NOTICE OF CONFIDENTIALITY
PORTIONS OF THIS DOCUMENT HAVE BEEN FILED UNDER SEAL

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO

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IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR APPROVAL OF THE 600 MW RUSH CREEK WIND PROJECT PURSUANT TO RULE 3660(H), A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE RUSH CREEK WIND FARM, AND A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE 345 KV RUSH CREEK TO MISSILE SITE GENERATION TIE TRANSMISSION LINE AND ASSOCIATED FINDINGS OF NOISE AND MAGNETIC FIELD REASONABLENESS.	)	**PROCEEDING NO. 16A-0117E**

PUBLIC VERSION DIRECT TESTIMONY AND ATTACHMENTS OF RILEY HILL

ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

NOTICE OF CONFIDENTIALITY:
PORTIONS OF THIS DOCUMENT HAVE BEEN FILED UNDER SEAL

Pages 41, lines 7, 8, 19; 42, line12; 44 lines 2, 7, 13, 15; 45, line 4; 46, lines 11, 12, 14, 22
Attachments RH-5, RH-6, and RH-7

May 13, 2016

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO**

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<u>SUMMARY OF THE DIRECT TESTIMONY OF RILEY HILL</u>

Mr. Riley Hill is Senior Vice President, Energy Supply of Xcel Energy Services Inc. He is responsible for the design, construction and operations of all non-nuclear generating facilities that are used to serve customers in all of the service territories of Xcel Energy's utilities that includes portions of eight states.

Mr. Hill describes several key reasons why the Company selected Rush Creek I and II as a strong and viable site for wind generation development. Included among these reasons for the Company's site selection are the site's location in a known high wind energy resource area of eastern Colorado, and the site's location relative to the Company's existing Missile Site Substation, which made the site a feasible option from a transmission delivery perspective. Mr. Hill

also describes the extensive due diligence process that the Company underwent to verify that the site was a low risk site with high quality wind production potential. A significant component of this due diligence effort involved a detailed third party analysis of the proposed wind resource performed by Mr. Matthew Hendrickson of 3TIER by Vaisala, who is another witness in this proceeding.

Mr. Hill further supports the Company's Application by demonstrating that the Rush Creek Wind Project can be constructed at a reasonable cost compared to the cost of similar eligible energy resources available in the market, as required by Rule 3660(h)(I). Mr. Hill walks through how the Project costs were estimated based, in part, on the Company's extensive experience with the development, construction, and operation of over 850 MW of utility-owned wind generation facilities in the NSP region. The total cost of construction of Rush Creek I and II is estimated to be approximately $915 million in capital costs.

Mr. Hill compares the total cost of construction of Rush Creek I and II with three wind farm projects developed by a Company affiliate, Northern States Power Company, a Minnesota corporation ("NSP") that are currently under construction or have been recently placed in service. Additionally, Mr. Hill compares the Rush Creek I and II construction cost with industry data provided in a Lawrence Berkeley National Laboratory report attached to his testimony, which provides an illustrative comparison with industry cost trends. The cost per kW installed of Rush Creek I and II, based on the estimated construction cost of $915 million, is $1,525/kW installed. This method of using the project nameplate capacity in determining the cost per kW installed is typical in the industry.

Based on Mr. Hill's cost comparison, he concludes that the construction cost of Rush Creek I and II is reasonable as compared to the three Company affiliate wind farm projects, as the estimated $1,525/kW installed cost is comparable to the NSP projects. Moreover, Mr. Hill concludes that the $1,525/kW cost per kW installed of Rush Creek I and II is reasonable as compared to the national 2014 average of $1,710/kW installed and the lowest-cost Interior region average of $1,640/kW installed, which are the $/kW installed from the data set analyzed in the Lawrence Berkeley National Laboratory report.

Mr. Hill also describes the six key components of constructing a wind farm and explains how these construction components are similar in nature to the type of construction work the Company does all across its service territory. Mr. Hill demonstrates that the Company has a long and successful history of constructing, operating, and maintaining tens of thousands of megawatts of generating units of all fuel types and sizes, including wind turbine generators, and tens of thousands of miles of transmission and distribution lines, as well as over a thousand substations. It is this depth of experience and competency that positions the Company well for successfully constructing the proposed 600 MW Rush Creek Wind Project.

Mr. Hill describes the four major contracts associated with the Rush Creek Wind Project. First, the Company has entered into two similar Purchase and Sale Agreements ("PSAs") for the acquisition of the construction ready Rush Creek I and II site as a "develop-transfer" transaction. Second, the Company has entered into a Turbine Supply Agreement ("TSA") with Vestas for 300 model 2.0 MW

V110 Vestas wind turbines. Third, the Company will enter into a fixed price Balance of Plant ("BOP") construction contract for the installation of the wind turbines and construction of the site infrastructure. A fourth major contract is the Service, Maintenance, and Warranty Agreement ("SMWA"), which is also with Vestas. The contracts are designated highly confidential and included as part of the Company's filing package.

Mr. Hill also lays out the construction schedule for the Rush Creek Wind Project and explains how the Project schedule and the initial turbine fabrication schedule under the wind TSA contract have been structured to ensure that the Company will qualify for the safe harbor to obtain the 100 percent PTC for customers. Additionally, Mr. Hill describes the comprehensive schedule risk mitigation and cost controls in place, which are integral to help ensure that the Rush Creek Wind Project is developed on time and on budget.

Finally, Mr. Hill describes the Company's transmission interconnection request for Rush Creek I and II and walks through the estimated cost of a 230 kV alternative (approximately $90.2 million, or $150/kW) and a 345 kV alternative (approximately $121.4 million, or $202/kW). Although the 345 kV alternative is more expensive on a capital cost basis, Mr. Hill explains that compared to a 230 kV alternative, the 345 kV alternative (1) has 0.9% lower line losses based upon the expected production at Rush Creek I and II, (2) provides significantly more capacity (1,600 MW with the 345 kV as opposed to 900 MW with the 230 kV), and (3) provides a greater ability to take on additional renewable energy (1,000 MW with the 345 kV as opposed to 100 MW with the 230 kV) in the future. Based on this comparison, Mr. Hill concludes that the proposed 345 kV transmission interconnection alternative is the most reasonable alternative and provides the most benefit to customers.

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO**

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DIRECT TESTIMONY AND ATTACHMENTS OF RILEY HILL

INDEX

INDEX

LIST OF ATTACHMENTS

Attachment No. RH-1	Rush Creek Wind Project Map
Attachment No. RH-2	Public Service Eligible Energy Resources (Wind) Map
Attachment No. RH-3	Company Wind Farm Development Model
Attachment No. RH-4	Xcel Energy Wind Farm Construction Sequence Photos
Highly Confidential Attachment No. RH-5	Purchase and Sale Agreement (Rush Creek I and II)
Highly Confidential Attachment No. RH-6	Turbine Supply Agreement
Highly Confidential Attachment No. RH-7	Construction Cost Estimate
Attachment No. RH-8	Construction Schedule (30-Line)
Attachment No. RH-9	Lawrence Berkeley National Laboratory Report

GLOSSARY OF ACRONYMS AND DEFINED TERMS

Acronym/Defined Term	**Meaning**
Act	Omnibus Appropriations Act
AFUDC	Allowance for Funds Used During Construction
BOP	Balance of Plant
BOT	Build Own Transfer
CACJA	Clean Air-Clean Jobs Act
CAR	Cost Analysis Report
GW	Gigawatt
GWh	Gigawatt hour
IPP	Independent Power Producer(s)
kV	kilovolt
kW	kilowatt
MET	Meteorological
MW	Megawatt(s)
NCF	Net Capacity Factor
NSP	Northern States Power Company, a Minnesota corporation
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
POD	Plan of the Day
PPA	Power Purchase Agreement
PSAs	Purchase and Sale Agreements

Acronym/Defined Term	**Meaning**
PTC	Production Tax Credit
Public Service or Company	Public Service Company of Colorado
RFP	Request for Proposal
ROW	Right of Way
SMWA	Service, Maintenance, and Warranty Agreement
TSA	Turbine Supply Agreement
Xcel Energy	Xcel Energy Inc.
XES or Service Company	Xcel Energy Services Inc.

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO

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DIRECT TESTIMONY AND ATTACHMENTS OF RILEY HILL

I. INTRODUCTION, QUALIFICATIONS, AND PURPOSE OF TESTIMONY

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Riley Hill. My business address is 1800 Larimer, Suite 1300, Denver, Colorado 80202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT POSITION?

A. I am employed by Xcel Energy Services Inc. (“XES”) as Senior Vice President, Energy Supply. XES is a wholly-owned subsidiary of Xcel Energy Inc. (“Xcel Energy”), and provides an array of support services to Public Service Company of Colorado (“Public Service” or “Company”) and the other utility operating company subsidiaries of Xcel Energy on a coordinated basis.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THE PROCEEDING?

A. I am testifying on behalf of Public Service.

Q. HAVE YOU INCLUDED A DESCRIPTION OF YOUR QUALIFICATIONS, DUTIES, AND RESPONSIBILITIES?

A. Yes. A description of my qualifications, duties, and responsibilities is included at the end of my testimony.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my testimony is to provide a detailed overview of the Rush Creek Wind Project the Company is proposing to construct in this proceeding. In my testimony, I will describe:

- The selection of the Rush Creek I and II generation sites and key attributes of the Project;
- The acquisition of the wind development rights from Invenergy and the accompanying Purchase and Sale Agreements ("PSA");
- The major material and construction contracts the Company has or expects to enter into for construction at Rush Creek I and II, Turbine Supply Agreement ("TSA")[1] and Balance of Plant contract ("BOP");
- The design and construction cost estimate for Rush Creek I and II;
- The construction schedule for the Project;
- The construction management techniques and oversight process the Company is employing to ensure the Project is developed on time and on budget;
- A comparison of the construction cost of Rush Creek I and II to the current market for similar wind projects;
- The transmission costs for the Rush Creek Gen-Tie; and

[1] The TSA consists of two interrelated agreements (Wind Turbine Supply Agreement, and Amended and Restated Wind Turbine Supply Agreement) and is presented as a single attachment in this proceeding.

- The best value employment metrics associated with the Rush Creek Wind Project.

