



### ADDENDUM # 3

**Date:** June 26, 2015

**Project:** Feasibility Study- Biomethanization Project

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Bidders must make sure that their bids are based on the latest version of the tender documents published and take into consideration the following amendments and information, including any information provided on amendments or Q&As previously published for this project.

Bidders that do not comply with this requirement will be discarded.

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#### **8. REQUEST FOR PROPOSALS, cover page**

**REPLACE:** "Solicitation Closes: **Monday, June 29, 2015, at 02:00 PM, EDT.**"

**WITH:** "Solicitation Closes: **Friday, July 3, 2015, at 02:00 PM, EDT.**"

#### **9. Appendix B, Statement of Work**

**REPLACE:** Appendix B, Statement of work document.

**WITH:** Appendix B, Statement of Work, Revision #1: June 26, 2015. Please find it attached.

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**All other conditions and requirements remain unchanged**



**APPENDIX “B”**  
**STATEMENT OF WORK**  
**Revision #1: 2015-06-26**

**Statement of Work**

**Purpose**

The purpose of this document is to provide an overview of the project and the services to be provided by the Consultant over the course of the project, and to describe the content and format of the deliverables.

**Project specifics**

**Project title and number**

Project title: Independent Feasibility Study – Biomethanization Project

Location: Dairy and Swine Research and Development Centre (DSRDC) - Sherbrooke

Project number: 01B46-15-0033

**Background**

According to the United Nations Food and Agriculture Organization (FAO), world demand for dairy products and meat is expected to double by 2050. It is therefore important for AAFC to be innovative in its processes and procedures in order to reduce the environmental footprint of its livestock production operations.

Given its two-fold mandate of livestock production and production of livestock feed, the goal of the Dairy and Swine Research and Development Centre (DSRDC) is to become a demonstration platform and technology showcase by developing various initiatives and innovations in order to demonstrate the feasibility of reducing the environmental footprint of livestock production. To this end, AAFC has developed a new high-performance, low-temperature anaerobic digestion technology in order to create value from liquid and solid animal waste.

In this context, the purpose of this independent feasibility study is to evaluate the prospects for improving the efficiency of swine and dairy operations by creating value from liquid and solid animal waste by biomethanization using those new technologies. For information, the DSRDC has a herd of 150 dairy cattle. Dairy operations are concentrated in Building #76. The solid and liquid fractions of manure from the dairy herd are separated and stored in two separate structures. The solid fraction is stored in two rectangular pits and the liquid portion in a circular pit. This pit also receives the wash water from the dairy complex. In addition, the centre has an experimental swine complex (Building #7). A liquid management system is used for the management of manure produced in the swine complex.



## **Project objectives**

In 2013, AAFC awarded a contract to Bio-Terre Systems Inc. for the delivery of plans and technical specifications, a Class A estimate related to the construction of an anaerobic bioreactor at the Dairy and Swine Research and Development Centre in Sherbrooke.

AAFC requires an independent feasibility study before proceeding with subsequent phases in the global project. An independent feasibility study cannot be done by an entity linked or having a business link to Bio-Terre. Consequently, those with entities linked or having a business link to Bio-Terre cannot bid.

This study, independent of that of Bio-Terre System Inc. team, must examine key questions described in the Consultant's terms of reference section.

The objectives of the feasibility study are divided into two phases:

### **Phase I**

- 1) In the first phase, the feasibility study will analyze the quantity and quality of the inputs (liquid and solid animal waste and not edible silage) available at the DSRDC. The first phase of the feasibility study will also analyze the methanogenic potential as well as the energy potential of the available inputs and provide a recommendation as to whether the DSRDC has a sufficient quantity and quality of inputs to support a biomethanization facility.

### **Phase II**

- 2) Should it be determined that the DSRDC has the necessary inputs on site to support a biomethanization facility, the second phase of the feasibility study will consist in analyzing the high-performance, low-temperature anaerobic digestion technology developed by AAFC and commercialized under licence by Bio-Terre Systems for liquid animal waste and another low-temperature anaerobic digestion also developed by AAFC for solid animal waste. In addition, the study will determine whether a project at the DSRDC using those specific technologies is financially viable and technically feasible according to two scenarios. The study will also analyze the potential environmental benefits of such a project (reduction in air pollution, reduction in odours and in soil and water contamination, potential reduction in greenhouse gases such as CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, potential reduction in fossil energy consumption, potential reduction in mineral fertilizers, etc.). In addition, the study will provide preliminary estimates (Class D) as well as preliminary design and engineering drawings.

## **Applicable Standards**

The feasibility study will take into consideration all the standards, codes and regulations applicable to this field of specialization.

