

**Report on Detailed Plans and Specifications for
Village of Crooksville Lift Stations B1 & B6 Replacement
PTI No. 1627752
May 2024**

On March 4, 2024, Ohio EPA received a Permit to Install (PTI) application, detailed engineering plans, and construction specifications for the Village of Crooksville's *Lift Stations B1 & B6 Replacement* project. The objective of the proposed project is to replace two lift stations nearing the end of their useful life that are critical to the operation of the Village's wastewater collection system. Crooksville has requested financing for this project through the Ohio EPA Water Pollution Control Loan Fund (WPCLF).

The PTI application, detailed plans, and specifications were prepared by Verdantas of Newark, Ohio.

Background

Crooksville uses a septic tank effluent pump (STEP) system to collect its wastewater. Individual on-site septic tanks are equipped with low-flow, high-head effluent pumps that convey the wastewater to larger lift stations throughout the Village. The collected wastewater is then pumped to the Village of Roseville for treatment.

In addition to replacing the two severely corroded lift stations, Crooksville is proposing to change their sequence of operation. Currently, Lift Station B1 pumps to Lift Station B6 where flow combines with wastewater from the Mohican Drive area. Lift Station B6 then pumps all flow to the Roseville wastewater system. With the Village's proposed improvements, the capacity of Lift Station B1 will be increased and B1 will pump directly to Roseville. The capacity of Lift Station B6 will be decreased, and B6 will serve only the Mohican Drive area. The project also will include several new segments of force main and gravity sanitary sewer to implement the change in operating sequence for Lift Stations B1 and B6.

Antidegradation Review

Crooksville's proposed project will not result in an increase in pollutant loadings discharged to the waters of the State of Ohio. No pipelines will cross or run parallel to streams. Sediment and erosion controls will be used during the construction to minimize run-off from construction-related activities. Areas disturbed by the project will be stabilized and restored after the construction. Therefore, the project is not subject to antidegradation review by Ohio EPA under OAC 3745-1-05.

New Lift Stations and Force Mains

Lift Station B1 is located on the north side of East Main Street west of Sycamore Street, and B6 is at the northeast corner of State Street and Mohican Drive. The replacement lift stations will be constructed adjacent to the existing systems. A new 10-inch force main will connect the replacement B1 lift station to the existing 10-inch force main running to Roseville, and a new 4-inch force main will connect the replacement B6 lift station to the same existing force main.

The two replacement lift stations will use submersible pumps installed in HDPE wet wells conforming to ASTM F1759 and ASTM D3350. The wet well for new Lift Station B1 will be 11.2 feet in diameter and 33 feet deep. The 5.5-foot diameter wet well for new Lift Station B6 will be 16 feet deep. The wet wells will be constructed with concrete anti-floatation collars. The valves and magnetic flow meters for the lift stations will be housed in HDPE chambers installed with concrete anti-floatation collars. Aluminum hatches will provide access to the wet wells and valve chambers.

The wet wells will be equipped with stainless steel guide rails and lift cables for pump removal, and the lift station specifications include pump crane hoists and sockets. Radar sensors will be used for level control with float switches as backup. The new lift stations will be equipped with audio and visual alarms and telemetry for operating and alarm conditions. The control panels will be NEMA 4X. Emergency power at the lift stations will be provided by permanent generators with automatic transfer switches. The generator at Lift Station B1 will be rated at 350 kW, and the B6 generator will have a rating of 100 kW. The lift station sites will be secured with 6-foot chain link fencing with barbed wire and vehicle gates.

The table below lists additional design information for the new lift stations.

Design Parameter	Lift Station B1	Lift Station B6
Number of Pumps	3 (2 duty, 1 standby)	2 (1 duty, 1 standby)
Type of Pump	Non-clog submersible	Non-clog submersible
Design Capacity, Head Loss	700 gpm @ 260 ft TDH	200 gpm @ 75 TDH
Discharge Opening Diameter	4 inch	3 inch
Motors	114 HP, variable speed	15.5 HP, variable speed
Electrical Requirements	460 volt, 3 phase	460 volt, 3 phase

TDH = Total dynamic head

The new segment of force main that will enable Lift Station B1 to pump to Roseville will be installed by horizontal directional drilling within the State Street right of way from South Delaware Drive to the existing force main near new Lift Station B6. A new force main will connect Lift Station B6 to the existing force main that transports wastewater to Roseville. Design information for the force mains is provided below.

Design Parameter	Lift Station B1 Force Main	Lift Station B6 Force Main
Pipe Diameter, Length	10 inch, 488 feet	4 inch, 120 feet

Pipe Material	PVC	PVC
Material Specification	AWWA C900	AWWA C900
Joint Specification	ASTM D3139	ASTM D3139
Bedding and Initial Backfill	HDD	ASTM D2321

New Gravity Sanitary Sewers

Crooksville’s project will include several new segments of gravity sanitary sewer to enable the change in the operating sequence of Lift Stations B1 and B6. The table below lists design information for the sewers.

Design Parameter	Proposed Design
Pipe Diameter, Total Length, Minimum Slope	12 inch, 220 feet, 0.22%
Pipe Material	PVC
Material Specification	ASTM D3034
Joint Specification	ASTM D3212
Bedding and Initial Backfill	ASTM D2321
Number of Manholes	4
Maximum Manhole Spacing	87 feet
Manhole Material Specification	Precast Concrete, ASTM C478
Manhole Joint Specification	ASTM C443

The new sewers will be tested for leaks using the low-pressure air method. Vacuum testing of the new manholes will be performed. Deflection testing of the completed sanitary sewers will be conducted at least 30 days after the final backfill has been placed over the pipe.

Construction Cost and Construction Schedule

The estimated construction cost for Crooksville’s proposed project is \$2,000,000. The expected construction period is 9 months.

Conclusions and Recommendations

The detailed plans and specifications for the project described above appear to be technically acceptable and in compliance with State rules. It is hereby recommended that these documents

be approved and a Permit to Install be issued. This is an approval of technical aspects of the plans and specifications and does not imply an approval for a WPCLF loan.

Reviewed by:

Dennis DeNiro, P.E.
Project Engineer
Division of Environmental
and Financial Assistance

Approved by:

A handwritten signature in black ink, appearing to read 'R. Laake', with a long horizontal flourish extending to the right.

Ryan Laake, P.E.
Engineering Unit Supervisor
Division of Environmental
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