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February 28, 2017

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**HAND DELIVERED**

Dr. Talina R. Mathews  
Executive Director  
Public Service Commission  
211 Sower Boulevard  
P.O. Box 615  
Frankfort, KY 40602-0615

RE: **Case No. 2012-00578**

Dear Dr. Mathews:

Enclosed please find and accept for filing the original and ten copies of Kentucky Power Company's Annual Status Report regarding the Mitchell generating station. It is being filed in accordance with Ordering Paragraph 6 of the Commission's October 7, 2013 Order in the above matter.

Please do not hesitate to contact me if you have any questions.

Very truly yours,

  
Mark R. Overstreet

MRO

Enclosure

cc: Michael L. Kurtz  
Rebecca Goodman  
Shannon Fisk  
Joe F. Childers

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

The Application Of Kentucky Power Company For: )  
(1) A Certificate Of Public Convenience And Necessity )  
Authorizing The Transfer To The Company Of An )  
Undivided Fifty Percent Interest In The Mitchell )  
Generating Station And Associated Assets; (2) Approval )  
Of The Assumption By Kentucky Power Company Of )  
Certain Liabilities In Connection With The Transfer Of )  
The Mitchell Generating Station; (3) Declaratory Rulings; )  
(4) Deferral Of Costs Incurred In Connection With The )  
Company's Efforts To Meet Federal Clean Air Act And )  
Related Requirements; And (5) For All Other Required )  
Approvals And Relief )

Case No. 2012-00578

MITCHELL GENERATING PLANT: MARCH 1, 2017 ANNUAL PERFORMANCE  
REPORT AND REPORT ON POTENTIAL IMPACTS OF FUTURE ENVIRONMENTAL  
REGULATIONS

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## 1) **Introduction**

Kentucky Power Company files this report in conformity with the Kentucky Public Service Commission's October 7, 2013 Order in Case No. 2012-00578. Portions of the required information are provided in the following attachments:

### Attachment 1: Plant Performance Data

- i. Net Capacity Factor
- ii. Equivalent Forced Outage Rate ("EFOR")
- iii. Equivalent Availability Factor
- iv. Net Unit Heat Rate

### Attachment 2: Unplanned System Outages

## 2) **Mitchell Plant Performance**

Attachment 1 to this report includes 2016 performance data for Mitchell Unit 1 and Unit 2. Both Mitchell units performed well during 2016, showing marked improvement over 2015. Annual Net Capacity Factors were 52% and 60% for Unit 1 and Unit 2, respectively, up from 42% and 37% in 2015. Equivalent Forced Outage Rate (EFOR) was 15.2% for Unit 1, down from 15.7% in 2015, and 12.1% for Unit 2, down from 14.5%.

## 3) **Mitchell Plant Unplanned System Outages**

Attachment 2 to this report shows the unplanned outage events that occurred at Mitchell Units 1 and 2 during the 2016 calendar year. Unplanned outages are those outage events not included on the planned maintenance schedule. Because the planned maintenance schedule is prepared at least a year in advance, any previously unscheduled outage requested to be taken before the next planned outage is classified as an unplanned outage. Maintenance outages can be scheduled to conduct any type of predictive, preventive, or corrective maintenance that can only be done when the unit is not operating. These scheduled outages are distinct from forced outages, which require immediate removal of a unit from service, another outage state, or a reserve shutdown state. Forced outages can result from such conditions as mechanical/electrical/hydraulic control system trips and operator-initiated trips in response to unit alarms.

The longest outage events at Mitchell in 2016 were each unplanned outages resulting from maintenance schedule changes. The longest outage event at Unit 1 was a 30-day maintenance outage in October to conduct Mercury and Air Toxics Standards (MATS) Rule compliance inspections. The longest outage at Unit 2 was 32-day maintenance outage in September for a boiler feed pump element replacement. The longest forced outages were 9 days and 8 days for tube leaks at Unit 1 and Unit 2, respectively.

