

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **022016-005** Project Number: 2015-04-048

Installation Number: 165-0007

Parent Company: Great Plains Energy

Parent Company Address: P.O. Box 418679, Kansas City, MO 64141

Installation Name: Kansas City Power & Light - Iatan Generating Station

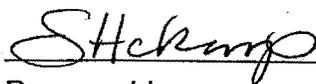
Installation Address: 20250 Hwy 45 North, Weston, MO 64098

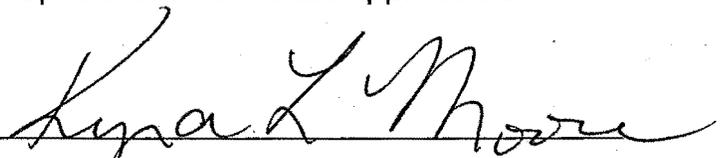
Location Information: Platte County, S08, T07S, R22E

Application for Authority to Construct was made for:
Spray dry evaporator (SDE) and process water concentrator (PWC) for Unit 1 & 2 scrubber process feedwater. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.


Prepared by
Susan Heckenkamp, PE
Environmental Engineer IV


Director or Designee
Department of Natural Resources

Feb 5, 2016
Effective Date

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources' regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

**Kansas City Power & Light - Iatan Generating Station
Platte County, S08, T07S, R22E**

1. Permit Expiration
Temporary permit 032014-004 issued by the air program expires upon the issuance of this permit.
2. Spray Dryer Evaporator (SDE)
 - A. Kansas City Power & Light - Iatan Generating Station (KCPL Iatan) shall route the SDE exhaust into the existing Unit 2 flue, upstream of the Unit 2 baghouse. KCPL Iatan shall demonstrate compliance visually, such that department employees may easily observe the connection between the SDE exhaust and Unit 2 flue.
 - B. KCPL Iatan shall exclusively handle Unit 1 & 2 scrubber process feedwater in the SDE. KCPL Iatan shall demonstrate compliance visually, such that department employees may easily observe Unit 1 & 2 scrubber process feedwater is the only SDE feedwater.
 - C. KCPL Iatan shall not process more than 1,944,000 gallons¹ feedwater in a 30 day block period in the SDE. The SDE feedwater input shall be equipped with a gauge or meter. The gauge or meter shall be located such that department employees may easily observe Unit 1 & 2 scrubber process feedwater. KCPL Iatan shall keep records on site of the total feedwater throughput for each 30 day block period.
 - D. KCPL Iatan shall maintain an operating and maintenance log for the SDE which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions;
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.; and
 - 3) Dates of all above schedules, incidents, activities, and actions.

¹ 1,944,000 gallons of water is equivalent to 45 gallons per minute totaled over 30 days.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

3. Process Water Concentrator (PWC)
 - A. KCPL latan shall operate the PWC in accordance with the manufacturer's specifications, which shall be kept on site.
 - B. KCPL latan shall exclusively process Unit 1 & 2 scrubber process feedwater in the PWC. KCPL latan shall demonstrate compliance visually, such that department employees may easily observe Unit 1 & 2 scrubber feedwater is the only PWC feedwater.
 - C. KCPL latan shall not exceed 150,000 ppm **by weight** (ppmw) of total solids content (total suspended solids plus total dissolved solids) in the feedwater being treated by the PWC.
 - 1) KCPL latan shall demonstrate compliance by monitoring and recording the feedwater total solids obtained after the addition of any additives at least once per week. If the PWC is operated for a portion of the week, testing shall occur during that period. Testing is not required during periods when the PWC is not operating.
 - 2) If KCPL latan exceeds 150,000 ppmw in any of the samples required by Special Condition 3.C.1) and prior to any testing outlined in Special 4, then KCPL latan shall be required to complete testing outlined in Special Condition 4 within 60 days of the date the exceedance occurs.
 - 3) In order for KCPL latan to operate at a higher total solids content than 150,000 ppmw, KCPL latan will have to complete testing in accordance with Special Condition 4. In addition, KCPL is required to submit a report outlining that testing demonstrates that the project will not exceed de minimis levels at higher total solids content. If applicable, the Permit Section will use this report and its results to amend this permit and allow for the higher justified solids content.
 - 4) After testing has been completed and an alternate solids content accepted, KCPL latan shall demonstrate compliance by monitoring and recording at least once per month the feedwater total solids obtained after the addition of any additives. If the feedwater total solids content is equal to or less than the agreed upon amount for six months of measurement, monitoring and recording may revert to a quarterly basis. If there is an exceedance at any time, KCPL latan shall fix the problem and conduct weekly testing for a minimum of four sequential passing tests and then to monthly and quarterly testing as outlined above. Records shall be kept on site.
 - D. KCPL latan shall not process more than 1,512,000 gallons of feedwater in a 30 daily block period in the PWC. The PWC input shall be equipped with a gauge or meter. The gauge or meter shall be located such that

