and was present for the duration of the meeting.

Attorney Kevin Reid, the Authority's Solicitor, was present along with Authority Staff, Liesel Gross, Ed Klein, Chris Moughan, Andrew Moore, AJ Capuzzi, Phil DePoe and Susan Sampson.

Chairman Nagle announced that the Board received their electronic and hard copies of the Board packet in advance. A copy of the packet is also available online.

REVIEW OF AGENDA

Liesel Gross stated there were no changes or additions to the agenda and no executive sessions planned.

APPROVAL OF MINUTES

February 10, 2025 Meeting Minutes

On a motion by Jeff Morgan, seconded by Linda Rosenfeld, the Board approved the minutes from the February 10, 2025 meeting as presented (7-0).

PUBLIC COMMENTS

None.

Board of Directors – Election of Officers

Chairman Nagle reported that Norma Cusick served as the Nominating Committee. Ms. Cusick provided a report detailing the following slate of nominations for 2025 officers:

Amir Famili, Chair	Ted Lyons, Treasurer
Jeff Morgan, Vice Chair	Kevin Baker, Assistant Treasurer
Linda Rosenfeld, Secretary	Norma Cusick, Assistant Secretary

Chairman Nagle asked if there were any other nominations, which there were not. On a motion by Norma Cusick, seconded by Ted Lyons, the Board elected the officers for 2025 as nominated: Amir Famili as Chair, Jeff Morgan as Vice Chair, Ted Lyons as Treasurer, Kevin Baker as Assistant Treasurer, Linda Rosenfeld as Secretary, and Norma Cusick as Assistant Secretary (7-0).

Suburban Water Facilities – SCADA System Upgrade

Chris Moughan reviewed the project to upgrade the Supervisory Control and Data Acquisition (SCADA) system for 42 facilities within the Authority's Suburban Division water and sewer systems. This year is the final year of this project, which was authorized in 2022. The facilities are reviewed

annually and prioritization adjusted over the course of the project. The goal is to develop a standardized system for all facilities for system management, operational data collection, and alarm protocols for operational events. The project is ahead of schedule and has already brought many system benefits such as decreased response time during emergencies, reduced number of boil advisories being issued, and improved employee adoption of the technology.

Liesel Gross explained an authorization mistake had been made in the prior two phases of the project due to a mischaracterization of the project as an operations expense. Due to the change in Authority purchasing thresholds requiring Board approval, as approved by the Board in January via Resolution 1-2025-1, it was discovered that the professional services provided in phases 2 and 3 were not brought to the Board for approval. However, the work has been completed and all invoices paid. This was included in the Board materials for review to ensure full disclosure of the error. She also noted that the process improvements made as a result of the Board's action in January will ensure this error is not repeated.

Chris Moughan reviewed the scope of phase 4 of the project, which will be completed in 2025.

There was some Board discussion about the operational efficiencies gained through this project and the overall benefits of having a robust SCADA system.

On a motion by Norma Cusick, seconded by Jeff Morgan, the Board approved the Capital Project Authorization Amendment for the Suburban Water / Wastewater SCADA Upgrade in the amount of $393,975.00 which includes the Professional Services Authorization to Keystone Engineering in the amount of $368,975.00 (7-0)

Emergency Declaration: Emergency Water Main Replacement in Fogelsville

Chris Moughan explained that on February 4, 2025, an Authority field inspector visited a construction site on Nursery Street in Fogelsville, connected to a new development being constructed in the area. The inspector noted that an Authority water line had been uncovered as part of a nearby stormwater system installation, and the pipe was found to be leaking and in very poor condition. Authority field crews were dispatched to investigate, and several other areas of pipeline deterioration were found, with the pipe material showing signs of pitting and delamination, which put the pipe at higher risk of failure. Authority staff recommended replacing 800 feet of water main in this area to prevent damage and ensure the water system is in good condition to serve the new development. The emergency water main replacement was approved administratively, and a contractor was contacted to complete the work. The water main replacement is expected to be completed later this week. The contractor estimates the total repair cost to be between $270,000 and $300,000.

There was some Board discussion about the cause of the pipe deterioration, and Mr. Moughan explained that the water main is not very old but appears to have been installed improperly by the original developer. There was no stone backfill placed in the pipe trench, and the pipe was surrounded by wet clay, which caused more rapid rusting and peeling than would normally occur.

On a motion by Norma Cusick, seconded by Sean Ziller, the Board approved the emergency declaration retroactively to February 5, 2025 to cover expenses incurred as a result of the emergency and waive standard purchasing guidelines as a result of acting as expeditiously as possible to address the emergency (7-0). Kevin Baker abstained from the vote due to his arrival at the meeting after the start of the discussion on this topic.

MONTHLY FINANCIAL REVIEW

Ed Klein gave an overview of the December 2024 financial statements, noting that an error was

found relating to how revenues were recorded for the Suburban Wastewater fund. An updated financial report will be issued to the Board after the meeting. He then reviewed the corrected financial report, highlighting variances between actual expenses and budgeted or forecasted expenses. He provided a year-end summary and noted the 2024 Audit will be completed to provide final numbers later in the year.

Amir Famili noted that the high number of vacancies the Authority faced in 2024 would result in lower costs in that category and asked if that is reviewed as compared to expense trends in other operating categories. Ed Klein explained a more detailed breakdown of expenses will become available after the Tyler EERP project goes live on July 1, 2025. There was some additional discussion regarding the presentation of administrative and personnel costs.

Jeff Morgan asked about the $15.2 million in capital projects that were not completed in 2024. Mr. Klein explained that a large portion related to the lead service line replacement work, budgeted for $5 million, which was not started due to the delay in resolving funding concerns with Pennvest.

MONTHLY SYSTEM OPERATIONS OVERVIEW

Andrew Moore reviewed the January 2025 report, noting there were no safety incidents during the month. He commented that the region remains in a Drought Watch status due to continued low precipitation. He also reviewed the permit exceedance that occurred in January at the Heidelberg Heights Wastewater Treatment Plant and commented that the Sand Spring incurred zero permit exceedances in January.

STAFF COMMENTS

Liesel Gross noted that the Lehigh County Board of Commissioners would be taking action to approve the Authority Board appointments at its next meeting on February 26, 2025.

Ms. Gross reviewed correspondence received from a customer who is formally disputing their water and sewer bill due to very high usage. She explained the investigation being conducted by the Authority staff and noted that a reasonable resolution will be sought through collaboration with the customer.

SOLICITOR'S COMMENTS

None.

PUBLIC COMMENTS / OTHER COMMENTS

None.

BOARD MEMBER COMMENTS

Norma Cusick stated that she has served on the Authority Board for 15 years alongside Brian Nagle, and he has been a pleasure to work with. She stated she, and the entire Authority, will miss him as his term is ending and he is not seeking reappointment.

Brian Nagle thanked Ms. Cusick for her comments. He then announced that the Authority once again received the award for excellence in financial reporting from the Government Finance Officers Association for the Annual Comprehensive Financial Report for the year ending December 31, 2023. He congratulated the staff for this achievement and highlighted the importance of the long history of excellence and transparency related to the Authority's financial reporting.

Chairman Nagle then stated it was his honor to serve on the Authority Board of Directors for the past 15 years. He has appreciated the professionalism and collaboration of all Board members during this time, which has helped the Authority to achieve success. He offered his best wishes to the organization for continued strong performance.

Each Board member took a moment to thank Chairman Nagle for his service to the Authority, stating their appreciation for his steady leadership through some challenging organizational decisions and transitions over the years.

EXECUTIVE SESSION

None.

ADJOURNMENT

There being no further business, the Chairman adjourned the meeting at 12:59 p.m.

Linda A. Rosenfeld
Secretary

MEMORANDUM

Date: March 24, 2025

To: Lehigh County Authority Board of Directors
From: Amy Rohrbach, Project Manager
Subject: Allentown Division – Lehigh River Pump Station Upgrades, Design and Bidding Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Project Authorization – Design and Bidding Phase	$319,372.60
2	Professional Services Authorization – Verdantas (1), (2)	$279,372.60

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

PROJECT BACKGROUND

The Lehigh River Pump Station was constructed in 1988 and is located off Riverside Drive near Bucky Boyle Park adjacent to the Lehigh River. The station was designed to convey raw water from the Lehigh River to the Allentown Water Filtration Plant (WFP) but is currently used infrequently due to taste and odor concerns and operational constraints with the existing pumps and intake. Proposed improvements at the station were identified in the WFP Master Plan to provide increased water supply redundancy and system sustainability. During a prior conceptual design phase, the specific improvements are broken into three categories: Chemical Feed, Pumping, and Intake Screening.

Chemical Feed: A powder activated carbon (PAC) chemical feed system is proposed to be added for taste and odor concerns. A PAC chemical feed system will address the taste and odor causing compounds present in the Lehigh River. This would include two new slurry storage tanks, new chemical feed piping and valving, feed pumps, metering, and associated new electrical systems. Also proposed is a new flow meter on the raw water transmission main, instrumentation and control, and site improvements including fencing and access driveway modifications.

Pumping: Proposed pumping improvements include replacement of existing problematic discharge valves with new motor operated discharge valves, new control panel and programming for valve control during pump startup to allow for flexibility in pumping capacities. New level sensors and upgrades to the existing HVAC system are also proposed.

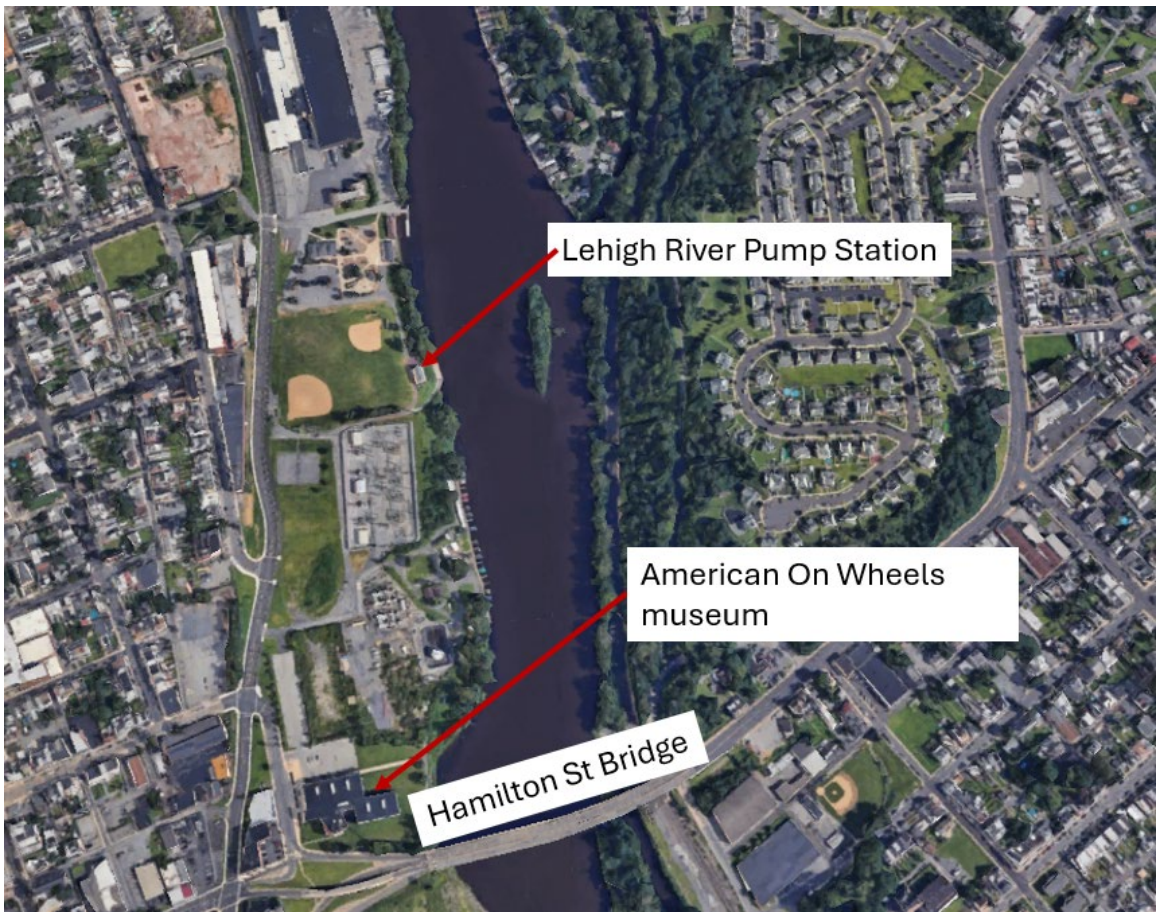
Intake: The proposed screening improvements will include replacing existing stop logs with sluice gates to provide for better isolation of the wet well during periods the pump station is offline reducing the sediment build up in the intake structure. Installation of a log boom in the Lehigh River to deflect floating debris and prevent from entering the intake structure and fencing to protect

the intake structure from potential vandalism and ensure safety of the public are also proposed as part of the intake improvements.

Additional Services: The project will also include the additional services of jar testing assistance and a transient analysis. The consultant will coordinate with the chemical vendor to facilitate jar testing to identify the ideal type of powder activated carbon and dose rate. The proposed transient analysis will be performed for the pipeline between the pump station and the filtration plant. The transient analysis will determine if any transient mitigation improvements are required to protect the pipeline and recommendations for optimal settings of the control devices will be made.

PROJECT LOCATION

The Lehigh River Pump Station is located along the Lehigh River off Riverside Drive adjacent to Bucky Boyle Park as shown on the map below.



FINANCIAL

This project received conceptual design approval from the City of Allentown on January 29, 2025 and is considered a Major Capital Improvements project; therefore, costs will be recovered in Capital Cost Recovery Charges (CCRC).

CONSULTANT SELECTION PROCESS

Three (3) consulting firms were invited to submit proposals for upgrades to the Lehigh River Pump Station. All firms were provided with the November 15, 2024 Basis of Design Report, prior 2018 Carbon Feed Study, O&M Manuals, and As-built plans as well as afforded the

opportunity to tour the existing pump station facility and ask questions. The proposals are summarized below:

CONSULTANT	DESIGN COST	MAN-HOURS	ADDITIONAL SERVICES	TOTAL
CHA	$256,800	1746	$35,800*	$292,600
HDR Engineering, Inc.	$394,400	2212	$111,300 **	$505,700
Verdantas (formerly Borton Lawson)	**$258,052.60**	**1662**	**$21,320 *** **	**$279,372.60**

*CHA's additional services, $35,800 were for the transient analysis and jar testing.
**HDR included cost of transient analysis in their base design cost. The $111,300 is for jar testing.
***Verdantas' transient analysis is $21,320. The cost of jar testing assistance ($4,005.20) is in the base design cost.

THIS APPROVAL – PRELIMINARY DESIGN PHASE SERVICES

Verdantas provided the most responsive proposal with a well-defined technical approach at the lowest cost. The Verdantas team has extensive pump station design experience and a proven track record with prior successful projects with LCA including the recent Fluoride System Upgrades design at the WFP, Spring Creek Pump Station design (currently under construction) and the High Service Pump VFD upgrades. Lehigh County Authority intends to retain the services of Verdantas to provide the design and bidding phase services for the project. The following table summarizes the professional services to be performed under this approval:

Professional Services [(1)]
1. Survey
2. Environmental and PaDEP Permitting
3. Hydrologic and Hydraulic Analysis
4. Geotechnical Engineering including Drilling
5. Testing Plan for PAC Chemical
6. Detailed Design, including Transient Analysis
7. Bidding Services

(1) See Verdantas. proposal dated February 14, 2025, for additional information

PROJECT SCHEDULE

Assuming approval of the Design and Bidding Phase Services at the March 24, 2025 Board meeting, it is anticipated that the work will be ready for bid in Spring of 2026.

FUTURE AUTHORIZATIONS – CONSTRUCTION PHASE

Following Design and Bidding Phase Services, Capital Project Authorization will be requested from the Board for Construction Phase Services. This is anticipated in spring of 2026.

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.: AD-W-23 **BUDGET FUND:** Allentown Div\W\Capital

PROJECT TITLE: Allentown Division – Lehigh River Pump Station Upgrades Design and Bidding Phase

PROJECT TYPE:

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

THIS AUTHORIZATION: **$319,372.60**
TO DATE (W/ ABOVE) **$411,372.60**

DESCRIPTION AND BENEFITS:

The purpose of this project is to upgrade the existing Lehigh River Pump Station. The scope will include a chemical feed system for taste and odor concerns, improvements to the intake screening, and pump upgrades. The existing pump station is used infrequently due to the taste and odor concerns but in the event of a shutdown of the Little Lehigh Creek intake due to long term maintenance, repairs, or water quality concerns, the Lehigh River must be made into a reliable back-up. A conceptual design of the proposed upgrades was prepared, and it is recommended Verdantas advance this design to final design level and provide bidding phase services.

AUTHORIZATION STATUS:

Prior Authorizations	
Preliminary Design	*$92,000*
Requested This Authorization – Design and Bidding Phase	
Design & Bidding Phase: Verdantas	**$279,372.60**
Staff	**$15,000**
Contingencies	**$25,000**
Total This Authorization	**$319,372.60**

Future Authorizations	
Construction Phase	

Review and Approvals:

Amy B Rohrbach	3/24/2025		
Project Manager	Date	Chief Executive Officer	Date
Chief Capital Works Officer	Date	Chairman	Date

Lehigh County Authority

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

PROFESSIONAL SERVICES AUTHORIZATION

Professional: VERDANTAS
3897 ADLER PLACE, BLDG C
BETHLEHEM, PA 18017

Date: March 24, 2025

Requested By: Amy Rohrbach

Approvals
Department Head: _____
Chief Executive Officer: _____

Allentown Division – WFP – Lehigh River Pump Station Upgrades Design and Bidding Phase Services
Verdantas will perform final design and bidding phase services for upgrades to the Lehigh River Pump Station. The following professional services are included in this authorization (reference attached proposal dated February 14, 2025):

Professional Services [(1)]
1. Survey
2. Environmental and PaDEP Permitting
3. Hydrologic and Hydraulic Analysis
4. Geotechnical Engineering including Drilling
5. Testing Plan for PAC Chemical
6. Detailed Design, including Transient Analysis
7. Bidding Services

(1) See Verdantas. proposal dated February 14, 2025, for additional information

Final Design and Bidding Phase:

This Authorization: ***$279,372.60***

Timetable and Completion Deadline: Bids anticipated to be received in Spring 2026.