4) **Mitchell Plant Operations & Maintenance ("O&M") Expenses**

The 2016 budgeted and actual O&M expenses for the Mitchell Plant, as well as the budgeted O&M expenses for 2016, are included in Table 1 below. The actual O&M expense in 2016 was approximately \$30.7 million, compared to a budgeted amount of approximately \$20.7 million. This variance is mostly due to performing maintenance tasks in 2016 that were originally planned for 2017.

The 2017 budgeted O&M expense of \$26.2 million reflects a reduction in scheduled outage spending previously planned for 2017 that was completed in 2016.

**Table 1**

Mitchell Plant O&M Expense		
2016		2017
Actuals	Budget	Budget
\$30,710,641	\$20,713,055	\$26,221,791

**NOTES:**

Totals reflect the 50% of Mitchell Plant owned by KPCo

5) **Mitchell Plant Capital Investments**

The 2016 actual and budgeted level of capital investment for the Mitchell Plant, as well as the forecasted capital investment for 2017, are included in Table 2.

In 2016, capital spending at the Mitchell Plant was approximately \$7.4 million compared to a budget of \$7.5 million.

The increased capital expenditures budgeted for 2017 reflect planned major projects including landfill expansion, purchase of two generator step-up unit transformers for Unit 1, and preliminary engineering studies related to Effluent Limit Guidelines (ELG) compliance.

**Table 2**

Mitchell Plant Capital Investment		
2016		2017
Actuals	Budget	Budget
\$7,350,756	\$7,468,377	\$22,119,060

**NOTES:**

Totals reflect the 50% of Mitchell Plant owned by Kentucky Power

6) **Discussion of Environmental Regulations and Potential Future Impacts**

The Mitchell Plant is subject to air, water, and solid waste regulations. Both units are fully controlled units with respect to air emissions. They are equipped with Electrostatic Precipitators ("ESPs") for the removal of approximately 99% of particulate matter; Selective Catalytic

Reduction (“SCR”) systems for reduction of approximately 90% of nitrogen oxide (“NO<sub>x</sub>”) emissions; and flue gas desulfurization (“FGD”) systems for the reduction of sulfur dioxide (“SO<sub>2</sub>”) emissions by approximately 98%. These systems are instrumental in maintaining compliance with existing air pollution control regulations.

### **Mercury and Air Toxics Standards (“MATS Rule”)**

The MATS Rule is a Clean Air Act regulation that creates additional environmental requirements for coal- and oil-fired electric generating units with respect to emissions of hazardous air pollutants. It became effective February 16, 2012 and had a compliance date of April 16, 2015. The emission parameters regulated by this rule are: 1) mercury; 2) several non-mercury metals such as arsenic, lead, cadmium and selenium; 3) various acid gases including hydrochloric acid (“HCl”); and 4) certain organic hazardous air pollutants. The MATS Rule establishes stringent emission rate limits for mercury, filterable particulate matter as a surrogate for all non-mercury toxic metals, and HCl as a surrogate for all acid gases. Alternative emission limits were also established for the individual non-mercury metals and for sulfur dioxide SO<sub>2</sub> (alternate to HCl) for generating units that have operating FGD systems. The rule regulates organic hazardous air pollutants through work practice standards.

The installed Mitchell SCR and FGD systems achieve co-benefit removal of mercury from the flue gas while the ESPs remove particulate bound mercury and other particulate hazardous air pollutants. The FGD systems allow the plant to meet the SO<sub>2</sub> alternate measurement for mitigation of acid gas emissions. These systems enabled the Mitchell Plant to meet the emissions requirements of the MATS Rule in 2016.