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

department employees may easily observe it. KCPL latan shall keep daily records on site of the total feedwater throughput, operating time, and rate.

- E. KCPL latan shall not discharge cake from the PWC at less than 30% moisture. KCPL latan shall demonstrate compliance by monitoring and recording at least once daily the moisture content. If the cake demonstrates 30% moisture or greater for 30 days of measurement, monitoring and recording will revert to monthly. Records shall be kept on site.
 - F. KCPL latan shall heat the PWC with 1) steam or 2) propane as defined by ASTM D1835, or equivalent standard. KCPL latan shall keep records on site of each fuel delivery amount and identification of the fuel as propane.
 - G. KCPL latan shall maintain an operating and maintenance log for the PWC which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions;
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.; and
 - 3) Dates of all above schedules, incidents, activities, and actions.
4. Optional Emission Testing
- A. KCPL latan shall test total PM₁₀ and PM_{2.5} at the exhaust of the PWC.
 - B. Emissions shall be tested for the duration or volume specified in the test method.
 - C. During the testing of the particulate, KCPL shall obtain at least 3 samples of the feedwater and test them for total solids. The samples shall be obtained after the addition of any additives and shall be collected at least an hour apart from the previous sample.
 - D. A written copy of the full test report and results shall be submitted to the Compliance/Enforcement Section within 30 days of completion of the testing. At a minimum, the report must include water sample testing, sampling date/time, legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required EPA Method for at least one sample run.
 - E. KCPL latan shall submit an analysis of the results of the total solids testing and the particulate testing at the exhaust of the PWC. The analysis shall be used to establish an alternate solids content as established in Special Condition 3.C and to verify that the proposed solids content will not cause

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

the project to exceed 15 tons per year of PM₁₀ or 10 tons per year of PM_{2.5}. The analysis shall be submitted to the Permits Section within 45 days of completion of the testing.

- F. A completed Proposed Test Plan Form (enclosed) shall be submitted to the Compliance/Enforcement Section at least 60 days prior to the proposed test date so that the Air Pollution Control Program may arrange a pretest meeting, if necessary, and assure that the test date is acceptable for an observer to be present. The Proposed Test Plan may serve the purpose of notification and must be approved by the Director prior to conducting the required emission testing. Each proposed test method shall be approved by the Air Pollution Control Program prior to conducting the respective test.
 - G. The test reports are to fully account for all operational and emission parameters addressed both in the permit conditions as well as in any other applicable state or federal rules or regulations. Applicable NSPS and MACT standards may have separate test requirements than this permit.
5. Record Keeping and Reporting Requirements
- A. KCPL Iatan shall maintain all records required by this permit for not less than five years and shall make them available immediately to any department personnel upon request. Alternate timelines may be proposed accepted by department personnel. These records shall include MSDS/SDS for all materials used.
 - B. KCPL Iatan shall report to the air program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 days after the end of the 24 hour period during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2015-04-048
Installation ID Number: 165-0007
Permit Number:

Installation Address:
KCP&L - Iatan Generating Station
20250 Hwy 45 North
Weston, MO 64098