MUNIS Account: 50609

(For Authority Use Only)

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

Proposal for

Final Design & Bidding Phase

Big Lehigh Pump Station Upgrades

Submitted to

Lehigh County Authority

Amy B. Rohrbach, Project Manager
amyrohrbach@lehighcountyauthority.org

Submitted by

verdantas

3897 Adler Place, Bldg., C
Bethlehem, PA 18017

February 14, 2025

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verdantas

3897 Adler Place, Bldg C
Bethlehem, PA 18017

02.14.2025

Amy Rohrbach
Lehigh County Authority – Allentown Division
1053 Spruce Road, P.O. Box 3348
Allentown, Pennsylvania 18106-0348
amyrohrbach@lehighcountyauthority.org

RE: Final Design & Bidding Phase Big Lehigh Pump Station Upgrades

Dear Ms. Rohrbach:

Verdantas is pleased to submit for your consideration our Proposal to provide Engineering Services for the Final Design & Bidding Phase associated with the Big Lehigh Pump Station Upgrades. We understand your need to have a trusted consultant, a partner, to focus and offer a wide range of solutions to your team and are eager to work with you in that capacity.

Dave Wieller, PE will be the Technical Lead and point of contact for the project. Dave has worked with the Authority successfully on the Water Filtration VFD Replacement Project, the Spring Creek Pump Station Upgrade Project, and most recently the Fluoride Room Upgrades project.

The enclosed Proposal gives a better look into our proposed team and our capabilities and capacity to service the Authority.

We welcome an opportunity to discuss our qualifications in person as part of your review process.

Please do not hesitate to contact me at 570.881.0253 or via email cmccue@verdantas.com should you have any questions.

Sincerely,

Verdantas

Christopher D. McCue, PE

Associate Vice President

Section 1:

Executive Summary

1. Executive Summary

Project Background

The Lehigh County Authority (LCA) is seeking to engage the services of a qualified professional engineering firm to develop plans and specifications for pumping and intake screen upgrades, as well as design of a chemical feed system to address taste and odor concerns at the Big Lehigh Pump Station (BLPS).

The scope of the project is broken down into following three (3) main components with a summary of each:

- Pumping Improvements
  - Replacement of discharge valves for four (4) pump and incorporation of new controls.
  - Level sensor replacement.
  - HVAC improvements.
  - Review of pump start-up sequence and remote automation.
  - Selective demolition
- Intake Screening
  - Replacement of stop logs with sluice gates at four (4) intake openings
  - Replacement of stop logs with sluice gate at partition dividing wet wells.
  - Installation of log boom in Lehigh River.
  - New fencing to restrict access to intake structure.
- Chemical Feed System
  - Design of PAC feed system consisting of two (2) 12,500-gallon tanks, pumps, piping, valves, metering, and power feed.
  - Design of containment system.
  - Installation of flow meter on 48-inch transmission line.
  - SCADA provisions.
  - Instrumentation and control for PAC system.
  - Site improvements.

Project Approach

The following provides a brief summary of the major tasks to be performed:

- Topographic survey of existing features.
- Erosion and sediment control design.
- Civil site design of improvements such as access and security fencing.
- Preapplication meeting with PADEP.
- Wetland delineation and report preparation.
- PADEP GP-11 for presumed water obstruction and encroachment permit.
- Aids to Navigation (ATON) plan for submission to the PA Fish and Boat Commission.
- Floodplain Development Permit.
- Hydrologic and Hydraulic study of Lehigh River to develop “No-Rise Certification.”
- Geotechnical borings, testing, and engineering for containment foundation design.
- PAC system design.
- Structural design of containment area.
- Electrical design for pumping improvements and PAC system.
- Automation design.

- Design of an exhaust fan and 2 louvers.
- Selection of clamp-on flow meter for transmission main.
- Motor operated valve and control system design.
- Sluice gate selection and design.
- Public Water Supply permit.

A separate scope and fee have been provided to perform a transient analysis between the BLPS and the WFP.

From a bidding perspective, the project will require three (3) prime contracts; General, Electrical, HVAC.

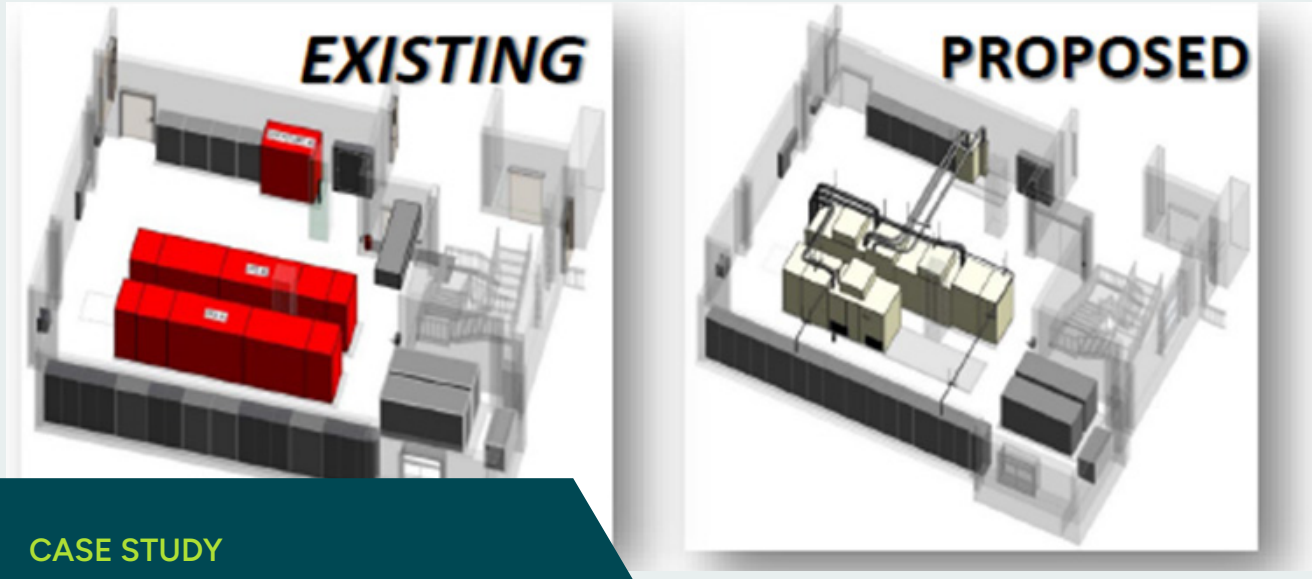
The Verdantas Advantage

Verdantas is an established Lehigh Valley multi-discipline firm with an established track record working with LCA. As a whole, Verdantas has approximately 1,750 professionals with a focus on the environment, water, and energy. The Lehigh Valley team has the ability to service LCA locally with our water, civil, mechanical, electrical and structural staff, and can leverage the additional technical resources available throughout Verdantas.

Dave Wieller, PE will serve as the technical lead and main interface with LCA. Dave previously worked with the Authority on the *Water Filtration Plant VFD Upgrade Project, Spring Creek Pump Station Upgrade Project,* and *Fluoride Room Upgrades.*

Section 2:

Qualifications



CASE STUDY

VFD Replacement, Water Treatment Plant

Overview

Verdantas (FKA Borton-Lawson) performed the design, bidding and construction administration services for the replacement of two (2) VFDs and one (1) RVSS associated with the three (2) 1,000 hp pumps associated with the High Service Pumping System, which had experienced regular failures due to aging electrical components. Additionally, the components were no longer supported by the manufacturer. These components were replaced with (3) VFDs.

Project constraints included limited space within the electrical room and the requirement that two (2) of the three (3) pumps remain in operation for the duration of construction. Verdantas (FKA Borton-Lawson) elected to complete a 3D photo scan of the electrical room, as well as adjacent areas, to document accurate existing conditions. This helped to determine that access modifications were required successfully remove existing equipment and bring in the new drives. A new exterior door and the enlargement of the electrical room door were designed as well as modifications to the HVAC system to accommodate access. The scan was also vital to establish a sequencing plan to ensure two (2) pumps would always be in operation.

While providing an efficient, accurate method to document existing conditions, the use of the scan also reduced the number of site visits required considering the scan provided a tremendous amount of information. An additional unrealized benefit was the ability to utilize

Quick Facts

Client

Lehigh County Authority
Charles Volk
Chief Capital Works Officer
P: 610-398-2503
E: charlesvolk@
lehighcountyauthority.org

Project Highlights

- Large scale equipment replacement access concerns, 3D reality capture, VFD replacement, structural, and architectural.

the model as part of the virtual prebid meeting, which occurred shortly after COVID-19 eliminated the possibility of in-person meetings and site visits.

Field observations conducted during design identified that one of the existing 1,000 motors required replacement to operate with the proposed VFD.

Concurrently with the design, a Power Study Analysis Study, which included an arc flash hazard analysis, short circuit study, and overcurrent protective device coordination study, was performed for the entire Allentown Water Filtration Plant.

CASE STUDY

Cadiz Water Treatment Plant Improvements

Overview

The Village of Cadiz public water system (PWS) draws its raw water supply from Tappan Lake which is owned and managed by the Muskingum Watershed Conservancy District (MWCD). As a surface water source, the Cadiz water plant is subject to the harmful algal bloom (HAB) monitoring and reporting rule issued as Ohio Administrative Code (OAC) 3745-90 effective June 1, 2016. The Rule requires a PWS to develop a written general plan if total microcystin concentrations reach certain trigger levels in the raw water, or when total microcystin is detected in any sample collected at a finished water sampling point or a distribution sampling point. The Cadiz PWS has occasionally experienced detections of total microcystin in the raw water from Tappan Lake in the past and therefore, retained the services of Verdantas (FKA Hull & Associates, Inc.) who proceeded to prepare the first Ohio EPA-approved HAB General Plan in 2016 - 17. The General Plan addresses activities and monitoring related to the source water for the PWS as well as the treatment capability of the PWS plant for managing HAB conditions.

In 2017, USEPA performed a Comprehensive Performance Evaluation (CPE) of the water system and noted several key areas of concern: filter operations and effluent quality, HAB preparedness, and water stability. An Ohio EPA sanitary survey in October 2018 yielded several additional water system deficiencies. Verdantas was retained by the Village to

Quick Facts

Client

Village of Cadiz
John Migliore
Mayor
740-942-8844 x224
mayor@villageofcadiz.com

Project Highlights

- Water treatment upgrades, PAC treatment, jar testing, multi-discipline services.

perform in-depth studies of the filter operations, powdered activated carbon (PAC) feed jar testing, and reinstatement of sedimentation and stabilization treatment processes to move the PWS forward in implementing the treatment optimization recommendations/requirements of the General Plan, and CPE.

Verdantas' treatment evaluation and optimization studies yielded empirically based recommendations for PAC dosing (type and quantity), sedimentation repairs, stabilization reinstatement, and filter operational improvements such as retrofitting the filters with pressurized backwash and filter-to-waste capabilities.

The completion of these improvements will ensure Cadiz's water system is compliant with federal and state regulations and more resilient given the challenges it faces with aging infrastructure and HAB events. Verdantas assisted the village with securing Ohio EPA WSRLA funding for the recommended plant improvements in the amount of 100% of the estimated project cost with 100% principal forgiveness (grant).

CASE STUDY

Llangollen Water Treatment Plant Improvements

Overview

Verdantas' multi-disciplinary team of engineers provide design, permitting, bidding services, construction administration, materials testing, special inspections and parttime resident project representative (RPR) services for a 2.2 MGD process upgrade at Artesian Water Company's existing treatment facility in New Castle County, Delaware. The existing water treatment facility was situated on a narrow 100 ft. wide tract of land nestled between residential homes on either side. The improvements included an aerator, manganese dioxide pressure filtration vessels for manganese and iron removal, and residuals management. Verdantas expedited land use approval through New Castle County in seven (7) months while simultaneously providing geotechnical, structural, civil, water, and electrical/controls engineering services to complete the Contract Documents. The $3.9 million project was completed on-time and within budget.

Quick Facts

Client

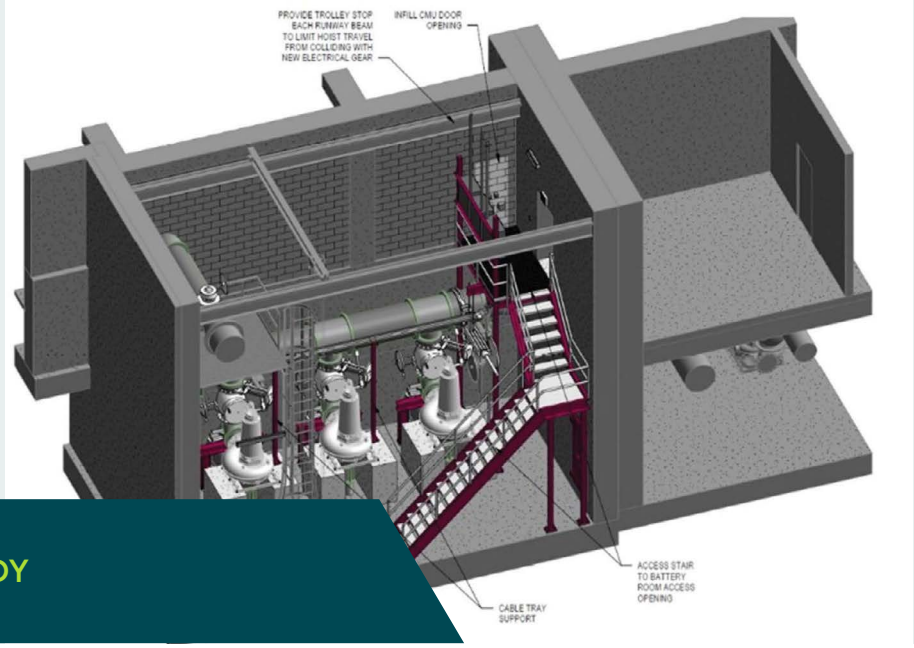
Artesian Water

Construction Cost

$3.9MM

Project Highlights

- Water treatment facility, multi-discipline services, design/bid/construction services.



CASE STUDY

West Influent Pump Replacement

Overview

The City of Bethlehem currently operates a 20-million gallon per day (gpd) activated sludge wastewater treatment plant, capable of handling peak wet weather flows of 50 million gpd. This project included technological upgrades to the West Influent Pump Room, which housed three (3) constant speed Yoemens 100 hp dry pit submersible pumps, each with a capacity of 12 MGD. The scope involved replacing existing pumps along with all associated piping, valves, and appurtenances within the West Influent Pump Room. The new pumps were designed to operate on variable frequency drives (VFDs) and were controlled based on wet well levels monitored by advanced instrumentation. This upgrade also included the replacement of the MCCs and the enhancement of existing control and alarm panels, which were integrated into the plant's sophisticated SCADA system. Additionally, the project encompassed the design of a new ventilation system and the replacement of existing stairs and platforms.

Verdantas leveraged cutting-edge 3D scanning and 3D modeling technology to efficiently design the project. Given the limited space and the necessity for all new equipment to fit within the existing structure, our team utilized 3D scanning to develop an accurate as-built model of the facility. This precise model was instrumental in designing the required improvements. Throughout the project, the City was able to maintain continuous operation of the treatment plant.

Verdantas was responsible for all survey, mechanical, electrical, structural, and automation design disciplines, preparation of bidding documents, and assisting the City with construction administration services.

Quick Facts

Client

City of Bethlehem, PA

Location

Bethlehem, PA

Project Highlights

- Wastewater
- Pumps
- Mechanical
- Structural
- Electrical
- HVAC
- Automation
- SCADA/PLC Programming

CASE STUDY

Intake Screen Experience

Overview

Verdantas Flow Labs has extensive experience in the research and development, evaluation, and design of fish screening facilities at water intakes. Through hydraulic model studies, laboratory, and field biological evaluations, Alden, a Verdantas Company has participated in the development of state-of-the-art fish protection facilities that are in use throughout North America. Such protection facilities include coarse- and fine-mesh modified traveling screens (Ristroph-type collection screens with fish lifting buckets), fixed and traveling fish diversion screens, and rotary drum screens. These screening systems have been installed in fresh and brackish water, as well as marine environments and have performed to specification. In addition, Alden, a Verdantas Company staff have conducted extensive research on the effectiveness of behavioral barriers for preventing fish impingement, including strobe lights, sound deterrent systems, infrasound, air bubble curtains, hanging chains, and water jet barriers. Alden, a Verdantas Company uses an integrated approach in developing designs for fish protection. This approach involves close cooperation between engineers and scientists to ensure that a design will be biologically effective, practicable to construct, operate, and maintain, and cost-effective while meeting regulatory requirements. Alden, a Verdantas Company has completed over 150 water intake structure alternative assessments throughout the U.S. and continues to do so as the CWA regulation develops.

Quick Facts

Project Highlights

- Hydraulic/Hydrologic Analysis
- CFD Analysis
- I&E Technology Evaluation
- Field or Lab Study

Project Experience

Project Name	Development of Design	Hydraulic/Hydrologic Analysis	CFD Analysis	I&E Technology Evaluation	Field or Lab Study
Potomac River Generating Station Evaluation of Biological Effectiveness of Geiger Screen Installation				✓	✓
Carlsbad Desalination Plant Fisheries Engineering Services	✓	✓	✓	✓	
Entergy Waterford Station Impingement and Entrainment Alternative Evaluation				✓	
Exelon Handley and Mountain Creek Impingement Alternative Evaluation				✓	
Entergy Sabine Station Impingement and Entrainment Alternative Evaluation				✓	
Indian Point Wedgewire Screen Testing			✓	✓	✓
Evaluation of Biological Effectiveness Issues of Fine Mesh Screens at CWIS				✓	✓
Huntington Beach Desalination Plant Discharge Diffuser Analysis	✓	✓			
People's Moss Landing Desalination Plant Intake and Outfall Design	✓				

Poseidon Carlsbad Desalination Plant

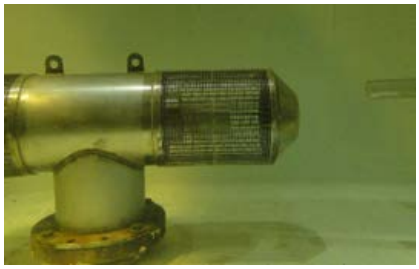
Verdantas Flow Labs (Verdantas) developed preliminary and hydraulic design and evaluations of a stand-alone intake and discharge structure for Poseidon's Carlsbad desalination plant. This included developing various fish protection intake screen alternatives to modify the existing intake as well as a new intake.Verdantas conducted CFD modeling of proposed fish protection screens considered for the intake. The objective of the modeling study was to optimize the intake design, provide uniform flow distribution at the intake screens and to communicate hydraulic conditions to resource agencies for fish protection. Verdantas developed the hydraulic design of the fish protection intake screens and conveyance system optimized with CFD modeling. A CFD model study of the discharge structure to determine brine discharge concentrations was conducted. The CFD model was used to optimize modifications to the discharge structure to meet the State mixing zone requirements.

