a PPL company

Hand Delivery

Louisville Gas and Electric Company
State Regulation and Rates
220 West Main Street
P.O. Box 32010
Louisville, Kentucky 40232
www.lge-ku.com

Robert M. Conroy
Director - Rates
T 502-627-3324
F 502-627-3213
robert.conroy@lge-ku.com

Jeff DeRouen, Executive Director
Public Service Commission of Kentucky
211 Sower Boulevard
P. O. Box 615
Frankfort, Kentucky 40602

RECEIVED
JUN 15 2011
PUBLIC SERVICE COMMISSION

June 15, 2011

RE: *In the Matter of: The Application of Louisville Gas and Electric Company for Certificates of Public Convenience and Necessity and Approval of Its 2011 Compliance Plan for Recovery by Environmental Surcharge*
Case No. 2011-00162

Dear Mr. DeRouen:

At page 1 in the direct testimony of Gary H. Revlett, Louisville Gas and Electric Company ("LG&E") committed to provide copies of permit applications for the projects in LG&E's 2011 Environmental Surcharge Compliance Plan as they are filed with the appropriate agencies.

Enclosed please find an original and ten (10) copies of LG&E's Mill Creek Construction Permit Application filed with the Louisville Metro Air Pollution Control District on June 13, 2011. The facilities referenced in the Construction Permit Application are the same facilities included in Project No. 26 of LG&E's 2011 Environmental Surcharge Compliance Plan in this proceeding.

Should you have any questions concerning the enclosed, please do not hesitate to contact me.

Sincerely,

Robert M. Conroy

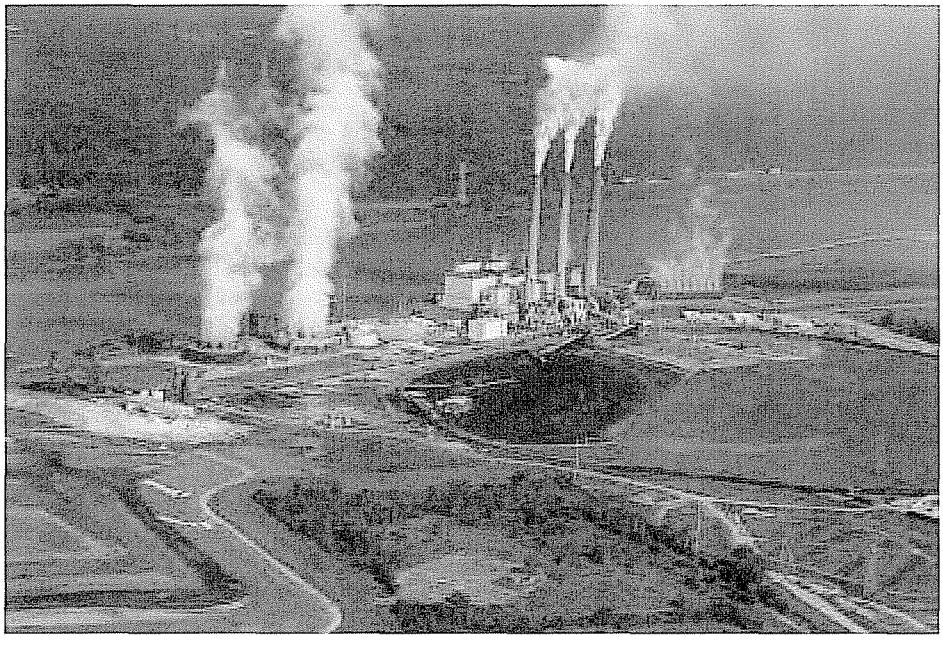
cc: Parties of Record

MILL CREEK GENERATING STATION
CONSTRUCTION PERMIT APPLICATION

LOUISVILLE GAS & ELECTRIC COMPANY
LOUISVILLE, KENTUCKY

Prepared by:

LOUISVILLE GAS & ELECTRIC COMPANY
220 West Main St.
Louisville, Kentucky 40232
(502) 627-4621



June 2011

Louisville Gas & Electric Company (LG&E) plans to construct additional air pollution control equipment at the existing Mill Creek electricity generating facility in Louisville, Kentucky. The project construction will coincide with the compliance dates for the new 1-hour SO_2 and NO_2 National Ambient Air Standards (NAAQS), the proposed new Clean Air Transport Rule (CATR), the proposed new Utility Boiler MACT (EGU MACT), the CO_2 NSR Tailoring Rule and the EPA reconsideration of the Regional Haze SIP for Kentucky (BART). As described in this application, the proposed project will be subject to District construction permitting requirements, but will not be subject to the requirements of Prevention of Significant Deterioration (PSD) or Non-Attainment New Source Review (NNSR) air permitting.

1.1 PROJECT DESCRIPTION

The construction project proposed for the Mill Creek facility is anticipated to begin in the summer of 2012 with full operation set to begin in 2016. The proposed construction projects at Mill Creek will consist of the following air emission units:

- Unit 1 (MC1)
  - Pulse Jet Fabric Filter
  - Powdered Activated Carbon injection
  - Hydrated Lime Injection
  - Combined Flue-Gas Desulfurization Unit (with MC2)
- Unit 2 (MC2)
  - Pulse Jet Fabric Filter
  - Powdered Activated Carbon injection
  - Hydrated Lime Injection
  - Combined Flue-Gas Desulfurization Unit (with MC1)
- Unit 3 (MC3)
  - Pulse Jet Fabric Filter
  - Powdered Activated Carbon injection
  - Hydrated Lime Injection (Previously permitted but not constructed)
  - Modification and Connection to MC4 Flue-Gas Desulfurization Unit
- Unit 4 (MC4)
  - Pulse Jet Fabric Filter
  - Powdered Activated Carbon injection
  - Hydrated Lime Injection (Previously permitted but not constructed)
  - Flue-Gas Desulfurization Unit

1.2 REGULATORY APPLICABILITY

The Mill Creek facility is comprised of a coal-fired power plant and is a PSD-major source. With the addition of the proposed control equipment at the facility, Mill Creek will remain a major source under the PSD permitting program because potential emissions of at least one pollutant will still

exceed the major source threshold of 100 tons per year (tpy). Further, as the facility will remain a PSD major source, PSD permitting is required for pollutants whose potential emissions increases due to the project exceed the Significant Emission Rate (SER). Emission increases of all PSD-regulated pollutants will be below the PSD permitting thresholds, including: oxides of nitrogen (NO_X), particulate matter (PM), particulate matter less than 10 and 2.5 microns in aerodynamic diameter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), volatile organic compounds (VOC), sulfuric acid mist (H_2SO_4), sulfur dioxide (SO_2), fluorides, and lead (Pb).

LG&E is submitting this construction permit application in accordance with all federal and Louisville Metro Air Pollution Control District (APCD) specific requirements. Emission units associated with the proposed control equipment will be subject to New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (NESHAP), and several APCD regulations. Potential facility-wide emissions, baseline emissions, and PSD/NNSR permitting applicability are presented in Table 1-1.

TABLE 1-1. PSD PERMITTING APPLICABILITY

Pollutant	Project Potential Emissions (tpy)	Baseline Actual Emissions (tpy)	Project - Net Emissions (tpy)	PSD/NNSR Thresholds (tpy)	PSD/NNSR Permitting Triggered?
PM	1,299.4	2,691.0	-1,391.6	25.0	No
PM_{10}	921.9	1,910.6	-988.7	15.0	No
$PM_{2.5}$	662.1	1,372.4	-710.3	10.0	No
SO_2	8,462.8	28,239.7	-19,776.9	40.0	No
H_2SO_4	296.2	1,412.0	-1,115.8	7.0	No
CO_2e	46,545.2	--	46,545.2	75,000	No
Hg	0.0264	0.2000	-0.1736	--	--

1.3 APPLICATION ORGANIZATION

The following information is included as part of this application submittal:

- Section 1 includes the application executive summary;
- Section 2 provides a description of the proposed project;
- Section 3 discusses the emissions calculation methodologies and presents the actual baseline emissions from units to be shutdown and future potential emissions from new units to be constructed;
- Section 4 details the regulatory applicability analysis;
- Section 5 contains an analysis demonstrating compliance with APCD STAR requirements for new emission units;
- Appendix A includes an area map, site layout, and process flow diagram;
- Appendix B contains the construction permit application forms;
- Appendix C presents the detailed emission calculations.

This section describes the proposed construction project at the Mill Creek Generation Station. A tentative facility layout and unit specific process flow diagrams are provided in Appendix A.

2.1 SITE DESCRIPTION

LG&E plans to modify and construct air pollution control equipment at the existing Mill Creek Generating Station in Louisville, Kentucky. The existing Mill Creek Generating Station, at which four coal-fired utility boilers and associated ancillary equipment are operated, is owned and operated by Louisville Gas & Electric. Jefferson County has been designated by the United States Environmental Protection Agency (U.S. EPA) as "attainment" or "unclassifiable" for all criteria pollutants except annual $PM_{2.5}$, for which Jefferson County has been designated nonattainment.[1]

2.2 PROPOSED NEW AND MODIFIED OPERATIONS

The proposed control equipment, scheduled to commence construction in summer of 2012 and completion in 2016. New operations from the proposed construction process will include the FGD construction and upgrade projects, Pulse Jet Fabric Filter with PAC injection, sorbent injection, storage silos, ash storage and haul roads.

A process flow diagram for the proposed additions and modifications to the air pollution control equipment for the four coal-fired utility boilers is included in Appendix A and each of the air emission units is discussed in the following subsections.

TABLE 2-1 PROPOSED & MODIFIED EQUIPMENT

Control Equipment	Unit 1	Unit 2	Unit 3	Unit 4
SCR	--	--	SCR Turn-Down	SCR Turn-Down
PJFF	New PJFF	New PJFF	New PJFF	New PJFF
PAC Injection	2 Storage Silos	2 Storage Silos	2 Storage Silos	2 Storage Silos
Lime Injection	2 Storage Silos	2 Storage Silos	2 Storage Silos	2 Storage Silos
FGD	New Combined FGD Unit		Upgrade of Unit 4 Current FGD	New FGD
Stack	New Combined Stack		Move to Unit 4's Existing	New
Ash Storage	1 New Silo			

[1] On March 9, 2011 EPA published a federal register notice indicating that the Louisville areas has attained the 1997 annual $PM_{2.5}$ NAAQS based on complete, quality-assured and certified 2007-2009 data. However, this determination is no equivalent to the redesignation of the area to attainment for the annual $PM_{2.5}$ NAAQS and NNSR requirements must continue to be evaluated for this project.

2.2.1 FLUE GAS DESULFURIZATION (FGD) UNITS

The Mill Creek Air Compliance Projects includes the installation of several new air pollution controls. Some of these new and upgraded facilities are necessary to comply with the 1-hour SO_2 NAAQS, under which LMAPCD is expected to declare Jefferson County a non-attainment area for the 1-hour SO_2 NAAQS and will require SO_2 emission reductions at Mill Creek.

The new controls include the construction of new Flue Gas Desulfurization ("FGD") equipment and upgrades to some existing FGD equipment. More specifically, LG&E proposes to build two new FGDs (one to serve both Mill Creek Units 1 and 2, another to serve Mill Creek Unit 4), to tie Mill Creek Unit 3 into the existing (but upgraded) Mill Creek Unit 4 FGD, and then to remove the current FGDs on Mill Creek Units 1, 2, and 3. The basic design of an FGD like the ones LG&E proposes to install is shown in the figure below.

Mill Creek Units 1 & 2

Constructing a new FGD is a more cost-effective option than redesigning and modifying the existing, first-generation FGDs to increase the SO_2 removal efficiency from the current approximate 90 percent removal rate to the 98+ percent SO_2 removal efficiency that today's technology can achieve. To gain the necessary increased efficiency from the existing FGDs would require multiple, extended outages to accommodate the necessary structural and infrastructure revisions and repairs from the original designs. Long outages (of multiple months) would likely require replacement power to meet loads at peak times that is typically less economic than running the Mill Creek units. The new combined FGD will be designed to remove 98+ percent of the SO_2 emissions from both units. FGD is the best available control technology currently available for SO_2 reduction. Also, the planned FGD will be able to comply consistently with the EGU MACT HCl emissions limitations (measuring SO_2 as a proxy for HCl, as allowed by the proposed MACT rule).

The new FGD installation requires locating the FGD and associated equipment away from the existing FGD locations. This allows construction to be performed while the units remain in operation and then, when the construction is completed, the units can be tied into the new technologies during shorter outages. The new FGD locations will require new chimneys similar to those installed on the FGD projects recently completed at the KU Ghent and Brown stations. The addition of a higher-efficiency FGD in combination with the installation of additional particulate matter control equipment will require the installation of larger induced draft fans and/or the installation of booster fans to account for the increased pressure drop through the flue gas train.

LG&E proposes to begin initial demolition activities related to the construction of the new Unit 1 & 2 FGD (e.g., demolition of existing warehouses and craft locker rooms northeast of Units 1 and 2) in the fall of 2011 and to begin constructing the new FGD in early 2012 with the work being placed into operation by mid-2015. Once the new

FGD to service both Units 1 and 2 is placed into operation, the existing Mill Creek Units 1 and 2 FGDs will be demolished.

Mill Creek Unit 4

LG&E proposes to install a new FGD for Unit 4 that can consistently achieve SO_2 emissions reductions greater than 98 percent. FGD is the best available control technology currently available for SO_2 reduction. The new FGD's SO_2 scrubbing capabilities (compared to its current FGD) will increase the amount of limestone required and byproduct produced proportionally to the additional capture of SO_2. Also, as with the new combined Units 1 and 2 FGD, Unit 4's planned FGD will be able to comply with the proposed EGU MACT rule's HCl emissions limitations (measuring SO_2 as a proxy for HCl, as allowed by the proposed regulation).

The Unit 4 new FGD installation requires locating the FGD and associated equipment away from the existing Unit 4 FGD location. This allows construction to be performed while the unit remains in operation and then, when construction is completed, Unit 4 can be tied in to the new technology during a shorter outage. The new FGD location will include a new chimney for Unit 4 (Mill Creek Unit 3 will utilize the existing Unit 4 chimney) similar to those installed on the FGD projects recently completed. The addition of a higher-efficiency FGD in combination with the installation of additional particulate matter control equipment will require the installation of larger induced draft fans and/or the installation of booster fans to account for the increased pressure drop through the flue gas train.

LG&E proposes to begin initial demolition activities related to the construction of the Unit 4 FGD in the fall of 2011, and to begin building Unit 4's new FGD in early 2012 with the Unit 4 tie in occurring in late 2014.

Mill Creek Unit 3

Once the new Mill Creek Unit 4 FGD is in service, LG&E proposes to upgrade Unit 4's existing FGD system to accommodate Unit 3 so it can consistently achieve SO_2 emissions of 98 percent on a continuous basis when burning high-sulfur-content coals. The existing Unit 4 FGD is approximately 20% larger in size than the existing Unit 3 FGD (due to generating capacity differences between Units 3 and 4) and can accommodate the needed efficiency upgrades, whereas the existing Unit 3 FGD cannot be modified for the increased capacity due to physical structural steel constraints. Therefore, upgrading the existing Unit 4 FGD with modified spray levels and/or flue gas contact rings/trays and flue gas flow modifications is the most feasible and economical control technology considered for SO_2 reduction for Unit 3. The upgrade is expected to allow the Mill Creek Unit 3 to comply consistently with the EGU MACT rule's HCl emissions limitations (measuring SO_2 as a proxy for HCl, as allowed by the proposed new regulation).

Tying in Unit 3 to Unit 4's existing FGD will result in Unit 3's using the existing Unit 4 chimney. Unit 3's current chimney will be capped and remain in place. Once

the tie-in to the upgraded FGD is completed, Unit 3's current FGD modules will no longer be needed and will be demolished similar to that of Units 1 and 2.

LG&E proposes to begin replacing Unit 4's current FGD in early 2012. Refurbishment work on the existing FGD will occur after tying Unit 4 into the new FGD. LG&E plans to place Unit 4 back into service in late 2014, with Unit 3 being placed back into service (after being tied into the refurbished former Unit 4 FGD) in late 2015.

The additional SO_2 scrubbing capabilities or efficiencies for all four units will increase the amount of limestone required and by-product produced proportionally to the increase in SO_2 removal. Therefore the limestone handling equipment annual hours of operation will increase, however no new or modified equipment will be needed to accommodate the increase in annual limestone usage.

2.2.2 SCR TURN DOWN

Under the proposed CATR, LG&E and KU will be required to reduce their SO_2 annual emissions by approximately 40%. In addition to the new FGDs the Mill Creek air compliance projects includes modifications to Mill Creek Units 3 and 4 to expand the operating range of the unit's existing Selective Catalytic Reduction ("SCR") equipment which will reduce nitrogen compound ("NO_x") emissions. Currently, the SCRs can operate efficiently only when the Mill Creek Unit 3 and Unit 4 are operating at relatively high load levels with the boiler exit gas temperature above 630 degrees Fahrenheit. This temperature range cannot currently be reached during periods when the boiler is generating steam at mid to lower capacity.

Reduction of NO_x only occurs inside the SCRs, once the operating temperatures meet the design levels and ammonia is injected to react with NO_x to form molecular nitrogen and water. Each SCR contains a catalyst system of two to three layers to enhance the reactions between the NO_x and ammonia. This configuration can achieve a 90% NO_x removal efficiency when ammonia is injected with a boiler exit gas temperature above 630 degrees Fahrenheit. The ammonia injection must be turned off at lower temperatures, even though the unit can continue to operate at a lower level of power output. Therefore, one way to expand the operating range at which an SCR can operate efficiently is to adjust the economizers (the last boiler circuit component) on a generating unit to keep the flue gas at higher temperatures when operating at lower load levels.

These changes will also have the benefit of allowing LG&E's Mill Creek Units 3 & 4 to be dispatched economically over a broader operating range after CATR goes into effect and fewer CATR NO_x allowances will be consumed. Having the ability to bring these two units to lower operating levels while still having high degrees of NO_x removal will allow system operators greater flexibility to ensure economical generating system operation.

The CATR related air compliance project also includes an upgrade to the Unit 4 SCR to enhance its NO_X removal efficiency. Unit 4's SCR, although it compares favorably to other industry SCRs, performs slightly less efficient than the SCRs installed in the same era on Mill Creek Unit 3. Modeling of the flue gas and ammonia mixing will take place to determine where additional mixing vanes can be installed to improve the ammonia mixing prior to entering the SCR. This modification will result in a higher NO_x removal ability of the SCR through better utilization of ammonia.

LG&E proposes to begin upgrading the Unit 4 SCR in late 2011, and the work should be complete by mid-2012. The changes to increase the SCR operating range is proposed to begin work on Unit 3 in late 2011, and the work should be complete by mid-2013. LG&E proposes to begin work on Unit 4 in late 2011, and the work should be complete by late 2014.

These proposed SCR modifications will provide additional margin against the NO_x tonnage caps proposed in the new CATR regulation, thus deferring the need for additional SCR installations and additional cost for compliance with the proposed CATR, which imposes an approximately 15 percent reduction in the LG&E/KU annual NO_x emissions.

2.2.3 PJFF WITH LIME & PAC INJECTION

The last new regulation requiring additional control equipment is the Electric Generating Unit (EGU) Maximum Achievable Control Technology (MACT) standard. Compliance with this new regulation will require Hazardous Air Pollutant (HAP) Particulate Matter Control Systems to serve each of the four Mill Creek units. Each HAP Particulate Matter Control System comprises a pulse-jet fabric filter ("baghouse") to capture particulate matter, a Powdered Activated Carbon ("PAC") injection system to capture mercury, and a lime injection system to protect the baghouse from the corrosive effects of sulfuric acid mist ("SAM"). These HAP Particulate Matter Control Systems will be similar to the baghouse (including the lime and PAC injection systems) installed at Trimble County Unit 2 ("TC2") as part of its overall air quality control system. Attached in Appendix A are line-drawing schematic diagram of the existing and proposed components of the entire flue-gas stream for each Mill Creek generating unit.

The primary component of the HAP Particulate Matter Control System is particulate-matter filtration via a fabric-filter baghouse. Baghouses like the ones LG&E proposes to install at Mill Creek can consistently achieve particulate matter emissions of less than 0.03 lb/MMBtu (the HAPs Rule's particulate matter emission limit) on a continuous basis, and will remove lime injection reagents and mercury-laden PAC, among other particulates. Each baghouse will increase the pressure drop of the flue gas system. As such, each unit's draft system will likely require additional fan capacity accomplished through the replacement of induced draft fans currently installed or the addition of booster fans.

The second component of the Particulate Matter Control System is a lime injection system. Lime injection ahead of the baghouse protects the internal components of the baghouse from the corrosive effects of SAM.

The third component of a HAP Particulate Matter Control System is PAC injection. PAC injection is necessary to capture mercury in the flue gas stream. Elemental and oxidized forms of mercury collect on the powered carbon, making it possible for a downstream particulate control device to capture the mercury containing carbon. Each generating unit's PAC injection system will be installed immediately upstream of the baghouse. Coupled with baghouses, the PAC injection systems LG&E proposes to install will be able to meet the HAPs Rule's mercury emission limit of 13 lbs/TWh on a continuous basis.

LG&E proposes to begin installing the HAP Particulate Matter Control Systems to serve all the Mill Creek units in early 2012, and the work should be complete by mid-2015 for Units 1 and 2, late 2015 for Unit 3 and late 2014 for Unit 4.

