# PROJECT NARRATIVE & ALTERNATIVE SEWAGE FACILITIES ANALYSIS

# SOUTHSIDE HOMES BY SMART LIVING

**CITY OF ALLENTOWN**
**LEHIGH COUNTY, PENNSYLVANIA**

**MARCH 30, 2018**

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**Hanover Project 4498(A)**

**Southside Homes by Smart Living**

**Project Narrative & Alternative Sewage Facilities Analysis**

**PADEP Sewage Facilities Planning Module**

**Component 3: Sections F & H**

The intent of the Southside Homes Subdivision and Land Development Project is to subdivide several properties within the South Fourth and Barber Streets within the City of Allentown, for the purpose of constructing a 53 unit (max density) Townhouse/Duplex Community. The total area of the project is approximately 4.5 acres. Existing rights of way are to be improved to current City standards, and new roadways constructed to be dedicated to the City of Allentown.

The site currently contains three (3) existing structures, one (1) of which is a previous "fruit stand" with a public sewer connection. The parent tracts also contain two (2) residential dwellings that utilize on-lot systems for sewage disposal.

Exact sewage flows from the existing fruit stand, when in operation are not available at this time, however for the purposes of this study have been estimated at 1 equivalent dwelling unit (EDU).

The development is bordered to the south by multi-family residential properties, and a single family residential property, and to the north by property owned and maintained by the City of Allentown and Allentown Commercial and Industrial Development Authority.

The proposed development currently consists of 51 townhome units, and 2 "duplex" units and associated improvements (sidewalks, roadways, etc.). For planning purposes, we are requesting 53 EDU's of allocation. The project will be developed as a "by-right" use in accordance with the City of Allentown Zoning Ordinance. **This Zoning District allows for 1800 square foot lots, which far exceeds recommended densities for on-lot disposal. Therefore, connection to the City of Allentown collection and treatment system is the selected alternative for the project. Existing and proposed flows are as follows:**

| **Proposed Development** | **EDUs** |
|---|---|
| 51 Townhomes | 51 |
| 2 Duplex Units ("Two-family Dwelling") | 2 |
| | **Total: 53 EDUs** |

| **Previous Development** | |
|---|---|
| One (1) Commercial Structure | 1 |
| | **Total: 1 EDUs** |

**NET INCREASE: 52 EDUs (20,800 gpd)**

**TOTAL FLOW : 53 EDUS (21,200 gpd)**
**Note: 1 EDU = 400 gal/day**

The project site is located within District 19 of the City of Allentown Collection System. Sanitary sewer flows from this District are conveyed to the City of Allentown Wastewater Treatment Plant (WWTP) via the Little Lehigh Creek #1 Interceptor, and are part of the Little Lehigh Creek Network, as defined in the "**City of Allentown Master Sewer Plan – April 1977**" (MSP). Excerpts from this plan have been attached to this narrative.

The development is within the previously approved "Sewer Service Area". Typically in scenarios such as this, a planning module exemption would be requested for the project. However, since the City of Allentown does not possess an approved Act 537 Plan at the present time, the Pennsylvania Department of Environmental Protection (PADEP) has requested that a completed sewage facilities planning module be prepared for the project. The Lehigh County Authority (LCA) is currently developing the City's Act537 Plan and is now responsible for operation and maintenance of the water and sewer facilities within the City.

Based upon this request we have discussed the project with the City's Engineering Department and the LCA, as well as reviewed available data related to the conveyance and treatment capabilities of the existing infrastructure surrounding the project.

As indicated on the attached documents, the project site is located within an area initially proposed for public sewer service at the inception of the MSP. This disposal method is anticipated to remain identical within the Act 537 Plan currently under development by the LCA. The land use of the surrounding area is a mix of commercial and residential properties, all of which are served by the city's collection system.

Additionally, the City of Allentown WWTP (NPDES #PA-0026000) is currently permitted for a capacity of 40 million gallons per day (MGD). The average reported flows for the WWTP during 2016 were approximately 30 MGD, well below the plant's capacity.

Based upon the above information, local Zoning, and previous land use history, the most reasonable alternative of sanitary sewer disposal for the proposed Southside Homes Project is connection to the existing City of Allentown collection and treatment system.

City of Allentown

# Master Sewer Plan

Allentown City Planning Commission

# CITY OF ALLENTOWN
# MASTER SEWER PLAN

**APRIL 1977**

THE PREPARATION OF THIS PUBLICATION WAS FINANCED IN PART THROUGH A COMPREHENSIVE PLANNING GRANT FROM THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, UNDER THE PROVISIONS OF SECTION '701' OF THE HOUSING ACT OF 1954, AS AMENDED, AND AS ADMINISTERED BY THE BUREAU OF PLANNING, PENNSYLVANIA DEPARTMENT OF COMMUNITY AFFAIRS.