Impingement and Entrainment Compliance Studies

The final 316(b) Rule requires facilities to reduce impingement mortality (IM) and or entrainment (E). Facilities that are required to reduce only IM are required to document the Chosen Method of Compliance with IIM Standards (§122.21(r)(6)). Facilities that need to reduce both IM and E are required to submit a Comprehensive Technical Feasibility and Cost Evaluation Study (§ 122.21(r)(10)). Both of these studies require an analysis of intake technologies to determine the best available compliance option for a site. Verdantas' Environmental and Engineering Services group has over 30 years of experience in developing and evaluating innovative fish protection technologies. Our scientists and engineers have extensive firsthand experience with the design, operation, permitting, and performance testing of intake technologies to reduce both IM&E. Verdantas has also completed intake technology feasibility and cost evaluation studies for over 200 facilities nationwide. As part of these studies Verdantas has estimated the biological efficacy of the

selected intake alternatives. The biological efficacy of the feasible technologies along with their costs are fundamental to determining the best compliance option for each site. The biological efficacy estimates also form the basis the Benefits Valuation Study (§ 122.21(r)(11)).

Indian Point Wedgewire Screen Testing



The objective of this evaluation was to quantify the entrainment reduction potential of cylindrical wedgewire screens in relation to larval lengths for different slot widths, flow conditions, screen orientation, and the morphometrics of various fish species. This laboratory study evaluated four slot widths (2, 3, 6, and 9 mm), three velocities (0.25, 0.50, and 1.00 ft/sec), and two through-slot velocities (0.25 and 0.50 ft/sec) in a large recirculating flume. Tests were conducted with both live and dead larvae, under ambient daylight and ambient nighttime conditions in order to determine if behavior avoidance was present by live larvae. Treatments were conducted by releasing a known number of test organisms (neutrally buoyant beads, zebrafish eggs, white sucker eggs, Atlantic tomcod larvae, striped bass larvae, white sucker larvae, and striped bass/white bass hybrids) at a location immediately upstream of the wedgewire screen. Rates of impingement and entrainment were determined for each replicate. The total length and body depth were recorded in order to correlate the rate of exclusion to fish species and size. The results of this laboratory evaluation aided in the development of a pilot field study conducted in the vicinity of the Indian Point Energy Center CWIS.

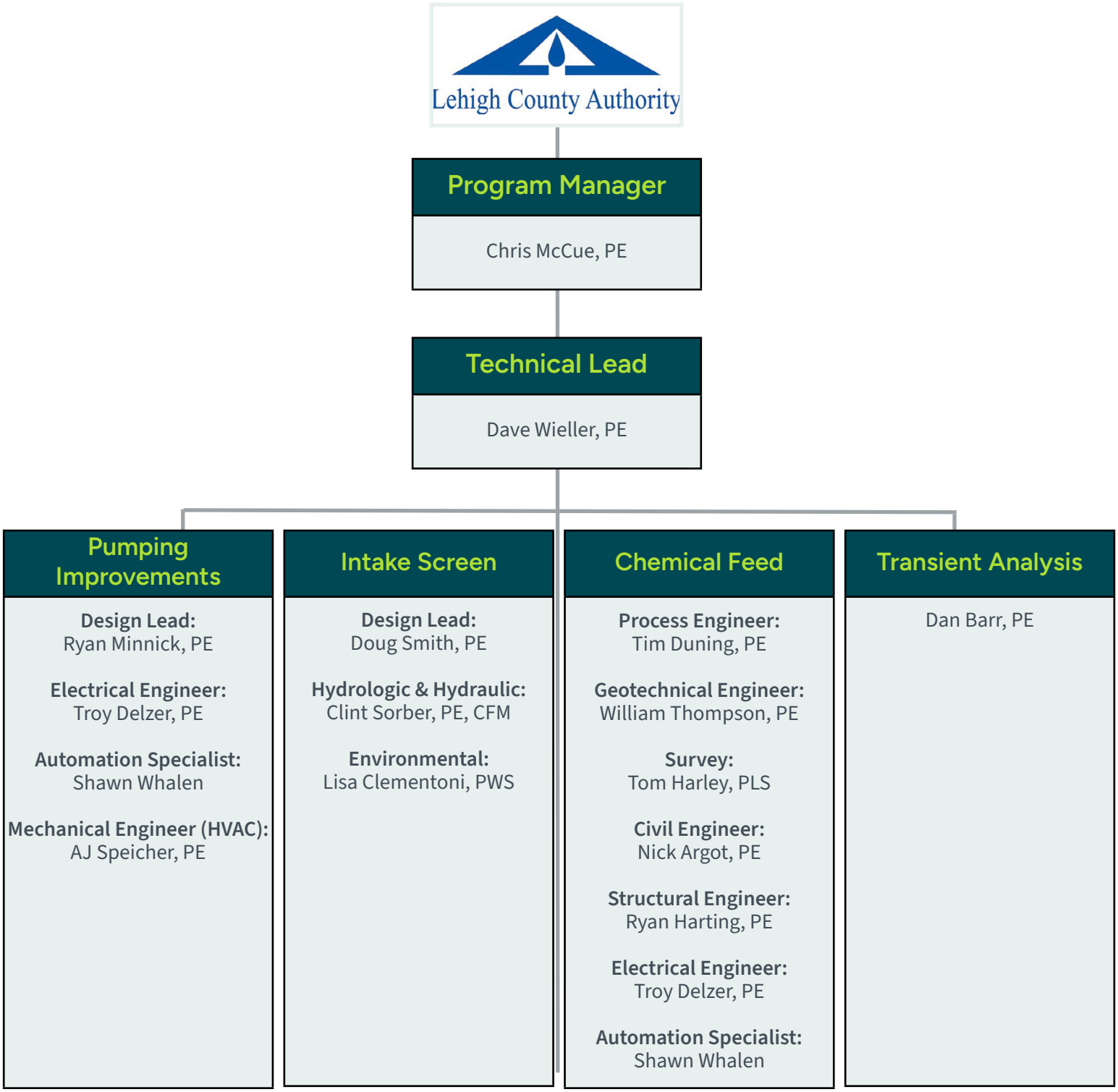
Huntington Beach Desalination Discharge Diffuser

Preliminary design development and final hydraulic design of a brine discharge diffuser retrofitted to the existing power plant discharge. The design was optimized using CFD modeling to meet the California Ocean Plan's requirements to minimize impacts to aquatic life, while also meeting the brine mixing zone concentration requirements. Efforts included design development, hydraulic analysis, CFD modeling and consultation with regulatory agencies.

Section 3:

Team

Organizational Chart



Section 4:

Technical Approach & Scope of Work

Christopher McCue, PE

Senior Consultant, Program Manager

Firm

Verdantas

Office Location

Wilkes-Barre, PA

Education

B.S., Civil Engineering, The Pennsylvania State University

M.S., Engineering Administration/Construction Management, The George Washington University

Licenses/Certifications

Professional Engineer, PA
Professional Engineer, DE
Professional Engineer, NY
Professional Engineer, MI
Professional Engineer, WV

Qualifications

- Water & Wastewater Engineering
- Project Management
- Land Development & Permitting
- Construction Management

Years of Experience

36 Years of Industry Experience

32 Years at Verdantas

Mr. Christopher McCue, PE, is the Water Resources Program Manager for Verdantas, responsible for oversight of Verdantas' efforts in Water Resources including water and wastewater activities. Mr. McCue is a principal with over 30 years' experience in water/wastewater, civil public works/infrastructure, municipal consultation, land development, natural gas, and environmental consulting. Mr. McCue is responsible for project development, project scheduling, and review of completed designs and studies. In addition to his role, he assumes the role of Project Manager on significant and complex projects where his expertise is best utilized. He has extensive experience in advising sewer and water authorities.

Project Experience

Spring Creek Station

Lehigh County Authority, PA
Project Manager for the replacement of three (3) VFDs, station modifications and all incidental work at the existing Spring Creek station.

Multiple Projects

Borough of Freeland Municipal Authority, PA
Principal in Charge responsible for overseeing the design, permitting, bidding, and construction administration services for several drinking water projects. Scope included design of the replacement for an aging reservoir including a 127,000-gallon ground storage tank, 450 gpm booster station, and sodium hypochlorite and sodium hydroxide chemical feed systems, as well as the design of water main extensions. Performed condition assessments on several municipal wells and designed upgrades.

Zone Improvements

Pennsylvania American Water Company, PA
Principal in Charge for the design, permitting, bidding, and construction administration services for the replacement of approximately 11,000 linear feet of existing 6-inch and 8-inch pipe with new 8-inch and 12-inch pipe along a state road. The project included the design of a new pressure reducing valve vault.

Applebutter Road Sanitary Pump Station Evaluation

City of Bethlehem, PA
Principal in Charge for this study to evaluate hydraulic capacity of existing pump station which give a major industrial user on the city's system. Scope included wet weather flow monitoring, hydraulic analysis, evaluation of existing pumps and force main and study of the industrial user flows. Deliverable included report of findings, recommendations to reduce wet weather flows, and preliminary design of a new flow wet for the station.

Spring Hill Pump Station

Hellertown Borough Authority, PA
Principal in Charge for upgrade of existing pump station including provision of new emergency generator. Project included PA DEP Water Quality Management Permit, bid documents, and construction administration services.

Renewable Hydrogen Facility

Williams Transco, NJ
Project Engineer for water related portion of this renewable hydrogen facility which will create hydrogen for mixing into regional natural gas transmission system. Water related scope includes development of new water well for required water supply, storage tank and waste disposal system.

Meshoppen Borough Water and Sewer Systems

Meshoppen Borough, PA
Principal in Charge responsible for the development of new Borough wide central sewage and water distribution system for the Borough. The new water system included 20,000 LF of 6 inch and 8 inch distribution system, rehabilitation and upgrade of 2 existing well sources, and a new 90,000 gallon storage tank. The sewage system includes approximately 22,000 LF of low-pressure collection system, grinder pumps, and a new 50, 000 GPD sewage treatment plant. Projects included assistance with DCED grant funding, Penn Vest funding, and Rural Utility Service funding; required studies, designs, permitting and bid documents; and oversight of all construction and start up activities.

Act 537 Plan and Consent Order Implementation Plan

Freeland Municipal Authority, PA
Project Manager for multi-year effort to reduce hydraulic overloads to the existing sewer system. Responsibilities included assistance with Consent Order, Act 537 Plan; multi-year flow monitoring and inflow/infiltrations studies; upgrade of CSO; system wide sewer rehabilitation including manhole and sewer main replacement, grouting, and slip lining. Project also included upgrade and expansion of the existing sewage treatment facility from 0.75 MGD to 1.2 MGD.

David Wieller, PE

Senior Engineer

Dave Wieller has more than 20 years of experience as a Technical Lead and Project Manager. Mr. Wieller has served as the primary contact for the Lehigh County Authority Water Filtration VFD Replacement, Spring Creek Pump Station Upgrades, and Fluoride System Upgrades projects.

Firm

Verdantas

Office Location

Lehigh Valley, PA

Education

B.S., Environmental Engineering, University of Delaware

Licenses/Certifications

Professional Engineer, PA

Qualifications

- Water & Wastewater Engineering
- Public Works Design & Permitting
- Project Management

Years of Experience

21 Years of Industry Experience

12 Years at Verdantas

Project Experience

Allentown Water Filtration Plant High Service Pump VFD Replacement

Lehigh County Authority, PA
Project Manager and local technical liaison for the replacement of two (2) VFDs and one (1) reduced voltage soft starter with three (3) new 1,000hp VFDs. Responsibilities included preparation of contract documents, bidding administration via PennBid, coordination with PADEP and PennVest, and construction administration services. Project included two (2) prime contracts.

Spring Creek Station Upgrade Project

Lehigh County Authority, PA
Project Manager for the replacement of three (3) VFDs, station modifications and all incidental work at the existing Spring Creek station.

Bloomsburg Flood Risk Mitigation Expansion Project

Town of Bloomsburg, PA
Senior Project Engineer responsible for the design, permitting, and bidding services for stormwater and sanitary sewer pump stations as well as associated flow control structures. Two (2) stormwater pump stations were required, each housing two (2) 15,000 gallon per minute (135 HP) submersible propeller pumps, resulting a total station capacity of 30,000 gallons per minute for each station. Two (2) sanitary sewer pump stations ranging from 40,000 to 10,000,000 gallons per day were also required. Required a PADEP Water Quality Management permit and a Component 3m for PADEP sewage planning. The project also required numerous slide gates for both sanitary sewer and stormwater applications. Participated in extensive public outreach. Responsibilities included preparation of contract documents, bidding administration via PennBid, planning, permitting, and construction administration services. Project included two (3) prime contracts.

West Influent Pump Room Upgrades

City of Bethlehem, PA
Local technical liaison for the replacement of three (3) 100hp dry pit submersible pumps, associated valves, piping and appurtenances, access stairs, and platform. Design also included the inclusion of three (3) VFDs and new PLC as well as ventilation upgrades. Responsibilities included preparation of contract documents, bidding administration via PennBid, coordination with PADEP, and construction administration services. Project included three (3) prime contracts

Applebutter Road Sanitary Pump Station Evaluation

City of Bethlehem, PA
Senior Project Engineer for this study to evaluate hydraulic capacity of existing pump station which give a major industrial user on the city's system. Scope included wet weather flow monitoring, hydraulic analysis, evaluation of existing pumps and force main and study of the industrial user flows. Deliverable included report of findings, recommendations to reduce wet weather flows, and preliminary design of a new flow wet for the station.

Spring Hill Pump Station

Hellertown Borough Authority, PA
Senior Project Engineer for the upgrade of an existing suction lift pump station and design of a new emergency generator. Responsibilities included preparation of contract documents, bidding administration via PennBid, obtaining a Water Quality Management permit, and construction administration services. Project included two (2) prime contracts.

Walnut Creek Outfall Stormwater Pump Station

City of West DesMoines, PA
Senior Project Engineer responsible for the design, bidding and construction administration services for a stormwater pump station featuring two (2) 20,000 gallon per minute (215 HP) and three (3) 50,000 gallon permit (455 HP) submersible propeller pumps. Two separate wet wells were designed to address low-flow and high-flow events. Project included the design of multiple slide gates.

Sanitary & Water System Projects

Sanofi-Pasteur, PA
Senior Project Engineer responsible for the design and construction administration services of a 16-inch water main extension and 2,000 GPM water booster station. Designed a submersible 500 GPM duplex sanitary sewer pump station and associated force main. Conducted hydraulic analysis and corrosion control investigation on portion of a sanitary sewer system experiencing rapid manhole determination.

Ryan Minnick, PE

Engineer

Mr. Ryan Minnick, PE, is a Professional Engineer for Verdantas. Minnick has been a technical lead and project manager on a variety of water and wastewater projects. Mr. Minnick has nearly a decade of experience with wastewater authorities and including being an Authority Engineer. He's experienced in wastewater treatment plant upgrades, pump, water main, and structural design. Mr. Minnick is familiar with preparing construction design drawings, contract documents, and DEP permitting.

Firm

Verdantas

Office Location

Philadelphia, PA

Education

B.S., Civil Engineering, The Pennsylvania State University

Licenses/Certifications

Professional Engineer, PA

Qualifications

- Water & Wastewater Engineering
- Public Works Design & Permitting
- PFAS
- Project Management

Years of Experience

7 Years of Industry Experience

1 Years at Verdantas

Project Experience

PFAS/PFOA Carbon Filter Upgrade

Gloucester City, NJ
Prepared construction design drawings and contract documents. Project included the installation of two 12-foot diameter granular activated carbon (GAC) systems for PFOA and PFOS removal. Each GAC system was able to treat 500 gpm.

East Whiteland Township 537 Special Study

Frazer, PA
Act 537, enacted by the Pennsylvania Legislature in 1966 requires that every municipality in the Commonwealth develop and maintain a current sewage facilities management plan (Title 25, Pa. Code, Chapter 71). The purpose of this Act 537 Special Study was to provide documentation requested by the Pennsylvania Department of Environmental Protection (PADEP) for the acquisition of the East Whiteland Township sanitary sewer system by Aqua Pennsylvania Wastewater Inc.

Sewer Improvements

Milford-Trumbauersville Area Sewer Authority, PA
Performed duties of the appointed Authority Engineer. Attended public meetings. Collaborated with the Authority Manager to perform various capital improvement projects including wastewater treatment plant upgrades, pump station upgrades, collection system maintenance and operational issues. Prepared annual regulatory reports.

Raw Water Distribution Pumping Station Upgrades

Morrisville Municipal Authority, PA
Prepared construction design drawings, contract documents, and conducted site inspections. Project included the installation of three 250-HP and one 100-HP vertical turbine distribution pumps; replacement of existing slide gates; and installation of new control building. Pumps were designed to supply a system pressure of 68 psi at 7 MGD ADF and a peak demand of 20 MGD.

Glass Street Pump Station

Cumberland County Utilities Authority, PA
Prepared construction design drawings and contract documents. Project included the replacement of three 50-HP dry pit submersible pumps; installation of two 24-inch diameter 531 linear feet horizontal directional drill river crossings; installation of 2,500 linear feet of 20-inch force main; installation new grit screen; installation new bypass and flow monitoring vaults.

Digestor Upgrades

Broadhead Reek Regional Authority, PA
Prepared construction design drawing, contract document, and conducted site inspections. Project included the partial demolition of the existing ATAD & SNDR reactors and installation of new Tideflex aeration system for two aerobic digester tanks.

Pump Station Upgrades

Lower Merion Township, PA
PA-Prepared construction design drawings and contract documents for various sanitary pump stations. Project included replacement of sewage pumps, influent grinder, force main, bypass pumping, and controls. (Ardmore PS, Spring Mill PS, Hollow Road PS, and Belmont PS)

WTP Aerator Replacement

Willingboro MUA, NJ
Prepared construction design drawings and contract documents. Project included the replacement of two induced draft aerators rated for 2,300 gpm each, which were necessary to oxidize high levels of ferrous iron prior to settling.

Pump Station Upgrades

Morrisville Borough Municipal Authority, PA
Prepared construction design drawings and contract documents. Project consisted of the upgrade and rehabilitation of nine sanitary pump stations including pumps, controls, piping, and ventilation.

Wastewater Treatment Plant Phase I Improvements

City of Davenport, FL
Prepared construction plans and documents. Project included the expansion of an existing wastewater treatment facility including grit removal system, 55-foot diameter clarifier, pump station, disinfection basin, and associated electrical controls.