2.2.4 STORAGE SILOS

All four units at Mill Creek currently include an electrostatic precipitator (ESP) for collection of particulate matter from each unit's flue gas stream. As part of the AQC modifications, the existing ESPs will supplemented by pulse jet fabric filters (PJFFs) to collect fly ash prior to the exhaust gas reaching the wet scrubbers. In addition, the project includes the injection of sorbent (lime/trona) for sulfuric acid (SO_3) control and powdered activated carbon (PAC) for mercury (Hg) control. The injected reagents must also be removed from the exhaust stream by the PJFF.

The lime and PAC injection system will require storage silos for the on-site storage of the material. Two PAC silos and two lime silos will be constructed for each unit for a total of eight PAC and eight lime storage silos. Each storage silo will be equipped with a bin vent for the control of particulate emissions.

The existing east and west ash storage silos each hold 2,081 tons. A new silo is sized at 3,620 tons to achieve total silo capacity of four days operation with the use of existing east and west silos and only new PJFFs in service. Total combined silo capacity of the existing east and west silos and the new silo is 7,782 tons with a total fly ash loading of Units 1, 2, 3 and 4 PJFFs combined of 1,945 tons per day. The fly ash handling system will include all equipment as indicated above for a complete operating system including, but not limited to, a new silo and truck unloading enclosure under the silo, platforms, stairs and ladders for access to all fly ash handling equipment including the silo, electric motors, control devices, and controls. A single vacuum conveying line will be used for Units 1, 2, and 3(each), and two vacuum conveying lines will be used for Unit 4. The new ash storage silo will be equipped with a bin vent for the control of particulate emissions.

2.3 SHUTDOWN OF EXISTING OPERATIONS

The Mill Creek facility currently operates flue gas desulfurization (FGD) processes on each of the coal-fired units. The Unit 1, Unit 2 and Unit 3 FGD units will be removed from service once the new units are constructed and connected to the existing coal-fired units.

Mill Creek is currently considered a "major" source with regards to the PSD/NNSR permitting programs. When a new project is implemented at a major source, the emissions changes resulting from the project must be below the SER thresholds for each PSD regulated pollutant to preclude PSD/NNSR applicability. When accounting for emissions increases associated with construction of new emission units, potential emission rates must be considered. However, when defining the magnitude of emissions decreases associated with shutdown emission units, actual emissions during a baseline period must be taken into consideration.

This section addresses the methodologies used to quantify the potential emissions decreases that will result from the addition of air pollution control equipment at the Mill Creek facility. Detailed emission calculations are shown in Appendix C. PSD/NNSR applicability is further defined in Section 4.

3.1 PSD-REGULATED POTENTIAL POLLUTANT EMISSION INCREASES

Sources of criteria pollutant and greenhouse gas (GHG) emissions increases from the FGD construction and upgrade projects, PJFF with PAC injection, sorbent injection, storage silos, ash storage and haul roads. Methodologies used to calculate potential emissions from these sources are discussed in the following sub-sections. Note that annual emissions are based on maximum operation at 8,760 hours per year unless otherwise noted.

3.1.1 FGD UNITS

Construction and modifications to the wet flue gas desulfurization (FGD) units were designed to obtain 98% SO_2 removal for each of the Mill Creek Units, which is considered the maximum attainable performance. The ability to realize high removal efficiencies on higher sulfur fuels is a major difference between wet scrubbers and semi-dry/dry FGD processes. In a WFGD system, the absorber module is located downstream of the induced draft (ID) fans. Flue gas enters the module and is contacted with a slurry containing reagent and byproduct solids. The SO_2 is absorbed into the slurry and reacts with the calcium through the following overall reactions:

$$SO_2 + CaCO_3 + \tfrac{1}{2}H_2O \rightarrow CaSO_3 \bullet \tfrac{1}{2}H_2O + CO_2$$

$$SO_2 + CaCO_3 + 2H_2O + \tfrac{1}{2}O_2 \rightarrow CaSO_4 \bullet 2H_2O + CO_2$$

In the Mill Creek FGD systems, air is bubbled through the reaction tank to practically convert all of the $CaSO_3 \bullet 1/2H_2O$ into calcium sulfate dihydrate ($CaSO_4 \bullet 2H_2O$), which is commonly known as gypsum. Mill Creek produces a commercial grade of gypsum that is beneficially reused as a by-product for the production of portland cement or wallboard.

The removal rate of SO_2 is directly proportional to the amount of limestone utilized by the FGD process. Increasing the efficiency of the FGD units from approximately 90% to 98% causes an increase in emissions of particulate and CO_2 emissions. The ball mill and crushing system for the limestone is a wet system, therefore increased PM emissions are solely from the offloading, limestone storage piles and conveying of the limestone to the crusher. The limestone at the Mill Creek facility contains approximately 90% $CaCO_3$ and the average sulfur content for the coal at Mill Creek is 3.5%. Based on technical and historical use data, approximately 3,600 pounds of limestone is utilized per ton of SO_2 removed from the flue gas.

The increase in CO2 emissions were evaluated based on the potential-to-emit for the units at Mill Creek. An average coal heating value of 10,600 Btu/lb was used to determine the coal throughput based on a heat input of 3,085 MMBtu/hr each for Unit 1 and Unit 2, 4,204 MMBtu/hr for Unit 3, and 5,025 MMBtu/hr for Unit 4.

A total of 6,362,983 tons per year of coal would emit 423,138.4 tons per year of SO_2 in the flue gas. Increasing the removal efficiency for SO_2 from 90% to 98% would remove an additional 33,851.1 tons per year and increase the limestone usage by 105,785 tons per year and CO_2 emissions by 46,545 tons per year.

Emissions from the barge unloading and conveying of the limestone are insignificant. Based upon AP-42 emission factors, the additional 105,785 tons per year of limestone would increase fugitive PM emissions by 0.12 tons/yr, PM_{10} by 0.056 tons/yr and $PM_{2.5}$ by 0.0085 tons per year.

Detailed calculations are presented in Appendix C.

3.1.2 STORAGE SILOS

Emission increases from the storage of the hydrated lime, PAC and ash are insignificant and presented in Appendix C.

3.2 PSD-REGULATED POLLUTANT EMISSION DECREASES

LG&E, as part of this PSD analysis, has also considered emission reductions from the proposed and modified control equipment at the Mill Creek facility. Actual emissions for existing Mill Creek emission units were calculated based on a combination of CEMS data, stack test factors, AP-42 emission factors, actual fuel usage records, raw material (coal) and by-product (ash) throughput information, and operating records for ancillary emission units. Detailed calculations of baseline actual emission rates are shown in Appendix C.

Emission units constructed as part of the proposed control equipment at the Mill Creek facility will be subject to certain federal, state and APCD air quality regulations. This section of the application summarizes the air permitting requirements and the key air quality regulations that will apply to emission units constructed as part of this project. Specifically, applicability to New Source Review (NSR), New Source Performance Standards (NSPS), pollutant- and category-specific National Emission Standards for Hazardous Air Pollutants (NESHAP), Compliance Assurance Monitoring (CAM), Title V operating permit regulations, Acid Rain Program (ARP), Clean Air Interstate Rule (CAIR)/Clean Air Transport Rule (CATR), and APCD-specific regulations are addressed.

4.1 NSR APPLICABILITY

The NSR permitting program generally requires a stationary source obtain a permit and undertake other obligations prior to construction of any project at an industrial facility if the proposed project results in emission increases in excess of certain threshold levels. The NSR program is comprised of two elements: Non-Attainment NSR (NNSR) and Prevention of Significant Deterioration (PSD). The NNSR program potentially applies to new construction or modifications that result in emission increases of a particular pollutant for which the area in which the facility is located is classified as "nonattainment" for that pollutant. The PSD program applies to project increases of those pollutants for which the area the facility is located in is classified as "attainment" or "unclassifiable".

4.1.1 NON ATTAINMENT NEW SOURCE REVIEW / PSD

The Mill Creek Generating Station is located in Jefferson County which has been currently designated by the U.S. EPA as "attainment" or "unclassifiable" for all criteria pollutants with the exception of PM_{25}. A source is considered "major" for NNSR if it has the ability to emit 100 tpy of more of any non-attainment pollutant or its appropriate precursors. The Mill Creek facility is currently considered a major source with respect to NNSR due to the fact that PM_{25} emissions are greater than 100 tpy.

A stationary source is considered "major" for PSD if it has the potential to emit either (1) 100 tons per year or more of a regulated pollutant if the source is classified as one of 28 designated industrial source categories, or (2) 250 tons per year or more of any regulated pollutant for unlisted sources. Mill Creek is currently considered a PSD major source. Because fossil fuel-fired steam electric plants are on the List of 28, and EPA considers a NGCC unit to constitute a fossil fuel-fired steam electric plant for the purposes of PSD, the source will remain a major source with regards to PSD because it will have the ability to emit 100 tons per year or more of regulated pollutants.[2]

[2] In contrast, EPA does not consider NGCC to qualify as a fossil fuel-fired steam electric plant for programs regulating individual units, such as New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants (NESHAP).

Thus, because the Cane Run Station is a major source under both PSD and NNSR, the proposed project emissions must not exceed the Significant Emission Threshold levels (SERs) for any of the regulated pollutants in order for the Mill Creek facility to be exempt from the additional permitting requirements of these regulations (see Table 1-1).

4.2 Applicable New Source Performance Standards

NSPS require new, modified, or reconstructed sources to control emissions to the level achievable by the best-demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, unless specifically excluded. The addition and modification to the control equipment at the facility is not anticipated to trigger any new NSPS standards. The facility will maintain and operate the units in accordance with all existing NSPS standards.

4.3 National Emission Standards for Hazardous Air Pollutants

NESHAP, federal regulations found in Title 40 Parts 61 and 63 of the CFR, are emission standards for HAP and are primarily applicable to major sources of HAP (facilities that exceed the major source thresholds of 10 tpy of a single HAP and 25 tpy of any combination of HAP from stationary sources) or specifically designated area sources. NESHAP apply to sources in specifically regulated industrial source classifications (Clean Air Act Section 112(d)) or on a case-by-case basis (Clean Air Act Section 112(g)) for facilities not regulated as a specific industrial source type. Pollutant specific NESHAP may also be applicable.

The addition and modification to the control equipment at the facility is not anticipated to trigger any new NESHAP standards. The facility will maintain and operate the units in accordance with all existing NESHAP standards.

4.4 Risk Management Program

The Risk Management Program (RMP) in Section 112(r) of the 1990 Clean Air Act Amendments was established to prevent accidental releases of hazardous substances. Applicability of the RMP program is determined by comparing the quantity of each hazardous material stored in a vessel to the 112(r) threshold quantity.

The Mill Creek facility has an RMP plan that covers the storage and usage of anhydrous ammonia. The ammonia storage tanks will be relocated as shown in the site diagram in Appendix A. The amount of anhydrous ammonia stored, usage rate and facility operating procedures will not change. The RMP will be updated to include new diagrams of the location of the storage tanks and any ancillary equipment when the units are moved.

4.5 Stratospheric Ozone Protection Regulations

The requirements originating from Title VI of the Clean Air Act, entitled *Protection of Stratospheric Ozone*, are contained in 40 CFR §82. Subparts A through E and Subparts G and H of 40 CFR §82 are

not applicable to the Cane Run Station. 40 CFR §82 Subpart F, *Recycling and Emissions Reduction*, potentially applies if the facility operates, maintains, repairs, services, or disposes of appliances that utilize Class I or Class II ozone depleting substances. Subpart F generally requires persons completing the repairs, service, or disposal to be properly certified. All repairs, service, and disposal of ozone depleting substances from such equipment (air conditioners, refrigerators, etc.) at Mill Creek will be completed by a certified technician.

4.6 TITLE V OPERATING PERMIT PROGRAM

40 CFR §70 establishes the federal Title V operating permit program. APCD has incorporated the provisions of the federal program in APCD Regulation 2.16, *Title V Operating Permits*. The major source thresholds with respect to the APCD Title V operating permit program for sources in attainment areas are 10 tons per year of a single HAP, 25 tpy of any combination of HAP, or 100 tpy of a criteria pollutant.

The existing Mill Creek facility is currently a Title V major source, with potential emissions of at least one regulated pollutant exceeding 100 tpy. The Mill Creek facility will maintain its status as a major source with respect to the Title V program.

4.7 ACID RAIN PROGRAM

The Acid Rain Program (ARP) found at 40 CFR §72-78 applies to utility units. A utility unit is defined as a unit owned or operated by a utility that serves a generator in any state that produces electricity for sale. Mill Creek is currently subject to the ARP. The ARP requires pollutant monitors in addition to possession of SO_2 allowances for each ton of SO_2 emitted. Possession of the SO_2 allowances is not required until after the end of the year in which the SO_2 is emitted. LG&E will amend the ARP permit application under separate when required.

4.8 CLEAN AIR TRANSPORT RULE

The Clean Air Interstate Rule (CAIR) found at 40 CFR §96 applies to utility units. Pursuant to the applicability criteria in §97.104(a)(1) and §97.204(a)(1) for the CAIR NO_X and SO_2 trading programs, respectively, the proposed NGCCs are subject to CAIR since they serve a generator that supplies more than one-third of its potential electrical output capacity to any power distribution system for sale. On July 11, 2008, the DC Circuit Court vacated CAIR in its entirety; however, the court has since re-instated the program while EPA develops a revised CAIR. On July 6, 2010, U.S. EPA proposed the Clean Air Transport Rule (CATR) to replace CAIR. CATR is expected to be finalized in summer 2011. Despite this pending change, LG&E will submit a CAIR/CATR permit application under separate cover to meet the requirements of this regulation. LG&E will comply with the forthcoming CATR and the implementing APCD regulations as applicable.

4.9 KENTUCKY REQUIREMENTS

In addition to federal air regulations, the Commonwealth of Kentucky implements the state implementation plan (SIP) under approval from EPA. EPA is reconsidering the Regional Haze SIP

for Kentucky (BART). Under Kentucky's proposed Regional Haze SIP (BART), Mill Creek Units 3 & 4 are required to install SAM mitigation. The construction of the SAM mitigation was previously permitted but has net yet been constructed.

4.10 District Regulatory Requirements

In addition to federal air regulations, APCD establishes regulations applicable at the emission unit level (source specific) and at the facility level for stationary sources. The rules also contain requirements related to the need for construction and/or operating permits.

4.10.1 APCD Part 1 – General Provisions

4.10.1.1 Regulation 1.01 – General Provisions

This regulation describes the general application of District regulations and emission standards. LG&E will abide by all appropriate regulations and emission standards as determined by the APCD.

4.10.1.2 Regulation 1.11 – Open Burning

This regulation imposes restrictions on open burning activities. The regulation specifies what type of burning is permitted and when it is permitted. The facility shall comply with the requirements of this regulation in the event of performing open burning.

4.10.1.3 Regulation 1.14 – Control of Fugitive Particulate Emissions

This regulation requires facilities to take reasonable precautions to prevent fugitive dust from becoming airborne. The appropriate precautions will be taken to prevent fugitive dust from becoming airborne and ensure that opacity from fugitive dust sources is less than 20% for any applicable units as required by this rule.

4.10.2 APCD Part 5 – Standards for Toxic Air Contaminants and Hazardous Air Pollutants

4.10.2.1 Regulation 5.01 – General Provisions

This regulation applies to the owner or operator of any process equipment that emits or may emit a toxic air contaminant or hazardous air pollutant or for which a toxic air contaminant or hazardous air pollutant emission standard or other requirement is prescribed in a Part 5 regulation. A new or modified process or process equipment shall comply with all applicable emission standards upon commencing operation. LG&E will comply with all appropriate Part 5 regulations upon commencing startup of the proposed control equipment.

4.10.2.2 Regulation 5.02 – Adoption of NESHAP

This regulation adopts particular NESHAP regulations that are listed in 40 CFR Parts 61 and 63. LG&E will comply with this District regulation by meeting the

requirements of all NESHAP regulations that were discussed in Section 4.4 of this application.

4.10.2.3 Regulation 5.21 – Environmental Acceptability of Toxic Air Contaminants

The purpose of this regulation is to establish the criteria for determining the environmental acceptability of emissions of toxic air contaminants. This regulation sets the appropriate levels of risk that can be associated with toxic air contaminants at a new or modified process/facility. The APCD has developed the Strategic Toxic Air Reduction (STAR) Program to help reduce the levels of harmful contaminants in ambient air. LG&E has submitted a STAR compliance demonstration on the Mill Creek facility. No new TACs or increase in existing TACs is predicted. Appropriate STAR related forms will be submitted once final design and construction are completed.

4.10.3 APCD Part 7 – Standards of Performance for New Affected Facilities

4.10.3.1 Regulation 7.01 – General Provisions

This regulation establishes general requirements for any affected facility the construction, modification, or reconstruction of which is commenced on or after the effective date of an applicable standard of performance in Regulation 7. The new and modified control equipment will meet all applicable requirements set forth in Regulation 7.

4.10.3.2 Regulation 7.02 – Adoption of Federal NSPS

This regulation adopts particular NSPS regulations that are listed in 40 CFR Part 60. LG&E will comply with this District regulation by meeting the requirements of all NSPS regulations that were discussed in Section 4.3 of this application.

4.10.3.3 Regulation 7.08 – New Process Operations

This regulation establishes emissions limitations from new process operations. PM emissions from control equipment applicable to this regulation will meet the required emission limitations.

5. STAR PROGRAM COMPLIANCE

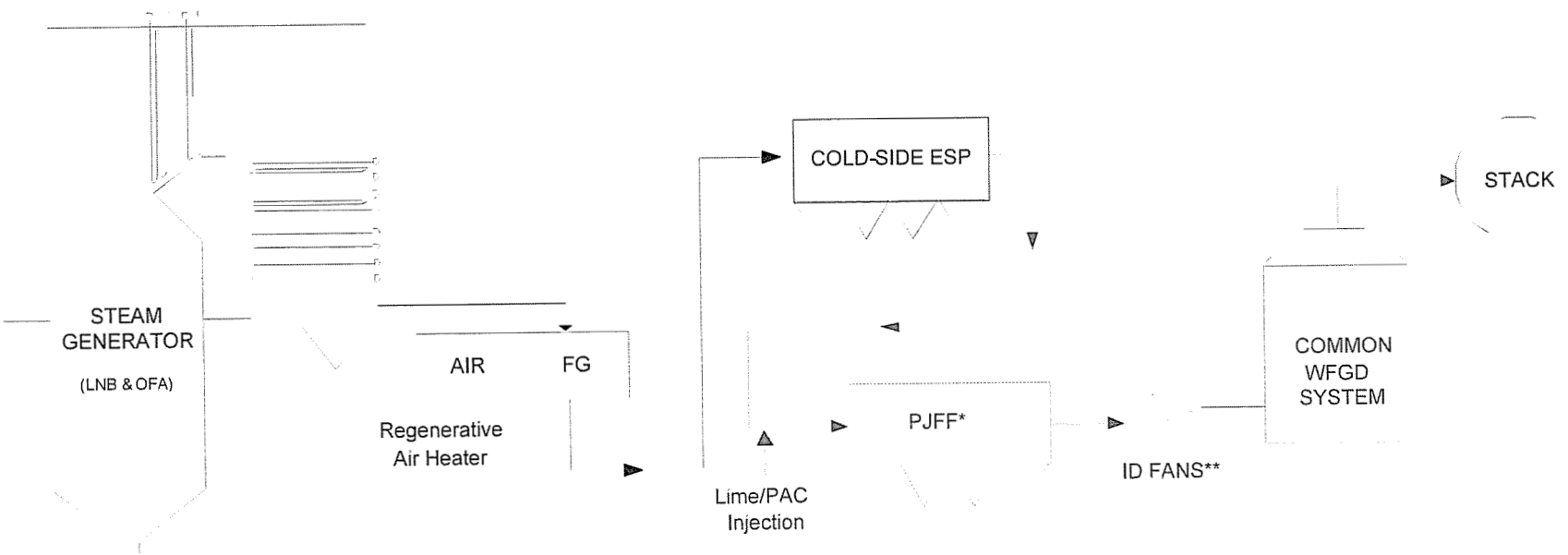
The proposed project will be subject to the Louisville Strategic Toxic Ambient Reduction (STAR) requirements (Regulation 5.01) for all regulated toxic air contaminants (TAC) that will be emitted at the Mill Creek facility. The proposed modifications to the control equipment, will be in compliance with all STAR requirements for all TAC emitted at the facility. No new TACs will be introduced at the facility. A modified facility STAR demonstration will be provided for the facility once final design specifications and facility lay-outs have been determined.