**ALLENTOWN · CITY · PLANNING · COMMISSION**

TABLE 5

LINE CAPACITIES

(Gallons/day)

| DISTRICT | Design Capacity (cfs) | Design Capacity (gal/day) | Average Capacity (gal/day) |
|---|---|---|---|
| 1 | 23.5 | 15,188,050 | 6,075,220 |
| 2 | 28.0 | 18,096,400 | 7,238,560 |
| 3 | 33.2 | 21,457,160 | 8,582,864 |
| 4 | 15.5 | 10,017,650 | 4,007,060 |
| 5 | 15.0 | 9,694,500 | 3,877,800 |
| 6 | 36.5 | 23,589,950 | 9,435,980 |
| 7 | 43.5 | 28,114,050 | 11,245,620 |
| 8 | 7.0 | 4,524,100 | 1,809,640 |
| 9 | 18.5 | 11,956,550 | 4,782,620 |
| 10 | 15.5 | 10,017,650 | 4,007,060 |
| 11 | 17.5 | 11,310,250 | 4,524,100 |
| 12 | 22.5 | 14,541,750 | 5,816,700 |
| 13 | 9.2 | 5,934,960 | 2,378,384 |
| 14 | 11.3 | 7,303,190 | 2,921,276 |
| 15 | 11.0 | 7,109,300 | 2,843,720 |
| 16 | 13.0 | 8,401,900 | 3,360,760 |
| 17 | 22.0 | 14,218,600 | 5,687,440 |
| 18 | 15.5 | 10,017,650 | 4,007,060 |
| 19 | 26.5 | 17,126,950 | 6,850,780 |

With the existing flows tabulated and line capacities calculated, it is now possible to deduce the remaining capacities of each line to determine the degree to which sewer service can be extended. Even though we will only be interested in seeing the remaining capacity with respect to the average capacity the remaining 'design' capacity will also be presented in Table 6 so as to provide an overall view of the existing situation.

TABLE 6

REMAINING CAPACITY

(Gallons/day)

| District | Cumulative Flow | Remaining 'Design' Capacity | Remaining 'Average Capacity |
|---|---|---|---|
| 1 | 372,329 | 14,815,721 | 5,702,891 |
| 2 | 1,264,288 | 16,832,112 | 5,974,272 |
| 3 | 2,357,250 | 19,099,910 | 6,225,614 |
| 4 | 3,949,131 | 6,068,519 | 57,929 |
| 5 | 1,254,488 | 8,440,012 | 2,623,312 |
| 6 | 4,984,098 | 18,605,861 | 4,451,891 |
| 7 | 8,562,668 | 19,461,382 | 2,592,952 |
| 8 | 308,741 | 4,215,359 | 1,500,899 |
| 9 | 1,908,193 | 10,147,357 | 2,973,427 |
| 10 | 1,649,781 | 8,367,869 | 2,357,279 |
| 11 | 4,199,183 | 7,111,067 | 324,917 |
| 12 | 2,396,974 | 12,144,776 | 3,419,726 |
| 13 | 718,694 | 5,227,266 | 1,659,690 |
| 14 | 203,859 | 7,099,331 | 2,717,417 |
| 15 | 1,351,597 | 5,757,703 | 1,492,123 |
| 16 | 1,851,782 | 6,550,118 | 1,508,978 |
| 17 | 4,749,650 | 9,468,950 | 937,790 |
| 18 | 8,167,883 | 1,849,767 | -4,160,823 |
| 19 | 9,010,074 | 8,116,876 | -2,159,294 |

As can be seen, districts 18 and 19 are substantially over the average capacity with only the existing flows included. This type of information is most valuable when analyzing the current situations, and will be the

*Jordan Creek System*

Presently, the Jordan Creek System discharges a total flow of 8,652,688 gals/day plus another 3,949,131 gals/day emanating from the Front Street interceptor, District 4 (Note: Flows from district 4 are not included in the "cumulative" flows for this system since the point of discharge into the Jordan Creek line is far enough downstream so as not to have any implications on the rest of the system, See Map 5). Again, due to the size and structural make-up of the lines in this system, there are no problems relative to line capacity.

This particular system is unique in the fact that the entire area is located in the delineated service area. That is, the only remaining developable areas are those completely surrounded by the existing system and would pose no serious problems if these areas were developed and provided sewerage. These additional areas include area for approximately seven (7) single family residences and some industry in District 5, and the Little Lehigh area in District 7 which was discussed under "proposed" flows. With a total projected flow of 46,606 gals/day then, it is recommended the entire area serviced by the Jordan Creek system be included in the final plan as existing in the current service area with no extensions of the system required.

