



Kentucky State Primer



**A Primer on
Developing Kentucky's
Landfill Gas-to-Energy
Potential**



**Kentucky Natural Resources and
Environmental Protection Cabinet**



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1. The Goals of This Primer

Throughout the country, the number of landfill gas-to-energy (LFGTE) projects is growing. Recovering methane gas at solid waste landfills provides significant environmental and economic benefits by eliminating methane emissions while capturing the emissions' energy value. The methane captured from landfills can be transformed into a cost-effective fuel source for generating electricity and heat, firing boilers, or even powering vehicles.

Permits, incentive programs, and policies for LFGTE project development vary greatly from state to state. To guide LFGTE project developers through the state permitting process and to help them to take advantage of state incentive programs, the U.S. Environmental Protection Agency's (EPA's) Landfill Methane Outreach Program (LMOP) has worked with state agencies to develop individual primers for states participating in the State Ally Program. By presenting the latest information on federal and state regulations and incentives affecting LFGTE projects in this primer, the LMOP and Kentucky state officials hope to facilitate development of many of the landfills listed in Table A.

To develop this primer, the Commonwealth of Kentucky identified all the permits and funding programs that could apply to LFGTE projects developed in Kentucky. It should be noted, however, that the regulations, agencies, and policies described are subject to change. Changes are likely to occur whenever a state legislature meets, or when the federal government imposes new directions on state and local governments. LFGTE project developers should verify and continuously monitor the status of laws and rules that might affect their plans or the operations of their projects.

Who Should Read This Primer?

This primer is designed to help realize the potential of landfill gas recovery in the Commonwealth of Kentucky. It provides information for developers of LFGTE projects, as well as all other participants in such projects: landfill operators, utility companies, independent power producers, utility regulators, state regulators, engineers, and equipment vendors.

- Landfill operators
- State regulators
- Utility companies
- Engineers
- Independent power producers
- Equipment vendors
- Utility regulators

What Information Does This Primer Contain?

If you are interested in taking advantage of the economic and environmental opportunities in LFGTE recovery in Kentucky, you will need to know the regulatory requirements that apply. You will also need to know what economic incentives are available to help make these projects more economically viable.

To address these needs, this primer covers the following topics:

- Federal Regulations and Permits. This section provides information on federal regulations that may pertain to LFGTE projects, including solid waste, air quality, and water quality regulations.
- State Regulations and Permits. This section provides information on state permits that apply to landfill gas recovery projects in Kentucky.

- Local Regulations and Permits. Local permit approval will often be needed for LFGTE projects. This section offers a step-by-step process you can follow to secure this approval.
- Federal Incentive Programs. This section presents information on federal incentives that may apply to LFGTE projects.
- State Incentive Programs. This section presents information on the environmental infrastructure financing opportunities that are available in the Commonwealth of Kentucky.

2. LFGTE Projects in Kentucky

One LFGTE project is presently operating in Kentucky. It is designed to recover all of the LFG produced by the Commonwealth's largest landfill, the Outer Loop Landfill in Jefferson County, and provide it to a nearby industrial plant for use as an energy source. The volume of LFG being recovered is approximately 4 million cubic feet per day. The contact at the company that developed the project, Toro Energy, is Taylor Clark. He can be reached at either (512) 322-9781 (Austin, TX) or (214) 691-0011 (Dallas). The contact person at Waste Management, Inc., the landfill operator, is Mark Messics, (610) 285-3106.

According to EPA's Opportunities for Landfill Gas Energy Recovery in Kentucky, another 20 landfills have the potential to support economically viable LFGTE projects. (Candidate landfills are defined as having more than 1 million tons of waste in place.) If these 20 landfills developed projects, 2.9 million tons of CO₂ equivalent could be reduced annually. Table A on the next page contains information on Kentucky's 20 candidate landfills.

The goal of the Commonwealth of Kentucky is to encourage the efficient capture and utilization of landfill gas in order to reduce harmful emissions and, where cost effective, to encourage the efficient production of energy.

Table A**Candidate Landfills**

Landfill Name	County	Operational Status
Addington Environmental/Tri-K	Lincoln	Open
Bavarian Trucking Co. LF	Boone	Open
BFI/Franklin LF	Franklin	Open
City of Bowling Green LF	Butler	Open
City of Glasgow LF	Barren	Open
City of Hopkinsville LF	Christian	Open
City of Owensboro LF	Daviess	Closed
Cooksey Brothers Disposal Company	Boyd	Open
Dozit Company	Union	Open
Epperson Waste Disposal Company LF	Grant	Open
E.R. Hopper & Son LF	Laurel	Open
Hardin County LF	Hardin	Closed
Laidlaw/Valley View LF	Trimble	Open
McCracken County LF	McCracken	Open
Pulaski Grading LF	Pulaski	Open
Rumpke/Montgomery County LF	Montgomery	Open
Rumpke/Pendleton County LF	Pendleton	Open
Southern Sanitation LF	Logan	Open
Williams LF	Spencer	Open
WMI/Lexington-Fayette LF	Fayette	Open

3. About the Landfill Methane Outreach Program

The recovery of energy from landfill gas provides local and global environmental and energy benefits, as well as economic benefits. The methane captured from landfills can be transformed into a cost-effective fuel source for generating electricity and heat, firing boilers, or even powering vehicles.

