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DECADES IN THE MAKING

Alcosan is preparing to deal with one of Pittsburgh's most intractable problems – massive stormwater runoff – and deliver cleaner water and rivers. But the tight time frame and scope of work is also a challenge.

BY PAUL J. GOUGH

When Alcosan Executive Director Arletta Scott Williams thinks about the length and sweep of the decades-long journey to the completion of the \$2 billion Clean Water Plan, she sometimes charts the path alongside her son's life. They were both born at just about the same time.

In February 1999, when Tyler was 4 months old, Williams opened an email from the U.S. Environmental Protection Agency that held the ini-

tial draft consent decree that would require the Allegheny County Sanitary Authority to embark on a costly journey to deal with the billions of gallons of stormwater that drain into the region's three rivers untreated every year. Two days before his seventh birthday, his mother signed the agreement for the first consent decree with the EPA and other regulators. As Tyler has matured, so has what has become known as the Clean Water Plan. Renegotia-

View from the rooftop of the East Headworks project, the first piece of Alcosan's Clean Water Plan to make the region's rivers cleaner.

tions of the consent decree have led to a less-expensive project to be done over a longer period of time, as well as other steps that were taken to comply with the regulatory mandate.

"When he was 14, I joked that by the time we get this done, Tyler will have a Ph.D.," Williams told the Business Times in a recent interview at Alcosan's North Side headquarters and treatment plant.

And she isn't the only one who

frames it that way.

"People who have been through the process with me ask, 'Where is Tyler now? What's he doing? What's his landmark?' because that's the next step," Williams said. "It has allowed me to take [the Clean Water Plan process] from what was termed 'the predicament' when it first landed to 'the opportunity of a lifetime.' Charting it along with

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Storyboards illustrating the Clean Water Plan line a meeting room at Alcosan's North Side offices.

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Clean Water Plan construction is expected to last until 2036. Above, work proceeds on the East Headworks piece of the project.

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Tyler has been fulfilling."

The plan, which has been developed and moved forward in fits and starts since that day in 1999 when Williams received the EPA's email, is the biggest project ever undertaken by Alcosan. Included is a doubling of the capacity at its treatment plant along the Ohio River and the construction of three large tunnels, each five miles long and 150 feet below the surface. They will be the cornerstones of one of the largest public works projects in the history of Pittsburgh.

"This is a good thing," Williams said. "The water [in the rivers] looks clean and is clean to a certain extent. But it should be cleaner on a more consistent basis."

Alcosan's Clean Water Plan, for all its complexity and moving pieces, is designed to do one thing above all: Improve Pittsburgh's water quality. It is being designed to eliminate 7 billion gallons of the estimated 9 billion gallons of untreated wastewater that go into the Allegheny, Ohio and Monongahela rivers every year from stormwater runoff in the Pittsburgh region. The plan is the result of a years-long process to deal with the issue, and its goals are being dictated by agreements with the EPA and other regulators.

The process is deliberate, based on consent decrees finalized in 2008

and again in 2019. Some of the work defined by the agreements has gone on already, with Alcosan working to acquire 200 miles of municipal sewers it doesn't already own across the region and encouraging green infrastructure projects to deal with stormwater creatively and with as little environmental impact as possible. It also has involved other municipalities, other water and sewer authorities, and community groups as well.

Alcosan has employed engineers and wastewater experts to design a system that will drastically increase the capacity for stormwater runoff to be transported to its North Side facility and, once there, treated. Once it flows back into the Ohio River, it will be cleaner.

What has been a mostly behind-the-scenes effort is about to burst into the open as the most visible aspects of the plan begin. A portion of the work has started: At Alcosan's treatment plant, two cranes have sprouted from the ground, with many signs of digging and construction of new buildings and infrastructure that will handle and treat the increased amounts of storm runoff that will be directed there when the system is operational.

"It's a positive for the region and a game-changing infrastructure project for Allegheny County," said Kimberly Kennedy, Alcosan's director of engineering and construction.

'A real feat in hydraulic engineering'

Alcosan's North Side plant, as it stands now, has the capacity to fully treat 250 million gallons of stormwater a day. Built in the late 1950s on a 59-acre inconspicuous space bounded by the Ohio River and railroad tracks, the plant has been upgraded over the years and has upped its capacity and capability to treat and clean wastewater. It's only during extreme weather, heavy thunderstorms or rainstorms when Alcosan falls short.

