



June 13, 2018

Kevin Bowers, PE  
Pennonni Associates  
1900 Market Street  
Philadelphia, PA 19103

Re: Federal Waiver Requests – Response to Township Review  
Ardmore Transportation Center  
Lower Merion Township, Montgomery County, PA

Dear Mr. Bowers,

On June 5, 2017, SEPTA provided Urban Engineers, Inc. (Urban), as SEPTA's Engineer of Record, with your June 5, 2017 e-mail to Bob Duncan, Lower Merion Township, discussing variance recommendations and additional comments in regards to the list of waivers requested of Federal Stormwater Management requirements for the Ardmore Transportation Center project prepared by Urban on May 24, 2016. As stated in Alex Coll's letter, dated April 28, 2017, SEPTA provided the stormwater plans and reports to Lower Merion Township in its capacity as a landowner in evaluating the proposed stormwater easement agreement, and not as part of any local land development approvals process. Any references in this letter to waivers from stormwater standards are not being made in connection with any land development application; instead, they are being made in connection with the Township's review of the stormwater easement agreement as a landowner. Compliance with applicable Federal stormwater management regulations will be reviewed by the Montgomery County Conservation District, which, as you know, reviews applications for both NPDES Permits and Erosion and Sediment Control Plan approval.

For ease of review, the following waiver requests and responses within this section have been put into numerical order corresponding to the order in which you addressed them in your email. Waiver requests not numbered in this section refer to requests that were not explicitly responded to within the email.

Line items with an asterisk (\*) preceding the comment represent waivers that were not originally requested by Urban Engineers and that have been recommended for inclusion into the final request by the Township Engineer.

It is assumed that waivers supported by the Township Engineer will be looked upon favorably by Lower Merion Township. The supported waivers have been shaded for ease of review, as no additional action is anticipated.

1. **SEPTA Request (May 24, 2016) § 121-4.A(1)** – *Requesting a waiver for during construction stormwater management. The project site is located in a highly urbanized area and the overall increase in impervious coverage will be minimal. Therefore, the increase in stormwater runoff during construction activities will be minimal. Additionally, construction will be performed in*

stages which will further decrease runoff due to impervious increases. Construction phasing will also be utilized to minimize overall earth disturbance. Appropriate erosion and sedimentation control measures will be implemented.

**LMT Engineer Response (June 5, 2017):** During construction stormwater management controls have not been addressed in the calculations. Additional phasing of the construction may be required to mitigate the impact depending on the evaluation.

**SEPTA Response (November 29, 2017, Revised June 13, 2018):** Construction Phasing plans and Erosion & Sedimentation Control plans have been developed and provided to SEPTA as part of the complete construction documentation package for Phase 1 and 2. Once Phase 2 is initiated, SEPTA will coordinate further review of these plans, as appropriate, with Lower Merion Township.

The Phase 1 impervious coverage increase is limited to 6,782 square feet (an 8.63% increase) and the Phase 2 impervious coverage increase is limited to 14,886 square feet (an 18.94% increase) above the existing conditions respectively. In addition, Phase 1 will be broken into four (4) distinct construction stages for a total of five (5) construction stages from ground breaking to full Phase 2 build-out. By breaking the project into multiple construction stages, the limit of disturbance associated with the overall project improvements is reduced (refer to G-series drawings).

The amount of runoff generated by the construction stages, based upon SCS Curve Number guidance, will be less than that of the existing conditions. Impervious surface has a TR-55 SCS curve number of 98, while “disturbed ground” which will be utilized for areas under construction has a curve number of 86. Per TR-55 the lower curve number will generate less stormwater runoff. As the existing site is 80% impervious, any transition of impervious to a disturbed ground cover type will empirically reduce the stormwater runoff during construction.

2. **\*LMT Engineer Comment (June 5, 2017) § 121-4.A(8)** – Areas of existing diffused drainage onto adjacent properties must be managed such that the peak rate of runoff does not increase in the general direction of discharge. This has not been demonstrated for Phase 1 toward the Mill Creek Drainage basin.

**SEPTA Response (November 29, 2017, Revised June 13, 2018):** The Post-Construction Stormwater Management Plan compares the pre-developed condition to the Final Phase 2 condition. Phase 1 was not modeled as it largely maintains the existing drainage with minor work to restore the existing condition and address the diffused drainage.

