

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF COLORADO

Docket No. 09A-324E

IN THE MATTER OF THE APPLICATION OF TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION, INC. (A) FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE SAN LUIS VALLEY-CALUMET-COMANCHE TRANSMISSION PROJECT, (B) FOR SPECIFIC FINDINGS WITH RESPECT TO EMF AND NOISE, AND (C) FOR APPROVAL OF OWNERSHIP INTEREST TRANSFER AS NEEDED WHEN PROJECT IS COMPLETED.

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**TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION, INC.'S  
STATEMENT OF POSITION**

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Pursuant to Decision No. R09-1435-I and Rule 1503 of the Colorado Public Utilities Commission's Rules of Practice and Procedure, Tri-State Generation and Transmission Association, Inc. ("Tri-State") submits its post-hearing Statement of Position in the above-referenced proceeding.

## **I. INTRODUCTION**

Colorado is facing an energy challenge: transmission constraints – the ability to move electricity from point A to point B reliably and cost effectively. For years, transmission constraints have affected the reliability and load serving capacity of the southern Colorado electric transmission system. These transmission constraints are also a major obstacle in the development and delivery of existing and potential renewable generation resources located in southern Colorado.

Tri-State and Public Service Company of Colorado ("Public Service") (collectively the "Applicants") have proposed a joint project for the construction of the San Luis Valley – Calumet-Comanche Transmission Project (the "Project"). The Project consists of building a new Calumet Substation and three new transmission line segments: 1) a new double-circuit 230 kV transmission line between the existing San Luis Valley Substation and the new Calumet Substation; 2) a new double-circuit 345 kV transmission line between the Calumet Substation and the Comanche Substation; and 3) a new single-circuit 230 kV transmission line between the Calumet Substation and the Walsenburg Substation. Each transmission segment originates from an existing substation and terminates at the proposed Calumet Substation.

The Project has two purposes. First, the Project will improve the reliability and load serving capacity of the southern Colorado electric transmission system by providing additional, looped transmission service to Tri-State's Members and to Public Service's customers in the San Luis Valley. The Project will also improve Tri-State's ability to serve loads between Pueblo,

Colorado and northeast New Mexico. Second, the Project will facilitate the export of renewable resources by relieving transmission constraints in the San Luis Valley and Walsenburg areas. Specifically, the Project will accommodate the development of approximately 1300 MW of new simultaneous generation in those areas.

The Project is the result of comprehensive and detailed studies which confirm not only its technical validity, but also the Project's ability to contribute to and meet the reliability and clean energy needs of southern Colorado and the rest of the state. In this regard, the Project is consistent with the coordinated transmission planning of the Colorado Coordinated Planning Group as well as the specific transmission plans of Tri-State and the SB-100 transmission plans of Public Service. As a joint project of Tri-State and Public Service, the Project represents an example of the coordinated, cost-effective transmission system improvements needed to meet the challenges identified by the General Assembly, the Governor's Energy Office, the Commission, and numerous stakeholders. The Project is required and warranted not only as a matter of public convenience and necessity; it is essential to meeting Colorado's goals of clean, reliable, affordable, and secure electrical power now and into a possible carbon-constrained future.<sup>1</sup>

## **II. CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY – STATUTORY STANDARD AND CONSIDERATIONS**

Section 40-5-101 of the Colorado Revised Statutes set forth the standard for approval of a Certificate of Public Convenience and Necessity ("CPCN") for the construction or expansion of transmission systems and facilities. The Commission shall approve a CPCN if it finds that "the present or future public convenience and necessity require or will require" the construction or

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<sup>1</sup> As discussed herein, Tri-State's primary goal in participating in the joint Project is to address certain reliability issues. Public Service's primary goal in participating in the Project is to accommodate future renewable resources to be located in southern Colorado. Given these complementary goals and the consolidated nature of these proceedings, Tri-State's Statement of Position will focus primarily on the reliability aspect of the Project. Tri-State adopts and incorporates by reference Public Service's Statement of Position filed in this consolidated docket contemporaneously herewith.

expansion of transmission systems and facilities. C.R.S. § 40-5-101. The Commission has explained that "the need for a transmission [facility or system] should be considered in light of the evidence and arguments presented at the evidentiary stage of the proceeding[.]" *See* Docket Nos. 09A-324E, 09A-325E, Decision No. C09-1004, at 5, Sept. 14, 2009.

In addition to the statutory standard set forth in Section 40-5-101, the Commission has expressly stated that it may also consider other factors in reviewing the Applicants' CPCN applications. The Commission has made clear that a utility's obligation to meet the renewable energy standards, particularly solar electric generation standards set forth in C.R.S. § 40-2-123, may be considered in determining whether there is a need for the Project. *See id.* at 6. Relatedly, the Commission has also made clear that a lack of contracts for generation resources does not by itself establish a lack of need for transmission lines. *See id.* at 5. In light of the evidence presented, it is clear that the proposed Project satisfies both the statutory standard for issuance of a CPCN and is consistent with the additional considerations identified by the Commission.

### **III. FACTUAL BACKGROUND**

#### **A. Tri-State's and Public Service's Transmission Resources in the Project Area**

Tri-State is a generation and transmission cooperative owned by its Members and governed by its Board of Directors. (Ex. 3, 5:1-5.) Tri-State provides wholesale electric power to its Members in four states. (*Id.*) In turn, Tri-State's Members provide retail power to their consumer-members. (*Id.*) Tri-State's Members expect, and Tri-State strives to provide, reliable and cost-effective transmission services and electrical power. (*Id.*) As a result, Tri-State continually identifies and implements transmission improvements to enhance the reliability of its transmission system and to provide cost effective opportunities supporting future resource decisions.

Tri-State Member San Luis Valley Rural Electric Cooperative ("SLVREC") serves electric loads in the San Luis Valley. (Ex. 1 at 1-2.) Tri-State Member San Isabel Electric Association ("SIEA") serves loads in the region east of the San Luis Valley and south of Pueblo, Colorado. (*Id.*) Currently, three transmission lines serve the San Luis Valley: a 69 kV line and a 115 kV line from Poncha Junction to San Luis Valley both of which are owned by Public Service, and a 230 kV line from Poncha to San Luis Valley jointly owned by Tri-State and Public Service. (Ex. 12, 4:1-6.)<sup>2</sup> These transmission lines are "radial lines," that is, they transmit power to the San Luis Valley from one source. (*Id.* at 4:19-21.)