Troy Delzer, PE, PMP

Electrical Engineer

Firm

Verdantas

Office Location

Pittsburgh, PA

Education

B.S., Power Systems, South Dakota School of Mines & Technology

Licenses/Certifications

Professional Engineer, PA
Professional Engineer, IN
Professional Engineer, SC
Professional Engineer, WI

Qualifications

- Electrical Engineering
- Project Management
- PLC & SCADA Programming
- On-Site Commissioning

Years of Experience

27 Years of Industry Experience
7 Years at Verdantas

Mr. Troy L. Delzer, P.E., is an Electrical Technical Leader with more than 20 years of experience to include system design, PLC & SCADA programming, vendor coordination, FAT & SAT execution for domestic and international clients, and on-site commissioning.

Project Experience

Spring Creek Pump Station Upgrade Project

Lehigh County Authority, PA

Electrical Engineer for the replacement of three (3) VFDs, station modifications and all incidental work at the existing Spring Creek station.

Furnace Rebuild

Confidential Glass Client, CO

Electrical Engineer responsible for the design of complete glass furnace removal and installation including electrical design calculations to complete construction drawings and equipment specifications. Electrical design and construction plans included new low voltage mcc relocation and replacement, low voltage power distribution, facility lighting, and process equipment feeders. Project work included relocation and refurbishment of medium voltage switch line up and new medium voltage vacuum circuit breaker. Work included multiple low voltage feeders to support a new oxygen plant and complete replacement of the pollution abatement system.

Furnace Major Repair

Confidential Glass Client, PA

Electrical Engineer responsible for the design of major glass furnace renovations including electrical design calculations to complete construction drawings and equipment specifications. Electrical design and construction plans included new low voltage switchgear, low voltage power distribution, generator back-up, facility lighting, and process equipment feeder sizing.

Manufacturing Headquarters
Industrial Equipment Manufacturing, PA

Electrical Engineer responsible for all areas of electrical engineering including load calculations, utility service sizing, emergency generator design, elevator coordination, facility layout, and equipment specification to meet client requirements and the NEC. Final work product included and equipment specifications and issued for construction drawings.

Facility Renovation
Logistics & Distribution Center (L&DC) Facility, PA

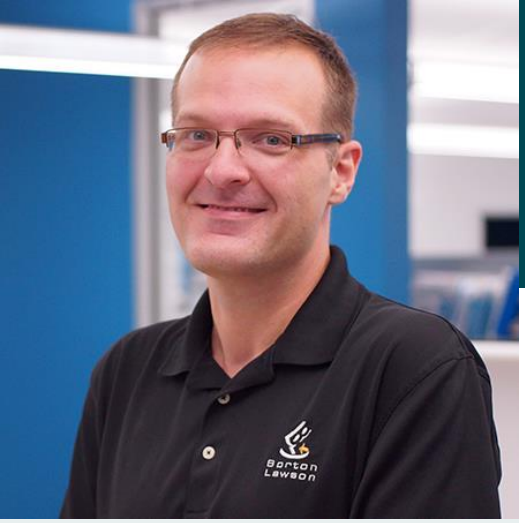
Responsible for all areas of electrical engineering to create construction drawings for the installation of a new 40kVA UPS with bypass and electrical feeders to support installation of new postal sorting line. This work included load calculations, equipment sizing, and specifications to meet client requirements and the NEC. Final work product included equipment specifications and issued for construction drawings.

Facility Evaluation
Pyrolysis Process Plant, MN

Responsible for electrical evaluation of facility as it applied to national, state and local code evaluation. Created EAC-electrical area classification plan for new 62,000 SF Oil Processing Facility per NFPA 497, NFPA 499, NFPA 30, and API 500.

Campus Power Study
High Education Client, PA

Responsible for power system study for eleven (11) campus facilities. Power system studies included equipment evaluation, short circuit calculation, protective device coordination study, arc flash calculations, and labeling. Study also included code evaluation and recommendations for corrections.



Shawn Whalen

Senior Automation Specialist

Firm
Verdantas

Office Location
Wilkes-Barre, PA

Education
B.S., Electrical Engineering Technology, The Pennsylvania State University

Qualifications

- Automation and Controls Design
- Power Distribution Design
- Telecommunications Infrastructure Design
- Programming of Allen Bradley PLC's& HMI's
- Commissioning & Start up Support

Years of Experience
17 Years of Industry Experience

9 Years at Verdantas

Shawn is an Automation Specialist, is a well-rounded automation professional with over 10 years of electrical experience. He has supported field and on-site project coordination for clients for Automation/Control designs, Main Power Distribution Designs, and Telecommunications Designs. He has also supported clients as an SME within these disciplines. Additional roles he has supported clients with are FAT (Factory Acceptance Testing), SAT (Site Acceptance Testing), Contractor/Vendor Submittal reviews for approval, UL (Underwriter Laboratories) review for conformance, and Construction field assessments.

Project Experience

Pharmaceutical Client - Biomedical Advanced Research and Development Authority (Barda) Project

PA

Responsible for being the client Subject Matter Expert. This project was for new government funded biomedical laboratory for the manufacturing of the influenza vaccine. This project entailed retrofitting three existing buildings, which included labs and main utilities infrastructures, along with the installation/construction of a brand-new facility within the campus that facilitated the for the production of the influenza vaccination. This role required the Electrical SME to support the Automation and Controls SME's, Process and HVAC SME's, IT (Information Technology) SME's, Fire Alarm and Haz-watch SME's on the facilities designs that spanned from basic engineering to detailed engineering. Additional requirements were to coordinate with the awarded Engineering Firm on detailed design with final review and approval of completed design before construction. This role also required the Electrical SME to perform construction administration on behalf of the client which included descope and bid reviews with awarded Construction Management firm, coordination with Construction Management firm for Cost Analysis, and review and approval/disapproval of RFI's and Change Notices on behalf of the client.

Municipality Client Waste Water Treatment Facility

PA

Responsible for designing a new controls systems for a Waste Water Treatment Facility. Was also responsible for developing a phased approach as the existing process could not be completely shutdown. Tasks included designing a new controls system, upgrading an existing power distribution system, and developing a specification for a local integrator to bid on fabrication, procurement, FAT/SAT programming, and commissioning/startup. Additional Tasks included reviewing Bids and submittals for approval.

Oil And Gas Client Greenfield Compressor Installation

PA

Responsible for FAT/SAT programming, and commissioning/startup programming and services for a new Gas Compressor Station. Tasks included developing PLC and HMI programs for the client, performing the FAT/SAT as the designer, and commissioning and start-up of the new greenfield site.

Private Entity Digital Currency Mining Facility

PA

Responsible for developing the network infrastructure for the entire system from the point of the utility into and throughout the facility. Tasks included developing the networking infrastructure that would encompass over 40,000 devices. Tasks also included review of the design with the stakeholders IT teams and supporting the development of the BOM with the IT teams.

Alfred Speicher, Jr., PE, PMP, CCP

Mechanical Engineer

Firm

Verdantas

Office Location

Wilkes-Barre, PA

Education

B.S., Mechanical Engineering, The Pennsylvania State University
M.S., Mechanical Engineering, Villanova University

Licenses/Certifications

Professional Engineer – PA, NJ, VA
U.S. Dept. of Energy Qualified Steam Specialist
AEE Certified Energy Manager
LEED Green Associate
Project Management Professional
Certified Commissioning Provider

Qualifications

- Mechanical Engineering
- Building Automation
- Commissioning
- Project Management

Years of Experience

24 Years of Industry Experience
16 Years at Verdantas

Mr. A.J. Speicher, P.E., is the Facility Optimization Service Leader with over 20 years of experience Building Automation System controls, commissioning, design and construction. He has managed various aspects of cGMP validated projects, including detailed design specifications, site acceptance tests, HVAC system commissioning, and installation and operational qualifications. Mr. Speicher has designed and created AutoCAD control drawings, sequences of operation, and valve/damper schedules for Building Automation System (BAS) control systems. He has also assisted with the BAS "point-to-point" checkouts and maintained overall project delivery and profitability.

Project Experience

Chiller Replacement Design

Confidential Client, PA

Provided project management and mechanical engineering services for the study and detailed design of the chilled water system replacement in a biotech R&D lab space. The study phase consisted of reviewing design options as related to air cooled and water cooled chiller systems. A.J. also assisted with HSE compliance in calculating energy reduction estimates for the new system. A.J. coordinated a complete 3D laser scan for the project and conducted a fully virtual project pre-bid meeting with the contractors. A.J. will complete the project by performing commissioning services on the new chiller and pumping systems.

Commissioning of Critical Environments

The Commonwealth Medical College, PA

Provided LEED fundamental and enhanced commissioning for a new, LEED Silver, $115 million, new Medical Sciences Building for The Commonwealth Medical College (TCMC). The new medical sciences facility, home of TCMC's academic and research programs, consists of two wings connected by a 2-story link. The facility includes a 20 table gross anatomy lab, state of the art simulation suites/research labs, a 250 seat auditorium, two 190 seat lecture halls, Library, teaching labs, small group rooms, as well as administration and support. The facility also includes an operative 6,000 SF vivarium.

Commissioning of BAS for LAB/Vivarium Spaces

Various Confidential Pharmaceutical Clients, PA | Date Range | Budget

Provided commissioning, verification and documentation of the functionality of the mechanical and electrical equipment for the HVAC systems in several pharmaceutical buildings. Mechanical equipment included new rooftop air handling units, exhaust fans, bag in bag out filter housings, steam/condensate systems, chilled water / condenser water systems, etc. Services provided included looking to eliminate simultaneous heating/cooling when not required and implement other items to condition the air more intelligently. All energy reduction suggestions needed to meet site and FDA requirements before they could be implemented and tested.

Doug Smith, PE, PLS

Senior Engineer

Firm
Verdantas

Office Location
Wilkes-Barre, PA

Education
B.S., Civil Engineering, The Pennsylvania State University

Licenses/Certifications
Professional Engineer, PA

Professional Land Surveyor, PA

Years of Experience
40 Years of Industry Experience

3 Years at Verdantas

About

Project Manager and Lead Designer Engineer for Civil Engineering, Water and Wastewater Engineering Projects. Doug Smith has over 40 years of experience in design and project management of water and wastewater projects, land development, roadway design, municipal engineering and consulting engineering projects for the U.S. Veterans Administration, U.S. Navy, PA Department of Transportation, U.S. Army Corps of Engineers, and PA Department of Environmental Protection.

Doug's design experience includes water and sewage planning and design, conceptual layout and design of land development and roadway projects, grading, stormwater design and management, erosion and sedimentation control design, specifications, development of sequence of operation, design of controls and monitoring systems, agency approvals and permitting. Doug has borough engineering and water/wastewater authority municipal engineering experience, including feasibility studies, projects' funding analyses, grant applications, drafting ordinances, rules and regulations, reviews of projects proposed by developers and general consulting on operations.

Qualifications

- Civil Engineering
- Water/Wastewater Engineering & Design
- Sewage Planning & Design
- Stormwater Design
- Permitting
- Project Management

Project Experience

350,000 GPD Equalization Tank

Pennsylvania | Technical Lead

Technical Lead for the design of a new 350,000-gallon domestic sewage equalization tank for the existing Kalahari sewage

discharge into the municipal system. Kalahari was mandated by the Township to provide equalization prior to discharge to the public conveyance system. Project included sizing of tank, design of aeration system, coordination with precast concrete tank supplier, coordination of all mechanical and electrical design requirements and technical support for all local and state permitting requirements.

Water Authority Engineer

Hughesville Borough, Pennsylvania | Municipal Engineer

Serves as municipal engineer for the Borough and for its water system. Specific projects include setup of telemetry system, rehabilitation of wells, lead and copper treatment, and water supply planning.

Hallstead – Great Bend Joint Sewer Authority (HGBJSA) Engineer

HGBJSA, Pennsylvania | Authority Engineering Consultant

Doug is the Authority Engineering Consultant for wastewater collection and treatment operation and design of improvements and upgrades to the sewer system and treatment plant. Doug has performed Act 537 sewage planning updates, assisted in preparation of an inter-authority agreement, has designed a 7-mile sewer extension to connect a new sewer system of another authority, and is planning for expansions of its sewage treatment plant.

Wastewater Treatment Plant BNR & Hydraulic Capacity Upgrades

HGBJSA, Pennsylvania | Project Manager & Lead Design Engineer

Project Manager and Lead Design Professional for the design, permitting, bidding and construction administration required to upgrade the wastewater plant to comply with nutrient removal permit limits. The process upgrade modified the treatment plant from an oxidation ditch with chlorine disinfection to an activated sludge four stage Bardenpho process, to address the requirements for reduction of total nitrogen and phosphorus. The design also provided a fully parallel system for effective maintenance and operation.

Clinton Sorber, PE, CFM

Senior Water Resources Engineer

Clinton Sorber, PE, CFM is a Senior Water Resources Engineer within Verdantas' Public-Private Infrastructure Division. His responsibilities include preparation, review, and oversight of Erosion and Sediment Pollution Control Plans, Stormwater Management Design, and Hydrologic and Hydraulic Studies. Clinton frequently provides internal drainage consultations across disciplines and, in doing so, displays his dedication to team and client. Software proficiencies held by Mr. Sorber include HEC-RAS, HY-8, and Bentley In-Roads.

Firm

Verdantas

Office Location

Wilkes-Barre, PA

Education

B.S., Water Resources, The Pennsylvania State University

Licenses/Certifications

Professional Engineer – PA

Certified Floodplain Manager

Qualifications

- Public and Private Infrastructure
- Stormwater Management
- Hydrologic/Hydraulic Studies

Years of Experience

11 Years of Industry Experience
10 Years at Verdantas

Project Experience

West End Flood Mitigation Study

Columbia County, PA

Senior Water Engineer part of an experienced team conducting a complicated flood mitigation study located within the floodplains of Fishing Creek and the Susquehanna River. The study included evaluation of structural and non-structural mitigation alternatives. Clint directed and oversaw development of a complex 2-D hydraulic model created to model the record flood event, evaluate induced flooding caused by proposed mitigation, and test alternatives intended to eliminate induced flooding. The completed study is anticipated to advance to design in 2023.

Brookside Levee Design and Accreditation City of Wilkes-Barre

Luzerne County, PA

Project manager responsible to evaluate existing levee system in the City of Wilkes-Barre and oversee all design and permitting to obtain accreditation. Scope of work includes:

- Coordination with FEMA, PennDot, US Army Corps of Engineers, PA DEP and Luzerne County Flood Protection Authority
- Review of previously completed FEMA hydraulic studies and completion of supplemented hydraulic studies
- Review of existing road closure structure and existing stormwater pump stations. Mechanical and electrical modifications to existing stormwater station
- Design and permitting required to raise existing levee to achieve required freeboard
- Geotechnical evaluation and seepage analysis required to achieve accreditation
- Utility investigation of all utilities within the levee footprint and general project area
- Bidding and construction services

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Exeter Borough Levee Flood Protection, Luzerne County Flood Protection Authority

Exeter Borough, PA

Project Manager responsible for the design and oversight of a 1700 linear feet of a new levee system along the Susquehanna River. Project includes public engagement, conceptual design services, preliminary design services, geotechnical investigations and a Conditional Letter of Map Revision (LOMR).

Spring Run/Solomon Creek Stream Restoration, Wyoming Valley Sanitary Authority

Hanover Township, PA

Project Manager and lead engineer responsible for design and project oversight of 2,000 linear feet of stream restoration. Project included stabilization of eroded stream banks, reconnection of the stream to floodplains, and design of bioengineering features such as log/boulder revetments, live stakes, and fascines. As lead engineer, Clint oversaw development of hydraulic modeling, directed design, provided oversight of plan production, and administered construction services for the client.

Luzerne County Flood Protection Authority Closure Structures Modifications

Wilkes-Barre, PA

Project Manager and Civil Engineer for a multi-site, multi-discipline project involving elimination of seven (7) sandbag closures in the 16-mile Wyoming Valley Flood Risk Management Project. The project involved structural, geotechnical, civil, and transportation engineering as well as coordination with the US Army Corps of Engineers, PennDOT, County Conservations District, and the Norfolk Southern Railroad Company. Clint steered this important public safety project to a successful completion which hardened the levee system and minimized flood operations response for the client.

Solomon Creek Wall Rehabilitation

Luzerne County, PA

Water Resources Specialist tasked with modeling the functionality of the creek under temporary conditions, designed the Erosion and Sediment Pollution Control Plan, designed the relocation of storm and sanitary networks, and obtained water obstruction and encroachment permits from the Pennsylvania Department of Environmental Protection. More recently, Clint has taken on a Project Management role in continuation of the infrastructure improvements along Solomon Creek to replace deteriorated walls and evaluate other flood mitigation and insurance mapping changes for the City of Wilkes-Barre.

SR 3046, South Valley Parkway, Hanover Township/City of Nanticoke

Luzerne County, PA

Water Resources Specialist acting as an integral member of an extensive team of engineers across multiple disciplines tasked with constructing approximately 4 miles of new, limited access highway through mountainous terrain. Clint was tasked with grading multiple drainage swales, berms, access roads, and PCSM basins using Bentley InRoads software. He exercised creativity in placing necessary E&S controls and BMPs beyond the most typical and exhibited flexibility in designing various stormwater management systems across the project. This new highway will connect Luzerne County Community College with SR 0029 and alleviate congestion on the existing routes.

Lisa Clementoni, PWS

Senior Environmental Scientist

Firm

Verdantas

Office Location

Wilkes-Barre, PA

Education

B.S., Environmental Science, Susquehanna University

Licenses/Certifications

Professional Wetland Scientist, PA

Qualifications

- Natural Resources
- Environmental Planning
- Wild Plant Management
- Wetland Delineation

Years of Experience

24 Years of Industry Experience

24 Years at Verdantas

Lisa currently holds over 20 years of experience in the environmental consulting field. She completes environmental evaluations for land developments, highway projects, master plans, and stream improvement projects. Lisa conducts wetland delineations on various sites for planned development and natural resource planning and prepares and secures Chapter 105/Section 404 water obstruction and encroachments permits, such as Joint Permits, General Permits, Waivers, and Environmental Assessments.

Her strong relationships with regulatory agencies have proven to move the permit review process along efficiently. She is responsible for the design of wetland mitigation projects, PNDI coordination, botanical surveys, habitat assessments, Phase I Bog Turtle Habitat Screening, benthic macro invertebrate studies, permit acquisition, and Pennsylvania Historic and Museum Commission (PHMC) coordination, among other tasks.

Project Experience

Columbia County Flood Mitigation Project

Town of Bloomsburg, PA
Environmental Lead responsible for wetland delineation, mitigation design, and securing Joint Permit Application as part of the $30 million flood mitigation system located in Bloomsburg, Columbia County, Pennsylvania. Lisa's work involved much coordination with the Baltimore District Army Corps of Engineers in resolving conservation easement and deed restriction issues in the protection of wetlands in perpetuity.