To promote the use of landfill gas as an energy source, EPA has established the Landfill Methane Outreach Program (LMOP). The goals of LMOP are to reduce methane emissions from landfills by:

- Encouraging environmentally and economically beneficial landfill gas-to-energy development
- Removing barriers to developing LFGTE projects

To achieve these goals, EPA establishes alliances with four key constituencies:

- State environmental and energy agencies
- Energy users/providers (including investor-owned, municipal and other public power utilities, cooperatives, direct end users, and power marketers)
- Industry (including developers, engineers, and equipment vendors)
- Community partners (municipal and small private landfill owners and operators; cities, counties, and other local governments; and community groups)

EPA establishes these alliances through a Memorandum of Understanding (MOU). By signing the MOU, each ally and partner acknowledges a shared commitment to promoting landfill gas energy recovery at solid waste landfills, recognizes that the widespread use of landfill gas as an energy resource will reduce methane and other air emissions, and commits to certain activities that enhance the development of this resource.

As of September 1999, more than 270 landfill methane recovery projects were operating in the United States. EPA estimates that up to 750 landfills could install economically viable landfill energy projects.

For more information about LMOP, contact:

U.S. Environmental Protection Agency
Landfill Methane Outreach Program (6202J)
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
(888) STAR-YES (782-7937)
Fax (202) 565-2077
<http://www.epa.gov/lmop>

For more information about LFGTE Projects in Kentucky, contact:

Mr. Geoffrey Young
Kentucky Division of Energy
663 Teton Trail
Frankfort, KY 40601
(502) 564-7192, or in Kentucky (800) 282-0868
Fax: (502) 564-7484
E-mail: geoffrey.young@mail.state.ky.us

Part 1: Regulations and Permits

1. Overview Of Federal Regulations And Permits

The following section discusses federal regulations that may pertain to LFGTE projects. LFGTE projects can be subject to solid waste, air quality, and water quality regulations. The federal regulations are presented in general terms, because individual state/local governments generally develop their own regulations for carrying out the federal mandates. Specific requirements may therefore differ among states. Project developers will have to contact relevant federal agencies and, in some cases, state agencies for more detailed information and applications. The discussion of each key federal regulation/permit contains three components:

- Importance of the regulation/permit to LFGTE project developers
- Applicability to LFGTE projects
- Description of each regulation/permit

1.1 Clean Air Act (CAA)

The CAA regulates emissions of pollutants to ensure that air quality meets specified health and welfare standards. The CAA contains two provisions that may affect LFGTE projects: New Source Performance Standards (NSPS) and New Source Review (NSR). Facilities that are planning to construct a new LFGTE system or that plan to modify a landfill operation to incorporate a LFGTE system must obtain an Authority to Construct (ATC) permit from the responsible air regulatory agency if emissions from the project exceed the major facility emission thresholds. The ATC permit specifies the NSPS and NSR requirements that the project must meet. Once construction is complete, the facility must obtain an operating permit that meets the requirements defined in Title V of the 1990 CAA Amendments. The general requirements of NSPS, NSR, and Title V for LFGTE projects are discussed below.

New Source Performance Standards (NSPS) and Emissions Guidelines for MSW Landfills

- Importance** LFGTE projects can be part of a compliance strategy to meet EPA's new emissions standards for landfill gas.
- Applicability** Landfills meeting certain design capacity, age, and emissions criteria are required to collect LFG and to either flare it or use it for energy.
- Description** EPA final regulations under Title I of the CAA Amendments require affected landfills to collect and control LFG. Specifically, the CAA targets reductions in the emissions of non-methane organic compounds (NMOCs) such as benzene, carbon tetrachloride, and chloroform found in LFG because they contribute to local smog formation. For landfills that received waste after November 8, 1987 ("existing landfills"), the standards are Emissions Guidelines (EG), and for landfills that commenced construction, reconstruction, modification, or began accepting waste on or after May 30, 1991 ("new landfills"), the standards are New Source Performance Standards (NSPS). The final regulations can be found in the Federal Register, March 12, 1996, Vol. 61, No. 49, pgs. 9907-9944.

The basic requirements are the same for both existing and new landfills. Landfills that meet both of the following criteria must comply with the regulations.

- Capacity—maximum design capacity greater than or equal to 2.5 million Mg (or 2.5 million cubic meters, about 2.75 million tons).¹
- Emissions—annual NMOC emission rate is greater than 50 Mg (about 55 tons).

Air Emissions: New Source Review (NSR) Permitting Process

- Importance** New LFGTE projects may be required to obtain construction permits under New Source Review (NSR). Depending on the area in which the project is located, obtaining these permits may be the most critical aspect of project approval.
- Applicability** The combustion of LFG results in emissions of carbon monoxide and oxides of nitrogen. Requirements vary for control of these emissions depending on local air quality. The relevant standards for a particular area will be discussed in Section 2, State Standards and Permits. Applicability of these standards to LFGTE projects will depend on the level of emissions resulting from the technology used in the project and the project's location (i.e., attainment or non-attainment area).
- Description** CAA regulations require new stationary sources and modifications to existing sources of certain air emissions to undergo NSR before they can operate. The purpose of these regulations is to ensure that sources meet the applicable air quality standards for the area in which they are located. Because these regulations are complex, a landfill owner or operator may want to consult an attorney or expert familiar with NSR for more information about permit requirements in a particular area.

