

AGREEMENT BETWEEN
TOWN OF MIDDLEBURY
AND
WRIGHT-PIERCE
FOR
WASTEWATER TREATMENT FACILITY UPGRADE

PRELIMINARY ENGINEERING REPORT PEER REVIEW AND ADDENDUM

SECTION 1 – INTRODUCTION

The Final Preliminary Engineering Report by Tata and Howard dated March 15, 2021 (2021 PER) followed the State Water Investment Division WID format and included:

- A. Project Planning (Section 1)
- B. Existing Wastewater Facilities (Section 2)
- C. Need for Project (Section 3)
- D. Alternatives Considered (Section 4)
- E. Selection of Alternative (Section 5)
- F. Proposed Project (Recommended Alternative) (Section 6)

The Wright-Pierce Preliminary Engineering Report Peer Review and Addendum shall refer to this previously completed study. The recommended alternative identified in the 2021 PER included the following:

The selected project consists of the following components:

- A. New Primary Clarifiers
- B. Convert SBR to A/O Process Tanks (4-Stage Bardenpho) and Secondary Clarifiers
- C. Build New Chlorine (Liquid Hypochlorite) Disinfection and Dechlorination System in former SBR Tank
- D. Replace Existing Belt Filter Presses with new Screw or Rotary Fan Presses for Sludge Dewatering
- E. Construct New Two-Phase (Thermophilic/Mesophilic) Anaerobic Digester Facility
- F. Implement Gas Cleaning & Power Generation with Digester Facility
- G. Construct New Plant Water System

- H. Upgrade Motor Control Center
- I. Modify SBR Effluent Channel
- J. Implement Green Infrastructure Consisting of Stormwater Improvements
- K. Upgrade Septage Receiving
- L. Repair Exteriors of all Existing Buildings.
- M. Modernize Administration Building HVAC System

The Town requests Wright-Pierce to provide peer review of the developed alternatives. Wright-Pierce will further develop alternatives as needed to identify:

- A. Influent design criteria
- B. Detailed design criteria by treatment process element
- C. Preliminary equipment sizing and selection
- D. Opinions of probable cost

Wright-Pierce will build off the work initiated by Hoyle Tanner that includes:

- A. Electrical existing conditions assessment by Don Folts, PE.
- B. Collected reference materials such as monthly operating reports, existing Operations and Maintenance Manual, WWTF record drawings, and annual industrial loading summaries for 2020-2022.
- C. Site visit notes

SECTION 2 - SCOPE OF SERVICES/SCHEDULE

Professional engineering consultant services are to be performed by the ENGINEER as follows.

I. Information Gathering

Existing studies, existing conditions plans, available drawings, and field measurements will be gathered and reviewed. Existing information to be gathered and reviewed may include the following:

- A. Monthly operations reports (January 2020 to present) already provided
- B. NPDES Permit already provided
- C. Operation and maintenance manuals already provided

- D. As-Built/Record drawings (WWTF already provided)
- E. Current operating budget
- F. Planned future development and sewer connections

II. Development of Influent and Effluent Design Criteria

Using historical operating data, Wright-Pierce will develop influent design criteria for Town and VTDEC concurrence. Peaking factors for peak hour and peak day will be developed. Design average daily flow (ADF) is determined by the discharge permit. Wright-Pierce will review historical data to confirm existing permitted capacity is provided. Effluent design criteria are also established in the discharge permit.

Wright-Pierce will request VTDEC to review potential changes to the NPDES permit using the most current water quality standards (WQS).

Wright-Pierce will develop a sampling plan for the Town to execute. Sampling of the influent for soluble BOD will help identify the potential for primary treatment to reduce loading on the biological process. Additional sampling may be identified during the study.

Updated Influent and Effluent Design Criteria will be provided in the PER Addendum.

III. Peer Review of Section 1 - Project Planning

Section 1 of the 2021 PER will be reviewed for concurrence on the projected wastewater flows and permit requirements. Wright-Pierce will document any updates provided by the Town that would impact projected wastewater flows and include the PER Amendment. Updates if any, will be included in the PER Amendment.

IV. Peer Review of Section 2 - Existing Facilities and Additional Assessment of Existing Facilities

The existing conditions are identified in the 2021 PER in Section 2. Wright-Pierce will provide peer review of the existing documentation. Wright-Pierce will discuss conditions identified in the report with Town staff and identify any updates to the condition assessment. Updates will be included in the PER Amendment.

