



1202 Musser Street  
Muscatine IA 52761-1645  
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MEMORANDUM

WATER & RESOURCE RECOVERY FACILITY

To: Gregg Mandsager, City Administrator

CC: Nancy Lueck, Finance Director  
Cinda Hilger, Administrative Secretary

From: Jon Koch, WRRF Director

Date: June 4, 2019

Re: WRRF Resource and Energy Pilot

I have been working with Jim Patchett of Conservation Design Forum (CDF) on a private pilot for the biogas portion of the MARRVE project. They have secured an American Recovery & Reinvestment Act (ARRA) grant through the Iowa Energy Office of the Iowa Economic Development Authority to perform the pilot at no cost to the City. This will aid in the next phase where we will be looking at how to clean, transport and sell the biogas created through the High Strength Waste Receiving Project.

They will conduct research at our facility to identify uses for the biogas and biosolids then conduct a two day visioning and planning workshop for our staff and stakeholders like Alliant Energy.

I would like to present this to Council at the June 13<sup>th</sup> in-depth session to receive approval to send a formal letter of support from the City Council to proceed with the project.



## Conservation Design Forum

Ecological Design Services • Landscape Architecture • Planning • Civil / Water Resources Engineering  
Sustainable Urbanism • Ecosystem Sciences

11 June 2019

Mr. Jon Koch, Director  
Water & Resource Recovery Facility (WRRF)  
City of Muscatine Department of Public Works  
1202 Musser Street  
Muscatine, Iowa 52761

### **Re: Comprehensive Municipal Waste Resource Recovery & Energy Generation Pilot Demonstration Project**

Dear Jon:

On behalf of our multi-disciplinary professional Project Team, with support from the Iowa Energy Office of the Iowa Economic Development Authority, I am very pleased to invite the City of Muscatine and the Muscatine Water & Resource Recovery Facility to participate in an innovative Municipal Wastewater Resource Recovery and Energy Generation pilot study. This unique public/private partnership is focused on showcasing how it is possible to eliminate the concept of waste by combining mature and proven technologies in creative ways. The holistic nature of this multi-disciplinary approach will focus on the identification and expanded research and application of cost-effective strategies for waste to energy conversion. Equally important is the identification of innovative wastewater discharge enhancement measures that absorb nutrients and provide enhanced disinfection through biological and other innovative means that not only meet but exceed emerging and increasingly rigorous regulatory guidelines.

Our Project Team is composed of nationally and internationally noted pioneers in the design, development, and operation of sustainable, integrated water, waste, and energy systems. We have the combined expertise to provide complete design/ build/ operations/ and financial support services for government and industrial wastewater clients. The pilot study will represent an initial phase of analysis and conceptual design to provide "Proof of Concept". These efforts will be primarily supported by an Iowa Energy Office grant under the American Recovery & Reinvestment Act (ARRA) funding program. The scope of the pilot study will involve a thorough analysis of existing conditions within and adjacent to the wastewater facility, and an examination of the land use character of the surrounding urban and rural watersheds that affect inflow and outflow. The Project Team will evaluate potential revenue generating waste to energy conversion strategies such as biogas and biochar production and examine a variety of water treatment measures that can establish new, unprecedented standards for water quality enhancement.

For this initial effort, the IEDA and the Project Team will select two (2) Iowa pilot communities. The team will work collaboratively with representatives from each pilot community and the Iowa Energy Office to assemble and review existing relevant site and community data. Following the in-office review effort, representatives from each of our multi-disciplinary team members will convene to conduct a two-day visioning and planning workshop. The workshop sessions will serve to gather input from community representatives and stakeholders, and to collectively introduce and explore a wide range of innovative options for energy and water enhancement measures within the existing wastewater facility, as well as strategies to reduce inflows and improve water quality in the adjacent urban and rural watersheds. Once the range of alternative strategies has been identified

and vetted, the team will begin to craft a preferred concept for each community that outlines the basic suite of recommended measures, along with a preliminary cost/benefit analysis that will serve as a "Proof of Concept". With the approval of the pilot community, this document will be used by the Project Team and the IEDA to reach out to potential funding partners.

The services outlined above will be provided at no cost to the two (2) selected Pilot communities. Furthermore, there is no obligation to proceed with the recommendations that will be developed as a result of this process. The IEDA and the Iowa Energy Office, however, do encourage the Pilot communities to strongly consider the implementation of measures that will clearly provide financial, environmental, and social benefits to the participating communities.