"The overflows are during wet weather," said Michelle Buys, Alcosan's director of environmental compliance and permitting. "During dry weather, our system works perfectly fine."

Once the water is cleaned and put back into the Ohio River, Alcosan says it is cleaner than the river water. **But stormwater runoff problems are not infrequent. The EPA, along with state and local regulators, began the process long ago**

to force Alcosan to be able to handle much more stormwater before it hits the region's three rivers.

For Alcosan, that's a multi-pronged challenge and effort. The past several years it has been dealing with the acquisition of sewer systems from surrounding regions and the installation of green infrastructure that is known internally as GROW (Green Revitalization of our Waterways). The GROW program is designed to head off water from getting into the sewers in the first place, and dozens of community projects around Allegheny County have received funding. The projects include sanitary sewer linings, removing inflow sources into the sewer system, and, in one \$30 million project from the Pittsburgh Water & Sewer Authority, the rerouting of stormwater through Schenley Park, Garfield, Hazelwood, Oakland and Squirrel Hill to the Monongahela River.

What's happening now, and will continue through the end of the decade, is construction at the plant that will raise the amount of wastewater Alcosan can treat there. By 2029, the plant will have a wet-weather peak of 600 million gallons per day, said Jefferson Argyros, manager of capital projects and the one responsible for the plant upgrades that are going on right now.

But the bulk of the spend of the Clean Water Plan will not be at the plant. Instead, the three new, deep underground tunnels will cost at least \$1.5 billion of the \$2 billion [and potentially more] price tag and will be on a scale never seen here.

The tunnels will run along the Ohio, Allegheny and Monongahela rivers and convey billions of gallons of stormwater runoff to the plant that will be expanded in capacity to take it.

Plans call for six drop shafts, near-surface water runoff pickup points and regulators in separate areas for each of the tunnels. Each drop shaft will be between 15 feet and 50 feet in diameter, running 150 feet down to the bedrock below.

This construction will be done in a way that **maximizes stormwater collection** and limits the amount of air and odor that would flow into the system.

"It's a real feat in hydraulic engineering," Kennedy said.

Alcosan is beginning with what



Arletta Scott Williams



Kimberly Kennedy

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is called the Ohio River tunnel. It is being designed by Mott McDonald and requires two Ohio River crossings – one at its northern terminus at the plant where it hooks up with Chartiers Creek and then again at the West End Bridge to pick up Saw Mill Run – before continuing up the Ohio and the Allegheny past the Point to the I-279 bridge. The construction will go up for bid by the summer of 2024 and will be awarded quickly, as the consent decree requires construction to begin Jan. 1, 2025.

That means a compressed timeline for the acquisition of property, which will be a combination of purchases for rights-of-way and eminent domain. That is going on right now, although the exact routes of the three tunnels have yet to be determined. Needless to say, there isn't a lot of wiggle room.

The next phase is designated the Allegheny River tunnel, starting where the Ohio River Tunnel ends, with a terminus near Highland Park in the city. Its design phase begins in 2025, but construction will not start until after the Ohio River tunnel system is completed.

The final project is the Mon River tunnel, which will begin at the I-279 junction, go underneath the Strip District, the Hill District and Uptown, then cross underneath the Mon at a number of spots until reaching Sandcastle in West Homestead. Its design isn't scheduled to start until 2028.

'We've ignored our infrastructure for too long'

How did Alcosan and the region get to this point? **Blame aging infrastructure that no longer meets the needs of today, whether it's water quality or dealing with the deluge of stormwater runoff that happens several times a year.**

Many East Coast and Midwest cities and regions, including Boston, Washington, D.C., and Akron, Ohio, have dealt in recent years with their stormwater runoff issues with big-ticket projects like Alcosan's. And, said Leonard Casson, an associate professor of environmental engineering at the University of Pittsburgh and a wastewater treatment expert, the issue has built up over decades.

"I know they have a consent decree, but Alcosan is struggling to deal with an issue that most large municipalities are dealing with across the United States," Casson said. "We've ignored our infrastruc-



Alcosan's North Side treatment facility.

JIM HARRIS/PBT

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ture for too long."