The existing CAA regulations for attainment and maintenance of ambient air quality standards regulate six criteria pollutants — ozone, nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter (PM-10), sulfur dioxide (SO₂), and lead. The CAA authorizes the EPA to set both health and public welfare-based national ambient air quality standards (NAAQS) for each criteria pollutant. Areas that meet the NAAQS for a particular air pollutant are classified as being in “attainment” for that pollutant and those that do not are in “non-attainment.” Because each state is required to develop an air quality implementation plan (called a State Implementation Plan or SIP) to attain and maintain compliance with the NAAQS in each Air Quality Control Region within the state, specific permit requirements will vary by state. (See 40 CFR 51.160-51.166 for more information.)

The location of the LFGTE project will dictate what kind of construction and operating permits are required. If the landfill is located in an area that is in attainment for a particular pollutant, the LFGTE project must undergo Prevention of Significant Deterioration permitting. Nonattainment Area permitting is required for those landfills that are located in areas that do not meet the NAAQS for a particular air pollutant. Furthermore, the level of emissions from the project determines whether the project must undergo major NSR or minor NSR. The requirements of major NSR permitting are greater than those for minor NSR. The following provides more detail on new source permits:

Prevention of Significant Deterioration Permitting

Prevention of Significant Deterioration (PSD) review is used in attainment areas to determine whether a new or modified emissions source will cause significant deterioration of local air quality. The State air office can assist LFG project developers in determining whether a proposed project requires PSD approval.

¹ Landfills with less than 2.5 million Mg are required to file a design capacity report.

All areas are governed to some extent by PSD regulations because no location is in nonattainment for all criteria pollutants. Applicants must determine PSD applicability for each individual pollutant. For gas-fired sources, PSD major NSR is required if the new source will emit or has the potential to emit any criteria pollutant at a level greater than 250 tons per year.

For each pollutant for which the source is considered major, the PSD major NSR permitting process requires that the applicants determine the maximum degree of reduction achievable through the application of available control technologies. Specifically, major sources may have to undergo any or all of the following four PSD steps:

- Best Available Control Technology (BACT) analysis
- Monitoring of local air quality
- Source impact analysis/modeling
- Additional impact analysis/modeling (i.e., impact on vegetation, visibility, and Class I areas)²

Minor sources and modifications (i.e., below 250 tons per year) are exempt from this process, but these sources must still obtain construction and operating air permits (see CFR. 40 CFR 52.21 for more information on PSD).

Nonattainment Air Permitting

An area that does not meet the NAAQS for one or more of the six criteria pollutants is classified as being in “nonattainment” for that pollutant. Ozone is the most pervasive nonattainment pollutant, and the one most likely to affect LFGTE projects. A proposed new emissions source or modification of an existing source located in a nonattainment area must undergo nonattainment major NSR if the new source or the modification is classified as major (i.e., if the new or modified source exceeds specified emissions thresholds). To obtain a nonattainment NSR permit for criteria pollutants, a project must meet two requirements:

- Must use technology that achieves the Lowest Achievable Emissions Rate (LAER) for the nonattainment pollutant
- Must arrange for an emissions reduction at an existing combustion source that offsets the emissions from the new project at specific ratios

Potential Exemptions

EPA recently furnished a guidance document to state and regional permitting authorities that provides an exemption from major NSR permitting requirements for landfill projects that qualify as “pollution control projects.” An existing landfill that plans to install a LFGTE recovery project may qualify as a pollution control project as long as it reduces non-methane organic compounds (NMOC) at the site. Under the guidance, the permitting authority may exempt the project from major NSR, provided it meets all other requirements under the CAA and the state, including minor source requirements. In nonattainment areas, offsets will still be required, but need not exceed a 1:1 ratio. States have discretion to exercise the increased flexibility allowed by the guidance on a case-by-case basis.

²Class I areas are specified under the Clean Air Act and include national parks. Projects situated within a certain distance from Class I areas are subject to more stringent criteria for emissions levels.

Title V Operating Permit

- Importance** Many LFGTE projects must obtain operating permits that satisfy Title V of the 1990 CAA Amendments.
- Applicability** Any LFGTE plant that is a major source, as defined by the Title V regulation (40 CFR Part 70), must obtain an operating permit.
- Description** Title V of the CAA requires that all major sources obtain new federally enforceable operating permits. Title V is modeled after a similar program established under the National Pollution Discharge Elimination System (NPDES). Each major source must submit an application for an operating permit that meets guidelines spelled out in individual state Title V programs. The operating permit describes the emission limits and operating conditions that a facility must satisfy, and specifies the reporting requirements that a facility must meet to show compliance with the air pollution regulations. A Title V operating permit must be renewed every 5 years.

