

BEFORE THE CORPORATION COMMISSION OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF
OKLAHOMA GAS AND ELECTRIC COMPANY
FOR COMMISSION APPROVAL OF THE
COMPANY'S PLAN TO INSTALL DRY
SCRUBBERS AT THE SOONER GENERATING
FACILITY

CAUSE NO. PUD 201600059

FILED
MAR 14 2016

COURT CLERK'S OFFICE - OKC
CORPORATION COMMISSION
OF OKLAHOMA



RESPONSIVE TESTIMONY OF

JASON C. CHAPLIN
March 14, 2016

TABLE OF CONTENTS

INTRODUCTION.....	3
EXECUTIVE SUMMARY	5
PURPOSE.....	6
PUD’S REVIEW PROCESS.....	6
PUD’S ANALYSIS.....	6
RECOMMENDATION.....	17

INTRODUCTION

1 **Q: Please state your name and business address.**

2 A: My name is Jason C. Chaplin. My business address is the Jim Thorpe Office Building,
3 Room 580, 2101 North Lincoln Boulevard, Oklahoma City, Oklahoma 73105.

4 **Q: Please state briefly your educational background and professional experience.**

5 A: I received dual Bachelor of Science degrees from the University of Nevada, Las Vegas in
6 Hotel Administration and Gaming Management in 2009 and a Master of Science degree
7 in Energy Management from Oklahoma City University in 2015. Previous to working for
8 the Oklahoma Corporation Commission, I worked as an Independent Petroleum Landman
9 chaining title from sovereignty of soil to present in order to verify mineral and surface
10 interests. For a complete list of my work history and educational background, please see
11 the attached Curriculum Vitae listed as Exhibit JCN-1.

12 **Q: What is your occupation and by whom are you employed?**

13 A: I am employed by the Public Utility Division ("PUD") of the Oklahoma Corporation
14 Commission ("OCC" or "Commission") as a Public Utility Regulatory Analyst.

15 **Q: How long have you been so employed?**

16 A: I have been employed with the Commission since October 2013.

1 **Q: What are your duties and responsibilities within the PUD?**

2 A: I work in the Transmission Group for the OCC and my primary area of focus for the PUD
3 is the Southwest Power Pool ("SPP"). The SPP is one of nine Independent System
4 Operators/Regional Transmission Organizations ("ISOs/RTOs") and one of eight North
5 American Electric Reliability Corporation ("NERC") Regional Entities. The SPP is
6 mandated by the Federal Energy Regulatory Commission ("FERC") to ensure reliable
7 supplies of power, adequate transmission infrastructure and competitive wholesale prices
8 of electricity. I serve as the Oklahoma Corporation Commission voting member on the
9 SPP Cost Allocation Working Group ("CAWG") and as the 2015 CAWG Chairman. The
10 membership of the CAWG, which reports to the SPP Regional State Committee ("RSC")
11 and assists the RSC in addressing matters for which it has responsibility, consists of a
12 representative from each of several SPP member states, as chosen by each
13 representative's respective state utility regulatory Commissioner who serves on the RSC.
14 I assist Commissioner Dana Murphy, who serves as the Oklahoma voting member on the
15 SPP RSC, on SPP transmission issues that fall under the SPP RSC purview. I also serve
16 as a voting member on behalf of CAWG for the Capacity Margin Task Force ("CMTF").
17 The CMTF is responsible for updating SPP Capacity Margin methodology and
18 requirements based upon SPP Stakeholder input. In addition to these voting roles, I also
19 monitor numerous SPP Committees, Working Groups, and Task Forces.

20 **Q: What are some of the groups within SPP that you monitor?**

21 A: I am the voting member on the CAWG and CMTF. In addition, I also monitor and/or
22 attend face-to-face meetings for the RSC, SPP Board of Directors/Members Committee,

1 Markets and Operations Policy Committee, Strategic Planning Committee, Seams
2 Steering Committee, Economic Studies Working Group, Transmission Working Group,
3 Project Cost Working Group, Regional Tariff Working Group, Generation Working
4 Group and the Regional Allocation Review Task Force.