After years of back and forth with federal, state and county regulators, a consent decree agreed to by Alcosan in January 2008 required the authority to control sewer overflows and comply with the federal Clean Water Act. Alcosan's first plan was submitted in 2012. It was designed to cut annual storm overflows from 9 billion gallons a year to 1 billion gallons a year and be completed by 2026. Yet the cost – estimated in 2012 as \$3.6 billion – was believed by Alcosan, the EPA and others as too costly for ratepayers to bear.

That led to a modified consent decree that shaved the cost to \$2 billion and cut down on the scope of the project, settling for a time frame that was lengthened until 2036 and would reduce stormwater runoff by 7 billion gallons.

Casson said it's critical that untreated stormwater is stopped from flowing directly into the river, and not just for Pittsburgh's sake. Downstream from Pittsburgh, millions of people depend on the Ohio River for drinking water.

"It's very important to understand that what we treat and discharge into the river becomes Wheeling's drinking water," Casson said. "And between say Pittsburgh and New Orleans, there's some portion of the water that goes to the Gulf and becomes saltwater. It's very good that we have an abundance of fresh drinking water, but we do have a responsibility to clean the water as much as we can."

What of Pittsburgh?

Barring an influx of government funding, Alcosan's ratepayers – every household and business within Alcosan's coverage area – will see their sewer costs rise over the long term to pay for the project.

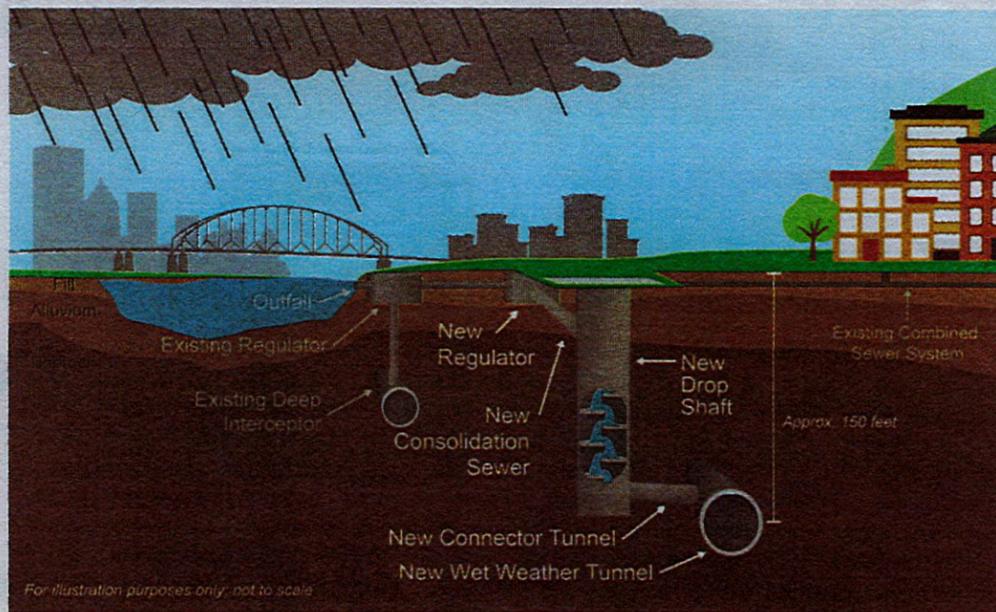
It isn't clear how much funding Alcosan will receive from the federal or state government for its Clean Water Plan, leading to the potential that ratepayers will have to foot the entire bill. While the project's cost is \$2 billion, Alcosan points out that it's \$2 billion in 2010 dollars and with inflation and the increased cost of labor and supplies, it could be more. Nobody knows how much more.

Casson doesn't think ratepayers will be happy about paying extra for the work to be completed, and he hopes Alcosan will be able to secure funding for a fair chunk of the \$2 billion or more. But he also said it's likely rates will rise in some fashion due to the project.

