MEMORANDUM

TO: Dr. R. Bowen Loftin
   President

THROUGH: Mr. Thomas H. Taylor
   Interim Senior Vice President for Administration

THROUGH: Dr. Karan Watson
   Interim Provost and Executive Vice President for Academic Affairs

SUBJECT: Recommendation from the Council on Built Environment: Anaerobic Biodigester

At its August 14, 2010 meeting, the Council on Built Environment reviewed the attached recommendation from the Technical Sub-Committee on a proposal to allow BioEnergy Partners of America (BEPA) to construct and operate an anaerobic biodigester on University land. The facility would be fully funded at a cost of $6M by BEPA and would be operated and maintained by the company. The Utilities & Energy Management department at TAMU would monitor the facility which will process and convert multiple types of biowaste to a bio-gas for generating electricity. There will be some profit-sharing to the University depending on the amount of waste processed.

There were some concerns about the odor, the traffic issues at the proposed site, and the fact that there is a similar digester currently in operation which also provides for research opportunities.

The Council on Built Environment approved the project, in concept, on the first alternate site at the current Wastewater Treatment Plant and now requests your approval of this recommendation in order for BEPA to continue development of this proposal. Please note that CBE will not give recommendation for approval until the concerns noted above are addressed.

Douglas J. Palmer, Dean
Chair, Council on Built Environment

Attachment

c: Members, Council on Built Environment
   Mr. Jim Riley
MEMORANDUM

To: Dr. Douglas Palmer  
Chair, Council for the Built Environment  

Subject: Proposed Construction: Anaerobic Bio-Digester Installation

RECOMMENDATION  
The Council for the Built Environment’s (CBE) technical sub committee (CBE-tsc) provides the following as a report to support the discussion and final recommendation(s) of the CBE regarding the proposed Anaerobic Bio-Digester Installation.

SCOPE  
The CBE-tsc met this morning with representatives of the University’s Utilities & Energy Management (U.E.M.) Office to consider the construction of an Anaerobic Bio-Digester on the TAMU Campus. The four acre site required for this facility is proposed to be located at the former Waste Water Treatment Facility, located generally south west of the FM-2818 and George Bush Drive intersection. The proposal includes providing the land to a non-university entity, which will construct and operate the facility, which will process campus bio-waste materials, creating the by-products: methane, fertilizer and water.

It is estimated that the non-University operator, BEPA (BioEnergy Partners of America) will invest over $6 million in the design and construction of the Anaerobic Bio-Digester.

ANALYSIS  
Facilities  
The general overview of the project was provided by U.E.M., which has additionally provided the attached 11 point response to the questions raised by CBE-tsc members and in other meetings on this proposal. Representatives from U.E.M and BEPA will be available to the CBE to provide answers to questions.

Bio-Digester Function  
It is proposed that the facility will process the bio-waste and other biodegradable substrates (manure, WWTP sludge, grass clippings, limbs, food wastes, etc) through a two stage process that transforms them into bio-gas that is used as fuel for a generator to produce electricity. Fertilizer and water will also be produced through this processing which can be distributed for campus use as appropriate.
Anaerobic Bio-Digester Installation
CBE-tsc Report
August 2, 2010
Page 2

Original Site
The original site was proposed adjacent and south of the Poultry Science Center on FM-2818. Based on concerns voiced by the CBE-tsc and others, the site was moved to the former Waste Water Treatment facility, just north of the Poultry Science Center. This quelled questions raised regarding the regulatory problems of the proximity to a former landfill, the approach path to runway 10-28 at Easterwood Airport and land use issues related to non-university developments. See attached current site map.

Odor Concern
Concerns were voiced by the CBE-tsc related to do with the potential for the odors which could be associated with this type of facility. The bio-materials to be injected into this facility for processing naturally have a distinctive odor and concerns were voiced by the committee as well as the City of College Station regarding how the odor would be mitigated. The proposed digester vendor BEPA has assured the university that this will be a no odor facility.

Parking and Campus Access
The parking requirements for the facility will be minimal for its operation.

Access to and from the facility will be of some concern. Entry to the site will be directly from FM-2818 on an existing driveway. To address the safety concern of utilizing the same drive to exit and attempting a left turn on FM-2818, against on-coming traffic, an alternative exit route has been suggested. The route will connect the site to George Bush Drive West. The route however will cross the existing Corps of Cadets Obstacle/training facility. The initial response from the Coordinator of the site was of great concern. It is recommended that if the Bio-Digester facility is approved that it come only after consultation and agreement by the Corps of Cadet interests. Depending on the volume of trucks exiting the site, there could be additional conflict with traffic exiting the Brayton Fire Training School and the fire trucks as they depart Fire Station #4, located at Easterwood Airport.

