Tetra Tech, Inc.

WORK ORDER INITIATION FORM
for the CITY OF CLEARWATER

Date: **June 7, 2016**

Project Number: _____

City Project Number: **16-0031-UT**

Plan Set Number: _____

1. PROJECT TITLE:

Water Treatment Fluoride Addition – WTP 1 and WTP 2

2. SCOPE OF SERVICES:

The City of Clearwater (City) has requested Tetra Tech, Inc. (Tetra Tech) to provide a scope of services for the design, permitting and bidding of new fluoride feed facilities at the City's Water Treatment Plants 1 and 2 (WTP 1 and WTP 2). The fluoride equipment includes storage, pumping and related equipment to add fluoride to the City's potable water system. In general, the following facilities are expected for each water treatment plant:

1. WTP 1- The existing sulfuric acid storage and pumping area at Water Treatment Plant 1 will be converted to a fluoride storage and pumping area.
2. WTP 2 – The existing empty chemical feed room and bulk storage containment area at Water Treatment Plant 2 will be equipped with fluoride storage and pumping equipment.

This project includes changes to the water treatment process at each facility and therefore permitting will meet the requirements of Florida Administrative Code (F.A.C.) 62-555 (Permitting, Construction, Operation, and Maintenance of Public Water Systems) in addition to compliance with applicable local building department requirements.

Electrical and instrumentation and controls (I&C) upgrades related to the additional of fluoride facilities are anticipated as follows:

A. Controls will be provided through the existing programmable logic controller (PLC) and SCADA HMI interface at each WTP.

B. The supply of electrical power will be through the existing plant MCC, starters, and power distribution panels.

The following tasks will be completed as part of the preliminary and final designs of the aforementioned facility improvements:

- Prepare Technical Memoranda to document the basis of design for the proposed improvements
- Develop the contract documents (bidding and contract documents, engineering drawings and technical specifications) for the procurement and construction of the facility improvements

Additionally, Tetra Tech will assist the City with completing the Florida Department of Health Fluoridation Grant Application.

In order to provide logical, orderly completion of this assignment, the project is presented in phases. Tasks to be completed in each phase are described herein.

I. TECHNICAL MEMORANDA

Task 1.1 - Data Request, Kickoff Meeting, Site Visits and Fluoride Determination

The purpose of the technical memoranda phase is to gather information, develop, evaluate, and present the basis of design for the fluoride addition. Tasks to be completed in this phase are described below.

A. Prepare a list of requested documents for the City to provide for Tetra Tech's use in evaluation and design of the proposed fluoride addition at the City's WTP 1 and WTP 2. It is anticipated that at a minimum, the following information will be provided by the City:

    1. Record Drawings and specifications from original and any expansion construction documents for WTP 1 and WTP 2.
    2. All available CAD files for the above record drawings.

B. Facilitate a project kick-off meeting and site visits of WTP 1 and WTP 2 with the City's and Tetra Tech's staff.

C. Prepare and distribute meeting minutes to all attendees.

D. Tetra Tech will evaluate the source of fluoride (liquid or dry additive) to be utilized. Chemical handling, safety, required equipment, available space and construction costs will be included in the evaluation. The sources of fluoride that will be evaluated include the water-based solution of hydrofluosilicic acid (also known as fluorosilicic acid, FSA, or HFS), and dry fluoride additives such as sodium fluorosilicate or sodium fluoride.

Task 1.2 – WTP 1 Fluoride Addition Technical Memorandum

The City operates WTP 1 without the use of sulfuric acid and the existing sulfuric acid storage and feed system is idle. The existing sulfuric acid system is located outside and under cover.

It is proposed that this sulfuric acid storage and pumping system be decommissioned and removed, and the proposed fluoride storage and pumping system equipment be located in this area.

