

THE PITTSBURGH WATER AND SEWER AUTHORITY

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Ms. Arletta Scott Williams
Executive Director
ALCOSAN
3300 Preble Avenue
Pittsburgh, PA 15233-1092

RE: Comments to the ALCOSAN Wet Weather Plan

Dear Ms. Scott Williams:

Earlier today, the Chairman of the Pittsburgh Water and Sewer Authority (PWSA), Mr. Dan Deasy, provided testimony concerning PWSA's policy views concerning Alcosan's Wet Weather Plan. What follows below are specific technical comments intended to supplement these policy views.

Saw Mill Run Planning Basin Improvements

ALCOSAN's "Recommended 2026 Plan" does not include the improvements in the Saw Mill Run planning basin that are identified in ALCOSAN's "Selected Plan". ALCOSAN's Selected Plan identifies improvements that are required to meet the established goal of not precluding the attainment of water quality standards and to eliminate SSO's. The selected plan includes a relief interceptor for SSO control and a CSO conveyance tunnel with 9 drop shafts in the Saw Mill Run planning basin. According to the ALCOSAN report, the Selected Plan also includes wet weather improvements proposed by its "customer municipalities" (i.e. Pittsburgh/PWSA and all of the other municipalities that are served by ALCOSAN). In the Saw Mill Run planning basin, these improvements consist largely of adjusting existing CSO diversion chambers to reduce combined sewer overflows and increasing the conveyance capacity of downstream trunk sewers to convey the resulting increased flows to the ALCOSAN Saw Mill Run interceptor system. However, ALCOSAN has determined that implementing that \$3.6 billion plan is unaffordable. Consequently, ALCOSAN's Recommended 2026 Plan proposes a phased course of wet weather controls at a cost of approximately \$2.0 billion. This Recommended 2026 Plan eliminates all of the ALCOSAN improvements in the Saw Mill Run planning basin. This change prompts the following questions and comments:

1. What is ALCOSAN's proposed/anticipated schedule, if any, for implementing the Selected Plan recommendations for the Saw Mill Run planning basin?
2. Is it reasonable to anticipate that the implementation of the Saw Mill Run customer municipalities will not be scheduled for completion until the downstream ALCOSAN improvements are implemented?

3. If the construction of the customer municipalities' improvements cannot be deferred until the implementation of ALCOSAN's Saw Mill Run improvements, how will ALCOSAN accommodate the resulting increased flows?
4. Are the impacts of ALCOSAN's proposals for the Saw Mill Run planning basin improvements upon the plans of the customer municipalities being addressed in negotiations/discussions with the regulatory agencies?
5. Will Pittsburgh/PWSA and the other affected customer municipalities be afforded the opportunity to participate in discussions/negotiations between ALCOSAN and the regulatory agencies?

A similar observation is made regarding the fact that ALCOSAN's Recommended 2026 Plan does not extend the tunnels identified in its Selected Plan to points-of-connection in the Nine Mile Run and Streets Run drainage areas.

Is ALCOSAN's Recommended Plan Truly Affordable to Pittsburgh Customers?

ALCOSAN's residential indicator of affordability assessment is based upon the median household income (MHI) for all households in the ALCOSAN service area (regional MHI). The estimated 2012 MHI for the ALCOSAN service area included in the ALCOSAN Wet Weather Plan is \$46,400/year. The estimated MHI for the City of Pittsburgh is \$38,500/year – 17-percent less than the service area value. It is worth noting that there are 19 other municipalities within the ALCOSAN service area with even lower MHIs. ALCOSAN's residential indicator analysis estimated that the cost of the \$3.6B Selected Plan to the residential users throughout the service area would result in costs for sewerage services equating to approximately 2.7% of MHI. The cost to City of Pittsburgh residents is estimated to be approximately 3.1% of the Pittsburgh MHI. USEPA guidelines define costs per household in excess of 2.0% of MHI as creating a "high burden".