The firm who will be awarded the contract pursuant to this Request for Proposal MUST mandatorily sign a confidentiality agreement with Bio-Terre Systems Inc. and AAFC.

By submitting a bid, the Consultant accepts this condition.



**Scope of the consultant’s services**

Provide professional environmental consulting services and produce a report to meet the objectives of this Request for Proposals, as described in the “Consultant’s terms of reference” section.

**Project parameters**

**Site access: The site is accessible during the day from 8:00 a.m. to 4:00 p.m.**

Access to facilities must be arranged with the research centre facilities manager, who will be identified when the contract is awarded.

**Available documents (after contract award)**

- 1) Plans of the dairy complex (Building #76 - 2010)
- 2) Plans of the swine complex (Building #7 - 1998)
- 3) Confidentiality Agreement

**Targeted project milestones**

**Activities – Phase I**

Surveys, review of the documentation and validation of requirements with the client	2 weeks
Presentation of the results of Phase I of the report	2 weeks
Client comments	1 week
Submission of the preliminary report	1 week

**Activities – Phase II**

Presentation of the results of Phase II of the report	3 weeks
Client comments	1 week
Submission of the final version of the report	1 week
<b>Total</b>	<b>11 weeks</b>

**Requested services**

**Consultant’s terms of reference**

Under the terms of reference of this contract, the Consultant will provide the following services and include the following elements in its report:



## Phase I

- 1) Review the requirements with the Departmental Representative
- 2) Conduct a literature review of the documents; available after contract award.
- 3) Analyze the high-performance, low-temperature anaerobic digestion technology developed by AAFC for liquid and solid animal waste
- 4) Conduct a complete on-site survey of the facilities
- 5) Determine the quantities of usable animal waste at the DSRDC for the purpose of biomethanization
- 6) Characterize the usable waste (liquid and solid animal waste and not edible silage)
- 7) Analyze the quality of the inputs
- 8) Analyze the methanogenic potential of the site's usable inputs
- 9) Analyze the energy potential of biogas production (in m<sup>3</sup>)
- 10) Determine and make a recommendation as to whether the site is a potential candidate for the establishment of a biomethanization facility. Indicate which inputs can or cannot be used in the biomethanization facility using the technology developed by AAFC.
- 11) Submit a preliminary report with the results and recommendations of Phase I to the Departmental Representative and hold a meeting at the DSRDC to present the content and recommendations of the preliminary report.

## Phase II (this phase is optional and depends on the conclusions of Phase I)

- 1) Analyze two options for use of the biogas: one option involving using the biogas to heat only the bioreactors and burning the excess in a flare, and another option involving using the biogas for various uses in buildings (heating, lighting, etc.)
- 2) Provide a flow chart diagram describing each of the proposed components for each of the options analyzed
- 3) Analyze and select the best potential location for the installation of the biomethanization infrastructure components for each of the options analyzed (e.g. location of the digesters, the control building, the storage building for the pre-treatment of the substrates, the heat exchange or electricity production system, the system for the collection and treatment of the biogas produced, the blower and the separation units, etc.)
- 4) Provide preliminary design and engineering drawings for each of the options analyzed



- 5) Analyze the method for the collection and transport of liquid and solid animal waste and not edible silage to the two biomethanization units
- 6) Estimate the number of workers who will be required to keep the biomethanization infrastructures operational
- 7) Estimate the annual costs to operate and maintain the facilities for each of the options analyzed
- 8) Analyze and recommend solutions for the use of the digestate
- 9) Determine the necessary permits and certificates relating to the operation of a biomethanization infrastructure in Quebec
- 10) Estimate the potential reduction in greenhouse gases such as CO<sub>2</sub>, CH<sub>4</sub>, NO<sub>2</sub> for each of the options analyzed
- 11) Estimate the emissions of atmospheric contaminants for each of the options analyzed
- 12) Carry out a preliminary financial analysis to evaluate the economic viability of the project according to the two aforementioned options
- 13) Determine the potential financial incentives available from various provincial and municipal government authorities, as well as from other organizations.
- 14) Prepare preliminary estimates (Class D) of the construction costs, including the various professional fees for the various disciplines required for the project (mechanical, electrical, structural, architectural, etc.) as well as contingencies for the two options analyzed
- 15) Submit a final report with the results and recommendations of Phase II to the Departmental Representatives and hold a meeting at the DSRDC to present the content and recommendations of the final report (Phase II)

### **Deliverables**

Presentation of the preliminary report with the results of Phase I	Meeting and report in PDF format
Presentation of the final report with the results of Phase II	Meeting and report in PDF format