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April 19, 2017

Mr. Mark Hilty, P.E.  
City of Franklin  
Director, Water Management Department  
124 Lumber Drive  
Franklin, Tennessee 37064

Subject: Proposed Amendment 4  
Franklin WRF Expansion Project

Dear Mark:

Amendment number 4 is attached for your review. Please let Zack or me know if you have any questions or need any additional information. We would also be glad to go through this with you at your convenience.

We sincerely appreciate this opportunity to continue our work with the City of Franklin.

Very truly yours,

Robert P. Huguenard  
Senior Project Manager  
CDM Smith

Enclosure

cc: Michelle Hatcher, City of Franklin  
Zack Daniel, CDM Smith  
Jennifer Osgood, CDM Smith



# Proposed Amendment 4

## Franklin Wastewater Reclamation Facility

### Modifications and Expansion Project

#### 1.0 Project Background

The design and permitting for the Franklin WRF Improvements project continues to be prolonged due to the lack of finalization of the plant's expanded NPDES permit; ultimately, delaying the funding (SRF) and bidding processes. In addition, there also continue to be questions and request for clarification by a small facet of the public and regional environmental group with regards to the planned biosolids upgrades and the permitted effluent discharge limits for the proposed expansion. The delays in themselves result in additional week-to-week expenditures required to continue managing and maintaining the project, but the public objections have also resulted in additional tasks required to respond to input and requests; and most recently, in the evaluation of a potential new biosolids process, the Lystek Thermal Hydrolysis Process.

The delaying of the NPDES permit has also resulted in additional coordination and delays with the SRF loan process for the City's approved financing. The process has become protracted and has required additional work above the originally defined scope of work; and most importantly, continues to impact the requirements and needs of the project on a weekly basis as we move towards approval of the permit and bidding of the project. This amendment will address these additional efforts to continue this push towards bidding the project and commencing construction in 2017.

#### 2.0 Scope

##### Task 1, Evaluation of Lystek System

The City was approached by Lystek International, through coordination by the Chestnut Bend Homeowners Association (CBHOA), and requested to be considered as an alternative to the previously selected Cambi thermal hydrolysis system, which is part of the currently designed biosolids system. The City Board of Mayor and Alderman (BOMA) decided to evaluate the Lystek system in comparison with the Cambi system to ensure that the City and CDM Smith are providing the most appropriate, cost-effective solution for the City's long-term biosolids processing and disposal needs.

Prior to preliminary design, procurement documents were prepared by CDM Smith to obtain competitive proposals for preselection of a thermal hydrolysis pretreatment (THP) system, with proposals obtained from Cambi and Krueger for their respective processes. The proposals were subjected to a meticulous economic (capital, operations and maintenance, and life-cycle costs) and non-economic analysis. Based on this analysis, the Cambi THP system was recommended and approved by the Board of Mayor and Alderman. This analysis and preselection was necessary due to the unique nature of the thermal hydrolysis systems and the variance between manufacturers in regards to their specific layouts, sizing, construction, support systems, and ancillary processes. Therefore, it was not possible to complete the design and produce construction documents for the biosolids treatment system without selecting a manufacturer to serve as the basis of design.

After the preselection of the Cambi system, the preliminary and final designs were completed for the system with the current biosolids process design documents at a 95% to 100% stage of completion.

The Lystek system is a thermal hydrolysis process; however, it is dramatically different from the Cambi and Krueger processes based on the ancillary systems that are required for a fully functioning system and the final product, which is a liquid fertilizer as opposed to the solids cake product produced by the currently designed system. Ultimately, the Lystek system is more of a post treatment step as opposed to a pretreatment step. The goal of this task is to perform an evaluation comparing the Lystek system to the Cambi system.

The evaluation requires establishing constraints and requirements that are commensurate to the constraints and requirements that were imposed in the bid package for the THP system selection. This process includes the development of process guarantee requirements; as well as penalties for not meeting these requirements, that are commensurate with those established for the original THP selection.

The equipment package to be pre-selected will include the thermal hydrolysis process equipment and the associated boiler units, feed hoppers, cooling units, dilution units and the digester feed pumps. The ancillary equipment identified herein was selected after discussions with the associated manufacturers. The goal was to identify equipment that potentially has an impact on the ability of the manufacturers to meet process guarantee requirements for the system.