The ALCOSAN Wet Weather Plan determined that the \$2.0B Recommended 2026 Plan will result in a regional residential indicator of near the 2% of MHI high burden threshold. Because the City of Pittsburgh's MHI is substantially lower than the regional MHI, the burden associated with the \$2.0B cost on its residents will be higher, approximately 2.3%, and well into the high burden category. This means that even the "affordable" Recommended 2026 Plan will not be affordable to the City of Pittsburgh residents based upon USEPA guidelines.

ALCOSAN's Wet Weather Plan acknowledges this situation, but does not offer a means of addressing this situation. Several possibilities to consider include:

1. Deferring elements of required improvements to Pittsburgh/PWSA and other customer municipality facilities. ALCOSAN's efforts to identify an affordable plan consisted of eliminating elements of facilities to be implemented by ALCOSAN. However, ALCOSAN is operating under the assumption that all of the customer municipalities' improvements will be constructed by the year 2026. \$0.5B out of the \$2.0B cost of the Recommended 2026 Plan represents the cost of improvements to customer municipalities' facilities that will not be shared by ALCOSAN. This implies that, in ALCOSAN's efforts to achieve affordability, it reduced the cost to ALCOSAN from \$3.1B (\$3.6B total cost – \$0.5B customer municipalities cost) to \$1.5B (\$2.0B total cost – \$0.5B customer municipalities cost). This is a reduction of nearly 52% in the cost to ALCOSAN which would be shared regionally as compared to no reduction in costs for projects that must be financed entirely by individual municipalities.

A more effective means of improving the affordability of ALCOSAN's Recommended 2026 Plan regionally while addressing financial capability disparities on the municipal level would be to consider the deferment of elements of individual customer municipality projects instead of elements of ALCOSAN's projects.

2. A disproportionate amount of ALCOSAN's regional facilities are located within the City of Pittsburgh. Roughly 63% of the ALCOSAN service population and 81% of the ALCOSAN service area lie outside of the City of Pittsburgh. However, the preponderance of facilities that ALCOSAN has proposed for construction lie within the Pittsburgh city limits. This includes the wastewater treatment plant and the deep tunnels and associated drop shafts. Consideration should be given to methods to discounting some of the project costs to City residents in recognition of the disproportionate amount of negative impacts on the City and its residents associated with the regional ALCOSAN facilities.

Green Infrastructure Technologies

It is the goal of the PWSA to effectively incorporate green infrastructure technologies into its final plan Long-Term Control Plan, due to the Department of Environmental Protection in July of 2013. The ALCOSAN Wet Weather Plan reports on evaluations of the ability of green infrastructure to provide wet weather control in each of the planning basins. The conclusions reported in the Plan are as follows:

1. Chartiers Creek Basin (source: ALCOSAN Wet Weather Plan, page 8-19)

"The Chartiers Creek basin planner also evaluated the ability of green infrastructure to provide wet weather control as a municipal alternative portion of a broader basin plan. An examination of these technologies in the context of Chartiers Creek system hydraulics revealed that green infrastructure must be coupled with improved conveyance capacity and a higher level of understanding of the existing system conveyance capacities in order to support the desired level of CSO control. Specific targets for green infrastructure application were identified based on the complexities of bringing flow to the existing interceptor or the relief interceptor. Combined sewer areas that were located downstream of proposed consolidation sewer intercept points were also considered. Hydraulic modeling of these areas was performed using gross hydrologic modification considerations consisting of initial abstraction modification in addition to impervious area reduction. Estimates of the necessary storage volume to achieve various levels of control were determined, and sewersheds with the greatest potential to meet desired levels of control underwent field screening based on land use within the sewershed.

Estimates of the necessary storage volume to achieve various levels of control were determined, and sewersheds with the greatest potential to meet desired levels of control underwent field screening based on land use within the sewershed.