Parent Company:
Great Plains Energy
P.O. Box 418679
Kansas City, MO 64141

Platte County, S08, T07S, R22E

REVIEW SUMMARY

- KCPL Iatan has applied for authority to construct a spray dry evaporator (SDE) and process water concentrator (PWC) for Unit 1 & 2 scrubber process feedwater.+
- The application was deemed complete on September 15, 2015.
- HAP emissions are expected from handling coal ash and combusting propane.
- None of the NSPS under 40 CFR 60 apply to the project emission units.
- None of the NESHAPs under 40 CFR 61 apply to the project emission units.
- None of the MACTs under 40 CFR 63 apply to the project emission units.
- The existing PSD permitted Unit 2 baghouse and scrubber are being used to control the SDE emissions (EU-12). The existing PSD permitted fly ash bin baghouse (EP-23) and the existing PSD permitted fly ash moisture content requirement are being used to control the SDE ash loadout emissions (EP-24). A special condition is not required for those control devices in this permit as the SDE solids are mixed with Unit 2 fly ash. The high moisture content of PWC ash is being used to control the PWC ash loadout emissions. The PWC stack is uncontrolled.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels. Potential emissions of NO_x and PM₁₀ exceed the insignificant emission exemption levels in 10 CSR 10-6.061(3)(A)3.
- This installation is located in Platte County, an attainment area for all criteria pollutants.

- This installation is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation is classified as item number 21, fossil-fuel boilers (or combination thereof) totaling more than 250 million British thermal units per hour heat input. The installation's major source level is 100 tpy and fugitive emissions are counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels and SMALs.
- Emission testing is not required as a condition of this permit. The PWC was tested under temporary permit 032014-004. The SDE emits commonly with the Unit 2 stack which is periodically tested according to PSD permit 012006-019D.
- Submittal of an application to amend the part 70 operating permit is required for this installation within 1 year of the SDE startup, or within 1 year of the first PWC operation occurring after this permit's issuance, whichever is first.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

KCPL Iatan is a primarily coal fired, electric generating station consisting of two main units. Unit 1 was permitted in 1977. It is a wall fired, dry bottom boiler rated at 7,800 MMBtu/hr input. Unit 2 was permitted in 2006. It is a supercritical, wall fired, dry bottom boiler rated at 8,100 MMBtu/hr input. The primary fuel is subbituminous coal with fuel oil for startup and flame stabilization. Controls include separate, dedicated selective catalytic reduction (SCR) units, baghouses, and wet scrubbers. Other emission units include an auxiliary boiler, coal receiving/handling, limestone receiving/handling, coal combustion residuals handling and landfill, haul roads, emergency engines, fuel tanks, degreasing units, and a cooling tower. The installation is a major source of PM, PM₁₀, PM_{2.5}, SO₂, NO_x, VOC, CO, sulfuric acid mist (SAM), and HAPs. The installation's source status of fluorides (excluding hydrogen fluoride), hydrogen sulfide (H₂S), total reduced sulfur, and reduced sulfur compounds has not been determined. The following new source review permits have been issued to KCPL Iatan.

Table 1: Permit History

Permit Number	Description
0277-EPA	PSD permit for Unit 1
1293-004	Section (5) permit for Unit 1 ESP changes
012006-019	Section (8) permit for Unit 2, auxiliary units, landfill, and upgrades to Unit 1
012006-019A	Amendment for Unit 2 to be supercritical
012006-019B	Amendment for Unit 1 modifications, and emission limits
012006-019C	Amendment for wording clarification
012006-019D	Amendment for adding sulfuric acid mist BACT, auxiliary changes
032014-004	Temporary permit for PWC

PROJECT DESCRIPTION

Iatan Unit 1 & 2 are controlled, among other devices, with a wet scrubber. Iatan's wet scrubbers create blowdown and do not have a National Pollutant Discharge Elimination System (NPDES) point source water pollution permit, and are deemed zero liquid discharge. The SDE is proposed to help attain zero liquid discharge. A portion of the scrubber process feedwater will be routed to the SDE and contact a slip stream of flue gas from the SCR outlet. The SDE will spray the feedwater and the flue gas will evaporate the water and other volatiles. The vapors, SDE solids, and flue gas will be routed back to the flue and be controlled by the existing Unit 2 baghouse and scrubber. Collected SDE solids will become part of the fly ash collected by the baghouse. Fly ash will be sold offsite or landfilled onsite. Fly ash destined for the landfill is mixed with water to at least 10% moisture before being loaded into trucks. Haul roads are paved between ash loadout and the landfill. The SDE is rated at 45 gpm of feedwater. The solids feed rate is 4,079 lb/hr. This final value is based upon feedwater obtained from the scrubber hydroclone, and not adding hydrated lime for corrosion control. The value is not supported by a SDE test report.