I will demonstrate that this is a strong project that allows us to take advantage of the established wind resource in the area, and, as required by Rule 3660(h)(I), I will further show that the Company's proposed Rush Creek Wind Project can be constructed at a reasonable cost relative to the cost of similar wind resources available in the market. I provide background and describe associated processes the Company has undertaken to come up with an accurate cost estimate for the Project. Moreover, the Company's proposed design and construction plan provides ample protection for customers against schedule and/or cost risks. In conclusion, I demonstrate the proposed Rush Creek Wind Project can be constructed in a timely and cost effective manner to ensure that customers obtain the substantial economic benefits the Project is forecast to provide.

Q. ARE YOU SPONSORING ANY ATTACHMENTS AS PART OF YOUR DIRECT TESTIMONY?

A. Yes, I am sponsoring Attachments RH-1 through RH-9, including Highly Confidential Attachments RH-5, RH-6, and RH-7. In addition, my testimony and all attachments have been prepared by me or under my supervision.

II. PROJECT DESCRIPTION AND SITE SELECTION

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section of my testimony is to provide a description of the Project, with a particular focus on why the Company selected the Rush Creek I and II site for the Rush Creek Wind Project. As part of this discussion, I walk through our due diligence approach and efforts to date.

Q. PLEASE PROVIDE A DETAILED DESCRIPTION OF THE RUSH CREEK WIND PROJECT.

A. The Rush Creek Wind Project will be a 600 Megawatt ("MW") nameplate capacity[2] wind farm located on two proximate sites known as Rush Creek I and Rush Creek II totaling approximately 96,000 acres of land south of Limon, Colorado, and spanning Elbert, Lincoln, Cheyenne and Kit Carson counties. To develop Rush Creek I and II, Public Service will install 300 model 2.0 MW V110 Vestas wind turbines designed for high energy production to reach the 600 MW capacity. Site infrastructure will include access roads, foundations, electrical cable collection systems, and collection system substations. Generation output will tie into the Public Service grid through a new approximately 90-mile 345 Kilovolt ("kV") generation intertie transmission line (referred throughout the Company's application and supporting testimony as the "Rush Creek Gen-Tie", or "Gen-Tie"). The Rush Creek Gen-Tie will interconnect at the existing

[2] "Nameplate" is the published maximum sustained output of the wind turbine generator units. Each turbine has a published maximum sustained output of 2 MW and there are 300 turbines for Rush Creek I and II; therefore, the total nameplate capacity is 600 MW.

Missile Site Substation in Arapahoe County. A map of the overall Rush Creek Wind Project is provided as Attachment RH-1. As discussed in more detail by Company witness Ms. Alice Jackson, the Rush Creek Wind Project will be completed in time to qualify for the full value of federal Production Tax Credits ("PTC"), therefore maximizing the available cost savings to our customers.

Q. GIVEN THAT THERE ARE TWO SITES, RUSH CREEK I AND II, WHY DOES THE COMPANY CONSIDER IT TO BE A SINGLE PROJECT?

A. This is a single project because both parcels were negotiated and designed as a single 600 MW wind generation project notwithstanding that the two sites are not adjacent. The cumulative costs of the project are premised upon the full 600 MW development of the site. Therefore, the scope of the project cannot be reduced without renegotiating or re-estimating contracts, which would result in reduced economies of scale, a reassessment of energy production and cost profile, and ultimately a reduction in customer benefits.

Q. PLEASE DESCRIBE HOW THE SITE WAS SELECTED.

A. In December 2015, following the PTC extension after the Omnibus Appropriations Act ("Act") was signed into law by President Obama, the Company immediately began exploring the potential for developing wind resources. As a first step in the evaluation process, the Company focused on a known high wind energy resource area of Colorado where other wind projects that the Company currently acquires energy through power purchase agreements are located. Specifically, the Limon I, Limon II, Limon III, Golden West and Cedar Point wind farms are all in this general area of eastern Colorado, and total just over 1 Gigawatt ("GW") of nameplate capacity. Attachment RH-2 provides a regional map of eastern Colorado that shows the locations of the eligible energy wind resources from which Public Service purchases power relative to the location of Rush Creek I & II. Attachment RH-1 shows a more detailed view of the existing wind farms in the immediate vicinity of Rush Creek I & II.

The topography of this area provides ideal conditions for siting wind energy facilities. Specifically, the ridge lines and rolling hills of the four counties (Elbert, Lincoln, Cheyenne and Kit Carson counties) encompassing the Rush Creek Wind Project site plan offer the Company the ability to efficiently locate wind turbines to maximize their generation output. Generally speaking and by way of background, siting the turbines in higher elevation areas allows for the capture of the highest wind speeds relative to the project area, thus maximizing energy production and overall capacity factor, while the wide gently rolling hills allow for optimally separated strings of turbines.

Q. WHAT HAPPENED AFTER THE COMPANY IDENTIFIED THIS REGION OF COLORADO AS SUITABLE FOR DEVELOPMENT OF NEW WIND GENERATION?

A. After identifying this area as particularly advantageous for a wind farm, we began contacting developers that either have been generally active in the targeted area or recently presented unsolicited proposals to the Company for informational purposes for projects in this area.

Q. WHY WAS THE RUSH CREEK I AND II SITE SELECTED BY THE COMPANY?

A. After evaluating several options and weighing all factors, we selected the Rush Creek I and II site for several key reasons.

First, the location of the Rush Creek I and II site relative to the existing Missile Site Substation made the site a viable option from a transmission delivery perspective because: (1) there is sufficient injection capability at the Missile Site Substation; and (2) the approximately 90-miles of generation intertie between the site and Missile Site Substation is feasible to construct within the timeframe required to obtain the full 100% PTC benefit.

Second, as described above, the topography makes this site well suited for new large scale wind development, and its proximity to the other successful wind farms operating in this area provides further support that this site will allow us to harness the strong wind energy resource that exists in this area.

Third, because of the site's proximity to five other wind farms from which the Company acquires over 1 GW of capacity, we have deep experience with wind resources in this region, including access to extensive data and forecasting capabilities.

Fourth, the selection of the Rush Creek I and II site allowed us to partner with Invenergy Wind Development North America, LLC ("Invenergy") – a well-established Independent Power Producer ("IPP"). Invenergy is North America's largest independent wind power generation company, with a strong track record of success having developed 68 wind farms across the United States, Canada and Europe, totaling over 7,654 MW. The opportunity to partner with Invenergy on the acquisition of the Rush Creek sites allowed us to combine the Company's construction and operations expertise with the wind development expertise of Invenergy, which gave us great confidence in having a "construction-ready" site of this scale within the timeframe necessary to take advantage of full PTC benefits for our customers.

In sum, Invenergy originally acquired the rights to these sites for a reason. Based on its extensive wind development expertise, Invenergy saw the ability to harness a strong wind resource and develop a project at the Rush Creek I and II sites. We picked the sites for the same reason, but we did not merely rely on Invenergy's representations about the wind resource available at the sites. To further verify and confirm that the Rush Creek I and II site was a strong and viable option, our Public Service team performed extensive due diligence. As I discuss later in my testimony, a significant component of this due diligence effort involved a detailed third party analysis of the proposed wind resource performed by Mr. Matthew

Hendrickson of 3TIER by Vaisala ("Vaisala"). Mr. Hendrickson is another witness in this proceeding.

Q. WHAT KIND OF DUE DILIGENCE DID THE COMPANY CONDUCT ON RUSH CREEK I AND II?

A. We identified due diligence tasks based upon our Northern States Power Company, a Minnesota corporation ("NSP"), wind farm development model. A sample of this model is attached as Attachment RH-3, and it has been deployed and developed through experience with our NSP wind farms. We started using this model with the Grand Meadow Wind Farm in 2008, and have since used it with the Nobles, Pleasant Valley, Border Winds, and Courtenay wind farms, which NSP owns and operates. The due diligence model has evolved over the years as we have gained experience with these wind farms in Minnesota and we have added content through knowledge gained on each of these NSP projects.

Our due diligence process begins with a matrix that features approximately 70 questions that we need to ask and answer in evaluating a proposed wind project for ultimate utility ownership. The nine general categories of questions or inquiry are: (1) transmission and interconnection; (2) land control; (3) wind turbine supply; (4) wind data; (5) siting and permitting; (6) technical attributes; (7) financial considerations; (8) legal; and (9) environmental. Questions in these categories are assigned to Company personnel with relevant skill sets and expertise, and we conduct weekly meetings to review research and due diligence outcomes and determine whether each question or issue could be closed out or whether further inquiry was necessary. The ultimate goal of the process is to ensure that a proposed project has been properly developed and is “shovel ready” or “construction ready” in industry terminology.

Q. HOW DID THE COMPANY USE THIS MODEL FOR RUSH CREEK I AND II?

A. The actions in the due diligence model have been undertaken and will continue with the Rush Creek Wind Project. Action items have been divided up among the relevant groups, consistent with the NSP model, based upon each individual group’s specialized expertise and core competencies. These groups have worked through their assigned action items and reported back to the Company’s project management team on their status and potential impacts. These groups also reviewed Invenergy’s documents and data to identify any questions and/or issues with the Project to date. Public Service also contracted with third party consultants where appropriate to verify the developer’s information.

Q. HAS THE COMPANY’S DUE DILIGENCE EFFORT TO DATE IDENTIFIED ANY SIGNIFICANT ISSUES THAT WOULD HALT THE DEVELOPMENT OF THE PROJECT?

A. No. Based on the results of the Company’s due diligence process, all nine categories of review have been identified as low risk and are expected to remain low risk throughout the acquisition, design, engineering, permitting, and construction phases of the Project. For example, the environmental evaluation identified low risk with regard to area wetlands, presence of endangered species, avian impacts, and cultural and historical resources. Other studies that may impact the Project, such as Federal Aviation Administration flight path studies of nearby or affected airports, have also been reviewed and determined as low risk to the Rush Creek Wind Project. Additional lower risk studies and assessments will be conducted throughout summer 2016, such as cultural resource, microwave beam path, wildlife, and soil/geotechnical studies. Additionally, project performance and wind data was independently verified to confirm its acceptability for the Project.