There are two transmission lines owned by Tri-State in the area between Pueblo and Walsenburg, Colorado: a single-circuit 230 kV line that originates at Public Service's Comanche Substation, interconnects to Tri-State's Walsenburg Substation, and terminates at Tri-State's Gladstone Substation in New Mexico; and a 115 kV line that originates at Black Hills Energy's West Station in Pueblo, interconnects to Tri-State's Stem Beach Substation, and terminates at the Walsenburg Substation. (*Id.* at 7:18-8:2.) These lines serve Tri-State Members SIEA, Southwestern Electrical Cooperative ("SWEC"), Springer Service Company ("SEC"), and Tri-State's Network Customer, Public Service Company of New Mexico ("PNM"). (*Id.* at 7:12-14.)

**B. Tri-State Has Identified and Methodically Studied the Transmission Reliability Problems in the Project Area.**

1. The 1997 San Luis Valley High Voltage Transmission System Study Report

In 1997, Tri-State identified a need for additional load-serving capability in the San Luis Valley. The information was summarized in Tri-State's "San Luis Valley High Voltage

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<sup>2</sup> All references to "Ex. \_\_\_" refer to exhibits admitted into evidence at the Hearing in this matter.

Transmission System Study Report" (the "Transmission System Study").<sup>3</sup> (Ex. 33, JRD-6 at 1.) The Transmission System Study found that the San Luis Valley was at risk of single contingency voltage collapse during an outage of the Poncha – San Luis Valley 230 kV line or a loss of the San Luis Valley 230/115 kV transformer when the total regional load exceeded 65 MW. (*Id.* at 1, 10.) In 1995, the total load in the San Luis Valley exceeded 65 MW approximately 15% of the time during the course of a year. (*Id.* at 1, 7.) The Transmission System Study concluded that the existing transmission facilities were not adequate to support peak loads or to support existing and projected regional loads during single contingency outages. (*Id.* at 1.)

In response to this need, Tri-State began development of the San Luis Valley Electric System Improvement Project ("SLVESIP") which would satisfactorily address the identified reliability needs and provide other benefits. The SLVESIP involved construction of a single-circuit 230 kV transmission line from Tri-State's and Public Service's San Luis Valley Substation to Tri-State's Walsenburg Substation.<sup>4</sup> (*Id.* at 1; Ex. 12, 3:9-11.) The proposed 230 kV line would improve system reliability and help mitigate single contingency voltage collapse concerns associated with an outage of the Poncha – San Luis Valley 230 kV line by providing loop service to the San Luis Valley. (Ex. 33, JRD-6 at 1, 69; Ex. 12, 3:19-21; Tr. I, 92:2-24.)<sup>5</sup> The Transmission System Study also recommended other operating and control strategies, system modifications, and additions to improve the reliability of the transmission system. (Ex. 33, JRD-6 at 1-4, 10-13, 23-27.) While pursuing development of the SLVESIP, Tri-State and Public Service implemented some of these additional recommendations, including replacing the single-

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<sup>3</sup> The Transmission System Study was a joint study between Tri-State, Public Service, and the Western Area Power Administration. (Ex. 33, JRD-6 at 17.) Tri-State, however, led the study.

<sup>4</sup> The SLVESIP was originally included in Tri-State's April 30, 2003 Rule 18 filing with the Commission, and most recently in Tri-State's April 30, 2008 Rule 3206 filing. (Ex. 3, 9:21-10:3.)

<sup>5</sup> Citations to the Hearing transcript are abbreviated as follows, for example: "Tr. I, 201:19-25" cites to lines 19 through 25 on page 201 of Volume I of the transcript.



phase 230/115 kV transformers at the San Luis Valley Substation with two three-phase units with voltage regulating capabilities, installing a second 230/115 kV transformer in the Walsenburg Substation, installing capacitor banks at the Alamosa terminal, and installing the Under Voltage Load Shedding ("UVLS") system. (Tr. I, 92:7-14, 150:14-25, 201:19-25; Ex. 13, 11:21-12:20.)

## 2. The 2004 PV Study

As the loads in the San Luis Valley continued to grow and with some of the lower cost reliability improvement modifications completed, it became necessary to re-evaluate alternatives to address the voltage collapse concerns. In 2004, Tri-State conducted additional studies to address the continuing reliability concerns related to the risk of voltage collapse in the San Luis Valley. The findings from the study are summarized in Tri-State's 2004 "PV Study Report." (Ex. 33, JRD-7.)

The PV Study Report found that the total load in the valley was nearing 150 MW and that during an outage of the Poncha – San Luis Valley line the remaining system could only serve a total load of 65 MW. (*Id.* at 2.) The PV Study Report further found that in 2003, the total load in the San Luis Valley had increased such that it exceeded 65 MW approximately 20% of the time. (*Id.*)

The PV Study Report supplemented the joint Transmission System Study by evaluating an exhaustive set of 230 kV transmission line alternatives into the San Luis Valley.<sup>6</sup> (*Id.*) The PV Study Report confirmed a 230 kV line from the San Luis Valley to Walsenburg was the overall best option for addressing the risk of voltage collapse resulting from an outage of the

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<sup>6</sup> The PV Study Report evaluated a range of transmission alternatives, including transmission alternatives running north from the San Luis Valley. (Ex. 33, JRD-7 at 3 ("Potential 230 kV interconnections were identified in every direction from San Luis Valley substation."); Tr. IV, 37:13-16.)

Poncha – San Luis Valley 230 kV line when the total regional load exceeded 65 MW. (*Id.*) The PV Study Report also concluded the proposed line would simultaneously strengthen the Walsenburg Substation thereby improving the reliability of service to Tri-State's Members in southeast Colorado and northeast New Mexico when the Comanche – Walsenburg 230 kV line suffers an outage. (Ex. 33, JRD-7 at 6.) The other alternatives did not. (*Id.*)

3. The 2008 Alternative Evaluation and Macro Corridor Study

In connection with its efforts to obtain financing for the then proposed SLVESIP, Tri-State prepared the "San Luis Valley Electric System Improvement Project Alternative Evaluation and Macro Corridor Study" (the "AE/MCS"). The AE/MCS evaluated several system alternatives that best met the identified purpose and need, including both transmission and generation alternatives.<sup>7</sup> (Ex. 16, MJM-2 at 1-1, 3-3, 3-4, 3-5; Ex. 12, 6:7-10, 6:18-20.) The research and study work from Tri-State's prior study reports was carried forward to the AE/MCS. (Ex. 16, MJM-2 at 1-2-1-3.)