"I don't think ratepayers will

DIGGING DEEP

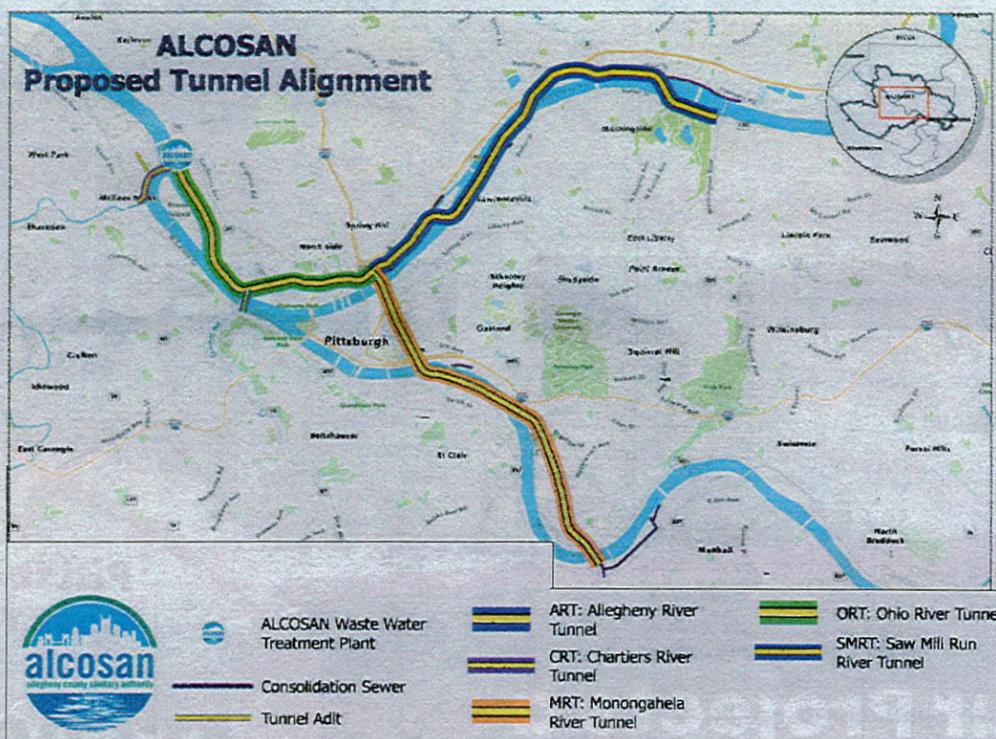
The new wet-weather collection tunnels for Alcosan's Clean Water Plan will be built 150 feet below ground and in some places below the three rivers themselves.



ALCOSAN

3 RIVERS, 3 TUNNELS

When completed, the deep tunnel system that is the centerpiece of Alcosan's Clean Water Plan will be able to divert 7 billion gallons of untreated stormwater.



ALCOSAN

want to have to pay more, but they also don't want rivers back to the way they were," Casson said.

Alcosan itself, while being obligated to do all the work by the consent decree on a set time frame, has also been concerned about the cost. The initiative is being funded by municipal bonds, but eventually the ratepayers will be called to pay for whatever can't be covered by direct government funding.

"We're such an important com-

ponent to the public health by virtue of what we do, but nobody wants to think about it, and the bill is going to be such that you are going to have to think about it," Kennedy said. "That does weigh on us."

An Allegheny Conference on Community Development and Pennsylvania Economy League of Greater Pittsburgh report in 2020 estimates that Alcosan's tunnel and near-surface construction work will result in 14,360 direct jobs with an econom-

ic impact of \$1.3 billion for direct, indirect and induced jobs over the life of the project. Ellen Gaus, market research manager with the Allegheny Conference and an author of the report, said more than half of the economic impact would come from construction and ancillary services. But it's not the whole story.

"This benefits dozens, hundreds of other industries," she said.

One major factor about the economic impact is its scope and length, said Jim Futrell, VP of market research and analysis at the Allegheny Conference.

"It's not just geography, it's the time frame," Futrell said. "It's a 15-year project through all three rivers."

That, he said, will boost the impact compared to other projects, even ones that are much higher in cost, he said.

But the benefits of the project go far beyond the dollars and cents that are being spent or the jobs, said Brian Jensen, senior director of policy and advocacy at the Allegheny Conference. It plays into the conference's view that major infrastructure investment needs to occur in southwestern Pennsylvania, including in water quality. It's a lifestyle, health and economic competitiveness issue, he said.