The most significant studies are complete and, by early fall, I expect that 80% of the outstanding studies will be complete. The timing and progression of these studies and site assessments is typical for a construction project prior to securing regulatory approvals. To the extent issues are identified through the further ongoing due diligence discussed above, we fully anticipate based on prior experience that we can mitigate any risks through project design. The available acreage at Rush Creek I and II allows for final turbine siting to avoid any undesirable soil conditions, geotechnical conditions or isolated cultural resource locations that may be identified during detailed studies. As provided in the PSAs, Invenergy will select 315 available sites for 300 turbines to allow us to react to the possible, though improbable, issues noted above. Having access to preselected additional sites is typical in the industry, and gives us flexibility to mitigate potential issues through siting and project design.

Q. PLEASE DESCRIBE THE DUE DILIGENCE RELATING TO PROJECT PERFORMANCE AND ASSESSMENT OF WIND DATA.

A. The due diligence relates to project performance and assessment of wind data consisted of the third party wind resource assessment that was performed by Vaisala. We went beyond just accepting the wind resource data we received from the developer, Invenergy, and retained the services of Vaisala to further verify the quality of the wind resource at Rush Creek I and II. This third party wind resource assessment was a significant component of our due diligence process.

Q. PLEASE BRIEFLY ADDRESS VAISALA'S ROLE IN THE DUE DILIGENCE PROCESS.

A. Public Service contracted with Vaisala to perform a third party analysis of the Rush Creek I and II wind data, and Mr. Matthew Hendrickson of Vaisala is submitting direct testimony in this proceeding. Vaisala is a recognized leader in weather instrumentation and industrial monitoring and was selected due to their significant expertise in this area. Moreover, Xcel Energy utilities have previously worked with Vaisala on other projects. As explained in more detail in the testimony of Mr. Hendrickson, as part of the wind resource assessment, Vaisala reviewed and confirmed Invenergy's site meteorological ("MET") tower data taken over the past six to seven years and compared that data to industry available information to develop models of the wind energy resource. Vaisala concluded that using the proposed Vestas model 2.0 MW V110 wind turbines, the expected net generation at Rush Creek I is 1,498.4 Gigawatt hour ("GWh") with a net capacity factor of 42.7%, and the expected net generation at Rush Creek II is 813.4 GWh with a net capacity factor of 46.4%. Net capacity factor characterizes the efficiency of the plant and is derived from taking what the plant is expected to generate and dividing it by the amount the plant could generate if operated at full output for an entire year.

Q. PLEASE BRIEFLY ADDRESS THE WIND RESOURCE ASSESSMENT CONDUCTED BY INVENERGY.

A. Developers typically analyze a wind farm site's wind resource by using wind data collected on-site and correlating it to publicly available long-term data sets to show the estimated performance of the site projected over the wind farm's estimated life. As part of the final engineering and design phase, Public Service and Invenergy will continue to optimize the production of Rush Creek I and II by performing a Production Analysis. This analysis will evaluate turbine locations and revise the site layout accordingly to increase the production of the site while also controlling construction costs.

Q. IS OBTAINING THIS TYPE OF DATA SIMILAR TO THE APPROACH USED IN DEVELOPING OTHER WIND PROJECTS?

A. Yes, receiving this type of performance data from the developer is typical in developing a wind project. Nevertheless, we also recognized in this case that the Rush Creek Wind Project represents a significant investment. Accordingly, to increase our confidence in the wind resource at the Rush Creek I and II site and as another check in our robust due diligence process, we retained Vaisala to review the wind data and provide the Company with its independent assessment of the wind resource.

Q. HOW DID THE COMPANY ULTIMATELY USE THIS DATA FROM INVENERGY AND VAISALA?

A. We chose to use the results from Vaisala's assessment in our cost analysis, which was the most appropriate given the loss factors and uncertainties factored into Vaisala's assessment methodology. Company witness Mr. James Hill discusses how Vaisala's wind resource assessment results were utilized to model the cost/benefit analysis of the Rush Creek Wind Project. The details of Vaisala's wind resource assessment methodology and results are discussed further in the testimony of Mr. Hendrickson.

Q. BASED ON THE SITE SELECTION PROCESS AND DUE DILIGENCE CONDUCTED TO DATE, DO YOU THINK THE RUSH CREEK WIND PROJECT IS A STRONG PROJECT?

A. Yes. The Company has identified a low risk site with a high quality wind resource, and as I discuss further below, the Project compares favorably from a cost perspective with other similar wind projects in the market. The benefits from a well thought out project with a strong wind resource and favorable price will flow to our customers, and the Rush Creek Wind Project satisfies each of these criteria.

III. WIND FARM CONSTRUCTION AND SPECIFICS OF OUR RUSH CREEK WIND PROJECT

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section of my testimony is to discuss how we construct a wind generation project and how our prior experience with similar projects gives us the requisite skills to develop this Project. I will also address how the Company has acquired the wind development rights for Rush Creek I and II and give background on the significant contracts the Company has entered into or intends to enter into for the Rush Creek Wind Project.

A. The Wind Farm Construction Process

Q. PLEASE DESCRIBE WHAT IS INVOLVED IN BUILDING A WIND GENERATION PROJECT, INCLUDING THE MAJOR CONSTRUCTION COMPONENTS OF THE RUSH CREEK WIND PROJECT.

A. Constructing a wind generation project, including the Rush Creek I and II, generally involves six (6) main components: turbine access roads, turbine foundations, tower erection, collector system, collector substation, and an operations and maintenance building. These components are described below and shown in the corresponding numbered photos included as Attachment RH-4, which are meant to provide some visual context for each of these construction components. While the components outlined below represent the typical construction sequence for any wind farm, some or many of these activities can occur simultaneously.

1. Road Construction: The first step in the construction sequence is to construct access roads to the turbine sites and substation locations to allow equipment and material delivery during construction. Roads will be designed with proper grading and drainage, and will be specifically constructed to support heavy machinery and construction materials. Following construction, the roads will continue to be used to access each turbine for ongoing maintenance and operation purposes.

2. Turbine Foundations: Foundations will be constructed at each tower site location using a typical foundation design of reinforced concrete consisting of layers of steel rebar and a centrally located anchor bolt cage design to support the Vestas loading requirements.

3. Tower Erection: Once the foundations have been constructed and backfilled, the approximately 80-meter turbine towers comprised of three sections will be unloaded adjacent to each foundation and erected using a crane. Turbine component deliveries will be scheduled a few weeks in advance of the tower erection to assure that there is an adequate "inventory" of turbine components staged on site and allow for unimpeded turbine erection. The nacelle is then raised and bolted to the top of the tower; the nacelle houses all of the generating components in a wind turbine, including the main shaft, gearbox, generator, and transformer. The hub and three 54-meter-long blades will then each be raised and attached to the nacelle. These components constitute the hub assembly.

4. Collector System: An electrical collector system will be trenched in underground to bring each turbine's electrical output to the collector substation described in #5 below. The collector cable sizes will be determined by the final engineering design.

5. Collector Substation: A collector substation will be constructed to accept the underground collection cables from each circuit and combined them prior to the voltage being stepped up by transformers from the turbines' 34.5 kV generation voltage to transmission interconnection 345 kV voltage where it will then connect to the Rush Creek Gen-Tie and electric grid for delivery to customers.

6. <u>Operations & Maintenance Building:</u> An O&M building will be constructed on each site to house the facility office, maintenance crews, computer systems for plant operations, spare parts storage, repair and maintenance shop areas and equipment storage.

Q. PLEASE GENERALLY ADDRESS THE COMPANY'S ROLE IN THE CONSTRUCTION PROCESS.

A. For Rush Creek I and II, Company personnel will assume overall project management responsibility. I have great confidence in our employees' collective ability to provide the overall project management based on the history of their successful project management of much larger and more complex projects in recent years. In addition to our internal leadership, both Vestas and the selected Balance of Plant ("BOP") contractor will have project management and engineering personnel on site as well. The Company's multi-disciplinary team, Vestas, and the BOP contractor ultimately selected will be highly invested in the success of the project and will work hand in hand with Company management to ensure the project is brought on-line safely, on time and on budget. Vestas and any of the BOP contractors being considered are major players in the wind farm industry and know that the success of this project is essential to their future opportunities in the industry.

Q. HOW IS THE COMPANY'S PREVIOUS CONSTRUCTION AND PROJECT DEVELOPMENT EXPERIENCE RELEVANT TO THIS PROCEEDING?

A. We have a long and successful history in all aspects of the types of construction associated with wind farm projects. To provide some overall perspective, currently the electric systems of all four of the Xcel Energy utilities are comprised of approximately 18,000 MWs of generating capacity (6,566 MWs of wind), 19,523 miles of transmission, 1,219 substations, and 48,068 miles of overhead and 26,580 miles of underground distribution. Therefore, we have constructed, operated, and maintained tens of thousands of megawatts of generating units of all fuel types and sizes including wind turbine generators and tens of thousands of miles of transmission and distribution lines, as well as over a thousand substations. All of our non-wind related generating stations that utilize combustion turbines, combined cycle units, and coal fired units are significantly more complex than wind turbine generators. Traditional generating units have hundreds to thousands of components (e.g., pumps, motors, boilers, and coal mills) not found on wind turbines.

Most importantly, we perform these projects safely and currently have an Occupational Safety and Health Administration ("OSHA") rate in the top quartile of the industry. For example, safety programs put in place and implemented by the Company for the Cherokee Clean Air-Clean Jobs

Act ("CACJA") project received OSHA's Voluntary Protection Program STAR status for excellence.

Q. HOW DOES THIS EXPERIENCE SPECIFICALLY APPLY TO THE CONSTRUCTION OF RUSH CREEK I AND II?

A. Based on the six main construction components I outlined above, we view the construction of a wind farm as very similar to construction of our typical transmission projects in that we build roads into an open field, set foundations, erect towers, pull/bury wire, build a substation and connect to the grid. We are very skilled at each of these various wind farm construction components because of their similarity to the type of work we do all across our service territory. For example, the collector system of a wind farm is basically an underground distribution system that is nearly identical (a collector system utilizes a higher voltage than our typical residential distribution systems) to an underground distribution system widely used across our service territory to serve residential subdivision customers.