The PWC can be used if the SDE is not operating, or together with the SDE. The PWC is proposed to control the same feedwater as the SDE. The PWC may accommodate other process water, but in doing so this permit is no longer valid. The PWC is not equipped with an add-on control device, therefore changes in feedwater could result in increased potential emissions requiring emission limits. Testing on PWC was conducted; however, the total solids of the water were not measured prior to or during testing. Therefore, a correlation between the total feedwater solids and the particulate emission rate could not be made. For project emissions, an assumption was made that the particulate tests were conducted at a low solid level of 6.8% and scaled up to a higher solids level. The solids level where the project remains below de minimis levels is 150,000 ppmw total solids. For these reasons, the PWC feedwater is restricted to a solids level below 150,000 ppmw. If KCPL Iatan wants the ability to operate at a higher total solids content level, KCPL Iatan is required to conduct further testing to confirm the correlation between total solids in the process water and the particulate out the exhaust of the PWC and to establish a higher total solids level that still result in project levels below de minimis thresholds.

Heat for the PWC evaporation is provided by 1) steam or 2) a direct-fired propane burner rated at 30 MMBtu/hr input. The PWC is rated at 35 gpm of feedwater. Feedwater mixed with a coagulant enter the heated chamber, then an entrainment separator. Water and other volatiles emit from a stack. Solids and remaining water transfer to another separating process. High moisture cake is transferred to trucks to be disposed in the landfill. Haul roads are paved for propane receiving and for PWC cake disposal. The wet cake density is 60 pounds per cubic foot and 37 cubic yards are generated a day. The estimated wet cake MHDR is 1.25 tph, at 30% moisture. The PWC is an existing emission unit on site through temporary construction permit 032014-004. Project emission units are summarized in Table 2.

Table 2: Project Emission Units

Emission Unit	Description	Permitted MHDR	Emission Point	New or Existing
EU-12	SDE	4,079 lb/hr solids, 1,944,000 gallons feedwater each 30 day period	EP-30	New emission unit, emission increase at existing stack
N/D	SDE increase at Unit 2 fly ash bin baghouse	4,079 lb/hr solids	EP-23	Emission increase at existing unit
N/D	SDE increase at Unit 2 fly ash bin transfer to truck	4,079 lb/hr solids	EP-24	Emission increase at existing unit
N/D	SDE increase at paved landfill road	4,079 lb/hr solids	EP-09	Emission increase at existing unit
N/D	SDE increase at landfill drop and grading	4,079 lb/hr solids	EP-35	Emission increase at existing unit
EU-40	PWC, PWC propane combustion	1,512,000 gallons feedwater each 30 day period solids limited to conditions during 2014 emission test, 30 MMBtu/hr propane input,	EP-40	New (existing under temporary permit)
Not an emission unit	PWC loadout to truck	2,514 lb/hr wetted solids	Not an emission unit	New
N/D	PWC increase at paved landfill road	2,514 lb/hr wetted solids	EP-09	Emission increase at existing unit
N/D	PWC increase at landfill drop and grading	2,514 lb/hr wetted solids	EP-35	Emission increase at existing unit
N/D	PWC coagulant and propane paved receiving road	9.6E-4 tph coagulant receiving, 0.69 tph propane receiving, each on long-term average	EP-09	Emission increase at existing unit

N/D = Not determined

EMISSIONS/CONTROLS EVALUATION

Several of the project emission units are existing units. The calculation method for affected existing units is *potentials minus actuals* or *projected actuals minus actuals*. The Unit 2 stack will see a potential increase, however the boiler is not affected. Ash handling, haul roads, and the landfill will see an increase, however that is due to the SDE and PWC solids using the same equipment/emission units or being comingled with the existing fly ash. Therefore project emissions were calculated as just the increase related to the project.