Solomon Creek Brook Street Stormwater/Flood Control Pump Station

City of Wilkes-Barre, PA
Environmental Lead for a 45,000 gallon per minute stormwater/flood control pump station located along Solomon Creek (a major tributary to the Susquehanna River) on Brook Street in South Wilkes-Barre, Luzerne County. The pump station is required to eliminate localized flooding, due to interior stormwater drainage issues, that occurs in a large residential and commercial area of South Wilkes-Barre adjacent to Solomon Creek. Permitting for the project included a PADEP GP-11 to address construction within the FEMA defined floodway. Construction was completed in November 2020. Total project costs approximately $1.6 million.

Flood Risk Management Expansion Project

Town of Bloomsburg & Bloomsburg Area School District, PA
Environmental Lead responsible for wetland delineation, and mitigation design for a new earthen levee flood risk management system. The flood risk management system included 4,400-feet of earthen levee, three (3) roadway stop-log closure structures, two (2) storm water pump stations rated at 30,000 GPM each, two (2) sanitary pump stations including a 10 MGD station and a 55,000 GPD packaged duplex grinder station, 2,600 lineal feet of 48-inch storm water SLCPP, storm water control manholes including sluice gates, sanitary sewer line work, and public utility coordination/relocations. The project required the approval of a Conditional Letter of Map Revision (CLOMR) from FEMA which was approved on December 18, 2018. A letter of map revision (LOMR) application is under preparation by Borton Lawson and will be secured to formally revise the 100-year flood plain on the Flood Insurance Rate Map (FIRM) for the levee protected area. A comprehensive Operation & Maintenance Manual (O&M) was developed for the overall flood risk management system. Construction was successfully completed, within budget, in December 2020. Borton Lawson is preparing the data certification package and application to FEMA to obtain full Accreditation of this levee system. Total project costs approximately $18 million.

Exeter Borough Levee Flood Protection, Luzerne County Flood Protection Authority

Exeter Borough, PA
Senior Environmental Scientist responsible for the environmental investigations and permitting oversight of a 1700 linear feet of a new levee system along the Susquehanna River. Project includes public engagement, conceptual design services, preliminary design services, geotechnical investigations and a Conditional Letter of Map Revision (LOMR).

Tim Duning, PE

Process Engineer

Firm

Verdantas

Office Location

Dublin, OH

Education

B.S., Environmental Engineering, The Ohio State University

Licenses/Certifications

Ohio Professional Engineer No. PE.81887

Class II Ohio WW Treatment Operator License No. WW2-20257964-23

Qualifications

- Water and Wastewater Engineering
- Wastewater Treatment Plant Operation

Years of Experience

12 Years of Industry Experience
1 Years at Verdantas

Training & Software

40-Hour OSHA Hazardous Waste Operations
8-Hour HAZWOPER annual refresher training

Tim Duning, PE is a Water and Wastewater Project Manager located in central Ohio. He holds a bachelor's degree from The Ohio State University in Environmental Engineering and is a registered Professional Engineer in the state of Ohio. Tim's experience includes planning, execution, and budget of a multitude of projects each year with scope and cost ranging up to multi-million dollars at a utility company. He led internal and external teams to complete projects on schedule and budget from conceptual/budgeting phase, to detailed design, including design-build, and construction management.

Tim has experience in consulting, design, operations, and management of projects at municipal water and wastewater treatment plants as well as industrial wastewater treatment. Treatment technology experience include, but are not limited to, lime/soda softening, coagulation/sedimentation, gravity and pressure filtration, disinfection, membrane softening (RO and NF), conventional biological wastewater treatment, and membrane bioreactor.

Project Experience

Aqua LDWWTP Clarifier Replacement

Lake Darby WWTP Galloway, OH | 2022-2023

As Project Manager, Mr. Duning oversaw the design and construction of the clarifier replacement at Aqua's Lake Darby WWTP. The project consisted of installing a new 40-ft diameter in ground concrete clarifier and associated valve/flow meter vault for the 0.5 MGD design (2.1 MGD max) flow rating. The project cost was about $3.2 million dollars and was completed via progressive-design build to successfully meet the aggressive deadline. Mr. Duning was the owner representative and was responsible for managing the design engineers, contractor, construction inspection, schedule, startup, troubleshooting and coordinating with operations.

Aqua WWTP Optimization Study

Union Rome Sewer WWTP Chesapeake, OH | 2023

Mr. Duning completed an engineering evaluation of a 1.0 MGD Membrane Bioreactor (MBR) WWTP to determine the cause of reduced treatment capacity and effluent quality. Each unit process was evaluated, and the Fine Screens were determined to be the leading issue. Mr. Duning then led the design to update the fine screen process.

Aqua Timberbrook WTP Rebuild

Timberbrook WTP Columbus, OH | 2022-2023

As Project Manager, Mr. Duning oversaw the design and construction of rebuilding the Aqua Timberbrook WTP that was rated at 0.18 MGD. The project consisted of a new building, concrete clear well, pressure filters, chemical addition, SCADA equipment, and high service pumps. Project cost was about $2.2 million dollars and was completed on-time and on-budget. Mr. Duning was the owner representative and was responsible for managing the design engineers, contractor, construction inspection, schedule, startup, troubleshooting and coordinating with operations.

William Thompson, PE

Area Geotechnical Practice Leader

Firm
Verdantas

Office Location
Tabernacle, NJ

Education
BS, Civil and Environmental Engineering, Rutgers University, USA

Licenses/Certifications
Professional Engineer, New Jersey, New York, North Carolina, Pennsylvania & Texas

Years of Experience
11 Years of Industry Experience

About

William Thompson is a geotechnical engineer and technical expert with over 11 years of consulting experience for clients in the transportation, rail, resources, power and utilities, water/wastewater, high-rise buildings, and federal government sectors. Bill has developed and administered geotechnical investigation reports, pile drivability studies, retaining wall design, settlement analysis, slope stability, rock mass analysis, and the design of shallow and deep foundations.

Project Experience

New York Power Authority (NYPA), Canal Embankment Assessments

Lockport, New York, USA

Bill assessed the embankments along their canal in the western portion of New York. He led the project as the geotechnical engineer of record, which involved discussing the requirements of NYPA for evaluating the embankments. Bill also coordinated the specifications for drilling geotechnical borings within the embankments to limit hydraulic fracturing and other dam safety concerns. In addition, he performed embankment stability and seepage analyses and provided recommendations for remediation to increase the canal's design life for an additional 50 years.

Confidential Client, Green Brook Flood Risk Management Project

Green Brook Township, New Jersey, USA

Bill provided geotechnical engineering to design a levee spanning two townships in Middlesex and Somerset counties. He led the geotechnical field investigation, which involved collaborating with township officials and private residents. The investigation comprised performing standard penetration borings and permeability testing for seepage analysis data. Bill also coordinated lab testing for the project and compiled a geotechnical data report following U.S. Army Corps of Engineers (USACE) requirements.

North Bergen Municipality Utility Authority, Combined Sewer Overflow (CSO) Tank
North Bergen, New Jersey, USA

Bill was the geotechnical engineer of record for constructing a five-million-gallon CSO tank. He oversaw the geotechnical investigation and analysis for the shallow foundations proposed for the tank, performed bearing capacity and sliding analyses for shallow footings and mat foundations, and developed a micropile option for the foundation. Bill also used Settle3 software to analyze differential settlements due to the tank's foundation bearing partially on bedrock and soil. He worked closely with the structural team to optimize the foundations for the client.

New Jersey American Water, Storage Tank and Pipeline
Eatontown, New Jersey, USA

Bill led the design and investigation for the construction of a two-million-gallon aboveground storage tank and approximately 4,500 LF of new water pipeline. As the engineer of record for the project, he oversaw the geotechnical investigation, design, and report development. The analysis included deep and shallow foundation designs, including a micropile option, and shallow foundations with differential settlement checks performed. A pavement design following the *AASHTO Guide for Design of Pavement Structures* (1993) was also provided as part of the pipeline construction.

New York Department of Environmental Protection (NYDEP), Catskill Aqueduct Repair and Rehabilitation
Newburgh, New York, USA

Bill provided geotechnical engineering for the Catskill Aqueduct repair and rehabilitation project by conducting quality and submittal reviews for an alternative retaining wall system proposed by the contractor. He also evaluated the as-equal submittal for a soil nail wall using chance helical anchors, provided comments, and oversaw anchor testing in the field to ensure the client received an appropriate wall system.

NYDEP, Hillview Reservoir Additional Facilities Project
Yonkers, New York, USA

Bill performed a quality assurance/quality control review of the proposed secant pile wall excavation support system prior to the construction of additional facilities at the Hillview Reservoir. The secant pile wall was to protect the reservoir during construction. His review involved ensuring the geotechnical report and design followed the project requirements and industry standard of care. In addition, Bill provided a constructability review of the proposed excavation support system.

Thomas Harley, Jr., PLS

Senior Project Manager, Survey

Firm

Verdantas

Office Location

Wilkes-Barre, PA

Education

A.S. Forest Technology,
Pennsylvania State University

Licenses/Certifications

Professional Land Surveyor, PA
Professional Land Surveyor, NJ
Professional Land Surveyor, WV
Professional Land Surveyor, OH
Professional Planner, NJ

Qualifications

- ALTA Surveys
- Boundary Surveys
- AutoCAD Civil 3D

Years of Experience

44 Years of Industry Experience
9 Years at Verdantas

Mr. Thomas Harley, Jr, PLS brings 44 years of survey and project management experience to Verdantas. He is responsible for field crew supervision, proposal preparation, project coordination with clients, deed research, boundary calculation, subdivision plan preparation, township meeting attendance and preparing metes & bounds descriptions. Tom has extensive experience in PA and NJ in many types of projects such as construction stakeout, topographic surveys, aerial mapping control, large boundary surveys, ALTA surveys, flood elevation certificates, wetland delineations, septic designs, gas wells, gas pipelines and power line right of ways. He has experience with total stations, GPS receivers, robotic instruments, data collectors, AutoCAD Civil 3D, Microsurvey, Bentley InRoads, Bentley OpenRoads, corpscon, AutoCAD design review and Trimble Geomatics Office.

Project Experience

Misericordia University – Minor Subdivisions

Dallas, PA
Responsible for supervising field crews, research of property records, research easements, as-built survey, subdivision and zoning ordinance review, preparing misc. minor subdivision plans, preparing metes & bounds descriptions and township meeting attendance.

North Branch Land Trust & Earth Conservancy

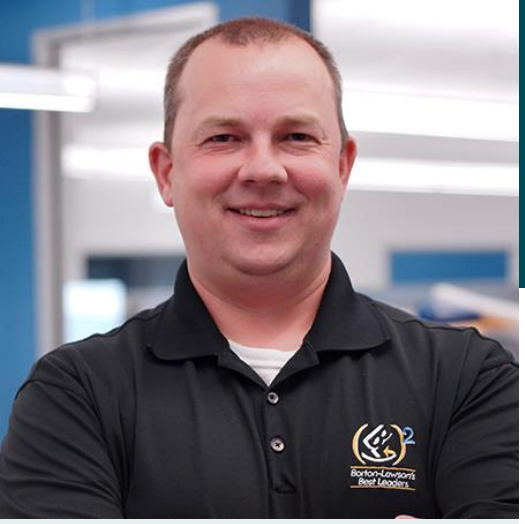
Hanover, PA
700-acre Survey and Subdivision. Tom was responsible for supervising field crews, research of property records, research easements, boundary survey calculations, subdivision and zoning ordinance review, preparing minor subdivision plans, preparing metes & bounds descriptions and township meeting attendance

PPL Electric Utilities

Plymouth Township, PA
Responsible for research of PPL records for right of way agreements, plan and profile maps and structure details. Establishment of centerline and right of way, preparing PPL base maps as per PPL cad standards.

Geisinger Health Systems – Alta Surveys

Miscellaneous Sites, PA
Responsible for supervising field crews, research of property records and easements, review of title commitment, boundary survey calculations and preparing ALTA survey plans for miscellaneous sites across Pennsylvania.



Nicholas Argot, PE, LEED

Civil Service Leader – Site/Civil

Firm

Verdantas

Office Location

Wilkes-Barre, PA

Education

B.S., Civil Engineering, Drexel University

Licenses/Certifications

Professional Engineer, PA
Professional Engineer, MD
Professional Engineer, RI
LEED Green Associate

Qualifications

- Site Design & Permitting

Years of Experience

17 Years of Industry Experience

13 Years at Verdantas

Nicholas is a Senior Civil Engineer with more than 15 years of civil engineering experience. The past 12 years of experience has been focused in land development engineering. During this time, he worked in the capacity of a design engineer and project manager in both private and public land development projects.

Nicholas has acted as the primary liaison between senior management, design professionals, township officials, regulatory agencies, developers, and contractors related to the approvals for commercial, industrial, and institutional development projects. He has a thorough understanding of the permitting process for both local (land development) and state approvals (NPDES and E&S).

Project Experience

Misericordia University Campus Improvements Project

Dallas, PA
Project Manager and Senior Civil Engineer responsible for design of a campus improvements project at Misericordia University. Responsible for the scheduling, management, and design of site infrastructure in order to obtain land development, stormwater management, and erosion control permitting. The work included a building addition, parking lot expansion, and pedestrian/vehicle circulation design.

Liberty at Allen

Allen Township, PA
Project Manager and Senior Civil Engineer responsible for design of a 1,000,000 square foot warehouse in Allen Township, PA. Responsible for the scheduling, management, and design of site infrastructure in order to obtain land development, stormwater management, and erosion control permitting. The work included a 1,000,0000 square foot warehouse building, parking, utility infrastructure, and stormwater management.

Geisinger Wyoming Valley, Central Utility Plant

Plains, PA
Project Manager and Senior Civil Engineer responsible for design of a Central Utility Plant on the Geisinger Wyoming Valley Medical Center campus. Responsible for the scheduling, management, and design of site infrastructure in order to obtain land development, stormwater management, and erosion control permitting. The work included a central utility plant, utility infrastructure, and stormwater management.

Geisinger Wyoming Valley, Cancer Center Building Addition

Plains, PA
Project Manager and Senior Civil Engineer responsible for design of a building addition to the existing Cancer Center on the Geisinger Wyoming Valley Medical Center campus. Responsible for the scheduling, management, and design of site infrastructure in order to obtain land development, stormwater management, and erosion control permitting. The work included a building addition, patient drop off, landscaping, utility infrastructure, and stormwater management.

West Carey Street Capital Improvement Project

Plains, PA
Project Engineer responsible for design of a sidewalk along West Carey Street in Plains Township. Project included design of sidewalk, ADA ramps, and permitting. Other tasks included preparation of project specifications, details, project bidding and construction inspections.

Ryan Harting, PE

Senior Structural Engineer

Firm

Verdantas

Office Location

Lehigh Valley, PA

Education

B.S., Civil Engineering,
University of Pittsburgh

Licenses/Certifications

Professional Engineer, PA

Qualifications

- Structural Engineering
- Project Management
- Construction Management

Years of Experience

19 Years of Industry Experience
17 Years at Verdantas

Mr. Harting works as a Structural Technical Leader within our Industrial Service Center but he plays a key role in all four of our business units in various capacities. He performs analyses and prepares designs for a wide variety of clients and has experience with many types of construction materials. His focus is on performing structural designs for unique structures such as glass furnaces, natural gas processing facilities, foundations for scrubbers, exhaust stacks, and electrostatic precipitators, as well as heavy equipment foundations.

Project Experience

West Influent Pump Replacement

City of Bethlehem, PA

Project Manager and lead structural engineer for this project to replace three (3) 100hp pumps with new pumps, piping and appurtenances. The new pumps were designed to operate in variable frequency drives (VFDs) and the scope included replacement of the MCCs, upgrade of alarm and control panels, design of a new ventilation system, and replacement of stairs and platforms.

Confidential Project

Confidential Client, PA

Structural Engineer involved with the structural design of several parts of this 500,000 square foot manufacturing facility including the design of an electrical substation, the liquid loadout building, and several mezzanine and equipment support projects. The electrical substation consists of a 40’ tall A-frame dead end structure, transformer box, circuit switcher and a control panel. Part of the substation design included the design of a support on the breaking and winnowing building to resists the 6,000 tension on the three electrical lines.

Confidential Project

Confidential Client, AZ

Ryan designed the foundations for the clinker cooler and first drive section for a cement plant located in Tucson, AZ. Ryan also developed a framing system to support a new process duct by spanning over an existing building in order to eliminate conflicts with buried utilities.

Confidential Project
Confidential Client, PA

Structural Designer responsible for the preliminary and final design of a three story 94,000 Sq. Ft. Office Building. Design parameters included a future addition and a cost evaluation to determine the most economical building material. Design included composite beam design, cross bracing to resist lateral forces, and several canopies surrounding the building. Ryan was also involved in the construction administration including coordination between various construction trades, shop drawing review, RFI's, and all construction related issues.

Confidential Project
Confidential Client, NC

Ryan designed a steel framing support system for three forehearths for a glass container manufacturer in Henderson, NC. The forehearths are refractory "channels" that carry the molten glass from the furnace to the forming machines. The design included accommodations for the thermal expansion of the refractory, tight deflection criteria, and complex geometry requiring special connection design of steel members. The design also included design of platforms over and around the glass forming machines with access stairs, oil drip pans, and reject chutes.

Confidential Project
Confidential Client, PA

Structural Designer responsible for the design of the PET Packaging mezzanine and roof top support. A 40' tall steel tower was designed to support a roof top unit. The structural design also included a crane beam design and the relocation of an existing column on an existing light gauge steel mezzanine.

Daniel Barr, PE

Senior Project Manager

Firm
Verdantas

Office Location
Columbus, OH

Education
BSCE, Case Western Reserve University

Licenses/Certifications
Registered Professional Engineer: OH, NC, WV

Years of Experience
29 Years of Industry Experience

Associations
AWWA: Distribution, Fire Protection, and O&M Committees

About

Daniel Barr's experience with wastewater systems includes more than 80 projects involving treatment plants, sewers, lift stations, force mains, water hammer analysis, and computer modeling. He also has experience in construction administration and inspection projects.

Dan has built his expertise through his active involvement in the American Waterworks Association, the Water Environment Federation, and other organizations. He has participated in developing standards and finding water solutions to smaller/rural communities.

