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PENNSTATE.



# Penn State University Water Reuse System

Act 537 Special Study  
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## Project Information

The Pennsylvania State University is undergoing master planning efforts for a water reuse system at its University Park campus. Currently, the University also owns and operates its wastewater treatment plant (WWTP), which treats wastewater generated on the campus and a small portion of wastewater from State College Borough. The facility currently produces Class C reuse effluent that is land applied at the University's Living Filter spray fields. In the next several years, the University is planning to upgrade its WWTP to treat wastewater to Class A reuse standards. In addition, a distribution system is being installed in order to convey reuse water to the various end users within the University.

The University intends to gradually install the reuse water distribution system in conjunction with other utility projects on campus. By doing so, when reuse water becomes available after upgrades to the WWTP, the distribution system will already be in place and ready to use. Before the system is used, however, the pipes will remain disconnected and sealed.

The majority of the Pennsylvania State University campus consists of approximately 1,600 acres in College Township, but there are several other large parcels owned by the University that are adjacent to this parcel in neighboring municipalities. The reuse water system itself will be located within parts of College Township, Ferguson Township, and State College Borough. Less than 10 acres are anticipated to be disturbed for the completion of this reuse system.

The reuse water system will be installed throughout the University Park campus, entirely within previously disturbed areas, and primarily within existing utility corridors. Some of the piping has already been installed in recent years in conjunction with other projects. The University is requesting retroactive approval of the piping already installed, as well as the future piping that is intended to be installed.

## Client (Municipality) Information

The reuse water distribution system will be owned and operated by the Pennsylvania State University. The University currently owns and operates its own water treatment plant (WTP) and wastewater treatment plant (WWTP). It also owns and operates its water distribution system and its wastewater collection system.

## Site Information

The reuse water distribution system will serve the Pennsylvania State University's University Park Campus, which is located in State College, Pennsylvania. As a result, the distribution piping will be installed entirely within the University Park campus with the work taking place within the areas shown in Figure 1.

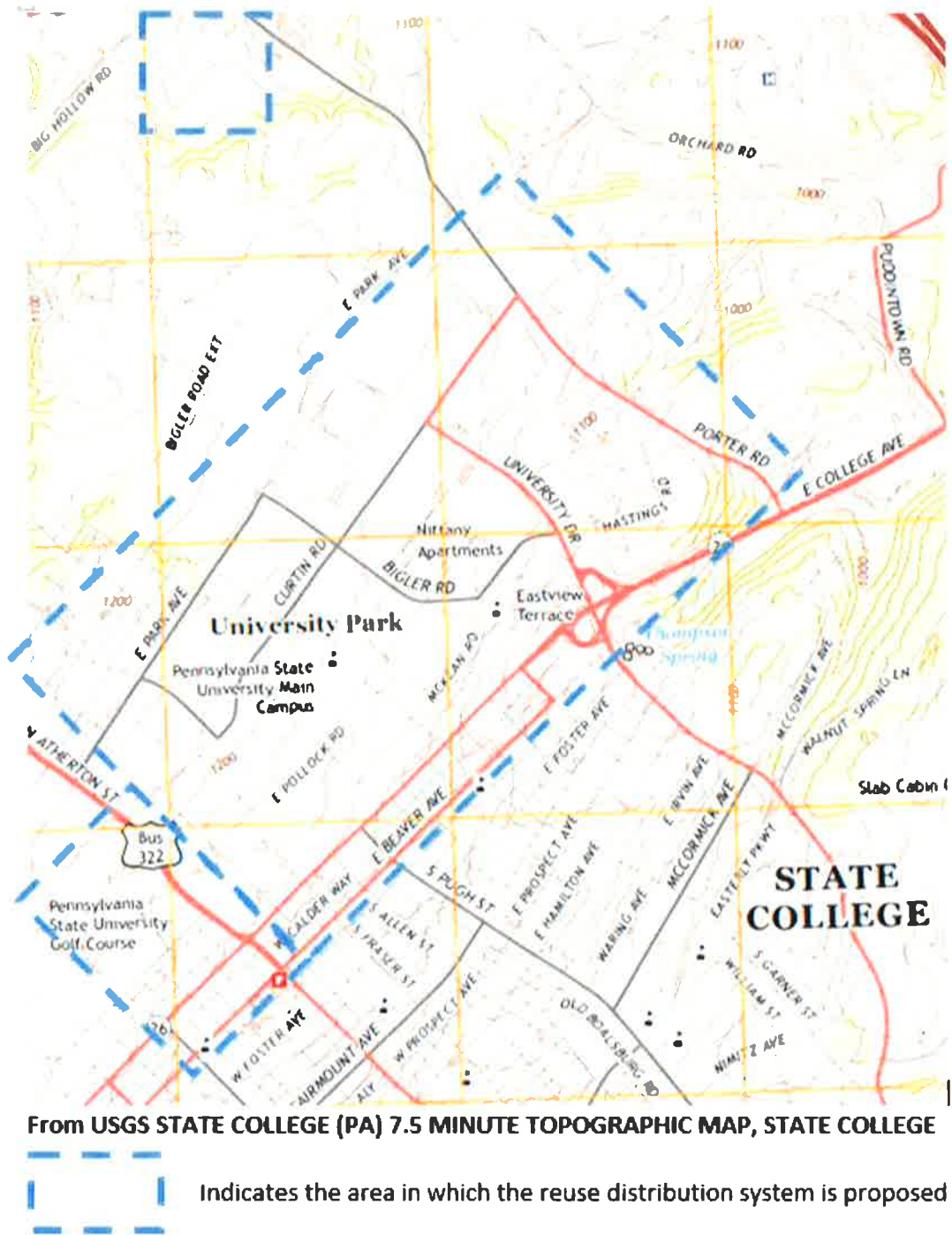


Figure 1. Reuse Distribution System Topographic Map

## **Project Consultant Information**

The Pennsylvania State University hired Hazen and Sawyer to complete a Water Reuse Study Update (Study). After the Study was complete, Hazen and Sawyer was also asked to assist the University in producing an Act 537 Special Study for the water reuse system.