With the above in mind, a bid package will be prepared for obtaining a proposal from Lystek that includes economic and non-economic information to perform a fair comparison with the pre-selected Cambi system. We assume that the evaluation will include the following subtasks/steps, some of which have already commenced:

Subtasks:

1. Pre-proposal support and efforts to define the proposed direction include:
  - a. CDM Smith performed initial public meeting preparation including researching and contrasting the Lystek system against other thermal hydrolysis systems. This initial research and analysis included conducting multiple calls and face-to-face discussions with Lystek staff.
  - b. CDM Smith attended a public meeting held by the City to learn more about the Lystek process. The public meeting, requested by the CBHOA, was held to discuss the potential use of the Lystek system in place of the proposed Cambi system; and ultimately, resulted in the BOMA decision to allow Lystek to present their process and conduct a formal comparison versus the Cambi THP process.
  - c. Preparation of a proposed approach for comparison of the Lystek system against the current design for City review and consideration.
  - d. The organization and completion of multiple conference calls to establish final direction on the evaluation.

2. A meeting was held in order to coordinate with Lystek staff to achieve the following goals:
  - a. Gain an in-depth understanding of the Lystek system to allow for the layout of the biosolids treatment system with the Lystek thermal hydrolysis process as the central process for the basis of conceptual design.
  - b. Gain an understanding of the Lystek business model and continue to work with Lystek to determine how that business model can be adjusted to fit City constraints and preferences. Lystek routinely provides their system/services as part of a design/build/finance/operate model. This is a drastically different approach than the current design-bid-build process envisioned.
  - c. Gain an understanding of the Lystek product marketing business model and continue to work with Lystek to determine how that business model can be adjusted to fit within City constraints.

To date, the City and CDM Smith have held a daylong meeting and site visit with multiple key Lystek staff at the Franklin WRF and anticipate the need for multiple conference calls to coordinate with Lystek to help define the scope for the bid documents. We have assumed that three conference calls will be necessary as part of the scope of work.

3. Define and produce a conceptual design (~10% to 20% documents) for the revised biosolids system with the Lystek system as its core, and identification of the equipment/processes that will be retained, adjusted or eliminated; as well as, the determination of any new process additions that may be required for a complete operating system. The final process layout must allow the ability of Lystek to meet the process guarantee requirements for the system that the other alternative THP processes were required to meet.

Following the analysis of the conceptual design, the sizing of the ancillary and support systems and facilities (i.e., portions of the biosolids system not directly in Lystek's scope) will be completed to allow for the performance of the cost analysis for the overall biosolids system. Draft figures and concepts will be developed and shared with the City in a summary memo and discussed as a group at a meeting attended by the core CDM Smith team (project manager, client service leader, and lead technical staff member).

4. Preparation of a pre-selection bid package. The package will include detailed performance based technical specifications, which will also include specific materials and equipment requirements. The package will include a bid sheet, measurement and payment details, a 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 draft package will be submitted to the City for review, and a conference call will be held to obtain City input. After receiving input, the bid package will be finalized and transmitted to Lystek for their detailed response. The package will have a defined response schedule similar to the previous package for Cambi and Krueger.

5. Once the package is transmitted to Lystek, CDM Smith will provide appropriate responses to any questions/comments from Lystek during their proposal preparation.
6. Once the bid package from Lystek is received, CDM Smith will provide an initial review of the Lystek proposal. The Lystek proposal will be reviewed, and an initial assessment will occur with the goal to identify any gaps in information provided. A letter requesting any additional required information will be prepared and transmitted to the City for review. A conference call will be held to obtain any City input, and the letter will be revised and transmitted to Lystek.
7. Upon submittal of the final response, final review of the Lystek proposal will be conducted.
8. Performance of a cost and non-cost analysis will be completed. Using the information provided by Lystek in their package, along with the documentation previously provided by Cambi, CDM Smith will perform an analysis similar in scope to the analysis performed for the Cambi/Krueger THP pre-selection. The analysis will include capital cost comparison, operation and maintenance cost comparison, life-cycle cost comparison, and non-cost comparison. A report similar to that produced for the Cambi pre-selection will be prepared. An internal draft of the report will be reviewed by CDM Smith technical experts and then revised and transmitted to the City for review. After the City has completed its review, CDM Smith will hold a review meeting with the City and subsequently finalize the report. The meeting will be attended in person by the project manager and client service leader and by others by phone.
9. If necessary, CDM Smith will assist the City with the preparation and presentation of the findings to the City administration and Board of Mayor and Alderman (BOMA). This scope of work includes one meeting for BOMA.
10. Upon approval by the City, CDM Smith will assist with obtaining a signed commitment letter from the successful manufacturer, if it is deemed necessary to change from the current direction.