"From the Conference's standpoint, it only makes sense for us in terms of being able to market the region and be competitive with other regions, to improve our quality of life and to offer prospective businesses and workforces an environment, particularly an outdoor recreational environment, that's conducive to that way of life," he said.

That, said Alcosan's Kennedy, is another benefit of the project: Nine environmentally sensitive areas around Pittsburgh's rivers, whether it's a water intake, a boat dock or other places where ordinary residents interact with the rivers, will, by the end of the project, no longer see the overflows that sometimes limit their enjoyment or use of the rivers.

"With the plant expansion and the tunnel project, it's a once-in-a-generation investment in the water quality of the region," Kennedy said.

Why a green approach can't fully solve the problems

When Matthew Galluzzo looks at the scope and scale of the \$2 billion initiative, he sees the opportunity to not only clean the rivers up, but also to reinvigorate the life and look of the rivers and their banks.

Galluzzo, the president and CEO

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of Riverlife, knows the benefits of strong community development and infrastructure along long-unloved parts of Pittsburgh through the nonprofit's two-decade leadership role in reimagining and redeveloping the city's riverfronts. Riverlife believes Alcosan's plan is a seismic investment. That's why the group has been working with Alcosan and others to shape the initiative, particularly on either side of the West End Bridge, encompassing both the West End and Manchester-Chateau, which is a key location for Alcosan's work in the future.

He imagines Alcosan's improvements, both in terms of clean water and improvements to the riverfront, will pair well with the upcoming refurbishment of the West End Bridge that will lead not just to more climate-resilient landscapes, but also a more livable waterfront. He sees a multiuse trail around the riverfront, one that accommodates walkways and pedestrian access to the West

End Bridge where there isn't any right now.

"That's a once-in-a-multigenerational opportunity to help set that vision and hopefully execute on it," Galluzzo said.

The idea of cleaning up the region's rivers is universally praised. But not everyone believes Alcosan and the consent decree go about it the best way. The borough of McKees Rocks, for instance, took Alcosan to court in 2021 over one of the tunnels along the Ohio River that borough officials said would do permanent damage to economic and social justice areas. In late June, the two sides were ordered to go into mediation by the U.S. District Court. The ADR (alternative dispute resolution) conference was slated for July 26. Alcosan declined comment on the McKees Rocks lawsuit for this story; McKees Rocks also didn't respond to requests for comment.

"The underlying idea is good. We definitely want to make sure that untreated wastewater is not going into our rivers," said Anna Coleman,

"This type of investment is super important and definitely something we support. But the idea of making sure that public funds are used as effectively as possible is where we run into conflict."

ANNA COLEMAN,
environmental justice organizer, Pittsburgh United

an environmental justice organizer at Pittsburgh United, a community group. "This type of investment is super important and definitely something we support. But the idea of making sure that public funds are used as effectively as possible is where we run into conflict."

Coleman said there hasn't been enough emphasis on greener and more environmentally sustainable ways to reduce stormwater runoff, which has been effectively done in other cities that have similar kinds of aging infrastructure. Alcosan, she said, is depending too much on engineering.

She said there is evidence that small-scale infrastructure changes can lessen the impacts of such stormwater projects. Coleman pointed to Washington, D.C., as an example of being able to use green methods to reduce stormwater runoff without as much big infrastructure projects like the large tunneling systems that Alcosan is proposing. Washington ended up using tunnels as part of its solution but not to the

same scale, and instead employed more green infrastructure like absorbent gardens, vegetated rooftops and other ways to deal with stormwater runoff beyond the traditional approaches.

Green infrastructure also would benefit the communities surrounding Alcosan's plant, Coleman said.

The Allegheny Conference's Jensen said a blue-ribbon panel Alcosan and the conference assembled about a dozen years ago looked at the issues surrounding the Clean Water Plan and made recommendations. A dramatic increase in green infrastructure was one of the items studied and discussed at length.

"But there was a recognition that green infrastructure wouldn't be able to handle the entirety of the problem and these big conveyance tunnels ... needed to be part of the solution," Jensen recalled. "But the study also recommended that to the extent that green infrastructure can address parts of the issue, let's not build out a system that's bigger than is necessary."