### **Cross-State Air Pollution Rule (“CSAPR”)**

The CSAPR addresses National Ambient Air Quality Standards (“NAAQS”) for ozone and particulate matter, and is focused on the reduction of emissions of SO<sub>2</sub> and NO<sub>x</sub> from electric generating units in 28 eastern, southern, and mid-western states, including Kentucky and West Virginia.<sup>1</sup> Along with other requirements, the final CSAPR established state-specific annual emission “budgets” for SO<sub>2</sub> and annual and seasonal budgets for NO<sub>x</sub>. Based on this budget, each emitting unit within affected states was allocated a specified number of NO<sub>x</sub> and SO<sub>2</sub> allowances for the applicable annual or ozone season (May-September) compliance period. Allowance trading within and between states is allowed on a regional basis.

On September 7, 2016 EPA issued a final rule updating the CSAPR to address the 2008 ozone NAAQS. The final rule significantly reduced ozone season NO<sub>x</sub> allowance budgets for many of the states covered by CSAPR. It is effective starting with the 2017 ozone season. The modified NO<sub>x</sub> ozone season emission budget for Kentucky and West Virginia are 47% and 29% lower, respectively, than in the previous version of CSAPR.

Collectively, the installed SCR and FGD systems’ respective emission reductions of NO<sub>x</sub> and SO<sub>2</sub>, the use of allocated NO<sub>x</sub> and SO<sub>2</sub> emission allowances in conjunction with adjusted banked allowances, and the purchase of additional allowances as needed through the open market will permit the Mitchell Plant to comply with CSAPR.

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<sup>1</sup> Final CSAPR issued by the USEPA on July 6, 2011 and published in the Federal Register on August 8, 2011.

## **Clean Water Act (“316(b)”) Rule**

A final rule under Section 316(b) of the Clean Water Act became effective on October 14, 2014. The final rule affects all existing power plants withdrawing more than two million gallons per day (“mgd”) of cooling water. The rule offers seven technology options to comply with a standard that addresses impingement of aquatic organisms on cooling water intake screens, and requires site-specific studies to determine appropriate compliance measures to address entrainment of organisms in cooling water systems for those facilities withdrawing more than 125 mgd. The overall goal of the rule is to decrease impacts on fish and other aquatic organisms from operation of cooling water systems. Additional requirements may be imposed as a result of consultation with other federal agencies to protect threatened and endangered species and their habitats.

Mitchell Plant cooling water withdrawal rate is 31 mgd, and thus is well below the entrainment study threshold of 125 mgd. In addition, facilities with existing closed cycle recirculating cooling systems, such as Mitchell, may not be required to make any technology changes. This determination will be made by the West Virginia Department of Environmental Protection as part of its current permit renewal review of Mitchell Plant’s National Pollutant Discharge Elimination System permit. If additional capital investment is required, the magnitude is expected to be relatively small compared to the investment that would be needed if the plant was not equipped with cooling towers.

## **Coal Combustion Residuals Rule**

The Coal Combustion Residuals (“CCR”) Rule regulates coal combustion residuals as a non-hazardous solid waste under Subtitle D of the Resource Conservation and Recovery Act. It became effective October 19, 2015. The CCR Rule is a comprehensive rule applicable to new and existing CCR landfills and CCR surface impoundments. It contains requirements with implementation schedules, for locational restrictions, liner design for new landfills, surface impoundment structural integrity requirements, CCR unit operating criteria, groundwater monitoring and corrective actions, closure and post-closure care, and recordkeeping, notification and internet posting obligations. EPA has not included a mandatory liner retrofit requirement for existing, unlined CCR surface impoundments. Use of an existing unlined surface impoundment must cease if groundwater monitoring data indicate there has been a release from the impoundment that exceeds applicable groundwater protection standards.

Installation of a groundwater monitoring network has been completed at the Mitchell Plant and groundwater sampling commenced in late 2016. Once eight sampling events have occurred, sampling data will be used in the determination of compliance with the CCR Rule. Mitchell Plant currently is equipped with a dry fly ash handling system and a dry ash landfill to meet current permit requirements. While the site-specific analysis to determine CCR Rule requirements at Mitchell Plant is ongoing, these existing dry fly ash handling and disposal systems may mitigate the impact of the CCR Rule on the plant’s future compliance costs.

