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VIA HAND DELIVERY

April 24, 2015

Mr. Jeff Derouen
Executive Director
Kentucky Public Service Commission
211 Sower Boulevard, P.O. Box 615
Frankfort, Kentucky 40602-0615

RECEIVED

APR 24 2015

PUBLIC SERVICE
COMMISSION

Re: **Case No. 2015-00089**
In the Matter of the Application of Duke Energy Kentucky, Inc., for a Declaratory Order that the Construction of a New Landfill Constitutes an Ordinary Extension in the Usual Course of Business or, in the Alternative, for a Certificate of Public Convenience And Necessity.

Dear Mr. Derouen:

Enclosed please find an original and twelve copies of the following for filing in the above referenced matter:

1. Direct Testimony of Tammy Jett;
2. Direct Testimony of Joseph A. Miller, Jr.;
3. Direct Testimony of Nicholas R. Sellet;
4. Direct Testimony of William Don Wathen Jr.;
5. Responses to Attorney General's First Request for Information;
6. Petition for Confidential Treatment; and,
7. Responses to Commission Staff's Initial Request for Information.

The Petition for Confidential Treatment is being filed in a white envelope, containing the confidential material to be filed under seal.

Please note that Duke Energy Kentucky, Inc.'s response to Staff-DR-01-002 will be supplemented.

Please date-stamp the two copies of the letter and the filing and return to me in the enclosed envelope.

Sincerely,



Rocco D'Ascenzo
Associate General Counsel
rocco.d'ascenzo@duke-energy.com

cc: Hon. Jennifer Hans (w/enclosures)

**COMMONWEALTH OF KENTUCKY
BEFORE THE
KENTUCKY PUBLIC SERVICE COMMISSION**

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PUBLIC SERVICE
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In The Matter of:

The Application of Duke Energy Kentucky, Inc.)
For a Declaratory Order that the Construction)
Of a New Landfill Constitutes an Ordinary)
Extension in the Usual Course of Business or,)
In the Alternative, for a Certificate of Public)
Convenience and Necessity)
Case No. 2015-00089

DIRECT TESTIMONY OF

TAMMY JETT

ON BEHALF OF

DUKE ENERGY KENTUCKY, INC.

April 24, 2015

TABLE OF CONTENTS

	<u>PAGE</u>
I. INTRODUCTION AND PURPOSE	1
II. GENERAL DESCRIPTION OF ENVIRONMENTAL CONTROLS AT DUKE ENERGY KENTUCKY'S EAST BEND GENERATION STATION.....	3
III. ENVIRONMENTAL REGULATIONS IMPACTING DUKE ENERGY KENTUCKY'S EAST BEND GENERATING STATION.....	7
V. CONCLUSION	16

I. INTRODUCTION AND PURPOSE

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Tammy Jett. My business address is 139 East Fourth Street,
3 Cincinnati, Ohio 45202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed by Duke Energy Business Services LLC. (Duke Energy Business
6 Services) as a Principal Environmental Specialist in the CCP (Coal Combustion
7 Products) Environmental Programs Department. Duke Energy Business Services
8 is a service company subsidiary of Duke Energy Corporation (Duke Energy),
9 which provides services to Duke Energy and its subsidiaries, including Duke
10 Energy Kentucky, Inc. (Duke Energy Kentucky or the Company).

11 **Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND**
12 **PROFESSIONAL BACKGROUNDS.**

13 A. I received a Master's Degree in Environmental Science from Miami University in
14 1989. I have also earned a Bachelor's Degree in Urban Ecology and an
15 Associate's Degree in Psychology from Thomas More College in 1987. I began
16 my career with The Cincinnati Gas & Electric Company in 1989 as an Intern as
17 part of my graduate degree curriculum. I was hired as a Junior Licensing
18 Specialist in 1989 after my internship was completed. I have held a number of
19 environmental compliance related positions over the last 25+ years in the
20 environmental organizations, within what is now call Duke Energy. These
21 positions involved increasing responsibility and include Regulatory Compliance
22 Coordinator, Environmental Scientist III and Senior and Lead Environmental
23 Specialist. In 2015, I was promoted to Principal Environmental Specialist, which

1 is the highest technical (non-managerial) position currently available in the Duke
2 Energy Environmental organization.

3 **Q. PLEASE SUMMARIZE YOUR DUTIES AS PRINCIPAL**
4 **ENVIRONMENTAL SPECIALIST.**

5 A. As Principal Environmental Specialist, I am the subject matter expert for
6 environmental coal ash compliance for the Duke Energy Kentucky and Ohio
7 generating stations. I have responsibility for permitting and specializing in all
8 facets of the coal ash program. I obtain permits for the Company's coal ash
9 facilities, such as coal ash landfills, and then assist with monitoring, record
10 keeping, reporting and other facets of our compliance program. I am also
11 responsible for reviewing new Federal and State regulations which include the
12 regulation of coal ash, such as the United States Environmental Protection
13 Agency's (EPA) newly published Coal Combustion Residual (CCR) rule and the
14 Kentucky Special Waste rules, among others, and determining their impact on our
15 generating coal ash facilities. I am involved in strategic planning across all the
16 Duke Energy service areas, including Ohio, Kentucky, Indiana, North Carolina,
17 South Carolina and Florida, for federal coal ash compliance issues to provide a
18 consistent strategy for implementing the CCR rule.

19 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY**
20 **PUBLIC SERVICE COMMISSION?**

21 A. No.

22 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
23 **PROCEEDING?**

1 A. The purpose of my testimony is to discuss the environmental requirements
2 applicable to the Company's operation of its East Bend Unit 2 Generating Station
3 (East Bend) that specifically relate to the construction and operation of a new
4 landfill on the western portion of the East Bend campus (West Landfill). In doing
5 so, I provide an overview of the environmental controls that exist today at East
6 Bend and the regulations that require such controls. I also discuss how East Bend
7 complies with the current environmental regulations and how the West Landfill
8 will comply with these regulations.

II. GENERAL DESCRIPTION OF ENVIRONMENTAL CONTROLS
AT DUKE ENERGY KENTUCKY'S EAST
BEND GENERATION STATION

9 **Q. PLEASE DESCRIBE THE ENVIRONMENTAL CONTROLS AT EAST**
10 **BEND.**

11 A. East Bend is designed to burn low- to high-sulfur eastern bituminous coal. The
12 major pollution control features are: a mechanical draft cooling tower, a high-
13 efficiency hot side electrostatic precipitator, a lime-based flue gas desulfurization
14 (FGD) system, low nitrogen oxide (NO_x) burners and a selective catalytic
15 reduction control (SCR) system which is designed to reduce NO_x emissions by
16 85%. The FGD system was upgraded in 2005 to increase the sulfur dioxide (SO₂)
17 emissions removal capability to about 97%. The station electrical output is
18 directly connected to the Duke Energy Midwest (consisting of Kentucky and
19 Ohio) 345 kilovolt (kV) transmission system.

20 **Q. PLEASE DESCRIBE HOW ASH IS CURRENTLY HANDLED AT EAST**
21 **BEND.**

1 A. Duke Energy Kentucky currently operates a landfill at its East Bend Generating
2 Station (East Landfill), which is used for the disposal of ash resulting from the
3 Company's FGD process and other CCR-producing processes. Depending upon
4 generation output, East Bend produces approximately 1.3 million tons of Poz-o-
5 tec, including approximately 156,000 tons of fly ash annually. The Poz-o-tec
6 material sets up much like concrete, and is placed in the East Landfill. The
7 remaining 20% of CCR material is bottom ash. This bottom ash is treated in an
8 ash pond located on site at East Bend.

9 **Q. PLEASE DESCRIBE THE EAST BEND EAST LANDFILL.**

10 A. The East Landfill is comprised of approximately 162 acres and has been in place
11 since East Bend was constructed. The presence of the East Landfill has permitted
12 Duke Energy Kentucky to manage its costs of environmental compliance and
13 provide safe and reliable electric service by eliminating the need to transport and
14 pay for sending generator waste to commercial landfills. The East Landfill has
15 also avoided the increased vehicle traffic that would be necessary if the Company
16 had to arrange offsite transportation.

17 Unfortunately, the East Landfill is reaching its capacity. The Company
18 will need to either construct the West Landfill or arrange to transport its CCR to
19 another landfill operated by a third party. The existing East Landfill is projected
20 to reach its capacity in approximately three to four years. However, East Bend
21 will need additional landfill space before the current landfill is full due to the
22 manner in which the material being landfilled must be handled. The Company
23 must have the replacement landfill operational prior to the East Landfill reaching
24 capacity in order to ensure a smooth and seamless transition.