5 **Q: Have you previously testified before this Commission, and were your qualifications**
6 **accepted?**

7 A: Yes, I have previously testified before this Commission, and my credentials have been
8 accepted.

9
10 **EXECUTIVE SUMMARY**

11 **Q: Please provide an executive summary of your testimony.**

12 A: The PUD recommends that this Commission approve OG&E's plan to install dry
13 scrubbers at the Sooner Generating Facility. PUD recommends approval of the plan to
14 install dry scrubbers because it achieves compliance with the Environmental Protection
15 Agency ("EPA") Regional Haze Rule ("Regional Haze" or "RH") Federal
16 Implementation Plan ("FIP") emission requirements for sulfur dioxide (SO₂) using Best
17 Available Retrofit Technology ("BART"), allows OG&E to stay compliant with SPP
18 capacity requirements and still remain competitive in the SPP Integrated Marketplace
19 ("IM"), and allows OG&E to preserve fuel diversity in the face of uncertainties.

PURPOSE

1 **Q: What is the purpose of your testimony in this application filed by Oklahoma Gas**
2 **and Electric?**

3 A: The purpose of my testimony is to provide the PUD's recommendation pertaining to
4 Oklahoma Gas and Electric Company's ("OG&E") application for Commission approval
5 to install dry scrubbers at the Sooner generating facility.

PUD'S REVIEW PROCESS

6
7 **Q: What was the PUD's review process in this cause?**

8 A: The PUD reviewed OG&E's application, OG&E witness testimony of Donald R.
9 Rowlett, Commission rules, Regional Haze Rule of the Clean Air Act¹, sent data
10 requests, reviewed all data response from OG&E, and performed an onsite audit at
11 OG&E headquarters with Regulatory Affairs personnel Donald Rowlett and David Dyke.

PUD'S ANALYSIS

12 **Q: Please explain how installing dry scrubbers achieves compliance with the RH FIP?**

13 A: OG&E is required by law to comply with the Environmental Protection Agency
14 EPA regulations under the federal Clean Air Act, for example Regional Haze, to meet
15 new emission limits for sulfur dioxide ("SO₂") by specified dates. The deadline for
16 meeting the RH SO₂ emission requirement is January 4, 2019. The new SO₂ emission
17 requirements under the RH FIP for affected Oklahoma units imposes a rolling, 30 day
18 SO₂ emission limit of 0.06 lbs/MMBtu. These emissions limits require taking steps with

¹ <https://www.epa.gov/visibility/visibility-regulatory-actions>

1 each of the four affected units to comply with the new emissions requirements. The
2 installation of scrubbers at the Sooner generating facility will reduce SO₂ emission rates
3 by about 90%, thus meeting the RH FIP SO₂ emission requirement.

4 **Q: Please explain BART in regards to the Clean Air Act?**

5 A: In the Clean Air Act, Congress created a program for protecting visibility in certain parks
6 and wilderness areas and instructed the EPA to issue rules for States to use in
7 determining BART. BART is used to control emissions from certain sources that cause or
8 contribute to visibility impairment in these protected areas. The five factors of BART are:
9 (1) the costs of compliance; (2) the energy and non-air quality environmental impacts of
10 compliance; (3) any existing pollution control technology in use at the source; (4) the
11 remaining useful life of the source; and (5) the degree of improvement in visibility that
12 may be expected as a result of such technology².

13 **Q: How was installing scrubbers at the Sooner facility determined to be BART?**

14 A: OG&E studied pre-combustion and post-combustion technology options to comply with
15 the SO₂ limits required by the RH FIP. Pre-combustion control options designed to
16 reduce SO₂ limits include coal switching, coal washing, and coal processing. Because
17 OG&E already uses low sulfur coal as the fuel source at its coal plants, pre-combustion
18 control options were ruled out as they would not achieve compliance with the RH FIP
19 SO₂ limits. Post-combustion flue gas desulfurization ("FGD") has been the most
20 commonly used SO₂ control technology for large pulverized coal-fired utility boilers,

² <https://www.epa.gov/visibility/visibility-regulatory-actions>

1 such as OG&E's affected coal units, with FGD technologies falling into two categories;
2 Wet-FGD ("Wet Scrubber") and Dry-FGD ("Dry Scrubber") systems. OG&E evaluated
3 Wet Scrubber and two Dry Scrubber technologies and the three alternatives were
4 compared and scored against criteria. Due to additional economic and environmental
5 impacts, Wet-FGD was eliminated. Dry-FGD systems evaluated were spray dryer
6 absorber ("SDA") and circulating dry scrubber ("CDS"). Based on the scoring evaluation
7 and risk assessment, CDS was recommended, pending site visits to generating stations
8 using CDS technology to verify assumptions used in the evaluation and risks considered.
9 OG&E visited two stations with CDS technology and solicited feedback from the
10 operating utilities on their experiences with the CDS technology. Based on this
11 evaluation, OG&E selected CDS as the BART to use at the Sooner Facility.