## **Effluent Limitation Guidelines and Standards**

On September 30, 2015 EPA finalized a revision to the Effluent Limitation Guidelines and Standards for the Steam Electric Power Generating category (ELG Rule). The ELG Rule

requires compliance with technology-based limits for waste water discharges from power plants. The main focus of the rule is on process water and wastewater associated with the handling of coal combustion wastes and by-products from coal-fired generation. Specifically, the ELG Rule will prohibit the discharge of fly ash and bottom ash transport water. It also requires the installation of physical, chemical, and biological treatment for FGD wastewater. The technology-based limits established by the ELG Rule will be incorporated during the Mitchell Plant's next NPDES permit renewal cycle.

Kentucky Power has determined that the bottom ash transport water and the FGD system wastewater will require additional treatment to meet the ELG Rule requirements. Kentucky Power is currently evaluating technologies to address both of these wastestreams.

### **National Ambient Air Quality Standards**

The Clean Air Act requires EPA to establish and periodically review NAAQS designed to protect public health and welfare. Several NAAQS have been recently revised or are under review, and could lead to more stringent SO<sub>2</sub> and NO<sub>x</sub> limits. This includes the NAAQS for SO<sub>2</sub> (last revised in 2010), NO<sub>x</sub> (last revised in 2010), fine particulate matter (last revised in 2013), and ozone (last revised in 2015).

Regarding the revised NAAQS for SO<sub>2</sub>, the West Virginia Department of Environmental Protection submitted a nonattainment State Implementation Plan with supporting modeling files, to EPA in late 2016. The State Implementation Plan included a lower SO<sub>2</sub> emission rate for the Mitchell Plant than currently permitted, but still significantly higher than the plant's current emission rate. This lower SO<sub>2</sub> emission rate is currently in effect pursuant to a consent decree with the West Virginia Department of Environmental Protection and is not expected to negatively impact operations. For the remaining revised NAAQS, the scope and timing of potential requirements is uncertain. However, because both units at the Mitchell Plant have already been retrofitted with SCR and FGD systems, the risk from more stringent SO<sub>2</sub> and NO<sub>x</sub> limits is expected to be manageable.

### **Clean Power Plan**

On August 3, 2015, EPA finalized two rulemakings to regulate CO<sub>2</sub> emissions from fossil fuel-based electric generating units. EPA finalized New Source Performance Standards under Section 111(b) of the Clean Air Act that apply to new fossil units as well as separate standards for modified or reconstructed existing fossil steam units. Separately, EPA finalized a rule referred to as the Clean Power Plan ("CPP"), which establishes CO<sub>2</sub> emission guidelines for existing fossil generation sources under Section 111(d) of the Clean Air Act. EPA also issued for public comment a proposed Federal Implementation Plan to implement the CPP if states fail to submit or do not develop an approvable state plan for compliance.

On October 23, 2015 a coalition of states filed a lawsuit challenging the CPP and a motion for stay with the D.C. Circuit. On January 21, 2016, the D.C. Circuit denied the coalition's request for stay and agreed to fast-track its consideration of the legal merits of the coalition's CPP challenge. The coalition of states filed a request with the Supreme Court to stay implementation of the CPP on January 26, 2016, and on February 9, 2016, the Supreme Court stayed implementation of the CPP while the rule is under legal review. The stay will remain in effect



until litigation of the CPP challenge is completed. Kentucky Power continues to analyze the available information and engage with the states and other stakeholders in an effort to understand the available program design options and their potential impacts on its operations.