1 **Q. PLEASE DESCRIBE DUKE ENERGY KENTUCKY'S PROPOSAL TO**
2 **ADDRESS THIS LANDFILL ISSUE.**

3 A. A repository for East Bend's Generator Waste is necessary for purposes of
4 environmental compliance for current and emerging regulations involving
5 handling of CCR. To satisfy these compliance requirements, the Company is
6 proposing to begin construction of the West Landfill. The West Landfill will
7 consist of approximately 200 acres of lined landfill that is designed to accept
8 approximately 30 years of generator waste from the East Bend Station and other
9 sources, as permitted. The Landfill will be lined with a leachate collections
10 system in accordance with all applicable federal, state, and local requirements and
11 will be constructed over time and in eight separate cells, with the first cell needed
12 to be available for use by 2018. The additional seven cells will be constructed in
13 approximately three-year increments in order that, the next cell will be in service
14 prior to reaching capacity in the active cell. The "West Landfill", will be owned
15 and operated by Duke Energy Kentucky just as it has owned and operated the East
16 Landfill. Duke Energy Kentucky already has the personnel and expertise in place
17 to construct and operate the West Landfill. The proximity of the West Landfill to
18 East Bend will allow Duke Energy Kentucky to continue to control its costs for
19 transporting and disposing of the generator waste material. The West Landfill
20 construction will also include the construction of all infrastructure required to
21 operate and maintain the West Landfill. The West Landfill infrastructure
22 includes, but is not limited to, roads for access and operation of the landfill,
23 electric transmission lines and electrical equipment for powering necessary
24 equipment for use at the landfill, and environmental monitoring equipment.

TAMMY JETT DIRECT

1 **Q. PLEASE BRIEFLY DESCRIBE THE ASH POND LOCATED AT EAST**
2 **BEND.**

3 A. The ash pond located at East Bend was commissioned in 1981. It has a volume of
4 1,844 acre feet. It is used to separate bottom ash from the water used to convey
5 the ash from the plant before the water is discharged to the Ohio River from the
6 pond under a National Pollutant Discharge Elimination System (NPDES) permit.
7 The pond is also used to treat other plant water streams, such as coal pile run-off
8 and landfill leachate, before they are discharged under the NPDES permit.

9 **Q. HAS DUKE ENERGY KENTUCKY RECEIVED THE NECESSARY**
10 **PERMITS FOR THE CONSTRUCTION OF THE WEST LANDFILL?**

11 A. Yes. The Company has received a permit from the Kentucky Division of Waste
12 Management, Permit number SW00800006. This permit, along with Kentucky
13 Department of Environmental Protection application form number 7094A, details
14 the design of the West Landfill. The West Landfill is permitted to receive various
15 forms of waste, including, but not limited to, FGD waste, fly ash and bottom ash
16 (Generator Waste), from a number of generating sources, including those
17 generating stations currently owned and/or operated by Duke Energy Kentucky
18 and for generating stations for other sources. These permitted sources include,
19 but are not limited to, the East Bend and Miami Fort 6 Generating Stations owned
20 by Duke Energy Kentucky, the Spurlock Generating Station owned by East
21 Kentucky Power Cooperative, the Ghent Generating Station owned by Kentucky
22 Utilities Company, and the Zimmer, Beckjord, Miami Fort and Killen Stations

1 (collectively Permitted Stations).¹ The permits are included as Exhibits 1 and 2 to
2 the Company's application in this proceeding.

3 **Q. PLEASE EXPLAIN WHY THE WEST LANDFILL IS PERMITTED TO**
4 **RECEIVE GENERATOR WASTE FROM OTHER COAL-FIRED**
5 **GENERATING STATIONS.**

6 A. The West Landfill is permitted to receive generator waste from sources other than
7 East Bend to ensure there is sufficient dry fly ash material to make the Poz-o-tec
8 byproduct necessary to operate the station's FGD handling process. As such, this
9 West Landfill will be beneficial for not only Duke Energy Kentucky, but
10 potentially for other CCR sources as well. While East Bend produces
11 approximately 1.3 million tons of fly-ash per year, at times the amount of ash
12 generated at East Bend is insufficient to produce the Poz-o-tec. Therefore, the
13 Company needs the ability to receive ash from additional sources other than East
14 Bend from time to time.

III. ENVIRONMENTAL REGULATIONS IMPACTING DUKE ENERGY
KENTUCKY'S EAST BEND GENERATING STATION

15 **Q. WHAT ARE THE MOST SIGNIFICANT ENVIRONMENTAL**
16 **REGULATIONS CURRENTLY IMPACTING DUKE ENERGY**
17 **KENTUCKY'S EAST BEND?**

18 A. There are several programs promulgated by the EPA under the Clean Air Act
19 (CAA) that impact all of the Company's generating stations, and particularly East

¹ The Miami Fort Generating Station has three operational units, Unit 6, 7, and 8. Duke Energy Miami Fort LLC, currently owns and operates Units 7 and 8. Duke Energy Miami Fort LLC is presently in the process of being sold to Dynegy. Duke Energy Kentucky owns Unit 6, but Duke Energy Miami Fort LLC operates Unit 6 on Duke Energy Kentucky's behalf pursuant to an approved service agreement.

1 Bend. These regulations are the primary drivers of Duke Energy Kentucky's
2 compliance strategies for its plants. They are as follows:

- 3 1) Mercury Air Toxics Standard (MATS);
- 4 2) Cross State Air Pollution Rule (CSAPR); and
- 5 3) NAAQS.

6 The newly published USEPA Coal Combustion Residuals rule (CCR rule), in
7 addition to other emerging regulations under the Clean Water Act (CWA), and
8 Green House Gas (GHG) emissions are likely to impact the Company's
9 generating stations. The regulations that most directly impact the Company's ash
10 handling strategies as it pertains to the landfill need and operation are the CAA,
11 and the CCR rule.

12 **Q. PLEASE BRIEFLY DESCRIBE THE CLEAN AIR ACT (CAA).**

13 A. The CAA is the comprehensive federal law that regulates air emissions from
14 stationary and mobile sources. Among other things, this law authorizes EPA to
15 establish a number of programs to regulate air emissions so as to protect public
16 health and public welfare. Many of these programs overlap and at times regulate
17 the same pollutants.

18 **Q. CAN YOU PROVIDE A BRIEF SUMMARY OF THE MATS RULE?**

19 A. The MATS rule regulates hazardous air pollutant emissions from new and
20 existing coal- and oil-fired steam electric generating units (EGUs) that are greater
21 than 25 MWs in capacity. It is a command and control program that imposes unit-
22 by-unit restrictions on emissions of mercury, acid gases such as hydrogen
23 chloride, and certain non-mercury metals, including arsenic, chromium, nickel
24 and selenium. MATS allows EGUs, as one option, to demonstrate compliance by

1 measuring mercury, hydrogen chloride, and non-mercury metal emissions
2 directly. It also allows the EGUs the option of demonstrating compliance by
3 measuring surrogates for acid gases and for non-mercury metals.

4 **Q. DOES EAST BEND CURRENTLY COMPLY WITH THE MATS RULE?**

5 A. Yes. Based on testing to date, East Bend, which is equipped with wet FGD
6 technology, can comply with the limits for acid gases. This testing also shows that
7 the wet FGD system installed to remove sulfur dioxide is also very effective at
8 removing hydrogen chloride and other acid gases. East Bend's FGD is also
9 effective at reducing the small amount of residual filterable particulate matter
10 (PM) that leaves the existing precipitators. Our testing to date confirms that the
11 existing FGD systems will allow the unit to meet the filterable PM standard. With
12 respect to mercury, Duke Energy Kentucky's emissions testing indicates that the
13 combination of SCR and wet FGD is effective at reducing mercury emissions.
14 The Company expects that only minor process changes and/or minor chemical
15 addition systems will be required to meet the mercury standard on a continuous
16 basis.

17 **Q. PLEASE PROVIDE A SHORT DESCRIPTION OF THE HISTORY AND**
18 **STATUS OF CAIR AND CSAPR.**

19 A. In 2005, the EPA finalized CAIR to address the contribution to ozone and fine
20 particulate matter (PM_{2.5}) non-attainment from the interstate transport of SO₂ and
21 NO_x emissions. In December 2008, the U.S. Court of Appeals for the D.C. Circuit
22 remanded the rule to the EPA to address provisions the court found unlawful. It
23 directed EPA to continue to administer CAIR until it finalized a replacement rule.
24 On August 8, 2011, the EPA published the final CSAPR rule to replace CAIR.

1 CSAPR established new state-level annual SO₂ and NO_x budgets and ozone-
2 season NO_x budgets. It was to take effect on January 1, 2012; however, on
3 December 30, 2011, the D.C. Circuit stayed CSAPR. On August 21, 2012, the
4 D.C. Circuit then vacated CSAPR and directed that EPA continue administering
5 CAIR pending completion of a new rulemaking to replace CSAPR. The EPA
6 ultimately petitioned the United States Supreme Court (Supreme Court), asking
7 that it review the D.C. Circuit's decision. The Supreme Court accepted the EPA's
8 request and oral arguments were held on December 10, 2013. On April 26,
9 2014, the Supreme Court reversed the D.C. Circuit's decision in its entirety and
10 remanded the case back to the D.C. Circuit for further proceedings. Potential
11 additional judicial proceedings could extend the litigation into 2015. Duke Energy
12 Kentucky cannot predict the outcome of these proceedings; however, it is likely
13 that CAIR will continue to be implemented for some period of time.

14 **Q. IF THE CSAPR WERE EVENTUALLY IMPLEMENTED, WOULD EAST**
15 **BEND COMPLY WITHOUT ADDITIONAL INVESTMENT?**

16 A. Because it has well performing wet FGD and SCR, East Bend is well positioned
17 to comply with CSAPR without additional controls. Because of its restrictions on
18 trading and the more limited allowance budgets, the allowance prices under
19 CSAPR are expected to be greater than those of CAIR and the Acid Rain
20 Programs.

