COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF KENTUCKY UTILITIES COMPANY FOR APPROVAL OF ITS 2020 COMPLIANCE PLAN FOR RECOVERY BY ENVIRONMENTAL SURCHARGE	**)** **)** **)** **)** **)**	**CASE NO. 2020-00060**

RESPONSE OF
KENTUCKY UTILITIES COMPANY
TO COMMISSION STAFF'S INITIAL REQUEST FOR INFORMATION
DATED MAY 6, 2020

FILED: MAY 22, 2020

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Robert M. Conroy,** being duly sworn, deposes and says that he is Vice President, State Regulation and Rates for Kentucky Utilities Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the foregoing responses for which he is identified as the witness, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.

Robert M. Conroy

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 19th day of May 2020.

Notary Public

Notary Public, ID No. 603967

My Commission Expires:

7/11/2022

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Andrea M. Fackler,** being duly sworn, deposes and says that she is Manager, Revenue Requirement/Cost of Service for Kentucky Utilities Company and an employee of LG&E and KU Services Company, and that she has personal knowledge of the matters set forth in the foregoing responses for which she is identified as the witness, and that the answers contained therein are true and correct to the best of her information, knowledge and belief.

Andrea M. Fackler

Andrea M. Fackler

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of May 2020.

Notary Public

Notary Public, ID No. 603967

My Commission Expires:

7/11/2025

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Gary H. Revlett,** being duly sworn, deposes and says that he is Director, Environmental Affairs for Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the foregoing responses for which he is identified as the witness, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.

Gary H. Revlett

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 20th day of May 2020.

Notary Public

Notary Public, ID No. 603967

My Commission Expires:

7/11/2022

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **R. Scott Straight,** being duly sworn, deposes and says that he is Vice President, Project Engineering for Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the foregoing responses for which he is identified as the witness, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.

R. Scott Straight

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 19th day of May 2020.

Notary Public

Notary Public, ID No. 603967

My Commission Expires:

7/11/2022

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Stuart A. Wilson,** being duly sworn, deposes and says that he is Director, Energy Planning, Analysis, and Forecasting for Kentucky Utilities Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the foregoing responses for which he is identified as the witness, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.

Stuart A. Wilson

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 19th day of May 2020.

Notary Public

Notary Public, ID No. 603967

My Commission Expires:

7/11/2022

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Question No. 1

Witness: Gary H. Revlett

Q-1. Refer to the application, page 5, and application Exhibit 1, page 1 of 2. For Project 43, provide a chart of necessary permits including the issuing authority, status, and actual or estimated dates filed and received.

A-1. Please see the chart below:

Project No.	Description	Permit Type	Issuing Authority	Status	Date Filed	Date Received
43	Ghent ELG Water Treatment, BATW Recirculation, & Wastewater Diffuser	KPDES	Kentucky Division of Water	Current Permit		Effective 5/1/2019
				Permit Modification	Est. 4th Qtr. 2020	Est. 2nd Qtr. 2021
		Construction Across or Along a Stream *-KYDOW permit requires local floodplain coordinator approval (Carroll Co. Judge Exec.) and public notice in local newspaper - (4-8 weeks to obtain permit)*	Kentucky Division of Water	Permit Needed	Est. 4th Qtr. 2020	Est. 2nd Qtr. 2021
		Nationwide Permit (NWP) #7-Outfall Structure	Army Corps of Engineers	Permit Needed	Est. 4th Qtr. 2020	Est. 1st Qtr. 2021

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Question No. 2

Witness: Gary H. Revlett

Q-2. Refer to the application, page 7, and application Exhibit 1, page 1 of 2. For Project 44, provide a chart of necessary permits necessary permits including the issuing authority, status, and actual or estimated dates filed and received.

A-2. Please see the chart below:

Project No.	Description	Permit Type	Issuing Authority	Status	Date Filed	Date Received
44	Trimble County ELG Water Treatment	KPDES	Kentucky Division of Water	Current Permit		Effective 4/1/2018
				Permit Modification	Est. 4th Qtr. 2020	Est. 2nd Qtr. 2021

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Question No. 3

Witness: Gary H. Revlett / R. Scott Straight

Q-3. Refer to the Direct Testimony of Robert M. Conroy (Conroy Testimony), page 3, regarding KU's expectations in 2016 of future compliance expenditures related to the 2015 Effluent Limitations Guidelines Rule (2015 ELG Rule). State whether KU anticipates any additional 2015 ELG Rule related compliance expenditures beyond those proposed in the instant matter.