Wright-Pierce will review existing soil boring logs, if available, from previous projects.

The Wright-Pierce team will review the electrical assessment provided by Don Folts, PE in an email to Hoyle Tanner dated July 27, 2023 and include relevant information provided in PER Amendment.

V. Peer Review of Section 3 - Need for Project

Wright-Pierce will review Section 3 of the 2021 PER and provide and recommended updates in the PER Amendment.

VI. Peer Review of Section 4 - Alternatives Considered

Wright-Pierce will provide peer review of Section 4 of the 2021 PER. Peer review will include as appropriate:

- A. Concurrence on or recommended elimination of alternatives considered by process element
- B. Recommendations for modifications to alternatives considered by process element
- C. Recommendations for additional alternatives to be considered

Findings of the Peer Review of Section 4 will be included in the PER Amendment.

VII. Identify, Develop and Evaluate Potential New or Updated Alternatives to be included in PER Addendum Section 4

Following the peer review of Section 4 of the 2021 PER, it is anticipated that the following will be required for all alternatives that have been reviewed and concurrence established that the process alternatives are reasonable for further consideration:

- A. Updated alternative based on any revisions to the design criteria developed in Task 2
- B. Update engineer's opinion of probable cost and life cycle cost analysis

For the Main Pump Station (MPS) the following alternatives may be developed:

- A. Evaluation of potential for additional storage at the MPS for flow equalization/CSO abatement
- B. Evaluation of alternatives to reduce hydrogen sulfide production at discharge end of force main

For review of the solids handling alternatives, the following shall be developed:

- A. Design Criteria
 - 1. Year 1 operations design criteria
 - 2. Design criteria at design flow
 - 3. Reasonable range of potential septage and direct to solids train sources
 - 4. Obtain VTDEC feedback on any potential future considerations for biosolids handling
- B. Digestion/Aerobic Sludge Holding
 - 1. Aerobic sludge holding
 - 2. Anaerobic Digestion for Class EQ biosolids (formerly known as Class A)

3. Note, development of energy recovery alternatives such as combined heat and power (CHP) systems is not included in this scope as it is anticipated that the application would likely not be of a scale to be feasible or cost effective. A conceptual heat recovery alternative may be considered.

C. Dewatering

1. Update existing alternatives as needed for the digestion and aerobic sludge holding alternatives

D. Sludge drying

- E. List of emerging technologies for PFAS destruction and planning level description of how they could potentially be incorporated into solids handling train in the future

F. Life cycle cost analysis to include:

1. Capital cost of construction
2. Estimated electrical operating cost for solids handling alternative
3. Estimated labor for solids handling operations
4. Solids disposal costs for current land application practice and Coventry landfill disposal to include:
 - a. Labor for transport
 - b. Cost per mile in fuel/vehicle wear for transport
 - c. Tipping fee

G. Green house gas (GHG) production for solids handling alternatives to include GHG:

1. Produced by solids handling process
2. Produced by transport of solids for disposal

H. Evaluation of solids handling alternatives based on non-monetary factors

1. Reliability of solution (proven track record of similar application)
2. Complexity of operations
3. Flexibility to meet future solids disposal requirements

VIII. PER Amendment Section 5 – Selection of Alternative

Wright-Pierce will complete Section 5 of the PER Amendment to include selection of alternatives by process element that will comprise the recommended project.

IX. PER Amendment Section 6 – Proposed Project/Recommended Alternative

The recommended alternative will be developed to include:

- A. Proposed Influent and Effluent Design Criteria
- B. Proposed Hydraulic Profile
- C. Proposed Process Flow Diagram
- D. Proposed Site Plan
- E. Equipment selection details including design criteria and preliminary layouts as needed
- F. Opinion of Probable Construction Cost
- G. Opinion of Probable Total Project Cost
- H. Project phasing defined in a Sequence of Work
- I. List of permits/approvals needed for State agencies
- J. Proposed project schedule
- K. Proposed next steps

X. Deliverable - Preliminary Engineering Report Addendum

The Preliminary Engineering Report Addendum (PER Addendum) will be prepared to incorporate the following information. The PER Addendum will follow the State Water Investment Division (WID) format and refer to section previously completed in the 2021 PER for the WWTF and MPS.