The above scope will be broken out into two tasks as part of this proposal to allow the City to determine the appropriate level of effort required for the analysis. The tasks shall include: Task 1A, Preliminary Evaluation and Impact Assessment Memorandum, and Task 1B, Detailed Evaluation and Comparison of Lystek versus Cambi. This task was originally conceived as a single process; however, as research into the proposed Lystek process and the development of the solicitation package proceeded, it became clear that implementation of the Lystek process for the Franklin WRF would have very significant technical and economic impacts and would require a significant process to perform a full evaluation of the two technologies. The purpose of the proposed Task 1A is to establish a decision point where the process could be truncated if BOMA feels that the higher-level analysis completed by CDM Smith which compares the regulatory options, non-cost factors and potential added expenditures and project delays for redesign required as part of Task 1B are not in the City's best interest.

**Task 1A, Preliminary Evaluation and Preparation of an Impact Assessment Memorandum**

At this juncture in the evaluation, CDM Smith has developed a rough draft of the bid document that would be necessary to obtain a quote from Lystek. While performing the necessary research and bid document development, it became clear that there would be very significant impacts associated with changing direction on the biosolids treatment system design. In response to this occurrence, the Water Management Department asked CDM Smith to prepare an initial memorandum outlining the high-level evaluation and feedback from regulators, as well as design and construction impacts to obtain input from BOMA on whether or not to stay the course on the full-blown Lystek evaluation.

Task 1A includes completion of subtasks 1 and 2, completion of a first draft subtask 3, preparation of a rough draft of subtask 4, and preparation of the impact assessment memorandum. The documents produced in subtasks 1 and 2 have not been delivered to the City at this point and would be progressed to a deliverable form under Task 1B, should the City elect to continue through the full evaluation. A draft of the impact assessment memorandum has been produced and reviewed by a CDM Smith technical expert, revised and submitted to the City for review. CDM Smith has participated in an initial review of the document with senior City staff and elected officials and stands ready to modify the document as required based on the review.

Current expenditures on this task are approximately \$50,000 as indicated in this proposal cost table. Should the City decide to truncate the overall evaluation proposed in Task 1B, additional support is still anticipated to be required to finalize the report and provide any further coordination on the process. It is difficult to define the additional support the City will need in response to the documents internal and external review and feedback. As such, we propose establishing an allowance for post memorandum support. Currently, as indicated in our proposal cost table, we anticipate \$10,380 for this final support and updates.

**Task 1B, Detailed Comparison of Lystek and Cambi**

As discussed, this task will include a full-blown comparative evaluation of the Lystek and Cambi processes with final recommendation memorandum to the City. In general, this task would include completing subtasks 3 and 4 as defined above and completing the additional analysis and deliverables discussed in subtasks 5 through 10. This work is currently listed as an optional task and will not be completed without the direction of the City of Franklin staff.

**Task 2, Assistance and Evaluations in Response to Public Input**

This task includes assistance with responses to public comments, inputs, and requests with respect to the proposed treatment system construction.

**Task 2.1, Preparation of Responses to July 25, 2016 Chestnut Bend HOA Letter**

This task involved the general assistance and preparation of responses to the comments and questions received from the Chestnut Bend Homeowners Association (CBHOA) and Harpeth River Watershed Association (HRWA) as a follow-up to the July 14, 2016 public meeting held as part of the requirements for the State Revolving Fund process. The response support and composing of a formal letter response required a significant effort that included research and

information gathering to address comments and questions, as well as claims made by both parties. The letter has been drafted, reviewed by the City staff and shared with the appropriate parties.