A-3. Mr. Revlett's and Mr. Straight's testimony reference the implementation of the projects in this ECR filing that are required to comply with the 2015 ELG regulations and the 2019 proposed amendment. The rulemaking process is anticipated to be finalized in the summer of 2020. The amendments clarify the requirements to treat FGD wastewater and bottom ash transport water. However, the EPA suspended its rulemaking on landfill leachate water treatment. This pending filing does not account for any potential capital or O&M associated, if any are required, to comply with the rulemaking on landfill leachate water if the EPA proposes new requirements in the future.

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Question No. 4

Witness: Gary H. Revlett / R. Scott Straight

Q-4. Refer to the Conroy Testimony, page 4, the Direct Testimony of Gary H. Revlett (Revlett Testimony), page 11, and the Direct Testimony of R. Scott Straight (Straight Testimony), pages 7–8.

a. Water usage at the Brown Generating Station (Brown) differs from water usage at the Ghent Generating Station (Ghent), the Trimble County Generating Station (Trimble County), and the Mill Creek Generating Station (Mill Creek). Explain whether Brown is able to achieve "net neutral" to "water-negative" operation solely because of the number of operating generating units.

b. Assuming water discharge is not eliminated at Brown, describe what steps would have to be taken to bring it into compliance with the 2015 ELG Rule and 2019 proposed revisions.

c. State how quickly the steps to comply with the 2015 ELG Rule and 2019 proposed revisions could be completed.

A-4. a. Brown is able to achieve a "net neutral" to "water negative" operation of the FGD wastewater facility due to several factors. First, the single coal-fired unit operation combined with the economically viable coals that have lower chlorine concentrations and moderately high sulfur content compared to the other coal-fired generating stations. The moderately high sulfur content generates enough gypsum with the requisite amount of chlorine and moisture to permit storage in the landfill. Second, the location of Brown does not lend itself to beneficial offsite reuse of CCR like the larger coal-fired stations located on the Ohio River that have direct access to barge transportation. Given this, the moisture content in the landfilled gypsum can have a higher moisture content (10 to 14 percent) than beneficially reused gypsum (usually 8 to 10 percent). This higher moisture content allows better landfilling and also increases the amount of water taken off the FGD process, thus turning it into a "net neutral" or "water negative" operation, especially when combined with the evaporation of water in the FGD that is discharged through the chimney.

b. The first method to manage short-term or intermittent conditions at Brown if "net neutral" cannot be maintained is to transfer excess water to a tank installed on the Process Water System ("PWS") projects under KU's 2016 ECR Plan. This tank can be used to replenish the FGD when it is returned to "net negative" conditions or be used

to fill water spraying trucks used for dust control on the landfill operations instead of using service water from Lake Herrington. If the current plans result in long-term issues with maintaining "net neutral" or better, several options are available to implement, such as temporary rental treatment systems, evaporators, additional hydrated lime usage, and mixing with fly ash for a flowable fill for placement in the landfill.

c. In the event Brown's FGD operation cannot maintain a "net neutral" or better operation using the processes and measures described in the responses to parts a and b, KU expects it would need up to 3 years to conceptualize, study, engineer and procure a permanent FGD wastewater treatment system for such a relatively small scale facility. Only the increment of water above being "net neutral" would need to be treated. With regards to the regulatory deadline, KU can operate in this "net neutral" or "net negative" process through 2021 to determine if long-term operation is feasible. If KU finds this operation is not feasible, it has ample time to implement a different long-term plan for the incremental water before the December 31, 2025 compliance deadline under the amendment to the proposed ELG rule.

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Question No. 5

Witness: Robert M. Conroy

Q-5. Refer to the Conroy Testimony, page 9. Describe in more detail the plans to finance the projects, including estimates on the debt and equity mix.