**Table 1: Mill Creek Drainage (3-18) Area Analysis**

|            | Drainage Area Cover Quantities |                      |                     |                    | Stormwater Discharge    |                           |
|------------|--------------------------------|----------------------|---------------------|--------------------|-------------------------|---------------------------|
|            | Total Area (sf)                | Impervious Area (sf) | Grass Area (sf)     | Gravel Area (sf)   | 2-yr, 24-hr Storm (cfs) | 100-yr, 24-hr Storm (cfs) |
| Existing   | 65,949                         | 48,049               | 10,432              | 7,468              | 5.55                    | 16.70                     |
| Phase 1    | 67,586                         | 57,124               | 9,349               | 1,113              | 6.04                    | 17.39                     |
| Net Change | +1,637<br>(+2.48%)             | +9,075<br>(+18.89%)  | -1,083<br>(-10.38%) | -6,355<br>(-85.1%) | +0.49<br>(+8.9%)        | +0.69<br>(+4.1%)          |

The table above shows that within the Mill Creek drainage area (Drainage Area 3-18) the impervious increase is 9,075 square feet (an 18.89% impervious increase) above the existing

condition. This includes the regrading of the SEPTA Leased Lot to correct the existing subsidence issue in the southeast corner of the parking lot. The regrading of the subsided area adds 1,637 square feet of impervious to the Mill Creek drainage area that is not currently present, but was historically. Also shown by the table above is that there is only a 1,083 square foot reduction in grass area. That is due to the majority of the new impervious cover replacing existing gravel areas.

A hydrograph analysis of the existing Mill Creek conditions versus the Phase 1 Mill Creek conditions shows that there will be a 0.49 cubic feet per second (cfs) increase during the 2-yr 24-hr storm event. The 100-yr 24-hr storm event increase is 0.69 cfs. This minimal increase in runoff generated by the increased impervious coverage will be captured utilizing a series of inlets and conveyed through a private stormwater conveyance network to connection points within Anderson Avenue to the LMT storm sewer.

3. **SEPTA Request (May 24, 2016) § 121-4.A(19)** – Requesting a waiver for drainage being routed across drainage area boundaries. The proposed parking garage (Phase 2) will be constructed overtop the drainage divide that bounds Stormwater District A and District 3-18. It is proposed to route all roof runoff from the garage to the east towards District A, which is a more restrictive release district. This runoff will be managed by a stormwater management facility prior to discharge into the Township stormwater system. By redirecting the roof runoff towards the basin, additional treatment of the runoff will be performed as no stormwater management facility is proposed on the western half of the site.

**LMT Engineer Response (June 5, 2017):** For development sites located in two or more subareas, the natural drainage areas shall not be modified. This waiver is required for both phases 1 and 2.

**SEPTA Response (November 29, 2017, Revised June 13, 2018):** As indicated above, during the final built condition (Phase 2) the garage will be situated over the drainage boundary. Runoff originally flowing west towards District 3-18 that falls on top of the garage will be routed east towards District A where it will be treated by a subsurface detention facility. This change in drainage pattern is approximately 22,800 square feet.

An added benefit of this change, not discussed above, is that there is currently no space available on the west side of the site to construct a stormwater BMP. By diverting runoff from District 3-18 to District A, we are able to provide a reduction in runoff to that below a pre-development levels within District 3-18 without the construction of a BMP, and, therefore, meeting rate control requirements within that district (see Table 2 below). The BMP to be constructed in District A will provide control enough to reduce discharge to that below pre-development conditions, even when comparing the smaller pre-development drainage area to that of the post-development drainage area. As currently designed, if the drainage boundaries are maintained, roof runoff discharging to District 3-18 would not be able to be treated for rate control as there is no room for a BMP within this project area and the project would not meet rate control requirements within this district.