SDE

SDE PM, PM₁₀ and PM_{2.5} potential emissions from the Unit 2 stack were calculated using total dissolved solids and total suspended solids values. The flue particulate in the SDE feedwater is from the baghouse exhaust and will be mostly PM_{2.5}. Total suspended solids is defined as passing a 2 micron filter, so this is also PM_{2.5}. It was conservatively assumed that the particles would not combine during the SDE process and would remain PM_{2.5}. Filter bag specifications show control efficiency ranging from 99.992% to 100.00% for particles from 0.3 to 3.0 microns. These values have not been

confirmed using site specific testing to the knowledge of the air program. This review assumed 99.996% PM_{2.5} control efficiency as the average. The same control was conservatively used for PM₁₀ and PM. Resulting SDE PM, PM₁₀, and PM_{2.5} potential emissions from the Unit 2 stack are each less than 1.0 tpy. If the highest provided solids content and lowest control efficiency were used, then the entire project PM and PM₁₀ emissions are still below PSD SERs. PM_{2.5} emissions would exceed the PSD SER, however this would be based upon the combination of several conservative assumptions and is unlikely to occur. Therefore, the SDE special conditions only dictate the process feedwater source from the Unit 1 & 2 scrubber and the maximum flowrate, but do not limit the solids content, nor require the feedwater to be from the scrubber hydroclone. SDE PM condensable emissions were assumed to be zero. Particulate matter emission rates could be verified using existing PM CEMS combined with stack tests, however this permit does not require emission testing as the potential emissions are relatively low. Replacement of the bags with bags of lower control efficiency is subject to permitting.

Potential PM and PM₁₀ emissions from the increase at the Unit 2 fly ash bin baghouse exhaust filter were calculated using emission factors obtained from SCC 3-05-011-17 associated with pneumatic cement supplement unloading into a controlled silo. PM_{2.5} was assumed equal to PM₁₀ as the published factors are controlled.

Potential PM, PM₁₀, and PM_{2.5} emissions from the increase at the Unit 2 fly ash bin transfer to trucks were calculated using the equation obtained from the U.S. Environmental Protection Agency document, *AP-42, Chapter 13.2.4, Aggregate Handling and Storage Piles*, November 2006. All of the SDE solids were assumed to pass through this unit and be landfilled on site as this method results in the most conservative project emissions. Fly ash destined for the landfill is wetted to at least 10% moisture per the PSD permit. As the SDE solids and fly ash will be comingled, the SDE solids will be wetted to at least 10% moisture. 4.8% moisture is the maximum recommended to retain the equation's quality rating, therefore the calculations used 4.8%. Wind speed of 10.6 mph was obtained from reference 8. Emissions are below 0.02 tpy.

Particulate HAP potential emissions from the SDE Unit 2 stack, SDE solids handling and disposal, and PWC solids handling and disposal were calculated using concentrations obtained from reference 7, multiplied by the PM potential emissions. Gaseous HAP potential emissions from the SDE Unit 2 stack were calculated using emission factors from the 2014 PWC emission test, multiplied by the SDE feedwater flowrate. Sulfuric acid mist and hydrogen fluoride potential emissions from the SDE Unit 2 stack and PWC stack were calculated using uncontrolled values and emission limits obtained from the PSD permit, with the SDE emissions being subject to scrubber control efficiency again.

PWC

Criteria pollutant and metal HAP potential emissions were calculated using emission rates obtained from the 2014 PWC stack test and scaling based on total solids assumptions. Products of propane combustion were scaled up by 12.6%, and metal HAPs were scaled up by 8.7% to account for the stack test occurring at less than

propane and feedwater MHDR, respectively. Potential emissions of other HAPs were calculated using emission factors obtained from AP-42, Chapter 1.4, *Natural Gas Combustion*, July 1998. A coagulant containing up to 0.1 weight % of acrylic acid is added to the PWC feedwater, at a rate of 7 tpy. The tpy usage rate was conservatively scaled up by 20% for potential emission purposes. Conservatively, 100% of the acrylic acid was assumed emitted. Resulting acrylic acid emissions are less than 0.01 tpy.

The PWC is uncontrolled. Therefore variations in water quality have a direct impact on potential emissions. Special conditions for PWC feedwater solids and flowrate are included.

Vendor calculations show the PWC wet cake is loaded out at over 44% water, while the application assumes 30%. This review assumed loading cake above 30% moisture into trucks would cause zero particulate emissions.