A-5. The Company does not engage in project financing. KU plans to finance the proposed projects with a mix of debt and equity that will allow it to maintain its strong investment grade bond ratings. The Company's target capital structure is 53% equity and 47% debt using FERC basis financial statements that do not include goodwill. Specifically, during construction, the Company expects to utilize existing short-term lines of credit and commercial paper until outstanding balances are significant enough to justify issuing a long-term first mortgage bond. The first mortgage bonds will have a minimum size of $300 million to allow the bonds to be "index eligible" making the bonds more marketable and therefore more attractive to investors. However, the Company will monitor the bond markets and will issue somewhat in advance if market conditions are favorable or will wait to issue if market conditions are particularly unattractive.

The Company does not expect any of the costs associated with the projects will qualify to be funded with tax-exempt bonds as there is no solid waste component to the projects. Ongoing analysis of this will continue.

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Question No. 6

Witness: Gary H. Revlett

Q-6. Refer to the Revlett Testimony, pages 6–7, regarding the 2019 proposed revisions to the flue gas desulfurization (FGD) wastewater limits and the bottom ash transport water (BATW) wastewater limits.

a. Provide the current daily and monthly effluent discharges of arsenic, mercury, selenium, and nitrates/nitrites in FGD wastewater for Trimble County and Ghent.

b. Provide the current daily discharge for BATW wastewater at Trimble County and Ghent.

A-6. a. Under the existing Trimble County and Ghent KPDES permits, the facilities are not required to monitor the FGD effluent until after all ELG required wastewater treatment equipment is installed and operating. In the current permits, this date is late 2023. However, to respond to the request, provided below are the results of performance testing that was conducted shortly after the installation of the physical/chemical treatment system. These effluent discharge test results of the physical/chemical FGD PWS were conducted in 2019 – 2020 in accordance with the contractual requirements and were performed at steady-state conditions.

Trimble Co. Station Process Water System Commercial Performance Tests

Test Period	Results Type	Arsenic (µg/l)	Mercury (ng/l)	Selenium (µg/l)	Total Nitrate & Nitrite (mg/l)
June 2019	Average	1.0	5	50	40
	High	1.0	5	66	40
	Low	1.0	5	41	40
July 2019	Average	1.0	5	76	40
	High	1.1	7	89	40
	Low	<0.1	5	58	40
August 2019	Average	<0.1	9	106	40
	High	<0.1	10	134	40
	Low	<0.1	7	82	40

Ghent Station Process Water System Commercial Performance Tests					
Test Period	Results Type	Arsenic (µg/l)	Mercury (ng/l)	Selenium (µg/l)	Total Nitrate & Nitrite (mg/l)
November 2019	Average	0.7	23	30	23.1
	High	0.7	30	46	24.7
	Low	0.6	20	22	22.1
December 2019	Average	1.0	51	54	19.0
	High	1.5	130	90	25.3
	Low	0.7	12	22	12.8
January 2020	Average	0.8	64	36	26.2
	High	1.1	284	59	20.2
	Low	0.6	27	28	14.1
February 2020	Average	0.7	71	56	19.1
	High	0.8	89	64	21.9
	Low	0.6	53	47	9.6

b. The Trimble County Station does not utilize Bottom Ash Transport Water ("BATW") systems and thus has no discharge. The Ghent Station has 3.5 to 7.0 million gal/day of BATW depending on equipment operations and seasonal conditions. The Ghent discharge is currently 100 percent of its generated BATW less the residual moisture on the bottom ash leaving the dewatering facility.

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Question No. 7

Witness: Gary H. Revlett

Q-7. Refer to the Revlett Testimony, page 9, regarding the deadline for compliance with the proposed revision to the 2015 ELG Rule. State whether KU has any expectation as to when the Division of Water (KDOW) will make a determination as to what the final compliance deadline date will be, and if so, provide the date KU anticipates that the KDOW to finalize that determination.

A-7. The Kentucky Division of Water ("KDOW") will make an initial determination of the compliance deadline date during its revised permit review period, but the finalization of that compliance deadline date will not occur until the modified permit is issued as final.