Tetra Tech will evaluate the existing sulfuric acid system and determine how much of the existing equipment (electrical, piping, etc.) can be utilized for the proposed fluoride system. The anticipated improvements are as follows:

1. Evaluate existing chemical storage area containment coating system and determine its compatibility with the selected form of fluoride chemical.
2. Replace existing sulfuric acid storage tanks and chemical dosing pumps with a fluoride system:
    a. If the fluoride system is hydrofluosilicic acid, install storage tanks (one bulk tank and one day tank) and positive displacement dosing pumps for precise chemical dosing.
    b. If the fluoride system is a dry additive (e.g. sodium fluorosilicate or sodium fluoride), add a bag unloader/hopper and a screw feeder, an upflow contactor and make-up water system.
3. Decommission existing sulfuric acid piping.
4. Add new fluoride piping and tap into the existing potable water distribution system.
5. Provide power to equipment area and locate a NEMA 4X panel board at the equipment slab if required.
6. Provide a NEMA 4X remote I/O panel and route communication lines to network with existing PLCs.
7. Provide integration of fluoride monitoring and controls equipment with existing SCADA system.

Tetra Tech will prepare a technical memorandum to document the proposed decommissioning of the sulfuric acid system and proposed installation of the fluoride storage, dosing and controls system. The memorandum will serve as a basis of design and will include a summary of the work, any restrictions on allowable impacts to the plant operations that must be followed during construction, and a draft sequence of operations. The memorandum will also include the City's equipment preferences to be used as a basis of design.

Task 1.3 – WTP 2 Fluoride Addition Technical Memorandum

WTP 2 currently has a vacant chemical storage and metering room that is proposed to be utilized to store and meter fluoride. Tetra Tech will review the record drawings of WTP 2 and determine the equipment needed to store, meter, monitor and deliver fluoride to the potable water. The anticipated work and improvements are as follows:

1. Evaluate existing containment coatings installed in the future chemical storage area and chemical feed room for compatibility with the selected form of fluoride chemical.
2. Install fluoride system:

a. If the fluoride system is hydrofluosilicic acid, install storage tanks (one bulk tank and one day tank) and positive displacement dosing pumps for precise chemical dosing.
b. If the fluoride system is a dry additive (e.g. sodium fluorosilicate or sodium fluoride), add a bag unloader/hopper and a screw feeder, an upflow contactor and make-up water system.

3. Review existing record drawings of WTP 2, determine location of existing piping and identify piping necessary to deliver fluoride to the finished water.
4. Evaluate existing chemical storage room ventilation system and determine compatibility with fluoride storage. Per F.A.C. 62-555, tanks holding hydrofluosilicic acid shall be vented only to the outside atmosphere.
5. Provide power to equipment area (480V, 3-phase or 120V, 1-phase per the City's preference) and locate a NEMA 4X panel board at the equipment slab.
6. Provide a NEMA 4X remote I/O panel and route communication lines to network with existing PLCs.
7. Provide integration of fluoride monitoring and controls equipment with existing SCADA system.

Tetra Tech will prepare a technical memorandum to document the installation of the fluoride storage, dosing and controls system. The memorandum will serve as a basis of design and will include a summary of the work, any restrictions on allowable impacts to the plant operations that must be followed during construction, and a draft sequence of operations. The memorandum will also include the City's equipment preferences to be used as a basis of design.

Deliverables – One (1) electronic pdf file copy will be provided of the following documents:

- *Draft and Final Technical Memoranda*

II. FINAL DESIGN PHASE

Task 2.0 – Final Design

Upon acceptance of the technical memoranda by the City, Tetra Tech will initiate final design of the Project. The final design will result in preparation of one (1) single set of bidding and contract documents for the fluoride facilities for WTP 1 and WTP 2 to include engineering drawings and technical specifications.

These contract documents will be submitted to the City for review at 75- and 100-percent completion levels. The 75-percent submittal shall include engineering drawings plan views, sections, and details; bidding, contractual, and technical specifications; and opinion of probable construction costs. The 100-percent submittal shall include updated engineering drawings; updated bidding, contract and technical specifications and updated opinion of probable

construction costs incorporating the City's comments. The project drawings will be prepared utilizing Autodesk AutoCAD and/or Revit 2013 to allow for the production of two dimensional drawings and bidding/specifications using MS WORD.