The AE/MCS found that in 2007, the total regional load in the San Luis Valley exceeded 65 MW approximately 23% of the time, or approximately 2,010 hours a year. (Ex. 16, MJM-2 at 3-1.) The AE/MCS reaffirmed Tri-State's prior conclusions that a San Luis Valley – Walsenburg 230 kV line would address reliability and dependability concerns, while it would also provide transmission capacity for renewable energy development in the San Luis Valley. (Ex. 16, MJM-2 at 1-4; Ex. 12, 6:20-22.) The AE/MCS concluded that the 230 kV line was the most cost-effective solution to the system reliability concerns in the San Luis Valley. (Ex. 16, MJM-2 at 3-13.)

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<sup>7</sup> The AE/MCS identified various alternative transmission line corridors between San Luis Valley and Walsenburg. (Ex. 16, MJM-2 at 4-1.) The AE/MCS also evaluated the use of generation from five gas turbines to address reliability concerns. (*Id.* at 3-3.) The capacity from the units ranged from 88 to 124 MW. (*Id.*) The AE/MCS concluded that the additional capacity was not an effective or economic remedy for the reliability issues. (*Id.* at 3-4, 3-5.)

The AE/MCS also identified other benefits of a San Luis Valley – Walsenburg 230 kV line. (Ex. 16, MJM-2 at 1-4.) Tri-State Members' transmission systems such as SIEA and Sangre De Cristo Electric Association ("SDCEA") would also benefit from a stronger system. (*Id.* at 1-4.) Additionally, and in light of renewable energy projects proposed for the San Luis Valley, the AE/MCS also concluded that the line could be used to transmit renewable energy out of the valley. (*Id.* at 1-4, 3-15 ("A line from the San Luis Valley to Walsenburg would also offer a benefit by significantly increasing the potential to transmit power out of the San Luis Valley."))

4. The Boone – Comanche – Stem Beach – Walsenburg 230 kV Line Report

In 2008, Tri-State studied the feasibility of constructing a Boone – Comanche – Stem Beach – Walsenburg 230 kV transmission line. The project had three objectives. First, the Project would address reliability concerns between Pueblo, Walsenburg, and northeast New Mexico. Second, and relatedly, the project would increase load serving capacity thereby supporting SIEA's, SWEC's, and SEC's ability to meet projected peak loads reliably and adequately. Third, the project would eliminate the Walsenburg – Gladstone 230 kV line Remedial Action Scheme ("RAS"), which is used when the Comanche – Walsenburg 230 kV transmission line experiences a single contingency outage. (Ex. 12, 7:8-14, 8:14-21, 8:25-9:7.) The study considered seven transmission alternatives. (Ex. 12, 8:19.)

The study concluded that a new 230 kV transmission line interconnecting the Boone, Comanche, Stem Beach, and Walsenburg Substations would help decrease contingency loading on the West Station – Stem Beach – Walsenburg 115 kV line and would eliminate the need for the Walsenburg – Gladstone 230 kV RAS. (Ex 12, 8:17-19, 8:25-9:7.) The study also concluded

that a West Station – Stem Beach – Walsenburg 115 kV line would facilitate the connection of new generation in the Walsenburg area. (Ex. 12, 7:14-15.)<sup>8</sup>

**C. Public Service's Transmission Plans in Southern Colorado Created the Opportunity for a Joint Project with Tri-State.**

In March 2007, the Colorado General Assembly passed Senate Bill 07-100 ("SB-100").<sup>9</sup> In part, SB-100 directed Public Service to develop plans for the expansion or construction of transmission facilities in order to deliver electric power consistent with the timing of the development of beneficial energy resources, and to submit applications for certificates of public convenience and necessity for those plans. *See* C.R.S. § 40-2-126(2). Consistent with SB-100, Public Service identified two areas in south-central Colorado that are transmission constrained: Energy Resource Zones 4 and 5. (Ex. 5, 5:18-6:5; Ex. 8, 8:10-14.) Zone 4 can be described as the area around San Luis Valley. (Ex. 5, 3:1-5; Ex. 5, JCT-1.) Zone 5 can be described as the area south and southeast of Pueblo. (Ex. 5, 3:6-9; Ex. 5, JCT-1.) Zones 4 and 5 are prime locations for the development of solar-powered generation. (Ex. 5, 5:19-22, 6:2-5; Ex. 8, 8:6-8.)

Under the Colorado law established as a result of House Bill 07-1281 (§ 40-2-124, C.R.S.) and the Commission's Renewable Energy Standard ("RES") rules, Public Service will be required to have 20% of its retail electric energy sales come from renewable generation sources by the year 2020.<sup>10</sup> (Ex. 5, 7:8-19.) As a result, Public Service indicated in its 2007 Colorado Resource Plan a desire to connect up to 700 MW of intermittent renewables and between 200 MW and 600 MW of concentrated solar-powered generation with storage or gas backup in the region. (Ex. 5, 5:11-16; Ex. 4, 8:20-5.) The majority of these resources will be located in the San Luis Valley. (Ex. 4, 9:10-12.)

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<sup>8</sup> Tri-State included this project in its April 30, 2008, Rule 3206 filing. (Ex. 3, 10:4-10.)

<sup>9</sup> SB-100 was codified at Colorado Revised Statutes Sections 40-2-126 and 40-5-101.

<sup>10</sup> House Bill 10-1001, which is pending, would increase the RES to 30% by 2020. (Ex. 54 at 2 ("The bill boosts [the Renewable Portfolio Standard] percentages to achieve 30% renewable generation by 2020 . . . .").)

