Amendment 2 Proposal
Franklin Wastewater Reclamation Facility Expansion and Upgrades

This document is the second proposed amendment to the March 4, 2013 contract between the City of Franklin, Tennessee (City) and CDM Smith for the Franklin Wastewater Reclamation Facility (WRF) Expansion and Upgrades project. Evaluations and investigations performed by CDM Smith during the design of the facility modifications have revealed that the following additional scope items are required or recommended to be completed as part of the final design process for the City of Franklin to adequately address existing constraints and/or expansion needs at the WRF. The proposed modifications to the scope and the rationale for those modifications are described in the scope sections below.

Scope

The proposed amendment to the scope of work consists of the following tasks:

- Task 412 – Addition of Solar Dryer System Competitive Pre-Selection
- Task 413 - Potable Water System Surveying, Evaluation and Design Expansion
- Task 414 – Design and Permitting of Temporary Construction Roadway Access from Mack Hatcher Parkway (TDOT) to WRF site
- Task 415 - Design of a Plant Water Booster Pump Station for the Biosolids Portion of the Site
- Task 416 - Scum Tank Related Inspection and Design
    - Inspection of the Existing Tank for Potential Reuse as a Scum Tank
    - Design of New Scum Receiving Tanks
- Task 603 – Expansion of the SCADA System Scope
    - Addition of the System-Wide Radio Survey and Report
    - Design of SCADA System Modifications to Incorporate Radio Survey Results
- Task 705 – Additional Water Reclamation Facility Permit and Total Maximum Daily Load (TMDL) Support (NPDES Permit for Expansion to 16 million gallons per day (mgd) and support of the on-going Harpeth River TMDL)
- Task 706 – Air Permitting for the Combined Heat and Power System

The purpose and scope for each of these tasks are provided below. Note that the design components of the tasks described below will include all associated deliverables as defined in the original scope of work for the 30%, 60% and 90% stages of design and associated services through bidding of the projects (SCADA System Early Package and Full WRF Package).

Additions and Deletions to the Design Scope

Task 412 Addition of Solar Dryer System Competitive Pre-selection

Each solar dryer system from the multiple manufacturers are specific in their layouts, sizing and construction; and therefore, each system requires different design drawings for the drying bays and ancillary facilities. In order to prevent the need for multiple designs for each system, a competitive procurement process allows selection of the solar dryer manufacturer and final design based on that specific system. To accommodate this process selection, CDM Smith assisted the City through the development of a package and pre-selection process for the solar dryer manufacturer.

This task includes the following responsibilities:

1. Preparation of a pre-selection bid package. The package included detailed performance based technical specifications, which also included specific materials and equipment requirements. The package included the development of a bid sheet, measurement and payment details, form(s) to gather information needed for long-term cost and non-cost evaluations, Division 1 specifications, and a letter agreement that commits the selected equipment manufacturer to providing equipment and services to the successful contractor at the bid cost under the conditions defined in the specifications. The first draft of this document was reviewed by CDM Smith technical experts and revised before submittal to the City. CDM Smith then transmitted the document to the City for review. A conference call was held to review the document with the City, and then a final document was prepared for bidding.

2. Bidding. CDM Smith assisted the City with the preparation of a bid advertisement and solicited proposals from the four identified potential solar dryer equipment manufacturers (Kruger, Parkson, IDI, and Huber). CDM Smith provided all day-to-day bidding period coordination and produced bid addendums based on questions and needed clarifications.

3. Performance of an alternatives analysis. Using the information provided by each of the manufacturers, CDM Smith performed an alternatives analysis similar in scope to the analysis performed for the UV and THP system pre-selections. The analysis included capital cost comparison, operation and maintenance cost comparison, life-cycle cost comparison, and non-cost factor comparison. Following the initial submittal, CDM Smith made one additional request for information and clarifications to each of the manufacturers on their initial submittal. A report similar to that produced for the UV and THP system pre-selection was prepared evaluating and comparing each of the submittals. An internal draft of the report was reviewed by CDM Smith technical experts and then revised and transmitted to the City for review. After the City had completed its review, CDM Smith held a review meeting with the City and subsequently finalized the report.