City of College Station
An e-mail from the College Station City Manager is attached for reference. The comments contained therein voice questions regarding:

1. **Land Use compatibility** regarding the proximity of the processing facility adjacent to multi-family residences (primarily student residents) in the area

2. Concern related to the **odors** coming from the facility
   - Suggested that contractually TAMU reserve the right to terminate operations with more than five complaints in two consecutive months.

Existing Bio-Digester Facilities
Since the CBE-tsc meeting, it has been discovered that a similar bio-digester facility, located in north Bryan has been in operation for some time and has a relationship with the TAMU Chemical Engineering Department. The **options related to augmenting the current bio-digester research relationship versus proceeding with the proposed BEPA facility will be presented to the CBE.**
Physical Plant

Review/comment of this project will be provided under a separate cover from this report.

Utilities

The needed infrastructure exists or will be provided as required to support this project.

Security and Safety

EHSD has the following issues/questions related to the proposed Bio-digester installation.
1. What are the byproducts of this process?
2. What contaminates can be expected in the effluents (air, water, etc)?
3. Who’s running the operation? Will BEPA have a full-time employee on-site?
4. Who will actually be delivering and processing the feed stock(s)?
5. What is the source of the feedstock(s)?
6. Will research be allowed with regard to the device? Could research affect contaminates in the effluents?
7. Has BEPA provided a copy of the quality controls that GHD (facility designer) provides?
8. Who is responsible for all state and federal licenses and registrations and who will be responsible for compliance with all required state and federal regulations?
9. EHS will require that both buildings be equipped with a fire alarm system.
10. EHS needs more information about the SOPs that will be in place with regard to the unit.
11. EHS needs a drawing that indicates the boundary of the landfill cap and the proposed 4-acre site. No construction activities of any kind are permitted on the landfill cap.
12. EHS is concerned that any odors generated by the unit could potentially cause public relations problems with nearby private land owners.

At the time of this writing, U.E.M indicated that most of EHSD’s questions had been addressed.

Student Affairs

Student Affairs representatives voiced a concern related to the potential odor associated with this operation and the threat it would pose to the students and other local residences living in close proximity to the bio-digester.

Telecommunications and Computing & Information Services

It was indicated at the CBE-tsc meeting that no additional telecommunication or IT services are required for this project. It is felt that this is unrealistic since in the long run, TAMU would inherit the structures. It is recommended that IT services/Phone service be provided to University standards.

Project Funding

Funding for the construction and operation will be provided by the successful RFP responded. BEPA will be contractually responsible for these items.
Anaerobic Bio-Digester Installation
CBE-tsc Report
August 2, 2010
Page 4

Logistic Services

All university rules related to the procurement of services or other materials related to the
proposed uses of this facility will be adhered to. Procurement Services has posted an RFP for a
firm to design, construct, operate and maintain a digester at no cost to the university. BEPA was
the successful respondent.

We are pleased to offer this report for this project and welcome further inquiries related to this analysis.

Sincerely,

[Signature]

James Massey
Chairman, CBE-technical sub committee
Director
Office of Facilities Coordination

Attachments
CC: CBE-tsc members
Texas A&M University
Anaerobic Bio-Digester Q&A

1. What is an anaerobic digester? What by-products will the digester produce?
   A. An anaerobic digester takes unprocessed bio waste and other biodegradable substrates (manure, WWTP sludge, grass clippings, limbs, food waste, etc.) through a two-stage process and transforms them into biogas (methane) that is used as fuel for a generator set engine to produce electricity. Bio-solids (bedding, fertilizer, and fiber-based products) with marketable value are also a by-product. A stream of water is also a by-product of the process that will be discharged directly to the TAMU sanitary sewer system, to be processed at the TAMU WWTP which is already permitted to process this type of effluent.
   B. The digester will meet all local, state and federal regulatory requirements, which will be the full responsibility of BEPA. The digester decomposition process significantly reduces odors that are naturally produced by manure and other biodegradable substrates which keeps odor to a minimum, maintains air quality, and provides fly and vector control.