To ensure proper design of the facilities, Tetra Tech will obtain approval from the City for any substantial changes in the technical memoranda prior to incorporation in the final design. Tasks to be completed during this phase are summarized below:

1. Prepare construction drawings necessary to clearly depict the improvements identified in the technical memoranda. The construction drawings shall be compiled using the City's Deliverables Standards, as referenced in Attachment "A". A preliminary list of drawings is presented below:

General
Cover Sheet
Index of Drawings, Location Map and General Notes
Legend and Abbreviations

Demolition
WTP1 Demolition Plan – Existing Sulfuric Acid Feed System

Process
Process Flow Diagrams
Fluoride System (WTP 1) - Feed Area Plan and Sections
Fluoride System (WTP 1) - Bulk Storage Plan and Sections
Minor Yard Piping Plan and Sections (WTP1)
Fluoride System (WTP 2) - Feed Room Plan and Sections
Fluoride System (WTP 2) - Bulk Storage Plan and Sections
Minor Yard Piping Plan and Sections (WTP2)
Process Mechanical Details (2 sheets)

Electrical
Electrical Symbols and Abbreviations
Modifications to Existing WTP 1 Facilities - Electrical and Control Plan
Modifications to Existing WTP 2 Facilities - Electrical and Control Plan
Control Diagrams & Panelboard Schedules
Electrical Details

HVAC
WTP 2 Fluoridation Equipment Ventilation

Instrumentation
Legend and Symbols
P&IDs (2 sheets – one per WTP)
SCADA System Architecture (2 sheets – one per WTP)

Panel and Instrument Details

2. Prepare a comprehensive project manual that contains the City's bidding and contract documents (Division 0 and 1) and technical specifications (Divisions 2 through 16) for competitive bidding. The project manual and its contents will be formatted in accordance with the Construction Specification Institute (CSI) and prepared using MS WORD.
3. Prepare and submit an opinion of probable construction costs with the 75- and 100-percent submittals based on vendor quotations and previous bid tabulations.
4. Prepare for and attend up to 2 project coordination meetings with the City during final design. Prepare and distribute meeting minutes to all attendees.
5. A review meeting will be held with the City following each submission. Tetra Tech will prepare comment tracking sheets at each completion level, document meeting minutes, and distribute such minutes to all attendees over the project duration.

Deliverables – Five (5) copies and one (1) PDF electronic copy will be provided for each submittal described below:

- *75- and 100-percent submittals of the bidding and contract documents, engineering drawings and technical specifications.*
- *Project coordination meetings minutes (pdf copies only, distributed by e-mail).*
- *75- and 100-percent submittal review meeting minutes and comment/response tracking spreadsheet.*
- *Opinion of probable construction costs at the 75- and 100-percent completion levels.*

III. PERMITTING

Based on the currently identified improvements, a FDEP General Permit will be necessary as the addition of fluoride is a change to the treatment process. Tetra Tech's scope for permitting includes the preparation and submittal of permit applications and supporting documentation to the FDEP to obtain a permit to construct of the proposed improvements. Tetra Tech will also respond to requests for additional information (RAIs) from the City to clarify the original applications. All permit application fees will be paid by the City. Anticipated permit related activities for this project and associated work are as follows:

1. FDEP Permitting of Fluoride Addition – Per FAC 62-555, a construction permit is required for the types of work or alterations described in F.A.C. 62-555.520. The 75% design documents will be utilized for permitting the fluoride addition at WTP 1 and WTP 2.

2. City of Clearwater Building Permit Application – Prepare for and attend one (1) meeting with the City's Planning and Development Department to review the project and assist in obtaining pre-approval for Contractor pickup.

Deliverables – Five copies (5) and one (1) electronic pdf file copy to be provided of the following documents:

- *Draft and Final Permit Applications*
- *Meeting minutes of pre-application and coordination meetings*

IV. BIDDING ASSISTANCE

Upon authorization to proceed with the bidding phase of the project, Tetra Tech will complete the following tasks:

1. Provide one (1) signed and sealed copy of the Contract Documents (engineering drawings and specifications) in PDF format for distribution to potential bidders by the City's Purchasing Department.
2. Attend the pre-bid meeting with the City.
3. Respond to questions as required to interpret, clarify or expand the bidding documents. The City Purchasing Department will prepare and distribute all addenda.
4. Review and evaluate the apparent low bidder's qualifications for undertaking the work and make recommendations of contract award.
5. Prepare and provide one (1) conformed set of the Contract Documents (engineering drawings in AutoCAD and PDF format and specifications in MS Word and PDF format) to the City.