21 **Q. PLEASE DESCRIBE THE MAJOR EFFORTS TO REGULATE**
22 **GREENHOUSE GASES THAT RELATE TO ELECTRIC GENERATING**
23 **UNITS.**

1 A. In 2007, the Supreme Court ruled in *Massachusetts v. EPA* that greenhouse gases
2 are a pollutant subject to regulation under the CAA.² Subsequently, the EPA
3 undertook a number of rulemakings including requiring major stationary sources
4 of greenhouse gases to obtain construction and operating permits. Because
5 immediate regulation of all such sources would overwhelm permitting authorities
6 and sources, the EPA issued the Timing and Tailoring Rules, in which it
7 determined that only the largest stationary sources would initially be subject to
8 permitting requirements. On January 8, 2014, the EPA re-proposed New Source
9 Performance Standards for CO₂ emissions from new natural gas and coal-fired
10 electric generating units. At the President's direction, the EPA on June 2 2014
11 proposed CO₂ emissions requirements for existing, modified and reconstructed
12 fossil-fueled EGUs. EPA plans to finalize those requirements by June 1, 2015.
13 States will then be required to submit their implementation plans to the EPA for
14 approval by June 30, 2016.

15 **Q. PLEASE DISCUSS THE EPA'S UPCOMING CO₂ REGULATION FOR**
16 **EXISTING EGUS WITH RESPECT TO EAST BEND?**

17 A. The final outcome of the EPA's proposed CO₂ regulations for existing EGUs is
18 uncertain. Once the EPA finalizes its rule by June 1, 2015, the states will then
19 develop their own regulations to implement those emissions guidelines. Duke
20 Energy Kentucky will not know the exact regulatory requirements that will apply
21 to its facilities until the State of Kentucky completes its rule and it is approved by
22 the EPA. As I stated before, the President directed the EPA to require that states
23 submit their rules to the EPA for approval by June 30, 2016, but the actual EPA

² *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497 (2007).

1 approval is not likely to occur until sometime in 2017. Duke Energy Kentucky
2 cannot predict what those regulatory requirements might be or whether the
3 resulting program might establish a price on CO₂ emissions. Duke Energy
4 Kentucky has therefore not attempted to model this regulation, but believes that
5 the CO₂ prices utilized in our analyses can act as reasonable placeholders for costs
6 that may be incurred as a result of this regulation.

7 **Q. PLEASE DESCRIBE THE CURRENT STATUS OF, AND THE**
8 **COMPANY'S MODELING ASSUMPTIONS FOR, THE PROPOSED CCR**
9 **RULE.**

10 A. In April 2009, the EPA began assessing the integrity of ash dikes nationwide, and
11 began developing regulations to manage CCRs. CCRs primarily include fly ash,
12 bottom ash, and FGD byproducts (typically calcium sulfate (gypsum) or calcium
13 sulfite) that are destined for disposal. In June 2010, the EPA proposed a rule
14 containing two options for handling CCRs: 1) as a special waste listed under the
15 Resource Conservation and Recovery Act (RCRA) Subtitle C Hazardous Waste
16 Regulations; and 2) as a solid waste under RCRA Subtitle D Non-Hazardous
17 Waste Regulations. Both options included dam safety requirements and had strict
18 new requirements regarding the handling, disposal, and beneficial use of CCRs
19 except when reused in encapsulated applications (such as ready mix concrete and
20 the production of wallboard).

21 When the EPA published its proposed Electric Effluent Limitations
22 Guidelines (ELG) revisions, it indicated that it was working to integrate the ELG
23 rule with the pending CCR rule. In the ELG proposal, the EPA said that there
24 could be strong support for a conclusion that regulation of CCR disposal under

1 RCRA Subtitle D would be adequate because of 1) potentially lower CCR risk
2 assessment results, 2) the ELG requirements that the EPA may promulgate, and 3)
3 increased Federal oversight such requirements could achieve. The newly
4 published CCR rule and/or ELG rule will likely result in conversions to dry
5 handling of fly ash and bottom ash; increased use of landfills; the closure of
6 existing wet ash storage ponds; and the addition of alternative wastewater
7 treatment systems. In its ELG proposal, the EPA indicated that the requirements
8 of the two rules needed to be harmonized before either rule was released. The
9 CCR rule was published as final as a Subtitle D, non-hazardous waste rule on
10 April 17, 2015. Compliance with some aspects of the CCR rule will begin within
11 6-12 months, while other actions may require 5 years or more.

12 We assume that the combination of ELG and CCR rule implementation
13 will require conversion to dry ash handling (both fly ash and bottom ash);
14 initiation of closure of active and inactive wet ash storage ponds possibly within 5
15 years; installation of balance-of-plant wastewater treatment systems; and
16 otherwise higher operations and maintenance costs for managing CCR under
17 more stringent disposal requirements.

18 **Q. WILL ANY OF THE PROPOSED CCR REGULATIONS IMPACT THE**
19 **CURRENT ASH POND OR EAST LANDFILL AT EAST BEND?**

20 A. The CCR regulations have the potential to impact the current ash pond and East
21 Landfill at East Bend. The CCR rule, published on April 17, 2015, includes
22 provisions which may require the conversion to dry handling of ash and closure of
23 the ash pond. The rule will most likely require an altered groundwater monitoring
24 program for both the East Landfill and the ash pond. The results of the

1 groundwater monitoring program may require additional actions, including but
2 not limited to, lining or closing the ash pond. The East Landfill will be required to
3 have a more stringent cap design than what is currently set forth in the permit.
4 The post-closure requirements for both the ash pond and East Landfill are
5 expected to be more stringent than current standards.

6 **Q. DOES THE CURRENT WEST LANDFILL DESIGN COMPLY WITH**
7 **CCR RULE?**

8 A. The current West Landfill design partially meets the US EPA's requirements for
9 CCR rule. The permitted design of the liner and cap for the West Landfill will
10 need to be modified to meet the CCR rule requirements. Cell 1 is not required to
11 meet the liner requirements if construction has commenced on site by October
12 2015. Duke Energy Kentucky anticipates that these activities will be in progress
13 by the required date if the Kentucky Public Service Commission approves Duke
14 Energy Kentucky's filing on the current, accelerated schedule. The design of the
15 future cells and cap of the proposed landfill will be modified to meet the CCR
16 rule requirements.

17 Duke Energy Kentucky anticipates that modifications to the groundwater
18 monitoring network and statistical analysis plans for the proposed landfill will be
19 required. It is possible that additional dust mitigation and storm water controls
20 will be required for the proposed landfill. Detailed engineering evaluations must
21 be completed in order to make a complete determination of conformation to the
22 CCR rule. It is anticipated that any design changes required to meet the rule will
23 be achievable.

1 **Q. WHAT IS THE ESTIMATED COST IMPACT TO THE WEST LANDFILL**
2 **CONSTRUCTION FOR THESE DESIGN CHANGES?**

3 A. Based on 2015 dollars, the Company's estimated fully loaded budgeted cost of
4 construction for all eight phases of the West Landfill is approximately \$159
5 million. This figure includes the cost of capping each of the eight cells. That cost
6 estimate includes anticipated design changes needed to comply with the CCR rule
7 as based on Duke Energy Kentucky's current understanding of the rule and the
8 potential impacts on the design of the landfill. The projected design changes do
9 not fundamentally change the economics of constructing the West Landfill versus
10 using a third party for disposal of the East Bend CCR materials.

11 **Q. WILL THE CONSTRUCTION OF THE WEST LANDFILL ALLOW THE**
12 **COMPANY TO COMPLY THE WITH CCR RULE?**

13 A. Yes. Duke Energy Kentucky must have a way to dispose of its generator waste,
14 especially the CCRs from the FGD process. An onsite landfill is the most
15 reasonable and cost effective manner in which to satisfy this need. With the soon
16 to be reached limit on capacity at the existing East Landfill, Duke Energy
17 Kentucky must have an alternative facility in place to receive such wastes by
18 2018. In addition to providing an avenue for proper CCR disposal under the CCR
19 rule, the West Landfill will allow East Bend to be prepared in the event the ash
20 pond must be closed and all the ash removed from the pond because that ash
21 could be placed in the West Landfill. This will provide a cost effective option for
22 disposal of the ash from the pond.

V. CONCLUSION

1 Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

2 A. Yes.

VERIFICATION

STATE OF OHIO

)

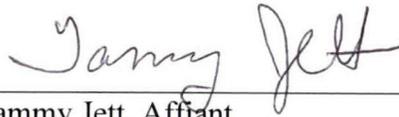
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SS:

COUNTY OF HAMILTON

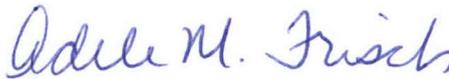
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The undersigned, Tammy Jett, Principal Environmental Specialist, being duly sworn, deposes and says that she has personal knowledge of the matters set forth in the foregoing testimony are true and correct to the best of her knowledge, information and belief.



Tammy Jett, Affiant

Subscribed and sworn to before me by Tammy Jett on this 17TH day of April, 2015.



NOTARY PUBLIC

My Commission Expires: 1/5/2019

**COMMONWEALTH OF KENTUCKY
BEFORE THE
KENTUCKY PUBLIC SERVICE COMMISSION**

In The Matter of:

The Application of Duke Energy Kentucky, Inc.)	
For a Declaratory Order that the Construction)	
Of a New Landfill Constitutes an Ordinary)	
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In the Alternative, for a Certificate of Public)	
Convenience and Necessity)	

DIRECT TESTIMONY OF

JOSEPH A. MILLER, JR.

