

## 8.1 SELECTED ALTERNATIVE(S)

### 8.1.1 Selected Wastewater Treatment Alternative

As discussed throughout this 537 Plan, the primary reasons for upgrades to the Shinglehouse Borough WWTP is to replace aged and deteriorated equipment, most of which is over 50 years old and to provide a treatment process with the flexibility to meet more stringent water quality parameters in the future, if necessary.

Based upon the alternatives evaluated for wastewater treatment the Selected Alternative is Alternative 2a – MLE Process New Oxidation Ditch

Alternative 2, Option A, provides with the lowest capital cost and with the second lowest operation and maintenance cost ranking it No.1 with the lowest present worth. This alternative integrates the secondary clarifier as part of its process configuration potentially presenting a hydraulic challenge during the design and construction phases of the project. Provision of new final clarifier(s) should be considered during preliminary design of the WWTP Upgrade Project.

Some advantages of this technology are:

- Lower Capital Cost
- Simple operation and maintenance
- Mature Technology with good track record
- Control system to minimize required operator attention to process
- Easy adapted for future nutrient reduction measures, if necessary

To implement an alternative the following facilities would need to be constructed, modified, or abandoned:

1. Provision of a Raw Wastewater Influent Screen
2. Replacement of existing raw sewage pumps
3. Replacement of existing level control instrumentation
4. New Grit Removal System
5. Elimination of the existing Primary Clarifier
6. Elimination of the existing Trickling Filters
7. Inclusion of the Secondary Clarifier. The following upgrades will be included:
  - a. Replacement of the existing rake mechanism in kind
  - b. Replacement of the existing secondary sludge pump
8. New Oxidation Ditch (MLE) System
9. Inclusion of existing Chlorine Disinfection System with rehabilitation of the baffle and tank walls.
10. Inclusion of existing Effluent Pump Station. The following upgrades will be included:
  - a. Replacement of existing effluent pumps
  - b. Replacement of existing level control instrumentation
11. Inclusion of existing Aerobic Digesters
12. Use of existing chemical feed system with minor improvements

This alternative would address the deficiencies associated with the existing WWTP and provide the

Borough with flexibility to meet nutrient reduction goals with minor capital investment, if required in the future.

### **8.1.2 Sewage Management Program**

As previously stated, the Borough has proposed to adopt and implement an On-lot Sewage Management Ordinance as a method to prevent malfunction of OLDS within the un-sewered areas of the Borough.

## **8.2 CAPITAL FINANCING PLAN FOR SELECTED STRUCTURAL ALTERNATIVE(S)**

The estimated project cost for the selected alternative, Alternative 2A – MLE/Oxidation Ditch is \$2,795,000.

To complete this plant upgrade while maintaining a reasonable user rate, a financing plan consisting of substantial up-front revenue and a low interest financing source will be required. Upon final alternative selection and prior to preliminary design, a detailed financial and funding analysis should be undertaken to examine all funding and financing options available in detail. Funding scenarios studied should include (1) grant monies, and other potential capital contributions to offset the capital costs of the project; (2) the ability to combine debt service and operation and maintenance costs into a reasonable rate structure, and (3) combinations of funding options.

Considering obtaining a \$979,000 grant through the Community Development Block Grant (CDBG) Program, the Borough would need to finance approximately \$1,816,000. Due to the average income level of the planning area, the Borough is fully grant eligible through PENNVEST although it is rare that any project get entirely grant funded. A minimum 60% pro-rated PENNVEST grant would be necessary to maintain a user rate of \$32.75 per month or \$393 annually based on projected operation and maintenance costs. Detailed financing estimates for each WWTP alternative is included in Appendix E.

Due to the complexities associated with funding of the Project, the Borough intends to implement the selected alternative in a minimum of two (2) phases. The first phase would include the necessary improvements to the Headworks, installation of a grit removal system, rehabilitation of the chlorine contact tank, and minor modifications to the chemical feed (disinfection) system. This phase is intended to be implemented using the CDBG funding. The second phase would include the construction of the MLE/oxidation ditch, rehabilitation of the secondary/final clarifier and replacement of the sludge pumps.

## **8.3 PROJECT IMPLEMENTATION SCHEDULE**

This project schedule is contingent upon the receipt of affordable funding and implementation timetable requirements. The following activities shall be undertaken to ensure successful implementation of the selected alternatives within the specified timeframes:

**Table 8-1 Implementation Schedule**

Years	Activity
0 to 1	Adopt Sewage Management Ordinance
	Secure Funding for Phase 1 – WWTP Upgrade
	Complete preliminary design and submit WQM Part II Permit Application for Phase 1 – WWTP Upgrade
1 to 2	Complete final design, Bid, and Construct Phase 1 – WWTP Upgrade
	Complete preliminary design and submit WQM Part II Permit Application for Phase 2 – WWTP Upgrade
3 to 10	Complete final design, Bid, and Construct Phase 2 – WWTP Upgrade