APPENDIX A

FACILITY INFORMATION

Process Flow Diagram

Mill Creek Unit 1 and 2
AQC Process Flow Diagram

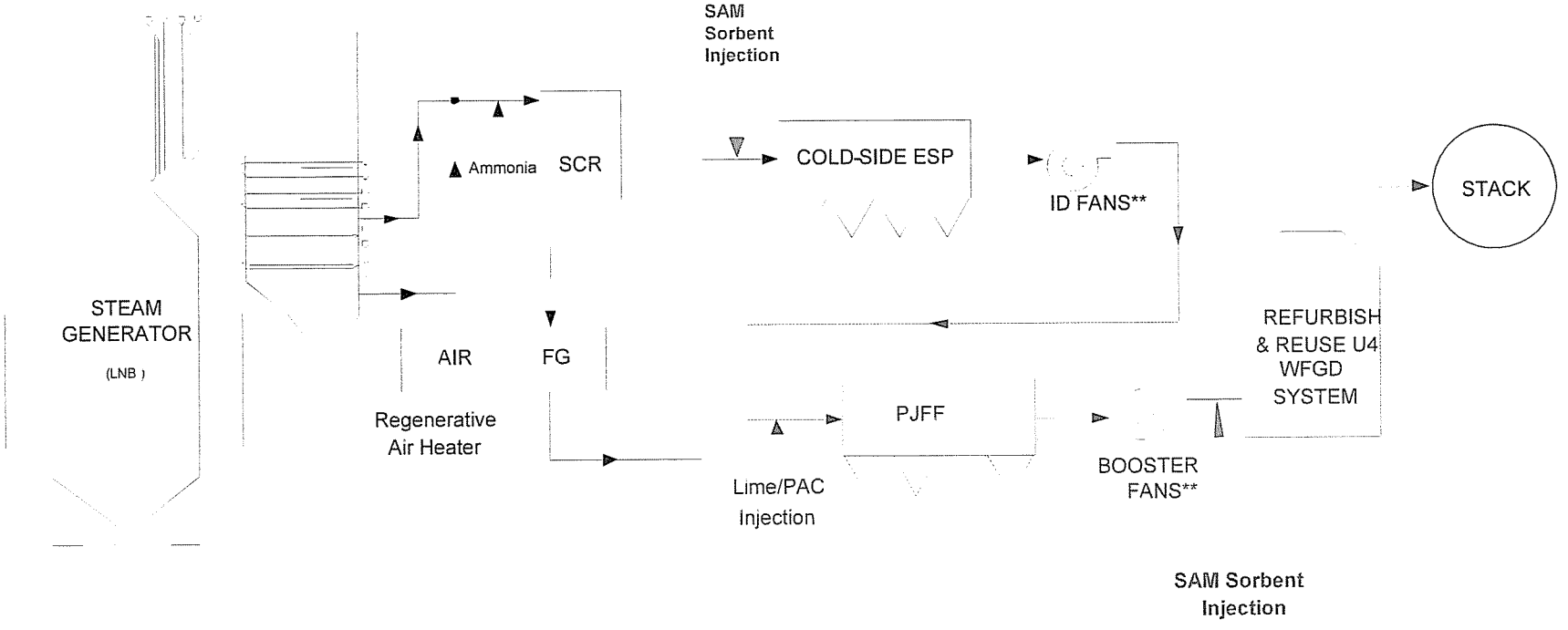


***Replacement to new Booster Fans or larger ID Fans is yet to be determined*

Black = Existing
Red = Preliminary Additions

Jun-11

Mill Creek Unit 3
AQC Process Flow Diagram

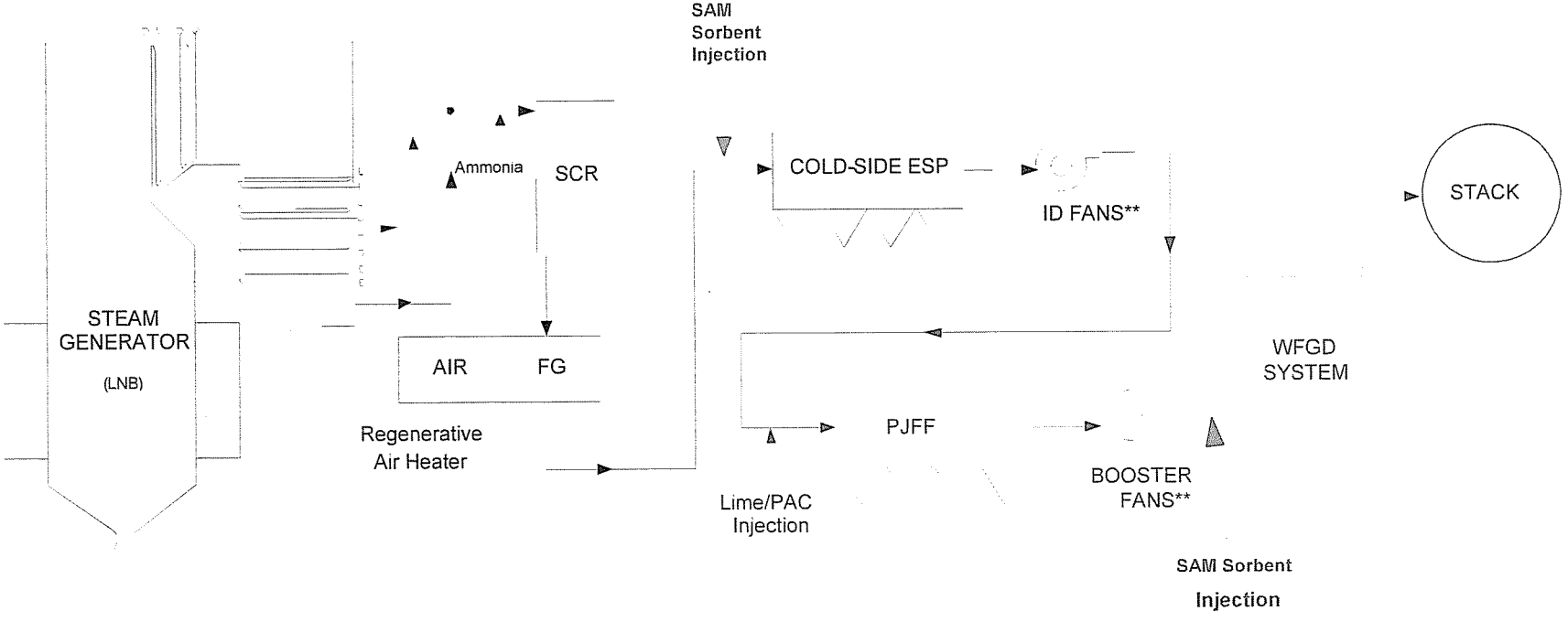


***Replacement to new Booster Fans or larger ID Fans is yet to be determined*

Black = Existing
Red = Preliminary Additions
Green = Previously approved. Not yet installed.

Jun-11

Mill Creek Unit 4
AQC Process Flow Diagram



***Replacement to new Booster Fans or larger ID Fans is yet to be determined*

Black = Existing
Red = Preliminary Additions
Green = Previously approved. Not yet installed.

Jun-11

APPENDIX B

CONSTRUCTION PERMIT APPLICATION FORMS

Louisville Metro Air Pollution Control District

Form: AP-0808 **Baghouse**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:

Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):

Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:

14660 Dixie Highway

Street Address

Louisville | KY | 40272 | -

City | State | Zip Code

Responsible Official Name: Ralph Bowling

Responsible Official Title: VP Power Production

Phone: (502)627-4121

Fax: (502)627-4030

E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:

☐ Check here if same as equipment location address.

220 West Main Street

Street Address

Louisville | KY | 40202 | 1377

City | State | Zip Code

Contact Name: Rebecca Cash

Contact Title: Environmental Engineer

Phone: (502)627-4633

Fax: (502)627-2550

E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification, Installation or Operation:

(MM/DD/YYYY)

Estimated Start Date: May 2015 Operation

Actual Start Date:

In accordance with District regulations 2.03. Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location?

Electric Services

SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling

Title: VP Power Production

Print Name: Ralph Bowling

Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information

Manufacturer: TBD

Model: TBD

Serial Number:

Is the baghouse insulated? ☑ YES ☐ NO

Design Minimum Operating Temperature: ° F

Design Maximum Operating Temperature: ° F

Are temperature controls provided? ☐ YES ☑ NO

If YES, describe the temperature controls:

Air Flow Through Baghouse:
- ☐ Forced
- ☑ Induced
- ☐ Other Specify:

Direction of Flow Through Filters:
- ☐ Inside Out
- ☑ Outside In

Particulate Removal Efficiency: 99 %

Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.

Section H: Compartment Information

Number of Compartments: TBD

Number of Filters (Bags) Per Compartment: TBD

Can the Compartments be Isolated for Replacement or Repair? ☑ YES ☐ NO

Section I: Gas Stream Information

Maximum Inlet Volumetric Gas Flow Rate: acfm at feet

Maximum Outlet Volumetric Gas Flow Rate: acfm at feet

Dew Point at maximum Moisture Content of Gas: ° F

pH of Gas Handled:

Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☑ Dry ☐ Other(Specify):

Section J: Contaminant Information

Percent of Each Contaminant in the Waste Gas and Removal Efficiency

If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Antimony Compounds	7440-36-0	0.000105	99
Arsenic Compounds	7440-38-2	0.002396	99
Cadmium Compounds	7440-43-9	0.000598	99
Chromium Compounds	7440-47-3	0.017737	99
Nickel Compounds	7440-02-0	0.011513	99

Section G: Equipment Information
Manufacturer:
Model:
Serial Number:
Is the baghouse insulated? ☐ YES ☐ NO
Design Minimum Operating Temperature: ° F
Design Maximum Operating Temperature: ° F
Are temperature controls provided? ☐ YES ☐ NO
If YES, describe the temperature controls:
Air Flow Through Baghouse: ☐ Forced ☐ Induced ☐ Other Specify:
Direction of Flow Through Filters: ☐ Inside Out ☐ Outside In
Particulate Removal Efficiency: %
Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.
Section H: Compartment Information
Number of Compartments:
Number of Filters (Bags) Per Compartment:
Can the Compartments be Isolated for Replacement or Repair? ☐ YES ☐ NO
Section I: Gas Stream Information
Maximum Inlet Volumetric Gas Flow Rate: acfm at **feet**
Maximum Outlet Volumetric Gas Flow Rate: acfm at **feet**
Dew Point at maximum Moisture Content of Gas: ° F
pH of Gas Handled:
Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☐ Dry ☐ Other(Specify):
Section J: Contaminant Information
Percent of Each Contaminant in the Waste Gas and Removal Efficiency
If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Cobalt Compounds	7440-48-4	0.000861	99
Lead Compounds	7439-92-1	0.019009	99
Manganese Compounds	7439-96-5	0.032000	99
Mercury Compounds	7439-97-6	0.000011	99
Selenium Compounds	7782-49-2	0.000229	99

Section K: Fabric Filter (Bag) Information

Fabric Type: ☐ Felted ☐ Membrane ☐ Ceramic Cartridge
☐ Woven ☐ PTFE Membrane ☐ Felted-Woven
☐ Sintered Metal ☐ Other (Specify):

Fabric Material: TBD

Maximum Continuous Filter Operating Temperature: TBD °F

Clean Fabric Permeability: TBD scfm/ft^2 at ΔP TBD inches of water

Fabric Filter (Bag) Diameter or Width: TBD **inches**

Fabric Filter (Bag) Length: TBD **inches**

Effective Area Per Filter: TBD **square inches**

Minimum Effective Air to Cloth Ratio: TBD **inches**

Maximum Effective Air to Cloth Ratio: TBD **inches**

Design Pressure Drop Across Baghouse: 6 **inches water**

Describe determining factor fabric filter changing/replacement:

Manufacturers recommendations and pressure drop across unit.

Attach the manufacturer's specification sheet for the fabric filters (bag).

Section L: Filter Cleaning Information

Filter Cleaning Method: ☐ Manual Cleaning ☐ Bag Collapse ☐ Reverse Air Jet
☐ Mechanical Shakers ☐ Sonic Cleaning ☑ Pulse Jet
☐ Pneumatic Shakers ☐ Reverse Air Flow ☐ Other (Specify):

Air Pressure: **psi**

Describe how air is supplied to system:

The cleaning frequency will be regulated by the control system based on overall fabric filter pressure drop. Online or isolated mode of cleaning of fabric filter will also be regulated by the control system. The fabric filter will be pulse-cleaned utilizing clean, dry, oil free, compressed air supplied by pulse jet air compressors and associated air receivers and dryers.

Describe how filter cleaning is initiated: ☐ Manual ☑ Pressure Drop
☐ Timer ☐ Other (Specify):

Section M: Hopper Information

Is the hopper heated? ☐ YES ☑ NO

Is there a hopper vibrator? ☐ YES ☑ NO

Describe how collected material is treated or disposed of:

The dust collected in the fabric filter discharge hoppers will be fluidized and removed by the Fly Ash Handling System. The flue gas from the outlet plenum of the fabric filter will flow through the induced draft fans in the Induced Draft System and then to the Wet Flue Gas Desulfurization System.

Section N: Stack Information			
Stack Height Above Grade: Exits through FGC Stack **feet**			
Stack Exit Diameter: **feet** *(Provide stack dimensions if rectangular stack.)*			
Is a Stack Cap Present? ☐ YES ☐ NO			
Stack Configuration: ☐ Vertical ☐ Horizontal ☐ Downward – Venting *(Check all that apply)* ☐ Other (Specify):			
Stack Exit Gas Temperature: ° F		Stack Exit Gas Flow Rate: ACFM	
Distance to Nearest Property Line: **feet**			
Describe nearest obstruction:			
Height of Nearest Obstruction: **feet**		Distance to Nearest Obstruction: **feet**	
Are stack **sampling ports** provided? ☐ YES ☐ NO			
Section O: Monitoring and Alarm Information			
Are there any **alarms** associated with this baghouse? ☑ YES ☐ NO			
If YES, complete the following.			
If there are more than three alarms, attach additional copies of this page as needed.			
Operating Parameter Monitored	**Describe Alarm Trigger**	**Monitoring Device or Alarm Type**	**Does the Alarm Initiate an Automated Response?**
Pressure drop across baghouse.		☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☑ YES ☐ NO Describe: Response will be dependent upon the type of alarm and current operating conditions.
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section P: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO

If yes, describe below:

The Particulate Removal System will collect particulate matter from the boiler flue gas stream on filter bags. Particulate matter will also be collected from the powder activated carbon (PAC) and sorbent injection systems in ductwork upstream of the pulse jet fabric filter. The collected particulate will be stored in hoppers until removed by the Fly Ash Handling System.

The Particulate Removal System consists of compartmentalized PJFF located between the sorbent injection lances and the inlet of the induced draft (ID) fans. The number of compartments is determined by economic compartment sizing, total flue gas flow rate, air-to-cloth ratio, and cleaning system design. The PJFF will be designed with a spare compartment.

Under normal operation, flue gas enters the fabric filter inlet plenum and is distributed to the individual compartments through inlet dampers at each fabric filter compartment. Flue gas will pass upwards through the filter bags where the particulates within the gas stream will collect on the outside of the filter bags and the clean gas exits each fabric filter compartment through an outlet damper into fabric filter outlet plenum. To prevent collapse of the bag, a metal cage is installed on the inside of the filter bags. Filter bags and cages are suspended from a tube sheet at the top of the compartment. Each individual compartment will be provided with inlet and outlet isolation dampers for access or maintenance.

The collected particulate will be cleaned from the filter bags by suddenly inflating the filter bags with a pulse of compressed air over several rows of filter bags, causing the dust on the outside to separate from the bags and drop into hoppers below. Online or isolated mode of cleaning of fabric filter will also be regulated by the control system.

The dust collected in the fabric filter discharge hoppers will be fluidized and removed by the Fly Ash Handling System. The flue gas from the outlet plenum of the fabric filter will flow through the induced draft fans in the Induced Draft System and then to the Wet Flue Gas Desulfurization System.

Emissions from MC1 and MC2 exit their respective baghouse and flow to a combined wet flue gas desulfurization (FGD) process before exiting a combined stack. See FGD form for MC1/MC2 for stack parameters.

Louisville Metro Air Pollution Control District

Form: AP-0808 **Baghouse**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:

Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):

Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:

14660 Dixie Highway
Street Address

Louisville | KY | 40272 - _____
City | State | Zip Code

Responsible Official Name: Ralph Bowling

Responsible Official Title: VP Power Production

Phone: (502)627-4121

Fax: (502)627-4030

E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:

☐ Check here if same as equipment location address.

220 West Main Street
Street Address

Louisville | KY | 40202 - 1377
City | State | Zip Code

Contact Name: Rebecca Cash

Contact Title: Environmental Engineer

Phone: (502)627-4633

Fax: _____

E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification, Installation or Operation:

(MM/DD/YYYY)

Estimated Start Date: April 2015 Operation

Actual Start Date: _____

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location?

Electric Services

SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling

Title: VP Power Production

Print Name: Ralph Bowling

Date: 6/9/15

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information
Manufacturer: TBD
Model: TBD
Serial Number:
Is the baghouse insulated? ☑ YES ☐ NO
Design Minimum Operating Temperature: ° F
Design Maximum Operating Temperature: ° F
Are temperature controls provided? ☐ YES ☑ NO
If YES, describe the temperature controls:
Air Flow Through Baghouse: ☐ Forced ☑ Induced ☐ Other Specify:
Direction of Flow Through Filters: ☐ Inside Out ☑ Outside In
Particulate Removal Efficiency: 99 %
Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.
Section H: Compartment Information
Number of Compartments: TBD
Number of Filters (Bags) Per Compartment: TBD
Can the Compartments be Isolated for Replacement or Repair? ☑ YES ☐ NO
Section I: Gas Stream Information
Maximum Inlet Volumetric Gas Flow Rate: acfm at **feet**
Maximum Outlet Volumetric Gas Flow Rate: acfm at **feet**
Dew Point at maximum Moisture Content of Gas: ° F
pH of Gas Handled:
Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☑ Dry ☐ Other(Specify):
Section J: Contaminant Information
Percent of Each Contaminant in the Waste Gas and Removal Efficiency
If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Antimony Compounds	7440-36-0	0.000105	99
Arsenic Compounds	7440-38-2	0.002396	99
Cadmium Compounds	7440-43-9	0.000598	99
Chromium Compounds	7440-47-3	0.17737	99
Nickel Compounds	7440-02-0	0.011513	99

Section G: Equipment Information
Manufacturer:
Model:
Serial Number:
Is the baghouse insulated? ☐ YES ☐ NO
Design Minimum Operating Temperature: °F
Design Maximum Operating Temperature: °F
Are temperature controls provided? ☐ YES ☐ NO
If YES, describe the temperature controls:
Air Flow Through Baghouse: ☐ Forced ☐ Induced ☐ Other Specify:
Direction of Flow Through Filters: ☐ Inside Out ☐ Outside In
Particulate Removal Efficiency: %
Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.
Section H: Compartment Information
Number of Compartments:
Number of Filters (Bags) Per Compartment:
Can the Compartments be Isolated for Replacement or Repair? ☐ YES ☐ NO
Section I: Gas Stream Information
Maximum Inlet Volumetric Gas Flow Rate: acfm at **feet**
Maximum Outlet Volumetric Gas Flow Rate: acfm at **feet**
Dew Point at maximum Moisture Content of Gas: °F
pH of Gas Handled:
Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☐ Dry ☐ Other(Specify):
Section J: Contaminant Information
Percent of Each Contaminant in the Waste Gas and Removal Efficiency
If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Cobalt Compounds	7440-48-4	0.000861	99
Lead Compounds	7439-92-1	0.019009	99
Manganese Compounds	7439-96-5	0.032000	99
Mercury Compounds	7439-97-6	0.000011	99
Selenium Compounds	7782-49-2	0.000229	99

Section K:Fabric Filter (Bag) Information

Fabric Type: ☐ Felted ☐ Woven ☐ Sintered Metal ☐ Membrane ☐ PTFE Membrane ☐ Other (Specify): ☐ Ceramic Cartridge ☐ Felted-Woven

Fabric Material: TBD

Maximum Continuous Filter Operating Temperature: TBD °F

Clean Fabric Permeability: TBD scfm/ft^2 at ΔP TBD inches of water

Fabric Filter (Bag) Diameter or Width: TBD **inches**

Fabric Filter (Bag) Length: TBD **inches**

Effective Area Per Filter: TBD **square inches**

Minimum Effective Air to Cloth Ratio: TBD **inches**

Maximum Effective Air to Cloth Ratio: TBD **inches**

Design Pressure Drop Across Baghouse: 6 **inches water**

Describe determining factor fabric filter changing/replacement:

Manufacturers recommendations and pressure drop across unit.

Attach the manufacturer's specification sheet for the fabric filters (bag).

Section L: Filter Cleaning Information

Filter Cleaning Method: ☐ Manual Cleaning ☐ Mechanical Shakers ☐ Pneumatic Shakers ☐ Bag Collapse ☐ Sonic Cleaning ☐ Reverse Air Flow ☐ Reverse Air Jet ☑ Pulse Jet ☐ Other (Specify):

Air Pressure: **psi**

Describe how air is supplied to system:

The cleaning frequency will be regulated by the control system based on overall fabric filter pressure drop. Online or isolated mode of cleaning of fabric filter will also be regulated by the control system. The fabric filter will be pulse-cleaned utilizing clean, dry, oil free, compressed air supplied by pulse jet air compressors and associated air receivers and dryers.

Describe how filter cleaning is initiated: ☐ Manual ☐ Timer ☑ Pressure Drop ☐ Other (Specify):

Section M: Hopper Information

Is the hopper heated? ☐ YES ☑ NO

Is there a hopper vibrator? ☐ YES ☑ NO

Describe how collected material is treated or disposed of:

The dust collected in the fabric filter discharge hoppers will be fluidized and removed by the Fly Ash Handling System. The flue gas from the outlet plenum of the fabric filter will flow through the induced draft fans in the Induced Draft System and then to the Wet Flue Gas Desulfurization System.