ON BEHALF OF

DUKE ENERGY KENTUCKY, INC.

April 24, 2015

TABLE OF CONTENTS

	<u>PAGE</u>
I. INTRODUCTION AND PURPOSE	1
II. GENERAL DESCRIPTION OF DUKE ENERGY KENTUCKY'S GENERATING STATIONS.....	2
III. DUKE ENERGY KENTUCKY'S PROPOSAL TO CONSTRUCT A NEW LANDFILL	4
IV. CONCLUSION	13

I. INTRODUCTION AND PURPOSE

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Joseph A. Miller Jr. My business address is 526 South Church Street,
3 Charlotte, North Carolina.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed by Duke Energy Business Services LLC (Duke Energy Business
6 Services) as Vice President Central Engineering and Services. Duke Energy
7 Business Services is a service company subsidiary of Duke Energy Corporation
8 (Duke Energy), which provides services to Duke Energy and its subsidiaries,
9 including Duke Energy Kentucky, Inc. (Duke Energy Kentucky or the Company).

10 **Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND**
11 **PROFESSIONAL BACKGROUNDS.**

12 A. I graduated from Purdue University with a Bachelor of Science degree in
13 Mechanical Engineering. I also completed twelve post graduate level courses in
14 Business Administration at Indiana State University. My career began with Duke
15 Energy (d/b/a Public Service of Indiana) in 1991 as a staff engineer at Duke
16 Energy Indiana's Cayuga Steam Station. Since that time, I have held various roles
17 of increasing responsibility in the generation engineering, maintenance, and
18 operations areas, including the role of station manager, first at Duke Energy
19 Kentucky's East Bend Steam Station, followed by Duke Energy Ohio's Zimmer
20 Steam Station. I was named General Manager of Analytical and Investments
21 Engineering in 2010, and became General Manager of Strategic Engineering in
22 2012 following the merger between Duke Energy and Progress Energy, Inc. I

1 became the Vice President of Central Engineering and Services in 2014.

2 **Q. PLEASE SUMMARIZE YOUR DUTIES AS VICE PRESIDENT OF**
3 **CENTRAL ENGINEERING SERVICES.**

4 A. In this role, I am responsible for providing direction and oversight for engineering
5 and business services, along with strategic and technical services including
6 environmental compliance planning, for Duke Energy's fleet of fossil and
7 hydroelectric ("hydro" and collectively, "fossil/hydro") facilities.

8 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY**
9 **PUBLIC SERVICE COMMISSION?**

10 A. No.

11 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
12 **PROCEEDING?**

13 A. I briefly describe Duke Energy Kentucky's East Bend Generating Station (East
14 Bend). I then describe and support the Company's proposal in this proceeding to
15 construct a new landfill on the western portion of the East Bend Campus (West
16 Landfill).

II. GENERAL DESCRIPTION OF DUKE ENERGY KENTUCKY'S EAST
BEND GENERATING STATION

17 **Q. PLEASE DESCRIBE THE EAST BEND GENERATING STATION.**

18 A. East Bend is a 648 megawatt (MW) (nameplate rating) coal-fired base load unit
19 located along the Ohio River in Boone County, Kentucky, that was commissioned
20 in 1981. Duke Energy Kentucky owns 100 percent of the station, having recently

1 completed its purchase of the Dayton Power and Light Company's 31 percent
2 interest in the station.

3 The nameplate ratings are the ratings provided by the manufacturer of the
4 generating equipment, and these ratings are actually engraved on a nameplate that
5 is affixed to the equipment. The net ratings represent the net amount of power
6 that we can dispatch from the plants after some portion of the gross power output
7 is used to power the plant machinery. The net rating for Duke Energy Kentucky's
8 share of East Bend is 600 MW. East Bend was originally planned for up to four
9 coal-fired units but only one unit (Unit 2) was constructed. The station has river
10 facilities to allow barge deliveries of coal and lime. East Bend is designed to burn
11 low- to high-sulfur eastern bituminous coal and achieved a net plant heat rate
12 year-to-date through March 2015 of 10,740 Btu/kWh. The major pollution
13 control features are: a mechanical draft cooling tower, a high-efficiency hot side
14 electrostatic precipitator, a lime-based flue gas desulfurization (FGD) system and
15 a selective catalytic reduction control (SCR) system designed to reduce nitrogen
16 oxide (NO_x) emissions by 85%. The FGD system was upgraded in 2005 to
17 increase the sulfur dioxide (SO₂) emissions removal to an average of 97%. The
18 station's electrical output is directly connected to the Duke Energy Midwest
19 (consisting of Kentucky and Ohio) 345 kilovolt (kV) transmission system.

20 Duke Energy Kentucky currently operates a landfill at its East Bend
21 Generating Station (East Bend Landfill), which is used for the disposal of waste
22 products resulting from the Company's flue gas desulfurization and other waste
23 material.

1 **Q. IS EAST BEND USED AND USEFUL FOR SERVING DUKE ENERGY**
2 **KENTUCKY'S NATIVE LOAD CUSTOMERS?**

3 A. Yes. East Bend, as described above, has performed well and is a high quality
4 generating asset relative to the age and condition of comparable generating plants.
5 One useful measure of the quality of a coal-fired generating station is the
6 equivalent availability factor, which measures the percentage of time that the
7 station is available for operations after planned and unplanned outages and derates
8 (which result from operational conditions) are taken into account. The equivalent
9 availability factor for East Bend for time period 2009 through 2013 was 83.07%.
10 The average equivalent availability for coal-fired plants in the North American
11 Electric Reliability Council (NERC) from 2009 through 2013, which is the most
12 recent data available for 600 MW units, was 82.79%.

13 East Bend has been well maintained and is in good working order. Coal
14 supplies are readily available. There are no transmission constraints.

III. DUKE ENERGY KENTUCKY'S PROPOSAL TO CONSTRUCT
A NEW LANDFILL

15 **Q. PLEASE BRIEFLY SUMMARIZE DUKE ENERGY KENTUCKY'S**
16 **PROPOSAL IN THIS APPLICATION.**

17 A. Duke Energy Kentucky is proposing to construct and operate a new landfill over a
18 period of years at East Bend. Duke Energy Kentucky Witness, Nicholas Sellet
19 more fully describes the construction of the West Landfill in his Direct
20 Testimony. The new West Landfill will replace the current landfill that is
21 reaching capacity and will allow East Bend to have a dedicated resource for

1 generator waste for many years to come. Duke Energy Kentucky has recently
2 acquired land adjacent to East Bend from its affiliate, Tri-State Improvement
3 Company (Tri-State)¹ and its parent Duke Energy Ohio, Inc. (Duke Energy Ohio),
4 and through its recent acquisition of the 31 percent interest in East Bend from the
5 Dayton Power & Light Company (DP&L) that is permitted for and can
6 accommodate the West landfill.² Duke Energy Ohio and Tri-State agreed to sell
7 and transfer the land to Duke Energy Kentucky at its original book value, which is
8 lower than the current market value and consistent with KRS 278.2207 and the
9 Federal Energy Regulatory Commission's (FERC) asymmetrical pricing
10 requirements.³ The land acquisition provides Duke Energy Kentucky the ability
11 to construct the West Landfill at East Bend and continue to store waste material
12 from East Bend on site, rather than incurring costs to transport to and dispose of
13 the waste material at third-party-owned landfills.

14 **Q. PLEASE DESCRIBE THE STATUS OF THE CURRENT LANDFILL**
15 **LOCATED AT THE EAST BEND GENERATING STATION.**

16 A. The East Bend Landfill is permitted to receive various forms of waste, including,
17 but not limited to, FGD waste, fly ash and bottom ash (Generator Waste), from a
18 number of generating sources, including those generating stations currently owned

¹ Tri-State Improvement is a wholly-owned subsidiary of Duke Energy Ohio.

² *In the Matter of the Application of Duke Energy Kentucky, Inc., for (1) A Certificate of Public Convenience and Necessity Authorizing the Acquisition of the Dayton Power & Light Company's 31% Interest in the East Bend Generating Station; (2) Approval of Duke Energy Kentucky, Inc.'s Assumption of Certain Liabilities in Connection with the Acquisition; (3) Deferral of Costs incurred as Part of the Acquisition; and (4) All Other Necessary Approvals, and Relief*, Case No 2014-00201 (Ky. P.S.C. Order, December 4, 2014.)

³ KRS 278.2207.

1 and/or operated by Duke Energy Kentucky and for generating stations for other
2 Kentucky utilities and Ohio-based electric generators. These permitted sources
3 include, but are not limited to, the East Bend and Miami Fort 6 Generating
4 Stations owned by Duke Energy Kentucky, the Spurlock Generating Station
5 owned by East Kentucky Power Cooperative, the Ghent Generating Station owned
6 by Kentucky Utilities Company, and the Zimmer, Beckjord, Miami Fort and
7 Killen Stations (collectively Permitted Stations).⁴ As explained below, the West
8 Landfill is permitted to receive Generator Waste from sources other than East
9 Bend to ensure that Duke Energy Kentucky has sufficient dry fly ash material
10 available to make the Poz-o-tec byproduct necessary to operate the station's FGD
11 handling process. This permitting for multiple stations is a significant benefit to
12 the Company as Duke Energy Kentucky, at times, does not produce sufficient
13 quantities of ash to make the Poz-o-tec. As such, this newly constructed West
14 Landfill provides the Company the ability to continue to dispose of its generator
15 waste through the life of the station and also the ability to have sufficient levels of
16 fly ash to properly make the Poz-o-tec byproduct.