*Little Lehigh Creek System*

The Little Lehigh Creek System differs from the other systems discussed due to the problems already existing within the area. The area as a whole (which

encompasses the West End of Allentown, parts of Center City, and transmits much of the flow from outlying municipalities) has a total discharge of 9,010,074 gals/day which places districts 18 and 19 over capacity by 4,160,823 and 2,159,294 gals/day respectively. Coupled with a projected flow of 265,020 gals/day, the amount over capacity is increased proportionately, although still not placing any of the other districts over capacity. Surely, some form of relief is necessary.

As stated previously, much of the flow, 60 percent or 5,439,062 gals/day, which this system carries originates from the outlying municipalities - Emmaus, Salisbury, Lehigh County Authority - in the area. This fact has been noticed by City and Lehigh County officials and relief seems to be on the way in the form of a relief main located in District 17 along the Little Lehigh Creek Collector in Lehigh Parkway. Located in this position, the line should relieve the collector of approximately 4.7 mgd - the equivalent of the total discharge by Lehigh County Authority, Emmaus, and some of Salisbury's total discharge - although it will have a capacity of 10 mgd. Specifically, the Little Lehigh System is broken down as follows:

TABLE 13 - EXISTING LITTLE LEHIGH SYSTEM CONDITIONS

| DISTRICT | INDIVIDUAL FLOW | "NON-CITY" FLOW | TOTAL PLUS COMMITTED | CUMULATIVE TOTAL |
|---|---|---|---|---|
| 13 | 42,252 | 676,442 | 748,346 | 748,346 |
| 14 | 203,859 | 00 | 203,859 | 203,859 |
| 15 | 272,724 | 156,320 | 429,044 | 1,381,248 |
| 16 | 465,685 | 34,500 | 500,185 | 1,881,434 |
| 17 | 177,850 | 4,571,800 | 4,749,650 | 4,749,650 |
| 18 | 1,566,451 | 00 | 1,568,635 | 8,199,719 |
| 19 | 842,191 | 00 | 842,191 | 9,041,910 |

Note: The dotted line represents the cut-off point with respect to the districts the relief line will have an effect on district 17, 18 and 19.

As can be seen then, with the location of the main being downstream of the majority of the discharge into the Little Lehigh Creek Collector (17) , a total flow of 4,749,650 gals/day could be diverted before reaching district 18 and 19. The result would be the following:

TABLE 14

LITTLE LEHIGH SYSTEM AFTER RELIEF LINE

| DISTRICT | CUMULATIVE FLOW (Before Relief) | CUMULATIVE FLOW (After Relief) | AVERAGE CAPACITY | REMAINING CAPACITY |
|---|---|---|---|---|
| 17 | 4,749,650 | 00 | 5,687,440 | 5,687,440 |
| 18 | 8,199,719 | 3,450,069 | 4,007,060 | 556,991 |
| 19 | 9,041,910 | 4,292,260 | 6,850,780 | 2,558,610 |

As exhibited in Table 14, this relief line would have a dramatic effect on the capabilities of the interceptor lines in District 18 and 19. While these figures are at best only estimates of the total impact, it is safe to assume the value of such a line and its subsequent favorable impacts on the remaining lines downstream.

Projections for the area serviced by the Little Lehigh Creek Systems include large tracts of vacant, developable land in northwest Allentown as well as smaller lots already serviced. The total projected flow then is 265,020 gals/day with

9,240 gals/day emanating from those locations in the service area in Districts 14 and 15.

The solution to the problem in this area then, is the proposed Lehigh County relief interceptor which, at last report, should be operable by late 1979, or early 1980. It is therefore recommended, contingent upon the successful completion of this relief line, that the areas delineated on the accompanying map be included in the Final Plan as sewerable in the five to ten year period or 1982 - 1987. Again, this recommendation is based on the completion of the relief line as scheduled, and if, in fact, the projected figures used for this study hold true until this time period.

*Trout Creek System*

The Trout Creek Sewer System serves exclusively south Allentown and exhibits a total discharge of 4,432,619 gals/day including 233,436 gals/day of committed flows. As indicated previously on Table 8, with the committed flows included, a remaining capacity of only 91,481 gals/day exists in District 11, the final line in the Trout Creek System. An increase of 238,360 gals/day is projected for the area, not including another 60,480 gals/day in District 8 which, however, will not be included in the accumulated flow since the point of discharge is far enough downstream as was the case of the Front Street interceptor in the Jordan Creek System. It should be pointed out however, that the existing flow of District 8 has been included in the overall flow due to the magnitude of the flow which is 308,741 gals/day.