Landfill

Emissions from unloading SDE and PWC solids from trucks to the landfill were considered equal to the emissions from loading the solids into the trucks, but were reduced using the ratios in the TVA/EPRI study described below.

Potential emissions from grading SDE and PWC solids were calculated using a multi-step approach refined from a general AP-42 calculation, to an ash specific landfill, to the latan Unit 2 ash disposal rate, to the SDE and PWC solids disposal rate.

Calculations began with AP-42, Section 11.9, *Western Surface Coal Mining*, October 1998, grading. The only input was grader speed.

Calculations were refined to an ash landfill using the study, *Fugitive Emissions from a Dry Coal Fly Ash Storage Pile*, TVA & EPRI, August 2012. The study proposes the AP-42 unloading and grading methods result in over-predicted emissions based upon recent monitored data. A ratio of 53:260 can be applied to the AP-42 PM and PM₁₀ emission factors based upon the EPRI study's, Table 1. The ratio is for particles in the range of 10 to 2.5 microns, but the ratio was applied to this project's PM as it was assumed PM would be more similar to the 10 to 2.5 micron range than the 2.5 micron and smaller range. The EPRI study's PM_{2.5} ratio of 19:29 was applied to the AP-42 PM_{2.5} emission factor. This method results in ash grading emissions, but is not specific to the latan landfill.

Calculations were refined to latan Unit 2 grading emissions by multiplying the study adjusted AP-42 emissions by the ratio of the Unit 2 and TVA ash disposal rates. Each unit's ash disposal rate was calculated using the difference between uncontrolled and controlled PM emission rates.

Calculations were refined to just the SDE and PWC grading increase by multiplying the Unit 2 grading emissions by the ratio of SDE and PWC solids to Unit 2 fly ash.

No new landfill excavation or increase in landfill size is being considered under this permit. Therefore an increase in wind erosion emissions was not considered for the project emissions. Wind still creates erosion emissions for the overall installation PTE.

Haul Roads

Propane receiving, coagulant receiving, PWC solids shipping, and SDE solids shipping haul road emissions were calculated using AP-42 Section 13.2.1, *Paved Roads*, January 2011. Distances were measured using aerial imagery. The average receiving unloaded/loaded truck weight is 25 tons. The average shipping unloaded/loaded truck weight is 35 tons. Silt loading of 7.4 grams per square meter was selected from AP-42 Table 13.2.1-3. 100 annual rain days were selected from AP-42 Figure 13.2.1-1.

Comparison to PSD permit

This project is not related to PSD permit 012006-019 or its amendments. Several emission units in the PSD permits will see an increase in potential throughput as a result of this project. Different calculation methods were used for this project and the PSD permits for common emission units. The new methods represent the portion of emissions from this project and utilize information that was not available at the time of the prior reviews. For instance, paved road emissions used to be calculated using the unpaved road calculation with 90% control added to represent paving. Now, a new paved road equation is used. Another example is the ash landfill study was not available during the PSD permit review. Also, PM_{2.5} is now a regulated pollutant requiring closer review of all particulate matter calculations.

The SDE stack emissions are comingled with the Unit 2 emissions at EP-30. SDE solids are combined with Unit 2 fly ash. Emissions and throughputs from EP-30 and ash handling are limited in the PSD permits. Those limits do not encompass this project. However, since the emissions and throughputs are comingled, values from this project will be represented towards compliance with the PSD limits. KCPL later has indicated the SDE/PWC and PSD throughputs will not be tracked separately. Even considering the increases from this project, KCPL later expects to remain in compliance with the PSD limits. If compliance issues arise, then the limits may be readdressed.

SDE and PWC Feedwater Additives

The only scrubber water additive identified in this review was Nalco 8190 coagulant for use at the PWC. It may contain less than 0.1% weight acrylic acid, which is a VOC and HAP. Potential VOC and HAP emissions from the additive are each less than 0.01 tpy. Any new additives require a construction permit if their potential HAP emissions exceed the respective SMAL, or if their potential VOC emissions exceed the insignificant emission exemption level of 2.75 lb/hr. The SDE calculation method and PWC special conditions ensure that particulate matter originating from an additive is accounted.