17 The current landfill has been in place since the station was constructed and
18 is reaching its capacity. The Company needs to either construct a new landfill or
19 arrange to transport its waste to another landfill operated by a third party. The
20 presence of an onsite landfill has permitted Duke Energy Kentucky to manage its

⁴ The Miami Fort Generating Station has three operational units, Unit 6, 7, and 8. Duke Energy Miami Fort LLC, currently owns and operates Units 7 and 8. Duke Energy Miami Fort LLC was recently sold to Dynegy. Duke Energy Kentucky owns Unit 6, but Duke Energy Miami Fort LLC operates Unit 6 on Duke Energy Kentucky's behalf pursuant to a Commission-approved service agreement.

1 costs of environmental compliance while providing safe and reliable electric
2 service by eliminating the need to transport and pay to dispose of the generator
3 waste in commercial landfills. The existing East Bend landfill is projected to
4 reach its capacity in approximately three to four years. Duke Energy Kentucky
5 thus has an immediate need to address the landfill capacity issue with a reasonably
6 priced and long-term solution. The land acquisition permits Duke Energy
7 Kentucky to construct the West Landfill located adjacent to, and continue to store
8 waste material from, its East Bend Generating Station on site, rather than
9 incurring costs to transport and dispose of the waste material at third-party-owned
10 landfills.

11 **Q. PLEASE DESCRIBE THE CONSTRUCTION PLAN FOR THE WEST**
12 **LANDFILL.**

13 A. Mr. Sellet more fully supports the Company's Construction Plan in his direct
14 testimony. The West Landfill will be constructed over time in eight separate
15 phases, with the first phase to be completed in 2016 or early 2017. The additional
16 seven phases will be constructed in three-year increments with a projected
17 completion date of 2037. Duke Energy Kentucky will own the West Landfill and
18 will be ultimately responsible for its operation just as it has owned and operated
19 the East Bend Landfill for the past several years. Duke Energy Kentucky already
20 has the personnel and expertise in place to construct and operate the West
21 Landfill. The proximity of the West Landfill to the East Bend Generating Station
22 will allow Duke Energy Kentucky to continue to control its costs for transporting
23 and disposing of the generator waste material. As more fully explained by Mr.

1 Sellet, the construction and maintenance of the West Landfill is a more economic
2 solution for the Company and its customers than identifying and engaging a third-
3 party landfill for disposal of generator waste.

4 **Q. WHY DOES THE COMPANY NEED TO BEGIN CONSTRUCTION OF**
5 **THE WEST LANDFILL NOW?**

6 A. Duke Energy Kentucky needs to begin constructing the West Landfill because its
7 current East Bend Landfill is reaching capacity. The Company must begin
8 construction soon, in order to ensure the West Landfill is operational and
9 available prior to the East Bend Landfill reaching capacity. The West Landfill
10 will allow Duke Energy Kentucky to continue to provide stable and reasonably
11 priced retail electric service to its customers by eliminating the need to transport
12 and pay for disposal of generator waste at third-party owned and operated landfills
13 once the East Bend Landfill reaches capacity.

14 **Q. PLEASE DESCRIBE THE ESTIMATED COST OF CONSTRUCTING**
15 **THE WEST LANDFILL.**

16 A. As Mr. Sellet more fully explains, the fully loaded, budgeted cost of construction
17 for all eight phases of the West Landfill is approximately \$159 million. The
18 estimated cost of initiating construction in the spring of 2015 and finishing the
19 first phase of the West Landfill is approximately \$30 million. This initial cell
20 construction cost estimate includes construction of roadways, trenches, and
21 installation of necessary transmission line that will be common for all future cells,
22 but must be constructed with the initial phase. The estimated cost for each
23 additional future cell is approximately \$18 million per cell.

1 **Q. PLEASE EXPLAIN WHY CONSTRUCTING THE WEST LANDFILL IS A**
2 **BETTER ECONOMIC LONG TERM SOLUTION THAN THIRD PARTY**
3 **LANDFILL DISPOSAL SERVICES.**

4 A. The Company has explored that option through inquiries to third-party owned
5 commercial landfills in the vicinity of East Bend. Based upon current market
6 inquiries, Duke Energy Kentucky estimates that the costs of transporting and
7 disposing of the Generator Waste material in a commercial landfill to be
8 approximately \$33-\$35 per ton. Duke Energy Kentucky's East Bend Generating
9 Station produces approximately 1.3 million tons of FGD waste material per year,
10 resulting in an annual expense, based upon today's dollars, of more than \$42
11 million to use a commercial landfill. Assuming a disposal need for the next 30
12 years, this amounts to approximately \$1,260,000,000 (in today's dollars) in third-
13 party disposal expense, assuming long-term availability of such third party
14 resources and not including inflation, additional regulation and transportation
15 costs to the third party landfill.

16 The fully loaded, budgeted cost of construction for all eight phases of the
17 West Landfill is approximately \$159 million. On-site disposal expenses (*e.g.*,
18 transportation) amount to approximately \$3.5 million per year. Over an assumed
19 thirty-year life of the West Landfill, the construction of all eight phases and
20 annual disposal expense equates to an annual investment of approximately \$8
21 million to \$9 million per year for the next thirty years. This is far below the
22 current estimated annual expense of approximately \$42 million to use a third-
23 party landfill for waste disposal.

1 **Q. WILL CONSTRUCTION OF THE NEW LANDFILL IMPACT THE**
2 **OPERATION OF EAST BEND OR RESULT IN WASTEFUL**
3 **DUPLICATION OF SERVICES?**

4 A. No. Duke Energy Kentucky will continue to be able to provide safe, reliable and
5 adequate service to its customers during the construction of the West Landfill. In
6 fact, that is precisely why the Company is seeking to begin construction of the
7 West Landfill at this time. The Company intends to have the first phase of the
8 West Landfill fully operational before the current East Bend Landfill reaches its
9 capacity so to ensure there is no interruption of service or impact to the plant's
10 operation.

11 The fact that the West Landfill will be operational prior to the closure of
12 the current East Bend Landfill is necessary so to ensure there is a seamless
13 transition from old to new. The existing landfill simply cannot last forever and
14 the Company must prepare for its inevitable closure.

15 **Q. HAS DUKE ENERGY KENTUCKY ACQUIRED THE NECESSARY**
16 **ENVIRONMENTAL PERMITS TO CONSTRUCT THIS WEST**
17 **LANDFILL?**

18 A. Yes. The West Landfill construction project includes construction of
19 approximately 200 acres of lined landfill. The West Landfill is designed to accept
20 approximately 30 years of Generator Waste from the East Bend Generating
21 Station, including other permitted stations. The Landfill will be lined with a
22 leachate collection system in accordance with all applicable federal, state, and
23 local requirements. The detail design of the West Landfill footprint is included in

1 the Kentucky Division of Waste Management Permit number SW00800006 and
2 the Kentucky Department of Environmental Protection permit number 7094A.
3 The West Landfill construction will also include the construction of all
4 infrastructure required to operate and maintain the West Landfill. The West
5 Landfill infrastructure includes, but is not limited to, roads for access and
6 operation of the landfill, electric transmission lines and electrical equipment for
7 powering necessary equipment for use at the landfill, and environmental
8 monitoring equipment. The permits are included as Exhibits 1 and 2 to the
9 Company's application in this proceeding.

10 **Q. IS THE NEED TO CONSTRUCT THE WEST LANDFILL A RECENT**
11 **DEVELOPMENT?**

12 A. No. The lifespan of the East Bend Landfill, and the eventual need for a new
13 alternative, were discussed before the Commission in Case No. 2003-00252 when
14 the Commission approved Duke Energy Kentucky's acquisition of the generating
15 stations from Duke Energy Ohio. At that time, it was contemplated that to
16 address future waste disposal needs, Duke Energy Kentucky would either acquire
17 land from Duke Energy Ohio to expand its existing landfill or that Duke Energy
18 Ohio might construct its own landfill and charge Duke Energy Kentucky for
19 disposal services. Exhibit 4 to the Company's application in this proceeding
20 includes the Company's responses to Commission discovery regarding the life
21 span of the East Bend landfill.

1 More recently, the Company discusses this need in Case No. 2014-00201
2 when it received Commission-approval to purchase the remaining 31 percent
3 interest in East Bend from DP&L.⁵

4 **Q. WHY IS DUKE ENERGY KENTUCKY PROPOSING TO CONSTRUCT**
5 **THE NEW LANDFILL AT THIS TIME?**

6 A. As I mentioned earlier, Duke Energy Kentucky has an immediate need for the
7 landfill development. The construction of the West Landfill will take time and
8 the Company must act now to begin construction so to complete the first phase of
9 the West Landfill for operation before the current East Bend Landfill reaches its
10 full capacity. Duke Energy Kentucky has a present opportunity to address the
11 landfill capacity issue with a reasonably priced and long-term solution.

12 **Q. WILL THE CONSTRUCTION OF THE WEST LANDFILL SOLVE DUKE**
13 **ENERGY KENTUCKY'S FUTURE GENERATOR WASTE DISPOSAL**
14 **NEEDS?**

15 A. The Company anticipates that this West Landfill will address those needs under
16 currently known environmental regulations.