Based on the most recent EPA information, a final ELG rule is expected to be released in summer 2020, but this information was provided prior to the COVID-19 pandemic. Therefore, the final regulations may be delayed by two to three months. As mentioned in Mr. Revlett's testimony, once the regulation becomes final and effective, the permittee has 90 days to submit an application to modify the permit. Based on these estimated timeframes, KU expects to submit the application to modify the permit in the fourth quarter of 2020 after receiving the bids from the Engineering, Procurement and Construction ("EPC") contractors and selecting an EPC to implement the ELG treatment projects. It is important to note that KU will include in its permit modification applications the implementation schedules of the EPC contractor that were obtained through competitive bidding, as well as add a reasonable period of commissioning, testing, and tuning to the overall requested compliance schedule. Thus, the KDOW will be reviewing the application during the first quarter of 2021, which is when an initial determination of a compliance deadline will be made. For this type of permit modification, KU expects the KDOW will be able to issue a final permit three to four months after receiving the application for modification. Thus, KU expects a final compliance deadline date will be established in the second quarter of 2021.

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Question No. 8

Witness: R. Scott Straight

Q-8. Refer to the Revlett Testimony, pages 9–10, regarding the need to comply with the 2015 ELG Rule with respect to the limitations on selenium and nitrates/nitrites in FGD wastewater. State whether KU has conducted or performed a study on the cost of compliance for Trimble County and Ghent for selenium and nitrates/nitrites limits as set forth in the 2015 ELG Rule. If so, provide a copy of the study.

A-8. Other than the Burns & McDonnell report included with Mr. Straight's testimony, KU has not conducted any other studies specifically on the cost of compliance for selenium and nitrates/nitrites.

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Question No. 9

Witness: Gary H. Revlett

Q-9. Refer to the Revlett Testimony, pages 10–11. Explain in more detail why a diffuser and a BATW recirculation system are needed for Ghent.

A-9. As described in Mr. Straight's testimony on pages 19-20, the diffusers are required to provide operational compliance headroom, especially for periods of upset conditions of the PWS and ELG wastewater treatment facilities. In addition, installation of the new PWS at Ghent significantly modified how and where process wastewater streams were collected, treated and discharged.

Notwithstanding the FGD wastewater, the Ghent Station has on multiple occasions failed to meet its effluent discharge limit for copper and on one occasion the Whole Effluent Toxicity ("WET") limit. These excursions of the copper and WET permit limit are associated with the facility's cooling tower blowdown. With the installation of a diffuser at this effluent discharge to the Ohio River, the permit limits will be raised, and continuous compliance will be achieved.

With respect to the need for a BATW recirculation system, this is a requirement of the ELG regulation. Both the 2015 ELG regulation and the proposed new ELG regulation require the elimination of BATW being discharged to surface water (Ohio River). The proposed new regulation will allow 10% of BATW to be discharged if the BATW wastewater is used as makeup water in the FGD system. All the plants except for the Ghent facility already meet this new ELG BATW requirement. However, at the Ghent Station, 100% of the BATW is discharged less the residual moisture on the bottom ash leaving the dewatering facility. The new Ghent BATW recirculation will need to be constructed as soon as possible, and under the proposed rule, no later the December 31, 2023.

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Question No. 10

Witness: R. Scott Straight

Q-10. Refer to the Straight Testimony, page 6

a. Explain the method and timing for issuing requests for proposals in relation to the proposed projects.

b. State whether the two vendors referenced in the testimony will be preferred for the purposes of these projects.

c. State whether international vendors will be considered for the proposed projects.

A-10.

a. With the assistance of the Companies' Owner's Engineer (Burns & McDonnell), the Companies prepared a technical specification and contract similar in format and content to those successfully used on the recent PWS treatment systems placed into service at Ghent, Mill Creek and Trimble County. This contract format was also successfully used on the PJFF baghouse projects, FGD projects, and the selective catalytic reduction projects implemented throughout the Companies' coal-fired fleet over the last 15-plus years. Project Engineering issued the Request for Quotation ("RFQ") to five bidders during the week of May 17, 2020.

b. The two technology suppliers referenced in Mr. Straight's testimony will be the only microbiological treatment vendors allowed to be supplied by the Engineering, Procurement and Construction ("EPC") bidders.

c. The two technology suppliers are considered U.S. vendors given the technology was developed in the U.S.; however, Suez's corporate headquarters are located in Paris, France. The systems built for the Companies would be designed and constructed in the U.S.