With the enactment of SB-100, Tri-State and Public Service saw an opportunity to develop a joint project that would meet both Tri-State's and Public Service's needs. (Ex. 3, 10:20-22; Ex. 8, 9:14-19; Tr. I, 204:7-10.) As a result, Tri-State postponed its SLVESIP and its Boone – Comanche – Stem Beach – Walsenburg project so that it could coordinate its goals with those of Public Service and propose one comprehensive, cost effective project that would increase transmission system reliability and accommodate the development of potential new generation resources in the region. (Ex. 3, 10:12-23; Tr. I, 202:9-16.) In October 2008, Tri-State and Public Service entered into a Memorandum of Understanding for Joint Participation in the Southern Colorado Transmission Addition Project. (Ex. 1, Ex. A.) The Memorandum specifically contemplated the opportunity for a joint project in the San Luis Valley and Walsenburg areas that would meet the combined needs of Tri-State and Public Service. (Ex. 1, Ex. A at 1.)

**D. A Joint Study Identified the San Luis Valley – Calumet – Comanche Transmission Project as the Optimal Solution to the Utilities' Needs.**

To determine the best way to meet their individual and joint goals, Tri-State and Public Service performed a joint study that included an evaluation of a benchmark case and alternatives that would meet the identified purpose and need: to increase transmission system reliability and accommodate more generation in the San Luis Valley and Walsenburg areas. (Ex. 12, 14:8-15:2.) The findings of the joint report are summarized in the "San Luis Valley – Calumet – Comanche Transmission Project Study Report" (the "Study Report"). (Ex. 10, TWG-1.)

The benchmark case evaluated in the Study Report was a single-circuit 230 kV line from the San Luis Valley to Walsenburg, and a single-circuit 230 kV line from Walsenburg to Stem Beach to Boone. (Ex. 10, 13:3-4; Ex. 12, 14:11-12.) Five distinct alternatives to the benchmark case were also studied:

- Alternative 1 was the proposed Project.<sup>11</sup> (Ex. 12, 14:13-15.)
- Alternative 2 was a double circuit 230 kV line from the San Luis Valley to Walsenburg; and a single-circuit 230 kV line from Walsenburg to Stem Beach to Comanche to Boone. (*Id.* at 14:16-17.)
- Alternative 3 was a single-circuit 230 kV line from the San Luis Valley to Walsenburg; a single-circuit 230 kV line from Walsenburg to Stem Beach to Comanche to Boone, and a single-circuit 345 kV line from the San Luis Valley to Comanche. (*Id.* at 14:18-20.)
- Alternative 4 was a double-circuit 230 kV line from the San Luis Valley to Calumet; a single-circuit 230 kV line from Calumet to Walsenburg; and a single-circuit 345 kV line from Calumet to Comanche. (*Id.* at 14:21-22.)
- Alternative 5 was a double-circuit 345 kV line from San Luis Valley to Calumet, a double-circuit 345 kV line from Calumet to Comanche, and a double circuit 230 kV line from Calumet to Walsenburg. (*Id.* at 15:1-2.)

While the Study Report confirmed that the benchmark and all five alternatives would correct the reliability concerns in the San Luis Valley and would eliminate the Walsenburg – Gladstone RAS, only Alternatives 1 and 5 met both Tri-State’s and Public Service’s needs and requirements as set forth above. (*Id.* at 15:7-11.) Alternative 1—the proposed Project—was preferred because it would cost-effectively correct the reliability issues in the San Luis Valley, eliminate the Comanche – Walsenburg 230 kV RAS, and support Public Service's SB-100 objectives. (*Id.* at 13:1-10.) Alternative 5—which is similar to the project proposed by Staff of the Commission ("Staff")—was rejected because a 345 kV line would be more costly to build, would not significantly increase the resource injection capability for the region, and would require additional right-of-way. (Ex. 10, 15:8-14; Ex. 12, 16:6-17:2, 17:9-10.)

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<sup>11</sup> The two projects Tri-State originally proposed contemplated using the Walsenburg Substation as a common point of interconnection. However, during the course of studying the initial proposals, it was determined that the Walsenburg Substation was constricted in terms of physical layout and could not be easily expanded to accommodate the several terminations that were under consideration. (Ex. 10, TWG-1 at 16.) Accordingly, the alternatives evaluated in the Study Report included a potential new Calumet Substation that would be constructed north of Walsenburg on property already owned by Tri-State. (Ex. 14, 4:13-15; Ex. 10, TWG-1 at 16; Ex. 10, TWG-1 at 16.) The new Calumet Substation would accommodate the physical needs of the alternatives under consideration while also providing space for future interconnection of additional resources. (Ex. 10, TWG-1 at 16.)

#### **IV. THE PROPOSED PROJECT**

##### **A. Description of the Project's Components**

As a result of the joint study, Tri-State and Public Service proposed the San Luis Valley – Calumet – Comanche Transmission Project. The proposed Project has four components.<sup>12</sup>

##### **1. The San Luis Valley – Calumet Segment**

The first transmission line segment will consist of approximately 95 miles of double-circuit 230 kV line from the San Luis Valley Substation to the new Calumet Substation. (*Id.* at 11:14-15.) This segment will use a single 1272 kcmil ACSR conductor per phase (Ex. 12, 11:16; Ex. 19 at 10), and each transmission circuit in this segment will have at least 600 MVA of thermal capability. (Ex. 10, 2:22-23.) Tri-State will also make improvements to the San Luis Valley Substation by expanding the existing three breaker ring bus and adding two new 230 kV circuit breakers and related equipment. (Ex. 19 at 16.)

This segment will require a new 150 foot wide right-of-way. (*Id.* at 7.) The right-of-way will cross topography ranging from flat terrain on the western part of the segment to mountainous terrain in the eastern part of the segment. (Ex. 16, 6:23-2.) The segment will cross through lands subject to a wide range of uses including agriculture uses. (*Id.* at 7:21-3.)

##### **2. The Calumet – Comanche Segment**

The second transmission line segment will be approximately 45 miles of double-circuit 345 kV line from the proposed Calumet Substation to Public Service's existing Comanche Substation, and will use two 1272 kcmil ACSR conductors per phase. (Ex. 12, 11:17-19) Each transmission circuit in this segment will have at least 1700 MVA of thermal capability. (Ex. 10, 3:3-5.) This segment will cross mostly open plains, foothills, and grasslands, (Ex. 16, 7:6-7), and will require a new 200 foot wide right-of-way. (Ex. 20, 4:1-3, 6:18-21.)

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<sup>12</sup> The Project is illustrated at MJM-3, a map which is attached to Exhibit 16.