The following sewersheds and municipalities were determined to have the greatest potential for green infrastructure applications

- C-10 – McKees Rocks
- O-06 – Stowe Township and McKees Rocks Borough
- O-08 through O-13 – City of Pittsburgh"

2. Lower Ohio Girty's Run Basin (source: ALCOSAN Wet Weather Plan, page 8-30)

"In conjunction with the control technology screening process, a sensitivity analysis relating the anticipated effects of green infrastructure on overflow frequencies was conducted. Outfalls producing the least frequent overflows under typical year conditions were evaluated to determine the percentage of flow reduction required to lower the frequency of overflow events to desired levels of control. The analysis compared overflow statistics from the fourth through eighth largest overflow events during the 2003 typical year to determine the amount of flow generated from the impervious and pervious portions of the sewershed. With this information, the primary flow source (impervious or pervious area) could be identified and a determination made as to whether green infrastructure should be investigated as a potential control.

The analysis indicated that CSOs at ALCOSAN POCs O-01, O-02 and O-05a within Stowe Township have the potential to eliminate the fourth through eighth largest overflows via the use of green infrastructure. Controls, including those incorporating other inflow reduction technologies, may need to be implemented in existing pervious and impervious areas to maintain this level of control. In addition, sewershed A-67 in Millvale Borough was identified as a host for potential green infrastructure installations. In A-67, the impervious area is relatively small compared to the total A-67 sewershed acreage and the removal of these impervious areas would not significantly reduce A-67-00 CSO frequency. However, they may be effective in reducing the volume and frequency of the GRJSA CSOs."

3. Main Rivers Basin (source: ALCOSAN Wet Weather Plan, pages 8-39, 8-40)

"In conjunction with the control technology screening process, a sensitivity analysis relating the anticipated effects of green infrastructure on overflow frequencies was conducted. Various reductions to impervious areas within a sewershed were modeled to determine whether the associated overflow reduction was significant enough to limit overflows to levels of control desired for ALCOSAN site alternatives. Evaluation of green infrastructure proved to be complex, in that it was difficult to validate whether or not an overflow could be sufficiently controlled to achieve a desired level of control. However, the analysis did provide insight into areas where the application of green technologies would likely be beneficial and have the potential to supplement other source reduction efforts. As such, implementation of green infrastructure could potentially reduce the capacity, size and costs of consolidation sewers. Sewersheds in which green infrastructure showed the greatest benefit were identified based on their potential ability to reduce CSOs to under 11 events per typical year with 10% or less of impervious area reduction. These areas, all located in the City of Pittsburgh, include: A-05, A-08, A-12, A-18Y, A-56, M-08 and O-37.

Green infrastructure was only analyzed at the site alternative level, and was not carried forward as a stand-alone technology for basin alternative development. It will be retained as a potential municipal control to supplement ALCOSAN controls in the Main Rivers Basin."

4. Saw Mill Run Basin (source: ALCOSAN Wet Weather Plan, page 8-52)

"Technologies related to sewer separation, removal of I/I, green infrastructure and stormwater management, sewer optimization and relief sewers were deemed to be more appropriate for addressing small, remote outfalls or for reducing overall volumes and flows at larger overflows. Therefore, these technologies were not evaluated as primary technologies, but will be revisited for implementation as part of optimization of a preferred plan to address wet weather in the SMR planning basin."

5. Turtle Creek Basin (source: ALCOSAN Wet Weather Plan, page 8-69)

Green infrastructure approaches can provide cost-effective alternatives with levels of wet weather control equivalent to more traditional I/I reduction and sewer separation that are retained for the basin alternatives analysis. However, since the appropriateness, applicability, and performance of green infrastructure approaches are highly site specific, it was judged to be infeasible to explicitly include green infrastructure in the TC basin alternatives analysis."

6. Upper Allegheny Basin (source: ALCOSAN Wet Weather Plan, page 8-71)

"The UA basin planner also evaluated the ability of green infrastructure and other source control alternatives to provide wet weather flow reduction as a municipal alternative portion of a broader basin plan. A source control sensitivity analysis was conducted on a basin-wide basis to determine potential locations for application of source control within the municipal systems.