- A. Project Planning (Section 1)
 - 1. Update of Section 1.4 - Plant Design Loading
 - 2. Update of Section 1.7 - Permit Requirements, as needed
 - 3. Update of Section 1.8 - Community Engagement, as needed
- B. Existing Facilities (Section 2)
 - 1. Updates to the 2021 PER Condition Assessment for WWTF and MPS only
 - 2. Findings of review of any existing soil boring logs

3. Findings of electrical assessment
- C. Need for Project (Section 3)
1. Update of Section 3.3 - Reasonable Growth, if needed, based on review of historical flow and loading data.
- D. Alternatives Considered (Section 4)
1. Review of developed alternatives in the 2021 PER. The Engineer will review the alternatives and identify any suggested updates, including updating engineer's estimated construction cost, for:
 - a. Main Pump Station/Headworks (Section 4.4-4.5)
 - b. Primary clarification (Section 4.6)
 - c. Biological process and clarification (Section 4.7)
 - d. Disinfection (Section 4.8)
 - e. Dewatering (Section 4.9)
 - f. Residuals management (Section 2.10)
 2. Additional Alternatives to be Developed/Further Developed. The following potential alternatives may be developed:
 - a. Septage receiving (mentioned in Section 4.11 with limited detail)
 - b. Consideration of a pre-equalization alternative
 - c. Residuals management
 - d. Develop range of potential source separated organics
 - e. Develop range of septage
 - f. Plant water alternative based on water demands in identified recommended alternative
 - g. Electrical evaluation and alternatives
- E. Selection of Alternative (Section 5)
1. Based on existing and/or updated alternatives, select recommended alternative for each process element based on monetary and non-monetary factors.
- F. Proposed Project (Recommended Alternative) (Section 6)

1. Proposed Influent and Effluent Design Criteria
2. Proposed Hydraulic Profile
3. Proposed Process Flow Diagram
4. Proposed Site Plan
5. Equipment selection details including design criteria and preliminary layouts
6. Opinion of Probable Construction Cost
7. Opinion of Probable Total Project Cost
8. Project phasing defined in a Sequence of Work
9. List of permits/approvals needed for State agencies
10. Proposed project schedule
11. Proposed next steps

XI. Review Meetings

Wright-Pierce will prepare for and conduct a Kickoff/30% (review of existing conditions), 60% (discussion of developed alternatives), and 90% (refined recommended alternative) review meetings with representatives of the Town and Vermont DEC WID during the preparation of the PER Addendum. The purpose of these meetings is to maintain involvement of all parties in the preparation of the study by reviewing the information as it is developed. For a total of three (3) review meetings.

Wright-Pierce will also prepare for and present the 60% draft (discussion of developed alternatives) with the Town Infrastructure Committee at one (1) meeting.

XII. Funding Assistance

A not-to-exceed budget is provided for funding assistance upon request for:

- A. USDA RD: Upon request and as budget allows, Wright-Pierce would provide assistance with USDA RD Apply application for the WWTF upgrade project. This will require calculating the equivalent dwelling unit (EDU) for input into the application, identification of number of residential, commercial, and industrial connections and associated flow rates. The funding application will require a completed Preliminary Engineering Report and Addendum and Environmental Document.
- B. CWSRF: Upon request and as budget allows, Wright-Pierce would provide assistance on completion of CWSRF planning loan applications and/or assistance on annual CWSRF Priority List Application.

- C. Other funding: Upon request and as budget allows, Wright-Pierce would provide assistance on completion of grant applications such as Congressionally Directed Spending, Norther Borders Regional Commission, Community Recovery and Revitalization Program (CRRP).

XIII. Additional Services

In addition to the foregoing being performed, the following services shall be provided only when mutually agreed upon in writing by and between the OWNER and the ENGINEER's compensation and time duration of the Agreement. Additional Services will commence when incorporated into this scope of services by written Amendment signed by both parties. Examples of Additional Services available are:

- A. Completion of the Environmental Report for the recommended alternative
- B. Process monitoring sample collection and laboratory analysis
- C. Soil Borings or Geotechnical Study
- D. Basis for Final Design
- E. Archeological resource assessment
- F. Survey
- G. Final design (Step II) services
- H. Other additional services not identified herein, but which may become necessary at a later date.

XIV. Owner Responsibilities

Your responsibilities under this agreement shall include:

- A. Provide all available information as to the project requirements.
- B. Provide access to the site(s).
- C. Designate a contact person who can act with the Owner's authority regarding this project.
- D. Complete sampling identified within an agreed upon sampling plan.
- E. Complete careful, timely Deliverables reviews and provide comments during Deliverable meetings.
- F. Attend critical meetings with the State and funding agencies if needed.