12 **Q: Was the CDS technology for the Sooner units reviewed and/or approved by any**
13 **State agency in regards to BART?**

14 **A:** Yes. Air quality permits are required to meet the Regional Haze mandates outlined above
15 and an air permit application is first prepared and submitted to the Oklahoma Department
16 of Environmental Quality ("ODEQ"). The permit application is then reviewed by the air
17 permitting staff of the ODEQ for completeness. If the ODEQ determines the application
18 meets all applicable state and federal requirements, it will then issue a draft permit. A
19 draft permit could then be subject to a public input process, depending on the type of
20 permit at issue. Following the public input process and any changes made to the draft
21 permit as a result of that process, a final permit is issued. In June 2014, OG&E filed a
22 permit application with the ODEQ for the installation of dry circulating scrubber system

1 on the Sooner units. The ODEQ issued a draft permit to OG&E for the installation of the
2 CDS system on September 16, 2014. This was followed by two rounds of public
3 comments and a public meeting where notice was provided. The draft permit did not
4 require OG&E to hold a public meeting however, OG&E's management decided it was in
5 the best interest of its customers to hold a public meeting, as an additional step to solicit
6 feedback from the public. OG&E received zero comments from both rounds of public
7 input and the public meeting it held. The EPA also had a 45-day review and comment
8 period of the draft permit and OG&E received zero input or feedback from the EPA.
9 With zero objections from the public or the EPA, the ODEQ issued the final permit
10 approving the CDS system as BART for the Sooner units on December 15, 2014.

11 **Q: Did OG&E follow competitive procurement procedures related to the dry scrubbers**
12 **for the Sooner Facility?**

13 **A:** Yes. OG&E states in response to data request AG 1-4, that the Company followed steps
14 outlined in its Purchasing Policy Handbook in regards to the competitive procurement
15 procedures used for the Sooner Facility dry scrubbers. These steps started by the
16 formation of a Cross-Functional Sourcing Team consisting of key members from Power
17 Supply, Supply Chain, Sargent & Lundy (independent engineering firm), Legal, Jones
18 Day (outside counsel), and Utility Technical Support. Evaluation criteria were created to
19 adequately assess all proposals provided from bidders.

20 OG&E released a Request for Information ("RFI") and Request for Proposals
21 (RFP") for both Equipment and Balance of Plant/Construction ("BOP") via a web portal
22 which allows vendors to ask questions and OG&E can respond in a more efficient

1 manner. OG&E released four RFP's in late 2013/early 2014 related to the environmental
2 upgrades at the Sooner facilities. These multi-round contract negotiations with the
3 original equipment manufacturer and BOP bidders were led by the Cross-Functional
4 Sourcing Team and outside counsel, Jones Day. As referenced above, Sargent & Lundy
5 was hired by OG&E to be its independent engineering firm on the project.

6 **Q: Please explain how OG&E's plan to install dry scrubbers at the Sooner Generating**
7 **Facility allows OG&E to stay compliant with SPP capacity requirements?**

8 A: The SPP IM is an energy market and does not operate a capacity market or conduct
9 annual regional processes to obtain incremental capacity as is the case in certain other
10 regions. OG&E is responsible for ensuring it has capacity sufficient to serve its peak load
11 and must meet these capacity obligations through OG&E owned generation or contracts
12 for capacity. Section 4.1.9 of the SPP criteria establishes OG&E's minimum required
13 capacity margin which states:

14 Each Load Serving Member's Minimum Required Capacity Margin shall
15 be twelve percent. If a Load Serving Member's System Capacity for a
16 Capacity Year is comprised of at least seventy-five percent hydro-based,
17 then such Load Serving Member's Minimum Required Capacity Margin
18 for that Capacity Year shall be nine percent.
19

20 As a member of SPP OG&E, as well as all other SPP load serving members, are required
21 to maintain capacity levels that allow for a minimum of 12% margin between capacity
22 and demand unless the capacity year is comprised of seventy-five% hydro, in which the
23 required capacity margin is 9%. Based on the SPP capacity margin requirement and
24 OG&E's peak load, OG&E relies on 1,042 MWs of capacity from the Sooner 1 and 2

1 units to maintain this capacity margin. This capacity represents just over 15% of OG&E's
2 total peak capacity.

