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 Greensboro, NC 27407  
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 www.JoyceEngineering.com

December 16, 2011

Mr. Ming-Tai Chao, P.E.  
 NCDENR, Solid Waste Section  
 1646 Mail Service Center  
 Raleigh, NC 27699

Permit No.	Date	Document ID No.
97-01	December 16, 2011	15772

**APPROVED DOCUMENT**  
 Division of Waste Management  
 Solid Waste Section  
 Received Dated: December 16, 2011 via an e-mail  
 Date: December 16, 2011 By: Ming-Tai Chao

RE: Wilkes County Germantown Landfill LFG Beneficial Use Project  
 Wilkes Co. Germantown Landfill  
 Permit No. 97-01

Dear Ming:

The purpose of this letter is to request approval from the Solid Waste Division for construction of a landfill gas (LFG)-to-Energy Facility at the closed Wilkes County Germantown Landfill. The existing and proposed LFG system components are shown on the attached Drawing 1, and a narrative is provided below to describe the system.

**BACKGROUND**

The Germantown Landfill is a closed municipal solid waste (MSW) landfill. The landfill ceased daily operations in 1993. Closure of the landfill included installation of 10 passive gas vents. In 2005, 4 of the vents were connected with wellheads to a 6" diameter below-ground HDPE pipe system designed to collect the landfill gas. A condensate trap was installed toward the base of the landfill to capture condensate.

Several years later, the HDPE pipe was further extended along the edge of the access road and a second condensate trap was installed.

Condensate that accumulates in the traps is removed via a vacuum pump truck and hauled offsite for disposal.

In 2009, an above-ground section of 6" diameter HDPE pipe was added to bring the pipe system to its current location, which is approximately 100 feet from the proposed location of the electricity generation facility.

## **LFG-TO-ENERGY FACILITY**

### **Overview**

The LFG collection piping will be connected to a vacuum blower that will actively extract the gas from the existing wells and piping, and deliver the gas to one of two combustion devices—a utility flare or an engine-generator.

The primary combustion device will be the engine-generator, with the flare being used during periods when the engine-generator is shut down for maintenance or repair, or if there is excess gas that is not needed by the engine-generator.

The electricity produced by the engine-generator will be sold to Duke Energy and distributed through the power grid.

A greenhouse will be installed adjacent to the combustion equipment. The greenhouse will utilize heat recovered from the engine-generator.

### **Equipment & Construction**

A pre-owned blower/flare assembly was purchased by Wilkes County and is being modified for use at the Germantown Landfill. The blower is an Ametek Rotron (model # EN404AR58ML), rated for 100 standard cubic feet per minute (scfm). The blower/flare assembly was originally manufactured by Piedmont Industrial Services in 2004.

The engine is an 8.1L Vortec General Motors spark-ignited internal combustion engine with modifications for running on landfill gas. The engine is rated at 162 horsepower. The generator coupled to the engine is manufactured by Stamford and is rated for a maximum of 85 kW.

Construction specifications were previously provided as part of the Request for Proposals (RFP) issued in April 2011 for the LFG beneficial use project. Construction documentation and Operations and Maintenance (O&M) procedures will become part of the facility's operating record at completion of construction.

### **Air Quality**

An application for a permit from the Division of Air Quality (DAQ) to construct and operate the system has been applied for. Construction of the facility is contingent upon receipt of approval from the DAQ.

### **Operations**

Operation of the energy facility and greenhouse will require part-time worker(s) which the County will provide. Remote monitoring of the blower/flare and genset will also be possible through a web-based interface.

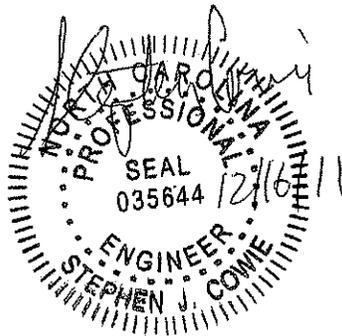
After completion of construction of the landfill gas blower/flare and engine-generator, County staff will be properly trained (by the contractor providing and installing the equipment) to maintain and operate the system.

Access to the facilities is limited by security fencing at the main entrance to the landfill.

### **De-Commissioning**

The blower/flare skid and engine-generator are suitable for being re-located (removed) from the site at the end of the useful life of the project. The equipment may be sold or re-used elsewhere by the County. The landfill gas beneficial use project will not result in any additional post-closure care costs for the landfill.

If you have any questions or concerns regarding the construction of this landfill gas collection and control system please let me know.

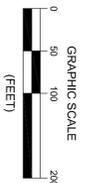
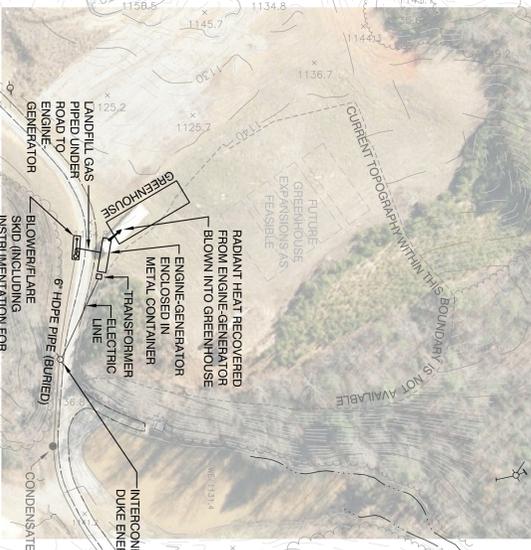


Sincerely,  
**JOYCE ENGINEERING, INC.**

A handwritten signature in cursive script that reads "Stephen Cowie".

