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MONTGOMERY COUNTY

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LOWM 132120

MEMORANDUM

TO: Ernie B. McNeely, Township Manager

FROM: Edward P. Pluciennik, PE, LEED AP, Township Engineer
Robert M. Campbell, PE, Senior Engineer *RMC /*

DATE: January 20, 2016

SUBJECT: Villanova University Campus Development
Sanitary Sewer Capacity Study

As requested, we have reviewed the request for sewer service by Radnor Township in conjunction with planned development at Villanova University and are herewith providing our findings and recommendations.

By way of background, Villanova University is planning to construct additional facilities on their campus in Radnor Township. In order to provide sanitary sewer service for the new facility, Villanova and Radnor Township have requested an increase in their sanitary sewer capacity allocation from Lower Merion Township. It is proposed to redirect sewage from existing facilities that currently discharge wastewater to the Radnor Township sanitary sewer system, which is currently near capacity, to the Lower Merion Township system. Sewage from the new facility could then be accommodated in the Radnor Township system.

Villanova University performed a flow study of the campus system in March and April 2015 to determine actual sewage flow rates required to be redirected to Lower Merion Township. A summary report prepared by Associated Engineering Consultants, Inc., dated May 7, 2015, indicates an average daily flow rate of 110,000 gallons per day (GPD). The peak flow rate observed during the monitoring period was 166 gallons per minute (GPM) (240,000 GPD). In order to accommodate the peak flow, Radnor Township needs an additional 600 EDUs of capacity (240,000 GPD / 400 GPD/EDU) in the Lower Merion Township system.

To accommodate the increase in sewage flow, Lower Merion had requested the Villanova study connecting the Lower Merion Sanitary Sewer System via a new connection at Clairemont Road which would convey flows to Gulph Creek Pump Station; through the Mill Creek Interceptor, to the Mill Creek Pump Station, and then to the City of Philadelphia for treatment. This study was requested because at that time, Lower Merion was unsure that the additional flow could be supported by the existing connection at North Ithan Avenue.

We reviewed a second option using the existing connection at North Ithan Avenue, which conveys sewage through an 8-inch main along Curwen Road, across Rosemont College, where the size increases to 10-inch and subsequently to the 18-inch Mill Creek Interceptor. In the past, this option was not available due to a heavily corroded cast iron pipe that has since been cleaned and lined.

We performed flow monitoring to determine the sanitary sewer capacity at the proposed connections and conveyance system. Five gravity flow meters were installed on October 8, 2015 and monitored flow until November 23, 2015. One meter split time between two locations. In addition, to obtain sewage flow data along the North Ithan Avenue connection path, one meter was installed from December 4, 2015 to December 15, 2015.

As a result of our investigation and analysis, we conclude the following:

OPTION 1: Clairemont Road - The Clairemont Road connection conveys sewage to Lower Merion's Gulph Creek pump station. The collection system appears to have adequate capacity to accommodate the additional flow; however, the collection system conveys sewage to the Gulph Creek Pump Station, which is nearing its operating capacity. The pump station would not be able to handle the additional 600 EDUs proposed from Villanova without improvements.

It appears that the pump station wet well and force main are of adequate size to accommodate the additional Villanova flow; however, the pumps and electrical system are not. While the pump station is scheduled to undergo mechanical and electrical refurbishment in the next 5 years, capacity improvements are not planned. We estimate that the total cost to upgrade the pump station to accommodate the proposed Villanova flow is in the $500,000 to $600,000 range, including design and permitting.

OPTION 2: North Ithan Avenue - The limiting section of the conveyance system is on the 8-inch sewer along Curwen Road. The calculated capacity in the main is 265 GPM (382,000 GPD), This is based on a theoretical hydraulic capacity of 75% of full capacity consistent with PaDEP guidance. The current peak metered flow through the 8-inch main is 70 GPM (100,000 GPD). If the additional 166 GPM from Villanova is directed to this connection, the remaining capacity would be 30 GPM or roughly 105 EDUs.

The existing collection system is mostly built-out and we do not anticipate significant growth in this area in the future.

Option 1 requires the construction of a pipe in Clairemont Road to connect Villanova to the Lower Merion system along with significant capacity upgrades to the Gulph Creek Pump Station. Heavy maintenance / refurbishment improvements not related to capacity are planned over the next 5 years. The increased flow would cause additional required maintenance on the station. Also, the sewage would be routed through two pumping stations rather than one when compared with Option 2.

Option 2: Since the existing system has adequate capacity to accommodate the proposed additional flow from Villanova at the North Ithan Avenue connection, no improvements to the Lower Merion system are required. However, the available reserve capacity in the area would be reduced from 705 EDUs to 105 EDUs.

Therefore, we recommend Option 2, the use of the existing North Ithan Avenue connection point, contingent upon the reduction of reserve being acceptable, and the other issues of concern with the existing agreement being resolved to the Board's satisfaction.

We trust that this memorandum adequately addresses this matter. As always, please do not hesitate to contact me at 215-796-0003 or at EPluciennik@Pennoni.com, if you have any questions or require additional information.

cc: Robert E. Duncan, Assistant Township Manager
Donald K. Cannon, Director of Public Works
Joseph Danisi, Sanitary Sewer Superintendent
Chris Leswing, Assistant Director of Building and Planning
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