17 **Q. DO YOU BELIEVE IT IS IN THE PUBLIC INTEREST FOR DUKE**
18 **ENERGY KENTUCKY TO CONSTRUCT AND OPERATE THE NEW**
19 **LANDFILL?**

⁵ See *In the Matter of: The Application of Duke Energy Kentucky, Inc., For (1) A Certificate of Public Convenience And Necessity Authorizing the Acquisition of the Dayton Power & Light Company's 31% Interest in the East Bend Generating Station; (2) Approval of Duke Energy Kentucky, Inc.'s Assumption of Certain Liabilities in Connection with the Acquisition; (3) Deferral of Costs Incurred as Part of the Acquisition; and (4) All Other Necessary Waivers, Approvals, and Relief*, Case No. 2014-00201 (Direct Testimony of J. Michael Geers, P.E.).

1 A. Yes. In anticipation of reaching capacity at the East Bend Landfill, Duke Energy
2 Kentucky began exploring alternatives to address the need to dispose of Generator
3 Waste material. The Company has determined that operating its own landfill
4 continues to be the best and lowest cost option for its customers and continues to
5 believe that constructing and operating its own landfill is the best way to address
6 generator waste disposal. Maintaining an onsite disposal facility minimizes any
7 transportation expenses and disposal fees, and avoids contractual limitations, such
8 as volume constraints, term of use, and renegotiations, that Duke Energy
9 Kentucky would incur if it were to use a third-party commercial landfill.

10 Since Duke Energy Kentucky operates the existing East Bend landfill, it
11 has the trained and skilled personnel capable of constructing and maintaining the
12 new landfill in accordance with good engineering practices. Duke Energy
13 Kentucky will be able to work to ensure that the West Landfill will be operational
14 and in use prior to the existing East Bend landfill reaching its capacity. This West
15 Landfill will provide necessary additional disposal capacity for the East Bend
16 Generating Station, as well as for emergency disposal services to support other
17 permitted facilities owned by Duke Energy.

IV. CONCLUSION

18 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

19 A. Yes.

VERIFICATION

STATE OF NORTH CAROLINA)
)
COUNTY OF MECKLENBURG) SS:

The undersigned, Joseph A. Miller, Jr, VP Central Engineering & Services, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing testimony are true and correct to the best of his knowledge, information and belief.



Joseph A. Miller, Jr., Affiant

Subscribed and sworn to before me by Joseph A. Miller, Jr. on this 15th day of April, 2015.



NOTARY PUBLIC
Kristi L. Aiken



My Commission Expires: 1/29/2017

**COMMONWEALTH OF KENTUCKY
BEFORE THE
KENTUCKY PUBLIC SERVICE COMMISSION**

In The Matter of:

The Application of Duke Energy Kentucky, Inc.)	
For a Declaratory Order that the Construction)	
Of a New Landfill Constitutes an Ordinary)	
Extension in the Usual Course of Business or,)	Case No. 2015-00089
In the Alternative, for a Certificate of Public)	
Convenience and Necessity)	

DIRECT TESTIMONY OF

NICHOLAS R. SELLET

ON BEHALF OF

DUKE ENERGY KENTUCKY, INC.

April 24, 2015

TABLE OF CONTENTS

	<u>PAGE</u>
I. INTRODUCTION	1
II. DISCUSSION.....	3
III. CONCLUSION	11

I. INTRODUCTION

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Nicholas R. Sellet and my business address is 6293 Beaver Road,
3 Union, Kentucky 41091.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed by Duke Energy Business Services LLC (DEBS) as Technical
6 Superintendent. DEBS provides various administrative and other services to Duke
7 Energy Kentucky, Inc., (Duke Energy Kentucky or the Company) and other
8 affiliated companies of Duke Energy Corporation (Duke Energy Corp.).

9 **Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND**
10 **PROFESSIONAL BACKGROUNDS.**

11 A. I graduated with a Bachelors of Mechanical Engineering from the University of
12 Dayton in 2004. After graduation, I began working for Cinergy Corporation in
13 the Engineering and Construction department. From 2004 to 2011, I worked at
14 the Zimmer Station in Moscow, Ohio. During my work at the Zimmer Station, I
15 was promoted through the ranks of our engineering organization from Engineer to
16 Staff Engineer to Engineer II and finally, to Engineer III. While holding these
17 positions I was responsible for budgeting, designing, and implementing capital
18 projects. I was responsible for varying mechanical projects including
19 maintenance of the steam generator, rebuild of bag filters, replacement of
20 expansion joints, and piping replacements. In 2009, I was given responsibility for
21 equipment ownership of the steam generator at Zimmer Station. In October 2009,
22 I obtained my Professional Engineer license, registered in the state of Ohio. In

1 2011, I was promoted to Engineering Manager at East Bend Station. In this role, I
2 was responsible for leading a group of six engineers implementing capital
3 projects. Projects ranged from minor pump replacements to turbine rotor
4 replacements, and also included planning for the West Landfill. In 2013, I was
5 promoted to my current position as Technical Superintendent. In this role, I am
6 responsible for the management of five engineers, titled System Owners, who
7 have responsibility for monitoring equipment as well as recommending
8 maintenance and repair strategies. This is my current position.

9 **Q. PLEASE SUMMARIZE YOUR DUTIES AS TECHNICAL**
10 **SUPERINTENDENT.**

11 A. As Technical Superintendent, I supervise a group of System Owners that provide
12 technical support to East Bend Station. I have a staff of six engineers that have
13 responsibility for different operational systems within the plant and are
14 responsible for monitoring the equipment, as well as recommending repairs and
15 maintenance strategies. I also have responsibility for the capital project
16 engineering group. This group budgets, designs, and implements capital
17 projects. The landfill project was budgeted and designed within this group.

18 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY**
19 **PUBLIC SERVICE COMMISSION?**

20 A. No.

21 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
22 **PROCEEDING?**

1 A. To provide detail on the design, cost, construction, and impact to current
2 operations for the new landfill to be constructed at Duke Energy's East Bend Unit
3 2 Generating Station (East Bend).

II. DISCUSSION

4 **Q. PLEASE PROVIDE A BRIEF OVERVIEW OF THE CURRENT**
5 **LANDFILL AT EAST BEND.**

6 A. The existing landfill at East Bend (East Bend Landfill) was part of the generating
7 asset acquisition approved in Case No. 2003-00252 and is operated by Duke
8 Energy Kentucky. The East Bend Landfill has been operational since the plants
9 original commissioning in 1981. The East Bend Landfill is used, incidentally, in
10 the production and furnishing of electric service as it serves as a means for storage
11 and disposal of generator waste material produced by East Bend. Today this
12 landfill comprises approximately 162 acres (approx. 23,000,000 cubic yards) at
13 the East Bend Station. Approximately 80 percent of the ash produced at East
14 Bend is dry fly ash, which is then combined with the liquid sulfate waste
15 byproduct ("slurry") produced by the station's scrubber technology and lime to
16 produce Poz-o-tec and is disposed of in the landfill. The remaining 20% of the ash
17 consists of bottom ash that is accumulated at an on-site ash pond.

18 **Q. PLEASE EXPLAIN THE DISPOSAL POZ-O-TEC PROCESS.**

19 A. The dry fly ash material is mixed with the spent scrubber slurry, and lime to make
20 a stable material called Poz-o-tec. This is done on an on-site waste stabilization
21 plant (WSP) located near the current East Bend landfill. The mixture sets up much
22 like concrete and is placed in the onsite landfill. The Poz-o-tec product is

1 necessary to stabilize and solidify the slurry for proper waste disposal. On
2 average the station produces a greater volume of the slurry than it does dry fly
3 ash. Therefore, based upon the station's generation, East Bend must be able to
4 receive additional fly ash waste from other sources to make sufficient Poz-o-tec to
5 dispose of the slurry.

6 **Q. PLEASE DESCRIBE THE COMPANY'S PROPOSAL TO CONSTRUCT A**
7 **NEW LANDFILL AT THE EAST BEND GENERATING STATION**
8 **(WEST LANDFILL).**

9 A. The West Landfill construction project includes construction of approximately
10 200 acres of lined landfill. The West Landfill is designed to accept approximately
11 30 years of generator waste from the East Bend Station, including other permitted
12 stations. The Landfill will be lined with a leachate collection system in
13 accordance with all applicable federal, state, and local requirements. The West
14 Landfill construction will also include the construction of all infrastructure
15 required to operate and maintain the West Landfill. The West Landfill
16 infrastructure includes, but is not limited to, roads for access and operation of the
17 landfill, electric transmission lines and electrical equipment for powering
18 necessary equipment for use at the landfill, and environmental monitoring
19 equipment.

20 **Q. PLEASE BRIEFLY EXPLAIN WHY THE COMPANY NEEDS TO BEGIN**
21 **CONSTRUCTION ON THE WEST LANDFILL.**

22 A. The current landfill is in its final phase and is expected to reach its capacity in the
23 next three to four years. Construction of the West Landfill will allow Duke

1 Energy Kentucky to continue to provide stable and reasonably priced retail
2 electric service to its customers by eliminating the need to transport to, and pay
3 for disposal of generator waste at third-party owned and operated landfills once
4 the East Bend Landfill reaches capacity.