**Table 2: Subshed 3-18 Discharge Summary following Drainage Redirection**

| Storm Event     | Pre-Developed (Hydrograph # 16) | Required Discharge | Post-Developed (Hydrograph #36) | Rate Below Required (CFS) |
|-----------------|---------------------------------|--------------------|---------------------------------|---------------------------|
| <b>1-year</b>   | 5.009                           | <b>5.009</b>       | 3.683                           | <b>1.33</b>               |
| <b>2-year</b>   | 5.883                           | <b>5.883</b>       | 4.241                           | <b>1.64</b>               |
| <b>5-year</b>   | 8.056                           | <b>8.056</b>       | 5.631                           | <b>2.43</b>               |
| <b>10-year</b>  | 9.781                           | <b>9.781</b>       | 6.737                           | <b>3.04</b>               |
| <b>25-year</b>  | 11.500                          | <b>11.500</b>      | 7.841                           | <b>3.66</b>               |
| <b>50-year</b>  | 12.990                          | <b>12.990</b>      | 8.805                           | <b>4.19</b>               |
| <b>100-year</b> | 17.020                          | <b>17.020</b>      | 11.420                          | <b>5.60</b>               |

During Phase 1, there is a minor change in the drainage pattern due to the improvements being made to the SEPTA parking lot on the inbound side of the track. In the existing condition, the east end of the surface lot is in poor condition and portions have subsided causing drainage to run east into the Lower Merion Township Municipal Lot. It is proposed in Phase 1 to fix this subsidence issue, resurface the lot, and replace the degraded curb along the eastern portion of the lot that divides it from the Municipal Lot. In making these repairs, the drainage boundary has been effectively restored to its original condition of having the curb along the east end of the SEPTA lot being the official drainage boundary. The areas and runoff associated with this repair are discussed in item #2 above.

4. **SEPTA Request (May 24, 2016) § 121-4.B(2)(d)[1]** – Requesting a waiver of infiltration requirement. As this area is highly urbanized, is bounded on the west, south, and east by existing and proposed buildings in close proximity and the north by the Amtrak right-of-way infiltration in this area is not recommended as it may adversely impact existing building foundations and basements.

**LMT Engineer Response (June 5, 2017):** The increased volume of stormwater generated by the proposed development for the twenty five (25) year storm shall be recharged. No recharge is proposed. Volume control waivers supported due to the location of the other buildings in the area and desire to be protective against infiltration into the basements.

**SEPTA Response (November 29, 2017, Revised June 13, 2018):** This infiltration requirement waiver request pertains to District A only. The increase in volume generated by the 25-yr storm event within District A comparing the Final Phase 2 development to the Pre-Developed conditions is 11,610 cubic feet. Waiver request supported by Township Engineer. No further action required.

5. **SEPTA Request (May 24, 2016) § 121-4.B(2)(a)[1]** Requesting a waiver of the water quality recharge requirement requiring the infiltration of the increased volume of stormwater generated by the proposed development for the twenty-five-year storm. As this area is highly urbanized, is bounded on the west, south, and east by existing and proposed buildings in close proximity and the north by the Amtrak right-of-way infiltration in this area is not recommended as it may adversely impact existing building foundations and basements.

**LMT Engineer Response (June 5, 2017):** As part of the development is located within the Darby-Cobbs Act 167 Drainage Area Release Rate District, it must be demonstrated that the infiltration

volume is equivalent to the runoff generated from one (1") inch of rainfall over all proposed impervious areas. No recharge is proposed for either phase. Volume control waivers supported due to the location of the other buildings in the area and desire to be protective against infiltration into the basements.

**SEPTA Response (November 29, 2017, Revised June 13, 2018):** This infiltration requirement waiver request pertains to District 3-18 only. Due to the redirection of the drainage areas there is a net reduction in volume generated by the 35-yr storm event within District 3-18 when comparing the Final Phase 2 development to the Pre-Developed conditions. The net volume reduction is -7,184 cubic feet. Waiver request supported by Township Engineer. No further action required.

6. **SEPTA Request (May 24, 2016) § 121-4.B(2)(d)[3]** - Requesting a waiver of infiltration requirement. As this area is highly urbanized, is bounded on the west, south, and east by existing and proposed buildings in close proximity and the north by the Amtrak right-of-way infiltration in this area is not recommended as it may adversely impact existing building foundations and basements.

**LMT Engineer Response (June 5, 2017):** As part of the development is located within the Darby-Cobbs Act 167 Drainage Area Release Rate District, double ring infiltrometer or hydraulic conductivity tests shall be performed at the level of the soil infiltration in order to determine the hydraulic conductivity rate. No tests were submitted as they do not proposed any recharge with either phase. Volume control waivers supported due to the location of the other buildings in the area and desire to be protective against infiltration into the basements.