### 3. The Calumet – Walsenburg Segment

The third transmission line segment will consist of six miles of new single-circuit 230 kV line installed on double-circuit structures between the new Calumet Substation and the existing Walsenburg Substation. (Ex. 12, 11:21-23; Ex. 10, 3:19-21.) This segment will use a single 1272 kcmil ACSR conductor per phase, which is the same size as the conductors on the existing Tri-State 230 kV Comanche to Walsenburg line. (Ex. 12, 12:1-4.) This segment will most likely not require a new right-of-way as it will be routed on the 100 foot wide right-of-way of the existing Stem Beach – Walsenburg 115 kV line.<sup>13</sup> (Ex. 19 at 7, 13.) Tri-State will also make improvements to its Walsenburg Substation by adding one 230 kV circuit breaker and related equipment for the new 230 kV line. (*Id.* at 17.) This segment will cross through mostly open plains, foothills, and grasslands. (Ex. 16, 7:6-7.)

### 4. The Calumet Substation

As part of the Project, a new substation will be built approximately six miles north of Tri-State's existing Walsenburg Substation on Tri-State's existing property. (Ex. 10, 3:12-13; Ex. 14, 4:12-15.) The Calumet Substation will connect to the existing 230 kV line between Walsenburg and Comanche. (Ex. 10, 3:13-14.) The substation will be equipped with 230 kV and 345 kV switchyards and two 560 MVA 345/230 kV autotransformers. (Ex. 19 at 17 and SAM-3; Ex. 12, 12:5-9.) The substation will also accommodate future generation interconnections. (Ex. 10, TWG-1 at 16.)

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<sup>13</sup> The 115 kV line from Walsenburg to West Station interconnects at the Stem Beach Substation. (Ex. 10, 3:24-26.) The Stem Beach – Walsenburg portion of the segment runs parallel to the proposed Calumet to Walsenburg transmission line segment. (*Id.*) As part of the proposed Project, the Stem Beach – Walsenburg portion of the segment will be rebuilt to a double-circuit 230 kV capable transmission line. (*Id.* at 3:27-30; Ex. 19 at 12-13.)



**B. Responsibility for Project Development and Cost Sharing**

Because the Project will benefit both Tri-State and Public Service, the Project will be developed and operated jointly. The allocation of ownership, costs, capacity rights, maintenance and replacement obligations, and the development responsibilities of Tri-State and Public Service are shown in the Applicants' Term Sheet. (Ex. 8, GMS-4.) In general, ownership and costs are based on the relative benefit of the overall Project to Tri-State and Public Service. (Ex. 3, 16:19-21.) The following chart summarizes the capacity rights, cost, and ownership interest of Tri-State and Public Service in the Project:<sup>14</sup>

	Capacity Rights		Ownership Interest		Cost	
	Tri-State	Public Service	Tri-State	Public Service	Tri-State	Public Service
San Luis Valley – Calumet Segment	40%	60%	40%	60%	40%	60%
Calumet – Comanche Segment	40%	60%	40%	60%	40%	60%
Calumet – Walsenburg Segment	80%	20%	80%	20%	80%	20%
Calumet Substation	40%	60%	40%	60%	40%	60%

Considering that Tri-State has performed extensive environmental and siting work on the previously proposed SLVESIP, Tri-State will have primary responsibility for designing, siting, permitting, building, and maintaining the San Luis Valley – Calumet and the Calumet – Walsenburg segments of the Project. (*Id.* at 17:2-7, 17:12-14.) Public Service will have primary responsibility for designing, permitting, building, and maintaining the Calumet – Comanche

<sup>14</sup> (See Ex. 3,16:22-17:4; Ex. 8, GMS-4.)

segment of the Project. (*Id.* at 11:15-17.) However, Tri-State will be responsible for the siting of this segment. (Ex. 8, GMS-4.)

The estimated total cost of the Project is \$180,000,000.<sup>15</sup> (Ex. 19 at 6.) This is a planning level cost estimate subject to a  $\pm$  30% variance. (*Id.* at 6-7.) Tri-State's share of the total cost of the Project is \$75,000,000, also a planning level cost estimate subject to a  $\pm$  30% variance. (Ex. 19, at 7.) (*Id.* 19 at 7.)

### **C. Procedural Background**

In accordance with the Colorado Public Utilities Law, C.R.S. § 40-5-101, *et seq.*, and Rules 1303 and 3102 of the Commission's Rules of Practice and Procedure, on May 14, 2009, Tri-State filed an application for a CPCN for the Project. Public Service filed its companion CPCN application for its participation on the same day. By Decision No. R09-0723-I, the two applications were consolidated for procedural purposes. (Docket Nos. 09A-324E, 09A-325E, Decision No. R09-0723-I, at 9-11, July, 6, 2009.) On February 1-5, 8, and 10-11, 2009, an evidentiary hearing was held on the consolidated applications before Administrative Law Judge Mana Jennings-Fader.

## **V. THE PRESENT AND FUTURE PUBLIC CONVENIENCE AND NECESSITY REQUIRE CONSTRUCTION OF THE PROJECT.**

### **A. The Project Is Necessary to Address Tri-State's and Public Service's Reliability Concerns in the San Luis Valley and Walsenburg Areas, and, in Fact, Does Address These Concerns.**

1. There is a Present Risk of Voltage Collapse in the Southern Colorado Electric Transmission System and the Project Is Needed to Resolve this Risk.

The proposed joint Project is necessary to meet load demand and improve the reliability of the southern Colorado electric transmission system, which for years has been vulnerable to

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<sup>15</sup>The cost estimate for the Project is show in greater detail in SAM-4, which is attached to Exhibit 19.

voltage collapse due to the lack of transmission capacity. The Project resolves significant reliability concerns related to 1) a potential for voltage collapse in the San Luis Valley in the event of an outage of the existing San Luis Valley 230 kV transmission line when the load in the San Luis Valley exceeds 65 MW; and 2) a potential for overloading the Stem Beach – Walsenburg 115 kV line in the event of an outage of the Comanche – Walsenburg 230 kV line. (Ex. 13, 3:4-12; Ex. 33, JRD-6, JRD-7; Ex. 16, MJM-2; Tr. I, 101:11-16.)