5 **Q. WHAT IS THE ESTIMATED COST OF CONSTRUCTING THE WEST**
6 **LANDFILL?**

7 A. Based on 2015 dollars, the Company's estimated fully loaded budgeted cost of
8 construction for all eight phases of the West Landfill is approximately \$159
9 million. This figure includes the cost of capping each of the eight cells. On-site
10 disposal expenses (*e.g.* transportation) amount to approximately \$3.5 million per
11 year. On-site disposal expenses account for the fact that there will be some
12 transportation expense to haul the Poz-o-tec material from the WSP to the West
13 Landfill once it is constructed. Over an assumed thirty-year life of the West
14 Landfill, the estimated cost of construction of all eight phases, and the annual
15 disposal expense equates to an annualized estimated cost of operation of
16 approximately \$8 million to \$9 million per year.¹ This is far below the current
17 estimated annual expense of approximately \$42 million to use a third-party
18 landfill for waste disposal.

19 The estimated cost of initiating construction in the spring of 2015 and
20 finishing the first phase of the West Landfill is approximately \$30 million. This
21 initial cell construction cost estimate includes construction of roadways, a
22 sedimentation pond, trenches, and installation of necessary transmission line that
23 will be common for all future cells, but must be constructed with the initial phase.

¹ (*i.e.* \$159MM/ 30yrs= \$5.3MM/ yr. \$5.3MM +\$3.5MM= \$8.8MM.

1 The estimated cost for each additional future cell is approximately \$18 million per
2 cell, including capping of each cell.

3 **Q. PLEASE DESCRIBE THE COMPANY'S CONSTRUCTION PLAN FOR**
4 **THE WEST LANDFILL.**

5 A. The West Landfill will be constructed in eight separate phases, with the first
6 phase to be completed in 2017. The additional seven phases will be constructed
7 in approximate three-year increments with a projected completion date of 2037
8 for all landfill phases. The approximate cost of the first phase is \$30 million. The
9 Company anticipates commencing engineering on the second cell in 2016 with
10 actual construction beginning in 2019. Future cell construction will be timed so
11 that the West Landfill can continue to operate without any interruption and in a
12 way that reduces construction and operational costs.

13 In terms of overall footprint, the West landfill will cover approximately
14 200 acres of land on the East Bend campus with a total of eight cells. This 200
15 acre footprint is comprised of the first five cells and the eighth and final cell.
16 Cells six and seven will be constructed directly on top of cells one through five.
17 The first cell is estimated to comprise approximately 38 acres of land. Cells two
18 and three are estimated to comprise approximately 37 acres of land. Cells four
19 and five are estimated at approximately 31 acres of land. Cell number six is
20 estimated at approximately 41 acres of land and cell seven is approximately 36
21 acres. Cell eight is estimated at 28 acres.

22 The Company hopes to begin construction as soon as possible so that there

1 is sufficient time to have the first cell operational prior to the current landfill
2 reaching capacity.

3 **Q. HOW DID DUKE ENERGY KENTUCKY ACQUIRE THE LAND TO**
4 **CONSTRUCT THE WEST LANDFILL?**

5 A. To construct the proposed West Landfill, Duke Energy Kentucky acquired
6 approximately 940 acres of land, located adjacent to East Bend, from its parent
7 and affiliate, Duke Energy Ohio and Tri-State and through the recent acquisition
8 of the remaining 31 percent interest in East Bend from DP&L.

9 **Q. DOES DUKE ENERGY KENTUCKY HAVE THE NECESSARY**
10 **ENVIRONMENTAL PERMITS TO CONSTRUCT THE WEST**
11 **LANDFILL?**

12 A. Yes. The Company has received a permit from the Kentucky Division of Waste
13 Management, Permit number SW00800006. This permit, along with Kentucky
14 Department of Environmental Protection application form number 7094A, details
15 the design of the West Landfill. This environmental permit and application form
16 to construct the West Landfill were included as Exhibits 1 and 2 to the
17 Company's application in this proceeding.

18 **Q. PLEASE DESCRIBE THE WASTE DISPOSAL PERMIT AT THE WEST**
19 **LANDFILL.**

20 A. The West Landfill is permitted to receive various forms of generator waste,
21 including, but not limited to, flue-gas desulfurization (FGD) waste (*i.e.*, Poz-o-
22 tec), fly ash and bottom ash, from a number of generating sources, including
23 generating stations for other Kentucky utilities and Ohio-based electric

1 generators. These permitted sources include, but are not limited to, the East Bend
2 and Miami Fort 6 Generating Stations owned by Duke Energy Kentucky, the
3 Spurlock Generating Station owned by East Kentucky Power Cooperative, the
4 Ghent Generating Station owned by Kentucky Utilities Company, and the
5 Zimmer, Beckjord, Miami Fort and Killen Stations (collectively Permitted
6 Stations).²

7 **Q. WHY IS THE WEST LANDFILL PERMITTED TO RECEIVE**
8 **GENERATOR WASTE FROM SOURCES OTHER THAN EAST BEND?**

9 A. The West Landfill is permitted to receive generator waste from sources other than
10 East Bend to ensure there is sufficient dry fly ash material to make the Poz-o-tec
11 byproduct necessary to operate the station's FGD handling process. As I
12 previously described Duke Energy Kentucky produces Poz-o-tec to stabilize,
13 solidify, and dispose of the slurry. Depending upon generation output, East Bend
14 produces approximately 1.3 million tons of Poz-o-tec and including
15 approximately 156,000 tons of fly ash annually. However this volume of East
16 Bend-produced ash is not sufficient to properly mix with the slurry to create
17 enough of the solid-state and stable Poz-o-tec material. As such there are times
18 when the Company actually must import ash from other sources to mix with its
19 slurry's so that it can properly create the Poz-o-tec material for dry landfill
20 disposal. In the past, Duke Energy Kentucky has imported ash from other
21 permitted generating stations, including Miami Fort Station, Zimmer, City of

² The Miami Fort Generating Station has three operational units, Unit 6, 7, and 8. Duke Energy Miami Fort LLC, currently owns and operates Units 7 and 8. Duke Energy Miami Fort LLC is presently in the process of being sold to Dynegy. Duke Energy Kentucky owns Unit 6, but Duke Energy Miami Fort LLC operates Unit 6 on Duke Energy Kentucky's behalf pursuant to an approved service agreement.

1 Hamilton, and St. Bernard. In most of those instances, the costs of transporting
2 ash from the permitted station was borne by Duke Energy Kentucky. That is
3 because nearly all of the other permitted stations have their own disposal facilities
4 on-site and transporting ash to Duke Energy Kentucky would've been an
5 incremental cost to that permitted station. It is important to note that Duke Energy
6 Kentucky has only imported ash from other sites when Duke Energy Kentucky
7 was unable to produce sufficient ash on its own. The Company has never, nor
8 does it intend to, simply offer its generator waste disposal services for sale.
9 Exhibits 1 and 2 are a true and accurate copy of the permits for construction of the
10 West Landfill from the Kentucky Division of Waste Management (DWM) and
11 Kentucky Department of Environmental Protection (KDEP), respectively.

12 **Q. DID THE COMPANY CONSIDER ANY ALTERNATIVES TO**
13 **CONSTRUCTING A NEW LAND FILL TO REPLACE THE CURRENT**
14 **LANDFILL THAT IS NEARING CAPACITY?**

15 A. Yes. In anticipation of reaching capacity at the East Bend Landfill, Duke Energy
16 Kentucky began exploring alternatives to address the need to dispose of generator
17 Waste material. The only viable alternative was to transport the generator waste
18 to a third-party owned and operated landfill. The Company explored the
19 possibility of off-site disposal at a third party owned landfill. However, the
20 Company does not believe this is a practical or economic solution in either the
21 short or long-term.

1 **Q. PLEASE EXPLAIN.**

2 A. The Company has performed informal market inquiries periodically over the past
3 few years. Based upon those past as well as more recent market inquiries to third
4 parties owning and operating landfills, Duke Energy Kentucky estimates that the
5 costs of transporting and disposing of the generator waste material in a
6 commercial landfill to be approximately \$33-\$35 per ton. East Bend produces
7 approximately 1.3 million tons of Poz-o-tec per year, resulting in an annual
8 expense, based upon today's dollars, of more than \$42 million to use a
9 commercial landfill. Assuming a disposal need for the next thirty years, this
10 amounts to approximately \$1,260,000,000 in third-party disposal expense before
11 even taking into account various concerns with short-term contracts, price
12 escalations, and inflation. Further, constructing an onsite landfill will avoid
13 significant public road traffic that would be necessary if the Company were to
14 transport its waste to a third party-owned offsite disposal facility.

15 The Company firmly believes that operating its own landfill continues to
16 be the best and lowest cost option for its customers.

17 **Q. PLEASE DESCRIBE HOW DUKE ENERGY KENTUCKY WILL CLOSE**
18 **THE CURRENT LANDFILL.**

19 A. The Company intends to follow the current procedure for closing the landfill as it
20 has followed for each and every prior cell as it reached capacity. This would
21 include capping the landfill, addition of soil, and over seeding to create green
22 space. This is done in accordance with existing environmental regulations. The

1 Company intends to continue to follow all current permits and regulations in order
2 to close the current landfill.

III. CONCLUSION

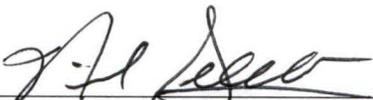
3 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

4 A. Yes.

VERIFICATION

STATE OF OHIO)
) SS:
COUNTY OF HAMILTON)

The undersigned, Nick Sellet, Supt Technical, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing testimony are true and correct to the best of his knowledge, information and belief.