**Mitchell Generating Plant  
Performance Data  
2016**

**Mitchell Unit 1**

**Net Max Capacity: 770**

Month	Forced Outage Rate (%)	Equiv Forced Outage Rate (%)	Equiv. Avail. Factor (%)	Net Cap. Factor (%)	Heat Rate Actual (BTU/KWH)
Jan 16	2.72	9.24	64.12	49.87	9,656
Feb 16	0.00	0.40	98.03	75.78	11,033
Mar 16	0.00	0.63	63.74	40.82	10,694
Apr 16	4.64	14.22	77.44	68.52	10,474
May 16	41.38	42.82	39.63	10.70	11,255
Jun 16	0.00	13.73	86.06	74.78	10,821
Jul 16	30.37	33.06	67.67	54.28	10,489
Aug 16	42.61	46.44	49.03	40.20	11,012
Sep 16	6.37	16.57	85.62	62.12	10,901
Oct 16	0.00	0.00	4.44	0.16	36,114
Nov 16	0.00	1.51	97.92	76.97	10,806
Dec 16	0.00	2.08	87.65	74.52	10,063
<b>YTD TOTAL</b>	<b>10.10</b>	<b>15.20</b>	<b>68.09</b>	<b>52.07</b>	<b>10,617</b>

**Mitchell Unit 2**

**Net Max Capacity: 790**

Month	Forced Outage Rate (%)	Equiv Forced Outage Rate (%)	Equiv. Avail. Factor (%)	Net Cap. Factor (%)	Heat Rate Actual (BTU/KWH)
Jan 16	3.70	4.82	94.08	80.54	9,891
Feb 16	0.00	1.08	98.01	84.00	9,159
Mar 16	0.82	7.69	85.56	71.26	9,583
Apr 16	35.27	40.41	10.59	6.46	10,514
May 16	14.06	14.13	66.60	56.54	9,503
Jun 16	0.00	2.27	84.63	66.83	10,338
Jul 16	0.00	1.28	96.91	85.76	9,773
Aug 16	14.38	15.78	84.28	74.28	10,019
Sep 16	79.28	80.73	10.53	7.44	11,020
Oct 16	0.00	0.99	44.90	38.16	10,040
Nov 16	0.00	2.70	96.79	79.11	9,830
Dec 16	24.28	26.10	73.04	68.44	10,161
<b>YTD TOTAL</b>	<b>10.04</b>	<b>12.09</b>	<b>70.56</b>	<b>59.99</b>	<b>9,832</b>

**Mitchell Generating Plant  
Unplanned Outages  
2016**

KPSC Case No. 2012-00578

March 1, 2017

Attachment 2

Page 1 of 2

**Kentucky Power Co.  
01/01/2016 To 12/31/2016  
Mitchell Unit 1**

Month	From	To	HOURS OF DURATION		Reason for Outage
			Unplanned	Event Type	
January	1/5/16 11:22 PM	1/6/16 12:29 PM	13.12	U1	Unit Tripped during Turbine Valve Tests
January	1/6/16 12:30 PM	1/14/16 2:00 AM	181.50	MO	To repair a hole in the Duct work
January	1/14/16 8:30 AM	1/16/16 1:15 AM	40.75	MO	Repair Condenser Leak. Repair Leak on HP Heater 7B
March	3/11/16 1:54 AM	3/22/16 3:24 AM	265.50	MO	Remove Clinker
April	4/26/16 9:50 PM	4/28/16 4:10 AM	30.33	U1	External Steam Leak
April	4/28/16 4:10 AM	5/7/16 1:47 PM	225.62	MO	MO to repair 2nd RH intercept valve; 7A high pressure heater; and to fix leak in the 200 psi header.
May	5/9/16 3:51 AM	5/10/16 3:51 AM	24.00	SF	Water detected in Turbine Oil
May	5/10/16 3:51 AM	5/12/16 10:50 AM	54.98	U1	Water Detected in Turbine Oil (Continuation of above outage)
May	5/12/16 10:50 AM	5/13/16 3:00 AM	16.17	MO	Circ Water Valve leaking
May	5/20/16 12:28 AM	5/27/16 11:00 PM	190.53	MO	Reheater Tube Leak
July	7/14/16 5:50 AM	7/23/16 9:00 AM	219.17	U1	Economizer tube leak
August	8/7/16 4:32 PM	8/9/16 9:42 AM	41.17	U1	Service water/hydroclone slurry piping failure.
August	8/16/16 9:32 AM	8/20/16 12:25 PM	98.88	U1	Economizer tube leak
August	8/20/16 12:25 PM	8/23/16 3:50 AM	63.42	MO	#11 turbine bearing inspect and repair after oil leak found with unit out of service
August	8/25/16 11:41 PM	9/2/16 3:50 AM	172.15	U1	Repair Oil Leak on #11 Turbine bearing.
September	9/18/16 6:05 PM	9/19/16 5:00 AM	10.92	U1	Exciter breaker failure
October	10/1/16 12:55 AM	10/30/16 3:52 PM	710.95	MO	General Boiler Inspection & Repair (GBIR); Mercury & Air Toxics Standards (MATS) Compliance Inspections
December	12/29/16 9:50 AM	1/6/17 5:47 AM	62.17	MO	Air Heater problem.

