



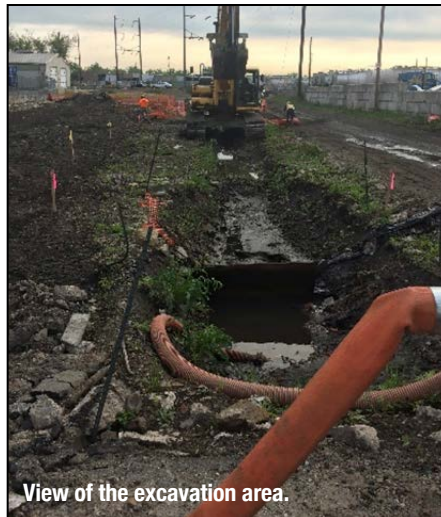
**Angelo Waters, PE, LEED AP.** Waters is a Vice President and Environmental Practice Leader at Urban Engineers. He provides environmental solutions to transit and rail authorities, transportation agencies, private developers and industries. Waters has presented several environmental training courses on topics such as NEPA and state environmental quality reviews, hazardous material assessments, and stormwater management. He is a 2013 Philadelphia Business Journal “40 Under 40” honoree and the 2015 ASCE Philadelphia Section Environmental/Water Resources Engineer of the Year. A registered Professional Engineer in five states and LEED AP, Waters earned his master’s in engineering management and bachelor’s in environmental engineering from Drexel University.

## Environmental Solutions Help Create New City Roadway

By Angelo Waters, PE, LEED AP

The Bridesburg and Port Richmond sections of Philadelphia recently became home to the city’s first new roadway in over 30 years, with the extension of Delaware Avenue. Before the ribbon had even been cut, large commercial trucks, cyclists, and pedestrians were already enjoying the 0.6-mile-long extension. It was apparent from the smiles on their faces that this project has a tremendous impact on these two communities, and Philadelphia as a whole.

While installing a section of subsurface drainage pipes for this project, the contractor encountered an approximately 200-linear foot section of petroleum contaminated soil and shallow groundwater in the vicinity of an abandoned underground oil/water separator. Up until the late 1980s, the area of concern was recorded as being a heat resistant brick and ceramic manufacturer. This release was reported to the Pennsylvania Department of Environmental Protection (PADEP) and



View of the excavation area.

the remedial investigation, planning, and implementation commenced.

The placement of the subsurface drainage system was on the project’s Critical Path Schedule. Due to the nature of the active construction and the need to complete the extension of Delaware Avenue in a timely manner, the Philadelphia Streets Department engaged Urban Engineers to provide environmental consulting to ensure

this roadway project could be completed. Urban’s tasks included soil and shallow groundwater characterization; a dewatering treatment pilot study; oil/water separator vault closure-in-place; a dewatering treatment system; and a post remedial care plan.

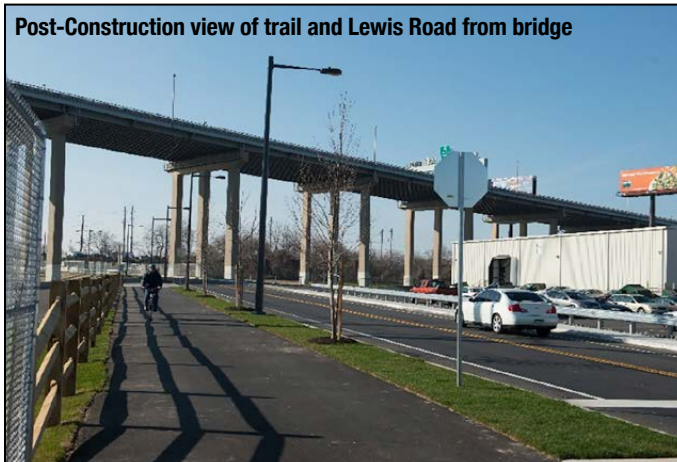
### Dewatering the Drainage System

Since the project involved dewatering during construction of the drainage system, the contaminated groundwater and handling of the excavated soils required a unique solution; therefore, a site-specific dewatering and groundwater treatment system was designed to remove floating free residual product, sediment, and dissolved organics from the pumped groundwater prior to discharge. The trailer-mounted dewatering treatment system that was utilized during dewatering activities included two parallel 18,000-gallon weir frac tanks and two internal bag filters. It also included four 5,000-gallon carbon absorber units and a back end flow meter.