Qualifications

- Project Management
- Planning
- Computer Modeling
- Construction Administration
- Contractor Management
- System Assessment & Investigation

Project Experience

Rattlesnake Water System

Fayette County, Ohio | 2021–2026 | $20M

Dan is one of the project leads for designing and constructing the supporting infrastructure for this multi-billion- dollar electric vehicle battery factory by Honda and LG Energy Solution. With the immediate impact on water demand anticipated from this development and other related growth, the Fayette County Commissioners coordinated with the project team to revise the initial treatment plant design to a much broader scope, including:

- A new 4 MGD surface water treatment facility
- A new 1 MG elevated water storage tank
- Improvements to the existing distribution system
- Raw water supply, pumping, and transmission facilities

Throughout the project, significant coordination was required with numerous agencies, including the Ohio EPA Division of Drinking and

Ground Waters, the OEPA Division of Surface Water, the Ohio Department of Transportation, the US Army Corps of Engineers, the Fayette County Building Department, and the Clinton County Building Department.

In addition to providing design and other related services for the construction of the permanent water treatment facilities, the design team supported the aggressive schedule for the availability of a larger volume of potable water while the new treatment plant was under construction. Also supported the county in developing and permitting two phases of temporary water treatment facilities.

Water Treatment Plant HAB Improvements

Cadiz, Ohio | 2019–2023 | $2.3M

The initial purpose of the HAB improvements was to reinstate and improve critical processes that need attention under the Ohio EPA Notice of Violation issued in December 2018. A parallel purpose for the upgrades was to enable the plant to meet the produced water capacity needs of the future Harrison County Power Plant and the village water needs.

The project scope includes, in part, replacing all intake water pumps and Sparrow Reservoir pumps, replacing high service pumps, replacing granular filter media, new piping, valves, and flow meters in the filter room, and installing Clearwell water quality monitoring systems.

This project is Ohio's first surface water plant to use temporary filtration units mounted on portable skids to maintain drinking water production while the plant was under construction.

WWTP Improvements

Sunbury, Ohio | 2021–2025 | $16.5M

The Wastewater Treatment Plant (WWTP) was last updated in 2004. The city expects new residential and commercial/industrial growth, leading to increased wastewater flows. Reviewed three-year monthly operation data for the existing flows, plant influent, and effluent parameters. Assessed existing and future planning areas and population growth and updated the service area.

In addition to increasing the permitted capacity of the plant, equipment installed as part of the 2004 upgrade is now 20 years old and needs replacement. The team made recommendations to meet the WWTP's future treatment goals. Wet stream process evaluation included an influent pump station, headworks (screen and grit removal), biological nutrient removal by Oxidation Ditch, Final Clarifiers, post-aeration, and UV Disinfection.

Johnson Island Water Main

Marblehead, Ohio | 2021–2024 | $7M

Provided services for the replacement and extension of 25,000 lf of 8” ductile iron water main, installed to furnish the island’s first central water system. Residents have been using cisterns for a long time.

The project includes a 3,000 lf 12” HDPE crossing Sandusky Bay, installed by direct burial from barges. The pipe is protected by concrete block mattresses underwater. Most of the water main installation is in rock, so extensive geotechnical investigations were done to characterize the shallow rock and determine

its hardness for bidding purposes. The entire area is a federal national historic site due to Civil War and Native American activities on the island, so extensive coordination with the Park Service, SHPO, and the Army Corps was required to obtain the proper permits for the project, which included using Ground-Penetrating Radar to search for grave sites.

Water Main Improvements

Waldo, Ohio | 2019–2023 | $5.5M

The Village of Waldo had been seeking a centralized water system for more than 50 years and was unsuccessful. A new water system was now possible using a combination of stimulus funding and a very generous funding package from the Ohio EPA Water State Revolving Loan Fund which included almost $3M of principal forgiveness plus Delco Water Company's support. This project involved design, bidding, and construction administration and inspection of more than 25,000 ft of 1-in to 12-in water main and 250-meter pits and water services. A railroad crossing was also included.

Water Main Improvements

Wheeling, West Virginia | 2021–2022 | $4.5M

Wheeling's downtown was evolving into its next phase as a center for health services and education and a destination for delicious food, festivals, and heritage tourism. As part of this evolution, downtown Wheeling is enhancing its streetscape and updating its infrastructure, including replacing cast iron water lines stamped with the year 1892 to ensure that clean water will continue to flow.

Provided design, bidding, and construction inspection of over a mile of water main replacement through downtown. The team successfully navigated the logistical challenge of replacing more than 5,500 lf of 16" active water main and updating almost 500 service lines while maintaining service to downtown businesses and keeping traffic moving. An accelerated schedule prompted by a separate project to replace downtown streets and sidewalks over the water mains also presented a challenge.

Section 4:

Technical Approach & Scope of Work

1.2 Technical Approach & Scope of Work

The following outlines services by design and permitting phase as well as on a discipline level.

SCOPE OF WORK BY PROJECT PHASE

Project Kickoff to 60% Design

- Meet with LCA to kick off the project.
- Conduct field survey.
- Complete wetland delineation and generate report.
- Create existing conditions model utilizing FEMA's effective hydraulic model.
- Perform geotechnical borings.
- Preapplication meeting with PADEP.
- Document existing conditions of the exterior and interior of pump station and intake structure.
- Coordinate with LCA regarding the selection of major equipment and proposed location of new facilities.
- Coordinate with vendors regarding design of major components.
- Develop and submit 60% design plans and technical specifications to LCA for review.
- Develop draft permit application packages.
    - Chapter 105 (PADEP GP-11)
    - Aids to Navigation (ATON) Plan.
    - Public Water Supply
    - Flood Management Permit
- 60% design review meeting

90% Design

- Address comments received from 60% design review.
- Develop construction details.
- Complete and submit permit applications.
- Incorporate comments and finalize design drawings and technical specifications.
- Develop Class 2 Opinion of Probable Cost.
- Develop and submit 60% design plans and technical specifications to LCA for review.
- 90% design review meeting

Final Design

- Conduct a design workshop to review comments received from LCA.
- Incorporate comments and finalize design drawings and technical specifications.
- Modify LCA standard front-end specifications to be project specific.
- Submit bid-ready documents to LCA.

Bidding Services

- Provide 2 sets of paper copies and one electronic copy of the final Contract Documents for use by LCA.
- Obtain a prevailing wage determination by the Pennsylvania Department of Labor and Industry and incorporate into bid documents.
- Prepare advertisement in accordance with public bidding laws.
- Setup project on the PennBid platform and administer process for the duration of bidding.
- Respond to questions by prospective bidders and equipment suppliers concerning

information in the Contract Documents. Coordinate with LCA as necessary regarding answers to RFIs.

- Schedule and conduct a mandatory Pre-Bid Meeting to discuss the scope of the project and bidding requirements. Include a site visit following the meeting. Prepare and distribute minutes to attendees and other appropriate parties.
- Prepare and issue Addenda as appropriate to interpret, clarify or expand upon the Contract Documents and to memorialize all RFI responses.
- Evaluate the bids received for compliance with the bidding requirements.
- Review qualifications and experience data furnished by bidders and contact project references as needed. Review bid bonds, insurance and other information provided for general conformance with Contract Documents.
- Provide recommendation with respect to acceptance of bids and award of construction contracts to LCA along with a copy of the bid tabulation sheets and supplementary information provided by bidders.
- Issue Notice to Proceed to the Contractors.
- Assumptions/Exclusions:
    - LCA will provide the most up-to-date Front-End documents to be tailored for this project.
    - Advertisement for bid will be placed by and paid for by LCA.
    - The project will require three (3) contracts – General, Electrical, HVAC
    - The Pre-Bid Meeting for all Contracts will be held concurrently.
    - LCA will issue Notice of Award, along with a blank agreement, performance and payment bonds to successful Contractors. LCA will review bonds and insurance and coordinate Agreement execution.

SCOPE OF SERVICES BY DISCIPLINE

General

- Detailed design drawings.
- Equipment schedules and details.
- Technical specifications.
- Quality Assurance/Quality Control
- An in-person 2-hour kickoff meeting held at LCA.
- Design review meetings with LCA for 60% and 90% design submissions.
- Assumptions/Exclusions:
    - The current building is code compliant and will remain code compliant.
    - LCA will assist with Flood Plain coordination.
    - Services necessitated by the enactment or revision of codes, laws, or regulations, including changing or editing previously prepared documents shall be subject to additional services.
    - Services not specifically described/listed herein shall be excluded from our scope/fee and can be added as an additional service should they be required.

Survey

- Establish site control on State Plane Coordinate System PA North Zone, NAD 1983 and NAVD 1988.
- Conduct a field survey to locate ground elevations, existing physical features such as buildings, inlet structure, access roads, visible utility features (e.g. valves, paint markings),

top of bank, bottom of bank, and vegetation.
- Prepare an AutoCAD survey base map drawing showing 1' topography and existing physical features.
- Assumptions/Exclusions:
  - Bathometric survey will not be performed.
  - An ALTA/ACSM Land Title Survey, extensive deed research to determine junior/senior rights, survey of municipal boundary lines will not be performed.
  - The surveyor will only locate the above ground utility structures and map the location of underground utilities that are visible from the above ground structures. No ground penetrating radar or excavations will be performed to determine the location of underground utilities.

Civil

- Based on topographic survey, previous conceptual plan and feedback received from the design team, prepare updated layout design for the site.
- Prepare site grading design.
- Prepare erosion and sediment control calculations and plans for site.
- Prepare erosion and sediment control plans as necessary for inclusion the Chapter 105 permit related to stream impacts.
- Design site improvements for feed system such as concrete tank pad, containment, fencing, access drive, and loading-port area.
- Assumptions/Exclusions:
  - The total limit of disturbance will be less than 1 acre and as a result an NPDES permit will not be required.
  - No additional site impervious is proposed and as result stormwater management design is not anticipated.
  - Technical specifications will be listed on drawings.
  - Land Development Plan submissions are not included.

Environmental Permitting

- Wetland Delineation / Report
  - A Wetland Scientist (WS) will perform a wetland delineation, identify and clearly mark the boundaries of any wetlands and/or surface water that may be present within the project area.
  - Survey methods will follow those detailed in the Army Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and subsequent Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0) (U.S. Army Corps of Engineers, April 2012).
  - The WS will collect and record pertinent data necessary to document and memorialize the findings of the wetland survey. If wetlands are found within the study area, the WS will incorporate this information in a Wetland Delineation Report. The report will include narrative descriptions of the areas evaluated, background resources reviewed, methodologies followed and survey findings. The reports will also include Site figures, wetland determination data forms; National Wetland Inventory (NWI) maps, soil survey maps and photographic documentation.
  - Deliverables:
    - KMZ, shapefile and AutoCAD file of Wetland data.

        - Wetland Report.
- Chapter 105 Permitting (PADEP GP-11)
    - A GP-11 applies due to a presumed Water Obstruction and Encroachment Permit that may have been acquired as part of the construction of the existing intake structures in the 1990's.
    - A General Permit GP-11 (Maintenance, Testing, Repair, Rehabilitation or Replacement of Water Obstructions and Encroachments) is required due to the need for maintenance and rehabilitation of the original intake structure and addition of floating debris screen.
    - Coordination with the reviewing agencies (PADEP) to determine all components of the permit applications will be conducted.
    - No Submerged Land License Agreements (SLLA) are anticipated for this project.
    - Verdantas will submit the permit application package through OnBase.
    - Deliverables:
        - GP-11 permit application package submission to DEP.
    - Assumptions / Exclusions:
        - If changes in the permit requirements are identified due to changes to the project design and or coordination with PADEP through the Pre-Application meeting, Verdantas will reassess potential impacts to the permitting tasks.
        - Permit application fees will be paid by LCA.
- ATON (Aids to Navigation) Plan
    - An ATON plan is required whenever there are impacts to safe navigation on a Commonwealth waterway. According to the PA Fish and Boat Commission (PFBC), the Lehigh River is listed as a waterway used by recreational boaters, therefore requiring an ATON plan
    - During the Pre-Application Meeting with the reviewing agencies for the project, PA Fish and Boat Commission will give guidance to Verdantas on components that the ATON Plan shall include, such as:
        - A narrative outlining the project location, scope, schedule of construction, and description of proposed ATON Plan will be included in this scope.
        - Maps, photographs, project plans with approved E&S Control Plans will be included.
        - Example of proposed ATON through drawings or photos of all proposed signs and buoys, including proper symbol and working, will be included in the ATON Plan.
    - Deliverables:
        - ATON Plan submitted to PFBC for review.
- Floodplain Management Permit
    - Assist LCA with obtaining a Flood Management Permit through the City of Allentown.
- Assumptions/Exclusions:
    - A GP-4 would does apply due to the size and configuration of the intake structures/internal piping network exceeding GP-4 thresholds Joint Permit Application.
    - T&E Species Habitat Studies is not required.
    - Cultural Resource Coordination/Studies is not required.
    - Section 4(f) documentation is not required.
    - Submerged Lands License Agreement (SLLA) is not required.
    - LCA will assist with Flood Plain coordination.

- Modifications to the structure will not be deemed a Substantial improvement as defined by the Nation Flood Insurance Program.

Hydrologic and Hydraulic (H&H) Study

- A Hydraulic Model of existing and proposed conditions will be compared utilizing the USACE Hydrologic Engineering Center's River Analysis System (HEC-RAS) or an approved equivalent program.
  - Obtain from the Federal Emergency Management Agency (FEMA) the current effective hydraulic model in HEC-RAS for a minimum of 1,000 linear feet of the Lehigh River (500' upstream and downstream of the project location).
  - Prepare a Duplicate Effective Model in order to replicate the data found in the effective Flood Insurance Study (FIS).
  - Create the Corrected Effective Model as necessary to correct any technical errors or include any floodplain changes prior to the date of the effective model.
  - Create the Existing Conditions Model by revising the Corrected Effective Model to include additional cross sections at the project location and any observable modifications that have occurred within the floodplain since the date of the effective model.
  - Create the Proposed Conditions Model by modifying the Existing Conditions Model to reflect the proposed debris boom and debris screen, assuming complete blockage of the screen.
  - Complete the necessary technical analyses needed to provide a 'no-rise' certification to the City of Allentown Floodplain Manager for the Base Flood.
- A Summary H&H Report shall be prepared which is to include:
  - Project description
  - Source information for all technical data used in the analysis
  - Description of analysis procedures and all changes made to the various models mentioned above
  - Cross section plots of all additional sections added to the model for existing and proposed conditions
  - Annotated effective FIRM showing additional cross sections and project site location
  - Annotated effective Floodway Data Table from the FIS.
  - Hard copy and electronic copy of all prepared models and output files
  - "No-Rise Certification", if warranted, signed by a Professional Engineer
- Assumptions/Exclusions:
  - No new hydrologic analysis will be required or performed.
  - The current effective hydraulic model will be available from FEMA in digital HEC-RAS format.
  - No major changes to the effective model will be required or conducted (i.e. changes to flow data, hydraulic structures, or boundary conditions)
  - Minor modifications which may be required in creation of the Corrected Effective Model shall include addition of cross sections at the project site, changes to overbank roughness factors, adjustments to ineffective flow areas, and coding of obstructions within the floodplain.
  - No review by FEMA will be required and no fees will be charged for a CLOMR review

Geotechnical

- Site Coordination and Utility Clearance
  - As required by law, our drilling subcontractor will contact Pennsylvania 811 One-Call to locate and mark public utilities. Marking of public utilities only occurs on public right of ways which may not extend onto private property and the proposed boring locations. We request that any information you may have about private utilities at the site be made available for review. The selected boring location will require owner approval to assure clearance of any utilities prior to drilling.
- Standard Penetration Test (SPT) Borings
  - Based on the provided information, our geotechnical field program will consist of two (2) test borings (performed in general accordance with ASTM D 1586) at the marked locations. Boring B-1 will extend to about 50 feet below grade and Boring B-2 will terminate at 12 feet in depth. If bedrock is encountered, a maximum of 10 feet of bedrock will be collected within sound rock utilizing NQ or NX sized coring in general accordance with ASTM D2113. A maximum of one (1) day for drilling has been assumed for this work. The field investigation is anticipated to consist of completing the following tasks:
    - Mobilization on one occasion to complete the work;
    - Split-spoon samples shall be obtained in accordance with ASTM D1586. Sampling intervals will be every 2 feet of depth to a depth of 12 feet. A 5-foot interval shall be sampled thereafter to the termination depth;
    - If bedrock is encountered, the boring will be advanced a minimum of 10 feet into sound rock at Boring B-1 utilizing NQ or NX sized coring in general accordance with ASTM D2113;
    - Utilize hydrochloric acid on samples to detect the presence of carbonate mineral which are the primary components of karst formations;
    - Split-spoon soil samples will be placed in tightly capped jars provided by the drilling subcontractor in order to prevent loss or gain in moisture content;
    - Measure ground water depth during and immediately after completion if practical. Note any anomalies observed that could affect the measured level of ground water in the borehole;
  - Samples will be preserved in the field and transported to Verdantas' Wilmington soil laboratory in general accordance with ASTM D4220 for further review and testing. At the conclusion of drilling, the boreholes will be backfilled with granular bentonite chips and cuttings.
  - The location of the Project is within potential Karst geology conditions. This proposal assumes that Karst conditions will not be encountered. If a void due to Karst is encountered during drilling, grouting of the hole may be required at an extra cost consistent with the fees noted in the Additional Geotechnical Terms.
  - If the drilling program requires modification based on the site conditions encountered or availability to access boring location, additional work will be invoiced on a unit rate basis, as provided in this proposal.
- Laboratory Testing Program
  - Perform laboratory index testing to classify the soil types encountered and to estimate their engineering characteristics. We have budgeted for testing that may include determination of soil sample moisture content, percent passing no. 200 sieve, Atterberg Limits, and compressive strength of intact rock. No environmental testing or analysis is included in this proposal.

- Report
  - A geotechnical engineering report will be prepared based on the results of the fieldwork, laboratory testing, and engineering evaluation. The report will be signed and sealed by a professional engineer specializing in geotechnical engineering in the Commonwealth of Pennsylvania. The report will include the following information, at a minimum:
    - Description of the exploration and sampling methods;
    - General description of the site, pertinent geological information, and subsurface soils encountered;
    - Plan view showing boring locations;
    - Boring logs and generalized subsurface profile(s) of the soil test borings;
    - Water depths encountered in the borings at the time of drilling and within selected waiting periods;
    - Color photographs of the site;
    - Core logs including Recovery (REC), Rock Quality Designations (RQD) and rock core photos, if encountered;
    - Depth of partially weathered rock or refusal materials, if encountered in borings, and a discussion of excavation difficulties;
    - Depth and location of unsuitable materials, if encountered in borings;
    - Depth to frost line;
    - Results of laboratory testing;
    - Recommendations for suitable foundation system(s) alternatives;
      - Shallow Foundations
        - Shallow foundation recommendations shall be provided and to include at a minimum:
          - Allowable bearing capacity;
          - Total and differential settlement analyses;
          - Global Stability analyses;
    - Recommended seismic site classification to include:
      - Seismic Site Class
      - Seismic Design Category
    - General information regarding site preparation including suitability of on-site materials for reuse as structural fill, compaction recommendations, anticipated excavation difficulties, and general dewatering recommendations.
    - The global stability analysis will evaluate the stability of the adjacent embankment due to the construction of the proposed tanks. Geometry of the embankment will use publicly available Lidar data. If an unstable condition is determined, a more detailed survey of the embankment's geometry may be required and is not included in this proposal.
- Assumptions/Exclusions:
  - if "unanticipated" subsurface conditions are encountered, LCA will be notified and recommendations for additional services will be provided.
  - If additional fieldwork, testing, or consulting services beyond those provided in our proposed scope are requested, they can be provided on a "time-spent" basis in accordance with the enclosed Hourly Rate Schedule and Additional Geotechnical Terms.