2. Who will deliver the waste products to the digester?
   A. As per the request for proposal responded to by BEPA, TAMU Utilities & Energy Management (UEM) will provide the following estimated annual waste inputs (estimated by UEM) to the digester:
      - 2,050 tons of wet waste from food and animal waste
      - 90 tons of wastewater treatment plant sludge
      - 175 tons of tree limbs and mulch
      - Biodegradable substrates (food, grease, grass clippings, WWTP waste, etc.)
   Other possible sources of waste include:
      - Manure and animal waste (cattle, poultry, etc.)
      - Other regional bio-waste (as approved by TAMU)

3. Is research on the digester a possibility and will research contaminate the effluent?
   A. Research and teaching opportunities for TAMU (e.g. renewable energy, Agri-Life, Chemical Engineering) are promising and certainly welcome by BEPA. A growing number of universities are performing research on this type of digester process.
   B. The normal scope of research will not contaminate the effluent. Most research requires taking samples throughout the process, therefore BEPA does not foresee any problems.

4. What quality controls does the digester manufacturer (GHD) provide?
   A. Temperatures, flows, and other testing is routinely performed by BEPA and their affiliated companies (e.g. GHD, NEWCO), which assume full responsibility for operation and maintenance of the digester, including quality control and assurance that all material handling and permitting requirements are met.

5. Who is responsible for all local, state, and federal licenses, permits and registrations?
   A. BEPA will be responsible for all local, state and federal licenses, permits, and registration for the project. The City of College Station is concerned with odor control within city limits and will be providing a maximum odor standard to be maintained. Texas Commission on
Environmental Quality (TCEQ) will have responsibility that any required air or water permits are maintained.

6. Are there any waste outputs that require special handling?
   A. Other than the water effluent that will be directed to the TAMU sanitary sewer system and processed at the wastewater treatment plant, there is virtual no waste product. All other by-products such as the methane gas and fertilizer generated by the digester can be fully utilized and will be processed for use by BEPA. BEPA is responsible to maintain the genset and associated electrical gear that will generate electricity and also process and sell the fertilizer produced.

7. What will the actual building look like?
   A. This is a picture of a typical building to be installed with the below-ground digester tank to the right side of the operations building.

8. What materials will be used in the construction of the generator set building and the digester tank?
   A. The digester tank is comprised of poured concrete for all floors and walls, with pre-cast concrete panels for the roof. A poured-in-place concrete building with a metal roof and metal doors is proposed for the building that will house the generator set.

9. Will any other above-ground storage tank be required?
   A. Because all water effluent will be discharged to the TAMU sanitary sewer system, there is no need for any above-ground storage tank or water distribution system.

10. Will there be any air emissions requirements?
    A. The generator set will emit CO2 at low levels that will not require special permitting. An emergency flare will be incorporated into the design to burn off the methane gas produced in the event of a generator set shutdown. Although flaring of the methane will be rare and only required during emergency operation, necessary permitting will be obtained by BEPA.

11. How will truck delivery traffic flow into and out of the digester site.
    A. Vehicle ingress to the site will be from FM 2818 onto a university-owned road between George Bush Drive and Luther Street. It is proposed that the digester project will construct an extension to an existing gravel road to allow trucks to exit the digester site to the north, allowing egress onto George Bush Drive where an existing traffic light will facilitate safer entry back onto FM 2818. See attached site map for proposed roadway locations.
James,

I sincerely appreciate the University asking for the City's thoughts and opinions regarding the proposed Bio Digester. The City has a couple of questions and possible concerns with the proposed construction of the biodigester located generally on the west side of FM 2818, north of the intersection with Luther Street.

The first question we have is in regards to the compatibility of land uses as this is in an area that we have a large number of multifamily residences. Using the alternate location farther to the north does alleviate some of these concerns, but the new location does not totally eliminate the concern.

Also there is concern of odors coming from this facility. We understand that the facility needs to be air-tight to operate; however, we want to be assured that this facility would not create an odor for citizens living in this general vicinity and that the transport of the materials to the biodigester would not adversely affect nearby residents. Would TAMU be willing to put a clause in your contract with BEPA that gives TAMU the right to terminate the contract at no cost to the University if the City gets odor complaints - perhaps something like more than 5 complaints in two consecutive months. (Or some other trigger point that would be acceptable to all concerned).

Let me know if you have any questions about the above concerns, and again we appreciate your asking for our input.