Section N: Stack Information			
Stack Height Above Grade:	Exits through FGD Stack **feet**		
Stack Exit Diameter: *(Provide stack dimensions if rectangular stack.)*	**feet**		
Is a Stack Cap Present? ☐ YES ☐ NO			
Stack Configuration: *(Check all that apply)* ☐ Vertical ☐ Horizontal ☐ Downward – Venting ☐ Other (Specify):			
Stack Exit Gas Temperature:	° F	Stack Exit Gas Flow Rate:	ACFM
Distance to Nearest Property Line:	**feet**		
Describe nearest obstruction:			
Height of Nearest Obstruction:	**feet**	Distance to Nearest Obstruction:	**feet**
Are stack **sampling ports** provided? ☐ YES ☐ NO			

Section O: Monitoring and Alarm Information			
Are there any **alarms** associated with this baghouse? ☑ YES ☐ NO			
If YES, complete the following.			
If there are more than three alarms, attach additional copies of this page as needed.			
Operating Parameter Monitored	**Describe Alarm Trigger**	**Monitoring Device or Alarm Type**	**Does the Alarm Initiate an Automated Response?**
Pressure drop across baghouse.	Will be programmed based upon the manufacturer's recommendation.	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☑ YES ☐ NO Describe: Response will be dependent upon the type of alarm and current operating conditions.
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section P: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO

If yes, describe below:

The Particulate Removal System will collect particulate matter from the boiler flue gas stream on filter bags. Particulate matter will also be collected from the powder activated carbon (PAC) and sorbent injection systems in ductwork upstream of the pulse jet fabric filter. The collected particulate will be stored in hoppers until removed by the Fly Ash Handling System.

The Particulate Removal System consists of compartmentalized PJFF located between the sorbent injection lances and the inlet of the induced draft (ID) fans. The number of compartments is determined by economic compartment sizing, total flue gas flow rate, air-to-cloth ratio, and cleaning system design. The PJFF will be designed with a spare compartment.

Under normal operation, flue gas enters the fabric filter inlet plenum and is distributed to the individual compartments through inlet dampers at each fabric filter compartment. Flue gas will pass upwards through the filter bags where the particulates within the gas stream will collect on the outside of the filter bags and the clean gas exits each fabric filter compartment through an outlet damper into fabric filter outlet plenum. To prevent collapse of the bag, a metal cage is installed on the inside of the filter bags. Filter bags and cages are suspended from a tube sheet at the top of the compartment. Each individual compartment will be provided with inlet and outlet isolation dampers for access or maintenance.

The collected particulate will be cleaned from the filter bags by suddenly inflating the filter bags with a pulse of compressed air over several rows of filter bags, causing the dust on the outside to separate from the bags and drop into hoppers below. Online or isolated mode of cleaning of fabric filter will also be regulated by the control system.

The dust collected in the fabric filter discharge hoppers will be fluidized and removed by the Fly Ash Handling System. The flue gas from the outlet plenum of the fabric filter will flow through the induced draft fans in the Induced Draft System and then to the Wet Flue Gas Desulfurization System.

Emissions from MC1 and MC2 exit their respective baghouse and flow to a combined wet flue gas desulfurization (FGD) process before exiting a combined stack. See FGD form for MC1/MC2 for stack parameters.

Louisville Metro Air Pollution Control District

Form: AP-0808 **Baghouse**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:

Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):

Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:

14660 Dixie Highway
Street Address

Louisville | KY | 40272 -
City | State | Zip Code

Responsible Official Name: Ralph Bowling

Responsible Official Title: VP Power Production

Phone: (502)627-4121

Fax: (502)627-4030

E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:

☐ Check here if same as equipment location address.

220 West Main Street
Street Address

Louisville | KY | 40202 - 1377
City | State | Zip Code

Contact Name: Rebecca Cash

Contact Title: Environmental Engineer

Phone: (502)627-4633

Fax:

E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification, Installation or Operation:

(MM/DD/YYYY)

Estimated Start Date: October 2015 Operation

Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location? Electric Services

SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling

Title: VP Power Production

Print Name: Ralph Bowling

Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information

Manufacturer: TBD

Model: TBD

Serial Number:

Is the baghouse insulated? ☑ YES ☐ NO

Design Minimum Operating Temperature: ° F

Design Maximum Operating Temperature: ° F

Are temperature controls provided? ☐ YES ☑ NO

If YES, describe the temperature controls:

Air Flow Through Baghouse:
- ☐ Forced
- ☑ Induced
- ☐ Other Specify:

Direction of Flow Through Filters:
- ☐ Inside Out
- ☑ Outside In

Particulate Removal Efficiency: 99 %

Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.

Section H: Compartment Information

Number of Compartments: TBD

Number of Filters (Bags) Per Compartment: TBD

Can the Compartments be Isolated for Replacement or Repair? ☑ YES ☐ NO

Section I: Gas Stream Information

Maximum Inlet Volumetric Gas Flow Rate: acfm at **feet**

Maximum Outlet Volumetric Gas Flow Rate: acfm at **feet**

Dew Point at maximum Moisture Content of Gas: ° F

pH of Gas Handled:

Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☑ Dry ☐ Other(Specify):

Section J: Contaminant Information

Percent of Each Contaminant in the Waste Gas and Removal Efficiency

If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Antimony Compounds	7440-36-0	0.000105	99
Arsenic Compounds	7440-38-2	0.002396	99
Cadmium Compounds	7440-43-9	0.000598	99
Chromium Compounds	7440-47-3	0.017737	99
Nickel Compounds	7440-02-0	0.011513	99

Section G: Equipment Information
Manufacturer:
Model:
Serial Number:
Is the baghouse insulated? ☐ YES ☐ NO
Design Minimum Operating Temperature: ° F
Design Maximum Operating Temperature: ° F
Are temperature controls provided? ☐ YES ☐ NO
If YES, describe the temperature controls:
Air Flow Through Baghouse: ☐ Forced ☐ Induced ☐ Other Specify:
Direction of Flow Through Filters: ☐ Inside Out ☐ Outside In
Particulate Removal Efficiency: %
Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.
Section H: Compartment Information
Number of Compartments:
Number of Filters (Bags) Per Compartment:
Can the Compartments be Isolated for Replacement or Repair? ☐ YES ☐ NO
Section I: Gas Stream Information
Maximum Inlet Volumetric Gas Flow Rate: acfm at **feet**
Maximum Outlet Volumetric Gas Flow Rate: acfm at **feet**
Dew Point at maximum Moisture Content of Gas: ° F
pH of Gas Handled:
Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☐ Dry ☐ Other(Specify):
Section J: Contaminant Information
Percent of Each Contaminant in the Waste Gas and Removal Efficiency
If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Cobalt Compounds	7440-48-4	0.000861	99
Lead Compounds	7439-92-1	0.019009	99
Manganese Compounds	7439-96-5	0.032000	99
Mercury Compounds	7439-97-6	0.000011	99
Selenium Compounds	7782-49-2	0.000229	99

Section K:Fabric Filter (Bag) Information

Fabric Type: ☐ Felted ☐ Woven ☐ Sintered Metal ☐ Membrane ☐ PTFE Membrane ☐ Other (Specify): ☐ Ceramic Cartridge ☐ Felted-Woven

Fabric Material: TBD

Maximum Continuous Filter Operating Temperature: TBD ° F

Clean Fabric Permeability: TBD scfm/ft^2 at ΔP TBD inches of water

Fabric Filter (Bag) Diameter or Width: TBD **inches**

Fabric Filter (Bag) Length: TBD **inches**

Effective Area Per Filter: TBD **square inches**

Minimum Effective Air to Cloth Ratio: TBD **inches**

Maximum Effective Air to Cloth Ratio: TBD **inches**

Design Pressure Drop Across Baghouse: 6 **inches water**

Describe determining factor fabric filter changing/replacement:

Manufacturers recommendations and pressure drop across unit.

Attach the manufacturer's specification sheet for the fabric filters (bag).

Section L: Filter Cleaning Information

Filter Cleaning Method: ☐ Manual Cleaning ☐ Mechanical Shakers ☐ Pneumatic Shakers ☐ Bag Collapse ☐ Sonic Cleaning ☐ Reverse Air Flow ☐ Reverse Air Jet ☑ Pulse Jet ☐ Other (Specify):

Air Pressure: **psi**

Describe how air is supplied to system:

The cleaning frequency will be regulated by the control system based on overall fabric filter pressure drop. Online or isolated mode of cleaning of fabric filter will also be regulated by the control system. The fabric filter will be pulse-cleaned utilizing clean, dry, oil free, compressed air supplied by pulse jet air compressors and associated air receivers and dryers.

Describe how filter cleaning is initiated: ☐ Manual ☐ Timer ☑ Pressure Drop ☐ Other (Specify):

Section M: Hopper Information

Is the hopper heated? ☐ YES ☑ NO

Is there a hopper vibrator? ☐ YES ☑ NO

Describe how collected material is treated or disposed of:

The dust collected in the fabric filter discharge hoppers will be fluidized and removed by the Fly Ash Handling System. The flue gas from the outlet plenum of the fabric filter will flow through the induced draft fans in the Induced Draft System and then to the Wet Flue Gas Desulfurization System.

Section N: Stack Information			
Stack Height Above Grade: Exits through FGE Stack. **feet**			
Stack Exit Diameter: **feet** *(Provide stack dimensions if rectangular stack.)*			
Is a Stack Cap Present? ☐ YES ☒ NO			
Stack Configuration: ☒ Vertical ☐ Horizontal ☒ Downward – Venting *(Check all that apply)* ☐ Other (Specify):			
Stack Exit Gas Temperature: ° F		Stack Exit Gas Flow Rate: ACFM	
Distance to Nearest Property Line: **feet**			
Describe nearest obstruction:			
Height of Nearest Obstruction: **feet**		Distance to Nearest Obstruction: **feet**	
Are stack **sampling ports** provided? ☐ YES ☐ NO			
Section O: Monitoring and Alarm Information			
Are there any **alarms** associated with this baghouse? ☑ YES ☐ NO			
If YES, complete the following.			
If there are more than three alarms, attach additional copies of this page as needed.			
Operating Parameter Monitored	**Describe Alarm Trigger**	**Monitoring Device or Alarm Type**	**Does the Alarm Initiate an Automated Response?**
Pressure drop across baghouse.	Will be programmed based upon the manufacturer's recommendation.	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☑ YES ☐ NO Describe: Response will be dependent upon the type of alarm and current operating conditions.
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section P: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO
If yes, describe below:

The Particulate Removal System will collect particulate matter from the boiler flue gas stream on filter bags. Particulate matter will also be collected from the powder activated carbon (PAC) and sorbent injection systems in ductwork upstream of the pulse jet fabric filter. The collected particulate will be stored in hoppers until removed by the Fly Ash Handling System.

The Particulate Removal System consists of compartmentalized PJFF located between the sorbent injection lances and the inlet of the induced draft (ID) fans. The number of compartments is determined by economic compartment sizing, total flue gas flow rate, air-to-cloth ratio, and cleaning system design. The PJFF will be designed with a spare compartment.

Under normal operation, flue gas enters the fabric filter inlet plenum and is distributed to the individual compartments through inlet dampers at each fabric filter compartment. Flue gas will pass upwards through the filter bags where the particulates within the gas stream will collect on the outside of the filter bags and the clean gas exits each fabric filter compartment through an outlet damper into fabric filter outlet plenum. To prevent collapse of the bag, a metal cage is installed on the inside of the filter bags. Filter bags and cages are suspended from a tube sheet at the top of the compartment. Each individual compartment will be provided with inlet and outlet isolation dampers for access or maintenance.

The collected particulate will be cleaned from the filter bags by suddenly inflating the filter bags with a pulse of compressed air over several rows of filter bags, causing the dust on the outside to separate from the bags and drop into hoppers below. Online or isolated mode of cleaning of fabric filter will also be regulated by the control system.

The dust collected in the fabric filter discharge hoppers will be fluidized and removed by the Fly Ash Handling System. The flue gas from the outlet plenum of the fabric filter will flow through the induced draft fans in the Induced Draft System and then to the Wet Flue Gas Desulfurization System.

Emissions from MC3 exit the baghouse and flow to a wet flue gas desulfurization (FGD) process before exiting the stack. See FGD form for MC3 for stack parameters.

Louisville Metro Air Pollution Control District

Form: AP-0808 **Baghouse**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:

Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):

Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:

14660 Dixie Highway

Street Address

Louisville | KY | 40272 -

City | State | Zip Code

Responsible Official Name: Ralph Bowling

Responsible Official Title: VP Power Production

Phone: (502)627-4121

Fax: (502)627-4030

E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:

☐ Check here if same as equipment location address.

220 West Main Street

Street Address

Louisville | KY | 40202 - 1377

City | State | Zip Code

Contact Name: Rebecca Cash

Contact Title: Environmental Engineer

Phone: (502)627-4633

Fax:

E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification, Installation or Operation:

(MM/DD/YYYY)

Estimated Start Date: November 2014 Operation

Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location?

Electric Services

SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling

Title: VP Power Production

Print Name: Ralph Bowling

Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information

Manufacturer: TBD

Model: TBD

Serial Number:

Is the baghouse insulated? ☑ YES ☐ NO

Design Minimum Operating Temperature: ° F

Design Maximum Operating Temperature: ° F

Are temperature controls provided? ☐ YES ☑ NO

If YES, describe the temperature controls:

Air Flow Through Baghouse:
- ☐ Forced
- ☑ Induced
- ☐ Other Specify:

Direction of Flow Through Filters:
- ☐ Inside Out
- ☑ Outside In

Particulate Removal Efficiency: 99 %

Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.

Section H: Compartment Information

Number of Compartments: TBD

Number of Filters (Bags) Per Compartment: TBD

Can the Compartments be Isolated for Replacement or Repair? ☑ YES ☐ NO

Section I: Gas Stream Information

Maximum Inlet Volumetric Gas Flow Rate: acfm at **feet**

Maximum Outlet Volumetric Gas Flow Rate: acfm at **feet**

Dew Point at maximum Moisture Content of Gas: ° F

pH of Gas Handled:

Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☑ Dry ☐ Other(Specify):

Section J: Contaminant Information

Percent of Each Contaminant in the Waste Gas and Removal Efficiency

If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Antimony Compounds	7440-36-0	0.000105	99
Arsenic Compounds	7440-38-2	0.002396	99
Cadmium Compounds	7440-43-9	0.000598	99
Chromium Compounds	7440-47-3	0.017737	99
Nickel Compounds	7440-02-0	0.011513	99

Section G: Equipment Information
Manufacturer:
Model:
Serial Number:
Is the baghouse insulated? ☐ YES ☐ NO
Design Minimum Operating Temperature: ° F
Design Maximum Operating Temperature: ° F
Are temperature controls provided? ☐ YES ☐ NO
If YES, describe the temperature controls:
Air Flow Through Baghouse: ☐ Forced ☐ Induced ☐ Other Specify:
Direction of Flow Through Filters: ☐ Inside Out ☐ Outside In
Particulate Removal Efficiency: %
Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.
Section H: Compartment Information
Number of Compartments:
Number of Filters (Bags) Per Compartment:
Can the Compartments be Isolated for Replacement or Repair? ☐ YES ☐ NO
Section I: Gas Stream Information
Maximum Inlet Volumetric Gas Flow Rate: acfm at **feet**
Maximum Outlet Volumetric Gas Flow Rate: acfm at **feet**
Dew Point at maximum Moisture Content of Gas: ° F
pH of Gas Handled:
Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☐ Dry ☐ Other(Specify):
Section J: Contaminant Information
Percent of Each Contaminant in the Waste Gas and Removal Efficiency
If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Cobalt Compounds	7440-48-4	0.000861	99
Lead Compounds	7439-92-1	0.019009	99
Manganese Compounds	7439-96-5	0.032000	99
Mercury Compounds	7439-97-6	0.000011	99
Selenium Compounds	7782-49-2	0.000229	99

Section K:Fabric Filter (Bag) Information

Fabric Type: ☐ Felted ☐ Membrane ☐ Ceramic Cartridge
☐ Woven ☐ PTFE Membrane ☐ Felted-Woven
☐ Sintered Metal ☐ Other (Specify):

Fabric Material: TBD

Maximum Continuous Filter Operating Temperature: TBD °F

Clean Fabric Permeability: TBD scfm/ft^2 at ΔP TBD inches of water

Fabric Filter (Bag) Diameter or Width: TBD **inches**

Fabric Filter (Bag) Length: TBD **inches**

Effective Area Per Filter: TBD **square inches**

Minimum Effective Air to Cloth Ratio: TBD **inches**

Maximum Effective Air to Cloth Ratio: TBD **inches**

Design Pressure Drop Across Baghouse: 6 **inches water**

Describe determining factor fabric filter changing/replacement:

Manufacturers recommendations and pressure drop across unit.

Attach the manufacturer's specification sheet for the fabric filters (bag).

Section L: Filter Cleaning Information

Filter Cleaning Method: ☐ Manual Cleaning ☐ Bag Collapse ☐ Reverse Air Jet
☐ Mechanical Shakers ☐ Sonic Cleaning ☑ Pulse Jet
☐ Pneumatic Shakers ☐ Reverse Air Flow ☐ Other (Specify):

Air Pressure: **psi**

Describe how air is supplied to system:

The cleaning frequency will be regulated by the control system based on overall fabric filter pressure drop. Online or isolated mode of cleaning of fabric filter will also be regulated by the control system. The fabric filter will be pulse-cleaned utilizing clean, dry, oil free, compressed air supplied by pulse jet air compressors and associated air receivers and dryers.

Describe how filter cleaning is initiated: ☐ Manual ☑ Pressure Drop
☐ Timer ☐ Other (Specify):

Section M: Hopper Information

Is the hopper heated? ☐ YES ☑ NO

Is there a hopper vibrator? ☐ YES ☑ NO

Describe how collected material is treated or disposed of:

The dust collected in the fabric filter discharge hoppers will be fluidized and removed by the Fly Ash Handling System. The flue gas from the outlet plenum of the fabric filter will flow through the induced draft fans in the Induced Draft System and then to the Wet Flue Gas Desulfurization System.

Section N: Stack Information		
Stack Height Above Grade: Exits through FGC Stack **feet**		
Stack Exit Diameter: **feet** *(Provide stack dimensions if rectangular stack.)*		
Is a Stack Cap Present? ☐ YES ☐ NO		
Stack Configuration: ☐ Vertical ☐ Horizontal ☐ Downward – Venting *(Check all that apply)* ☐ Other (Specify):		
Stack Exit Gas Temperature: ° F	Stack Exit Gas Flow Rate: ACFM	
Distance to Nearest Property Line: **feet**		
Describe nearest obstruction:		
Height of Nearest Obstruction: **feet**	Distance to Nearest Obstruction: **feet**	
Are stack **sampling ports** provided? ☐ YES ☐ NO		

Section O: Monitoring and Alarm Information			
Are there any **alarms** associated with this baghouse? ☑ YES ☐ NO			
If YES, complete the following.			
If there are more than three alarms, attach additional copies of this page as needed.			
Operating Parameter Monitored	**Describe Alarm Trigger**	**Monitoring Device or Alarm Type**	**Does the Alarm Initiate an Automated Response?**
Pressure drop across baghouse.	Will be programmed based upon the manufacturer's recommendation.	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☑ YES ☐ NO Describe: Response will be dependent upon the type of alarm and current operating conditions.
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section P: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO

If yes, describe below:

The Particulate Removal System will collect particulate matter from the boiler flue gas stream on filter bags. Particulate matter will also be collected from the powder activated carbon (PAC) and sorbent injection systems in ductwork upstream of the pulse jet fabric filter. The collected particulate will be stored in hoppers until removed by the Fly Ash Handling System.

The Particulate Removal System consists of compartmentalized PJFF located between the sorbent injection lances and the inlet of the induced draft (ID) fans. The number of compartments is determined by economic compartment sizing, total flue gas flow rate, air-to-cloth ratio, and cleaning system design. The PJFF will be designed with a spare compartment.

Under normal operation, flue gas enters the fabric filter inlet plenum and is distributed to the individual compartments through inlet dampers at each fabric filter compartment. Flue gas will pass upwards through the filter bags where the particulates within the gas stream will collect on the outside of the filter bags and the clean gas exits each fabric filter compartment through an outlet damper into fabric filter outlet plenum. To prevent collapse of the bag, a metal cage is installed on the inside of the filter bags. Filter bags and cages are suspended from a tube sheet at the top of the compartment. Each individual compartment will be provided with inlet and outlet isolation dampers for access or maintenance.

The collected particulate will be cleaned from the filter bags by suddenly inflating the filter bags with a pulse of compressed air over several rows of filter bags, causing the dust on the outside to separate from the bags and drop into hoppers below. Online or isolated mode of cleaning of fabric filter will also be regulated by the control system.

The dust collected in the fabric filter discharge hoppers will be fluidized and removed by the Fly Ash Handling System. The flue gas from the outlet plenum of the fabric filter will flow through the induced draft fans in the Induced Draft System and then to the Wet Flue Gas Desulfurization System.

Emissions from MC4 exit the baghouse and flow to a wet flue gas desulfurization (FGD) process before exiting the stack. See FGD form for MC4 for stack parameters.

Louisville Metro Air Pollution Control District

Form: AP-0908 **Scrubber**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:
Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):
Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:
14660 Dixie Highway
Street Address
Louisville | KY | 40272 | -
City | State | Zip Code

Responsible Official Name: Ralph Bowling
Responsible Official Title: VP Power Production
Phone: (502)627-4121
Fax: (502)627-4030
E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:
☐ Check here if same as equipment location address.
220 West Main Street
Street Address
Louisville | KY | 40202 | 1377
City | State | Zip Code

Contact Name: Rebecca Cash
Contact Title: Environmental Engineer
Phone: (502)627-4633
Fax: (502)627-2550
E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification, Installation or Operation:
(MM/DD/YYYY)
Estimated Start Date: April/May 2015 Operation
Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location?
Electric Services

SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling
Title: VP Power Production
Print Name: Ralph Bowling
Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information

Manufacturer: TBD

Model: TBD

Serial Number: TBD

Attach the Manufacturer's Specification Sheet for the Scrubber and any Removal Efficiency calculations.