Nick Sellet, Affiant

Subscribed and sworn to before me by Nick Sellet on this 17TH day of April, 2015.



NOTARY PUBLIC

ADELE M. FRISCH
Notary Public, State of Ohio
My Commission Expires 01-05-2019

My Commission Expires: 1/5/2019

**COMMONWEALTH OF KENTUCKY
BEFORE THE
KENTUCKY PUBLIC SERVICE COMMISSION**

In The Matter of:

The Application of Duke Energy Kentucky, Inc.)	
For a Declaratory Order that the Construction)	
Of a New Landfill Constitutes an Ordinary)	
Extension in the Usual Course of Business or,)	Case No. 2015-00089
In the Alternative, for a Certificate of Public)	
Convenience and Necessity)	

**DIRECT TESTIMONY OF
WILLIAM DON WATHEN JR.
ON BEHALF OF
DUKE ENERGY KENTUCKY, INC.**

April 24, 2015

TABLE OF CONTENTS

	<u>PAGE</u>
I. INTRODUCTION	1
II. DISCUSSION.....	2
III. CONCLUSION	6

I. INTRODUCTION

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is William Don Wathen Jr., and my business address is 139 East Fourth
3 Street, Cincinnati, Ohio 45202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed by Duke Energy Business Services LLC (DEBS) as Director of
6 Rates & Regulatory Strategy - Ohio and Kentucky. DEBS provides various
7 administrative and other services to Duke Energy Kentucky, Inc., (Duke Energy
8 Kentucky or the Company) and other affiliated companies of Duke Energy
9 Corporation (Duke Energy Corp.).

10 **Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND**
11 **PROFESSIONAL BACKGROUNDS.**

12 A. I received Bachelor Degrees in Business Administration and Chemical
13 Engineering, and a Master of Business Administration Degree, all from the
14 University of Kentucky. After completing graduate studies, I was employed by
15 Kentucky Utilities Company as a planning analyst. In 1989, I began employment
16 with the Indiana Utility Regulatory Commission as a senior engineer. From 1992
17 until mid-1998, I was employed by SVBK Consulting Group, where I held several
18 positions as a consultant focusing principally on utility rate matters. I was hired
19 by Cinergy Services, Inc., in 1998, as an Economic and Financial Specialist in the
20 Budgets and Forecasts Department. In 1999, I was promoted to the position of
21 Manager, Financial Forecasts. In August 2003, I was named to the position of

1 Director - Rates. On December 1, 2009, I took the position of Director of Rates &
2 Regulatory Strategy - Ohio and Kentucky.

3 **Q. PLEASE SUMMARIZE YOUR DUTIES AS DIRECTOR OF RATES &**
4 **REGULATORY STRATEGY - OHIO AND KENTUCKY.**

5 A. As Director of Rates & Regulatory Strategy - Ohio and Kentucky, I am
6 responsible for all state and federal rate matters involving Duke Energy Kentucky
7 and its parent, Duke Energy Ohio, Inc. (Duke Energy Ohio).

8 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY**
9 **PUBLIC SERVICE COMMISSION?**

10 A. Yes. I have presented testimony on numerous occasions before the Kentucky
11 Public Service Commission (Commission) and various other state, local, and
12 federal regulators.

13 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
14 **PROCEEDING?**

15 A. The purpose of my testimony is to provide an overview of the Company's
16 proposed financial and accounting treatment and corresponding rate impact of the
17 Company's proposal to construct a new onsite landfill at Duke Energy
18 Kentucky's East Bend Generating Station (East Bend) on the western portion of
19 the East Bend Campus (West Landfill).

II. DISCUSSION

20 **Q. PLEASE BRIEFLY DESCRIBE THE COMPANY'S APPLICATION IN**
21 **THIS PROCEEDING.**

1 A. Duke Energy Kentucky is proposing to construct a new/replacement landfill for
2 disposal of generator waste at East Bend. The West Landfill is being constructed
3 to replace the current onsite landfill that is nearing its capacity. Over time, the
4 West Landfill will be constructed in eight phases in approximate three year
5 increments. Each new phase will be constructed separately in order to be in place
6 and ready for operation before the prior phase reaches capacity. Duke Energy
7 Kentucky's interest in land surrounding East Bend, of which approximately 200
8 acres of land will soon become the West Landfill, was acquired through two
9 separate transactions: 1) the Company's recent acquisition of the remaining 31
10 percent interest in East Bend from the Dayton Power & Light Company (DP&L)
11 and 2) through a recent purchase from Duke Energy Kentucky's parent, Duke
12 Energy Ohio, and its affiliate, Tri-State Improvement Company (Tri-State).¹
13 Although the Company acquired more than these 200 acres of land in the two
14 transactions, the additional acreage will be held for future use and as a buffer
15 around the West Landfill.

16 **Q. WILL THE CONSTRUCTION OF THE WEST LANDFILL**
17 **MATERIALLY IMPACT DUKE ENERGY KENTUCKY'S FINANCIAL**
18 **CONDITION?**

19 A. No. The land acquisition and construction of the West Landfill will not require an
20 investment sufficient to materially affect Duke Energy Kentucky's financial

¹ *In the Matter of the Application of Duke Energy Kentucky, Inc., for (1) A Certificate of Public Convenience and Necessity Authorizing the Acquisition of the Dayton Power & Light Company's 31% Interest in the East Bend Generating Station; (2) Approval of Duke Energy Kentucky, Inc.'s Assumption of Certain Liabilities in Connection with the Acquisition; (3) Deferral of Costs incurred as Part of the Acquisition; and (4) All Other Necessary Approvals, and Relief, Case No 2014-00201 (Ky. P.S.C. Order, December 4, 2014.)*

1 condition. The land acquisition has already been accomplished at a reasonable
2 price. Approximately 31 percent of the total interest in the land was acquired as
3 part of the purchase of East Bend from DP&L. Additionally, the land acquired
4 from Duke Energy Ohio and Tri-State was accomplished at a net book value of
5 approximately \$2.5 million, well below the estimated market value of the land.

6 The West Landfill will be owned and operated by Duke Energy Kentucky
7 just as it has owned and operated the East Bend Landfill for the past several years.
8 Accordingly, Duke Energy Kentucky already has the personnel in place to operate
9 and maintain the West Landfill. The West Landfill will be constructed on land
10 adjacent to the existing East Bend site. This proximity will allow Duke Energy
11 Kentucky to better control and minimize its ongoing transportation costs for
12 disposing of the waste material.

13 As discussed in the Direct Testimony of Duke Energy Kentucky witness
14 Nicholas Sellet, the construction and maintenance of the West Landfill is, in the
15 long term, a more economical solution for Duke Energy Kentucky and its
16 customers than identifying and engaging a third-party landfill for generator waste
17 disposal that could be subject to price renegotiation, contract term limits, and
18 other uncertainties relating to future ongoing disposal options.

19 **Q. WHAT ARE THE ESTIMATED COSTS OF CONSTRUCTING THE**
20 **WEST LANDFILL?**

21 **A.** Based upon information provided by Mr. Sellet, the total estimated cost of
22 construction and eventual capping for all eight phases of the West Landfill is
23 approximately \$159 million in today's dollars. The initial construction of phase

1 one is estimated at approximately \$30 million. This initial cell construction cost
2 estimate includes construction of roadways, trenches, and installation of necessary
3 electric transmission line that will be common for all future cells, but must be
4 constructed with the initial phase. The estimated cost for each additional future
5 cell is approximately \$18 million per cell. As explained by Mr. Sellet, the
6 construction and operation of the West Landfill is a lower cost and more optimal
7 solution than third party-owned landfill disposal alternatives.

8 **Q. HOW IS THE COMPANY PROPOSING TO FINANCE THE WEST**
9 **LANDFILL CONSTRUCTION?**

10 A. The Company is proposing to finance the construction through continuing
11 operations and, if necessary, through debt issuances.

12 **Q. WILL THERE BE AN IMMEDIATE IMPACT TO CUSTOMER RATES**
13 **WITH THE LANDFILL CONSTRUCTION?**

14 A. No. While the Company will seek to include the cost of construction and
15 operation and maintenance of the landfill in its rates at some point, the Company
16 is not seeking such authority in this application. The Company may seek to
17 include this project as part of an overall environmental compliance plan and
18 recovery mechanism pursuant to KRS 278.183 or it may simply seek recovery
19 through a traditional base rate case. A final decision in that regard has not yet
20 been reached; however, in either case the Company acknowledges that
21 Commission approval will be required in order to recover these costs.

III. CONCLUSION

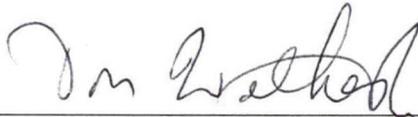
1 Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

2 A. Yes.

VERIFICATION

STATE OF OHIO)
) SS:
COUNTY OF HAMILTON)

The undersigned, William Don Wathen Jr, Director of Rates & Regulatory Strategy OH/KY, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing testimony are true and correct to the best of his knowledge, information and belief.



William Don Wathen Jr, Affiant

Subscribed and sworn to before me by William Don Wathen Jr, on this 15th day of April, 2015.



NOTARY PUBLIC

ADELE M. FRISCH
Notary Public, State of Ohio
My Commission Expires 01-05-2019

My Commission Expires: 1/5/2019