The following table provides an emissions summary for this project. Existing potential emissions were obtained from permit OP2014-034. Existing actual emissions were obtained from the installation's 2014 EIQ. Potential emissions of the application represent the potential of the new equipment and increases at the existing equipment, assuming continuous operation (8,760 hours per year). Hydrogen fluoride emissions appear to exceed the SMAL. However, due to the uncertainties in the potential

emission calculations, combined with the SMAL significant figures, the hydrogen fluoride emissions can be rounded down for comparison to the SMAL. The SMAL is a “not to exceed” value. Therefore, potential emissions of 0.12 tpy do not exceed the 0.1 tpy SMAL.

Table 3: Emissions Summary (tpy)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2014 EIQ)	Potential Emissions of the Project	New Installation Conditioned Potential
PM	25.0	Major	N/D	13.52	major
PM ₁₀	15.0	1,821.09	594.11	10.81	1,831.90
PM _{2.5}	10.0	943.68	536.12	<10.0	953.68
SO ₂	40.0	3,151.06	286.40	0.05	3,151.11
NO _x	40.0	5,649.74	2,594.50	17.66	5,667.40
VOC	40.0	186.57	1.37	0.57	187.14
CO	100.0	6,751.67	887.11	0.20	6,751.87
GHG (CO ₂ e)	75,000	14,997,067.72	9,311,819	15,929.11	15,012,996.83
GHG (mass)	0.0	N/D	N/D	15,538.36	N/D
Combined HAPs	25.0	5,375.53	2.41	0.85	5376.38
Arsenic	¹ 0.005	N/D	N/D	3.96E-04	N/D
Beryllium	¹ 0.008	N/D	N/D	4.57E-05	N/D
Cadmium	¹ 0.01	N/D	N/D	2.22E-04	N/D
Chromium	¹ 5	N/D	N/D	3.98E-03	N/D
Cobalt	¹ 0.1	N/D	N/D	1.87E-04	N/D
Lead	¹ 0.01	N/D	N/D	4.36E-04	N/D
Manganese	¹ 0.8	N/D	N/D	2.60E-03	N/D
Mercury	¹ 0.01	N/D	N/D	2.52E-05	N/D
Nickel	¹ 1	N/D	N/D	5.96E-03	N/D
Selenium	¹ 0.1	N/D	N/D	6.21E-04	N/D
Hydrogen chloride	¹ 10	N/D	N/D	0.46	N/D
Sulfuric acid mist	7.0	N/D	N/D	0.15	N/D
Hydrogen fluoride	¹ 0.1	N/D	N/D	0.12	N/D
Acrylic acid	¹ 0.6	N/D	N/D	8.40E-03	N/D

N/A = Not Applicable; N/D = Not Determined

¹ = SMAL

² GHG (CO₂e) actual emissions obtained from reference 9.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels. Potential emissions of NO_x and PM₁₀ exceed the insignificant emission exemption levels in 10 CSR 10-6.061(3)(A)3.

APPLICABLE REQUIREMENTS

Kansas City Power & Light - Iatan Generating Station shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110 applies to the project. Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required for the first full calendar year the equipment (or modifications) approved by this permit are in operation.
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400 applies to the PWC stack EP-40. Potential PM filterable emissions are 0.885 lbs/hr. The feedwater process rate is 17,514 lb/hr, and the allowable emissions are 17.5 lbs/hr. Alternatively, the dry solids feed rate is 1,405 lb/hr, and the allowable emissions are 3.2 lbs/hr. Compliance is demonstrated with either method.
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260 does not apply to the PWC as the burner combusts propane, and does not combust the feedwater solids.
- *Restriction of Particulate Matter Emissions From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-6.405. Unit 2 remains subject to the limit of 0.10 lbs of PM per MMBtu input. Unit 2 remains subject to a more stringent PSD permit limit.
- 40 CFR 64 Compliance Assurance Monitoring
- 40 CFR 63 Subpart UUUUU, *National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units*

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

1. The Application for Authority to Construct form for the PWC, dated May 15, 2015, received May 26, 2015, designating Great Plains Energy as the owner and operator of the installation.
2. The Application for Authority to Construct form for the SDE, dated May 8, 2015, received May 26, 2015, designating Great Plains Energy as the owner and operator of the installation.
3. KCPL and department emails dated June 18, July 2 and 27, August 5 and 25, September 4 and 15, October 2, 6, 7, 8, of 2015.
4. *Compliance Emissions Test Report, Kansas City Power and Light Iatan Generating Station Heartland Concentrator Stack Weston, Missouri Project No. M143009-02 September 9 through 11, 2014*, Mostardi Platt, 2014.