3 **Q: How does the SPP dispatch or select which generating units to run?**

4 A: SPP IM dispatches generating resources based on Security Constrained Economic
5 Dispatch ("SCED"). SCED is an optimization process that takes in to account certain
6 factors in selecting the generating units to dispatch, to deliver a reliable supply of
7 electricity at the lowest cost possible under given conditions. A unit's production cost to
8 generate energy will determine how often it will be dispatched in the marketplace, with
9 the cheapest forms of energy being dispatched first and the more expensive units
10 dispatched last under the given conditions. There are two stages, or time periods, to the
11 economic dispatch process: day-ahead unit commitment (planning for tomorrow's
12 dispatch) and unit dispatch (dispatching the system in real time).

13 **Q: What is the remaining net plant and scheduled retirement date of Sooner 1 and 2?**

14 A: Sooner 1's net plant remaining as of December 31, 2014 is \$144,208,983, and the unit is
15 scheduled to retire in 2044. Sooner 2's net plant remaining as of December 31, 2014 is
16 \$84,754,138, and that unit is scheduled to retire in 2045. That totals \$228,963,121 of
17 remaining net plant left at the Sooner Facility. OG&E's scrubber equipment investment
18 to date at the Sooner Facility is \$133,084,306. These add up to \$362,047,427 total
19 remaining net plant at the Sooner Facility with 28 and 29 years of expected life on Sooner
20 units 1 and 2 before they are scheduled to retire.

21 **Q: Did OG&E consider any alternatives to the scrubbing the Sooner units?**

1 A: Yes. In OG&E's 2014 IRP Update on page 40, figure 9, "Regional Haze Compliance
2 Alternatives" shows OG&E's two alternatives to scrubbing the Sooner units: (1) Convert
3 Sooner units to burn natural gas (Convert Alternative) or (2) Replace the Sooner units
4 with new combined cycle units (Replace Alternative). OG&E's RH compliance
5 alternative analysis shows the cost increase to customers associated with converting the
6 Sooner units as compared to installing scrubbers on the units is over \$100 million on a
7 30-year, net present value ("NPV") basis. The analysis also shows the cost increase to
8 customers associated with replacing the Sooner units as compared to installing scrubbers
9 on the units is over \$1 billion on a 30-year, NPV basis. Based on these NPVs and the
10 remaining useful life of the Sooner units, the replace options must be eliminated as the
11 impact to customers is not fair, just, and reasonable.

12 **Q: Will the Sooner units be dispatched more in the SPP IM as coal-fired units with**
13 **CDS technology as opposed to being converted to natural gas-fired units?**

14 A: Based on OG&E's analysis, the Sooner units will be dispatched much more in the SPP
15 IM as coal-fired units with CDS technology as opposed to being converted to natural gas-
16 fired units. This can be explained by comparing OG&E's projected price per MWh and
17 the projected capacity factors of the units through the end of their useful lives as coal-
18 fired units versus being converted to natural gas-fired units. OG&E's analysis revealed
19 the average capacity factors over the expected life of Sooner 1 and 2 operating as coal-
20 fired units with CDS technology are 72.6% and 72.1% respectively. In addition, OG&E's
21 analysis revealed the average capacity factors over the expected life of Sooner 1 and 2
22 converted to and operating as natural gas-fired units are 1.6% and 1.5% respectively.

Examining OG&E's production cost assumptions and projected price per MWh over the expected life of the units operating as coal units with CDS technology versus natural gas units explains why the units have a much higher capacity factor as coal units opposed to being converted to natural gas. When the units are converted to natural gas, the total fixed fuel adder assumption is much greater than if the units are scrubbed and kept as coal-fired units. Table 1 below, shows the average projected price per MWh in 5 year increments as a scrub option and convert option until retirement.