Stephen Cowie, P.E.  
Sr. Project Consultant

Attachment:  
Drawing 1



PROJECT NO. <b>356.1101.11</b>	SCALE <b>AS SHOWN</b>	<b>GERMANTOWN LANDFILL          WILKESBORO, NC</b>			DESIGNED _____ DRAWN CADD/ CHECKED _____ APPROVED _____ DATE _____		DATE _____	REVISIONS AND RECORD OF ISSUE	NO BY CK APP
		<b>LANDFILL GAS COLLECTION, CONTROL &amp;          BENEFICIAL USE PROJECT          SITE PLAN</b>			© 2011 Joyce Engineering, Inc. All rights reserved.				

## Chao, Ming-tai

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**From:** Steve Cowie [scowie@joyceengineering.com]  
**Sent:** Friday, December 16, 2011 1:11 PM  
**To:** Chao, Ming-tai  
**Subject:** RE: Wilkes co. Germantown LFG project  
**Attachments:** Wilkes\_Germantown LFG-Energy (solid waste submittal)\_12-16-11.pdf

Ming,

Thank you for your review and comments. Please see attached for the revised submittal in pdf format. I am sending the hard copy today.

**Stephen Cowie, P.E.**  
*Sr. Project Consultant*

**JOYCE ENGINEERING, INC.**  
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Greensboro, NC 27407  
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direct: (336) 790-0081  
fax: (336) 323-0093  
cell: (336) 254-7706  
[www.JoyceEngineering.com](http://www.JoyceEngineering.com)

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**From:** Chao, Ming-tai [<mailto:ming.chao@ncdenr.gov>]  
**Sent:** Friday, December 16, 2011 10:05 AM  
**To:** Steve Cowie  
**Subject:** RE: Wilkes co. Germantown LFG project

Hey Steve:

I have completed a review of the draft application and have questions stated below:

- The LFGCCS has been installed and operated for years, so I believe that County has the valid Air Quality Permit for the flare and well trained staffs to handle the tasks. For the LFGTE project, please indicate the staffs will be or has been trained for the new tasks of the project in "Operation." Please clarify. Will the existing Air Quality Permit be modified for operating the new generator? If the new permit is required, please reflect the fact in the application. I don't need the copy of the Air Permit(s) for approval of this project, but once you have one (now or later), I would like to have a copy for the record.
- Will the Specifications contained in the RFP dated May 2011 be still applicable? If so add the reference to the application. There is no need to send in another copy. Any QA/QC test results and the O&M Plan of the LFGTE must be placed in the operating record.

Please finalize the plan by stamping your PE seal with signature & date on the drawing and cover letter. If you can have these requirements done today, I may have the approval letter for construction and operation of the LFGTE project out to you and Wilkes County today.

The Solid Waste Section determines that the County does not have to pay the review fee for this application. Should you have any questions please contact me.

Best regards,

Ming-Tai Chao, P.E.  
Environmental Engineer II  
Permitting Branch, Solid Waste Section  
Division of Waste Management  
1646 Mail Service Center  
Raleigh, NC 27699-1646 (Mailing Address)

**Green Square, 217 West Jones Street**  
**Raleigh, NC 27603**  
**Tel. 919-707-8251**  
[ming.chao@ncdenr.gov](mailto:ming.chao@ncdenr.gov)  
<http://portal.ncdenr.org/web/wm/sw>

*E-mail correspondence to and from this address may be subject to the North Carolina Public Records Law and may be disclosed to third parties.*

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**From:** Steve Cowie [<mailto:scowie@joyceengineering.com>]  
**Sent:** Thursday, December 15, 2011 3:19 PM  
**To:** Chao, Ming-tai  
**Subject:** wilkes co. germantown LFG project

Ming,  
Please see attached for information on the Wilkes County Germantown LFG project for which we are requesting permission to construct. Let me know if this submittal is sufficient, and I can send a hard copy.

**Stephen Cowie, P.E.**  
*Sr. Project Consultant*  
**JOYCE ENGINEERING, INC.**  
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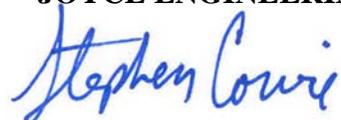
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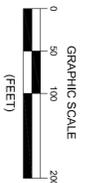
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Sincerely,  
**JOYCE ENGINEERING, INC.**

A handwritten signature in blue ink that reads "Stephen Cowie". The signature is written in a cursive, flowing style.

Stephen Cowie, P.E.  
Sr. Project Consultant

Attachment:  
Drawing 1



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