**SEPTA Response (November 29, 2017):** Waiver request supported by Township Engineer. No further action required.

7. **SEPTA Request (May 24, 2016) § 121-4.B(2)(d)[6]** - Requesting a waiver of infiltration requirement. As this area is highly urbanized, is bounded on the west, south, and east by existing and proposed buildings in close proximity and the north by the Amtrak right-of-way infiltration in this area is not recommended as it may adversely impact existing building foundations and basements.

**LMT Engineer Response (June 5, 2017):** The proposed design does not incorporate the usual recharge elements in the stormwater quality treatment facilities for phase 2 and no quality facilities in Phase 1 for the Mill Creek drainage direction. Volume control waivers supported due to the location of the other buildings in the area and desire to be protective against infiltration into the basements.

**SEPTA Response (November 29, 2017, Revised June 13, 2018):** Waiver request supported by Township Engineer. No further action required. Please refer to volumes discussed in items #4 and 5.

9. **\*LMT Engineer Comment (June 5, 2017) § 121-5.B(4)(a)** – The Cn number for the pre-developed conditions on the train station site shall be considered as meadow for all rate control analysis. The present submission does not consider all impervious areas as meadow in the pre-development analysis.

**SEPTA Response (November 29, 2017, Revised June 13, 2018):** This section indicates that,

*“This exemption (of §121-5.B(4)) shall not apply to any property where more than 75% of the principal building area is being demolished and a new principal building is being constructed. In such case the existing impervious surface on the property shall be considered as meadow for the purpose of calculating stormwater runoff required by this chapter.”*

The existing inbound and outbound stations that are to be demolished are located on a 105 mile long contiguous property owned by Amtrak that contain multiple principal buildings (the Amtrak right-of-way contains numerous stations along the corridor, 22 of which are SEPTA stations on the Paoli-Thorndale line, 6 of which are within Lower Merion Township). Assuming each of the 22 SEPTA stations are equivalent in size, the demolition of the Ardmore station constitutes approximately 4.5% of only the SEPTA Regional Rail station structures. This number would further decrease when taking the Amtrak Stations west of Thorndale into account. Therefore, modeling the pre-developed impervious coverage as meadow is not required.

The pre-development model was prepared per the NPDES CG-1 requirement. As such, all existing lawn has been considered meadow and 20% of the existing impervious surface has been considered meadow for analysis purposes. This pre-development model satisfies the Montgomery County Conservation District and DEP pre-development modeling requirements for this site.

**SEPTA Request (May 24, 2016) § 121-4.B(2)(b)** – Requesting a waiver of the Provisional Infiltration District requirements within Act 167 District 3-18. It is proposed to not infiltrate in this urban environment. It was discussed with the Township Engineer that in lieu of providing infiltration up to and including the 5-year storm event, the post-development peak flows of the 1-year through 100-year storm must be limited to pre-development rates.

**LMT Engineer Response (June 5, 2017):** Volume control waivers supported due to the location of the other buildings in the area and desire to be protective against infiltration into the basements. (Waiver request not explicitly responded to. This response is a general response from the Township Engineer in regards to infiltration.)

**SEPTA Response (November 29, 2017, Revised June 13, 2018):** As previously discussed with the Township Engineer, the post-development peak flow rates have been designed to be controlled to that below the pre-development rates. Waiver request supported by Township Engineer. No response required.

**SEPTA Request (May 24, 2016) § 121-4.B(2)(d)[2]** - Requesting a waiver of infiltration requirement. As this area is highly urbanized, is bounded on the west, south, and east by existing and proposed buildings in close proximity and the north by the Amtrak right-of-way infiltration in this area is not recommended as it may adversely impact existing building foundations and basements.

**LMT Engineer Response (June 5, 2017):** Volume control waivers supported due to the location of the other buildings in the area and desire to be protective against infiltration into the basements. (Waiver request not explicitly responded to. This response is a general response from the Township Engineer in regards to infiltration.)

**SEPTA Response (November 29, 2017, Revised June 13, 2018):** The increase in runoff associated with the Retention Volume ( $Re_v$ ) equation is 4,627 cubic feet. Waiver request supported by Township Engineer. No response required.

**SEPTA Request (May 24, 2016) § 121-4.B(2)(d)[5]** – Requesting a waiver of infiltration requirement. As this area is highly urbanized, is bounded on the west, south, and east by existing and proposed buildings in close proximity and the north by the Amtrak right-of-way infiltration in this area is not recommended as it may adversely impact existing building foundations and basements.