4. Preparation of Materials for Presentation of Results and Recommendations to the Board of Mayor and Alderman (BOMA). CDM Smith prepared a PowerPoint presentation for City staff to

present to BOMA. A CDM Smith representative attended the BOMA meeting to address and answer any questions.

5. CDM Smith assisted the City with the preparation of a letter of intent for the selected manufacturer's signature upon approval by BOMA. Once approved, CDM Smith assisted with obtaining a signed commitment letter from the successful manufacturer.

Task 413 - Potable Water System Evaluation and Design Expansion, including survey, from Hillsboro Road to the WWTP

Due to the significant potable water demands of the new biosolids facilities, it became necessary to evaluate and increase the flow and pressure at the WRF. To accomplish this evaluation and design, the following activities will be required to be completed by CDM Smith:

1. Utilizing the existing City water model, CDM Smith developed potential alternatives to increase the available potable water flow to the WRF site which was documented in a technical memorandum and reviewed with the City. After receiving comments from the City, additional modeling analysis was performed; and ultimately, the addition of a new 12-inch main from Hillsboro Road to the facility site was the alternative selected by the City.

2. Survey of Project Corridor. CDM Smith, along with our subcontractor CIA, Inc., prepared a topographic survey of the approximately 1,700 foot long corridor from Hillsboro Road, along Claude Yates Drive to the limits of our existing scoped plant survey at the proposed biosolids expansion. The survey was approximately 70 feet wide, and included a 400 foot long by 50 foot wide corridor survey along the existing water line and easement between the homes at 906 and 908 Hillsboro Road. The survey was completed to the previously established guidelines in the initial scope of work with the City of Franklin.

3. Our team is currently preparing construction plans and specifications for the 3,500 linear foot of new 12-inch water main along Claude Yates Drive from the connection to the existing main on Hillsboro Road to the general vicinity of the WRF main gate where the new water line will connect to the existing 6-inch water main on site. An additional 8-inch water main is being designed to provide a loop around the new biosolids facilities, connecting to the new 12-inch line on each end of the loop along Claude Yates Drive.

   The design scope includes:
   - Water main plan and profile sheets at 1"=50' horizontal and 1"=5' vertical (Estimation of 3 sheets).
   - Additional construction and connection details as necessary for a complete description to the proposed bidders (Estimation of 1 sheet)
   - Traffic control plans (Estimation of 2 sheets)
   - Erosion and sediment control plans (Estimation of 3 sheets)
   - Paving and restoration plans (Estimation of 3 sheets)

- Design coordination with the City, all appropriate affected utilities, street department, property owners and any other affected entities
- Modifications to 4 other sheets.

All work elements for the inclusion of the design of the new 12-inch water main will be completed and prepared for inclusion and delivery to the City of Franklin as part of the final design deliverables per the current schedule.

Task 414 - Design and Permitting of Temporary Construction Roadway Access from Mack Hatcher Parkway (TDOT) to WRF

In order to minimize impacts to the existing Franklin WRF system operations, minimize disruption to traffic on the nearby roads, and minimize wear and tear on secondary roads in the WRF area, during construction of the expanded facilities, CDM Smith is working with the City to acquire a temporary construction entrance approval from TDOT for access to the construction site from Mack Hatcher Parkway on the northern side of the plant property. To complete the submission process, CDM Smith, along with our subcontractor CIA, Inc., will provide survey of the required temporary roadway corridor to develop a set of plans to demonstrate the layout and details for the temporary roadway to be used during construction. Once the construction sheets are completed, the plans and request will be submitted to the appropriate TDOT office for review and approval. CDM Smith will coordinate and complete all follow-up needs of TDOT for approval of the temporary access and will incorporate the additional construction plan(s) into the final bid set for the project. We anticipate that this will require preparation of additional submittal figures for the application and two additional drawing sheets.

Task 415 - Design of a Plant Water Booster Pump Station for the Biosolids Portion of the Site

After evaluating and establishing the total plant water demands and required pressures for the new biosolids portion of the site and the subsequent modeling exercises to identify the final needs, it became clear that the modified reuse/plant water pumping system would not be able to meet the pressures at the total demands required for proper operation in the biosolids area. As such, it became necessary to design a booster pump station that will be located in the Solids Processing Building to ensure the proper operations of the systems being implemented.