1.2 Resource Conservation and Recovery Act Subtitle D

- Importance** Before a LFGTE project can be developed, all Resource Conservation and Recovery Act (RCRA) Subtitle D requirements (i.e., requirements for non-hazardous waste management) must be satisfied.
- Applicability** Methane is explosive in certain concentrations and poses a hazard if it migrates beyond the landfill facility boundary. Landfill gas collection systems must meet RCRA Subtitle D standards for gas control.
- Description** Since October 1979, federal regulations promulgated under Subtitle D of RCRA required controls on migration of landfill gas. In 1991, EPA promulgated landfill design and performance standards; the newer standards apply to municipal solid waste landfills that were active on or after October 9, 1993. Specifically, the standards require monitoring of LFG and establish performance standards for combustible gas migration control. Monitoring requirements must be met at landfills not only during their operation, but also for a period of 30 years after closure.

Landfills affected by RCRA Subtitle D are required to control gas by establishing a program to periodically check for methane emissions and prevent offsite migration. Landfill owners and operators must ensure that the concentration of methane gas does not exceed:

- 25 percent of the lower explosive limit for methane in facilities' structures
- The lower explosive limit for methane at the facility boundary

Permitted limits on methane levels reflect the fact that methane is explosive within the range of 5 to 15 percent concentration in air. If methane emissions exceed permitted limits, corrective action (i.e., installation of a LFG collection system) must be taken. Subtitle D may provide an impetus for some landfills to install energy recovery projects in cases where a gas collection system is required for compliance (see 40 CFR Part 258 for more information).

1.3 National Pollutant Discharge Elimination System (NPDES) Permit

Importance LFGTE projects may need to obtain NPDES permits for discharging wastewater that is generated during the energy recovery process.

Applicability LFG condensate forms when water and other vapors condense out of the gas stream due to temperature and pressure changes within the collection system. This wastewater must be removed from the collection system. In addition, LFGTE projects may generate wastewater from system maintenance and cooling tower blowdown.

Description NPDES permits regulate discharges of pollutants to surface waters. The authority to issue these permits is delegated to state governments by EPA. The permits, which typically last five years, limit the quantity and concentration of pollutants that may be discharged. To ensure compliance with the limits, permits require wastewater treatment or impose other operation conditions. The state water offices or EPA regional office can provide further information on these permits.

The permits are required for three categories of sources and can be issued as individual or general permits. A LFGTE project would be included in the “wastewater discharges to surface water from industrial facilities” category and would require an individual permit. An individual permit application for wastewater discharges typically requires information on:

- Water supply volumes
- Water utilization
- Wastewater flow
- Characteristics and disposal methods
- Planned improvements
- Storm water treatment
- Plant operation
- Materials and chemicals used
- Production
- Other relevant information.

1.4 Clean Water Act, Section 401

Importance LFGTE projects may need CWA Section 401 certification for constructing pipelines that cross streams or wetlands.

Applicability LFG recovery collection pipes or distribution pipes from the landfill to a nearby gas user may cross streams or wetlands. When construction or operation of such pipes causes any discharge of dredge into streams or wetlands, the project may require Section 401 certification.

Description If the construction or operation of facilities results in any discharge into streams or wetlands, such construction is regulated under Section 401. This requirement may affect the construction of LFGTE project facilities or pipelines to transport LFG.

The applicant must obtain a water quality certification from the State in which the discharge will originate. The certification should then be sent to the U.S. Army Corps of Engineers. The certification indicates that such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act (CWA).

1.5 Other Federal Permit Programs

The following are brief descriptions of how other federal permits could apply to LFGTE project development.

- RCRA Subtitle C could apply to a LFG project if it produces hazardous waste. While some LFG projects can return condensate to the landfill, many dispose of it through the public sewage system after some form of on-site treatment. In some cases, the condensate may contain high enough concentrations of heavy metals and organic chemicals for it to be classified as a hazardous waste, thus triggering federal regulation.
- The Historic Preservation Act of 1966 or the Endangered Species Act could apply if power lines or gas pipelines associated with a project infringe upon an historic site or an area that provides habitat for endangered species.

State Regulations and Permits

This section provides information on permits required by the Commonwealth of Kentucky for the development of a LFGTE project.³ Information provided on each permit includes how the permit is applicable to LFGTE projects, the appropriate agency contact, a description of the permit, the statute/regulation, information required and suggestions for a successful application, the application and review process, the review/approval period, and any fees required. For an overview of required permits, contact information, and length of the review period, see Tables 2.1 and 2.2.

Currently, the Commonwealth of Kentucky does not have written criteria for landfill gas collection and energy systems. It is anticipated that Kentucky will develop criteria within the next few years.

Summary of Permits

The principal permits required for LFGTE projects in Kentucky are related to air quality and water quality, and are regulated by the Kentucky Department for Environmental Protection (DEP), a department of the Natural Resources and Environmental Protection Cabinet (NREPC).

Permitting Assistance

The DEP has implemented a one-stop permit coordination process to assist applicants in obtaining necessary state-level environmental permits and to improve coordination of the DEP's permitting processes for projects requiring multiple permits. The purpose of the process is to aid applicants at the initial stages of project planning by identifying all DEP permits, registrations, or approvals that could be required for a project. A permits coordinator position has been established within the Commissioner's Office in the DEP. The permits coordinator undertakes the following activities:

- Serves as a central contact for applicants to obtain permit application information including permit application forms and copies of current regulations.
- Identifies, based on information supplied by the applicant, all DEP permit and registration requirements and outlines the probable steps and times involved to secure the permits.
- Coordinates pre-application conferences between the applicant and the DEP.
- Provides coordination for DEP during the permit application review process and can respond to applicant inquiries concerning the DEP review process.