Section H: Contaminant Information

Concentration of Each Contaminant in the Waste Gas, Vapor Pressure, Solubility in the Scrubbing Liquor, and Removal Efficiency

If more than six contaminants are present, attach additional copies of this page as needed.

Contaminant	CAS Number	Concentration in Waste Gas	Vapor Pressure	Solubility in Scrubbing Liquor	Removal Efficiency
SO2		3-3.5 % by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☑ Highly soluble ☐ Miscible ☐ Not Applicable	98 %
HCl		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☑ Highly soluble ☐ Miscible ☐ Not Applicable	98 %
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%

Section I: Gas Stream Information

Maximum Inlet Volumetric Gas Flow Rate: 695,086	**acfm** at 330	° F
Maximum outlet Volumetric Gas Flow Rate: 577,347	**acfm** at 128	° F
Pressure Drop Across Scrubber: 12.0	**inches water**	

Section J: Scrubbing Liquor Information

Scrubbing Liquor Components

If more than five components are present, attach additional copies of this page as needed.

Scrubbing Liquor Component	CAS Number	Concentration
Limestone		14-16 % by Weight
		% by Weight
		% by Weight
		% by Weight
		% by Weight

Scrubbing Liquor Flow Rate: 19,400 **gallons/minute**

pH Operating Range: 5-6

Is the scrubbing liquor recirculated? ☐ YES ☑ NO

Is there more than one operating scenario for the scrubber? ☐ YES ☑ NO

If YES, complete the following information.

Alternate Operating Scenario Scrubbing Liquor Flow Rate: **gallons/minute**

Alternate Operating Scenario pH Operating Range:

Is the scrubbing liquor recirculated in the alternate operating scenario? ☐ YES ☐ NO

Describe how spent scrubbing liquor is treated or disposed of:

Section K: Operational Information

Scrubber Type: ☑ Spray Tower ☐ Packed Bed ☐ Ionizing ☐ Tray Tower ☐ Fluidized Bed Scrubber ☑ Other (Specify): ☐ Venturi

Scrubber Height: **feet**

Scrubber Inside Diameter: **feet**

Does the scrubber use **packing**? ☐ YES ☑ NO

If YES, complete the following information.

Packing Type: ☐ Berl Saddle ☐ Intalox Saddle ☐ Raschig Ring ☐ Lesig Ring ☐ Pall Ring ☐ Tellerette ☐ Marbles ☐ Other (Specify):

Packing Size: **inch**

Packing Material:

Height of Packing: **feet**

Does the scrubber use **trays, plates, or baffles**? ☑ YES ☐ NO

Type of Impactor/Impingement: ☑ Trays ☐ Plates ☐ Baffles ☐ Other (Specify):

Type of Perforation: ☑ Holes ☐ Bubble Caps ☐ Movable Discs ☐ Adjustable Trays ☐ Other (Specify):

Spacing Between Trays, Plates, or Baffles: 60 **inches**

Configuration:	☑ Counter - Current ☐ Co - Current ☐ Other (Specify):
Will a **mist eliminator** be installed?	☑ YES ☐ NO
If YES, complete the following.	
Describe the mist eliminator:	

Section L: Stack Information

Stack Height Above Grade: 600	**feet**
Stack Exit Diameter: 15.5 *(Provide stack dimensions if rectangular stack.)*	**feet**
Is a **stack cap** present?	☐ YES ☑ NO
Stack Configuration: *(Check all that apply)*	☑ Vertical ☐ Horizontal ☐ Downward – Venting ☐ Other (Specify):
Stack Exit Gas Temperature: 130 ° F	Stack Exit Gas Flow Rate: 2,067,979 ACFM
Distance to Nearest Property Line:	**feet**
Describe nearest obstruction:	
Height of Nearest Obstruction: **feet**	Distance to Nearest Obstruction: **feet**
Are stack **sampling ports** provided?	☑ YES ☐ NO

Section M: Monitoring and Alarm Information

Are there any **alarms** associated with this scrubber? ☑ YES ☐ NO

If YES, complete the following.

If there are more than three alarms, attach additional copies of this page as needed.

Operating Parameter Monitored	Describe Alarm Trigger	Monitoring Device or Alarm Type	Does the Alarm Initiate an Automated Response?
Recycle Pump Amps	> 10 Amps	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe: Valves and the mist eliminator are on automatic control with manual capability.
Reaction Tank pH	> 4.0 pH	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
Stack Exit Temperature	100 F < T < 170 F	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section N: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO
If yes, describe below:

Constructing a new FGD is a more cost-effective option than redesigning and modifying the existing, first-generation FGDs to increase the SO2 removal efficiency from the current approximate 90 percent removal rate to the 98+ percent SO2 removal efficiency that today's technology can achieve. To gain the necessary increased efficiency from the existing FGDs would require multiple, extended outages to accommodate the necessary structural and infrastructure revisions and repairs from the original designs. Long outages (of multiple months) would likely require replacement power to meet loads at peak times that is typically less economic than running the Mill Creek units. The new combined FGD will be designed to remove 98+ percent of the SO2 emissions from both units. FGD is the best available control technology currently available for SO2 reduction. Also, the planned FGD will be able to comply consistently with the EGU MACT HCl emissions limitations (measuring SO2 as a proxy for HCl, as allowed by the proposed MACT rule).

The new FGD installation requires locating the FGD and associated equipment away from the existing FGD locations. This allows construction to be performed while the units remain in operation and then, when the construction is completed, the units can be tied into the new technologies during shorter outages. The new FGD locations will require new chimneys similar to those installed on the FGD projects recently completed at the KU Ghent and Brown stations. The addition of a higher-efficiency FGD in combination with the installation of additional particulate matter control equipment will require the installation of larger induced draft fans and/or the installation of booster fans to account for the increased pressure drop through the flue gas train.

LG&E proposes to begin initial demolition activities related to the construction of the new Unit 1 & 2 FGD (e.g., demolition of existing warehouses and craft locker rooms northeast of Units 1 and 2) in the fall of 2011 and to begin constructing the new FGD in early 2012 with the work being placed into operation by mid-2015. Once the new FGD to service both Units 1 and 2 is placed into operation, the existing Mill Creek Units 1 and 2 FGDs will be demolished.

Louisville Metro Air Pollution Control District

Form: AP-0908 **Scrubber**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:
Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):
Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:
14660 Dixie Highway
Street Address

Louisville | KY | 40272 | -
City | State | Zip Code

Responsible Official Name: Ralph Bowling
Responsible Official Title: VP Power Production
Phone: (502)627-4121
Fax: (502)627-4030
E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:
☐ Check here if same as equipment location address.
220 West Main Street
Street Address

Louisville | KY | 40202 - 1377
City | State | Zip Code

Contact Name: Rebecca Cash
Contact Title: Environmental Engineer
Phone: (502)627-4633
Fax: (502)627-2550
E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☐ New Construction /Installation
- ☑ Modification
- ☐ Reconstruction
- ☐ Operation
- ☐ Change of Ownership
- ☐ Change of Location
- ☐ Administrative Change

Date of Construction, Modification, Installation or Operation:
(MM/DD/YYYY)
Estimated Start Date: November 2014 Operation
Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location?
Electric Services

SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling
Title: VP Power Production
Print Name: Ralph Bowling
Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information

Manufacturer: TBD

Model: TBD

Serial Number: TBD

Attach the Manufacturer's Specification Sheet for the Scrubber and any Removal Efficiency calculations.

Section H: Contaminant Information

Concentration of Each Contaminant in the Waste Gas, Vapor Pressure, Solubility in the Scrubbing Liquor, and Removal Efficiency

If more than six contaminants are present, attach additional copies of this page as needed.

Contaminant	CAS Number	Concentration in Waste Gas	Vapor Pressure	Solubility in Scrubbing Liquor	Removal Efficiency
SO2		3-3.5 % by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☑ Highly soluble ☐ Miscible ☐ Not Applicable	98 %
HCl		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☑ Highly soluble ☐ Miscible ☐ Not Applicable	98 %
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%

Section I: Gas Stream Information

Maximum Inlet Volumetric Gas Flow Rate: 447,593	acfm at 330	° F
Maximum outlet Volumetric Gas Flow Rate: 371,776	acfm at 128	° F
Pressure Drop Across Scrubber: 12.0	inches water	

Section J: Scrubbing Liquor Information

Scrubbing Liquor Components

If more than five components are present, attach additional copies of this page as needed.

Scrubbing Liquor Component	CAS Number	Concentration
Limestone		14-16 **% by Weight**
		% by Weight
		% by Weight
		% by Weight
		% by Weight

Scrubbing Liquor Flow Rate: 24,000 **gallons/minute**

pH Operating Range: 5-6

Is the scrubbing liquor recirculated? ☑ YES ☐ NO

Is there more than one operating scenario for the scrubber? ☐ YES ☑ NO

If YES, complete the following information.

Alternate Operating Scenario Scrubbing Liquor Flow Rate: **gallons/minute**

Alternate Operating Scenario pH Operating Range:

Is the scrubbing liquor recirculated in the alternate operating scenario? ☐ YES ☐ NO

Describe how spent scrubbing liquor is treated or disposed of:

Section K: Operational Information

Scrubber Type: ☑ Spray Tower ☐ Ionizing ☐ Fluidized Bed Scrubber ☐ Venturi ☐ Packed Bed ☐ Tray Tower ☑ Other (Specify):

Scrubber Height: **feet**

Scrubber Inside Diameter: **feet**

Does the scrubber use **packing**? ☐ YES ☑ NO

If YES, complete the following information.

Packing Type: ☐ Berl Saddle ☐ Pall Ring ☐ Intalox Saddle ☐ Tellerette ☐ Raschig Ring ☐ Marbles ☐ Lesig Ring ☐ Other (Specify):

Packing Size: **inch**

Packing Material:

Height of Packing: **feet**

Does the scrubber use **trays**, **plates**, or **baffles**? ☑ YES ☐ NO

Type of Impactor/Impingement: ☑ Trays ☐ Baffles ☐ Plates ☐ Other (Specify):

Type of Perforation: ☑ Holes ☐ Adjustable Trays ☐ Bubble Caps ☐ Other (Specify): ☐ Movable Discs

Spacing Between Trays, Plates, or Baffles: 60 **inches**

Configuration: ☑ Counter - Current ☐ Co - Current ☐ Other (Specify):

Will a **mist eliminator** be installed? ☑ YES ☐ NO

If YES, complete the following.

Describe the mist eliminator:

Section L: Stack Information

Stack Height Above Grade: 600 **feet**

Stack Exit Diameter: 19.5 **feet**

(Provide stack dimensions if rectangular stack.)

Is a **stack cap** present? ☐ YES ☑ NO

Stack Configuration: *(Check all that apply)* ☑ Vertical ☐ Horizontal ☐ Downward – Venting ☐ Other (Specify):

Stack Exit Gas Temperature: 130 ° F

Stack Exit Gas Flow Rate: 1,348,885 ACFM

Distance to Nearest Property Line: 765 **feet**

Describe nearest obstruction: building

Height of Nearest Obstruction: 219.5 **feet**

Distance to Nearest Obstruction: 145 **feet**

Are stack **sampling ports** provided? ☑ YES ☐ NO

Section M: Monitoring and Alarm Information

Are there any **alarms** associated with this scrubber? ☑ YES ☐ NO

If YES, complete the following.

If there are more than three alarms, attach additional copies of this page as needed.

Operating Parameter Monitored	Describe Alarm Trigger	Monitoring Device or Alarm Type	Does the Alarm Initiate an Automated Response?
Recycle Pump Amps	> 10 Amps	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
Reaction Tank pH	> 4.0 pH	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
Stack Exit Temperature	100 F < T < 170 F	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section N: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO
If yes, describe below:

Once the new Mill Creek Unit 4 FGD is in service, LG&E proposes to upgrade Unit 4's existing FGD system to accommodate Unit 3 so it can consistently achieve SO2 emissions of 98 percent on a continuous basis when burning high-sulfur-content coals. The existing Unit 4 FGD is approximately 20% larger in size than the existing Unit 3 FGD (due to generating capacity differences between Units 3 and 4) and can accommodate the needed efficiency upgrades, whereas the existing Unit 3 FGD cannot be modified for the increased capacity due to physical structural steel constraints. Therefore, upgrading the existing Unit 4 FGD with modified spray levels and/or flue gas contact rings/trays and flue gas flow modifications is the most feasible and economical control technology considered for SO2 reduction for Unit 3. The upgrade is expected to allow the Mill Creek Unit 3 to comply consistently with the EGU MACT rule's HCl emissions limitations (measuring SO2 as a proxy for HCl, as allowed by the proposed new regulation).

Tying in Unit 3 to Unit 4's existing FGD will result in Unit 3's using the existing Unit 4 chimney. Unit 3's current chimney will be capped and remain in place. Once the tie-in to the upgraded FGD is completed, Unit 3's current FGD modules will no longer be needed and will be demolished similar to that of Units 1 and 2.

LG&E proposes to begin replacing Unit 4's current FGD in early 2012. Refurbishment work on the existing FGD will occur after tying Unit 4 into the new FGD. LG&E plans to place Unit 4 back into service in late 2014, with Unit 3 being placed back into service (after being tied into the refurbished former Unit 4 FGD) in late 2015.

Louisville Metro Air Pollution Control District

Form: AP-0908 **Scrubber**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:
Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):
Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:
14660 Dixie Highway
Street Address

Louisville | KY | 40272 | -
City | State | Zip Code

Responsible Official Name: Ralph Bowling
Responsible Official Title: VP Power Production
Phone: (502)627-4121
Fax: (502)627-4030
E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:
☐ Check here if same as equipment location address.
220 West Main Street
Street Address

Louisville | KY | 40202 - 1377
City | State | Zip Code

Contact Name: Rebecca Cash
Contact Title: Environmental Engineer
Phone: (502)627-4633
Fax: (502)627-2550
E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Modification
- ☐ Reconstruction
- ☐ Operation
- ☐ Change of Ownership
- ☐ Change of Location
- ☐ Administrative Change

Date of Construction, Modification, Installation or Operation:
(MM/DD/YYYY)
Estimated Start Date: November 2014 Operation
Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location? Electric Services
SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling
Title: VP Power Production
Print Name: Ralph Bowling
Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information

Manufacturer: TBD

Model: TBD

Serial Number: TBD

Attach the Manufacturer's Specification Sheet for the Scrubber and any Removal Efficiency calculations.

Section H: Contaminant Information

Concentration of Each Contaminant in the Waste Gas, Vapor Pressure, Solubility in the Scrubbing Liquor, and Removal Efficiency

If more than six contaminants are present, attach additional copies of this page as needed.

Contaminant	CAS Number	Concentration in Waste Gas	Vapor Pressure	Solubility in Scrubbing Liquor	Removal Efficiency
SO2		3-3.5 % by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☑ Highly soluble ☐ Miscible ☐ Not Applicable	98 %
HCl		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☑ Highly soluble ☐ Miscible ☐ Not Applicable	98 %
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%
		% by Weight	psi at ° F	☐ Insoluble ☐ Slightly Soluble ☐ Highly soluble ☐ Miscible ☐ Not Applicable	%

Section I: Gas Stream Information

Maximum Inlet Volumetric Gas Flow Rate: 2,026,176	**acfm** at 350	° F
Maximum outlet Volumetric Gas Flow Rate: 1,674,655	**acfm** at 130	° F
Pressure Drop Across Scrubber: 12.0	**inches water**	

Section J: Scrubbing Liquor Information

Scrubbing Liquor Components

If more than five components are present, attach additional copies of this page as needed.

Scrubbing Liquor Component	CAS Number	Concentration
Limestone		14-16 **% by Weight**
		% by Weight
		% by Weight
		% by Weight
		% by Weight

Scrubbing Liquor Flow Rate: **gallons/minute**

pH Operating Range: 5-6

Is the scrubbing liquor recirculated? [✓] YES [ ] NO

Is there more than one operating scenario for the scrubber? [ ] YES [✓] NO

If YES, complete the following information.

Alternate Operating Scenario Scrubbing Liquor Flow Rate: **gallons/minute**

Alternate Operating Scenario pH Operating Range:

Is the scrubbing liquor recirculated in the alternate operating scenario? [ ] YES [ ] NO

Describe how spent scrubbing liquor is treated or disposed of:

Section K: Operational Information

Scrubber Type: [✓] Spray Tower [ ] Ionizing [ ] Fluidized Bed Scrubber [ ] Venturi
[ ] Packed Bed [ ] Tray Tower [✓] Other (Specify):

Scrubber Height: **feet**

Scrubber Inside Diameter: **feet**

Does the scrubber use **packing**? [ ] YES [✓] NO

If YES, complete the following information.

Packing Type: [ ] Berl Saddle [ ] Pall Ring
[ ] Intalox Saddle [ ] Tellerette
[ ] Raschig Ring [ ] Marbles
[ ] Lesig Ring [ ] Other (Specify):

Packing Size: **inch**

Packing Material:

Height of Packing: **feet**

Does the scrubber use **trays, plates, or baffles**? [✓] YES [ ] NO

Type of Impactor/Impingement: [✓] Trays [ ] Baffles
[ ] Plates [ ] Other (Specify):

Type of Perforation: [✓] Holes [ ] Adjustable Trays
[ ] Bubble Caps [ ] Other (Specify):
[ ] Movable Discs

Spacing Between Trays, Plates, or Baffles: 60 **inches**

Configuration:	☑ Counter - Current ☐ Co - Current ☐ Other (Specify):
Will a **mist eliminator** be installed?	☑ YES ☐ NO
If YES, complete the following.	
Describe the mist eliminator:	

Section L: Stack Information

Stack Height Above Grade: 600	**feet**
Stack Exit Diameter: 24.0	**feet**
(Provide stack dimensions if rectangular stack.)	
Is a **stack cap** present?	☐ YES ☑ NO
Stack Configuration: *(Check all that apply)*	☑ Vertical ☐ Horizontal ☐ Downward – Venting ☐ Other (Specify):
Stack Exit Gas Temperature: 130 ° F	Stack Exit Gas Flow Rate: 1,641,798 ACFM
Distance to Nearest Property Line:	**feet**
Describe nearest obstruction:	
Height of Nearest Obstruction: **feet**	Distance to Nearest Obstruction: **feet**
Are stack **sampling ports** provided?	☑ YES ☐ NO

Section M: Monitoring and Alarm Information

Are there any **alarms** associated with this scrubber?	☑ YES ☐ NO
If YES, complete the following.	

If there are more than three alarms, attach additional copies of this page as needed.

Operating Parameter Monitored	Describe Alarm Trigger	Monitoring Device or Alarm Type	Does the Alarm Initiate an Automated Response?
Recycle Pump Amps	> 10 Amps	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
Reaction Tank pH	> 4.0 pH	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
Stack Exit Temperature	100 F < T < 170 F	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section N: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO
If yes, describe below:

LG&E proposes to install a new FGD for Unit 4 that can consistently achieve SO2 emissions reductions greater than 98 percent. FGD is the best available control technology currently available for SO2 reduction. The new FGD's SO2 scrubbing capabilities (compared to its current FGD) will increase the amount of limestone required and byproduct produced proportionally to the additional capture of SO2. Also, as with the new combined Units 1 and 2 FGD, Unit 4's planned FGD will be able to comply with the proposed EGU MACT rule's HCl emissions limitations (measuring SO2 as a proxy for HCl, as allowed by the proposed regulation).

The Unit 4 new FGD installation requires locating the FGD and associated equipment away from the existing Unit 4 FGD location. This allows construction to be performed while the unit remains in operation and then, when construction is completed, Unit 4 can be tied in to the new technology during a shorter outage. The new FGD location will include a new chimney for Unit 4 (Mill Creek Unit 3 will utilize the existing Unit 4 chimney) similar to those installed on the FGD projects recently completed. The addition of a higher-efficiency FGD in combination with the installation of additional particulate matter control equipment will require the installation of larger induced draft fans and/or the installation of booster fans to account for the increased pressure drop through the flue gas train.

LG&E proposes to begin initial demolition activities related to the construction of the Unit 4 FGD in the fall of 2011, and to begin building Unit 4's new FGD in early 2012 with the Unit 4 tie in occurring in late 2014.