In order to proceed with project implementation, including the data collection and workshop tasks, the IEDA requests a formal letter of support from the City Council of each designated Pilot community. We would be very pleased to work with you and the City of Muscatine on this important endeavor and hope that community leaders will support our request for support. The City of Iowa Falls has already agreed to serve as a pilot community, and we intend to proceed with the analysis and workshop phases for both selected communities within the next several weeks. We anticipate that the initial phase of studies and planning will be completed prior to the end of the calendar year.

Should you have any questions or require additional information following your review of this request, please do not hesitate to contact me directly. We are eager to share the full breadth of our professional experience as it relates to this important project and want to thank you again for your consideration. We look forward to hearing from you soon.

Sincerely,  
James M. Patchett, FASLA, LEED AP  
Founder and President  
Conservation Design Forum  
403 W St. Charles Rd., Lombard, IL 60148  
630.559.2000  
jpatchett@cdfinc.com

The members of our diverse professional Project Team include the following partner firms:

Conservation Design Forum [www.cdfinc.com](http://www.cdfinc.com)  
Jacobs Engineering Group [www.jacobs.com](http://www.jacobs.com)  
Wakefield Biochar [www.wakefieldbiochar.com](http://www.wakefieldbiochar.com)  
Greenleaf Advisors LLC [www.greenleafadvisors.net](http://www.greenleafadvisors.net)  
Biohabitats [www.biohabitats.com](http://www.biohabitats.com)  
Northern Filter Media [www.northernfiltermedia.com](http://www.northernfiltermedia.com)  
Solutions in the Land [www.solutionsintheland.com](http://www.solutionsintheland.com)  
John Todd Ecological Design [www.toddecological.com](http://www.toddecological.com)  
GlidePath™ Power Solutions [www.glidepath.net](http://www.glidepath.net)  
Moxie Solar [www.moxiesolar.com](http://www.moxiesolar.com)



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To: Iowa Economic Development Authority-Energy Office  
From: Muscatine City Council  
Date: June 13, 2019

Re: ARRA Grant

To whom it may concern:

The City Council of Muscatine has been presented the information involving an American Recovery and Reinvestment Act grant for the City's Water and Resource Recovery Facility. The Conservation Design Forum team led by Jim Patchett has proposed to work with the City to plan use of the biogas created from the Muscatine Area Resource Recovery for Vehicles and Energy (MARRVE) waste to energy program. It is the City's desire to utilize this renewable energy source in the most effective and beneficial manner.

We hereby formally support the work as proposed and encourage the CDF team and City staff to proceed with the pilot project. The Muscatine City Council is excited for this opportunity and will strongly consider the implementation of measures that will clearly provide financial, environmental, and social benefits to our community.

Sincerely,

Diana Broderson  
Mayor



## Conservation Design Forum

Ecological Design Services • Landscape Architecture • Planning • Civil / Water Resources Engineering  
Sustainable Urbanism • Ecosystem Sciences

March 29, 2019

RYAN YOUNG, PROJECT MANAGER  
IOWA ECONOMIC DEVELOPMENT AUTHORITY  
IOWA ENERGY OFFICE  
200 E GRAND AVE  
DES MOINES, IA 50309

Re: **Proposed Work Plan & Project Budget**  
Comprehensive Municipal Waste Resource Recovery & Energy Generation Pilot Demonstration Projects  
Two (2) Iowa Communities

Dear Ryan:

On behalf of our multi-disciplinary professional team, Conservation Design Forum is pleased to submit the following proposed Work Plan, deliverables, anticipated schedule, and associated budget for your review and consideration. The Work Plan outlines a series of tasks associated with the organization and implementation of an innovative municipal waste resource recovery and energy generation planning workshop leading to the preparation of conceptual conversion plans including Proof of Concept for each pilot community.

As described in the following Work Plan outline, our Project Team will help lead and participate in two community workshops. Each workshop will cover a two-day period that will provide adequate time for the Project Team to completely familiarize team members with existing wastewater treatment facilities including their layout, function, technologies, capabilities, and potential challenges with respect to meeting evolving regulatory standards for disinfection and nutrient reduction.

Following a facility tour, the workshop sessions are intended to allow participants an opportunity to explore the full range of integrated waste conversion, energy generation, and water quality enhancement measures that can be brought to bear through the expertise of our diverse Professional Team members in cooperation with local community and representatives from the IEDA and the Iowa Energy Office. The workshop session will include breakout sessions, discussions, and presentations on the various strategies explored by the workshop participants.

Prior to conducting the workshop, CDF staff will work with representatives from the pilot communities to assemble and disseminate for review all pertinent data concerning facility layout and operations, and surrounding conditions and land uses that may affect the selection of preferred solutions.