This process does not eliminate or modify any requirement set out by Kentucky statutes or regulations. This process provides the applicant and other individuals a central contact point for DEP information. Contact Margaret Shanks at the Department for Environmental Protection, Commissioner's Office, at 502-564-2150 for more information.

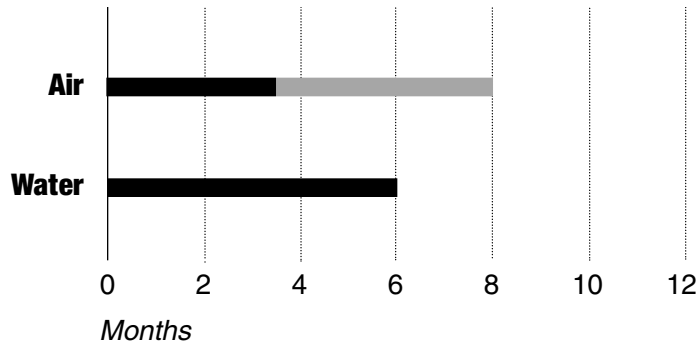
The DEP has also published a handbook called *The Environmental Permitting Handbook* which focuses on DEP-administered permitting programs. Information on the Department's permit requirements and application procedures are contained in this document and were compiled in January 1998. Additional information or detailed instructions on applying for the environmental permits issued by the DEP may be obtained on the Internet at <http://www.nr.state.ky.us/nrepc/permithome.htm> or by phone at 502-564-2150.

³The permits contained in this handbook were suggested by state permitting agencies.

Table 2.1**Summary Table of State Regulations/Permits**

Standard	Permit	Agency/Contact	Appropriate Review Period
Air	<i>Permit to Construct and Operate an Air Contaminant</i>	Division for Air Quality 803 Schenkel Lane Frankfort, KY 40601 Tel: 502-573-3382 Fax: 502-573-3787	60 to 210 days
Water	<i>Kentucky Pollutant Discharge Elimination System (KPDES) Permits</i>	Division of Water KPDES Branch Frankfort Office Park 14 Reilly Road Frankfort, KY 40601 Tel: 502-564-3410 Fax: 502-564-4245	180 days

Table 2.2 Permit Approval Timeline



Notes

Solid black band denotes the minimum review/approval period; gray band the maximum.

Table 2.3 Permit to Construct and Operate an Air Contaminant Source

Applicability to Landfill Gas Projects	Emissions from equipment used at LFGTE recovery facilities, such as gas turbines or boilers, are subject to state air regulations. However, LFGTE projects may be exempt from the requirement to obtain an air pollution permit if emissions are below de minimis regulated levels.
Agency Contact	Division for Air Quality 803 Schenkel Lane Frankfort, KY 40601 Tel: 502-573-3382 Fax: 502-573-3787
Description	Owners of equipment that emits, or controls the emission of, substances into the air are required to obtain a Permit to Construct and Operate an Air Contaminant Source. The purpose of this permit is to prevent the significant deterioration of air quality in areas of the Commonwealth of Kentucky and to provide conditions for the construction of new or modified sources that would impact on nonattainment areas so that major new or major modified sources will not exacerbate existing violations of the ambient air quality standards. Separate construction and operating permits were replaced by one permit issued in three phases (draft, proposed and final) to major sources and in one step (final) to minor sources. New major sources, if subject to Prevention of Significant Deterioration (PSD) regulations or nonattainment area regulations, must be issued a proposed permit prior to the start of construction. Kentucky issues two types of permits: federally enforceable permits, issued to major sources under Title V, and state origin permits, issued to minor sources or synthetic minors (a voluntary limit on production to qualify as a minor source) under Title V.
Statute/Regulation	Kentucky Revised Statute (KRS) 224.10-100 and 224.20-110 and 401 Kentucky Administrative Regulation (KAR) 50:035
Information Required/Suggestions	New sources must have a permit to authorize construction prior to beginning construction. Construction must be commenced within 18 months after the permit is issued.
Application Process	Applicants can obtain DEP 7007 form series from the Division for Air Quality or via the Internet at http://www.nr.state.ky.us/nrepc/dep/daq/prb/daqapp.htm

Review Process

After the permit application is submitted, the division must make a completeness determination within 60 days. The permit review process after that step depends on whether a source is new or existing and whether the source is major or minor. Some applications will be reviewed by the federal Environmental Protection Agency. A public notice and hearing may also be required. However, there is no public notice requirement at this time for a state origin permit.

Review/Approval Period

The regulatory review/approval period for the federally enforceable draft permit is 120 days and for a proposal permit 210 days; however, the Division for Air Quality target review time is 60 days for a draft permit and 120 days for a proposal permit. The regulatory review/approval period for a state enforceable permit is 120 days; however, the Division for Air Quality target review time is 60 days.