While there are multiple individual radial lines presently serving the San Luis Valley, these transmission lines all originate in the Poncha area and are routed through the same geographical corridor. Therefore, the existing lines do not provide the benefits of a looped system where a secondary source of power can be used as a backup in the event of an outage of the primary source. (Ex. 12, 4:21-23.) The planning studies Tri-State conducted show that existing transmission lines serving the San Luis Valley have reached their capacity due to growth in residential and irrigation electric loads. (Ex. 3, 8:19-21; Ex. 12, 4:12-14.) As a result, these lines are no longer adequate to support loads in the event of a single contingency outage of the existing San Luis Valley 230 kV transmission line. (Ex. 12, 5:5-7; Ex. 33, JRD-6, JRD-7; Ex. 16, MJM-2; Tr. I, 101:11-16.) Presently, a potential for voltage collapse exists in the San Luis Valley during an outage of the Poncha – San Luis Valley 230 kV line when the total load in the valley exceeds 65 MW. (Tr. III, 305:12-21; Ex. 12, 5:7-9, 5:12-18; Ex. 3, 8:21-23.) This is because the 115 kV line is not able to supply sufficient power to meet the peak load in the San Luis Valley. (Ex. 12, 5:12-18.) Under such circumstances, Tri-State load must be removed from the 115 kV line, or otherwise risk a voltage collapse in the valley. (Ex. 12, 5:14-15; Ex. 3, 9:5-6; Tr. I, 196:1-8; Tr. IV, 15:3-8.)

The risk of voltage collapse in the San Luis Valley is not speculative. There have been low voltage conditions consistent with voltage collapse in the San Luis Valley in the past. For example, in 1998, 2002, and 2003, low voltage conditions forced Tri-State to shed load manually or through the use of the UVLS system to avoid a voltage collapse. (Ex. 13, 11:9-20.) While in these instances a voltage collapse was averted, it was at the expense of large numbers of customers who lost their electrical service for a period of time. (*Id.* at 11:9-20; Tr. IV, 68:14-16.) Regardless of the length of these individual outages, Tri-State and its Members consider the UVLS an unacceptable long-term solution that can be resolved by construction of the Project.

Project opponents may try to argue that the instances of near voltage collapse are few and far between and, therefore, do not justify the Project. However, the probability of voltage collapse in the San Luis Valley has increased over time. (Ex. 13, 13:10.) In 1995, the total load in the San Luis Valley exceeded 65 MW 15% of the time. (Ex. 33, JRD-6 at 1; Tr. I, 213-4-7.) In 2003, the total load in the San Luis Valley exceeded 65 MW 20% of the time. (Ex. 33, JRD-7 at 1; Tr. I, 213-4-7.) In 2007, Public Service's and Tri-State's combined peak load in the San Luis Valley exceeded 120 MW and the average load had increased such that it exceeded 65 MW over 2,000 hours during the year. (Ex. 12, 5:9-12; Ex. 16, MJM-2 at 1-3.) That is, the regional load exceeded 65 MW 23% of the time, with loads varying between 50 and 65 MW an additional 3,450 hours, or approximately 39% of the time. (Tr. I, 213:7-10; Ex. 16, MJM-2 at 1-3, 3-1.) As regional load continues to grow, situations giving rise to the potential for voltage collapse will become more frequent. (Ex. 13, 15:2-9.) It is these present and future reliability concerns that motivate Tri-State's and Public Service's CPCN applications and that demonstrate the need for the Project.

Project opponents may also try to argue that the UVLS system and the RAS are sufficient tools to mitigate against the risk of voltage collapse. However, while a load shedding system may mitigate the chance of voltage collapse, it is not an acceptable long-term solution to Tri-State's and Public Service's reliability concerns. (Tr. IV, 72:6-11.) Neither is it acceptable to Staff which shares Tri-State's and Public Service's concern with the use of a load shedding system as a viable solution to the reliability concerns. (Ex. 37, 6:13-15 ("I certainly believe the Commission should take issue with load shedding as a viable solution with a transmission line N-1.")) The reality is that there are inherent problems with using a load shedding system to mitigate against voltage collapse. As a practical matter, since a load shedding system operates using several mechanical components, the failure of any of the mechanical components could result in the system not operating properly. (Tr. IV, 71:1-72:5.) If the load shedding operation is unsuccessful for any reason, there remains a risk that both Public Service's customers and Tri-State's Members will be out of power for an extended period of time. (Ex. 12, 5:15-18; Ex. 3, 9:6-8.)<sup>16</sup>

The transmission lines serving the Walsenburg area and northeast New Mexico are also susceptible to voltage collapse due to the lack of transmission capacity. (Ex. 3, 9:8-12.) Currently, there is a potential for overloading the Stem Beach – Walsenburg 115 kV line in the event an outage occurs on the Comanche – Walsenburg 230 kV line. (Ex. 13, 3:10-12.) If an outage does occur, the overload is addressed by opening Tri-State's Walsenburg – Gladstone 230 kV line (the RAS) at the expense of loss of load to Tri-State Members in northeast New Mexico. (*Id.* at 3:18-21.)

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<sup>16</sup> Additionally, since the 230 kV line can only be taken out of service when the load is below 65 MW (the 115 kV Poncha – San Luis Valley carries the load), the increase in hours the San Luis Valley load exceeds 65 MW restricts the opportunity for maintenance operations on the line. (Ex. 13, 15:13-16.)

2. The Project Creates a Looped Transmission System that Eliminates Tri-State's and Public Service's Reliability Concerns in the San Luis Valley and Walsenburg Areas.

The Project as proposed eliminates Tri-State's and Public Service's reliability concerns with the southern Colorado electric transmission system by establishing a looped transmission system into the San Luis Valley and a secondary path for transmission service between the Pueblo and Walsenburg areas. (Ex. 3, 6:14-21; Tr. IV, 61:20-25, 62:16-19.) The looped system will enhance Tri-State's ability to provide reliable service to its Colorado Members in the Project area, its New Mexico Members in northeast New Mexico, and its Network Service Customer PNM.

As discussed, the existing lines that transmit power into the San Luis Valley are radial lines that provide a single-source of power. (Ex. 12, 4:19-21.) Thus, the San Luis Valley does not benefit from the reliability that would exist if power was also supplied from a second source. (Ex. 16, MJM-2 at 1-2.) Another source of power is necessary to adequately serve load to the valley and provide a backup in the event of an outage of the primary source. (Ex. 12, 4:21-5:3.)