In accordance with our previously submitted ARRA Pre-Application document, our Project Team presents the following work plan and corresponding budget for your final consideration.

**Task 1 – Project Definition Meeting, Data Collection, & Pre-Workshop Document Review**

A project organizational meeting will be conducted with representatives from each of the pilot communities and key members of our Project Team to initiate the project. The purpose of the meeting is to review the basic goals and objectives of the project, to coordinate the collection and distribution of critical background documentation concerning each community's wastewater facility, as well as site and surrounding land uses, surrounding urban and rural watershed characteristics, and other information of importance to the potential design solutions. The Project Team will review the overall recommended project approach and confirm the anticipated project schedule and budget. CDF staff will be responsible for data collection and distribution to Project Team members and will produce appropriate base maps and other support graphics that will be used for the technical workshop sessions.

**Task 2 – Conduct Technical Workshop Planning Sessions for each of the Two (2) Selected Pilot Communities**

The Project Team will help coordinate and conduct two (2) pilot community Technical Workshop Sessions, one in each of the selected communities. The technical workshop sessions, as described above, are intended to allow participants an opportunity to explore the full range of integrated waste conversion, energy generation, and water quality enhancement measures that can be brought to bear through the expertise of our diverse Professional Team members in cooperation with local community and representatives from the IEDA and the Iowa Energy Office. The workshop session will include breakout sessions, discussions, and presentations on the various strategies explored by the workshop participants. It is anticipated that by the completion of each workshop session, a general concept will be developed, and consensus direction agreed upon leading to the following plan refinement and proof of concept phase.

CDF staff will be responsible for coordination of the technical workshop logistics and organization including administration, invitation, meals, location, working session materials, printed materials, and similar needs.

**Task 3 – Preparation of Refined Conceptual Plan Approach for Each Pilot Community Including “Proof of Concept” & Community and IEO Presentations**

Upon completion of the site visit and technical workshop planning sessions, the Project Team will work collaboratively to prepare refined concepts for each community's wastewater facility and surrounding areas as described in the Pre-Application Document. An overall cost/benefit analysis will be prepared for all concepts. Potential funding partners will be identified. Detailed design and implementation strategies will be identified and outlined for anticipated next steps.

**Task 4 – Final Concept Refinement and Presentation to Pilot Communities and the Iowa Energy Office including Recommended Next Steps for Project Implementation**

At the completion of Task 3, Project Team members will return to present our findings to each of the Pilot Communities and to representatives from the Iowa Energy Office and the Iowa Economic Development Authority. All aspects of each community project will be reviewed and discussed with the intent to develop consensus direction concerning to potential of moving forward with detailed design and project implementation phases of pilot initiatives. The “Proof of Concept” documents will also include a discussion of anticipated research and educational outreach measures that would be conducted in collaboration with extended team partners from the University of Iowa, or other potential educational and research affiliates.

**Anticipated Project Schedule**

Our Project Team is prepared to initiate this effort immediately upon authorization from the Iowa Energy Office. We envision a 5-6-month timeframe to complete the technical workshop sessions, prepare refined Proof of Concept Plans, review them with the IEO and the Pilot Communities, and outline a clear vision for proceeding with

the detailed design and implementation phases of each project, depending upon community interest and funding support, which we anticipate will be forthcoming.

### Project Budget

Our Project Team will complete the basic services described above for a lump sum fee for Tasks 1 thru 5 of \$95,000 including reimbursable expenses (estimated at \$7,000.00, see below).

Task	Description	Estimated Fee
1	Project Definition Meeting, Data Collection & Pre-Workshop Document Review	\$5,000.00
2	Conduct Technical Workshop Planning Sessions for each of the Two (2) Selected Pilot Communities	\$58,500.00
3	Preparation of Refined Conceptual Plan Approach for Each Pilot Community Including "Proof of Concept" & Community and IEO Presentations	\$15,000.00
4	Final Concept Refinement and Presentation to Pilot Communities and the Iowa Energy Office including Recommended Next Steps for Project Implementation	\$9,500.00
5	Anticipated Reimbursable Expenses	\$7,000.00
	<b>Total</b>	<b>\$95,000.00</b>

### Reimbursable Expenses

Costs for all project expenses including shipping, courier services, printing, plotting, reproductions, aerial photographs, maps, supplies, and travel expenses including mileage will be invoiced monthly at cost. Details of all reimbursable expenses will be included with each monthly invoice.

James M. Patchett, FASLA, LEED AP  
 Founder and President

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