Event Type	NERC Description
MO	Maintenance Outage - can be deferred beyond the end of the next weekend but must occur before the next planned outage
SF	Startup Failure - results when a unit is unable to synchronize within a specified startup time following an outage or reserve shutdown.
U1	Unplanned (Forced) Outage - requires immediate removal from service
U2	Unplanned (Forced) Outage - required removal from service within 6 hours
U3	Unplanned (Forced) Outage - can be postponed beyond 6 hours but requires removal from service before the end of the next weekend

**Mitchell Generating Plant  
Unplanned Outages  
2016**

Kentucky Power Co.  
01/01/2016 To 12/31/2016  
Mitchell Unit 2

Month	From	To	HOURS OF DURATION		Reason for Outage
			Unplanned	Event Type	
January	12/20/15 9:03 AM	1/2/16 2:30 AM	26.50	U1	Expansion joint failure
March	3/8/16 9:57 AM	3/8/16 11:18 AM	1.35	U1	Loss of Control Air
March	3/8/16 10:35 PM	3/9/16 2:53 AM	4.30	SF	supply steam problems
March	3/30/16 12:20 AM	4/1/16 11:00 PM	70.67	MO	Maintenance Outage
April	4/26/16 8:03 AM	4/27/16 10:15 PM	38.20	U1	Hole developed in a turbine drain line
May	5/22/16 12:15 AM	5/25/16 10:55 AM	82.67	U1	TubeLeak
May	5/25/16 10:55 AM	6/4/16 9:05 PM	250.17	MO	Inspect Generator Hydrogen Seals for suspected leakage.
August	8/7/16 3:59 PM	8/10/16 3:58 AM	59.98	U1	Service water/hydroclone slurry piping failure.
August	8/13/16 11:32 AM	8/13/16 5:15 PM	5.72	U1	Operator initiated trip after water chemistry indicated parameters outside the operational envelope for the unit.
August	8/30/16 7:27 AM	9/7/16 4:00 PM	200.55	U1	Tube leak
September	9/11/16 12:39 AM	9/15/16 8:16 AM	103.62	U1	Turbine Crossover Pipe Steam Leak
September	9/15/16 8:16 AM	10/17/16 3:00 PM	774.73	MO	General Boiler Inspection & Repair (GBIR); Boiler Feedpump element replacement.
December	12/24/16 11:22 AM	1/4/17 5:56 PM	180.63	U1	Boiler Feed Pump Issues

Event Type	NERC Description
MO	Maintenance Outage - can be deferred beyond the end of the next weekend but must occur before the next planned outage
SF	Startup Failure - results when a unit is unable to synchronize within a specified startup time following an outage or reserve shutdown.
U1	Unplanned (Forced) Outage - requires immediate removal from service
U2	Unplanned (Forced) Outage - required removal from service within 6 hours
U3	Unplanned (Forced) Outage - can be postponed beyond 6 hours but requires removal from service before the end of the next weekend