Table-1

	2020	2025	2030	2035	2040	2044
Scrub	\$33.94	\$39.55	\$46.16	\$53.55	\$62.25	\$69.86
Convert	\$58.80	\$70.75	\$88.37	\$111.63	\$0	\$0

The table shows the projected price per MWh for the convert option is much higher than the scrub option. Table 1 shows the convert option as \$0 for years 2040 and 2044, this is because the projected price per MWh is so high the units do not get selected in the SPP IM at all, during those years. Sooner 1 has a projected price for the convert option in year 2039 of \$129.84. Sooner 1 is not selected all in years 2040, 2041, and 2044 and has a projected price of \$150.83 in 2042 and \$159.32 in 2043. Sooner 2 has a projected price for the convert option in year 2038 of \$125.12. Sooner 2 is not selected in years 2039, 2040, 2041, and 2044 and has a projected price of \$150.83 in 2042 and \$159.32 in 2043.

Q: Please explain fuel diversity and the benefits of fuel diversity when faced with uncertainties?

A: Edison Electric Institute defines fuel diversity as:

The combination of energy sources used is referred to as the generation, or fuel mix. America's electric companies rely on a variety of domestic fuels

1 to generate electricity. Fuel diversity helps to protect electric companies
2 and their customers from contingencies such as fuel unavailability,
3 fuel price fluctuations, and changes in regulatory practices that can drive
4 up the cost of a particular fuel. Fuel diversity also helps to ensure stability
5 and reliability in electricity supply and strengthens national security.

6 The United States' electricity generation fleet is currently experiencing a shift due to a
7 timing build out of new generation resources, low natural gas prices and new regulations.
8 Caution must be taken now against an overreliance on one fuel source. In July 2014, IHS
9 Energy published a study on "The Value of US Power Supply Diversity" and explains the
10 problems of overreliance on one fuel source. The study states: To great of a reliance on
11 one fuel source, especially a fuel source with a history of price volatility creates a
12 significant risk exposure to electricity price escalation and supply disruptions.
13 "Production cost risk is the uncertainty in future prices of fuels that translate into
14 uncertainty regarding the cost to produce electricity. ...A diversified portfolio is the most
15 cost-effective tool available to manage this production cost risk."³ "The economic
16 benefits of a diverse power supply illustrate the conventional wisdom of not putting all
17 your eggs in one basket applies to power generation much in the same way as it does to
18 investing, which is called the portfolio effect."⁴ The Study went on to state:

19 Diversity enables the flexibility to respond to dynamic fuel prices by
20 substituting lower-cost resources for more expensive resources in the short
21 run by adjusting the utilization of different types of generating capacity.

³ The Value of US Power Supply Diversity, Lawrence J. Markovich, Arron Marks and Leslie Martin, IHS Energy, July 2014, p. 5.

⁴ ⁴ The Value of US Power Supply Diversity, Lawrence J. Markovich, Arron Marks and Leslie Martin, IHS Energy, July 2014, p. 18.

1 This ability to move eggs from one basket to another to generate fuel cost
2 savings is the substitution effect.⁵

3 The Study also states:

4 The 2014 winter "Polar Vortex" demonstrated the danger of relying too
5 heavily on any single fuel source and that all fuels are subject to seasonal
6 price fluctuations, price spikes, and deliverability and infrastructure
7 constraints. These recent events demonstrated that natural gas
8 deliverability remains a risk and natural gas prices continue to be hard to
9 predict, prone to multiyear cycles, strongly seasonal, and capable of
10 significant spikes.

11 Therefore, an overreliance on natural gas power generation could saddle
12 Oklahoma ratepayers with higher electricity prices in the future. PUD believes the best
13 approach to affordable and reliable electricity is to have a broad mix of power generation
14 resources where each resource can serve a purpose in the generation mix and each
15 resource has strengths that compensate for weaknesses of others.