Alcosan's Williams said the

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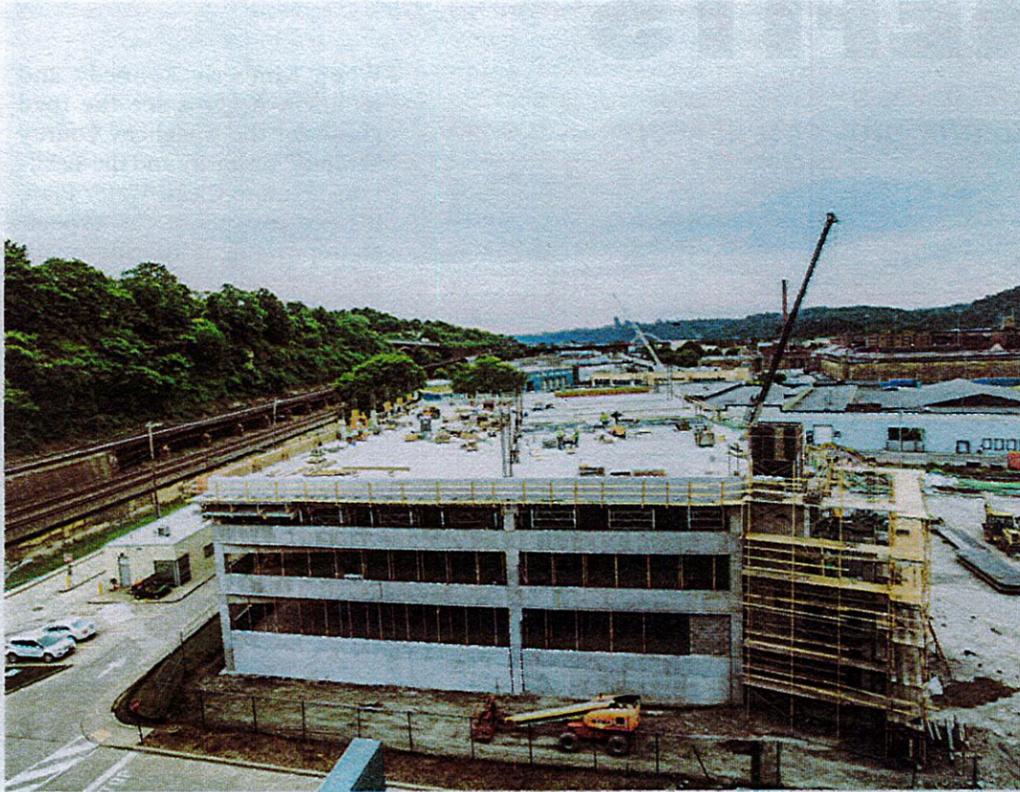
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JIM HARRIS/PBT

Construction on the new garage for employee parking at Alcosan's North Side facility.

authority's plan has encompassed green infrastructure and is open to even more applications of it, but that the tunnels have always been essential. That's not just Alcosan's belief; it's the regulators' belief as well. Williams recalled that an EPA administrator called the tunnels "the great backbone of an overall plan."

"They did not anticipate there was going to be anything but a need for that great backbone," Williams said. "There could be flesh on those bones on a variety of ways, as long as they met the compliance requirements. They were agreeable to that. Has it been a lengthy, tedious, sometimes confrontational process? Yes, it has. But I'm glad we have gone through that. I think we have demonstrated a process so as to be responsive to people's concerns."

Pitt's Casson believes Alcosan has looked at the matter extensively and employed outside engineers to help them come up with a deep and engineered plan – "a holistic solution" – that takes into account all competing interests, including

environmental and social justice.

Even with a project with such a long horizon, stretching out to the middle of the 2030s, Alcosan and observers say complying with the consent decree won't be a complete solution. Technological innovation and the impact of climate and the built environment, along with changes in policy, will require further changes even when the tunnels begin funneling stormwater to the revamped North Side plant.

"At the end of the project they will have already moved the goal-post again," Casson said. "It'll be a good thing. We'll have improved the infrastructure, improved the environment. We'll have cleaner rivers. We'll move toward sustainable infrastructure but will have to do better. I see at the end there will be a lot more work to be done."

Williams agreed.

"We keep moving to meet that moving target that is going to be there to protect water quality, which provides for so much throughout the region," she said.