Adding a San Luis Valley – Calumet double-circuit 230 kV line will provide loop service to the San Luis Valley thereby reducing the risk of voltage collapse and loss of load. (Tr. III, 304:9-17; Tr. IV, 60:19-23; Ex. 12, 3:17-18; *see also* Ex. 10, TWG-1, Fig. 1 at 1 (illustrating loop); Tr. I, 141:9-16, 143:22-24, 146:8-16 (explaining that because the San Luis Valley – Calumet Segment will provide loop service by connecting to a second source, the San Luis Valley – Calumet Segment is a superior option to all other proposed alternatives.)) The new line will also eliminate the need for the UVLS system for a single contingency outage of the Poncha – San Luis Valley 230 kV line. (Ex. 13, 16:1-4; Tr. I, 150:3-9.)

The Project will also improve reliability in the southern Colorado electric transmission system by creating a secondary path for transmission service between the Pueblo and

Walsenburg areas. The addition of the Calumet – Comanche – Walsenburg transmission lines will improve reliability in the areas of Walsenburg and northeast New Mexico by preventing loss of load as a result of a single contingency outage of the 230 kV Comanche – Walsenburg line. (Ex. 3, 9:12-16; Tr. IV, 60:24-61:9.) The lines will also serve additional planned loads for Tri-State Member SIEA and will eliminate the Walsenburg – Gladstone 230 kV line RAS. (Ex. 3, 8:3-8.)

As proposed, the Project truly creates a looped transmission system:

So this project would provide truly a loop transmission system in that from Comanche-to-Calumet-to-San Luis Valley, we're completing two legs of a loop, if you will. Now, if you lose a Comanche-to Walsenburg corridor, the Walsenburg substation would be reinforced by the San Luis Valley-Calumet line.

(Tr. IV, 61:20-25.) Another significant advantage of the Project is that it connects Zones 4 and 5 thereby creating a robust, looped system between energy zones:

In this case, we actually have the two energy zones connected. We're able to meet the purpose and need of the project by having a single project that creates a more robust transmission system. We've talked a lot in the studies I've been involved . . ., where we have an individual project for every individual resource, or in this case, resource zones. In this case, we're accommodating both resource zones, building in from a separate source, separate corridor. We have a much more robust system.

(Tr. VIII, 218:11-20.)

Without the proposed Project, Tri-State Members will not be able to meet projected peak load demands in the years to come. As a result, the southern Colorado transmission system in the San Luis Valley will remain vulnerable to voltage collapse. As discussed fully in Section V.B below, there is no dispute the southern Colorado electric transmission system is susceptible to voltage collapse due to a lack of transmission capacity. The load in the San Luis Valley has grown historically and is projected to continue to increase. Based on the operational history of these lines, there is a need to add transmission capacity to correct the reliability concerns in the

San Luis Valley and Walsenburg areas, and generally to improve Tri-State's and Public Service's ability to reliably serve these loads in the future. The proposed Project will do that.

**B. The Intervenors Agree with Tri-State and Public Service that the Project Will Address Multiple Reliability Concerns.**

There is no dispute among the parties that the Project as proposed will address the reliability concerns in the San Luis Valley and Walsenburg areas. Intervenors Blanca Ranch Holdings, LLC and Trinchera Ranch Holdings, LLC (collectively "Trinchera Ranch") do not dispute this, and in fact, agree with it:

Q. Let me just ask you, as a first question, you do agree that the company's proposed project in this case, Public Service and Tri-State, addresses the reliability issues in the San Luis Valley area in northern New Mexico and also provides such additional transmission with capabilities to support the level of new generation additions that Public Service is currently proposing to potentially commit to in the San Luis Valley and Calumet-Walsenburg areas?

A. Yes.

(Tr. VII, 110:10-19.) Other intervenors also agree. For example, Staff agrees that the Project is necessary to address both reliability concerns in the San Luis Valley and necessary for the transmission of renewable resources out of the valley:

Staff agrees with [Public Service] and Tri-State that a San Luis-Calumet/Walsenburg-Comanche transmission line project is needed to improve the load serving of the San Luis Valley area. The transmission line project is also required to transport renewable energy sources out of the San Luis Valley which has a great potential for solar generation.

(Ex. 37, 21:6-8.)

Similarly, Western Resource Advocates ("WRA"), which represents the environmental community in this proceeding, agrees that there exists a purpose and need for the Project:

Q. And you recognize the need for this proposed project and this line, don't you, Mr. Darin?



A. To the -- I am aware of and agree with the two stated purposes and need for this proposal, yes.

(Tr. IV, 315:15-19.) WRA has stated that it supports the Project:

We recommend that the Colorado Public Utilities Commission (Commission) grant Tri-State Generation And [sic] Transmission Association (Tri-State) and Public Service Company of Colorado (Public Service) the Certificate of Public Convenience and Necessity (CPCN) needed to pursue the proposed transmission project . . . .

(Ex. 24, 4:11-14.)

Recognizing the importance of the proposed Project to the transmission needs of Colorado, the Governor's Energy Office ("GEO") also fully supports the proposed Project and has encouraged the Commission to approve the CPCN applications. (Ex. 28, 2:1-3 ("GEO supports the applications of Tri-State and [Public Service]"), 7:4-5 ("The GEO encourages the Commission to issue a timely approval of the Applicants' request for a CPCN."), 7:17-18 ("The GEO's position is that this Project will advance the public's convenience and necessity."))

As demonstrated by the above-referenced statements, several Intervenors have explicitly agreed that the proposed Project will address the reliability concerns in the southern Colorado electric transmission system and will facilitate the export of renewable resources out of the San Luis Valley. By itself, addressing these well-recognized reliability concerns is sufficient justification for the Project and the requested CPCN. However, the Project is also needed to accommodate planned and potential new generation in southern Colorado.

**C. The Proposed Project Meets Tri-State's and Public Service's Objectives of Facilitating the Export of Renewable Resources out of the San Luis Valley and Walsenburg Areas.**

In addition to correcting and improving the reliability concerns in the San Luis Valley stemming from the use of a radial, single-source of power, and correcting the reliability concerns in the Walsenburg area, the proposed Project also facilitates the transmission of new generation

from the San Luis Valley and Walsenburg areas. The Project supports Public Service's SB-100 objectives by accommodating renewable resources in Zones 4 and 5 and aids in future Tri-State generation resource additions. (Ex. 3, 7:20-22.)