Hydraulic modeling for this analysis was performed using hydrologic modification to sewershed impervious areas in the combined sewer basins. Targeted reductions (25%/50%/75%) were made for each combined sewershed with 25% reduction assumed to represent aggressive green infrastructure programs and 50% to 75% reductions assumed to represent combinations of green infrastructure with other source reduction alternatives such as partial sewer separation. Sewersheds with the greatest potential to meet desired levels of control were documented. In general, overflow volume appeared to be more sensitive to the targeted reductions than the number of activations or the peak flow rates, with relatively high volume reductions projected for most of the targeted reduction categories. However, the sensitivity analysis indicated that in most sewersheds source reductions of 50% or greater would be required in order to achieve significant reductions in CSO activations, and therefore application of green infrastructure as a standalone technology would not be sufficient to achieve the targeted levels of control."

7. Upper Monongahela Basin (source: ALCOSAN Wet Weather Plan, page 8-84)

"In conjunction with the control technology screening process, a sensitivity analysis relating the anticipated effects of green infrastructure on overflow frequencies was conducted. Various reductions to impervious areas across the planning basin were modeled to determine whether there were particular sewersheds in which reasonable reductions to impervious area, achieved via green infrastructure, could produce overflow reductions significant enough to limit overflows to levels of control desired for ALCOSAN site alternatives. At a minimum, the overflow reductions should result in cost effective reductions to the size of the necessary gray infrastructure (pipes, tanks, etc.). The analysis identified three sewersheds in which a reduction in impervious area, in combination with I/I reduction, could meet or exceed desired levels of control. These sewersheds were: M-31Z in the City of Pittsburgh, M-44 in West Homestead Borough and M- 61 in North Braddock Borough. Because green infrastructure would need to be implemented in the tributary municipal systems at these locations, customer municipalities were apprised of these results as part of ALCOSAN's coordination and outreach efforts. Other planning activities identified simple modifications that could be made directly to M-31Z and M-61 that could reduce overflows to desired levels of control without upstream green infrastructure."

The total area of the specific sub-catchment areas which ALCOSAN has identified where green infrastructure may potentially be effective in playing a substantive role in controlling CSOs areas is approximately 870-acres or 1.2-square miles. Considering that the ALCOSAN service area encompasses 309 square miles and City of Pittsburgh alone encompasses 56-square miles, the ALCOSAN analysis appears to indicate that, from the practical standpoint of CSO mitigation, the role of green infrastructure is small. Is this a reasonable interpretation of the results of ALCOSAN's analysis?

The ALCOSAN Wet Weather Plan offers no additional guidance that can be used by the municipalities to fully evaluate the merits of green infrastructure opportunities within their municipalities. The intrinsic value of green infrastructure technologies is accepted. However, key determinants relative to specifically how the implementation and funding of those technologies can appropriately be incorporated into the municipal feasibility studies include their effectiveness in reducing/eliminating the cost of required gray infrastructure and how the gray infrastructure cost savings can be applied to financing green infrastructure. Since the cost of ALCOSAN's facilities accounts for three quarters of ALCOSAN's estimated cost for its Recommended 2026 Plan, quantification of the potential performance and cost implications of green technologies on ALCOSAN's facilities is critical to enabling regional and municipality specific evaluations of those technologies. A better quantification of the impacts of green infrastructure on ALCOSAN's facilities is required in order for the individual municipalities to fully and fairly evaluate green infrastructure alternatives. ALCOSAN, not the individual municipalities, has the ability to define these impacts upon its system.

Evaluation of Satellite Treatment

It is not clear that the costs/benefits of satellite treatment were fully analyzed. Were potential reductions in the cost of tunnels and the potential benefits of avoiding extensive construction in the densely developed river corridors of the City fully reflected in the analysis?

Thank you for the opportunity to submit these comments. We look forward to meeting with you and your staff in the near future to discuss how these comments can be incorporated into the final Wet Weather plan. We welcome the opportunity to work with ALCOSAN to move forward to the successful completion of wet weather planning for our region.

Sincerely,



James L. Good
Interim Executive Director
PWSA

CC:

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