16 **Q: Does OG&E's plan to install dry scrubbers at the Sooner Facility preserve fuel**
17 **diversity on OG&E's system?**

18 **A:** Installing scrubbers at the Sooner Facility does preserve fuel diversity on OG&E's
19 system as compared to converting the Sooner units to natural gas. In regards to capacity
20 requirements and assuming Muskogee 4 and 5 will be converted to natural gas, scrubbing
21 the Sooner units will allow OG&E to retain 27% capacity from coal-fired facilities;
22 OG&E's current coal capacity on its system is 42%. If OG&E converts the Sooner
23 facility to natural gas, this would reduce OG&E's coal-fired capacity to 820 MW or 12%

⁵ ⁵ The Value of US Power Supply Diversity, Lawrence J. Markovich, Arron Marks and Leslie Martin, IHS Energy; July 2014, p. 19.

1 of its generation mix. Because SPP accredits wind between 0.05 and 0.10% in regards to
2 capacity requirements, this would leave OG&E with 88% of its generation mix coming
3 from natural gas or essentially from one fuel source. By scrubbing Sooner 1 and 2,
4 OG&E will preserve some fuel diversity on its system.

5 **Q: Does OG&E's plan to install dry scrubbers at the Sooner Facility provide the**
6 **Company and its customers a balanced approach of two risks when facing an**
7 **uncertain environment?**

8 **A:** Yes, by scrubbing the Sooner units the Company is balancing two risks associated with
9 fossil fuel power generation in the future. Continuing to operate coal-fired power
10 generation units in the future presents the risk of not knowing if future regulations could
11 shut down coal-fired facilities in the United States. However, coal does offer the
12 reliability benefit in that it can be stored onsite, alleviating the risk against fuel
13 unavailability. The risk associated with natural-gas power generation in the future deals
14 with fuel price uncertainty and fuel unavailability.

15 As stated earlier in my testimony, natural gas has a history of price volatility and
16 weather events and infrastructure constraints can make the fuel unavailable in times of
17 need. OG&E alternatives to the replace options are the convert option and the scrub
18 option. While the scrub all option scored well in OG&E's analysis, the scrub all option
19 leaves OG&E exposed to a large amount of risk related to potential future regulations that
20 could affect coal-fired power plants. The convert all option leaves OG&E exposed to a
21 large amount of risk related to the future price of natural gas and fuel availability.

1 In discussed earlier in my testimony, if OG&E converts all four of its affected
2 coal-fired units to natural gas-fired units this could potentially saddle Oklahoma
3 ratepayers with higher energy costs in the future and relying on 90% of it's accredited
4 capacity from one fuel source. PUD believes scrubbing Sooner 1 and 2 and converting
5 Muskogee 4 and 5 to natural gas balances the risk of potential new regulations affecting
6 coal-fired power plants and the uncertainty relating to the future price of natural gas and
7 natural gas unavailability.

RECOMMENDATION

8 **Q: What is the PUD's recommendation in this Cause?**

9 **A:** The PUD recommends that this Commission approve OG&E's plan to install dry
10 scrubbers at the Sooner Generating Facility. PUD recommends approval of the plan to
11 install dry scrubbers for the following reasons:

- 12 • Installation of the scrubbers achieves compliance with the Regional Haze FIP
13 emission requirements for SO₂ using BART;
- 14 • Installation of the scrubbers allows OG&E to stay compliant with SPP capacity
15 requirements and still remain competitive in the SPP IM; and
- 16 • Installation of the scrubbers allows OG&E to preserve fuel diversity in the face of
17 uncertainties.

I state, under penalty of perjury under the laws of the State of Oklahoma, that the foregoing is true and
correct.

Signature

Date

03/14/2016

Chaplin Responsive Testimony
OKLAHOMA GAS AND ELECTRIC COMPANY – Cause No. PUD 201600059