Fees

There is no air permit application fee or permit issuance fee. The state has general emission fee authority to fund various aspects of its air pollution control program. Sources with actual emissions of less than 25 tons of pollutants (sulfur dioxide, nitrogen dioxide, volatile organic compounds and PM10 [particulate matter under 10 microns in diameter]) per year pay a flat \$150 annual fee. Larger sources are required to pay a per-ton fee, which for Fiscal Year 1998 was \$32.50.

**Table 2.4 Kentucky Pollutant Discharge Elimination System (KPDES)
(Discharges to Surface Water or Ground Water)**

Applicability to Landfill Gas Projects	Some LFGTE projects treat condensate, which forms as water and other vapors condense out of the gas steam due to temperature and pressure changes within the gas collection system. Also, energy recovery projects may generate wastewater from system maintenance and cooling tower blowdown. Such wastewater streams are typically combined with landfill leachate streams for treatment and discharge to surface waters or ground waters. In addition, any project that disturbs more than 5 acres needs a construction site erosion control permit.
Agency Contact	Division of Water KPDES Branch 14 Reilly Road Frankfort, KY 40601 Tel: 502-564-3410 Fax: 502-564-4245
Description	The KPDES program requires permits for the discharge of pollutants from any point source into surface and ground waters of the Commonwealth of Kentucky. These permits typically place limits on the quantity concentration of pollutants that may be discharged. Compliance with the KPDES program requirements constitutes compliance with the operational permit requirements of 401 KAR 5:005. The permit is valid for a period of 5 years. Storm water discharges associated with construction activity are also required.
Statute/Regulation	Statute - KRS 224.10-100, 224.16-050, KRS 224.70-110 and KRS 224.70-120. Regulation - 401 KAR 5:055.
Information Required/Suggestions	Applications must be submitted at least 180 days before the date on which the discharge is to commence. Storm water discharges associated with construction activity must have applications submitted 90 days before the date construction begins.
Application Process	The applicant should obtain the appropriate KPDES application forms from the Division of Water and submit the completed application to the division. Forms can also be obtained from the Internet at http://water.nr.state.ky.us/dow/permapr.htm

Review Process

Upon completing the administrative review of the application, the division will notify the applicant in writing within 30 days if the application is complete or incomplete. Once a draft permit is prepared (based on a completed application), at least 30 days are allowed for public comment. A public hearing on the decision to issue a permit may be required if there is a significant degree of public interest in a draft permit. Public notice of the hearing is to be given at least 30 days before the hearing.

Review/Approval Period

180 days

Fees

An application filing fee must be submitted with each KPDES permit application. The filing fee is 20 percent of the appropriate permit base fee. The Division of Water determines the total permit fee and bills the applicant for the permit fee less the filing fee before issuing the permit. The base fee for a permit is \$2,100.

3. Overview of Local Regulations and Permits

Within the framework of federal and state regulation, local governments will have some jurisdiction over LFGTE development in nearly all cases. Typically, local permits address issues that affect the surrounding community. These permits generally fall under the categories of construction, environment and health, land use, and water quality/use. Local governments are also responsible for administering some permits for federal and state regulations in addition to their own. For example, many local governments are responsible for ensuring compliance with federal air quality regulations. It should be noted, however, that some local standards and regulations are more strict than state or federal regulations.

Steps to Successful Local Permits Approval:

The following 6 steps will assist LFGTE project developers to achieve successful local permits approval:

- Step 1** Determine which local authorities have jurisdiction over the project site.
- Step 2** Contact local, city, and/or county planning and public works departments to obtain information about applicable permits and to discuss your plans. Meeting with agency staff to discuss the LFG project and required permits often helps to expedite the permitting process.
- Step 3** Obtain essential information regarding each permit, including:
 - what information is required
 - the permitting process that should be followed
 - time frames (including submittal, hearing, and decision dates)
- Step 4** Obtain copies of the regulations to compare and verify what is required in the permit applications. If they differ, contact the appropriate permitting agency.
- Step 5** Submit a complete application. Incomplete applications typically result in processing delays.
- Step 6** Attend meetings or hearing(s) where the application will be discussed to respond to any questions that are raised. Failure to do so could result in delays.

Typical Local Permits

Table 3.1 lists typical local permits and approvals required for LFGTE projects.