**LMT Engineer Response (June 5, 2017):** Volume control waivers supported due to the location of the other buildings in the area and desire to be protective against infiltration into the basements. (Waiver request not explicitly responded to. This response is a general response from the Township Engineer in regards to infiltration.)

**SEPTA Response (November 29, 2017):** Waiver request supported by Township Engineer. No response required.

#### **TOWNSHIP ENGINEER DESIGN COMMENTS:**

This section includes additional comments received from the Township Engineer that do not correspond to a specific waiver request from Urban Engineers. For ease of review, comments in this section have been put into numerical order corresponding to the email response received from the Township Engineer when applicable.

**LMT Engineer Comment (June 5, 2017) § 121-4.F(14)** – At a minimum, all inlet and culvert designs shall be based upon a 25 year storm. The 25 year storm shall be used for designs when carried through a pipe. It has not been documented clearly in the calculations that this requirement has been met.

**Urban Response (November 29, 2017):** The proposed stormwater management conveyance system was designed to handle the 25 year storm. The calculations have been revised to clearly state that this was the basis of design and are included with this letter.

**LMT Engineer Comment (June 5, 2017):** Township Engineer requests that Urban consider restriction of the post-development flows from the five year peak rate to that which occurred in the predevelopment condition from the one year event.

**SEPTA Response (November 29, 2017, Revised June 13, 2018):** As indicated in the stormwater management report, within both Districts the 2-yr and 1-yr post-development discharge rates have been reduced to that below the pre-development 1-yr discharge rate within their respective District, exceeding current rate control requirements. Table 3 below shows how this project exceeds current rate control requirements.

**Table 3: Discharge Summary for Districts 3-18 and A**

| District 3-18 |                                 |                    |                                 |                           |
|---------------|---------------------------------|--------------------|---------------------------------|---------------------------|
| Storm Event   | Pre-Developed (Hydrograph # 16) | Required Discharge | Post-Developed (Hydrograph #36) | Rate Below Required (CFS) |
| 1-year        | 5.009                           | 5.009              | 3.683                           | 1.33                      |
| 2-year        | 5.883                           | 5.883              | 4.241                           | 1.64                      |
| 5-year        | 8.056                           | 8.056              | 5.631                           | 2.43                      |
| District A    |                                 |                    |                                 |                           |
| Storm Event   | Pre-Developed (Hydrograph # 22) | Required Discharge | Post-Developed (Hydrograph #50) | Rate Below Required (CFS) |
| 1-year        | 2.550                           | 2.550              | 2.054                           | 0.496                     |
| 2-year        | 2.987                           | 2.550              | 2.313                           | 0.237                     |
| 5-year        | 4.071                           | 2.987              | 2.938                           | 0.049                     |

**LMT Engineer Comment (June 5, 2017)** § 121-4.E(4)(a) – A description of how each undedicated permanent stormwater control and BMP will be operated and maintained shall be submitted by the design professional. In addition the plans should include the following information:

- The frequency of any required inspection.
- The identity and contact information associated with the person(s) responsible for operation and maintenance.
- A statement signed by the owner of the property acknowledging that the stormwater controls and BMP's are fixtures that can be altered or removed only after approval by the Township.

**SEPTA Response (November 29, 2017):** An Operation and Maintenance plan will be presented for review and approval by the Township following resolution of the waiver discussion here-in.

**LMT Comment (June 5, 2017):** The plan shall be presented in recordable form to the Township as a covenant running with the land, shall be approved by the Township Solicitor, and shall be recorded in the Office for the Recording of Deeds of Montgomery, County.

**SEPTA Response (November 29, 2017):** The plan will be presented for review and approval by the Township Solicitor, and will be in a recordable form.

If you have any questions regarding the waivers listed above, please contact me at 215-922-8081 ext 1222 or at [mjthomas@urbanengineers.com](mailto:mjthomas@urbanengineers.com).

Very truly yours,  
URBAN ENGINEERS, INC.



Mike Thomas, PE  
Senior Project Manager

Cc: Alex Coll (SEPTA)  
Angela Murray (LMT)  
A. Scott, PE (Urban)  
C. Gubeno, PE (Urban)

Attached: 2017-06-05 Township Email