The addition of the booster pump station will require adjustments to the existing on-site plant water system models and the sizing and selection of compatible pumps and pressure relief valves for proper operation. The addition of the plant water booster station will include the following plan modifications:

- Addition of one process mechanical drawing
- Modification of one process mechanical drawing
- Addition of one instrumentation and control drawing
- Modification of one instrumentation and control drawing
- Modification of multiple electrical drawings.

Task 416 - Scum Tank Related Inspection and Design

In the original scope of work, it was identified that the scum removed from the final clarifiers would be treated as it is in the current operation; the scum would be blended with the waste activated sludge (WAS) before being sent to the new solids treatment process. However, upon further investigation, the design team learned that scum capacity and pumping records (the quantity of scum pumped) were not available. Due to the lack of scum quantity data, the design team recommended handling the scum separately from the WAS in order to avoid diluting the WAS and potentially requiring a larger and more expensive centrifuge to achieve the desired cake solids concentration. CDM evaluated several options for management of the scum and the concept of an aerated scum holding tank, periodically cleaned out by a vacuum truck, was approved by the City following discussions of the potential options for scum treatment.

Based on the recommendation, CDM Smith first wanted to analyze and review the option of utilizing one of the existing tanks within the biosolids system to be reused for the scum holding tank. CDM Smith contracted with a specialized contractor to clean and inspect the existing bolted steel tank; however, the field investigations determined that the existing steel storage tank was unsuitable for conversion into the scum holding tank. A report from the inspection was developed with documentation as to the existing tank condition. This report was delivered and discussed with the City staff; and ultimately based on the inspection and inability for reuse, it was agreed that it was necessary to design a new scum holding tank, to be located in the vicinity of the existing solids processing facilities.

The addition of the new scum storage tank resulted in the following plan additions:

- Modification of four civil drawings
- Addition of two process mechanical drawings
- Addition of one electrical drawing
- Modification of multiple electrical drawings
- Addition of one instrumentation and control drawing
- Modification of one instrumentation and control drawing

Task 603 - Expansion of SCADA Design Scope

Addition of System-Wide Radio Survey and Report

To expand on the previously scoped Field Radio Survey (Task 602 – RTU and Radio Design), CDM Smith prepared an initial procurement package on behalf of the City to select and contract with a SCADA integration firm to complete a system-wide radio survey. This task required a subcontractor, Lord & Company Inc., to perform an actual radio survey at the approximately 40 sites to determine tower/pole placement and necessary height for optimal radio signal strength. The study also evaluated and defined the location and height of the centralized primary antenna at the Public Works facility for receiving the radio signals. The Subcontractor performed the radio survey in advance of, and to aid with the design of, the future SCADA improvements project. The study will provide a conceptual system architecture for the future SCADA system that meets the requirements described herein, and in the future project, will provide the backbone recommendations for a new city-wide SCADA system which will connect all remote pumping stations, tanks and flow monitoring stations to a master station located at the City's Public Works Facility using new controllers and radios.

As the future radios were required to meet the terms and limits of the existing FCC licenses, the radio characteristics used in the survey were completed within these constraints. Antenna heights and the number and locations of repeaters are the main design elements that may be varied and were analyzed as part of the study.

The first phase of the study was completed utilizing a computerized tool to gain an initial understanding and recommendations for the system. The report was reviewed with the City staff and followed by a meeting with CDM Smith and Lord & Company where the results were presented to the City. Upon acceptance of the computerized study, an actual field survey to confirm and make adjustments to the initial findings was completed. The final report and recommendations will be used to design the final system improvements as part of the SCADA System Upgrades project. CDM Smith and Lord & Company will hold a conference call with the City to go over the report.

Design of SCADA System Modifications to Incorporate Radio Survey Results

After completing the radio survey and receiving the recommendations from Lord & Company, CDM Smith will make modifications and additions to the previously developed SCADA systems improvements package to produce final contract and bid documents for the project.