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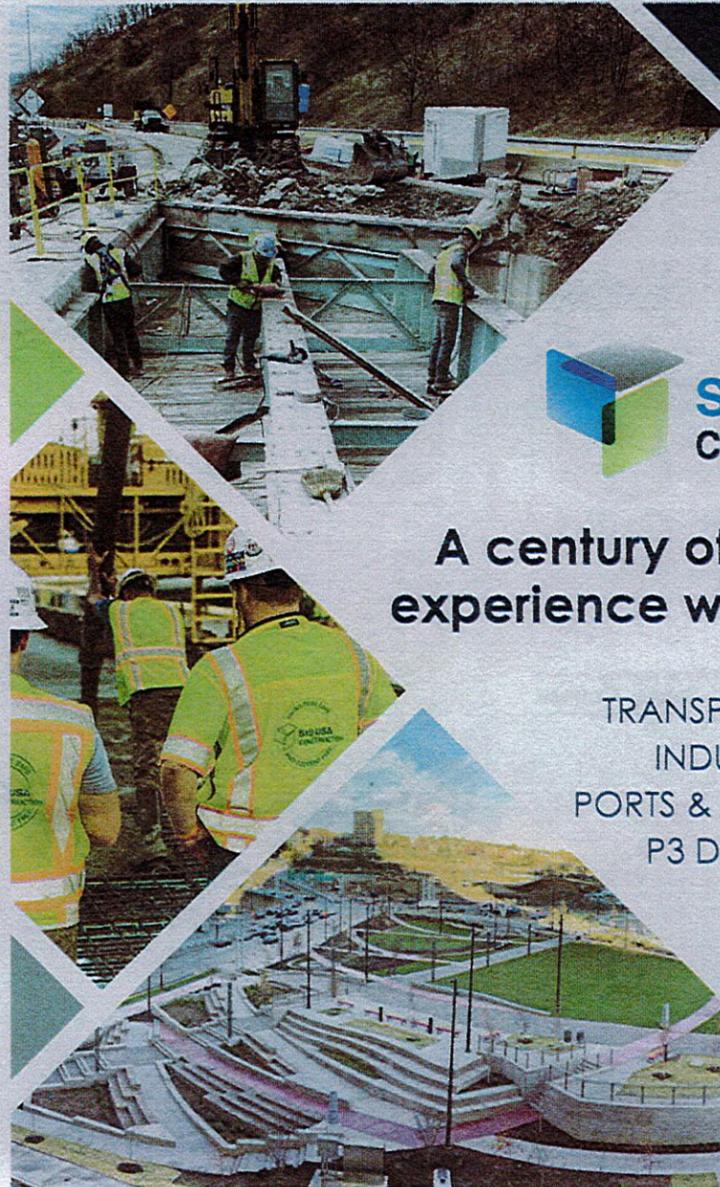
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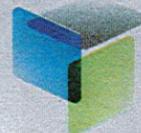
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LASTING BENEFITS

The length of time involved in Alcosan's big infrastructure project will keep engineers and construction workers busy until 2036.

BY PAUL J. GOUGH

When Kimberly Kennedy and Jefferson Argyros see the road ahead for the Allegheny County Sanitary Authority and the \$2 billion-or-more Clean Water Plan, it's not just about the expected improvement in water quality in the region that the massive infrastructure program will provide. They also see big opportunities for engineers, other workers and companies for nearly two decades.

Kennedy, director of engineering and construction, and Argyros, manager of capital projects, are leading the initiative, which is in the midst of sweeping capacity upgrades and improvements at its North Side plant.

And more significantly, they are overseeing the creation of three 5-mile tunnels, each 150 feet underneath the Ohio, Allegheny and Monongahela rivers – as well as Pittsburgh itself – that will funnel up to 7 billion gallons of stormwater to the plant annually that is otherwise going into the rivers untreated.

"It's a wonderful time to be in engineering in this city," Kennedy said.

She said young engineers working on the project will get a chance to shepherd infrastructure that will serve the Pittsburgh region for many years to come.

"This can set their career, working on something of this magnitude," Kennedy said. "It's really pretty exciting."

Alcosan is obligated to do the work under a consent decree with the U.S. Environmental Protection Agency and other regulators signed in 2008 and then revamped in 2020.

But the length and scope of the project goes beyond a single construction site.