## **Availability of Drinking Water Supply**

The reuse water distribution system will not require any additional demand from the University's WTP. However, the implementation of a reuse water system does have the potential to decrease the demand from the WTP as some of the current demands can be served by reuse water. The University's WTP is aware of this potential impact, and a letter from the University stating its awareness of the possible impacts has been attached as Appendix C to this report.

## **Project Narrative**

The Pennsylvania State University Water Reuse System project is focused on the installation of a water reuse distribution system at the University Park campus. Ultimately, it is the goal of Penn State University to produce its own Class A reuse water from its WWTP to distribute to various end users throughout campus. Additional information about the project can be found in Water Reuse Study Master Plan Update, which has been attached to this report as Appendix A. This report focused on the following four major aspects of implementing a water reuse system for Pennsylvania State University: a reuse water demand evaluation, the identification of implementation issues, a reuse water distribution/storage evaluation, and a summary of recommendations.

As stated in the Water Reuse Study, it is estimated that there is a current demand of 310,000 gallons per day for reuse water on campus, and a twenty-year future demand of 740,000 gallons per day. The reuse demand will be met by the University's WWTP, with raw water backup to supplement the reuse water on days of peak demands. The reuse distribution system will connect the University's existing Living Filter force main, which is already fed by the WWTP. These connections will include pressure reducing valves (PRVs) and chlorination stations to provide a disinfection residual and help maintain satisfactory water quality throughout the system.

## **Sewage Disposal Needs Identification**

This project will not have any impact on the sewage disposal needs, other than the upgrades to the WWTP to produce Class A reuse water. The University's existing WWTP is not expected to have an increase in the amount of wastewater. Any anticipated water quality impacts have been discussed in both the Water Reuse Study Update (see Salt Balance Model) in Appendix A and the Water Quality Report in Appendix B.

## Existing Wastewater Facilities

All of the existing facilities—the WTP, WWTP, and collection and distribution systems—are owned and operated by Pennsylvania State University.

## Proposed Wastewater Facilities

The proposed facilities for this project can be found in the Water Reuse Study (Appendix A).

- **Plot Plan:** A reuse map, which shows the location of the proposed reuse water lines for the reuse water distribution system can be found in the Water Reuse Study.
- **Wetlands Protection:** There are no wetlands within the project area.
- **Primary Agricultural Land Protection:** An NRCS Soil Survey can be found in Appendix D. The soil survey area shows the overall area in which the project will occur rather than the proposed pipe pathways. The results of the soil survey indicate that some areas have been designated as prime farmlands. However, all proposed reuse water lines are located in areas that have been previously disturbed, and the majority will be installed in existing utility corridors. The PHMC review also concluded that the reuse water lines will be located entirely within previously disturbed areas. Therefore, there should be no interference with prime farmland.
- **Stormwater Management Impacts:** There are no conflicts between the proposed plan and the existing Spring Creek Act 167 Stormwater Management Plan. Installation of the reuse water distribution system will follow the regulations and guidelines established by the Centre County Conservation District, and detailed plans will be submitted for approval by the Conservation District as appropriate.

The University is very familiar with and sensitive to the impacts of their activities on stormwater quality, since they have been land applying reuse water at the Living Filter for decades. Similar practices used at the Living Filter to protect stormwater quality will be applied to other reuse water applications (particularly irrigation) as appropriate.

- **PNDI Consistency:** A PNDI review was completed and can be found in Appendix E. There are no issues foreseen with this proposed project.
- **Comprehensive Plan Consistency:** The proposed reuse water distribution system is consistent with municipal comprehensive plans.
- **PHMC Coordination:** A Cultural Resource Notice was submitted to PHMC and there are no concerns with the proposed project. The submittal and PHMC's response can be found in Appendix F.
- **Additional Requirements for PENNVEST:** This project is being funded privately by the University.

## **Alternatives Analysis**

There is no alternative analysis for this project.

## **Chapter 94 Report Consistency**

As mentioned earlier, there will be no impact from this project on the flows to the University's WWTP. Potential water quality impacts are discussed in both the Water Reuse Study (see Salt Balance Model) in Appendix A and the Water Quality Report in Appendix B.

## **Institutional Evaluation**

The Pennsylvania State University will own and operate the proposed reuse water distribution system as it also owns operates its wastewater collection systems and potable water distribution systems. The University will construct portions of the reuse water distribution itself, but may also bid out the work to contractors. The University will also obtain the necessary permits.

## **Project Cost and Funding Analysis**

A cost estimate of the reuse water system can be found in the Water Reuse Study (Appendix A). The project will be funded privately by the University.

## **Project Implementation Schedule**

As there is no required date for the University to have its water reuse system in place, the University does not have a defined project implementation schedule. To date, the reuse water pipe has been installed in conjunction with other construction projects, and the University intends to continue with this approach to minimize construction impacts to the community.

## **Public Notification Requirement**

The public notification and proof of public notification have been attached to this report as Appendix G.

## **Additional Project Specific Planning Elements**

There are no additional planning elements to this project.

## **Planning Agency Reviews**

The planning agency reviews have been attached to this report as Appendices H through K.



## **Resolution of Adoption**

Resolutions of adoption were provided to the necessary municipalities. The original signed and sealed resolutions are attached.