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Question No. 11

Witness: R. Scott Straight

Q-11. Refer to the Straight Testimony, page 6, lines 7–9 and Exhibit SAW-1, pages 24–28 of 41. Explain whether KU evaluated using a dry bottom-ash transport system at Ghent. If so, provide the results of that analysis.

A-11. KU performed a high-level conceptual evaluation of implementing a dry bottom ash system at Ghent. The evaluation was not detailed due to the simple comparison of a dry bottom ash conveying system costing greater than $150 million when using Mill Creek's recent dry bottom ash conveying system cost that was installed in 2018-2019, scaled up for Ghent's generating capacity and escalated. This cost is much higher than converting Ghent's remote dewatering system (installed in 2014) to include a recirculation system for an estimated $64 million.

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Question No. 12

Witness: R. Scott Straight

Q-12. Refer to the Straight Testimony, pages 6–7, regarding the benefits in moving forward with the proposed projects now rather than waiting. State whether KU has performed any analysis to quantify the reduction in risks and costs. If so, provide a copy of that analysis.

A-12. The ELG regulation and the proposed amendment thereto require the ELG technology to be implemented "as soon as possible." This requirement is more direct than past regulations that required compliance on an "as soon as practicable" or "as soon as reasonable" basis. Regardless of this "as soon as possible" requirement, the Companies know from past major compliance projects and from the actions listed below that execution and cost risk are reduced by being on the front of the execution curve across the U.S. instead of on the back of the curve.

While the Companies have not performed a detailed analysis to quantify the reduction of risk, the Companies' Project Engineering department has extensive market knowledge, held detailed discussions with the technology vendors' management, toured operating biological treatment systems for FGDs and visited with those station management/engineering teams, and reviewed the technology vendors' abilities to perform a limited number of projects simultaneously. In addition to the technology vendors, the Companies' Project Engineering management has held numerous discussions with the available EPC contractors that can perform projects of this scale and that are familiar with the industry. Thus, the Companies have a very good understanding of the EPC's senior management teams, field construction management teams and availability, labor availability, and engineering capabilities of the EPC bidders.

These reviews and discussions indicate that there are a limited number of field and engineering execution teams throughout the U.S. Being on the front-end of the industry to contract for the EPC contractor's best management and engineering teams for the Companies' three sites has proven numerous times to be a significant contributing factor in reducing execution risk in the field, and thus cost. Being on the front of the execution curve also allows the acquisition of all engineered equipment that the EPC contractor will supply on the projects early in each equipment/technology vendor's plans to support the industry's compliance with the ELG regulation throughout the U.S., thus allowing for better management and controlling of project cost. The Companies have a successful history of reducing these execution risks on major scale environmental projects. Examples include the Companies' SCR projects installed under the 2001 ECR plan, the FGD and

PJFF projects installed under the 2011 ECR plan, and the PWS projects recently installed under the 2016 ECR plan.

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Question No. 13

Witness: R. Scott Straight / Andrea M. Fackler

Q-13. Refer to the Straight Testimony, pages 22, 23, and 25.

a. Explain whether the ELG water treatment systems will require KU to hire additional personnel.

b. Refer also to the Direct Testimony of Andrea M. Fackler, page 5, lines 21–23. Explain whether KU is seeking to recover incremental expense associated with additional personnel through the Environmental Cost Recovery Surcharge.

A-13.

a. As mentioned in Mr. Straight's testimony on pages 22-23, additional personnel will be required to operate and maintain the ELG biological treatment systems. KU does not anticipate additional personnel to operate the BATW recirculation system, but as referenced in Mr. Straight's testimony on page 22, KU does expect to have incremental maintenance for the added BATW equipment. KU has not made a determination on whether the incremental operating personnel will be KU employees or contractors.

b. Yes, as stated in Mr. Straight's testimony on pages 22-23, KU is seeking to recover the incremental expenses associated with the additional personnel through the Environmental Cost Recovery Surcharge.