V. FDOH GRANT APPLICATION ASSISTANCE

Tetra Tech will assist the City with completing the Florida Department of Health (FDOH) Fluoridation Grant Application, including completing the grant application and providing supporting materials, preparing the budget summary form and communication with the Florida Department of Health.

3. PROJECT GOALS:

The following work products will be delivered to the City as part of this project:

- *Draft and Final Technical Memoranda*
- *75%, and 100% Design Plans and Specifications*
- *Draft and Final Permit Applications*
- *One (1) conformed set of the Contract Documents*
- *Draft and Final FDOH Fluoridation Grant Application and Supporting Documents*
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Five (5) hard copies and electronic pdf file copies of these documents will be provided to the City. The project drawings will be produced utilizing AutoCAD and/or Revit 2013. At the completion of the project, the record drawings will be submitted in AutoCAD Release 2011 format.

4. BUDGET:

See attachment "B"

This price includes all labor and expenses anticipated to be incurred by Tetra Tech, Inc. for the

completion of these tasks in accordance with Professional Services Method “B” – Lump Sum – Percentage of Completion by Task, **for a fee not to exceed one hundred forty two thousand seven hundred forty dollars ($142,740.00).**

The City will be responsible for paying permit application fees.

5. SCHEDULE:

The project design and permitting is to be completed 10 months from issuance of notice-to-proceed. The project deliverables are to be phased as follows:

Data Collection and Fluoride Chemical Evaluation	**60 calendar days**
Technical Memoranda	**120 calendar days**
75% Construction Documents	**180 calendar days**
Final (100%) Construction Documents	**240 calendar days**
FDOH Grant Application	**330 calendar days**

6. STAFF ASSIGNMENT (Consultant):

Many team members will be involved in this project. Tetra Tech's primary staff assignments for this project are as follows:

- Project Manager - Emilie Moore
- Engineer of Record - Jarrett Kinslow: Process; David Burger: Electrical and I&C
- Quality Assurance/ Quality Control (QA/QC) – James Christopher, Jon Fox, David Burger
- Project Engineers – Jennifer Roque, Jason Seignoret, Justin Coward

The City's primary staff assignments for this project are as follows:

- Project Manager – Robert Fahey
- Project Team – David Porter, Fred Hemerick, Glenn Daniel, Chris Owens, Rich Gardner

7. CORRESPONDENCE/REPORTING PROCEDURES:

Engineer's/Architect's project correspondence shall be directed to Emilie Moore, PE, ENV SP. City project correspondence shall be directed to Robert S. Fahey, PE with copies to others as appropriate.

8. INVOICING/FUNDING PROCEDURES:

Invoices for work performed shall be submitted monthly to the City of Clearwater, Engineering Department, Attn.: Veronica Josef, Senior Staff Assistant, PO Box 4748, Clearwater, Florida 33758-4748.

CityInvoicing Code: 327-96740-561300-533-000-0000

9. INVOICING PROCEDURES

At a minimum, in addition to the invoice amount(s) the following information shall be provided on all invoices submitted on the Work Order:

A. Purchase Order Number and Contract Amount.
B. The time period (begin and end date) covered by the invoice.

C. A short narrative summary of activities completed in the time period.

D. Contract billing method- Lump Sum or Cost Times Multiplier.

E. If Lump Sum, the percent completion, amount due, previous amount earned and total earned to date for all tasks (direct costs, if any, shall be included in lump sum amount).

F. If Cost Times Multiplier, hours, hourly rates, names of individuals being billed, amount due, previous amount earned, total earned to date for each task and other direct costs (receipts will be required for any single item with a cost of $50 or greater or cumulative monthly expenses greater than $100).

G. If the Work Order is funded by multiple funding codes, an itemization of tasks and invoice amounts by funding code.

10. SPECIAL CONSIDERATIONS

The consultant named above is required to comply with Section 119.0701, Florida Statutes (2013) where applicable.