Similarly, the substations, transformers, and transmission line are all identical to infrastructure in place all across our service territory. Development of all of these components, i.e., generators, substations, transmission lines and underground distribution systems, are our core competencies and we have decades of experience in designing, constructing, operating and maintaining these components.

Furthermore, the commissioning process for the collector system, transmission and substation facilities is identical to the commissioning of any other substation, transmission, and distribution project on our system. The commissioning of the wind turbines is much simpler than the commissioning of a gas combustion turbine, combined cycle, or gas/coal fired steam generating station as there are significantly fewer moving parts and systems. As part of their contract to supply the turbines, Vestas will commission the wind turbines for the Company once construction is completed. Commissioning wind turbine generators includes, but is not limited to, calibrations, UPS battery checks, blade pitch, yaw checks, and equipment alignments. When all testing and commissioning has been completed, we declare the facility commercial and turn its operation over to our commercial operations group to dispatch.

Q. PLEASE BRIEFLY ADDRESS SPECIFIC EXPERIENCES WITH OTHER WIND FARM CONSTRUCTION.

A. With regard to specific wind farm construction on our system, in recent years, we contracted to have our Pleasant Valley Wind Project and Border Winds Project (in the NSP service territory) built through a build own transfer, commonly known as a Build Own Transfer, structure. In this structure, we had the developer perform construction up to the point of "handing us the keys." However, we were not a passive participant or merely a buyer of the project. Rather, we were very involved in the oversight of the projects and gained a great deal of expertise during the respective processes. For our latest project in NSP - the Courtenay Wind Farm in North Dakota - we transitioned to a more hands on approach. We purchased the Courtenay site from the developer as a “construction ready” site. The developer had completed upfront development activities included but not limited to permitting, lease agreements and preliminary design work. Once purchased from the developer, we took over control and management of all aspects of the project. This hands on approach that we implemented for the Courtenay Wind Farm is nearly identical to our approach for the Rush Creek Wind Project. While the Courtenay project is still under construction, it is on budget and on schedule. From the Courtenay project, we have learned a significant amount about constructing a new wind farm through this process, but more than anything, we have learned that we already possess the skills to build, operate and maintain wind farms successfully. I am very confident in our ability to complete the Rush Creek Wind Project safely, within budget, and on time.

Q. WHAT CONTRACTS HAS THE COMPANY ENTERED INTO OR IS IN THE PROCESS OF ENTERING INTO WITH REGARD TO THE RUSH CREEK WIND PROJECT?

A. There are several major contracts associated with the Rush Creek Wind Project. First, the Company has entered into two similar Purchase and Sale Agreements (which I will refer to in the singular as the PSA unless the context requires otherwise) for the acquisition of the construction ready Rush Creek I and II sites.[3] Second, Public Service has entered into a TSA with Vestas for 300 model 2.0 MW V110 Vestas wind turbines. Third, the Company will enter into a fixed price Balance of Plant ("BOP") construction contract for the installation of the wind turbines and construction of the site infrastructure. The value of these major contracts is discussed in the following section of my testimony addressing the design and construction cost estimate for the Rush Creek Wind Project. The PSA is included as Highly Confidential Attachment RH-5. The TSA is included as Highly Confidential Attachment RH-6. A fourth major contract is the Service, Maintenance, and Warranty Agreement ("SMWA"), which is also with Vestas. The SMWA has a term of three years and is attached to the testimony of Company witness Mr. William P. Zawacki as Highly Confidential Attachment WPZ-1.

We have moved forward systematically through an established system of prioritization in executing these contracts. The PSA necessarily needed to be executed first so we had development rights on the real property at the Rush Creek I and II sites. The TSA was next in line as it provides for procurement of the actual wind turbines to be erected on the site and establishes the design criteria of the site infrastructure. The SMWA was executed as part of the TSA process. And we are now moving expediently to bid out and secure the BOP contract by this August, which will cover the construction of the site, roads, foundations, tower

[3] The term "construction ready" is formally defined in the PSA.

erection, and collector system. Finally, I would also note that there will also be a few smaller contracts to be entered into including, but not limited to, contracts for long lead time substation transformers, engineering services, and geotechnical investigations.

B. Purchase and Sale Agreement

Q. PLEASE DESCRIBE THE PURCHASE AND SALE AGREEMENTS AND PROVIDE ANY RELEVANT BACKGROUND ON THE AGREEMENTS.

A. On April 1, 2016 and April 4, 2016, Public Service entered into two similar PSAs with Invenergy for the acquisition of the Rush Creek I and II sites, respectively, which collectively will be able to site the proposed 600 MW of wind turbines. The PSAs spell out the requirements remaining for Invenergy to complete in order to have a construction ready site by the end of 2016. This will allow us to construct the 600 MW Project by the end of December 2018 to qualify for the full 100% PTC benefit.

Generally speaking, the transaction is structured as a "develop-transfer." A project company subsidiary of Invenergy will perform the development activities, after which Public Service will buy the project company from Invenergy complete with all project contracts, permits and other assets for which Invenergy is responsible. The closing of the PSAs will occur once Invenergy has performed its development obligations and Commission approval and other permits have been obtained, among certain other closing conditions. Below is a non-exhaustive list of the most critical development activities that Invenergy must perform with regard to the Rush Creek Wind Project:

- Obtain all real property rights necessary for the siting and construction of the Rush Creek Wind Project, including certain lease amendments to clarify the calculation of project output-based payments to landowners;
- Manage negotiations with landowners prior to closing, including landowner meetings as appropriate (discussed in the testimony of Company witness Mr. John D. Lupo);
- Manage zoning and permitting, including all permits necessary to complete the development of the Project;
- Manage title issues, including title commitments and curative work;
- Complete the microwave beam path analysis;
- Complete the FAA flight path study; and
- Assist with site layout, including turbine locations and alternate locations to optimize the project's performance.

Invenergy is responsible for making the site "construction ready," while Public Service is responsible for construction, including roads and procurement of turbines or other equipment under the TSA.

C. <u>Turbine Supply Agreement</u>

Q. PLEASE DESCRIBE THE TSA WITH VESTAS AND PROVIDE ANY RELEVANT BACKGROUND ON THE AGREEMENT.

A. On April 7, 2016, Public Service entered into the fixed price TSA with Vestas, a leading international wind turbine supplier with manufacturing operations in Colorado. The TSA was entered into with Vestas after the Company obtained pricing from both Vestas and another major international wind turbine manufacturer. We determined that the Vestas proposal offered more favorable pricing and conditions, and the TSA is the result of comprehensive negotiations between Public Service and Vestas. Vestas is an international manufacturer and supplier of wind turbines, but the nacelles, towers, and blades of the Rush Creek Wind Project turbines (i.e., the major components) will all be manufactured in Colorado. Moreover, the Vestas pricing and contract terms offered the Company the best opportunity to control schedule and costs. It offered the best opportunity to control costs because, in the Company's experience, local manufacturing significantly reduces delivery schedule and cost risks as it eliminates long duration sea or rail transportation, and minimizes delivery delays.

D. <u>Service Maintenance and Warranty Agreement</u>

Q. WHAT IS THE SMWA?

A. As discussed in more detail by Company witness Mr. William P. Zawacki, it is a contract that obligates Vestas to perform warranty work and three years of scheduled maintenance on the wind turbine generators after final commissioning. The defect warranty period for each turbine runs for approximately two years. SMWA costs are not capital costs but rather are classified as an O&M cost of facility operation for ongoing maintenance of the project.

Q. WHY DID THE COMPANY CHOOSE TO CONTRACT WITH VESTAS FOR MAINTENANCE AND WARRANTY WORK?

A. Vestas required a minimum three-year service agreement as a condition to providing the warranties and price structure that we ultimately obtained for the purchase of the 300 wind turbines. As with our other utility-owned wind farms in the NSP region, we intend to competitively bid the services contract to Vestas and other qualified third party service providers after the three-year service agreement period expires.

E. Balance of Plant Contract

Q. PLEASE DESCRIBE THE BOP CONTRACT AND PROVIDE ANY RELEVANT BACKGROUND ON THE CONTRACT.

A. The BOP contract will also be a fixed price contract, which, as with the TSA, will minimize schedule and cost risk. The contract will be awarded later this year and conditioned on approval of the Rush Creek Wind Project by the Commission. The scope of the BOP contract will include installation of the wind turbines and construction of the site infrastructure. Site infrastructure includes access roads, foundations, electrical cable collection systems, collection system substations, and operations and maintenance buildings. Public Service has initiated discussions with three established BOP contractors that have built wind projects in Colorado to discuss the Rush Creek Wind Project scope and develop reasonable cost estimates for the relevant scope of work, as discussed later in my testimony. After completion of preliminary engineering later this spring, the Company will issue a firm price Request for Proposals ("RFP") to qualified contractors in the summer and obtain firm pricing by August 2016.

IV. DESIGN AND CONSTRUCTION COST ESTIMATE

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section of my testimony is to discuss the design and construction cost estimate for Rush Creek I and II, and provide the bases for the overall estimate.

Q. WHAT IS THE ESTIMATED COST OF CONSTRUCTION OF RUSH CREEK I AND II?

A. The total cost of construction of Rush Creek I and II is estimated to be approximately $915 million in capital costs, plus an Allowance for Funds Used During Construction ("AFUDC") of about $59.4 million.

Q. PLEASE PROVIDE A HIGH-LEVEL BREAKDOWN OF THIS PROJECTED TOTAL CONSTRUCTION COST.

A. There are six major categories of items making up this cost. These costs are detailed in Highly Confidential Attachment RH-7 and total $915 million.

Q. PLEASE ADDRESS HOW THE FIRST THREE LINE ITEMS WERE ESTIMATED TO CALCULATE THE TOTAL PROJECT COST ESTIMATE.

A. These estimates were arrived at in different ways to come up with the overall cost estimate for Rush Creek I and II. Starting with the first two line items, the PSA and TSA, these estimates are based on firm price contracts that the Company has negotiated and entered into with Invenergy and Vestas, respectively. The TSA estimate contains contingency for possible delay costs.