Dewatering activities were scheduled to occur in mid-May of 2015. The discharge rate ranged from 50 to 100 gallons per minute and a total of 190,000 gallons of groundwater water

*Continued on page 6*

Post-Construction view of trail and Lewis Road from bridge



Post-Construction view of the I-95 bridge from south.





View of the treatment system, which includes two bag filters and four 5,000 lbs Carbon Units.



View of water running into the settling tank.

## Roadway *Continued from page 5*

went through the treatment system. A temporary discharge permit was obtained by the PADEP in order to discharge the treated groundwater to the Frankford Creek via the newly installed storm utility line and outfall. No sheens of floatables were noted during the treatment process or while the contractor completed the required work.

The area within the right-of-way had to be capped to prevent any leftover oil from potentially percolating up through porous material. This was done by capping the area with a geotextile membrane with a six-inch subbase on top of it. Each portion of the area also received its various capping treatment on top of the geotextile and subbase.

### Defining a Roadway as Brownfield

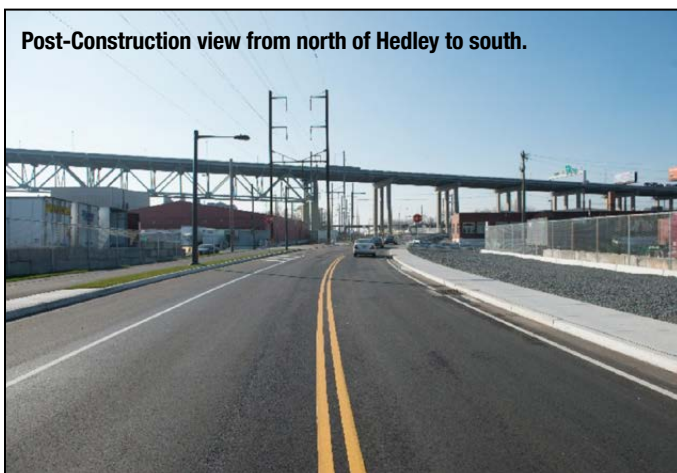
Brownfields are defined by the Environmental Protection Agency as

real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Typically, brownfields are associated with real estate development, but in the case of the development of the first road in over 30 years – this project more than meets the definition. This project will go a long way in realizing benefits including reduction in environmental and safety risks, economic revitalization, greenspace preservation, and more.

“As a business owner, our employees can get in and out more efficiently,” said Tom LaCroix of the Bridesburg Business Association at the project’s ribbon cutting. “It’s long overdue, especially with the new charter school, kids are constantly crossing the streets at odd hours of the day, and this is going to loop truck traffic off of Richmond Street, which is what we wanted for years.”

The environmental issues involving the contaminated soil impacted the installation of the drainage, and thus, impacted the schedule. The contractor and city adjusted the construction staging to work on other areas of the project while the investigation and re-design were performed. This impacted the installation of the proposed six-inch gas main that feeds one property north of Frankford Creek. South of the creek was a gas regulator station that had to be removed. The regulator station could not be removed until the six-inch gas main was installed. Also affecting this issue was the fact that the gas could only be shut down between June 15 and the first week of September.

The contractor and the city met these challenges and adapted the staging accordingly. This, as well as the project team’s quick reaction and coordination, allowed the project to proceed as close to schedule as possible. ■



Post-Construction view from north of Hedley to south.