The City is providing record drawings of WTP 1 and WTP 2 and these drawings will be utilized for the design of the fluoride facilities at these WTPs, respectively.

The City is responsible for paying all application fees for permits, registrations, and certifications.

11. EXCEPTIONS

Design services do not include structural or architectural modifications to existing facilities. Tetra Tech shall submit a proposal for additional services should any such alterations become necessary.

No services related to geotechnical investigations, subsurface utility investigations, or survey are anticipated or included within this scope of services.

PREPARED BY:

Emilie A. Moore, PE
Tampa Area Regional Manager
Tetra Tech, Inc.

Date

APPROVED BY:

Michael D. Quillen, PE
City Engineer
City of Clearwater

Date

WORK ORDER INITIATION FORM

CITY OF CLEARWATER DELIVERABLES STANDARDS

FORMAT:

The design plans shall be compiled utilizing one of the following standards:

City of Clearwater CAD standards or Consultant’s CAD standards (please provide all supporting documents when utilizing Consultant’s Standards).

DATUM:

Horizontal and Vertical datum shall be referenced to North American Vertical Datum of 1988 (vertical) and North American Datum of 1983/90 (horizontal). The unit of measurement shall be the United States Foot. Any deviation from this datum will not be accepted unless reviewed by City of Clearwater Engineering/Geographic Technology Division.

DELIVERABLES:

A minimum of two (2) signed and sealed Plans and Contract Documents (specifications book) labeled “ISSUED FOR BID” shall be provided at the onset of the bid phase, as well as electronic copies. Electronic plan copies in PDF and CAD and electronic contract documents in PDF and MS Word.

The design plans shall be produced on bond material, 24" x 36" at a scale of 1" = 20’ unless approved otherwise. The consultant shall also deliver all digital files in CAD drawing format and PDF format together with all project data in AutoCAD Civil 3D file format. All references, such as other drawings attached, images and graphic files, custom fonts and shapes shall be included in hard copy and electronic copy.

Prior to the City Council award date, a minimum of two (2) copies of signed and sealed plans and contract documents (specifications book) labeled “CONFORMED” shall be provided. All revisions made during the bid phase shall be included in the plan sets and noted in the revision block or as a footnote. Copies of each Addendum shall be included at the front of the contract and all revisions made during the bid phase shall be incorporated into the Contract Documents.

Electronic copies of “CONFORMED” plans (PDF and CAD) and contract documents (PDF and MS Word) shall be provided prior to the City Council award date.

NOTES:

- If approved deviation from using Clearwater CAD standards, the consultant shall include all necessary information to aid in manipulating and printing/plotting the drawings. Please address any questions regarding file format to Mr. Tom Mahony, Geographic Technology Manager, at (727) 562-4762 or email address: tom.mahony@myclearwater.com.

Water Treatment Fluoride Addition
Design, Permitting and Bidding

Tetra Tech, Inc.

WORK ORDER INITIATION FORM
PROJECT BUDGET

Task	Description		Consultant Services	Total
1.0	**Technical Memoranda**			
1.1	Data Request, Site Visit, Kickoff Meeting		$	16,585
1.2	WTP 1 Technical Memorandum		$	22,304
1.3	WTP 2 Technical Memorandum		$	19,730
				$58,619
2.0	**Final Design**			
2.1	Project Management & Progress Meetings		$	4,955
2.2	QA/QC, Design Coordination, Cost Estimating		$	6,148
2.3	75% Design		$	37,023
2.4	100% Design		$	20,534
				$68,660
3.0	**Permitting**			
3.1	Meetings, Permits/Notifications Preparation		$	6,582
				$6,582
4.0	**Bidding Assistance**			
4.1	Prepare Bid Documents		$	777
4.2	Pre-Bid Meeting, Respond to Bidding Questions		$	2,911
4.3	Bid Evaluation, Recommendation		$	720
4.4	Prepare Conformed Documents		$	2,444
				$6,852
5.0	**FDOH Grant Application Assistance**			
5.1	Grant Application / Support Docs Preparation		$	2,027
				$2,027
Grand Total				**$142,740.00**