### **Task 2.2, Preparation of Process Fact Sheets for Public Education**

In response to additional comments and questions from HRWA and CBHOA with respect to the potential off-site impacts of the existing and proposed processes; as well as the opportunity to educate the public and system customers on the proposed improvements, the City decided to produce process fact sheets that systematically addressed the following topics for each major process proposed for the plant:

- Purposes and benefits of process,
- Description of process,
- Identification of process modifications to be made,
- Potential for odor production and measures taken for odor control,
- Noise production potential and measures taken for noise control,
- Impacts to look and feel of the site, and
- Safety considerations.

The 15 process fact sheets that CDM Smith developed, in conjunction with the City staff, provide information to all parties interested in the project and give a non-technical general description of the key process upgrades at the plant. The fact sheets are limited to two pages in length each and focus on the issues of highest importance for each process. These fact sheets are available on the City's Water Management Department website and have been available to attendees at multiple public events and hearings. These quick reference guides are anticipated to receive continued use as the City moves through the next 3-4 years of bidding and construction efforts on the facility.

### **Task 3, Continuing Support for the SRF and Permitting Processes**

The SRF and NPDES permitting process timeframes and efforts have continued to expand due to the public response and prolonged process. This continues to result in significant additional incurred costs; as well as, anticipated future costs for CDM Smith through the bidding and award of the construction contract. Currently, the project is anticipated to advertise in July or August and be finalized with an executed contract with the general contractor in December of this year. The increased efforts are associated with continued week-to-week coordination efforts between CDM Smith, SRF, TDEC, and the City, additional meetings and conference calls to discuss the project status and comments, and response to additional SRF and TDEC questions and requirements. These expanded efforts and coordination has proven beneficial recently with the City's proposed SRF loan being expanded from the original commitment of \$45 million to almost \$80 million dollars. Although the exact interest and fee savings cannot be determined until the loan is finalized, this total financed funding is anticipated to save the City well over \$25 million over the life of the loan compared to traditional bonds.



To capture incurred time to date plus estimated future costs, we propose establishing a task budget of \$136,920 for the period from August 2016 (effective date of previous amendment) through the anticipated completion of bidding and award of the project to the selected general contractor in December 2017 (72 weeks). This budget was derived assuming the following weekly charges based on our historical tracking of the project to date and estimated needs of the project going forward:

<u>Staff Role</u>	<u>Hours per week</u>
Project Manager	4 hours
Client Manager/Technical Specialist	2 hours
SRF Specialist	4 hours
<u>Administrative Support</u>	<u>2 hour</u>
Total	12 hours per week (864 total hours)

#### **Task 4, Additional Project Management**

As the duration of the project has extended, so have the daily, weekly and monthly management tasks required to conduct and complete the project. These tasks include additional management from August 2016 (date of last amendment) to December 2017 (anticipated completion of bidding and contracting for construction). The efforts under this task are broken into subtasks for 1) monthly coordination meetings and 2) monthly reporting and tracking, including budget and expenditure tracking, coordination calls with City staff, and internal team meetings and coordination.

For monthly coordination meetings, we have continued to budget for one monthly coordination meeting with City staff to address the work completed in the previous month and work that is required to be addressed in the upcoming months. This meeting will continue to be attended by project manager (Bob Huguenard), client manager/representative (Zack Daniel) and the assistant project manager, as well as other technical support staff as required for the specific topics to be discussed. In addition to the meeting itself, this task will include all required meeting preparation, including agenda and updated schedule preparation, and meeting minutes preparation and distribution to the project team.

Monthly reporting and tracking includes tracking of progress against budgets and schedules, updating of schedules and other tracking tools, preparation of monthly status reports, preparation of invoices, and planning for the coming monthly period. In addition to the other external monthly coordination, CDM Smith will continue to conduct internal coordination calls and team meetings as required to meet all requirements of the project.