The existing sites that require changes in antenna location or height based on the SCADA system radio survey will require more extensive design efforts. The proposed scope will include the following components:

Design of Improvements – We have assumed that the design will include addition of three electrical drawings and two instrumentation and control drawings, and modification of two instrumentation and control drawings including an update to the general location map and the overall system architecture. If the recommendations of the study include modifications to additional existing masts or towers, the responsibility for additional surveying, and geotechnical work will be placed on the Contractor. Also, as

previously planned, the design of foundations for the masts and antennas will be made the responsibility of the tower manufacturer.

In addition to the modifications and additions to the bidding documents, CDM Smith will provide support throughout the bidding process for the SCADA system package as similar to the WRF bidding process as detailed in the original scope of services.

Task 705 - Additional Water Reclamation Facility Permit Support (NPDES Permit for Expansion to 16 MGD and support of the on-going wastewater system lawsuit and TMDL development)

In the original scope of work, CDM Smith was scoped to provide permitting support to the City of Franklin on the permit application for the 16 mgd plant expansion. During the process of the project, CDM Smith assisted with the initial meetings and discussions on the previously submitted 12 mgd permit application renewal based on the expiration of the existing permit in November 2011. The draft permit was issued for the 12 mgd permit on April 22, 2013. CDM Smith reviewed the draft permit and prepared comments that were submitted on June 27, 2013. Following a public hearing on October 29, 2013 for the 12 mgd permit, no final permit was ever issued by TDEC and CDM Smith and the City moved forward with preparing the 16 mgd permit for the on-going plant expansion design, which included coordination on additional monitoring and data collection to support the permit application. As of this week, TDEC has not released the draft permit for the 16 mgd.

As the process moves forward into the release of the draft permit for the 16 mgd plant expansion, CDM Smith will continue with technical support of the permit process including technical review of the draft permit, submission of formal permit comments to TDEC, preparation for a public hearing, as applicable, and all other support necessary to ultimately receive the final permit for the expansion of the permit to 16 mgd.

In addition to the on-going permit support, CDM Smith is continuing to provide technical support for the on-going Harpeth River Watershed Association (HRWA) lawsuit and the recently commenced TMDL process being jointly developed by the EPA and TDEC, as requested by the City. The exact required technical support for these processes is hard to define, but will include review of data, documents and other findings, preparation of technical comments, attendance at hearings and meetings, review of draft and final TMDL documents and all other assistance to support the City through the process.

Based on the unknown nature of the continued support on the 16 mgd permit negotiations and final permit approval, the assistance on the on-going lawsuit and support during the development of the TMDL, CDM Smith has included an allowance of $100,000 for this task in the proposed amendment budget. We will provide updates on work completed and costs to date on each monthly progress report and invoice to keep the City up-to-date on the work completed for support. To date, approximately $35,000 has been spent in support of the Aquatic Resource Alteration Permit application and negotiations, initial TMDL process in conjunction with the City of Franklin, TDEC, USEPA and other included agencies and support of the on-going WRF permit and negotiations and HRWA lawsuit.

Task 706 - Air Permitting for the Combined Heat and Power System

This task involves preparation of an air permit for the combined heat and power (CHP) engine and the backup flare. Gas from the digesters will be cleaned and consumed by the engine, which is part of the CHP system. A flare will be used to get rid of gas when engine outages must occur. This task includes the following components and assumptions. The assumptions are predicated upon preliminary discussions with TDEC.

1. Reviewing the applicable regulations and communication and coordination with TDEC to verify our understanding of the Tennessee permitting requirements.
2. Conducting emissions calculations. For the purpose of this proposal we are assuming that this will be a minor source permit application based on anticipated air emissions discharge.
3. Preparing the permit application. We assume that we will only be developing a permit application for the CHP engine and flare and that it won't be necessary to develop a site wide permit. We have also assumed that air modeling such as dispersion modeling, air toxics modeling, and wastewater emissions modeling won't be required.
4. Reviewing and revising the permit application
5. Participating in a conference call with the City to review the permit application.
6. Transmitting the permit application to TDEC. We assume that the City will pay any permit application fees.
7. Responding to TDEC comments on the permit application. We assume that it will be necessary to respond to one set of comments.