Glenn

Glenn Brown
City Manager
979-764-3510

City of College Station--Home of Texas A&M University

8/17/2010
Project Concept Initiation Form

I. GENERAL PROJECT INFORMATION
A) Project name: Anaerobic Bio-digester
B) Type of project: 1) New building 2) Renovation 3) Addition 4) Deferred Maintenance 5) Other Capital Improvement
C) TAMUS System part: Texas A&M University
D) Department name: Utilities & Energy Management

II. PROJECT DESCRIPTION, JUSTIFICATION AND SCOPE
A. Description
Installation of anaerobic bio-digester on 4 acre tract of land near Solid Waste Mgmt Building
B. Justification:
TAMU Procurement Services posted an RFP for a firm to design, construct, operate, and maintain a digester at no cost to the University which will reduce bio-waste on campus. If installed, benefits will include reduced operational costs for solid waste disposal and potential for income to TAMU from electricity generation.
C. Scope:
1. Total estimated gross square feet
2. Total estimated net square feet
3. Total estimated cost
4. Will this project include education and general (E&G) space? [Yes] [No]

III. CAPITAL PLANNING
A. Is the project compatible with the strategic plan of the requesting division or agency? [Yes] [No]
B. Is this project on a TAMUS capital plan? [Yes] [No]
C. Source of funds: Third party financing and installation
D. Fiscal year during which the project will be initiated:

IV. LOCATION OF REQUESTED BUILDING SITE
West of Hwy 2818 near intersection of Luther Drive and Hwy 2818.

Initiator's name: Jim Riley
Phone number: 979-845-7210

The project described above is endorsed by this division or agency of the Texas A&M University System, and is offered for consideration as an agenda item of the CBE's technical subcommittee:

[Signature]
Vice President/Agency Director

2010
Anaerobic Bio-Digester Land Use Proximities

1/2 mile radius

08/18/2010
Proposed Anaerobic Bio-Digester Installation at Texas A&M University

Presented to:
Council for the Built Environment October 13, 2010

Key Points and Benefits

Bio-Energy Partners of America (BEPA) proposes to finance, design, construct, operate, maintain, and manage an anaerobic bio-digester located at the TAMU wastewater treatment plant at no cost to the University.

Improved Sustainability – Eliminate waste to landfill and generate renewable energy while reducing operating cost and generating income.

Terrabon will continue to receive all food waste from TAMU campus. BEPA will receive all other bio-waste from campus.

Digester will receive over 2,000 tons of bio-waste annually from the TAMU campus, reducing solid waste delivered to the landfill.

Third-party bio-waste from off-campus may be added to increase throughput and revenue generation, if approved and agreed to in writing by TAMU.
Key Points and Benefits

Electricity will be generated from methane gas providing between $40k (at 2% of revenue) and $100k (at 5% of revenue) annually to the University.

Additional $50k annual savings potential through lower solid waste management operating cost - through reduced landfill trips and fees.

Fertilizer is a secondary output of the digester, which has value and can also be sold to generate additional revenue.

Provides opportunity for TAMU academic departments to partner with BEPA for research and teaching students about sustainability and renewable energy.

Other University Digester Locations

Iowa State University – Anaerobic Digester Course
Washington State University – Digester Research
Michigan State University – Fiber Research
Univ of Wisconsin at Platteville – Fiber and Soil Research
Purdue – Renewable Energy Course
Ohio State – Anaerobic Research Course
Cornell Univ – Digester Research / Extension Service
University of Minnesota – Algae Research (from digester)
Marquette University – Lab work associated with biogas
Proposed Anaerobic Bio-Digester Installation

Bio-Energy Partners of America (BEPA) proposes to finance, design, construct, operate, maintain, and manage an anaerobic bio-digester located at the TAMU wastewater treatment plant at no cost to the University.

Improved Sustainability – Eliminate waste to landfill and generate renewable energy while reducing operating cost and generating income.

Terrabon will continue to receive all food waste from TAMU campus. BEPA will receive all other bio-waste from campus.

Digester will receive over 2,000 tons of bio-waste annually from the TAMU campus, reducing solid waste delivered to the landfill.

Third-party bio-waste from off-campus may be added to increase throughput and revenue generation, if approved and agreed to in writing by TAMU.

Electricity will be generated from methane gas providing between $40k (at 2% of revenue) and $100k (at 5% of revenue) annually to the University.

Additional $50k annual savings potential through lower solid waste management operating cost - through reduced landfill trips and fees.

Fertilizer is a secondary output of the digester, which has value and can also be sold to generate additional revenue.

Provides opportunity for TAMU academic departments to partner with BEPA for research and teaching students about sustainability and renewable energy.