Louisville Metro Air Pollution Control District

Form: AP-1108 **Adsorption**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:
Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):
Louisville Gas & Electric - Mill Creek Generating Station

Section B: Equipment Location

Equipment Location Address:
14660 Dixie Highway
Street Address

Louisville | KY | 40272 | -
City | State | Zip Code

Responsible Official Name:
Responsible Official Title: VP Power Production
Phone: (502)627-4121
Fax: (502)627-4030
E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:
☐ Check here if same as equipment location address.
220 West Main Street
Street Address

Louisville | KY | 40202 - 1377
City | State | Zip Code

Contact Name: Rebecca Cash
Contact Title: Environmental Engineer
Phone: (502)627-4633
Fax: (502)627-2550
E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification, Installation or Operation:
(MM/DD/YYYY)
Estimated Start Date: See baghouse application
Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location?
Electric Services

SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling
Title: VP Power Production
Print Name: Ralph Bowling
Date: 6/9/14

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information
Manufacturer: TBD
Model: TBD
Serial Number: TBD
Attach the manufacturer's specification sheet for the adsorption equipment.
Section H: Adsorbent Information
Describe adsorbent type and physical properties: Injection of Powdered activated carbon and hydrated lime into pulse jet fabric filter. The hydrated lime protects the fabric filter from the corrosivity of the flue gas due to the Low NOx burners. The PAC injection controls the mercury emissions from the flue gas. The PAC and hydrated lime injected into the system is mixed with the ash exiting the fabric filter.
Breakthrough Capacity (pounds contaminant/100 pounds adsorbent):
Operating Temperature Range of Adsorbent: from °F **to** °F
Life Expectancy of Adsorbent:
Provide any necessary additional information regarding the absorbent:
Section I: Adsorber Bed Information
Adsorbent Charge per Adsorber Vessel: NA
Number of Adsorber Vessels:
Configuration of Adsorber Vessels: ☐ Series ☐ Parallel ☐ Other (Specify):
Length of Mass Transfer Zone: **feet**
Attach basis of design for the length of the mass transfer zone calculation.
Adsorber Bed Cross Sectional Area: **square feet**
Adsorption Bed Depth: **feet**
Working Capacity of Adsorbent **%**
Section J: Regeneration Information
Is the adsorbent **regenerated**? ☐ YES ☑ NO
If the adsorbent is regenerated, complete the following information. If not, proceed to Section K.
Predicted Regeneration Cycle:
Describe Regeneration Trigger:
Predicted Number of Times Adsorbent Will be Regenerated Before Replacement:
Regeneration Location: ☐ On-Site ☐ Off-Site
*If regeneration is conducted **on-site**, complete the following information. If it is conducted **off site**, proceed to Section K*
Type of Regeneration: ☐ Steam ☐ Electric ☐ Hot Air ☐ Other (Specify):
*If **steam regeneration** is used, complete the following information. If not, proceed to Section K*
Available Steam for Regeneration: **pounds of steam**
Describe how the regeneration liquid is treated or disposed of:

Section K: Gas Stream Information			
Maximum Inlet Volumetric Gas Flow Rate:	**acfm** at	° F and	**% moisture**
Maximum Outlet Volumetric Gas Flow Rate:	**acfm** at	° F and	**% moisture**
Design Range of Pressure Drop Across Bed: NA	**inches water**		
Residence Time:	**minutes**		

Section L: Contaminant Information

Will heat of adsorption potentially lead to temperature excursions? ☐ YES ☑ NO

If YES, describe how temperature excursions will be handled:

Contaminant	CAS Number	Percent Relative Saturation	Vapor Pressure	Removal Efficiency
Mercury		%	psi	90 %
		%	psi	%
		%	psi	%
		%	psi	%
		%	psi	%

Section M: Stack Information

Stack Height Above Grade: Exits through FGD Stack **feet**

Stack Exit Diameter: **feet**
(Provide stack dimensions if rectangular stack)

Is a **stack cap** present? ☐ YES ☐ NO

Stack Configuration: *(Check all that apply)* ☐ Vertical ☐ Horizontal ☐ Downward – Venting ☐ Other (Specify):

Stack Exit Gas Temperature: ° F

Stack Exit Gas Flow Rate: ACFM

Distance to Nearest Property Line: **feet**

Describe Nearest Obstruction:

Height of Nearest Obstruction: **feet**

Distance to Nearest Obstruction: **feet**

Are stack **sampling ports** provided? ☐ YES ☐ NO

Section N: Monitoring and Alarm Information

Are there any **alarms** associated with this control device? ☐ YES ☑ NO

If there are more than three alarms, attach additional copies of this page as needed.

Operating Parameter Monitored	Describe Alarm Trigger	Monitoring Device or Alarm Type	Does the Alarm Initiate an Automated Response?
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section N: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO

If yes, describe below:

See Appendix C of application packet for calculations for throughput of PAC and hydrated lime through each of the four fabric filter systems.

Louisville Metro Air Pollution Control District

Form: AP-1908 **Silo**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:
Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):
Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:
14660 Dixie Highway
Street Address

Louisville | KY | 40272
City | State | Zip Code

Responsible Official Name: Ralph Bowling
Responsible Official Title: VP Power Production
Phone: (502)627-4121
Fax: (502)627-4030
E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:
☐ Check here if same as equipment location address.
220 West Main Street
Street Address

Louisville | KY | 40202 - 1377
City | State | Zip Code

Contact Name: Rebecca Cash
Contact Title: Environmental Engineer
Phone: (502)627-4633
Fax: (502)627-2550
E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification, Installation or Operation:
(MM/DD/YYYY)
Estimated Start Date: See baghouse application
Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location? Electric Services
SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling
Title: VP Power Production
Print Name: Ralph Bowling
Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information

Manufacturer: TBD

Model: TBD

Serial Number: TBD

Silo Type: ☑ Tower Silo ☐ Bunker Silo ☐ Other (Specify):

Number of Compartments in Silo: 1

Material Stored in Silo: Powdered Activated Carbon (PAC)

If there are more than three materials stored in the silo, attach additional copies of this page as needed.

Material	Material Density	Compartment Stored In
Powdered Activated Carbon (PAC)	0.0125 **tons/cubic foot**	
	tons/cubic foot	
	tons/cubic foot	

Attach a Material Safety Data Sheet (MSDS) for <u>each</u> material stored in the silo.

Silo Storage Capacity: 94 **tons**

Silo Loading Method: ☐ Pneumatic ☑ Vacuum ☐ Hydraulic ☐ Other (Specify): ☐ Mechanical

Maximum Rate of Silo Loading: **tons/hour** | Maximum Unloading Rate: **tons/hour**

Is the silo equipped with a **pressure-vacuum relief valve**? ☑ YES ☐ NO

If yes, describe the pressure relief valve settings:

TBD

Is the silo equipped with a system that prevents overfilling? ☐ YES ☐ NO

Describe the overfilling prevention system:

TBD

Is the silo equipped with a **silo level monitoring system**? ☐ YES ☐ NO

If YES, Type of Level Indicator: ☐ Point ☐ Continuous ☐ Other (Specify):

TBD

Is the silo equipped with a power/control panel with a high level indicator? ☐ YES ☐ NO

Section H: Control Device Information			
Is an **air pollution control device** used? ☑ YES ☐ NO			
If an air pollution control device is used, complete the following:			
Is a **cyclone collector** used? ☐ YES ☑ NO			
If yes, complete form AP-1208 and attach to this application.			
Is a **baghouse** used? ☑ YES ☐ NO			
If yes, complete form AP-0808 and attach to this application.			
Is any other control device used? ☐ YES ☑ NO			
If yes, attach a copy of the control device manufacturer's specification sheets.			
If any other control device is used, complete the following:			
Describe control device:			
Pollutants Controlled: ☐ HAPs ☐ TACs ☐ PM ☐ PM_{10} ☐ Metals ☐ Other (Specify):			
Control Device Manufacturer:			
Control Device Model:			
Control Device Serial Number:			
Control Device Design Capacity:			
Control Device Removal or Destruction Efficiency:			
Section I: Stack Information			
Stack Height Above Grade: TBD **feet**		Stack Exit Diameter: **feet** *(Provide stack dimensions if rectangular stack.)*	
Is a **stack cap** present? ☐ YES ☐ NO			
Stack Configuration: *(Check all that apply)* ☐ Vertical ☐ Horizontal ☐ Downward – Venting ☐ Other (Specify):			
Stack Exit Gas Temperature: ° F		Stack Exit Gas Flow Rate: **ACFM**	
Distance to Nearest Property Line: **feet**			
Describe Nearest Obstruction:			
Height of Nearest Obstruction: **feet**		Distance to Nearest Obstruction: **feet**	
Are stack **sampling ports** provided? ☐ YES ☐ NO			

Section J: Monitoring Information			
Will emissions data be recorded by a **continuous emission monitoring system** (CEMS)? ☐ YES ☑ NO			
If yes, attach a copy of the continuous emission monitoring system manufacturer's specification sheets.			
If yes, complete the following information:			
Pollutants Monitored: ☐ VOC ☐ HAPs ☐ TACs ☐ PM ☐ PM_{10} ☐ NO_x ☐ SO_2 ☐ Metals ☐ Other (Specify):			
Describe the continuous emission monitoring system:			
Manufacturer:			
Model:			
Serial Number:			
Will multiple emission unites be monitored at the same point? ☐ YES ☐ NO			
If Yes, Emission Units Monitored:			
Will more than one emission unit be emitting from the combined point at any time? ☐ YES ☐ NO			
Emission Units Emitting Simultaneously:			
Section K: Visible Emissions Monitoring Information			
Proposed Technique Used to Monitor Visible Emissions: ☐ Opacity Monitor (COM) ☑ Manual (Method 9) ☐ Manual (Method 22) ☐ Other (Describe): _____			
*If an **opacity monitor** (COM) is used, complete the following information:*			
Describe the continuous opacity monitoring system:			
Manufacturer:			
Model:			
Serial Number:			
Proposed Frequency of Opacity Monitoring:			
Section L: Monitoring and Alarm Information			
Are there any **alarms** associated with this silo? ☐ YES ☐ NO			
If there are more than three alarms, attach additional copies of this page as needed.			
Operating Parameter Monitored	**Describe Alarm Trigger**	**Monitoring Device or Alarm Type**	**Does the Alarm Initiate an Automated Response?**
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section M: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO

If yes, describe below:

Two PAC silos will be constructed for each unit for a total of eight PAC silos.

Louisville Metro Air Pollution Control District

Form: AP-0808 **Baghouse**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:

Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):

Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:

14660 Dixie Highway
Street Address

Louisville | KY | 40272 -
City | State | Zip Code

Responsible Official Name: Ralph Bowling

Responsible Official Title: VP Power Production

Phone: (502)627-4121

Fax: (502)627-4030

E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:

☐ Check here if same as equipment location address.

220 West Main Street
Street Address

Louisville | KY | 40202 - 1377
City | State | Zip Code

Contact Name: Rebecca Cash

Contact Title: Environmental Engineer

Phone: (502)627-4633

Fax:

E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification. Installation or Operation:

(MM/DD/YYYY)

Estimated Start Date: See Silo Application

Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location?

Electric Services

SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling

Title: VP Power Production

Print Name: Ralph Bowling

Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information
Manufacturer: TBD
Model: TBD
Serial Number:
Is the baghouse insulated? ☑ YES ☐ NO
Design Minimum Operating Temperature: ° F
Design Maximum Operating Temperature: ° F
Are temperature controls provided? ☐ YES ☑ NO
If YES, describe the temperature controls:
Air Flow Through Baghouse: ☐ Forced ☑ Induced ☐ Other Specify:
Direction of Flow Through Filters: ☐ Inside Out ☑ Outside In
Particulate Removal Efficiency: 99 %
Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.
Section H: Compartment Information
Number of Compartments: TBD
Number of Filters (Bags) Per Compartment: TBD
Can the Compartments be Isolated for Replacement or Repair? ☑ YES ☐ NO
Section I: Gas Stream Information
Maximum Inlet Volumetric Gas Flow Rate: acfm at **feet**
Maximum Outlet Volumetric Gas Flow Rate: acfm at **feet**
Dew Point at maximum Moisture Content of Gas: ° F
pH of Gas Handled:
Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☑ Dry ☐ Other(Specify):
Section J: Contaminant Information
Percent of Each Contaminant in the Waste Gas and Removal Efficiency
If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Powdered Activated Carbon		100	99

Section K: Fabric Filter (Bag) Information

Fabric Type: ☐ Felted ☐ Membrane ☐ Ceramic Cartridge
☐ Woven ☐ PTFE Membrane ☐ Felted-Woven
☐ Sintered Metal ☐ Other (Specify):

Fabric Material: TBD

Maximum Continuous Filter Operating Temperature: TBD °F

Clean Fabric Permeability: TBD scfm/ft^2 at ΔP TBD inches of water

Fabric Filter (Bag) Diameter or Width: TBD **inches**

Fabric Filter (Bag) Length: TBD **inches**

Effective Area Per Filter: TBD **square inches**

Minimum Effective Air to Cloth Ratio: TBD **inches**

Maximum Effective Air to Cloth Ratio: TBD **inches**

Design Pressure Drop Across Baghouse: TBD **inches water**

Describe determining factor fabric filter changing/replacement:

Manufacturers recommendations and pressure drop across unit.

Attach the manufacturer's specification sheet for the fabric filters (bag).

Section L: Filter Cleaning Information

Filter Cleaning Method: ☐ Manual Cleaning ☐ Bag Collapse ☐ Reverse Air Jet
☐ Mechanical Shakers ☐ Sonic Cleaning ☑ Pulse Jet
☐ Pneumatic Shakers ☐ Reverse Air Flow ☐ Other (Specify):

Air Pressure: **psi**

Describe how air is supplied to system:

Describe how filter cleaning is initiated: ☐ Manual ☑ Pressure Drop
☐ Timer ☐ Other (Specify):

Section M: Hopper Information

Is the hopper heated? ☐ YES ☑ NO

Is there a hopper vibrator? ☐ YES ☑ NO

Describe how collected material is treated or disposed of:

Bin vent material is released back to the silo or mixed with landfill waste.

Section N: Stack Information		
Stack Height Above Grade: TBD feet		
Stack Exit Diameter: feet *(Provide stack dimensions if rectangular stack.)*		
Is a Stack Cap Present? ☐ YES ☐ NO		
Stack Configuration: ☐ Vertical ☐ Horizontal ☐ Downward – Venting *(Check all that apply)* ☐ Other (Specify):		
Stack Exit Gas Temperature: ° F	Stack Exit Gas Flow Rate: ACFM	
Distance to Nearest Property Line: feet		
Describe nearest obstruction:		
Height of Nearest Obstruction: feet	Distance to Nearest Obstruction: feet	
Are stack **sampling ports** provided? ☐ YES ☐ NO		

Section O: Monitoring and Alarm Information			
Are there any **alarms** associated with this baghouse? ☐ YES ☑ NO			
If YES, complete the following.			
If there are more than three alarms, attach additional copies of this page as needed.			
Operating Parameter Monitored	**Describe Alarm Trigger**	**Monitoring Device or Alarm Type**	**Does the Alarm Initiate an Automated Response?**
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section P: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO

If yes, describe below:

The bin vent controls fugitive emissions from top of silo. One bin vent will be constructed for each silo for a total of eight bin vents.

Louisville Metro Air Pollution Control District

Form: AP-1908 **Silo**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:
Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):
Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:
14660 Dixie Highway
Street Address

Louisville | KY | 40272 | -
City | State | Zip Code

Responsible Official Name: Ralph Bowling
Responsible Official Title: VP Power Production
Phone: (502)627-4121
Fax: (502)627-4030
E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:
☐ Check here if same as equipment location address.
220 West Main Street
Street Address

Louisville | KY | 40202 | 1377
City | State | Zip Code

Contact Name: Rebecca Cash
Contact Title: Environmental Engineer
Phone: (502)627-4633
Fax: (502)627-2550
E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Modification
- ☐ Reconstruction
- ☐ Operation
- ☐ Change of Ownership
- ☐ Change of Location
- ☐ Administrative Change

Date of Construction, Modification, Installation or Operation:
(MM/DD/YYYY)
Estimated Start Date: See Baghouse Application
Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location? Electric Services
SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling
Title: VP Power Production
Print Name: Ralph Bowling
Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information

Manufacturer: TBD

Model: TBD

Serial Number: TBD

Silo Type: ☑ Tower Silo ☐ Bunker Silo ☐ Other (Specify):

Number of Compartments in Silo: 1

Material Stored in Silo: Hydrated Lime

If there are more than three materials stored in the silo, attach additional copies of this page as needed.

Material	Material Density	Compartment Stored In
Hydrated Lime	0.016 **tons/cubic foot**	
	tons/cubic foot	
	tons/cubic foot	

Attach a Material Safety Data Sheet (MSDS) for <u>each</u> material stored in the silo.

Silo Storage Capacity: 120 **tons**

Silo Loading Method: ☐ Pneumatic ☑ Vacuum ☐ Hydraulic ☐ Other (Specify): ☐ Mechanical

Maximum Rate of Silo Loading: 40 **tons/hour** | Maximum Unloading Rate: 40 **tons/hour**

Is the silo equipped with a **pressure-vacuum relief valve?** ☑ YES ☐ NO

If yes, describe the pressure relief valve settings:

TBD

Is the silo equipped with a system that prevents overfilling? ☐ YES ☐ NO

Describe the overfilling prevention system:

TBD

Is the silo equipped with a **silo level monitoring system?** ☐ YES ☐ NO

If YES, Type of Level Indicator: ☐ Point ☐ Continuous ☐ Other (Specify):

TBD

Is the silo equipped with a power/control panel with a high level indicator? ☐ YES ☐ NO

Section H: Control Device Information						
Is an **air pollution control device** used?	☑ YES	☐ NO				
If an air pollution control device is used, complete the following:						
Is a **cyclone collector** used?	☐ YES	☑ NO				
If yes, complete form AP-1208 and attach to this application.						
Is a **baghouse** used?	☑ YES	☐ NO				
If yes, complete form AP-0808 and attach to this application.						
Is any other control device used?	☐ YES	☑ NO				
If yes, attach a copy of the control device manufacturer's specification sheets.						
If any other control device is used, complete the following:						
Describe control device:						
Pollutants Controlled:	☐ HAPs	☐ TACs	☐ PM	☐ PM_{10}	☐ Metals	☐ Other (Specify):
Control Device Manufacturer:						
Control Device Model:						
Control Device Serial Number:						
Control Device Design Capacity:						
Control Device Removal or Destruction Efficiency:						

Section I: Stack Information			
Stack Height Above Grade: TBD	**feet**	Stack Exit Diameter: *(Provide stack dimensions if rectangular stack.)*	**feet**
Is a **stack cap** present?	☐ YES	☐ NO	
Stack Configuration: *(Check all that apply)*	☐ Vertical	☐ Horizontal	☐ Downward – Venting
	☐ Other (Specify):		
Stack Exit Gas Temperature:	° F	Stack Exit Gas Flow Rate:	**ACFM**
Distance to Nearest Property Line:	**feet**		
Describe Nearest Obstruction:			
Height of Nearest Obstruction:	**feet**	Distance to Nearest Obstruction:	**feet**
Are stack **sampling ports** provided?	☐ YES	☐ NO	

Section J: Monitoring Information			
Will emissions data be recorded by a **continuous emission monitoring system** (CEMS)? ☐ YES ☑ NO			
If yes, attach a copy of the continuous emission monitoring system manufacturer's specification sheets.			
If yes, complete the following information:			
Pollutants Monitored: ☐ VOC ☐ HAPs ☐ TACs ☐ PM ☐ PM_{10} ☐ NO_x ☐ SO_2 ☐ Metals ☐ Other (Specify):			
Describe the continuous emission monitoring system:			
Manufacturer:			
Model:			
Serial Number:			
Will multiple emission unites be monitored at the same point? ☐ YES ☐ NO			
If Yes, Emission Units Monitored:			
Will more than one emission unit be emitting from the combined point at any time? ☐ YES ☐ NO			
Emission Units Emitting Simultaneously:			
Section K: Visible Emissions Monitoring Information			
Proposed Technique Used to Monitor Visible Emissions: ☐ Opacity Monitor (COM) ☑ Manual (Method 9) ☐ Manual (Method 22) ☐ Other (Describe): _____			
*If an **opacity monitor** (COM) is used, complete the following information:*			
Describe the continuous opacity monitoring system:			
Manufacturer:			
Model:			
Serial Number:			
Proposed Frequency of Opacity Monitoring:			
Section L: Monitoring and Alarm Information			
Are there any **alarms** associated with this silo? ☐ YES ☐ NO			
If there are more than three alarms, attach additional copies of this page as needed.			
Operating Parameter Monitored	**Describe Alarm Trigger**	**Monitoring Device or Alarm Type**	**Does the Alarm Initiate an Automated Response?**
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section M: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO

If yes, describe below:

Two hydrated lime silos will be constructed for each unit for a total of eight hydrated lime storage silos.

Louisville Metro Air Pollution Control District

Form: AP-0808 **Baghouse**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:

Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):

Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:

14660 Dixie Highway
Street Address

Louisville | KY | 40272
City | State | Zip Code

Responsible Official Name: Ralph Bowling

Responsible Official Title: VP Power Production

Phone: (502)627-4121

Fax: (502)627-4030

E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:

☐ Check here if same as equipment location address.

220 West Main Street
Street Address

Louisville | KY | 40202 - 1377
City | State | Zip Code

Contact Name: Rebecca Cash

Contact Title: Environmental Engineer

Phone: (502)627-4633

Fax:

E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification, Installation or Operation:

(MM/DD/YYYY)

Estimated Start Date: See Silo Application

Actual Start Date:

In accordance with District regulations 2.03, Section I, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location?

Electric Services

SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling

Title: VP Power Production

Print Name: Ralph Bowling

Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information

Manufacturer: TBD

Model: TBD

Serial Number:

Is the baghouse insulated? ☑ YES ☐ NO

Design Minimum Operating Temperature: ° F

Design Maximum Operating Temperature: ° F

Are temperature controls provided? ☐ YES ☑ NO

If YES, describe the temperature controls:

Air Flow Through Baghouse:
- ☐ Forced
- ☑ Induced
- ☐ Other Specify:

Direction of Flow Through Filters:
- ☐ Inside Out
- ☑ Outside In

Particulate Removal Efficiency: 99 %

Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.