The third line item of the estimate is associated with the BOP construction contract. We engaged in a detailed analysis to come up with our cost estimate for the BOP contract as it is not yet executed. We started with the BOP contract estimate from the known fixed cost BOP contract (which was competitively bid) for our most recent (2015) 200 MW wind project, the Courtenay Wind Farm near Jamestown, North Dakota. The Courtenay Wind Project BOP contract price of approximately [redacted] – in addition to being a fixed price contract – reflects the contractor's risk within it. We therefore view this contract as indicative of the current market for these BOP services and further believe it represents a reasonable starting point to develop the BOP contract cost estimate for the Rush Creek Wind Project.

Q. WHAT STEPS DID THE COMPANY TAKE TO DEVELOP THE BOP COST ESTIMATE FROM THIS STARTING POINT?

A. Because Rush Creek I and II is three times larger in nameplate capacity than the Courtenay Wind Project (i.e., 600 MW versus 200 MW), we took the Courtenay Wind Project BOP contract price as a foundation for developing the Rush Creek BOP estimate. More specifically, we applied the [redacted] fixed BOP cost for the Courtenay Wind Farm as a "per 200 MW" cost structure to develop our cost estimate for the 600 MW Rush Creek I and II. This new base estimate was increased for known scope differences between the Courtenay Wind Project and Rush Creek I and II.

We then modified the estimate to account for locality specific construction issues that our team is familiar with based on past experience, such as local geology, availability of road base, and labor. We also discussed these Colorado-centric construction issues with the North Dakota-based contractor for the Courtenay Wind Project, Wanzek Construction Company, who also has experience with wind farm construction in Colorado, to obtain their insights on these issues and factor them into our estimate. Finally, we looked at approximately 25 total risks and estimated contingencies for these risks, then applied them to the relevant construction category. This information resulted in further modification to the estimate, and as modified we scaled the estimate up to approximately [redacted]

Q. WAS THIS THE ONLY COST ESTIMATE EXERCISE FOR THE BOP CONTRACT UNDERTAKEN BY THE COMPANY?

A. No. We also conducted an exercise to come up with an independent BOP estimate for comparative purposes. We first clarified and further defined the scope of the Rush Creek Wind Project by confirming the turbine technology selection and collector substation equipment. We then contacted three wind farm contractors, all with recent Colorado wind farm construction experience as previously discussed, to prepare budget estimates based on this clarified scope. These budget estimates from the three contractors were able to incorporate specific wind turbine pad locations and standard Company construction specifications because of the clarified Project scope we provided to them.

The budgetary estimates we received were next divided into typical construction categories and compared side-by-side to identify any concerns or outliers in scope or pricing between these estimates. The Company discussed and clarified each contractor's assumptions and scope inclusions to make certain that the pricing was based on a common scope. The Company then selected pricing for each construction category which best fit our risk assessment and construction experience. Construction categories include, without limitation: wind turbine erection, foundations, roads, collector systems, and substations. The three contractors offered differing estimates for different cost categories, not surprisingly, based in part on differing construction approaches and analyses of risk. For example, one contractor assumed more roads were necessary than another contractor, and its estimate for that construction category was correspondingly higher. Given that we are still working through these types of details, we selected the higher amount for each construction category to ensure that our construction cost estimate for Rush Creek I and II was conservative. We declined to select the lowest bid for each category because we believe that cherry-picking low cost estimates will not result in an accurate BOP contract cost estimate. Finally, to further develop the cost estimate, Public Service also identified installation unit rates to validate our comparison and to identify potential increased scope concerns, such as subsurface unknowns. Our estimate came out at approximately [redacted] from this second estimate exercise using the BOP contractor estimates.

Q. WHICH ESTIMATE DID THE COMPANY USE IN THE OVERALL CONSTRUCTION COST ESTIMATE FOR RUSH CREEK I AND II?

A. Given that the two estimates were very close to one another, we moved forward with the independent BOP budget estimate of [redacted] million for the BOP contract and other construction contracts. We selected the independent BOP estimate over the Courtenay Wind contract price estimate since the independent estimate was established from information supplied by contractors familiar with constructing wind farms in Colorado and contains further clarified and defined details of the Rush Creek project as previously noted. I should note that this [redacted] million estimate still includes conservatism.

To get to our total estimate for this line item from this [redacted] million, we then added in the transformer estimate. The transformer portion of the cost estimate was developed using budgetary pricing received from an alliance supplier of transformers to Public Service. This supplier has provided transformers to the Company for use in transmission and distribution systems with over 75 transformers supplied in the past 10 years. The budgetary pricing estimates were based on Public Service's standard transformer technical specification and it comes out to approximately $15 million. We used a conservative estimate for six small transformers versus three larger ones, which would provide higher availability in the event of transformer failure. Adding transformer and other miscellaneous cost (e.g., security and phone systems, legal) to our [redacted] brings us to our [redacted] BOP contract estimate.

V. ADDITIONAL LINE ITEMS

Q. PLEASE ADDRESS THE FOURTH LINE ITEM REGARDING LANDOWNER PAYMENTS, CONSULTING FEES, TAXES, AND INSURANCE.

A. As to the fourth line item, the estimate is premised on BOP estimated lengths for access roads and collection cables. We totaled the leases that have been entered into to allow for the Project and associated transmission, and we have also included an estimate for additional leases and associated costs that we will need to enter into prior to commercial operation. The estimated landowner payments during construction amount to approximately [redacted] Our consulting fees estimate of [redacted] is based on contracts we have either entered into or anticipate entering into for necessary services such as geotechnical and stormwater engineering services. Tax estimates of approximately [redacted], which also fold into the fourth line item, were developed in consultation with our tax group. The taxes are based on point of delivery and are county-specific or municipality-specific. These amounts combine into the $20.6 million estimate for line item 4.

Q. HOW DID THE COMPANY ARRIVE AT THE ESTIMATE FOR THE FIFTH LINE ITEM ADDRESSING PROJECT MANAGEMENT AND ASSOCIATED COSTS?

A. The [redacted] estimate for line item 5 consists of internal time for Company personnel and our developed staffing plan for the Rush Creek

Wind Project. Accordingly, it includes an estimate for all of the internal labor we expect to allocate towards managing the development and ownership of the Project. It also includes external labor and contract staff such as safety personnel and construction management, and these external personnel estimates are developed hourly based on a 50- to 60-hour work week. This is a standard work week for these types of contractors. We also included overhead, which is applied at 0.59%, the same rate we used to develop the 569 MW natural gas plant built at the Cherokee site pursuant to the CACJA.

Q. PLEASE ADDRESS THE CONTINGENCY ESTIMATE IN THE FINAL LINE ITEM.

A. This is a general project contingency that is a provision for mitigating uncertainties created by unforeseen events or circumstances. This contingency allowance is approximately 1% of the project cost because separate design, construction, and scope contingency allowances were applied to individual elements of the BOP and TSA contracts.

VI. CONSTRUCTION SCHEDULE

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section of my testimony is to discuss the construction schedule for the Rush Creek Wind Project.

Q. PLEASE PROVIDE AN OVERVIEW OF THE CONSTRUCTION SCHEDULE, INCLUDING KEY MILESTONES.

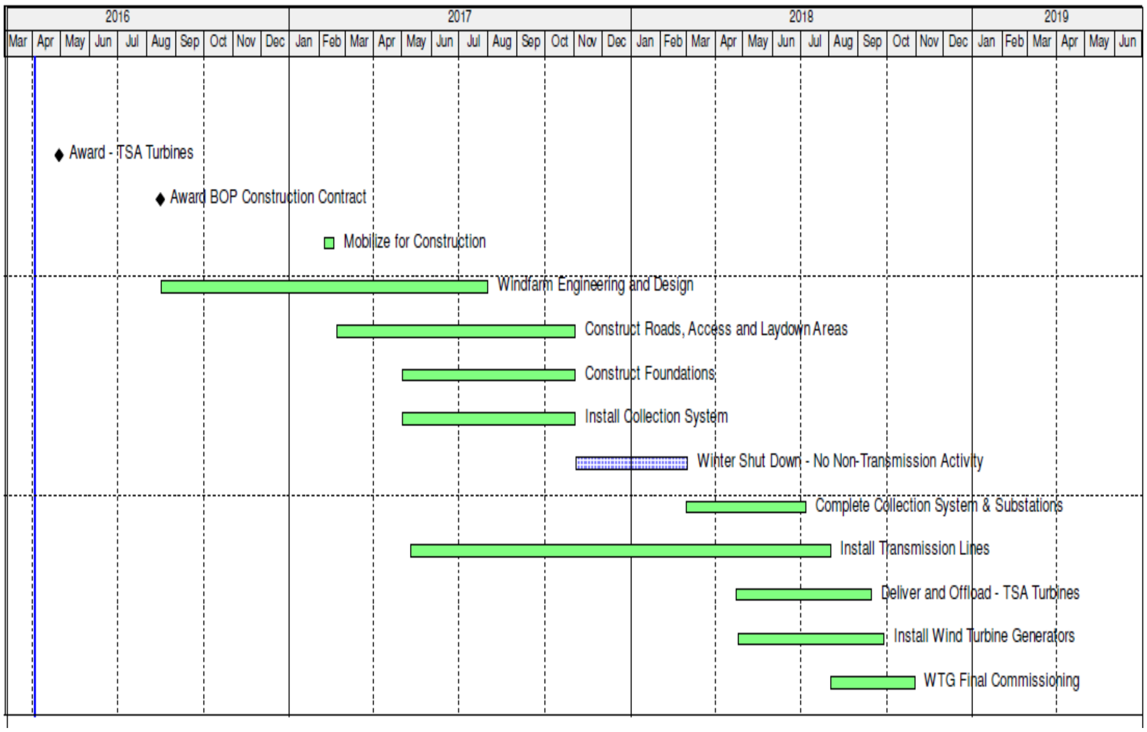
A. We will manage the overall project schedule by coordinating between Vestas' fabrication, delivery, and commissioning efforts and the BOP construction tasks. Both Vestas and the BOP contractor will provide the necessary input to allow for schedule optimization and risk reduction. The project schedule was initially developed in consultation with Vestas to allow them to schedule their turbine fabrication activities. This schedule will be reviewed with the selected BOP contractor during contract negotiations to allow for input and concurrence. Any efficiency noted by the BOP contractor during this process that requires a schedule adjustment will be coordinated with Vestas. This process will allow continual schedule improvement and reduce schedule and cost risks. The current construction schedule is set forth in Table 2 below, subject to these potential changes as the contracting process moves forward. In addition, the more detailed schedule known as the 30-line schedule, which includes additional activities and completion dates, is included as Attachment RH-8.