PAC System Design (Processing Engineering)

- Review Chemical Feed System Tech Memo and Basis of Design.
- Request and review raw water quality from Big Lehigh Pump Station.
- Review raw water line hydraulic information to verify sufficient velocity in order to prevent PAC settlement in pipe.
- If client has preferred or existing carbon vendor, Verdantas will work with them to facilitate jar testing in order to determine: 1) the ideal type of powder activated carbon (e.g. – bituminous, coconut shell, lignite, etc.), and 2) the dose rate.
    - Treatment material vendors will often perform this testing at no charge to the client. It is assumed that treatment vendor will perform the jar testing at no cost and that the client will collect and ship the required samples to the vendor's laboratory.
    - It should be noted that this dose rate may change with seasonal changes in water quality
    - Verdantas will coordinate with the vendor to provide a testing procedure
    - Verdantas will coordinate with the client on proper sampling procedures for indicative samples.
- Verify sizing of proposed 12,500-gallon slurry tanks per the jar testing above, local agency requirements, and 10-State Standards. Utilize Snyder as the proposed manufacturer provided in RFP Basis of Design and evaluate up to 2 additional manufacturers.
- Size meter pumps according to client flow requirements and dosing results from jar testing
- Work with PAC system vendor to provide PLC system that fully integrates to the client's SCADA system.
- Provide system process flow diagram (PFD), process and instrumentation diagram (P&ID), layout, and system specification for a full-functioning PAC feed system.
- Assumptions/Exclusions:
    - In-plant and/or pilot plant studies are not required.
    - Chemical and biological analysis is not required.

Electrical

- Pumping Improvements:
    - Site survey and documentation of existing conditions to gather data for the upgrade plans. Contact PPL electric to determine main service capacity.
    - Motor control center (MCC) modifications necessary for the demolition and addition of new work equipment described in this proposal. Design scope is based on the MCC and main electric utility company service entrance having adequate capacity to serve all the upgrade equipment.
    - Power to serve new pump throttling control panel and MOV's for the 4 raw water pumps.
    - Demolition of the existing throttling PARCO Hydraulic Control System.
    - Replace existing bubbler level sensors with submersible level or radar sensors for wet well/river levels at the 2 wet wells.
    - Demolition of the existing obsolete small air compressor.
    - HVAC – Power and control of a new exhaust fan and 2 Intake Air Louvres.
    - Review the existing raw water pumps start up sequence and possible remote automation of the sequence from the water filtration plant. This will be a review to recommend possible automation methods that could be added to the design scope.

- Chemical Feed System (PAC):
  - Power and control wiring for truck unloading system control panel.
  - Level indicating transmitters (LIT/LE) for 2 slurry tanks, 12,500 Gallons each.
  - Chemical slurry tank agitator motors for the 2 slurry tanks.
  - Chemical slurry tank discharge line LIT/LE and auto shutoff valve.
  - Power for 2 chemical metering pump motors for PAC slurry system.
  - Flow meter on raw water transmission main at the BLPS exit.
  - PAC slurry tank system control panel power, instrumentation, and controls.
  - Power for heat tracing on slurry tanks, and heat tracing on slurry tanks discharge line.

Automation

- Design of a new control panel, design shall include the following
  - Allen Bradley Compact Logix 5380 Processor
  - 5069-IB16 Digital Input Cards
    - I/O Included
      - Slurry Storage Tank General Alarming
      - Chemical Feed General Alarming
      - UPS General Alarming
  - 5069-IF8 Analog Input Cards
    - I/O Included
      - New throttling MOV valves replacing the existing Parco Hydraulic Valves.
      - Big Lehigh Pump Station Transmission Flow Meter
      - Wet Well Level Transmitters
  - 5069-OF8 Analog Output Cards
    - I/O Included
      - Big Lehigh Flow Output to PAC system
  - NEMA 4X Enclosure
  - Allen Bradley Stratix 5700 Ethernet Switch
  - Control Panel UPS (Internal)
- Develop Network Topology Drawing (or update to existing)
- Develop Functional Specification for new MOV Valve control.
- Develop SCADA Specification for new I/O control at the WFP
- Assumptions/Exclusions:
  - Ethernet/IP Communications Protocol shall be utilized.
  - Existing IT infrastructure shall be sufficient to tie in the new control panel plc.
  - Any IT infrastructure upgrades required shall be provided by LCA.
  - All IT Networking configurations (example: firewall, Static IP addressing, VPN configurations) shall be provided by LCA IT representative.
  - PAC Chemical Treatment Instrumentation and Controls provided my OEM
  - Exterior Truck Fill Station Instrumentation and Controls provided by OEM
  - Verdantas shall coordinate with PAC OEM for General Alarming Input Identifications (chemical Feed / Slurry Storage Tanks) to tie into the new control system for monitoring.
  - Existing Cellular WiFi / Radio communications shall be utilized via Ethernet/IP extension to new control panel PLC.
  - Existing WFP SCADA upgrades shall be provided by others.

Structural

- Design of a new foundation slab to support (2) new 12,500 gallon tanks that measure 12 feet diameter and 16.5 feet tall.
- Exterior tank foundation slab and retaining walls that form the containment area to be protected from frost / heave.
- Steel stairs to get into the containment area to be designed by Verdantas. Ladder down into the containment is assumed to be a pre-fabricated item.
- Concrete access driveway for chemical delivery adjacent to the tank area to be a conventional slab on grade and designed for a minimum of H-20 loading.
- Sump pit formed out of concrete in containment area is by Verdantas.
- Any foundation walls required are assumed to be supported on conventional shallow spread footings.
- The (2) tanks to be set 4 feet below the surrounding grade with containment walls that will go 3 feet above the surrounding finish grade. Containment / tank area to be approximately 15 feet x 30 feet.
- Assumptions/Exclusions:
    - Deep foundations and high seismic are not included.
    - No structural work at the water intake areas / sluice gates is included.
    - No structural work at the existing intake access hatches is included.
    - Connection of the tanks to the slab / foundation is by the manufacture.
    - No work is being done in the existing building adjacent to the tank area.
    - Design of temporary earth retention systems is not included.
    - Design of concrete sidewalks and other hardscape elements outside the tank and access driveway footprint is not included.

HVAC

- Design Two exhaust louvers, and one exhaust fan.
- Perform code review.
- Select louvers and exhaust fans.
- Assumptions and Exclusions:
    - The space requires 6 air changes per hours.
    - The louvers will be manual only and not be automated.
    - Re-use of existing louvers openings without any alterations to building openings.
    - The existing heating system is not being redesigned. Heating modifications within the space is excluded.

Mechanical

- Selection of motor control valve system.
- Selection of flow main on transmission main.
- Design of exterior and interior PAC system piping, valves, and appurtenances.
- Selection of sluice gates for intake structure.
- Assumptions and Exclusions:
    - Mounting of the 9’x7’ sluice gates will be surface mounted to the intake structure without structural modifications.
    - Installation of the 4’x8’ sluice gate can be installed within in the existing partition

TRANSIENT ANALYSIS (SEPARATE FEE PROVIDED)

A transient analysis will be performed for the pipeline connecting the BLPS and the WFP to determine if any transient mitigation improvements are required for the protection of the pipeline.

- Build a Transient/hydraulic computer model of the pump system in Bentley's WaterGEMS/Hammer.
- Analyze both an uncontrolled shutdown from power loss and a controlled shutdown using the pump control valves and VFDs to evaluate their performance and determine if there are any improvements necessary.
- Compare the computer model to the pump system's actual performance if any data is available from the owner such as pressure readings or SCADA data.
- Develop recommendations on any improvements and optimal settings of the control devices.
- Incorporate all into a technical memo that will be submitted to the Owner.
- This proposal assumes the Owner furnishes as-built drawings for the existing pump station and pipeline as well as all pump curves for the existing pumps.

DRAWING LIST

The anticipated drawing list is as follows:

- Cover Sheet
- Legend, Abbreviations and Symbols
- Site/Grading Plan
- Log Boom Plan
- Erosion and Sediment Control Notes
- Erosion and Sediment Control Plan
- Erosion and Sediment Control Details
- Structural General Notes
- Structural Special Inspections
- Structural Plan
- Structural Sections
- Structural Details
- Mechanical Demolition Plan
- Mechanical Plan and Sections – Motor Operated Valves
- Mechanical Plan and Sections – Sluice Gates
- Mechanical Details
- PFD – PAC System
- P&ID – PAC System
- Mechanical Plan and Sections – PAC System
- PAC System Piping Plan
- Mechanical Details – PAC System
- HVAC Demolition and Installation Plan
- Electrical General Notes
- Electrical Symbol Legend & Abbreviations
- Electrical General Specifications
- Electrical Demolition Plan
- Electrical Single Line
- Power Plan – Pump Station Upgrades
- Power Plan – PAC System
- Instrumentation Plan

Verdantas LLC – Additional Geotechnical Terms [rev-01/01/22]

Drilling/Field Program Conditions

1. If refusal to advancement of the explorations is encountered at shallow depths (i.e., 10 feet or less), the client will be contracted for direction and the exploration will be offset one time, approximately 2 to 3 feet from the original location to attempt additional penetration. If repeated refusal is encountered, the explorations will be terminated. Additional explorations, if required due to offsets or the need for deeper penetration based on soil conditions, will be performed in accordance with the unit rates provided herein.
2. The explorations will be performed by a non-union operator under subcontract to Verdantas. If union representation is required, we have assumed it will be handled by others.
3. We have not budgeted for the performance of portland cement concrete coring or cutting, which requires specialty equipment.
4. The locations and ground surface elevations at the locations of the explorations will be estimated in the field based on the available information provided to Verdantas.
5. Unless otherwise noted, this proposal assumes that work will be performed during normal weekday hours (i.e., Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m.), and that your office will coordinate such that these proposed exploration locations are accessible prior to arrival on-site. This proposal also does not include provisions for site clearing or site accessibility. Delays in accessing the proposed exploration locations will be invoiced as downtime in accordance with the rates included herein.
6. It is understood that no special health and safety precautions related to the site conditions (e.g., decontamination of equipment, special handling of cuttings, etc.) other than those specifically outlined herein will be required for our field work. If such provisions are required, they can be provided for an additional cost, as provided herein.
7. Verdantas' subcontractor will contact 8-1-1 for clearance of site utilities as required by law. However, we will require that your field representative provide delineation of private and other site utilities not in the public "right-of-way." To assist with field delineation of explorations, we request that a copy of all available site plans indicating the location of previously existing structures and underground site utilities be provided to our office. Verdantas will not be responsible for damages to, or repair of, utilities that are not clearly marked in the field at the time of our field evaluation program.
8. At the completion of our field evaluation program, Verdantas will backfill the explorations with cuttings. Borings located in existing pavement areas will be patched with bituminous concrete "cold-patch." No additional compactive effort or restoration has been included as part of this proposal. Excess soils will be stockpiled on site at a nearby location as directed by your office. You should be aware that settlement and softening of the soils replaced in the test explorations are likely to occur, resulting in depressions or holes in the ground surface. Consequently, additional site restoration may be required. The cost for additional site restoration is not included in the fee estimate below; however, this service can be provided, if requested, for an additional fee to be negotiated.

Additional Geotechnical Terms

Drilling/Field Unit Rates

Drilling Rig Mobilization/Demobilization	$	1,440.00 each
SPT Boring 5-foot Interval Sampling	$	49.00 per foot
Standby Time for Drill Rig, Spoils Management, Weather Delays	$	375.00 per hour
Borehole Abandonment with Soil Bentonite Mix	$	4.00 per linear foot
Rock Coring	$	75.00 per foot

Geotechnical Laboratory Testing Unit Rates

Moisture Content (ASTM D 2216)	$	12.50 per sample
Percent Passing No. 200 Sieve (ASTM D 1140)	$	18.00 per sample
Mechanical Sieve (ASTM D 422, without hydrometer)	$	150.00 per sample
Mechanical Sieve (ASTM D 422, with hydrometer)	$	235.00 per sample
Atterberg Limits (ASTM D 4318)	$	90.00 per sample
Standard/Modified Proctor (ASTM D 698/1557)	$	250.00 per sample
California Bearing Ratio (ASTM D 1883)	$	500.00 per sample
Unconfined Compression (ASTM D 2166)	$	300.00 per sample
Tri-axial Unconsolidated Undrained (3-point) (ASTM D 2850)	$	1,200.00 per sample
Tri-axial Consolidated Undrained (3-point) (ASTM D 4767)	$	1,200.00 per sample
One Dimensional Consolidation (ASTM D 2435)	$	800.00 per sample
Unconfined Compression on Rock Core (ASTM D7012)	$	50.00 per sample
Corrosion Suite (resistivity, pH, chloride, sulfate; AASHTO Stds.)	$	350.00 per sample

Section 5:

Schedule

5. Schedule

The dates in the following tentative schedule for major milestones of the project.

Week of:	Milestone
March 17, 2025	Notice to Proceed
March 24, 2025	Kickoff Meeting with LCA
March 24, 2025	Survey/Site Visits
April 7, 2025	Geotechnical Borings
July 28, 2025	60% Design Submission
October 27, 2025	90% Design Submission
October 27, 2025	Permit Application Submissions
February 23, 2026	Obtain Permits
March 9, 2026	Final Design Submission

Schedule is contingent upon the following.

1. Length of time it takes to enter a contract.
2. Equipment vendor coordination/cooperation.
3. LCA review time.
4. PADEP review time.

Verdantas is receptive to working with LCA to develop a mutually agreeable schedule as part of the Design Award, if necessary

Section 6:

Fee Proposal

FINAL DESIGN AND BIDDING PHASE - BIG LEHIGH PUMP STATION UPGRADES

	Dave Wieller, Technical Lead	Ryan Minnick, Water Engineer	Brian Springer, Staff Engineer	Mike Giovannini, Designer	Tom Harley, Senior Surveyor	Field Crew	Staff Surveyor	Aaron Sisler, Civil Engineer	Julie Pham, Civil Designer	Jason Moses, Permitting Lead	Lisa Clementoni, Environmental Lead	Emily Twining, Staff Engineer	Michaela Fehn, Staff Engineer	Clint Sorber, H&H Lead	Eric Yang, H&H Modeler	Joe Jakubowski, Geotech Lead	Andrea Sanchez, Staff Geotech	John Kaminsi, Staff Geotech	Tim Duning, Senior Water Engineer	Michael Kravtsov, Senior Water Engineer	CAD Tech	Staff Scientist	Marjorie Cruz Licera, Structural Engineer	Daniel Saldarriaga, Structural Designer	Ryan Harting, Structural Engineer	Matt Lesione, Mechanical Engineer	Brandy Flatford, Mechanical Designer	Bob Peters, Senior Electrical Designer	Doug Begg, Senior Electrical Designer	Troy Deitzer, Senior Electrical Engineer	Shawn Whalen, Automation Specialist	Cost
Rate	$ 209.95	$ 209.95	$ 148.20	$ 114.00	$ 172.90	$ 204.25	$ 109.25	$ 209.95	$ 134.90	$ 209.95	$ 190.00	$ 148.20	$ 148.20	$ 172.90	$ 190.00	$ 233.70	$ 158.65	$ 134.90	$ 190.00	$ 241.30	$ 114.00	$ 134.90	$ 134.90	$ 114.00	$ 224.20	$ 224.20	$ 114.00	$ 147.25	$ 147.25	$ 224.20	$ 224.20	
	Mechanical				**Survey**			**Civil**		**Environmental Permitting**				**H&H**		**Geotechnical**			**PAC Chemical Feed**				**Structural**			**HVAC**		**Electrical**			**Automation**	
Survey					2	12	10																									**$ 3,889.30**
Site Plan/E&S Control								8	40																							**$ 7,075.60**
Enivronmental Permitting										24	8	80	40																			**$ 24,342.80**
Hydrologic and Hydraulic Analysis														10	60																	**$ 13,129.00**
Geotechnical Engineering																8	40	4														**$ 8,755.20**
Geotechnical Drilling																																**$ 4,700.00**
PAC Design	8																		76	24	108	16										**$ 36,381.20**
Jar Testing																			16	4												**$ 4,005.20**
Mechanical Design/Plans	40	40	80	80																												**$ 29,374.00**
Structural Design/Plans																							40	40	4							**$ 10,852.80**
HVAC Design/Plans																										20	20					**$ 6,764.00**
Electrical Design - Pumping Upgrades																												170	40	4		**$ 31,819.30**
Electrical Design - PAC System																												110	80	4		**$ 28,874.30**
Automation																															80	**$ 17,936.00**
Public Water Supply Permit	12	24	80																													**$ 14,375.40**
Technical Specifications	4	8	40																													**$ 6,767.80**
Front End Specifications	2		8																													**$ 1,605.50**
Bid Services	4		16																4						2			4			4	**$ 5,905.20**
Reimbursables (billed at cost)																																**$ 1,500.00**
TOTALS	**70**	**72**	**224**	**80**	**2**	**12**	**10**	**8**	**40**	**24**	**8**	**80**	**40**	**10**	**60**	**8**	**40**	**4**	**96**	**28**	**108**	**16**	**40**	**40**	**6**	**20**	**20**	**284**	**120**	**8**	**84**	**$ 258,052.60**

TRANSIENT ANALYSIS

	Dan Barr, Senior Project Manager	Staff Engineer 2	Cost
Rate	$ 221.00	$ 156.00	
Transient Analysis	40	80	**$ 21,320.00**
TOTALS	**40**	**80**	**$ 21,320.00**

Lehigh County Authority
System Operations Review - February 2025
Presented: March 24, 2025

		Feb-25	2025 Totals***	2024 Totals	2023 Totals
Recordable Safety Incidents*	Total LCA	1	1	2	33
Non-Recordable Safety Incidents	Total LCA	1	1	25	[redacted]
Incident Types **	Injuries	0	2	15	[redacted]
	Property Damage	0	0	11	[redacted]
	Near Miss	0	0	1	[redacted]

***Numbers adjusted to match current tracking methodology

* Recordable Safety Incidents are those that result in death, days away from work, restricted duty, medical treatment beyond first aid.