Jason C Chaplin

Exhibit JCN-1
2016 Curriculum Vitae

Contact	j.chaplin@occeemail.com Tel: 405-521-4114 Fax: 405-521-2087	580 Jim Thorpe Building P.O. Box 52000 Oklahoma City, OK 73152
Education	Oklahoma City Community College • A.A., General Studies	2002-2005
	University of Nevada Las Vegas • B.S., Hotel Administration • B.S., Gaming Management	2005-2009
	Oklahoma City University • M.S., Energy Management	2013-2015
Work Experience	Oklahoma Corporation Commission Public Utility Regulatory Analyst <ul style="list-style-type: none">Research and analysis of Public utility issues; analyzing utility applications, reports, financial records, and cost studies in order to make accurate recommendationsOklahoma Corporation Commission voting member on the Cost Allocation Working Group (CAWG) and the 2015 CAWG Chairman, CAWG voting member on the Capacity Margin Task Force (CMTF), Economic Studies Working Group (ESWG), Gas Electric Coordination Task Force (GECTF), Regional Allocation Review Task Force (RARTF)	2013-Present
	Independent Petroleum Landman <ul style="list-style-type: none">Mineral/Surface Title ResearchPrepare Ownership Reports/Runsheets/Flow ChartsPrepare Documents/Closing Packets for Lease Acquisition	2011-2013
	Westin Hotel Casino Spa, Las Vegas, NV Customer Service Professional <ul style="list-style-type: none">ValetFront DeskCatering and EventsBarbackBartender	2005-2011
Professional Training	<ul style="list-style-type: none">National Association of Regulatory Utility Commissioners Utilities Rate SchoolInstitute of Public Utilities Grid SchoolWitness PreparationInternships:<ul style="list-style-type: none">Hospitality- Westin Casuarina Hotel Casino SpaBeverage- Westin Casuarina Hotel Casino SpaGaming- ShuffleMaster EntertainmentEnergy- Oklahoma Corporation Commission	

CERTIFICATE OF SERVICE

This is to certify that on March 14, 2016, a true and correct copy of the above and foregoing, was sent via electronic mail and/or United States Postal Service, postage fully prepaid thereon to the following interested parties:

Dara Derryberry
Eric Davis
Kimberly Carnley
Victoria Korrekt
Office of Attorney General
313 NE 21st Street
Oklahoma City, OK 73105
dara.derryberry@oag.ok.gov
eric.davis@oag.ok.gov
kimberly.carnley@oag.ok.gov
victoria.korrekt@oag.ok.gov

William J. Bullard
Kimber Shoop
William Humes
Oklahoma Gas and Electric Company
P.O. Box 321
Oklahoma City, Oklahoma 73101
bullarwj@oge.com
shoopkl@oge.com
humeswl@oge.com

Deborah R. Thompson
OK Energy Firm, PLLC
PO Box 54632
Oklahoma City, OK 73154
dthompson@okenergyfirm.com

Jack G. Clark Jr.
CLARK, WOOD, & PATTEN, P.C.
3545 N.W. 58th Street, Suite 400
Oklahoma City, Oklahoma 73112
cclark@cswp-law.com

Thomas P. Schroedter
Hall, Estill, Hardwick, Gable,
Golden & Nelson, P.C.
320 S. Boston, Suite 200
Tulsa, OK 74103
tschroedter@hallestill.com

Cheryl A Vaught
Vaught & Conner, PLLC
1900 NW Expressway, Suite 1300
Oklahoma City, OK 73118
cvaught@vcokc.com

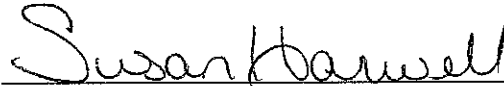
Jennifer H. Castillo
Hall, Estill, Hardwick, Gable,
Golden & Nelson, P.C.
100 N. Broadway, Suite 2900
Oklahoma City, OK 73102
jcastillo@hallestill.com

Jon Laasch
Jacobson & Laasch
212 East Second Street
Edmond, OK 73034
jonlaasch@yahoo.com

Jacquelyn L. Dill
Dill Law Firm, P.C.
3133 NW 63rd Street
Oklahoma City, OK 73116
jdill@dilllawfirm.com

Anthony J Ferate
500 NE 4th Street
Oklahoma City, OK 73105
ajferate@oipa.com

Marc Edwards
Dominic D. Williams
Jim Roth
PHILLIPS MURRAH, P.C.
Corporate Tower, Thirteenth Floor
101 N. Robinson
Oklahoma City, OK 73102
medwards@phillipsmurrah.com
ddwilliams@phillipsmurrah.com
jaroth@phillipsmurrah.com



TISH COATS, Regulatory Admin. Oversight Manager
BARBARA COLBERT, Administrative Assistant
SUSAN HARWELL, Asst. PUD Regulatory Analyst
LESIA POLLARD, Asst. Telecom PUD Regulatory Analyst
KELI WEBB, Administrative Assistant
OKLAHOMA CORPORATION COMMISSION