Table RH-2 Estimated Construction Schedule

Activity Description	Completion Date
Award TSA Turbines	April 29, 2016
Award BOP Construction Contract	August 15, 2016
Mobilize for Construction	February 17, 2017
Windfarm Engineering and Design	July 31, 2017
Construct Roads, Access and Laydown Areas	November 1, 2017
Construct Foundations	November 1, 2017
Complete Collection System & Substations	July 6, 2018
Install Transmission Lines	August 1, 2018
Deliver and Offload – TSA Turbines	September 14, 2018
Install Wind Turbine Generators	September 28, 2018
Wind Turbine Generator Commissioning	Late 2018

The Figure below shows the construction schedule in a visual format, including the winter shutdown at the end of 2017 and beginning of 2018 during which we have no non-transmission construction activity scheduled. This figure reflects the period of time over which activities will occur as opposed to just start and end dates.

Figure RH-1 Estimated Construction Schedule



Q. WHAT IS THE STATUS OF EQUIPMENT PROCUREMENT NEEDED TO CONSTRUCT THE PROJECT?

A. The wind TSA has been signed and fabrication of the PTC components – meaning that portion of the turbine components valuing five percent of the total project cost - will begin this fall, which will allow the Company to qualify for the safe harbor under the Act. This is because in order to achieve “safe harbor” the Company must pay or incur (depending on its method of accounting) five percent or more of the total cost of the facility prior to January 1, 2017, after which the Company must make continuous efforts to advance towards completion of the facility. This initial turbine fabrication schedule therefore will be completed by the end of 2016 to allow Public Service to satisfy the safe harbor requirements and obtain the

100% PTC for customers. Fabrication of the remaining wind turbines, i.e., the non-safe harbor turbines, is conditioned on Project approval by the Commission. Vestas has already assigned fabrication slots in their production schedule to allow the remaining wind turbines to be delivered in early 2018.

Beyond turbine fabrication, commodity materials will also need to be procured for construction of the Rush Creek Wind Project. Commodity materials such as concrete, rebar, electric cable, and substation components will be procured by the selected BOP contractor. Based on our experience, there is low risk with delivery of these commodity materials and it is thus unlikely to impact the anticipated late 2018 commercial operation date for the Rush Creek Wind Project. Collector system transformers, which will be procured by the Company, have an estimated 44 week delivery cycle. The contract for these components will be awarded in late 2016 or early 2017.

Q. ARE THERE ANY CONSTRUCTION PROGRESS AND LOGISTICS ISSUES YOU WISH TO ADDRESS?

A. Yes. Public Service and Invenergy have reached out to local communities and landowners at or near the Rush Creek Wind Project site and will continue to do so. This outreach is discussed in more detail in the testimony of Company witness Mr. John Lupo, but as it relates to my testimony, keeping these clear lines of communication will allow the Company to identify potential construction issues in advance of the selected BOP contractor's mobilization to the site. One key area for coordination will be the timing of ongoing local and county road repairs as construction progresses. The BOP contract will have specific requirements for adequately maintaining all public roads. For example, turbine deliveries require large, specialty shipping vehicles. Helping the farming community understand the impact these vehicles will have on the local road system could eliminate potential "traffic jams" between the delivery vehicles and farm equipment during planting/harvesting seasons.

Q. HOW DOES THE COMPANY PLAN TO MONITOR PROGRESS AND QUALITY ISSUES DURING CONSTRUCTION?

A. In addition, our construction management team will review and audit quality documents. Quality documents are contractor internal documents that generally provide testing results for construction-related activities at the site. For example, if the contractor inspects a weld, personnel complete a form and sign off on said inspection. As another example, if the contractor pours concrete, personnel take temperature, slump, and other measurements and submit reports to document whether the work meets all applicable specifications. Our team at Public Service reviews all of these quality documents when completed to stay current on progress and any issues encountered at the site. We also will monitor wind turbine fabrication by Vestas by conducting frequent inspection and observation visits to the fabrication facilities. This is discussed later in my testimony and seeks to assure that purchased equipment is fabricated in accordance with the agreed upon technical specifications.

Q. WHAT OBLIGATIONS DOES INVENERGY HAVE BETWEEN SIGNING THE PSA AND CLOSING THE TRANSACTION?

A. For the period of time leading up to the closing, Invenergy and its affiliates have select obligations tied to closing conditions and must assist the Company in achieving successful closing of the transaction. The closing conditions are spelled out in Section 2.7 of the PSAs. In addition, the costs for Invenergy to complete their obligations are partially funded by deposit payments from Public Service. These deposit payments are installments of the PSA and come out of the total PSA cost. The Company makes these payments to Invenergy, which fund some of the work conducted by Invenergy to satisfy outstanding obligations under the PSAs. Given the “develop-transfer” structure of the transaction, we fully anticipate cooperation in these tasks as it is in Invenergy’s best interest that the transaction closes in order to receive final payment.

Q. WHAT HAPPENS BETWEEN RECEIPT OF FINAL REGULATORY APPROVAL FROM THE COMMISSION AND CLOSING THE TRANSACTION?

A. Invenergy and its affiliates must obtain additional land leases and amendments, complete the reports identified in the PSAs, and make themselves available to us to keep working on the project to complete necessary activities to deliver a construction ready site. Public Service has the right to terminate the PSA in the event we are unable to obtain regulatory approval, as Commission approval is a condition to closing in the PSA. In addition, the TSA is structured in a way that allows us to cancel the Project with minimal financial exposure if regulatory approval is not obtained. The BOP contract will be similarly structured.

VII. RISK MANAGEMENT AND COST CONTROLS

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. This section of my testimony sets forth the construction management techniques and oversight processes that we have developed through our experience with other projects, interactions with others in the industry, and work with contractors. In this section, I also describe why these processes are integral to helping ensure that the Rush Creek Wind Project is developed on time and on budget. I further describe the comprehensive risk mitigation and well-developed and deployed cost controls in place, and explain why I am confident we can develop the Rush Creek Wind Project within the budget discussed earlier in my testimony.

A. Material Risks and Risk Management

Q. WHAT ARE THE MATERIAL RISKS YOU HAVE IDENTIFIED RELATING TO THE CONSTRUCTION OF THE RUSH CREEK PROJECT?

A. There are two categories of material risks that the Company needs to manage in constructing this project: (1) the construction timing risk, and (2) the construction cost risk. The Company has a plan in place to adequately address each of these risks.

Q. PLEASE DESCRIBE THE CONSTRUCTION TIMING RISK AND MANAGEMENT OF THAT RISK.

A. This issue has two aspects. First, it is important that construction be completed on a schedule that ensures we qualify for the full 100% PTC benefit. This means the most immediate need is to qualify for the safe harbor before the end of 2016, and then ensure that Rush Creek I and II are in service by the end of 2020. As discussed earlier in my testimony, we already have a fabrication schedule in place with Vestas to ensure safe harbor protection by the end of 2016. We also have contracts in place to have the Project in service by the end of 2018. Just before the filing of our Application in this proceeding, the Internal Revenue Service gave notice that it will allow four years for projects to be completed (December 31, 2020) after safe harbor qualification as opposed to the typical two years. Therefore, while we fully intend to put the Project in service in 2018, we have additional time if unexpected issues arise to develop the Project and retain the 100% PTC benefit for customers.

Second, our construction schedule assumes that we can initiate site preparation work in early 2017, including foundation construction for the turbines and installing the underground collection system at the same time. This work sequencing maximizes the likelihood of timely completion and also provides a more efficient and lower-cost deployment schedule by eliminating stacking of work and trades. For example, wet weather conditions could result in delays for the road construction crew, which in turn could result in delays to the foundation construction crew if their schedules were 'stacked' or overlapping. By properly sequencing these schedules, the site is less congested and construction crews can work around timing delays more easily and efficiently. In the proposed estimated construction schedule, the winter of 2017 to 2018 is removed from the schedule (i.e., no construction activities over the winter months of late 2017 and early 2018). By beginning in early 2017 and completing roads and foundations by late 2017, this scheduling option would eliminate possible delays and inefficiencies due to adverse weather during that time period. The Company construction management team plans to meet daily with the BOP contractor in what are typically referred to as "Plan of the Day" ("POD") meetings. These POD meetings identify and address any safety, coordination, or schedule issues in real time. The POD meeting also allows for timely responses and immediate mitigation of any quality related issues on site such as adding protective coverings, or heating foundation areas before and after concrete pours. The Company will also hold summary weekly meetings with the contractor to review safety trends and longer term schedule items. Finally, monthly management meetings will take place with the BOP contractor and turbine supplier (Vestas) to summarize the status of the work and resolve any commercial issues pending. This extensive contact and communication with contractors is one reason that the Company has been so successful with major capital projects in the past.

Q. PLEASE DESCRIBE THE CONSTRUCTION COST RISK.

A. As with any major construction project, there is the risk that costs could increase above what has been projected. Our analysis and budgeting for the Project has taken this risk into account. The single largest cost component of the Rush Creek Wind Project is the purchase of the wind turbines under the TSA. The TSA is a fixed price contract with little potential for change orders or other cost increases. Additionally, we have negotiated this agreement early to avoid any potential schedule delays. As a result, we believe that this cost aspect will not be subject to any significant cost increase pressure.

Similarly, our purchase price from Invenergy under the PSA is a fixed amount that is not subject to change orders or cost increases. We could potentially incur some downstream consulting fees from Invenergy for additional project development support not contemplated in the agreement or other consulting fees for environmental reviews, land surveying or civil design reviews. However, any such amount would be minor and would not materially change the overall cost profile.

The BOP contract cost could potentially increase depending on various circumstances, but there are also specific milestone requirements and liquidated damages provisions as I discuss later in my testimony. Most notably, if we have weather or other delays in our construction schedule, it could result in an increase in the construction costs. The amount of any increase in costs would be dependent on the length of the delay. Finally, some of the other costs identified for the Rush Creek Wind Project are not under fixed price contracts and could be subject to some increase. However, our assessment of costs includes a modest contingency that reflects the potential for construction cost increases.