Table 3.1 Local Regulations and Permits

Permit	Description
Building Permit	Most county/local governments require building permits for construction, which entail compliance with several types of building codes, such as plumbing and electrical. A typical building permit application may require detailed final plans for structures, including electrical and plumbing plans, floor layout, sewage facilities, storm water drainage plan, size and shape of lot and buildings, setback of buildings from property lines and drain field, access, size and shape of foundation walls, air vents, window access, and heating or cooling plants (if included in the design).
Zoning/Land Use	Most communities have a zoning and land use plan that identifies where different types of development are allowed (i.e., residential, commercial, and industrial). The local zoning board determines whether a particular project meets local land use criteria, and can grant variances if conditions warrant. A landfill gas project may require an industrial zoning classification.
Storm Water Management	Some local public works departments require a permit for discharges during construction and operation of a LFGTE project. Good facility design that maintains the pre-development runoff characteristics of the site will typically enable the project to meet permitting requirements easily.
Solid Waste Disposal	A LFGTE project may generate solid wastes, such as packaging material, cleaning solvents, and equipment fluids. If the landfill is closed, disposal of these solid wastes may be subject to review by a local authority.
Wastewater	The primary types of wastewater likely to be generated by a LFGTE project include maintenance wastewater and cooling tower blowdown. The city engineer's office should be contacted to provide information about available wastewater handling capacity, and any unique condensate treatment requirements or permits for landfills.
Fire Hazards and Precautions	The mix of gases in landfill gas has a moderate to high explosion potential; methane is explosive in concentrations of 5 to 15 percent in air. Because methane has the potential to migrate from the landfill to onsite or offsite structures, it poses a significant public safety hazard. EPA requires that methane concentrations be less than 5 percent at a landfill property line, and less than 25 percent of the lower explosive limit (LEL) in a facility's structures. County regulations may call for as strict or stricter standards to be observed at the landfill.
Noise	Most local zoning ordinances stipulate the maximum allowable decibel levels from noise sources. These levels vary depending on the location of the site. For example, LFG energy recovery projects located near residential areas will likely have to comply with stricter noise level standards than projects located in non-populated areas.

Part 2: Incentive Programs

1. Overview of Federal Incentive Programs

There are three federal incentive programs that may apply to LFGTE projects: the Renewable Energy Production Incentive (REPI), the Qualifying Facilities (QF) Certification and the Section 29 Tax Credit. Each program is described below.

1.1 Renewable Energy Production Incentive (REPI)

The Renewable Energy Production Incentive (REPI), mandated under the Energy Policy Act of 1992, may provide a cash subsidy of up to 1.5 cents per kilowatt hour to owners and operators of qualified renewable energy sources, such as landfills, that began operation between October 1993 and September 2003.⁴ Private sector entities may qualify to earn tax incentives based on a tier system. Tier 1 facilities (solar, wind, geothermal, or closed loop biomass) receive full payments or pro rata payments if funds are too minimal to match all requests. Any remaining funds fall to Tier 2 which includes landfill gas facilities. If there are insufficient funds to cover Tier 2 applicants, a pro-rata system is implemented. The Department of Energy (DOE) will make incentive payments for 10 fiscal years, beginning with the fiscal year in which application for payment for electricity generated by the facility is first made and the facility is determined by DOE to be eligible for receipt of an incentive payment. The period for payment under this program ends in fiscal year 2013. REPI payments are subject to adjustment because they are appropriated by Congress each year.

For further information, contact:

U.S. Department of Energy
National Renewable Energy Laboratory
Golden Field Office
Golden, Colorado 80403
(303) 275-4795
U.S. Department of Energy

Efficiency and Renewable Energy
Forrestal Building, Mail Station EE-10
1000 Independence Avenue, S.W.
Washington, DC 20585
Phone: (202) 586-2206

1.2 Qualifying Facilities Certification

LFGTE projects that generate electricity will benefit from Qualifying Facilities (QF) certification, which is granted through the Federal Energy Regulatory Commission (FERC). The following describes the benefits of QF status and the steps for applying for such status.

The Public Utility Regulatory Policies Act (PURPA) — one of five parts of the National Energy Act of 1978 — was designed to promote conservation of energy and energy security by removing barriers to the development of cogeneration facilities and facilities that employ waste or renewable fuels. Such facilities are called Qualifying Facilities, or QFs. Under PURPA, utilities are required to purchase electricity from

⁴ Final Rule Making, 10 Federal Register Part 451, July 19, 1995, Vol. 60, No. 138.

QFs at each utility's avoided cost of generating power. PURPA provides that a small power production facility, such as a LFGTE project that meets FERC standards, can become a QF.

In order to apply for QF status, applicants must prepare either (1) a Notice of Self-Certification, which asserts compliance with the FERC's technical and ownership criteria, or (2) an Application for Commission Certification of Qualifying Status, which requires a draft Federal Register notice and which provides actual FERC approval of QF status. In either case, the applicant must also file Form 565, which is a list of questions about the project, and must pay any filing fees associated with certifications, exemptions, and other activities. FERC will provide the QF "Info Packet" that describes the necessary steps, requirements, and background information. After submittal of the initial application, further justifications and submittal of information may be required.

For the QF Info Packet and applications, contact:

Federal Energy Regulatory Commission
Qualifying Facilities Division
825 North Capitol Street, N.E.
Washington, DC 20426
Phone: (202) 208-0577
<http://www.ferc.fed.us>

1.3 Section 29 Tax Credit

Developers of LFGTE projects who sell LFG to an unrelated third party may qualify for a tax credit under Section 29 of the Internal Revenue Service (IRS) tax code. In order to take advantage of the credits, project developers may bring in an outside party when developing power projects. The Section 29 tax credit was established in 1979 to encourage development of unconventional gas resources, such as landfill gas. Section 29 tax credits are available through 2007 to LFG projects that have a gas sales agreement in place by December 31, 1996 and are placed in service by June 30, 1998. The credit has been extended several times by the U.S. Congress and currently it is discontinued.