To capture incurred time to date plus estimated future costs, we propose establishing a task budget of \$235,800 for the period from August 2016 (effective date of previous amendment) through the anticipated completion of bidding and award of the project in December 2017 (72 weeks). This budget was derived assuming the following weekly charges based on our historical tracking of the project to date:



<u>Staff Role</u>	<u>Hours per week</u>
Project Manager	6 hours
Client Manager	4 hours
Assistant PM/Engineer	4 hours
Technical Specialist	2 hours
Senior Engineer	2 hours
<u>Administrative Support</u>	<u>2 hour</u>
Total	20 hours per week (1,440 total hours)

### 3.0 Time of Completion/Schedule

Amendment No. 4 extends the contract period of services for the above mentioned scope of work from the previous services in August 2016 (per Amendment #3) to December 2017 for all tasks associated with the design, permitting, and bidding phase services for the project. This proposed timing aligns with our current estimated project schedule which anticipates advertising the bid for the project in July/August of 2017 and the award the project, by BOMA, in December of 2017. Delays outside of CDM Smith's control, particularly associated with the NPDES and SRF funding processes, have continued to delay the project to date and may continue to result in an extension of this anticipated schedule and potential additional costs to proceed with the project through bidding. As has occurred to date, CDM Smith will continue to keep the City staff apprised of the schedule and potential impacts at our monthly progress meetings; as well as, any delays potential impacts on the costs of services.

### 4.0 Compensation and Payment

The work in this amendment will be performed for an additional not-to-exceed budget of \$580,880. A breakdown of the cost for this amendment is provided in Table 1. The work will be performed on a billing rate basis in accordance with the rates established in the original contract. Please note that the cost to take the Lystek evaluation to culmination is included in this proposal as a separate optional task (Task 1B) in order that the City may easily remove the task and cost from the proposal if so desired. The total proposed amendment, without Task 1B, is \$482,750.

**Table 1**  
Summary Spreadsheet  
Franklin WRF Amendment 4

	Task No.	1A Lystek - Preliminary Evaluation and Impact Assessment Memo	1A Lystek - Memo Finalization, Post Public Assistance	1B Lystek - Detailed Comparison of Lystek vs. Cambi (Optional)	2 Assistance in Response to Public Input, Public Education	3 Continuing Support During SRF and Permitting Processes	4 Additional Project Management Services/ Staff Support	Total	Total without Task 1B (Detailed Lystek Evaluation)
<b>LABOR</b>	Rate								
Officer	\$215	24	8	80	16	144	288	560	480
Project Manager	\$170	60	16	140	80	288	432	1016	876
Senior Technical Specialist	\$190	60	0	32	40	0	0	132	100
Technical Specialist	\$170	40	32	80	60	0	144	356	276
Senior Eng./Sci/SRF Specialist	\$150	0	0	0	40	288	144	472	472
Engineer/Scientist	\$120	120	0	60	80	0	288	548	488
Junior Engineer/Scientist	\$100	0	0	240	0	0	0	240	0
Administration	\$75	10	0	40	0	144	144	338	298
TOTAL HOURS		314	56	672	316	864	1440	3662	2990
TOTAL DOLLARS		\$48,710	\$9,880	\$94,880	\$50,440	\$133,920	\$226,800	\$564,630	\$469,750
<b>OTHER DIRECT COSTS</b>									
Car Mileage		\$0	\$250	\$750	\$0	\$1,000	\$4,000	\$6,000	\$5,250
Hotel		\$500	\$250	\$1,000	\$0	\$500	\$2,000	\$4,250	\$3,250
Document Reproduction		\$250	\$0	\$1,000	\$250	\$1,000	\$2,000	\$4,500	\$3,500
Shipping		\$500	\$0	\$500	\$0	\$500	\$0	\$1,500	\$1,000
TOTAL ODCs Plus 0% Markup		\$1,250	\$500	\$3,250	\$250	\$3,000	\$8,000	\$16,250	\$13,000
<b>OUTSIDE PROFESSIONALS</b>									
Subtotal OPs		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTALS</b>		<b>\$49,960</b>	<b>\$10,380</b>	<b>\$98,130</b>	<b>\$50,690</b>	<b>\$136,920</b>	<b>\$234,800</b>	<b>\$580,880</b>	<b>\$482,750</b>