** Safety incidents may be categorized in more than one incident type.

Year To Date Safety Incidents	Root Cause Analysis Completed	Corrective Actions Indentified	Corrective Actions Completed
[redacted]	1	3	0

Current Month Incidents

Description	Date	Type	Root Cause(s)	Corrective Action(s)
An employee reported experiencing a sharp and pulling sensation in their lower back while moving 4-gallon chlorine containers. Specifically, the employee was carrying two 2-gallon containers, one in each hand, while walking downhill.	2/10/2025	Recordable	A lack of a comprehensive risk assessment process for material handling tasks	Comprehensive Risk Assessment: Conduct a comprehensive risk assessment of all material handling tasks. Ergonomic Evaluation: Conduct an ergonomic evaluation of the task to identify potential improvements in work procedures, equipment, and workspace design. Review Lifting Procedures: Immediately review and reinforce proper lifting techniques with all employees, with a specific focus on handling heavy objects.
A carbon monoxide alarm sounded in the boiler room, accompanied by brownish smoke emanating from the chimney. Two operators exhibited symptoms of carbon monoxide exposure but recovered after exposure to fresh air. A third operator was also evaluated by paramedics. All were released at the scene.	2/2/2025	Equipment Failure	Malfunctioning control systems.	Replacement of current Carbon Monoxide Leak Detection System for all similar locations MSA Air Monitors for Operators

Lehigh County Authority

System Operations Review - February 2025

Presented: March 24, 2025

Critical Activities	System	Description	Feb-25	2025 Totals	2024 Totals	Permit
			Daily Avg (MGD)	Daily Avg (MGD)	Daily Avg (MGD)	Daily Max (MGD)
Water Production	Allentown	Total	21.77	21.74	22.39	39.0
		Schantz Spring	6.28	6.30	6.82	9.0
		Crystal Spring	3.83	3.83	3.87	4.0
		Little Lehigh Creek	11.66	11.56	11.47	30.0
		Lehigh River	0.00	0.06	0.23	28.0
	Central Lehigh	Total	10.69	15.69	11.49	19.04 MGD Avg
		Feed from Allentown	6.63	6.82	6.88	7.0 MGD Avg 10.5 MGD Max
		Well Production (CLD)	4.67	4.17	4.60	8.54 MGD Avg
		Sum of all (12) other Suburban Water Systems	0.15	0.15	0.15	1.71 Sum of all wells
Wastewater Treatment		Kline's Island	29.56	30.68	34.04	40.0
		Pretreatment Plant	4.86	4.64	4.98	5.75 (design capacity)
		Sum of all (5) other Suburban WW Systems	0.19	0.17	0.19	0.36

		Feb-25	2025 Totals	2024 Totals	2023 Totals
Precipitation Totals (inches)		2.47	3.33	41.88	46.38
Compliance Reports Submitted to Allentown		24	51	278	280
Notices of Violation (NOVs)	(Allentown + Suburban)	1	1	5	3
Sanitary Sewer Overflows (SSOs)/Bypasses	(Allentown + Suburban)	1	2	17	24
Main Breaks Repaired	Allentown	0	7	27	8
	Suburban	0	0	14	12
Customer Service Phone Inquiries	(Allentown + Suburban)	1070	2711	16,690	11,221
Water Shutoffs for Non-Payment	(Allentown + Suburban)	145	261	2,010	1,995
Injury Accidents	(Allentown + Suburban)	2	2	15	19
Emergency Declarations	Allentown	0	0	2 @ 228,181.55	2
	Suburban	1	1	1 @ 56, 662.50	0

Significant Repairs/Upgrades:

Description of Non-Compliance Events:

On February 1, 2025, a sanitary sewer overflow (SSO) occurred at the intersection of Jordan Dr. and Fullerton Ave. Approximately 20 gallons overflowed due to a grease blockage in the sewer line. A Notice of Violation was issued to the Allentown Wastewater Treatment Plant by the PA Department of Environmental Protection for various violations between 2020 and 2025. The NOV and response are included in this packet.

Other:

An emergency declaration was retroactively approved by the board on February 24, 2025 for an emergency main repair on Nursery Street. The final costs will be updated upon completion.

Critical Activities	System	Description	Feb-25	2025 Totals	2024 Totals
Wastewater Compliance	Allentown	Bypass	0	0	3
		Bypass Volume	0	0	1,713,644
		Permit Exceedances	0	0	0
		Sanitary Sewer Overflows	1	2	5
		COA Issued NOVs	0	0	0
		Regulatory Agency issued NOVs	1	1	0
	Arcadia	Bypass	0	0	0
		Bypass Volume	0	0	0
		Permit Exceedances	0	0	1
		Sanitary Sewer Overflows	0	0	0
		NOVs	0	0	1
	Heidelberg Heights	Bypass	0	0	4
		Bypass Volume	0	0	2,125,696
		Permit Exceedances	0	1	9
		Sanitary Sewer Overflows	0	0	0
		NOVs	0	0	0
	Lynn	Bypass	0	0	2
		Bypass Volume	0	0	1,010,000
		Permit Exceedances	0	0	2
		Sanitary Sewer Overflows	0	0	0
		NOVs	0	0	0
	Sand Spring	Bypass	0	0	0
		Bypass Volume	0	0	0
		Permit Exceedances	1	1	44
		Sanitary Sewer Overflows	0	0	0
		NOVs	0	0	1
	Wynnewood	Bypass	0	0	0
		Bypass Volume	0	0	0
		Permit Exceedances	0	0	9
		Sanitary Sewer Overflows	0	0	3
		NOVs	0	0	1
Water Compliance	Allentown	Boil Water Advisories	0	0	0
	Central Lehigh	Boil Water Advisories	0	0	0
	Suburban Water Systems	Boil Water Advisories	0	0	1

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

February 4, 2025

NOTICE OF VIOLATION

Delivered via email

Lehigh County Authority
435 Hamilton Street
Allentown, PA 18101

Attention: Gary Saunders

RE: Sewage
LCA Allentown Division WWTP
Permit No. PA0026000
Allentown City, Lehigh County

Dear Gary Saunders:

A review of Lehigh County Authority's Discharge Monitoring Reports ("DMRs") has indicated a pattern of effluent violations with respect to the limitations set forth in NPDES Permit No. PA0026000. The effluent violations are as follows:

Monitoring Period	Parameter	Permit Limit	Reported Value	Concentration Unit
July 2021	Fecal Coliform *Geometric Mean*	200	>17	No./100 ml
November 2021	Fecal Coliform *Instantaneous Maximum*	2,000	>704	No./100 ml
September 2022	Ammonia-Nitrogen *Average Monthly*	5.0	6.1	mg/L
December 2022	Fecal Coliform *Instantaneous Maximum*	2000	>647	No./100 ml

NPDES Permit No. PA0026000, Part B.I.G.4.b. states, Unanticipated Bypass – The permittee shall submit oral notice of any other unanticipated bypass within 24 hours, regardless of whether the bypass may endanger health or the environment or whether the bypass exceeds effluent limitations. The notice shall be in accordance with Part A III.C.4.b. According to reports submitted by Lehigh County Authority, the following bypasses occurred at Outfall 003:

Start Date	End Date
May 25, 2020	May 25, 2020
August 4, 2020	August 5, 2020
November 9, 2020	November 9, 2020
November 30, 2020	November 30, 2020

December 25, 2020	December 25, 2020
March 27, 2021	March 27, 2021
September 1, 2021	September 2, 2021
April 7, 2022	April 8, 2022
December 22, 2022	December 22, 2022
April 30 2023	May 1, 2023
December 3, 2023	December 3, 2023
December 18, 2023	December 18, 2023
December 28, 2023	December 28, 2023
January 9, 2024	January 10, 2024
March 23, 2024	March 23, 2024
August 11, 2024	August 11, 2024

Lehigh County Authority notified The Department of Environmental Protection ("Department") of overflows that have occurred at the LCA Allentown Division WWTP. NPDES Permit No. PA0026000, Part B.I.F. states the permittee shall take all reasonable steps to minimize or prevent any discharge, sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment. According to reports submitted by Lehigh County Authority, the following overflows occurred within the treatment plant:

Date	**Location**
October 17, 2020	Leachate Transfer Pipe
October 24, 2024	#2 Primary Digester
November 29, 2024	#2 Primary Digester

On August 26, 2020, the Department was made aware of a pollution incident which occurred at the LCA Allentown Division WWTP. Lehigh County Authority's wastewater plant manager notified the Department that a contracted hauler's leachate truck ruptured a hydraulic fluid line, which released approximately 1-2 gallons on the permittee's property. This pollution incident described above constitutes a violation of 25 Pa. Code 91.34(a). On August 27, 2020, the Department received an electronic written report citing the incident and the leak was contained on the permittee's property.

On February 1, 2023, the Department was made aware of an incident which occurred in Allentown City. Lehigh County Authority's director of plant operations notified the Department that a trailer containing dewatered biosolids for land application overturned near the intersections of Grammes and Lehigh Parkway South, which released approximately 69,000 pounds of dewatered biosolids onto the roadway. There was a nearby storm drain, which was monitored to ensure the spilled material did not reach the storm drain until the affected entire area was cleaned. This pollution incident described above constitutes a violation of 25 Pa. Code 91.34(a). On February 8, 2023, LCA submitted an electronic written report to the OnBase system.

NPDES Permit No. PA0026000, Part B.I.H. prohibits the overflow of wastewater, or other untreated discharge from a separate sanitary sewer system (which is not a combined sewer system), which results from a flow in excess of the carrying capacity of the system or from some other cause prior to reaching the headworks of the sewage treatment facility. The following Sanitary Sewer Overflows ("SSOs") were reported by Lehigh County Authority:

Calendar Year	Total # of SSO's
2020	16
2021	1
2022	6
2023	3
2024	5
2025	1

Please be advised that failure to comply with the terms and conditions of your NPDES Permit is a violation of said Permit and 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 Lehigh County Authority respond in writing to this Notice within 15 days of its receipt. Said response should indicate the cause of the above-described non-compliance and the steps that will be or have been taken in order to ensure future compliance.

Please confirm receipt of this Notice by sending an email to scconfer@pa.gov.

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 any of 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,

Scott T. Confer

Scott T. Confer
Water Quality Specialist
Clean Water Program

cc: City of Allentown

LEHIGH COUNTY AUTHORITY 1053 SPRUCE ROAD * P.O. BOX 3348 * ALLENTOWN, PA 18106-0348
610-398-2503 * FAX 610-398-8413 * www.lehighcountyauthority.org
email: AndrewMoore@lehighcountyauthority.org

February 18, 2025

Mr. Scott Confer
Water Quality Specialist
Pennsylvania Department of Environmental Protection
Bethlehem District Office
4530 Bath Pike
Bethlehem, PA 18017-9044

Re: Allentown Wastewater Treatment Plant (WWTP)
NPDES Permit No. PA0026000
Allentown City, Lehigh County

Dear Mr. Confer:

The Lehigh County Authority (LCA) is in receipt of the Notice of Violation (NOV) issued electronically by the Pennsylvania Department of Environmental Protection (DEP) on February 4, 2025. The following is the required response to the violations that occurred between May 2020 and January 2025.

Plant Background

The City of Allentown's wastewater treatment plant, known as Kline's Island Wastewater Treatment Plant (KIWWTP), has been operated by LCA since 2013. The facility, originally constructed in 1928, has undergone several upgrades and is hydraulically rated for 44.6 million gallons per day (MGD). It is a dual-stage trickling filter facility, using both plastic and rock media for biological treatment. Settling tanks are used before and after each stage of biological treatment to remove solids from the process. Sodium hypochlorite and sodium bisulfite are used for disinfection and dechlorination before discharge into the Lehigh River. The solids treatment train includes two primary and one secondary digester for solids stabilization, and three belt filter presses for dewatering. All dewatered solids are land applied as class B biosolids.

The KIWWTP service area includes the City of Allentown and fourteen surrounding municipalities, serving a population of 270,000 people. On average, KIWWTP treats ~34 MGD before discharge into the Lehigh River.

Effluent Violations

The NOV noted four effluent violations that occurred between July 2021 and December 2022. The three fecal coliform violations were geometric mean exceedances carrying the "greater than" symbol. The greater than symbol affected the geometric mean calculations, suggesting non-compliance even with the geometric mean below the permitted limit. The laboratory standard operating procedure for the fecal coliform analysis (Colilert 18) has been adjusted to increase the standard dilution, which will make it is less likely to have a result with a "greater than" symbol. However, this adjustment also makes the method reporting limit higher.

In September 2022, the KIWWTP exceeded the ammonia as nitrogen limit due to an increase in solids at the facility. This issue arose from the failure to close a valve after a digester cleanout, which resulted in the return of digested sludge to the headworks. Additionally, a permitted industry experienced a plant upset and discharged an unusually large amount of solids during the month. KIWWTP was unable to process these solids quickly enough, leading to an increase in solids and Biochemical Oxygen Demand (BOD) downstream. This, in turn, inhibited nitrification and caused the monthly ammonia average to be exceeded.

Bypass Events

The NOV made note of sixteen bypass events from May 2020 to August 2024. Eight of the events were due to exceeding the hydraulic capacity of the facility from rain derived inflow and infiltration (I & I) within the collection system. The remaining incidents were attributable to a variety of mechanical and electrical failures, which collectively resulted in relatively brief bypasses totaling approximately 0.6 MG.

KIWWTP is currently in the design stage of two projects to address the electrical, mechanical, and capacity challenges the facility currently faces. The first project, the upgrade of electrical substation one, is scheduled to begin construction in 2025. This project will improve the reliability and operability of the power feed to the facility. Currently, if the power is interrupted

there is a very manual process to restore power to the facility. Often, minor power interruptions can cause additional issues to the main pumping station such as issues with the vacuum prime system which can lead to the loss of pumping capacity.

The main and auxiliary pumping station upgrades are nearing the completion of final design, in which construction is expected to start in 2026. This project will modernize and increase the capacity of the main and auxiliary sewage pumping capacity in the facility. Additionally, there will be upgrades to various components of the downstream process to ultimately increase the maximum hydraulic capacity of the facility from ~86 MGD to 100 MGD. Peaking factors to the treatment facility have exceeded 100 MGD, but the increase is expected to minimize future wet weather-related bypasses.

The Kline's Island Sewer System (KISS) is currently developing a regional Act 537 sewer plan. The intent of the plan is to address KIWWTP bypasses and sanitary sewer overflows. As part of this plan, LCA and the 15 KISS municipalities have investigated alternatives including source reductions of inflow and infiltration and to increase the peak wet-weather capacity of the facility, which will be described in detail in the Act 537 plan to be submitted later in 2025.

Treatment Plant Spills

Four spills were noted in the NOV, of which three were on the KIWWTP grounds.
In October 2020, a leak occurred in the transfer hose used for leachate delivery. Upon discovery the transfer was immediately stopped and the hose was replaced. The affected area has a natural slope back to the tank and any grassy areas were treated with lime. None of the spilled leachate reached a storm drain.

In October and November 2024, KIWWTP Digester #2 overflowed due to a restriction in the decant line. The design of the decant line has multiple 90 degree bends, which has the tendency to accumulate heavy solids or objects within the pipe. Following both overflows, the decant line was disassembled to remove any build up that may have been restricting flow. A more permanent modification to remove unnecessary turns in the line is being investigated. A vacuum truck was used to clean up any solids from the overflow on both occasions. The digester overflow was contained and cleaned before being able to reach a stormwater outfall.

In February 2023, a tractor trailer spilled approximately 69,000 pounds of treated biosolids onto the roadway. The spill was a solid material and was easily contained without reaching a stormwater outfall. After containing the spill, the solids were removed and the area was thoroughly cleaned. The cause of the accident was thoroughly investigated and appropriately addressed.

Sanitary Sewer Overflows

Thiry-two Sanitary Sewer Overflows (SSO) were reported from 2020 to 2025. Of the 32 reported, 20 were related to wet weather events and the direct result of I&I. LCA staff conduct "walkover" inspections of the interceptors after wet weather events. These walkovers are essential in assessing the impact of weather events on the infrastructure, ensuring that any issues arising from inclement weather were swiftly addressed and mitigated.

The City's I&I Source Reduction Plan (SRP) for the next five years (2026-2030) will focus on reducing I&I through a variety of methods. Using collected flow metering data from 2021 and nighttime weiring data, a comprehensive sanitary sewer evaluation study (SSES) field investigation will first be undertaken in two of the City's eight sewer sheds. The two selected sewer sheds in 2025 are East Side and Trout Creek, as the collected data indicates these are two are the highest contributors towards I&I. The goal of the 2025 SSES will be to specifically pinpoint what neighborhoods have the greatest issues and attempt to distinguish between the private and public I&I sources and quantities. Expected public side rehab methods for 2026 and beyond include a combination of cured in place lining, grouting of main line joints, and lining of manholes. Expected private-side rehab methods include disconnecting downspouts, fixing clipped cleanouts, and grouting of lateral tap connections. Additional SSES will be required for the remaining six sewer sheds upon completion of the 2025 efforts.

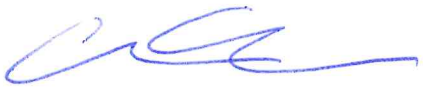
In conjunction to the ongoing SSES work, a parallel manhole inspection and rehab program is occurring. All ~7,200 public manholes in the City's system will be inspected before 2030, as a large majority of manholes have already been inspected to date since late 2023. Rehab of the manholes will occur annually as inspections warrant.

Twelve of the reported SSOs were related to blockages caused by grease and/or rag build up. In 2024, LCA undertook extensive preventative maintenance measures to reduce grease and rag build-ups in the sewer system. This included a combination of CCTV inspections covering 75,422 feet and jetting operations spanning 821,091 feet. These activities were crucial in identifying and addressing potential blockages, ensuring the cleanliness and efficiency of the infrastructure while mitigating issues arising from grease and rag accumulations. Local restaurants and businesses that may be contributing to the issue are notified of City ordinances and educated on the impact grease discharges have on the system.

Summary

Lehigh County Authority is committed to our regulatory responsibilities, and we always strive for full compliance. LCA staff and stakeholders of the KIWWTP are thoroughly committed to eliminating bypasses and SSOs within the system. Additional details of the projects mentioned in this response can be found in the Water Quality Part II permit applications and the Act 537 plan, which will be submitted to the department later this year. If you have any questions, please do not hesitate to call me at 610-597-8100.

Sincerely,



Andrew Moore
Director of Plant Operations