2. State Incentive Programs

State-level incentives for LFGTE projects are valuable for several reasons: projects that use landfill gas for energy require large capital investments, and federal tax incentives for this type of energy project are no longer available. In addition, the prices that utility companies pay for excess electricity are low in Kentucky. In 1998, legislation to provide state-level tax credits was proposed by Kentucky's Natural Resources and Environmental Protection Cabinet and introduced by Representative Jim Wayne, but was not considered by the House Appropriations and Revenue Committee.

The Kentucky Division of Energy makes approximately \$24,000 a year available to help fund biomass energy demonstration projects in Kentucky. LFGTE projects are eligible. The funding is from the U.S. Department of Energy's Southeastern Regional Biomass Energy Program. Projects are selected competitively; a match of at least 50 percent funding from non-federal sources is required.

Contact: Mr. Geoffrey Young
Kentucky Division of Energy
(502) 564-7192, or in Kentucky (800) 282-0868
Fax 502-564-7484
E-mail: geoffrey.young@mail.state.ky.us

3. Electricity Restructuring and LFGTE

What Is Electricity Restructuring?

Electricity restructuring refers to the introduction of competition into both the wholesale and retail electricity markets. Until now, electric utilities operated as monopolies authorized by federal and state regulatory authorities as the sole provider of electric service to consumers within a specific service territory. Under restructuring, utilities will lose these monopolies, enabling other energy providers to compete for their customers. The result may be more energy options for consumers, lower energy prices, and greater use of renewable energy sources.

Efforts to restructure the electric utility industry began in 1978 with passage of the Public Utilities Regulatory Policies Act (PURPA), which required utilities to buy a portion of their power from unregulated power generators in an effort to encourage the development of smaller generating facilities, new technologies, and renewable energy sources. The National Energy Policy Act of 1992 (EPACT) expanded on PURPA, allowing more types of unregulated companies to generate and sell electricity, effectively creating a competitive wholesale market for electric power.

Restructuring at the retail level has been a hot issue in many states since the passage of EPACT, which delegated states the authority to introduce competition among electric utilities within their borders. As of January 1999, 22 states have enacted some form of restructuring legislation, while the remaining 28 are considering such legislation.

How Do These Changes Affect Landfill Gas Recovery?

Many states are including renewable energy provisions in their restructuring legislation. Such provisions mandate utilities to include a certain percentage of electricity generated from renewable, or “green energy,” sources into their energy mixes. LFGTE is one such green energy source.

In March 1998, the Clinton Administration unveiled its “Comprehensive Electricity Competition Plan” to restructure the electricity industry nationwide. Contained in that proposal is a Renewable Portfolio Standard (RPS) that would guarantee that a minimum percentage of the nation’s electricity be powered by green energy. Energy service providers would be required to cover a percentage of their electricity sales with generation from non-hydroelectric renewable sources such as wind, solar, geothermal, and biomass (which includes LFGTE).

Marketing Landfill Gas Recovery as Green Power

One of the emerging areas and most promising mechanisms to encourage utilities and other energy marketers to participate in LFGTE projects is the development of green marketing programs. Green marketing programs are designed to enable energy marketers to position renewable energy products (including LFGTE) as premium products, and therefore, collect a premium price from their customers. In addition, green marketing allows energy marketers in competitive marketplaces to differentiate their energy product, and allows utilities in non-restructured marketplaces to gain critical product marketing experience in preparation for competition. However, the general public is less familiar with LFGTE than other sources of renewable energy; support from the LMOP can help ensure the success of early LFGTE green marketing efforts.

Get the Latest Information on Electricity Restructuring in Your State

For up-to-date information on electricity restructuring in Kentucky, visit www.nr.state.ky.us/nrepc/dnr/energy/dnrdoe.html.

Appendix A: State Contacts

Department of Natural Resources
Natural Resources and
Environmental Protection Cabinet
Secretary
Frankfort Office Park
14 Reilly Road
Frankfort, KY 40601
Tel: 502-564-3350
Fax: 502- 564-3354

Department for
Environmental Protection
Frankfort Office Park
14 Reilly Road
Frankfort, KY 40601
Tel: 502-564-2150
Fax: 502-564-4245

Air Quality

Division for Air Quality
803 Schenkel Lane
Frankfort, KY 40601
Tel: 502-573-3382
Fax: 502-573-3787

Water Quality

Division of Water
KPDES Branch
Frankfort Office Park
14 Reilly Road
Frankfort, KY 40601
Tel: 502-564-3410
Fax: 502-564-4245

Waste Management

Division of Waste Management
Frankfort Office Park
Frankfort, KY 40601
Tel: 502-564-6718
Fax: 502-564-4049

Other Contacts:

Public Information and Education
Tel: 502-564-5525

Regional Air Offices

Ashland Regional Office
3700 13th Street
Ashland, KY 41105
Tel: 606-325-8569

Bowling Green Regional Office
1508 Westen Avenue
Bowling Green, KY 42101
Tel: 502-843-5475

Florence Regional Office
7964 Kentucky Drive, Ste. 8
Florence, KY 41042
Tel: 606-292-6411

Hazard Regional Office
233 Birch Street
Hazard, KY 41701
Tel: 606-439-2391

Owensboro Regional Office
311 West Second Street
Owensboro, Ky 42301
Tel: 502-686-3304

Paducah Regional Office
4500 Clarks River Road
Paducah, KY 42003
Tel: 502-898-8468