Section H: Compartment Information

Number of Compartments: TBD

Number of Filters (Bags) Per Compartment: TBD

Can the Compartments be Isolated for Replacement or Repair? ☑ YES ☐ NO

Section I: Gas Stream Information

Maximum Inlet Volumetric Gas Flow Rate: acfm at **feet**

Maximum Outlet Volumetric Gas Flow Rate: acfm at **feet**

Dew Point at maximum Moisture Content of Gas: ° F

pH of Gas Handled:

Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☑ Dry ☐ Other(Specify):

Section J: Contaminant Information

Percent of Each Contaminant in the Waste Gas and Removal Efficiency

If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Calcium Hydroxide	1305-62-0	90	99

Section K: Fabric Filter (Bag) Information

Fabric Type: ☐ Felted ☐ Membrane ☐ Ceramic Cartridge
☐ Woven ☐ PTFE Membrane ☐ Felted-Woven
☐ Sintered Metal ☐ Other (Specify):

Fabric Material: TBD

Maximum Continuous Filter Operating Temperature: TBD °F

Clean Fabric Permeability: TBD scfm/ft^2 at ΔP TBD inches of water

Fabric Filter (Bag) Diameter or Width: TBD **inches**

Fabric Filter (Bag) Length: TBD **inches**

Effective Area Per Filter: TBD **square inches**

Minimum Effective Air to Cloth Ratio: TBD **inches**

Maximum Effective Air to Cloth Ratio: TBD **inches**

Design Pressure Drop Across Baghouse: TBD **inches water**

Describe determining factor fabric filter changing/replacement:

Manufacturers recommendations and pressure drop across unit.

Attach the manufacturer's specification sheet for the fabric filters (bag).

Section L: Filter Cleaning Information

Filter Cleaning Method: ☐ Manual Cleaning ☐ Bag Collapse ☐ Reverse Air Jet
☐ Mechanical Shakers ☐ Sonic Cleaning ☑ Pulse Jet
☐ Pneumatic Shakers ☐ Reverse Air Flow ☐ Other (Specify):

Air Pressure: **psi**

Describe how air is supplied to system:

Describe how filter cleaning is initiated: ☐ Manual ☑ Pressure Drop
☐ Timer ☐ Other (Specify):

Section M: Hopper Information

Is the hopper heated? ☐ YES ☑ NO

Is there a hopper vibrator? ☐ YES ☑ NO

Describe how collected material is treated or disposed of:

Bin vent material is released back to the silo or mixed with landfill waste.

Section N: Stack Information			
Stack Height Above Grade: TBD **feet**			
Stack Exit Diameter: **feet** *(Provide stack dimensions if rectangular stack.)*			
Is a Stack Cap Present? ☐ YES ☐ NO			
Stack Configuration: ☐ Vertical ☐ Horizontal ☐ Downward – Venting *(Check all that apply)* ☐ Other (Specify):			
Stack Exit Gas Temperature: ° F		Stack Exit Gas Flow Rate: ACFM	
Distance to Nearest Property Line: **feet**			
Describe nearest obstruction:			
Height of Nearest Obstruction: **feet**		Distance to Nearest Obstruction: **feet**	
Are stack **sampling ports** provided? ☐ YES ☐ NO			
Section O: Monitoring and Alarm Information			
Are there any **alarms** associated with this baghouse? ☐ YES ☑ NO			
If YES, complete the following.			
If there are more than three alarms, attach additional copies of this page as needed.			
Operating Parameter Monitored	**Describe Alarm Trigger**	**Monitoring Device or Alarm Type**	**Does the Alarm Initiate an Automated Response?**
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section P: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO

If yes, describe below:

The bin vent controls fugitive emissions from top of silo. One bin vent will be constructed for each silo for a total of eight bin vents.

Louisville Metro Air Pollution Control District

Form: AP-1908 **Silo**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:
Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):
Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:
14660 Dixie Highway
Street Address

Louisville | KY | 40272 -
City | State | Zip Code

Responsible Official Name: Ralph Bowling
Responsible Official Title: VP Power Production
Phone: (502)627-4121
Fax: (502)627-4030
E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:
☐ Check here if same as equipment location address.
220 West Main Street
Street Address

Louisville | KY | 40202 - 1377
City | State | Zip Code

Contact Name: Rebecca Cash
Contact Title: Environmental Engineer
Phone: (502)627-4633
Fax: (502)627-2550
E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification, Installation or Operation:
(MM/DD/YYYY)
Estimated Start Date: Fall 2014
Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location? Electric Services
SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowling
Title: VP Power Production
Print Name: Ralph Bowling
Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information

Manufacturer: TBD

Model: TBD

Serial Number: TBD

Silo Type: ☑ Tower Silo ☐ Bunker Silo ☐ Other (Specify):

Number of Compartments in Silo: 1

Material Stored in Silo: Fly Ash

If there are more than three materials stored in the silo, attach additional copies of this page as needed.

Material	Material Density	Compartment Stored In
Fly Ash	0.0205 **tons/cubic foot**	
	tons/cubic foot	
	tons/cubic foot	

Attach a Material Safety Data Sheet (MSDS) for each material stored in the silo.

Silo Storage Capacity: 3,620 **tons**

Silo Loading Method: ☐ Pneumatic ☑ Vacuum ☐ Hydraulic ☐ Other (Specify): ☐ Mechanical

Maximum Rate of Silo Loading: 79.5 **tons/hour** | Maximum Unloading Rate: 79.5 **tons/hour**

Is the silo equipped with a **pressure-vacuum relief valve**? ☑ YES ☐ NO

If yes, describe the pressure relief valve settings:

Is the silo equipped with a system that prevents overfilling? ☐ YES ☐ NO

Describe the overfilling prevention system:

TBD

Is the silo equipped with a **silo level monitoring system**? ☐ YES ☐ NO

If YES, Type of Level Indicator: ☐ Point ☐ Continuous ☐ Other (Specify):

TBD

Is the silo equipped with a power/control panel with a high level indicator? ☐ YES ☐ NO

Section H: Control Device Information						
Is an **air pollution control device** used? ☑ YES ☐ NO						
If an air pollution control device is used, complete the following:						
Is a **cyclone collector** used? ☐ YES ☑ NO						
If yes, complete form AP-1208 and attach to this application.						
Is a **baghouse** used? ☑ YES ☐ NO						
If yes, complete form AP-0808 and attach to this application.						
Is any other control device used? ☐ YES ☑ NO						
If yes, attach a copy of the control device manufacturer's specification sheets.						
If any other control device is used, complete the following:						
Describe control device:						
Pollutants Controlled: ☐ HAPs ☐ TACs ☐ PM ☐ PM_{10} ☐ Metals ☐ Other (Specify):						
Control Device Manufacturer:						
Control Device Model:						
Control Device Serial Number:						
Control Device Design Capacity:						
Control Device Removal or Destruction Efficiency:						
Section I: Stack Information						
Stack Height Above Grade: 30 **feet**				Stack Exit Diameter: **feet** *(Provide stack dimensions if rectangular stack.)*		
Is a **stack cap** present? ☐ YES ☐ NO						
Stack Configuration: *(Check all that apply)* ☐ Vertical ☐ Horizontal ☐ Downward – Venting ☐ Other (Specify):						
Stack Exit Gas Temperature: ° F				Stack Exit Gas Flow Rate: **ACFM**		
Distance to Nearest Property Line: **feet**						
Describe Nearest Obstruction:						
Height of Nearest Obstruction: **feet**				Distance to Nearest Obstruction: **feet**		
Are stack **sampling ports** provided? ☐ YES ☐ NO						

Section J: Monitoring Information

Will emissions data be recorded by a **continuous emission monitoring system** (CEMS)? ☐ YES ☑ NO

If yes, attach a copy of the continuous emission monitoring system manufacturer's specification sheets.

If yes, complete the following information:

Pollutants Monitored: ☐ VOC ☐ HAPs ☐ TACs ☐ PM ☐ PM_{10} ☐ NO_x ☐ SO_2 ☐ Metals ☐ Other (Specify):

Describe the continuous emission monitoring system:

Manufacturer:

Model:

Serial Number:

Will multiple emission unites be monitored at the same point? ☐ YES ☐ NO

If Yes, Emission Units Monitored:

Will more than one emission unit be emitting from the combined point at any time? ☐ YES ☐ NO

Emission Units Emitting Simultaneously:

Section K: Visible Emissions Monitoring Information

Proposed Technique Used to Monitor Visible Emissions:
- ☐ Opacity Monitor (COM)
- ☑ Manual (Method 9)
- ☑ Manual (Method 22)
- ☐ Other (Describe): _____

*If an **opacity monitor** (COM) is used, complete the following information:*

Describe the continuous opacity monitoring system:

Manufacturer:

Model:

Serial Number:

Proposed Frequency of Opacity Monitoring:

Section L: Monitoring and Alarm Information

Are there any **alarms** associated with this silo? ☐ YES ☑ NO

If there are more than three alarms, attach additional copies of this page as needed.

Operating Parameter Monitored	Describe Alarm Trigger	Monitoring Device or Alarm Type	Does the Alarm Initiate an Automated Response?
Opacity	Method 9 or other visual inspection method	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
Throughput	Monthly throughput records	☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section M: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☐ YES ☑ NO
If yes, describe below:

Louisville Metro Air Pollution Control District

Form: AP-0808 **Baghouse**

Application For Permit To Construct, Reconstruct, Install, Modify, or Operate Process or Process Equipment

Mail Application To:
Louisville Metro APCD
850 Barret Avenue
Louisville, KY 40204

(502) 574-6000
FAX: (502) 574-5137
www.louisvilleky.gov/apcd

Section A: Owner/Operator Information

Business Name of Owner /Operator To Appear On The Permit:

Louisville Gas & Electric - Mill Creek Generating Station

Owner's Business Name (only if different from Business Name of Owner/Operator):

Louisville Gas & Electric

Section B: Equipment Location

Equipment Location Address:

14660 Dixie Highway
Street Address

Louisville | KY | 40272 | -
City | State | Zip Code

Responsible Official Name: Ralph Bowling

Responsible Official Title: VP Power Production

Phone: (502)627-4121

Fax: (502)627-4030

E-Mail: Ralph.Bowling@lge-ku.com

Section C: Permit Mailing Address

Permit and Correspondence information:

☐ Check here if same as equipment location address.

220 West Main Street
Street Address

Louisville | KY | 40202 - 1377
City | State | Zip Code

Contact Name: Rebecca Cash

Contact Title: Environmental Engineer

Phone: (502)627-4633

Fax:

E-Mail: Rebecca.Cash@lge-ku.com

Section D: Application Type

Reason for Submitting Application (Select all that apply):

- ☑ New Construction /Installation
- ☐ Change of Ownership
- ☐ Modification
- ☐ Change of Location
- ☐ Reconstruction
- ☐ Administrative Change
- ☐ Operation

Date of Construction, Modification, Installation or Operation:

(MM/DD/YYYY)

Estimated Start Date: See Silo Application

Actual Start Date:

In accordance with District regulations 2.03, Section 1, you may not construct, install, modify, or operate an affected facility unless a permit has been issued by the District (LMAPCD). Please complete all requested information in this application. Incomplete applications may result in denial of issuing a permit to construct and operate process or process equipment.

Section E: Facility Business Information

What type of business is being conducted at this equipment location?

Electric Services

SIC Code: 49

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Signature of Responsible Official: Ralph Bowl

Title: VP Power Production

Print Name: Ralph Bowling

Date: 6/9/11

LMAPCD Use Only	Application Tracking #:	Assigned Engineer:	Permit No(s):	Plant ID #:	NAICS Code:

Section G: Equipment Information
Manufacturer: TBD
Model: TBD
Serial Number:
Is the baghouse insulated? ☑ YES ☐ NO
Design Minimum Operating Temperature: ° F
Design Maximum Operating Temperature: ° F
Are temperature controls provided? ☐ YES ☑ NO
If YES, describe the temperature controls:
Air Flow Through Baghouse: ☐ Forced ☑ Induced ☐ Other Specify:
Direction of Flow Through Filters: ☐ Inside Out ☑ Outside In
Particulate Removal Efficiency: 99 %
Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.
Section H: Compartment Information
Number of Compartments: TBD
Number of Filters (Bags) Per Compartment: TBD
Can the Compartments be Isolated for Replacement or Repair? ☑ YES ☐ NO
Section I: Gas Stream Information
Maximum Inlet Volumetric Gas Flow Rate: acfm at **feet**
Maximum Outlet Volumetric Gas Flow Rate: acfm at **feet**
Dew Point at maximum Moisture Content of Gas: ° F
pH of Gas Handled:
Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☑ Dry ☐ Other(Specify):
Section J: Contaminant Information
Percent of Each Contaminant in the Waste Gas and Removal Efficiency
If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Antimony Compounds	7440-36-0	0.000105	99
Arsenic Compounds	7440-38-2	0.002396	99
Cadmium Compounds	7440-43-9	0.000598	99
Chromium Compounds	7440-47-3	0.17737	99
Nickel Compounds	7440-02-0	0.011513	99

Section G: Equipment Information
Manufacturer:
Model:
Serial Number:
Is the baghouse insulated? ☐ YES ☐ NO
Design Minimum Operating Temperature: ° F
Design Maximum Operating Temperature: ° F
Are temperature controls provided? ☐ YES ☐ NO
If YES, describe the temperature controls:
Air Flow Through Baghouse: ☐ Forced ☐ Induced ☐ Other Specify:
Direction of Flow Through Filters: ☐ Inside Out ☐ Outside In
Particulate Removal Efficiency: %
Attach the manufacturer's specification sheet for the baghouse and particle size removal efficiency curve and basis of determination.
Section H: Compartment Information
Number of Compartments:
Number of Filters (Bags) Per Compartment:
Can the Compartments be Isolated for Replacement or Repair? ☐ YES ☐ NO
Section I: Gas Stream Information
Maximum Inlet Volumetric Gas Flow Rate: acfm at feet
Maximum Outlet Volumetric Gas Flow Rate: acfm at feet
Dew Point at maximum Moisture Content of Gas: ° F
pH of Gas Handled:
Dust Characteristics: ☐ Sticky ☐ Wet ☐ Corrosive ☐ Dry ☐ Other(Specify):
Section J: Contaminant Information
Percent of Each Contaminant in the Waste Gas and Removal Efficiency
If more than five contaminants are present, attach additional copies of this page as needed.

Contaminant Name	Contaminant CAS Number	Percent of Waste Gas	Removal Efficiency
Cobalt Compounds	7440-48-4	0.000861	99
Lead Compounds	7439-92-1	0.019009	99
Manganese Compounds	7439-96-5	0.032000	99
Mercury Compounds	7439-97-6	0.000011	99
Selenium Compounds	7782-49-2	0.000229	99

Section K: Fabric Filter (Bag) Information

Fabric Type:
- ☐ Felted
- ☐ Woven
- ☐ Sintered Metal
- ☐ Membrane
- ☐ PTFE Membrane
- ☐ Other (Specify):
- ☐ Ceramic Cartridge
- ☐ Felted-Woven

Fabric Material: TBD

Maximum Continuous Filter Operating Temperature: TBD °F

Clean Fabric Permeability: TBD scfm/ft^2 at ΔP TBD inches of water

Fabric Filter (Bag) Diameter or Width: TBD **inches**

Fabric Filter (Bag) Length: TBD **inches**

Effective Area Per Filter: TBD **square inches**

Minimum Effective Air to Cloth Ratio: TBD **inches**

Maximum Effective Air to Cloth Ratio: TBD **inches**

Design Pressure Drop Across Baghouse: TBD **inches water**

Describe determining factor fabric filter changing/replacement:

Manufacturers recommendations and pressure drop across unit.

Attach the manufacturer's specification sheet for the fabric filters (bag).

Section L: Filter Cleaning Information

Filter Cleaning Method:
- ☐ Manual Cleaning
- ☐ Mechanical Shakers
- ☐ Pneumatic Shakers
- ☐ Bag Collapse
- ☐ Sonic Cleaning
- ☐ Reverse Air Flow
- ☐ Reverse Air Jet
- ☑ Pulse Jet
- ☐ Other (Specify):

Air Pressure: **psi**

Describe how air is supplied to system:

Describe how filter cleaning is initiated:
- ☐ Manual
- ☐ Timer
- ☑ Pressure Drop
- ☐ Other (Specify):

Section M: Hopper Information

Is the hopper heated? ☐ YES ☑ NO

Is there a hopper vibrator? ☐ YES ☑ NO

Describe how collected material is treated or disposed of:

Fly ash is either mixed with scrubber waste to form gypsum that is transferred off-site for beneficial reuse, mixed in with landfill waste or sold as fill or raw material substitute material in the cement or other related industry.

Section N: Stack Information		
Stack Height Above Grade:	TBD	**feet**
Stack Exit Diameter: *(Provide stack dimensions if rectangular stack.)*		**feet**
Is a Stack Cap Present? ☐ YES ☐ NO		
Stack Configuration: ☐ Vertical ☐ Horizontal ☐ Downward – Venting *(Check all that apply)* ☐ Other (Specify):		
Stack Exit Gas Temperature:	° F	Stack Exit Gas Flow Rate: ACFM
Distance to Nearest Property Line:		**feet**
Describe nearest obstruction:		
Height of Nearest Obstruction:	**feet**	Distance to Nearest Obstruction: **feet**
Are stack **sampling ports** provided? ☐ YES ☐ NO		

Section O: Monitoring and Alarm Information

Are there any **alarms** associated with this baghouse? ☐ YES ☑ NO

If YES, complete the following.

If there are more than three alarms, attach additional copies of this page as needed.

Operating Parameter Monitored	Describe Alarm Trigger	Monitoring Device or Alarm Type	Does the Alarm Initiate an Automated Response?
		☑ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☑ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:
		☐ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other	☐ YES ☐ NO Describe:

Section P: Additional Information

Attach potential emissions calculations with your application. If there are no emission calculations provided with the application, the LMAPCD will calculate the potential emission rates for this equipment. This will result in a delay in the issuance of the permit. The potential emission rates shall be based on operation at maximum equipment capacity. The annual potential emissions shall be based on 8,760 operating hours per year. All potential emission calculations shall represent pre-control emissions.

Is there any additional information pertinent to this application? ☑ YES ☐ NO

If yes, describe below:

The bin vent controls particulate emissions from the ash storage silo.