Q. IF CHANGE ORDERS OCCUR AND THE PROJECT FALLS BEHIND SCHEDULE ARE THERE TECHNIQUES AND PROCESSES THE COMPANY CAN EMPLOY TO GAIN BACK TIME?

A. As discussed earlier in my testimony, we currently do not have the winter of 2017 to 2018 in the construction schedule. We therefore have a cushion of time built into the schedule and we could work through this period instead if necessary. While we have commercial obligations that to put the Project in service by the end of 2018, we also have some cushion on the back end given the PTC deadline extension to December 31, 2020 (assuming one qualifies for safe harbor protection by December 31, 2016). In addition, we could have Vestas increase turbine commissioning personnel or perform some early pre-commissioning activities so that we can have turbines commissioned more quickly. Both of these approaches could help us make up time in the event that construction falls behind schedule.

The BOP contract will also have specific milestones for the selected BOP contractor. It is up to the BOP contractor to meet these deadlines or, if these deadlines are not met, the BOP contractor will be subject to liquidated damages. Accordingly, there is a significant financial incentive for the BOP contractor to stay on schedule and find ways to make up time if construction falls behind. It is also relevant that the contractors that we will seek BOP contract bids from all have significant experience in wind farm construction. We will not be employing a contractor that is constructing its first wind farm, and these contractors do the BOP work for the IPP projects in Colorado that the Company purchases power from. Over the years they have developed strategies to make up time and expedite construction when necessary and appropriate to avoid incurring liquidated damages and to stay on schedule. I have a high degree of confidence in these BOP contractors and their ability to meet the deadlines we need them to meet.

B. Cost Controls and Reporting

Q. DOES THE COMPANY HAVE PROCESSES AND PROCEDURES IN PLACE TO CONTROL AND TRACK PROJECT COSTS?

A. Yes.

Q. PLEASE GENERALLY DESCRIBE THESE COST CONTROLS.

A. For all of our major projects, we first develop a detailed project schedule, a cost analysis report (which serves as a cost tracking tool), monthly cash flow projections, a contracting strategy, labor resource loading strategies, design criteria, and a project organization chart. This occurs early in the development phase of our projects, and these tools become the basis for our comprehensive project management process. Throughout construction, we are regularly revisiting and updating these tools and strategies to reflect what we are encountering at the site and hearing from personnel in the field. This ensures the cost control processes are as up-to-date and robust as possible.

Additionally, we utilize numerous reporting requirements up through the various levels of the Company and Xcel Energy. Any proposed scope changes are carefully evaluated by each project manager and the Director of Regional Capital Projects to help ensure that they are consistent with the original intent of the project. There is no scope change cost threshold to trigger this review process; rather, all changes are recorded and approved by the project manager and Director of Regional Capital Projects.

We also bid out each major contract, whether it is for equipment or construction. Bids are evaluated by the project team based on criteria including safety, capital costs, ongoing O&M costs, and the ability to perform the work and scope as required. With regard to evaluating a bidder's ability to perform the work, we focus our review on the bidder's past experience and safety record. The safety review is an integral piece of our evaluation. After conducting this review, the proposal that offers the best overall value based on a comprehensive evaluation of these criteria is selected by the Company.

Q. ARE THERE ANY COST CONTROL PROCESSES IN PLACE FOR TURBINE FABRICATION?

A. Yes. Frequent inspections by the Project team, including the engineering and quality groups, will be made at fabrication facilities to assure that purchased equipment is fabricated in accordance with the agreed upon technical specifications. These inspections and observations are intended to ensure that the manufacturer is following the requirements of the TSA as well as appropriate industry codes and standards. Our management personnel will monitor construction in the field to verify compliance with specifications and standards. Invoiced costs are reviewed by our team to assure compliance with contract terms.

Q. DOES THE COMPANY HAVE ONGOING REPORTING AND REVIEWS RELATED TO COST CONTROLS?

A. Yes. A monthly report is generated that outlines the current status of the project, significant progress achieved, schedule and budget status. These reports contain monthly cost forecasts and compare them to actual costs. The reports also show the overall Project budget and discuss projected changes and adjustments to the overall construction budget. These reports are distributed to the Director of Regional Capital Projects, the Vice President of Engineering and Construction, and me as the Senior Vice President of Energy Supply.

Moreover, monthly review meetings are held with the Director of Regional Capital Projects to conduct a detailed review of safety, the construction budget, and construction schedule. Significant variations in project scope, cost and schedule will be discussed in these meetings. When changes in overall project budgets are identified, a change order will be executed to adjust the Project budget. These changes are then reflected in monthly and overall project cost forecasts. In addition, the Financial Performance Team and president of Public Service review reasons for variations in project monthly cash flow and yearly forecasts on a regular basis.

Q. ARE THERE SPECIFIC COST CONTROL MANUALS THAT WILL BE USED FOR THE RUSH CREEK WIND PROJECT?

A. Yes. We have a standard cost analysis report ("CAR") used on our major capital projects. The CAR is a compilation of all cost tracking reports needed to effectively manage a major project. This includes, without limitation, the overall detailed cost estimates, monthly variances to expected spend, change order tracker by contract, procurement tracker for status of deliverables, staff resource loading, invoice tracker, and progress trending curves.

Q. IS THIS REPORTING AND REVIEW PROCESS AND OVERALL COST CONTROL METHODOLOGY SIMILAR TO PROCESSES USED BY THE COMPANY FOR OTHER CONSTRUCTION PROJECTS?

A. We have found these tools very helpful in successfully completing two major billion dollar plus programs in Colorado, specifically Comanche 3 and the CACJA projects. These projects gave us an opportunity to refine and improve our cost control methodologies based on our experiences with these projects. We also use these similar tools in our other regions to have consistent approaches across all service territories with regard to cost control.

Q. DOES THE COMPANY INTEND TO FILE SEMI-ANNUAL REPORTS FOR THE RUSH CREEK WIND PROJECT SIMILAR TO THE REPORTS FILED FOR CACJA PROJECTS IN OTHER PROCEEDINGS?

A. Yes. We would agree to provide semi-annual reports as we have done on all of our recent major capital projects over the past eight years, most recently on our CACJA projects.

Q. IS THE COMPANY CONFIDENT THAT IT CAN DEPLOY THE RUSH CREEK WIND PROJECT FOR A TOTAL PRICE IN THE RANGE PROVIDED, INCLUDING CONSIDERATION OF THESE RISKS?

A. Yes.

VIII. COST COMPARISON

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section of my testimony is to discuss the cost comparison with similar wind resources in the market that our team conducted in evaluating Rush Creek I and II. This is not meant to supplant the Independent Evaluator's report, but instead illustrate that based upon our experience and expertise, we believe Rush Creek I and II can be constructed at a reasonable cost as compared to these other eligible energy resources.

Q. HAS THE COMPANY COMPARED THE CONSTRUCTION COSTS OF RUSH CREEK I AND II TO OTHER SIMILAR WIND PROJECTS?

A. Yes.

Q. WHAT SPECIFIC PROJECTS WERE RUSH CREEK I AND II COMPARED TO AND WHY?

A. I compared the Rush Creek I and II construction costs to three other wind projects developed by Company affiliates that are currently under construction or were recently placed in service, including: (1) the Pleasant Valley Wind Project, a 200 MW facility near Hayfield, Minnesota that began operating in 2015; (2) the Border Winds Project, a 150 MW facility near Rolette, North Dakota that also began operating in 2015; and (3) the Courtenay Wind Farm, which is a 200 MW facility near Jamestown, North Dakota that is currently under construction and will be in service this year. This comparison was appropriate because we have accurate construction cost data on these wind farms and they are actively under construction or recently completed construction.

Q. PLEASE DESCRIBE THE PROCESS USED TO CONDUCT THIS COMPARISON AND THE RELEVANT RESULTS.

A. I derived a cost per kW installed ($/kW) based upon the costs of each wind farm and compared the construction estimate of Rush Creek I and II to these figures. The cost per kW installed of Rush Creek I and II, based on the estimated construction cost of $915 million, is $1,525/kW installed. This method of using the project nameplate capacity in determining the cost per kW installed is typical in the industry.

Q. WHAT WERE THE RESULTS OF THIS COMPARISON?

A. A table showing the results of the comparison is below.

Table RH-3 Comparative Analysis

Wind Farm	***Cost ($/kW installed)***
Pleasant Valley Wind Project	1,680
Border Winds Project	1,764
Courtenay Wind Farm	1,465

Q. DID YOU CONDUCT ANY OTHER COMPARATIVE ANALYSIS?

A. Yes. I also looked more generally for cost information in industry publications. I identified an August 2015 report from the Lawrence Berkeley National Laboratory within the U.S. Department of Energy, which is included with my testimony as Attachment RH-9. This study compiled data on the installed cost of wind power projects in the U.S. from 1997 up to and including 36 projects completed in 2014. For 2014, this data included 3,888 MW of wind power (80% of the capacity installed in 2014) and overall, the data set included 743 projects completed in the U.S. totaling 54,014 MW (82% of wind power installed by the end of 2014).