TIME OF COMPLETION/SCHEDULE

To maintain the scheduled completion date as discussed with the City of Franklin staff, CDM Smith has already initiated work on portions of the Amendment No. 2 scope of work. Additional work will be initiated following approval of this amendment by the City of Franklin BOMA. Work will be completed in accordance with the active schedule maintained by CDM Smith and reviewed at each monthly meeting. The permitting and SRF coordination assistance and duration is not within the control of CDM Smith or the City; however, CDM Smith will continue to work with the City to obtain the appropriate permits and approvals for funding necessary to move forward with the work as outlined in Tasks 705 and 706. Currently all required permits are anticipated to be completed late in 2015.

COMPENSATION AND PAYMENT

Invoicing shall continue to be completed monthly on a billing rate basis based on the work completed within the dates of the invoice per the approved Task and Labor Categories and the corresponding billing rate for the individual(s) completing the work. A project status report will accompany each progress billing to update the OWNER on the work and project progress. The not-to-exceed upper limit fee for the proposed additional work is $ 740,500. This will bring the revised total project upper limit to $ 6,000,650. A breakdown of additional project values by tasks is presented in Table 1 below, and the billing rates for the project shall remain the same as the original contract values. All project related expenses shall be billed at CDM Smith's cost with no mark-up as per the existing contract.

Table 1: Task Value

Task No.	Description	Task Value
412	Solar Dryer Pre-selection	$ 92,000
413	Potable Water System Expansion	$ 153,200
414	Design & Permitting of Temporary Construction Access	$ 30,000
415	Plant Water Booster Station for Biosolids Process	$ 57,600
416	Scum Tank Inspection and Design of New Tank	$ 100,800
603	SCADA System Scope Additions	$ 147,700
705	WRF Permit Support	$ 100,000
706	Air Permitting for CHP Equipment	$ 59,200
TOTAL AMENDMENT AUTHORIZATION		$ 740,500

	Task No.	412	413	414	415	416	603	705	706	
LABOR	Rate	Solar Dryer Preselection	Potable Water System Expansion	Temporary Construction Road Design & Permitting	Biosolids Water Booster Pump Station	Scum Tank Inspection & Design of New System	SCADA - Radio Read Survey and Deisgn Modificaitons	WRF Permitting and TMDL Support	CHP Air Permitting	Totals
Officer	$215	12	8	2	2	4	4	60	8	100
Project Manager	$170	60	40	8	20	20	20	60	12	240
Senior Technical Specialist	$190	160	60	0	40	8	60	180	60	568
Technical Specialist	$170	48	60	0	60	32	60	150	120	530
Senior Engineer/Scientist	$150	80	160	80	80	120	120	40	80	760
Engineer/Scientist	$120	120	160	40	80	120	80	40	40	680
Junior Engineer/Scientist	$100	60	140	40	60	100	80	0	0	480
Senior Designer	$115	0	180	0	32	110	40	0	0	362
Senior Construction Specialist	$150	0	0	0	0	4	0	0	0	4
Construction Esimator	$110	16	0	0	0	8	0	0	0	24
Designer/Drafter/Technician	$95	0	200	60	40	110	80	0	0	490
Administration	$75	20	16	10	12	8	20	19	24	129
TOTAL HOURS		576	1024	240	426	644	564	549	344	4367
TOTAL DOLLARS		$87,000	$128,220	$29,040	$57,610	$78,800	$75,160	$95,025	$54,160	$605,015
OTHER DIRECT COSTS										
TOTAL ODCs		$5,000	$5,000	$1,000	$0	$2,000	$2,500	$5,000	$5,000	$25,500
OUTSIDE PROFESSIONALS										
Surveying		$0	$20,000	$0	$0	$0	$0	$0	$0	$20,000
Radio Survey		$0	$0	$0	$0	$0	$70,000	$0	$0	$70,000
Tank Inspector		$0	$0	$0	$0	$20,000	$0	$0	$0	$20,000
TOTAL OPs		$0	$20,000	$0	$0	$20,000	$70,000	$0	$0	$110,000
TOTALS		$92,000	$153,220	$30,040	$57,610	$100,800	$147,660	$100,025	$59,160	$740,515
Rounded Totals		$92,000	$153,200	$30,000	$57,600	$100,800	$147,700	$100,000	$59,200	$740,500