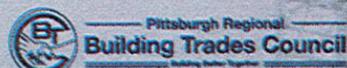
In addition to the reshaping and capacity-building at the North Side plant, the creation of the three tunnels will be unlike anything seen in the region. They will require acres of land along the riverfront for access in at least 20 spots, where sewer connectors, flow regulators and especially the 150-foot shafts will be located. And big boring machines, working at a rate of 60 feet per day, will burrow underground near the riverbanks and, in some cases, underneath the rivers themselves.

With the exception of the boring, which will require specialized machinery that doesn't exist in Pittsburgh, a majority of the project is going to be done by

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local contractors and suppliers: 14,630 direct jobs alone will be created over the life of the project, which will last until 2036, according to an estimate from an Allegheny Conference on Community Development and Pennsylvania Economy League of Greater Pittsburgh report in 2020.

About \$200 million in contracts have been awarded since 2019, and work has already started. There are two cranes at the North Side site, surrounding a 70-foot hole where additional initial treatment for wastewater will be done in a building called the East Headworks. There also has been work completed along the north side of the plant, where the treated water flows back into the Ohio River.

Already local companies have won significant contracts: Michael Baker International is the overall project manager. (The company declined to talk about the project for this story. Other contractors did not respond to a request for comment.)



JIM HARRIS/PBT

Alcosan's entrance with the new employee parking garage construction in the background.

"A lot of our contractors will be involved in that project, a lot of labor unions will be involved," said Jeff Nobers, executive director of the Builders Guild of Western Pennsylvania and Pittsburgh Works Together. "It's a critical piece of infrastructure, and it provides a lot of opportunities for the members of our trade unions today and those who are just entering the construction field over the next 10-15 years."

Nobers said the timing of Alcosan's projects, between the work at the treatment plant and the three tunnels, comes at a good time for the region's workforce.

The nearly decadelong work at the Shell Polymers plant in Beaver County is almost complete. And while other big projects, including the airport terminal and UPMC Presbyterian, are in process or about to begin, there is always room for more work.

"It continues to help us remain a very viable construction market," Nobers said.

With the Alcosan project, there's an agreement in place with unions and the building trades to prioritize a local workforce, and it has commitments to have between 10% and 25% participation by minority and women-owned businesses for all contractors and consultants. There's also a requirement for 3% participation in professional services for companies that are service-disabled veteran owned.

The request for proposals on various parts of the work, whether it's for engineering and design or the construction itself, have been appearing on Alcosan's website regularly and will for many years. Alcosan is parceling out the projects on a time frame that is long and manageable given the scope of the work that needs to be done as well as Alcosan's day-to-day mission of making sure the water is clean.

"We cannot do everything at once because we have to keep the plant in operation 24/7," Kennedy said.



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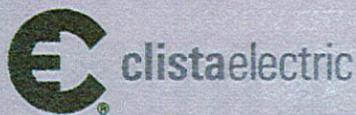
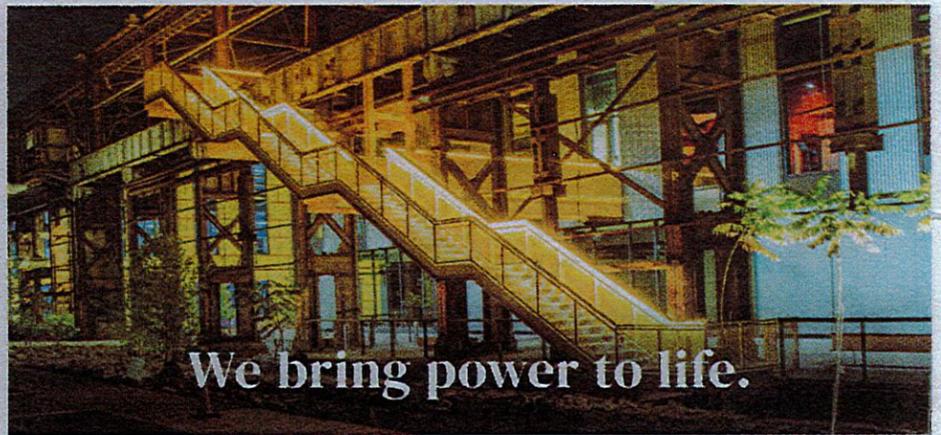


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