The following documents are references for this permit:

1. EPA Air Markets Program Data website accessed June 16, 2015, <http://ampd.epa.gov/ampd/>
2. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
3. *Powder River Basin Coal Resource and Cost Study*, John T. Boyd Company, September 2011.
4. *A Critical Review of Published Coal Quality Data From the Southwestern Part of the Powder River Basin, Wyoming*, James Luppens, U.S. Geological Survey, 2011.
5. *Guide to Coal Mines*, BNSF Railway, June 12, 2013.
6. *Fugitive Emissions from a Dry Coal Fly Ash Storage Pile*, Stephen Muller et al, Tennessee Valley Authority, Stephanie Shaw, Electric Power Research Institute, 2012.
7. *Reuse Options for Coal Fired Power Plant Bottom Ash and Fly Ash*, Jayaranjan, Hullebusch, and Annachatre. Reviews in Environmental Science and Biotechnology. Published online April 1, 2014. DOI 10.1007/s11157-014-9336-4.
8. NOAA Global Climate Station Summaries website accessed October 22, 2015, <http://gis.ncdc.noaa.gov/map/viewer/#app=cdo&cfg=isdssummaries&theme=isdssummaries>
9. EPA facility level information on greenhouse gases tool (flight) website accessed October 27, 2015, <http://ghgdata.epa.gov/ghgp/main.do>
10. Missouri Emissions Inventory System (MOEIS) website accessed October 27, 2015, <https://www.dnr.mo.gov/moeis/main/login>

APPENDIX A

Abbreviations and Acronyms

%	percent	m/s	meters per second
°F	degrees Fahrenheit	Mgal	1,000 gallons
acfm	actual cubic feet per minute	MW	megawatt
BACT	Best Available Control Technology	MHDR	maximum hourly design rate
BMPs	Best Management Practices	MMBtu	Million British thermal units
Btu	British thermal unit	MMCF	million cubic feet
CAM	Compliance Assurance Monitoring	MSDS	Material Safety Data Sheet
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs	National Emissions Standards for Hazardous Air Pollutants
CFR	Code of Federal Regulations	NO_x	nitrogen oxides
CO	carbon monoxide	NSPS	New Source Performance Standards
CO₂	carbon dioxide	NSR	New Source Review
CO_{2e}	carbon dioxide equivalent	PM	particulate matter
COMS	Continuous Opacity Monitoring System	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
CSR	Code of State Regulations	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
dscf	dry standard cubic feet	ppm	parts per million
EQ	Emission Inventory Questionnaire	PSD	Prevention of Significant Deterioration
EP	Emission Point	PTE	potential to emit
EPA	Environmental Protection Agency	RACT	Reasonable Available Control Technology
EU	Emission Unit	RAL	Risk Assessment Level
fps	feet per second	SCC	Source Classification Code
ft	feet	scfm	standard cubic feet per minute
GACT	Generally Available Control Technology	SDS	Safety Data Sheet
GHG	Greenhouse Gas	SIC	Standard Industrial Classification
gpm	gallons per minute	SIP	State Implementation Plan
gr	grains	SMAL	Screening Model Action Levels
GWP	Global Warming Potential	SO_x	sulfur oxides
HAP	Hazardous Air Pollutant	SO₂	sulfur dioxide
hr	hour	tph	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		

Mr. Stephen Courtney
Environmental Services
Kansas City Power & Light
P.O. Box 418679
Kansas City, MO 64141

RE: New Source Review Permit - Project Number: 2015-04-048

Dear Mr. Courtney:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, Third Floor, 131 West High Street, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.oa.mo.gov/ahc.

If you have any questions regarding this permit, please do not hesitate to contact me, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:dld

Enclosures

c: Kansas City Regional Office
PAMS File: 2015-04-048

Permit Number: