TOWN OF PLYMOUTH
DEPARTMENT OF PUBLIC WORKS
159 Camelot Drive
Plymouth, Massachusetts 02360

FAX: (508) 830-4165
PUBLIC WORKS DEPARTMENT

MEMO

Date: September 6, 2016

To: Advisory & Finance Committee

cc: Melissa Arrighi, Town Manager
Lynne Barrett, Finance Director
Gary Frizzell, Wastewater Manager

From: Jonathan Beder, Director of Public Works

Re: Fall 2016 Annual Town Meeting
Article 4B-Wastewater Treatment Plant Audit

We are requesting funds to evaluate current conditions at the Wastewater Treatment Plant and the 5 municipal lift stations which include; Holmes Point, Water Street, Hedge Road, Industrial Park, and the Long Pond Stations.

Combined, these facilities are covered under the current operation and maintenance agreement with Veolia North America, which is set to expire on June 30, 2021. All relevant disciplines will be reviewed and a risk matrix will be developed along with a preliminary planning cost estimate. This condition assessment is critical, as it will delineate any item needing to be addressed, including its value. This will also allow the town to effectively and efficiently address any deficiencies that may be observed.

The Operator (Veolia) is required to transition the Plant and all the Stations back over to the town in good working order and in compliance with all legal requirements subject to normal wear and tear, consistent with good industry practice. The proposed assessment will assist the Town in determining the current condition of the infrastructure.

The lump sum cost to perform this work is $174,470 and is expected to take approximately 5 months to complete. Our overall Capital request is for $200,000 should any more in-depth investigations be required. We respectfully request your support in developing a comprehensive wastewater condition assessment.

KLEINFELDER
Bright People. Right Solutions.

August 22, 2016

Mr. Jonathan Beder
Director, Department of Public Works
159 Camelot Drive
Plymouth, MA 02360

SUBJECT: PROPOSAL FOR PROFESSIONAL SERVICES
WASTEWATER FACILITIES CONDITION ASSESSMENT/AUDIT

Dear Mr. Beder:

We appreciate the opportunity to assist the Town with conducting a condition assessment/audit of its wastewater facilities, including the wastewater treatment plant (WWTP) and five (5) wastewater pump stations, including Water Street, Holmes Point, Hedge Road, Industrial Park, and Long Pond Road. The goal of the project is to document existing conditions that will be used as a baseline to establish future capital improvement needs and approaches to operation and maintenance.

Kleinfelder's proposes to evaluate the condition of these facilities utilizing a comprehensive multi-disciplinary approach consisting of Kleinfelder experts as well as a team of specialize sub-consultants. Disciplines represented include wastewater process engineering; Supervisory Control and Data Acquisition (SCADA); architecture; structural engineering; heating, ventilation and cooling (HVAC); electrical; plumbing and fire protection. In addition, Kleinfelder proposes to conduct a building code review to assess gaps between the facilities and current building, fire protection, egress and life safety codes. The evaluation from each discipline will be consolidated into an overall risk matrix of the wastewater facilities. Further, a preliminary planning level cost estimate will be prepared that would address the deficiencies observed.

Kleinfelder will participate in up to three (3) meetings with the Town to convey the findings of this study. Further, Kleinfelder is available to assist the Town in future phases of evaluation should there be such a need.

This proposal is based on our discussions to date with you Gary and Chad, as well as our site visit, and consists of our proposed Scope of Work, Schedule and Compensation for services rendered, as detailed in the following sections.

SECTION 1 - SCOPE OF WORK

1) **Preliminary Tasks**
    a) Develop List of Information (Data, Plans, Reports, etc.) Needed and Obtain from Town
    b) Review, summarize, and tabulate acquired Information

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c) Kick-Off Meeting with Town to review Scope, Schedule, Deliverable
d) Develop Methodology for Conditional Assessment
e) Develop Forms for Field Assessment
f) Develop Asset Inventory and pre-populate Field Assessment forms
g) Develop a detailed process flow diagram
h) Conduct Staff Interviews to understand condition, design, and redundancy concerns

2) Conduct Field Assessment

a) Coordination with Field Assessment Team, including sub-consultants
b) Perform WWTP and Pump Station Field Assessment (the following disciplines)
    i) Wastewater Process and Mechanical
    ii) SCADA, Instrumentation and Control
        (1) Age and condition of SCADA computers
        (2) Version/revision/support status of all software and OS
        (3) Network architecture
        (4) Age, FRN, and legacy status of PLC hardware
        (5) Accuracy/adequacy/viability of all process instrumentation
        (6) Assessment of alarm notification/response system
        (7) Failure analysis of critical components/hardness assessment
    iii) Building Condition and Code Compliance
        (1) Architectural
        (2) Structural
        (3) HVAC / Plumbing / Fire Protection
        (4) Electrical (Power, Lighting, Standby Power)
        (5) Building Code Review (building, fire, life safety and accessibility)
c) Corrosion Assessment of Inlet Tank *(one side only)* by dewatering tank and entering for visual inspection:
    i) Review existing information and conduct staff interviews
    ii) Perform a field inspection of the concrete inlet tank not previously rehabilitated.
    iii) Inspections may consist of the following:
        1. Visual inspection; and
        2. Sounding tests.
    iv) Review data and assess the condition of the concrete structures.
d) Determine Process Equipment in need of further evaluation/inspection
e) Coordination with Manufacturer Service Representatives to conduct follow-up evaluations
f) Conduct Return Visits with Manufacturer's Representatives to perform more in-depth evaluations. Up to Five (5) follow-up site visits are assumed for budgeting purposes and include the following processes:
    i) SBR Control and Equipment review
    ii) Water Street pump station pumping systems
    iii) Standby generators at WWTP and pumping stations
    iv) Gravity Belt Thickener
    v) One Process to be determined
g) Compile and Archive Field Forms and Photographs
h) Summarize WWTP and pump station general conditions and deficiencies

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3) **Pump Station Force Main Corrosion Assessment (four (4) force mains)**
   a) Review existing information and conduct staff interviews
   b) Perform a site walk of each force main and identify potential access points (manholes) and test pit locations.
   c) Coordination with the Town to dig test pits, and coordination with corrosion specialist.
   d) Perform laboratory tests of soils to assess external corrosivity.
   e) Perform direct visual inspection to assess the condition of the pipe and measure remaining wall thickness using ultrasonic testing (up to three locations per force main).
   f) Review data and assess the condition of each force main.

4) **Risk Assessment of the Condition Findings**
   a) Conduct a Workshop with Town to review findings from Prior Tasks
   b) Review of CMMS program, preventive maintenance schedule and maintenance history of equipment
   c) Prepare Risk and Condition Assessment
      i) Develop numerical Condition Rating Criteria
      ii) Develop Criticality Weighting Criteria
      iii) Develop Risk Based Asset Matrix (Equipment, Buildings, etc.)
      iv) Complete the Prioritized Asset Matrix Condition Assessment
   d) Determine best alternative to address deficiencies – *NOTE: Under this phase of the work, we will not consider alternative technologies*
      i) Do Nothing/run to failure
      ii) Refurbish/rehabilitate
      iii) Replace In Kind
   e) Develop preliminary planning level costs to address deficiencies
   f) List operational or maintenance concerns discovered from Field Assessment
   g) Summarize findings, recommendations and Draft Report
   h) Conduct a Workshop with Town to review Draft Report
   i) Finalize Report

5) **Meetings with Town**
   a) Prepare for and attend up to three (3) meetings with the Town as follows:
      i) (1) Board of Selectmen Executive Session
      ii) (1) Public Presentation at Board of Selectmen Meeting
      iii) (1) Additional Board of Selectmen (or others) Meeting

6) **Project Management and Administration**
   a) Develop agreements with sub-consultants
   b) Monthly status report and invoicing
   c) Project coordination and communications

DELIVERABLES

1. Presentations for Public Meetings
2. Final Report summarizing findings from the audit and preliminary planning level costs to address deficiencies

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SCOPE OF WORK CLARIFICATIONS AND DETAILS:

1. Town will provide Kleinfelder a digital asset list exported from the Town's CMMS database.
2. This phase of the work will not analyze alternative solutions. However, if appropriate, a cost range to implement a variety of solutions may be developed to address a particular deficiency.
3. Where access to certain areas is infeasible, we will make assumptions of condition based on other observations made of similar equipment/facilities and conditions.
4. Architectural and structural assessments of buildings and structures will not include drilling, coring, sampling or testing to determine deficiencies, deteriorations, or remaining concrete wall thickness over rebar, unless explicitly described above. Assessment will be made on visual observations. Based on the findings, we may recommend further investigations as part of a future phase.
5. The following assumptions are made for pricing of the force main corrosion assessment. These assumptions are subject to revision upon review of force main as-built records which were not available during preparation of this proposal:
    - No corrosion assessment of the Water Street Pump Station force main will be performed since it is being replaced.
    - Town will provide excavator / operator for test pits related to FM corrosion analysis. Test pits will be pre-dug prior to the corrosion evaluation in order to maximize the time of the evaluator on site.
    - Three test pits will be dug for each force main.
    - 2 days will be needed for assessment of each force main, for 8 days total field evaluation time.
    - 1 soil sample will be analyzed for each test pit (12 in total).
6. In cases where multiple tanks or structures exist (SBR tanks for example), we will assess the condition of one tank only and assume the remaining tanks are of a similar condition.
7. Town staff may be requested to dewater tanks and structures or operate equipment to make access available for evaluations.
8. Town will directly pay for police details, if any.
9. Potential future work tasks are identified below:
    - Condition assessment follow-up where more in depth investigations are warranted.
    - Develop WWTP staffing plan.
    - Develop WWTP process model.
    - Evaluate wastewater process redundancy needs.
    - Review WWTP operations for potential O&M cost savings.
    - Assess alternative wastewater technologies for potential cost savings.
    - Review contract operations agreement relative to the results of this condition assessment.

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SECTION 2 - SCHEDULE

We are prepared to commence work under this proposal immediately upon execution of an Agreement between the Town and Kleinfelder. The schedule below shows approximately five (5) months to complete the project, not including the subsequent meetings. We will keep the Town fully apprised of the project status as work progresses.

		2016			2017			
TASK	TASK DESCRIPTION	OCT	NOV	DEC	JAN	FEB	MAR	APR
0	*Notice to Proceed*	■						
1	Preliminary Tasks		■	■				
2	Conduct Field Assessment			■	■			
3	Pump Station Force Main Corrosion Assessment			■	■			
4	Risk Assessment of the Conditions				■	■		
5	Town Meetings						■	■
6	Project Management and Administration		●	—	—	—	—	●

SECTION 3 - COMPENSATION

We propose to provide services rendered under this proposal on the basis of the lump sum amount indicated below.

Task	Description	Hours	Labor	Expenses	Subconsultants	Total
1	Preliminary Tasks	52	$7,860	$200	$0	**$8,060**
2	Conduct Field Assessment	202	$30,360	$970	$26,000	**$57,330**
3	FM Corrosion Assessment	20	$4,340	$150	$37,800	**$42,290**
4	Risk Assessment	162	$23,390	$350	$18,700	**$42,440**
5	Town Meetings	42	$8,930	$430	$0	**$9,360**
6	Project Management & Admin	80	$14,940	$50	$0	**$14,990**
	PROJECT TOTAL	**558**	**$89,820**	**$2,150**	**$82,500**	**$174,470**

We hope you find this proposal meets the needs of your project. We look forward to working with you, Gary and Chad. Please contact us should you have any questions on this proposal.

Sincerely,

KLEINFELDER

David T. Peterson, P.E.
Project Manager

Mark J. Thompson, P.E.
Principal-In-Charge

cc: File

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