APPENDIX C

EMISSIONS SUPPORTING INFORMATION

Table C-1. Summary of Project Emissions Increases

Past Actual Emission Totals (tons)							
	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	$CO2_e$	Mercury
Baseline							
Unit 1	670.8	476.3	342.1	4,073.5	203.7		0.040
Unit 2	624.5	443.4	318.5	4,981.9	249.1		0.039
Unit 3	630.1	447.4	321.4	9,742.9	487.1		0.055
Unit 4	765.6	543.6	390.5	9,441.4	472.1		0.066
Facility Total	**2,691.0**	**1,910.6**	**1,372.4**	**28,239.7**	**1,412.0**		**0.200**

Future Projected Potential to Emit Totals (tons)							
	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	$CO2_e$	Mercury
Units 1-4 Boilers	1,298.05	921.61	662.00	8,462.77	296.20		0.1079
FGD Emissions Increase						46,545.22	
Limestone Conveyors	0.12	0.06	0.01				
Lime Silo	0.05	0.02	0.00				
PAC Silos	0.02	0.01	0.00				
Ash Silo	0.02	0.01	0.00				
Haul Roads	0.23	0.06	0.00				
Facility Total	**1,298.48**	**921.76**	**662.02**	**8,462.77**	**296.20**	**46,545.22**	**0.1079**

Past Actual to Future Projected Actual Emission Increase (tons)							
	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	$CO2_e$	Mercury
Future Projected Actual - Past Actual	**(1,392.5)**	**(988.9)**	**(710.4)**	**(19,777)**	**(1,115.79)**	**46,545.22**	**(0.092)**
Allowable Increase	**25**	**15**	**10**	**40**	**7**	**75,000.0**	
Net Out?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	

Table C-2. Coal Combustion Criteria Pollutants Potential-to-Emit

Coal-Fired Unit	Coal Usage (tons)	Coal Heat (MMBtu)	AP-42 Table 1.1-3 SO2			AP-42 Table 1.1-4 (Assume 12% ash content) PM			AP-42 Table 1.1-6 Scrubber (71% Cumulative Mass for PM10) PM10			AP-42 Table 1.1-6 scrubber (51% Cumulative Mass for PM2.5) PM2.5			AP-42 Table 1.1-17 Hg			AP-42 Ch. 1 Background Document (assume of 1% SO2 Emissions) H2SO4		
			Emission Factor (lb/ton)	Uncontrolled Emissions (tons)	Controlled Annual Emissions (tons)	Emission Factor (lb/ton)	Uncontrolled Emissions (tons)	Controlled Annual Emissions (tons)	Emission Factor (lb/ton)	Uncontrolled Emissions (tons)	Controlled Annual Emissions (tons)	Emission Factor (lb/ton)	Uncontrolled Emissions (tons)	Controlled Annual Emissions (tons)	Emission Factor (lb/MMBtu)	Uncontrolled Emissions (tons)	Controlled Annual Emissions (tons)	Emission Factor (lb/ton)	Uncontrolled Emissions (tons)	Controlled Annual Emissions (tons)
Unit 1	1,274,745	27,024,600	133	84,771	1,695.4	120.000	76,484.717	2600	85.20	54,304.149	184.6	61.20	39,007.206	132.6	1.60E-05	0.216	0.022	1.33	847.7	59.3
Unit 2	1,274,745	27,024,609	133	84,771	1,695.4	120.000	76,484.717	2600	85.20	54,304.149	184.6	61.20	39,007.206	132.6	1.60E-05	0.216	0.022	1.33	847.7	59.3
Unit 3	1,737,125	36,827,040	133	115,519	2,310.4	120.000	104,227.472	354.4	85.20	74,001.505	251.6	61.20	53,156.011	180.7	1.60E-05	0.295	0.029	1.33	1,155.2	80.9
Unit 4	2,076,368	44,019,000	133	138,078	2,761.6	120.000	124,582.075	423.6	85.20	88,453.274	300.7	61.20	63,536.858	216.0	1.60E-05	0.352	0.035	1.33	1,380.8	96.7
Total	6,362,983	134,895,240		423,138.371	8,462.8		381,778.981	1,298.0		271,063.077	921.6		194,707.280	662.0		1.079	0.1079		4,231.4	296.2

Table C-3. FGD CO_2 Emissions

Coal Heating Value Btu/lb	10,600
Existing SO2 removal capacity	90.00%
Proposed SO2 removal capacity	98.00%
Average %S in Coal	3.50
Lb Limestone/ton SO2 Removed	3600.00

Unit	Projected Heat Input (MMBtu/hr)	Coal (ton/yr)
MC1	3,085	1,274,745.28
MC2	3,085	1,274,745.28
MC3	4,204	1,737,124.53
MC4	5,025	2,076,367.92

Date	Coal Throughput (tons/yr)	SO2 to FGD (tons/yr)	Existing SO2 Removed (tons/yr)	Proposed SO2 Removed (tons/yr)	Net SO2 Removed (tons/yr)	Total Limestone Throughput (tons/yr)	Increased Limestone Throughput (tons/yr)	Total CO2 Emissions from FGD (tons/yr)	Net CO2 Emissions Increase (tons/yr)
2006	4,469,488	275,950.8	250,486.4						
2007	4,819,015	296,008.7	268,112.4						
2008	4,819,014	310,235.0	281,651.8						
2009	4,747,794	304,427.3	280,193.3						
2010	4,819,374	303,508.4	276,375.2						
PTE	**6,362,983**	**423,138.4**	**380,824.5**	**414,675.6**	**33,851.1**	**1,295,861.26**	**105,784.6**	**570,178.95**	**46,545.22**
2011	*4,550,454*	302,605.2	*272,344.7*	296,553.1	24,208.4	926,728.40	75,651.3	407,760.49	33,286.57
2012	*4,451,300*	296,011.5	*266,410.3*	290,091.2	23,680.9	906,535.07	74,002.9	398,875.43	32,561.26
2013	*4,329,639*	287,921.0	*259,128.9*	282,162.6	23,033.7	881,758.04	71,980.2	387,973.54	31,671.31
2014	*4,156,711*	276,421.3	*248,779.2*	270,892.9	22,113.7	846,540.17	69,105.3	372,477.68	30,406.34
2015	*4,249,239*	282,574.4	*254,317.0*	276,922.9	22,606.0	865,384.08	70,643.6	380,769.00	31,083.18

2011-2015 data is based on projected generation rates.

Table C-4. Raw Material Handling Emissions

Mill Creek Construction Emissions	E-13 Gypsum Processing Plant Flyash Silo (2)	E-24 Limestone Clamshell/ barge unloading to Hopper	E-25 Limestone Hopper to Feeder Belt LA	E-26 Limestone Feeder Belt LA to Conveyor LB	E-27 Limestone Conveyor LB to Limestone Storage Pile	E-28 Limestone Ball Mill & Crusher & Conveyor	E-39 Haul Road Fugitives (see Note 1)	E-XX Lime Storage Silo	E-XX PAC Storage Silo	E-XX Ash Storage Silo	E-XX Fly Ash Transfer Bins	Total
Total Increased Throughput (tons)	105,785	105,785	105,785	105,785	105,785	105,785	7,758	46,647	16,644	19,579	19,579	
Total Number of New Units	0	0	0	0	0	0	0	8	8	1	4	
Operating Hours	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	
PM Emission Factor (lb/ton)	0.1947	0.00163	0.00016	0.00016	0.00016	0.00016	0.2942	0.1947	0.1947	0.1947	0.1570	
Control Efficiency	99.50	0.00	0.00	0.00	0.00	0.00	80.00	99.00	99.00	99.00	99.00	
PM Emissions (tons/yr)	**0.0515**	**0.0860**	**0.0082**	**0.0082**	**0.0082**	**0.0082**	**0.2282**	**0.0454**	**0.0162**	**0.0191**	**0.0154**	**0.4947**
PM10 Emission Factor (lb/ton)	0.0921	0.000769	0.000074	0.000074	0.000074	0.000074	0.0722	0.0921	0.0921	0.0921	0.0742	
PM10 Emissions (tons/yr)	**0.0243**	**0.0407**	**0.0039**	**0.0039**	**0.0039**	**0.0039**	**0.0560**	**0.0215**	**0.0077**	**0.0090**	**0.0073**	**0.1820**
PM2.5 Emission Factor (lb/ton)	0.0139	0.000116	0.000011	0.000011	0.000011	0.000011	0.0000	0.0139	0.0139	0.0139	0.0112	
PM2.5 Emissions (tons/yr)	**0.0037**	**0.0062**	**0.0006**	**0.0006**	**0.0006**	**0.0006**	**0.0000**	**0.0033**	**0.0012**	**0.0014**	**0.0011**	**0.0191**
Antimony Emission Factor (lb/ton)	2.04E-05									2.04E-05	1.65E-05	
Antimony Emissions (lbs/yr)	**1.08E-02**									**3.99E-03**	**3.22E-03**	**0.0180**
Arsenic Emission Factor (lb/ton)	4.66E-04									4.66E-04	3.76E-04	
Arsenic Emissions (lbs/yr)	**2.47E-01**									**9.13E-02**	**7.36E-02**	**0.4116**
Cadmium Emission Factor (lb/ton)	1.16E-04									1.16E-04	9.39E-05	
Cadmium Emissions (lbs/yr)	**6.16E-02**									**2.28E-02**	**1.84E-02**	**0.1027**
Chromium Emission Factor (lb/ton)	4.96E-03									4.96E-03	4.00E-03	
Chromium Emissions (lbs/yr)	**2.62E+00**									**9.71E-01**	**7.83E-01**	**4.3774**
Nickel Emission Factor (lb/ton)	2.24E-03									2.24E-03	1.81E-03	
Nickel Emissions (lbs/yr)	**1.19E+00**									**4.39E-01**	**3.54E-01**	**1.9780**
Cobalt Emission Factor (lb/ton)	1.68E-04									1.68E-04	1.35E-04	
Cobalt Emissions (lbs/yr)	**8.86E-02**									**3.28E-02**	**2.65E-02**	**0.1479**
Lead Emission Factor (lb/ton)	3.70E-03									3.70E-03	2.98E-03	
Lead Emissions (lbs/yr)	**1.96E+00**									**7.24E-01**	**5.84E-01**	**3.2658**
Manganese Emission Factor (lb/ton)	6.23E-03									6.23E-03	5.02E-03	
Manganese Emissions (lbs/yr)	**3.29E+00**									**1.22E+00**	**9.83E-01**	**5.4977**
Mercury Emission Factor (lb/ton)	2.14E-06									2.14E-06	1.73E-06	
Mercury Emissions (lbs/yr)	**1.13E-03**									**4.19E-04**	**3.38E-04**	**0.0019**
Selenium Emission Factor (lb/ton)	4.46E-05									4.46E-05	3.59E-05	
Selenium Emissions (lbs/yr)	**2.36E-02**									**8.73E-03**	**7.04E-03**	**0.0393**
HAPS Total (tons/yr)	4.75E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-03	1.42E-03	**0.0079**

Notes:

PAC and lime will be delivered by truck. Based on consumption rates, 58 loads per week are anticipated for a total of 3,016 loads per year with a distance of 2 miles inside facility for a total of 6,032 vehicle
1 miles traveled (VMT).

Additional load to landfill estimated at 18,820 lbs per hour including additional ash from PJFF, PAC and lime. Assuming an average 24 ton truck, 3,453 loads would be required with an average of 0.5 miles per load. This would increase the haul roads by 1,726 VMT.

Table C-5. Baseline Emissions for Boiler Unit 1

Month-Year	Pollutant (tons)								
	SO_2[1]	NO_X[1]	PM[2]	PM_{10}[2]	$PM_{2.5}$[2]	H_2SO_4[3]	Lead[4]	CO_2[1]	Hg[4]
January-07	369.3	356.5	66.1	46.9	33.7	18.5	0.019	202,503	0.0038
February-07	408.8	317.5	60.0	42.6	30.6	20.4	0.017	183,858	0.0034
March-07	472.4	345.2	66.0	46.8	33.6	23.6	0.019	202,038	0.0038
April-07	375.7	332.6	65.1	46.2	33.2	18.8	0.019	199,350	0.0037
May-07	323.5	306.1	62.7	44.5	32.0	16.2	0.018	191,970	0.0036
June-07	274.7	234.8	49.9	35.5	25.5	13.7	0.015	152,952	0.0029
July-07	323.7	268.4	56.5	40.1	28.8	16.2	0.016	172,894	0.0032
August-07	463.7	302.5	63.8	45.3	32.5	23.2	0.018	195,344	0.0036
September-07	198.9	181.2	38.4	27.2	19.6	9.9	0.011	117,454	0.0021
October-07	275.2	254.1	54.6	38.8	27.8	13.8	0.017	167,244	0.0034
November-07	363.8	292.8	62.7	44.5	32.0	18.2	0.018	192,046	0.0035
December-07	378.0	288.7	62.2	44.2	31.7	18.9	0.018	190,650	0.0036
January-08	481.5	317.5	65.6	46.6	33.5	24.1	0.019	200,971	0.0038
February-08	319.6	265.0	56.0	39.8	28.6	16.0	0.018	171,525	0.0035
March-08	449.1	277.9	58.9	41.8	30.1	22.5	0.018	180,495	0.0035
April-08	334.0	281.8	57.5	40.8	29.3	16.7	0.017	176,008	0.0034
May-08	250.7	216.9	47.5	33.7	24.2	12.5	0.015	145,372	0.0030
June-08	366.5	284.8	60.9	43.2	31.0	18.3	0.019	186,448	0.0037
July-08	321.8	279.0	58.8	41.8	30.0	16.1	0.018	180,180	0.0036
August-08	280.4	229.1	49.1	34.9	25.1	14.0	0.016	150,466	0.0031
September-08	307.4	256.4	55.7	39.5	28.4	15.4	0.017	170,575	0.0034
October-08	112.7	92.8	19.9	14.1	10.2	5.6	0.006	60,964	0.0012
November-08	272.2	198.1	41.5	29.4	21.1	13.6	0.013	126,953	0.0025
December-08	423.4	298.2	62.3	44.2	31.8	21.2	0.019	190,695	0.0037
January-09									
24-Month Rolling Average (tons/yr)	4,073.5	3,238.9	670.8	476.3	342.1	203.7	0.2	2,054,476	0.040

1. SO_2, NO_X, and CO_2 emissions tracked via CEMS data.
2. Pollutant emissions based on emission factors developed from previous stack testing data.
3. H_2SO_4 emissions assumed to be 5% of all SO_2 emissions.
4. Emissions based on emission factors for Bituminous Coal in AP-42 Section 1.1, Table 1.1-18.
4. Emissions based on emission factors for Bituminous Coal in AP-42 Section 1.1, Table 1.1-19.

Table C-6. Baseline Emissions for Boiler Unit 2

Month-Year	Pollutant (tons)								
	SO_2[1]	NO_X[1]	PM[2]	PM_{10}[2]	$PM_{2.5}$[2]	H_2SO_4[3]	Lead[4]	CO_2[1]	Hg[4]
January-07	415.8	323.7	49.3	35.0	25.1	20.8	0.018	194,409	0.0036
February-07	438.5	287.8	43.2	30.6	22.0	21.9	0.016	170,339	0.0031
March-07	581.8	319.3	48.5	34.4	24.7	29.1	0.017	191,427	0.0034
April-07	459.9	333.3	52.6	37.3	26.8	23.0	0.018	207,472	0.0036
May-07	401.2	298.7	48.3	34.3	24.7	20.1	0.017	190,739	0.0033
June-07	422.3	283.8	46.0	32.7	23.5	21.1	0.016	181,478	0.0032
July-07	362.2	258.3	42.9	30.4	21.9	18.1	0.015	169,132	0.0030
August-07	535.3	296.2	49.3	35.0	25.2	26.8	0.018	194,659	0.0035
September-07	365.2	269.8	45.4	32.3	23.2	18.3	0.016	179,318	0.0032
October-07	243.0	184.2	31.0	22.0	15.8	12.2	0.011	122,412	0.0022
November-07	159.0	114.3	19.0	13.5	9.7	8.0	0.007	74,957	0.0013
December-07	458.9	311.1	52.3	37.1	26.7	22.9	0.019	206,351	0.0037
January-08	591.7	327.7	69.2	49.1	35.3	29.6	0.019	215,068	0.0038
February-08	434.8	284.4	60.2	42.7	30.7	21.7	0.017	187,130	0.0034
March-08	557.1	302.3	65.9	46.8	33.6	27.9	0.018	205,034	0.0036
April-08	427.0	319.9	64.4	45.7	32.8	21.3	0.018	200,198	0.0036
May-08	359.9	248.8	55.2	39.2	28.1	18.0	0.016	171,609	0.0031
June-08	479.3	281.8	61.1	43.4	31.2	24.0	0.017	190,115	0.0034
July-08	283.8	208.8	45.3	32.2	23.1	14.2	0.013	140,788	0.0026
August-08	411.9	286.6	61.2	43.4	31.2	20.6	0.018	190,194	0.0035
September-08	369.9	239.3	51.5	36.6	26.3	18.5	0.015	160,184	0.0029
October-08	477.9	309.6	65.4	46.4	33.4	23.9	0.019	203,351	0.0037
November-08	375.3	266.4	58.1	41.2	29.6	18.8	0.017	180,550	0.0034
December-08	351.9	302.8	63.6	45.2	32.5	17.6	0.019	197,826	0.0038
January-09									
24-Month Rolling Average (tons/yr)	4,981.9	3,329.5	624.5	443.4	318.5	249.1	0.2	2,162,370	0.039

1. SO_2, NO_X, and CO_2 emissions tracked via CEMS data.
2. Pollutant emissions based on emission factors developed from previous stack testing data.
3. H_2SO_4 emissions assumed to be 5% of all SO_2 emissions.
4. Emissions based on emission factors for Bituminous Coal in AP-42 Section 1.1, Table 1.1-18.
4. Emissions based on emission factors for Bituminous Coal in AP-42 Section 1.1, Table 1.1-19.

Table C-7. Baseline Emissions for Boiler Unit 3

Month-Year	Pollutant (tons)								
	SO_2[1]	NO_X[1]	PM[2]	PM_{10}[2]	$PM_{2.5}$[2]	H_2SO_4[3]	Lead[4]	CO_2[1]	Hg[4]
January-07	990.1	615.7	73.6	52.2	37.5	49.5	0.028	321,212	0.0055
February-07	862.7	524.9	60.0	42.6	30.6	43.1	0.022	261,909	0.0043
March-07	716.5	384.1	47.3	33.6	24.1	35.8	0.017	206,536	0.0034
April-07	63.6	33.1	5.7	4.1	2.9	3.2	0.002	24,984	0.0004
May-07	742.7	73.0	58.3	41.4	29.7	37.1	0.023	254,664	0.0045
June-07	831.4	70.9	65.4	46.5	33.4	41.6	0.024	285,660	0.0047
July-07	988.6	67.2	73.1	51.9	37.3	49.4	0.026	319,083	0.0051
August-07	1,008.5	61.9	73.8	52.4	37.6	50.4	0.027	322,236	0.0053
September-07	842.0	64.1	64.1	45.5	32.7	42.1	0.024	279,973	0.0047
October-07	844.3	492.7	63.8	45.3	32.5	42.2	0.026	278,374	0.0052
November-07	799.5	477.1	61.7	43.8	31.5	40.0	0.026	269,505	0.0052
December-07	751.2	449.7	58.2	41.3	29.7	37.6	0.026	254,197	0.0051
January-08	792.0	412.6	43.1	30.6	22.0	39.6	0.024	238,887	0.0047
February-08	520.2	306.6	30.3	21.5	15.5	26.0	0.016	168,106	0.0033
March-08	1,012.4	512.2	49.4	35.1	25.2	50.6	0.025	274,011	0.0050
April-08	798.4	504.8	46.8	33.3	23.9	39.9	0.024	259,812	0.0048
May-08	821.4	67.4	49.5	35.1	25.2	41.1	0.026	274,491	0.0051
June-08	852.9	48.6	49.9	35.4	25.5	42.6	0.026	276,782	0.0050
July-08	879.1	61.3	48.7	34.6	24.9	44.0	0.025	270,260	0.0050
August-08	1,057.3	59.1	50.5	35.9	25.8	52.9	0.026	280,311	0.0051
September-08	860.0	70.9	46.5	33.0	23.7	43.0	0.025	257,780	0.0049
October-08	795.0	431.6	45.6	32.4	23.2	39.7	0.024	252,798	0.0047
November-08	887.4	501.2	49.3	35.0	25.2	44.4	0.027	273,620	0.0053
December-08	768.5	462.1	45.4	32.3	23.2	38.4	0.024	252,057	0.0047
January-09									
24-Month Rolling Average (tons/yr)	9,742.9	3,376.3	630.1	447.4	321.4	487.1	0.3	3,078,624	0.055

1. SO_2, NO_X, and CO_2 emissions tracked via CEMS data.
2. Pollutant emissions based on emission factors developed from previous stack testing data.
3. H_2SO_4 emissions assumed to be 5% of all SO_2 emissions.
4. Emissions based on emission factors for Bituminous Coal in AP-42 Section 1.1, Table 1.1-18.
4. Emissions based on emission factors for Bituminous Coal in AP-42 Section 1.1, Table 1.1-19.

Table C-8. Baseline Emissions for Boiler Unit 4

Month-Year	Pollutant (tons)								
	SO_2[1]	NO_X[1]	PM[2]	PM_{10}[2]	$PM_{2.5}$[2]	H_2SO_4[3]	Lead[4]	CO_2[1]	Hg[4]
January-07	887.8	615.4	76.4	54.2	39.0	44.4	0.033	348,422	0.0065
February-07	777.4	506.1	60.9	43.2	31.0	38.9	0.025	277,526	0.0050
March-07	601.2	389.1	50.5	35.9	25.8	30.1	0.021	230,331	0.0042
April-07	815.4	589.7	74.0	52.6	37.8	40.8	0.032	337,612	0.0064
May-07	777.5	63.7	70.7	50.2	36.1	38.9	0.031	322,422	0.0062
June-07	739.3	54.1	66.6	47.3	34.0	37.0	0.031	303,681	0.0061
July-07	765.9	53.1	66.1	46.9	33.7	38.3	0.032	301,217	0.0063
August-07	898.2	51.8	67.8	48.1	34.6	44.9	0.033	309,169	0.0065
September-07	742.3	51.8	65.4	46.4	33.4	37.1	0.030	298,281	0.0059
October-07	711.4	512.4	62.2	44.2	31.7	35.6	0.027	283,558	0.0053
November-07	731.7	500.2	59.8	42.4	30.5	36.6	0.025	272,632	0.0050
December-07	936.0	567.9	66.8	47.4	34.1	46.8	0.028	304,454	0.0055
January-08	1,060.3	617.1	73.2	52.0	37.3	53.0	0.031	333,946	0.0061
February-08	752.7	574.9	62.8	44.6	32.0	37.6	0.026	286,277	0.0052
March-08	830.5	513.4	56.4	40.0	28.8	41.5	0.024	257,179	0.0047
April-08	102.1	104.6	10.5	7.5	5.4	5.1	0.004	47,938	0.0009
May-08	734.4	70.9	64.6	45.9	33.0	36.7	0.027	294,613	0.0054
June-08	970.8	77.4	66.5	47.2	33.9	48.5	0.029	303,166	0.0056
July-08	930.5	80.3	63.9	45.4	32.6	46.5	0.029	291,471	0.0057
August-08	940.7	66.3	72.7	51.6	37.1	47.0	0.031	331,705	0.0060
September-08	738.0	67.0	71.0	50.4	36.2	36.9	0.030	323,577	0.0058
October-08	826.7	656.1	70.1	49.8	35.8	41.3	0.029	319,688	0.0057
November-08	850.7	597.6	68.5	48.6	34.9	42.5	0.030	312,329	0.0060
December-08	761.3	553.2	63.9	45.4	32.6	38.1	0.029	291,380	0.0058
January-09									
24-Month Rolling Average (tons/yr)	9,441.4	3,967.0	765.6	543.6	390.5	472.1	0.3	3,491,287	0.066

1. SO_2, NO_X, and CO_2 emissions tracked via CEMS data.
2. Pollutant emissions based on emission factors developed from previous stack testing data.
3. H_2SO_4 emissions assumed to be 5% of all SO_2 emissions.
4. Emissions based on emission factors for Bituminous Coal in AP-42 Section 1.1, Table 1.1-18.
4. Emissions based on emission factors for Bituminous Coal in AP-42 Section 1.1, Table 1.1-19.