The report derives a capacity-weighted average installed project cost for each year, and the capacity-weighted average installed project cost for 2014 was roughly $1,710/kW installed. This was slightly higher than 2013 (which the report notes had a small sample size) but is $580/kW installed less than peak costs in 2009 and 2010. Further, "[e]arly indications from a limited sample of 17 projects (totaling more than 2 GW) currently under construction and anticipating completion in 2015 suggest no material change in capacity-weighted average installed costs in 2015."[4]

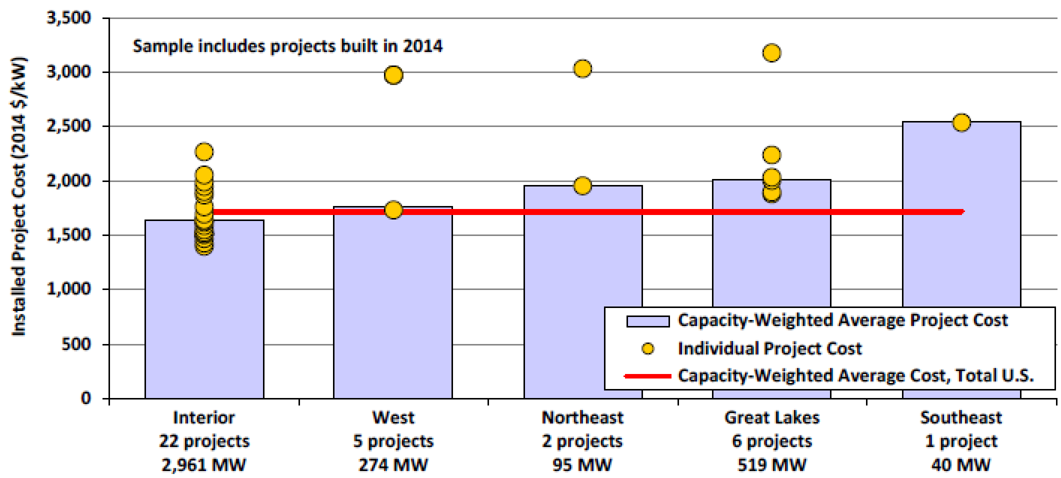
Q. DOES THE LAWRENCE BERKELEY NATIONAL LABORATORY REPORT CONTAIN ANY REGION-SPECIFIC ANALYSIS?

A. Yes. The report contains a figure showing regional costs based on five regions: (1) Interior, (2) West, (3) Great Lakes, (4) Northeast, and (5) Southeast. Colorado falls in the Interior region, with the western border of Colorado representing the end of the Interior region and the eastern border of Utah serving as the eastern border of the West region.[5] The figure below is excerpted from the report and shows project costs based only on projects installed in 2014. The study further provides that "[t]he Interior region—with by far the largest sample—was the lowest-cost region

[4] Attachment RH-9, at 48.
[5] Attachment RH-9, at 36.

on average, with average costs of $1,640/kW, while the Southeast was the highest-cost region (although with a sample of just one project)."[6]

Figure RH-2 Installed wind power project costs by region: 2014 projects



Source: Berkeley Lab

Figure 42. Installed wind power project costs by region: 2014 projects

Q. WHAT ARE YOUR CONCLUSIONS ARE CONDUCTING THIS COMPARISON?

A. With regard to the Company affiliate projects, the construction cost of Rush Creek I and II is reasonable as compared to all three comparable projects. The Rush Creek I and II construction cost of $1,525/kW installed is less than the cost of the Pleasant Valley Wind Project and the Border Winds Project. While the Rush Creek I and II cost is higher than the Courtenay Wind Farm costs, based on my experience I would not categorize the cost difference as significant. Rather, my analysis of these

[6] Attachment RH-9, at 50.

costs leads me to conclude that the Rush Creek I and II construction costs are reasonable in comparison to the costs of these similar projects.

The Lawrence Berkeley National Laboratory information is also instructive in the cost comparison. The report caveats that "reported project costs reflect turbine purchase and installation, balance of plant, and any substation and/or interconnection expenses. Data sources are diverse, however, and are not all of equal credibility, so emphasis should be placed on overall trends in the data rather than on individual project-level estimates."[7] Looking at the overall trend, however, the cost per kW installed of Rush Creek I and II is very reasonable when compared to the national 2014 average of $1,710/kW installed and the lowest-cost Interior region average of $1,640/kW installed. Because no material change in capacity-weighted average installed costs is anticipated for 2015, I also think it is reasonable to conclude that the construction costs of Rush Creek I and II are reasonable as compared to anticipated 2015 costs as well.

Based on this comparative exercise and my experience, I believe Rush Creek I and II can be constructed at a reasonable cost compared to the cost of similar eligible energy resources available in the market, as required by Rule 3660(h)(I).

[7] Attachment RH-9, at 47-48.

IX. TRANSMISSION COSTS

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section of my testimony is to discuss: (1) our transmission interconnection request for Rush Creek I and II, and (2) the estimated cost of the Rush Creek Gen-Tie.

Q. PLEASE PROVIDE BACKGROUND ON THE INTERCONNECTION REQUEST YOU SUBMITTED FOR RUSH CREEK I AND II.

A. On February 12, 2016, we submitted a voltage neutral interconnection request for Rush Creek I and II. After submitting the request, we participated in the scoping process with Transmission and held a scoping meeting on February 26, 2016. We were required to identify a requested voltage during the scoping process, and we ultimately decided upon a 345 kV interconnection request.

Q. WHY?

A. We made this decision for several reasons. We are a public utility, which factors into the calculus when evaluating "just enough" and the "most cost effective" transmission alternatives. A "just enough" option would be a 230 kV alternative, but the 345 kV line had 0.9% lower line losses based upon the expected production at Rush Creek I and II. We also believe that the 345 kV option is the most prudent from a siting and land rights and overall construction perspective. I say this because a 345 kV line optimizes the use of the right-of-way and lessens the future burden on landowners, local officials and other stakeholders because expansion in the future will not be necessary. For these reasons, the 345 kV alternative provided the best way to get the Rush Creek I and II power to the Missile Site Substation and we therefore made the interconnection request at that voltage. Company witness Ms. Betty Mirzayi discusses the benefits of the 345 kV line from a transmission planning perspective.

In addition, as discussed further by Company witness Ms. Alice Jackson, a 345 kV alternative also provides future networking potential to all developers if and when there is future development of eligible energy resources in this part of Colorado that seeks to take advantage of the same strong wind resource we have with the Rush Creek Wind Project.

Q. HAVE YOU SINCE SUBMITTED AN INTERCONNECTION REQUEST AT 230 kV?

A. Yes. We submitted an interconnection request at 230 kV on April 25, 2016. We made this request because as the developer, we felt it was important to consider both alternatives from a cost and feasibility perspective.

Q. WHAT ARE THE CONSTRUCTION COSTS FOR THE RUSH CREEK GEN-TIE?

A. The estimated construction cost for the Rush Creek Gen-Tie is $121.4 million ($202/kW). As discussed, the proposed Rush Creek Gen-Tie is a 345 kV line. The construction costs are set forth in the table below.

Table RH-4 Rush Creek 345 kV Gen-Tie Capital Cost Estimates

Line Item	*Cost Category*	*Amount*
1	Substation Costs including Land, Switching and Communications	$20.6 million
2	Transmission Costs including Land	$100.8 million

Q. DOES THE COMPANY HAVE A CONSTRUCTION COST ESTIMATE FOR THE 230 kV LINE?

A. Yes. At 230 kV, the construction cost of the transmission line is approximately $90.2 million ($150/kW). This construction cost estimate, using the same cost categories as Table 4 above, is set forth in the table below.

Table RH-5 230 kV Rush Creek 230 kV Gen-Tie Capital Cost Estimates

Line Item	*Cost Category*	*Amount*
1	Substation Costs including Land, Switching and Communications	$14.8 million
2	Transmission Costs including Land	$75.4 million

Line items 3, 6 and 8 make up the entire cost delta as between the 230 kV line and the Rush Creek Gen-Tie. As discussed by Company witness James Hill, the losses are higher with the 230 kV alternative. Additionally, there is significantly more capacity on the 345 kV alternative (1,600 MW with the 345 kV as opposed to 900 MW with the 230 kV), and a greater ability to take on additional renewable energy (1,000 MW with the 345 kV as opposed to 100 MW with the 230 kV) in the future. Furthermore, the overall cost to customers is less for the 345 kV alternative. Accordingly, while the Rush Creek Gen-Tie at 345 kV is more expensive on a capital cost basis (the 345 kV alternative raises the cost of the Project by approximately $52/kW more than the 230 kV alternative), the customers are overall better off with the 345 kV alternative. Therefore, I believe that the Rush Creek Gen-Tie at 345 kV is the most reasonable alternative.

X. BEST VALUE EMPLOYMENT METRICS

Q. HAS THE COMPANY CONSIDERED BEST VALUE EMPLOYMENT METRICS FOR THE CONSTRUCTION OF THE RUSH CREEK WIND PROJECT? PLEASE EXPLAIN YOUR ANSWER.

A. Yes. The requirement to consider Best Value Employment Metrics ("BVEM") appears in various Commission rules. Most recently the Commission modified Rule 3102(e)-(f) to require that we provide the following BVEM information for new generation project CPCNs, such as Rush Creek I and II: (1) the availability of training programs, including training through apprenticeship programs; (2) the employment of Colorado workers as compared to importation of out-of-state workers; (3) long-term career opportunities; and (4) industry-standard wages, health care, and pension benefits.

As discussed earlier in my testimony, the BOP contractor will construct the generation facilities. While a BOP contractor has not been selected, the Company will request that potential BOP bidders provide best value employment metrics information with their bids. We will provide this information to the Commission upon receipt by filing it in this proceeding. As required by Rule 3102(f), we will provide a status report within 45 days after a contract is awarded and parties may comment on this status report within 15 days.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Statement of Qualifications

Riley Hill

I graduated from Wichita State University in 1989 with a Bachelor of Science Degree in Electrical Engineering. I graduated summa cum laude with university honors.

I began my employment in the utility industry with Kansas Gas & Electric (KG&E, which later became Westar Energy) in Wichita, Kansas in 1980 as a laborer in the line department. While at KG&E I served in many operations and support positions up to and including my last position of Sr. Director of Substation engineering, construction and operations. Additionally, while at KG&E, I returned to school and completed my Bachelor of Science Degree in Electrical Engineering in 1989.

In 2004, I left Westar Energy and joined Xcel Energy to serve as the Director of the Denver Metro West gas and electric distribution operations for Public Service Colorado (PSCo) in Denver, CO. Additionally while at PSCo, I served as the Vice President of Construction, Operations and Maintenance for our gas and electric distribution and gas transmission organizations. Finally, while at PSCo, I served as the Vice President of Customer and Community Relations. In 2009 I moved to Texas to serve as the President and CEO of Southwestern Public Service Company (an Xcel Energy company) based in Amarillo, Texas.

In 2014, I moved into my current role of Senior Vice President of Energy Supply based in Denver Colorado. In my current role, I am responsible for the design, construction and operations of all non-nuclear generating facilities that are used to serve customers in all of Xcel Energy's service territory in eight states.