Transmission capacity is a critical element in the development of renewable energy projects in the San Luis Valley. (Ex. 16, MJM-2 at 1-4.) However, the same constraints that limit the ability to serve loads in the San Luis Valley also limit the amount of power than can be exported from the San Luis Valley. (Ex. 10, 6:4-5, 6:10-12; Ex. 5, 5:22-6:2.)<sup>17</sup> Intervenors WRA, Interwest Energy Alliance ("Interwest"), and the GEO all agree that the existing transmission system in southern Colorado is not adequate for the export of renewable resources:

The existing lines will not be adequate for development at the scale that I believe will be required in the future.

(Ex. 30, 9:20-21 (Gregory Blue on behalf of Interwest).)

Transitioning Colorado to the New Energy Economy will be based, in large part, on the development of renewable energy resources, which will require significant expansion of the current transmission infrastructure.

(Ex. 24, 4:4-5, 8:1-5) (explaining the "proposed facilities in this case help resolve [the chicken-and-egg dilemma] by building generation to a renewable rich energy zone.") (Tom Darin on behalf of WRA).)

Colorado must accelerate construction of high-voltage electric power transmission to bring renewable energy from renewable resource-rich areas in rural Colorado to the state's major load center.

(Ex. 28, 6:15-17 (Morey Wolfson on behalf of GEO).) Furthermore, as Staff acknowledged, "the project is needed to provide an outlet for the vast solar generation potential from the solar resources in the San Luis Valley, consistent with the SB 07-100 intent." (Ex. 37, 6:20-7:2, 21:8-10.)

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<sup>17</sup> These transmission constraints "have already prevented cost effective Colorado wind projects from being built and from delivering full value of benefits to Colorado electric consumers." (Ex. 106 at 3.)

The National Renewable Energy Laboratory has identified a technical potential of 240,000 MW for concentrated solar power in the San Luis Valley and 35,000 MW in the Walsenburg area. (Ex. 106 at 64.) The proposed Project will alleviate constraints and will allow renewable energy from Zones 4 and 5 to be delivered to customers in the Front Range and throughout Colorado. (Ex. 10, 6:5-7, 6:18-20; Tr. I, 146:12-13.) The Project will accommodate simultaneous generation of 850 MW at the San Luis Valley and 450 MW near Calumet. (Ex. 128; Ex. 10, TWG-1 at 1.) As the GEO stated: "Approval of the Applicants' request for a CPCN for this Project would set the stage for the pathway to deliver a small fraction of this vast potential solar resource to the grid." (Ex. 28, 5:18-20.)

In addition to supporting Public Service's SB-100 objectives, the Project will assist Tri-State Members in meeting their Renewable Portfolio Standards ("RPS") requirements by providing Tri-State and its Members the opportunity to acquire and transmit power from renewable resources in southern Colorado. Tri-State will benefit from the ability to export renewable resources out of the San Luis Valley and Walsenburg areas. Under the applicable RPS, Tri-State's Colorado Members must supply 10% of their retail electric sales from eligible energy resources by 2020. (Tr. I, 186:7-10; Ex. 106 at 1.) As Tri-State witness Joel Bladow explained, the Project will allow Tri-State to develop renewable resources in the San Luis Valley in accordance with future demands:

[G]iven the changes in policy going to renewable portfolio standards, in the future, Tri-State understands that we will have more need for renewables on our system. And so as we build this project, one of the key elements we want to make sure we accommodate is future needs and, therefore, renewables.

(Tr. I, 199: 19-25; Tr. I, 186:23-187:6.) This is an important reason for Tri-State's participation in the Project. (Tr. I, 200:1-9, 200:20-201:1.) Without the transmission

capacity to export renewable resources out of the Valley, developing solar in the San Luis Valley in the future would not be an option for Tri-State. (Tr. I, 187:6-7.)

**D. The Project Meets the Goals of Tri-State and Public Service at a Reduced Cost.**

A significant benefit of the proposed Project is the cost sharing between Tri-State and Public Service. (Tr. I, 15:5-12.) Joint projects have "a track record of saving costs to consumers[.]" (Ex. 3, 10:14-15.) Tri-State's estimated cost for the Project is \$75,000,000. (Ex. 19 at 7.) This is less than the cost of the two transmission projects originally planned by Tri-State: the SLVESIP and the Boone – Comanche – Stem Beach – Walsenburg 230 kV transmission line project. (Ex. 12, 12:19-20.) Because the cost of the Project will be shared between Tri-State and Public Service, Tri-State's share of the Project cost will be spread out among Tri-State's Members in four states. (Tr. VIII, 14:21-15:1.)

The cost sharing also significantly benefits Public Service and its customers. To meet its SB-100 objectives, Public Service needs to build transmission lines to facilitate the export of renewable resources out of Zones 4 and 5, whether or not Tri-State is a participant. (Ex. 5, 4:23-5:2 ("While [Public Service] has existing injection capability in the valley, additional transmission is required to import significant levels of solar generation from the Valley to the front-range load centers.")) However, Tri-State's participation in the Project considerably lowers the cost of the Project to Public Service. The net result is that by joint participation in the Project, Public Service's rate payers will save money. (Tr. I, 204:14-17.)

**VI. REASONABLENESS FINDINGS**

Tri-State further requests that in granting the CPCN the Commission make specific findings that the projected noise levels for the Project are reasonable, and establish a

reasonableness level of 150 mG for magnetic field exposure for all segments of the Project.<sup>18</sup> (See Ex. 1 at 13.) As evidenced by the studies conducted and the testimony presented by witnesses Danny Pearson and Dr. Robert Pearson, the noise and magnetic field effects from the transmission lines in the proposed Project are reasonable and are less than other line designs approved by the Commission in prior cases. Accordingly, the Commission should make specific findings on noise and magnetic field levels in accordance with Tri-State's and Public Service's requests.<sup>19</sup>

**A. The Project's Potential Noise Levels Are Reasonable.**

Section 25-12-103(12) of the Colorado Revised Statutes authorizes the Commission to determine, in the course of reviewing an application for a CPCN for an electrical transmission facility, whether projected noise levels for a proposed facility are reasonable. See C.R.S. § 25-12-103(12)(a). Based on the Application and testimony submitted by Tri-State in this matter, the Commission should make specific findings that the projected noise levels for the San Luis Valley – Calumet and Calumet – Walsenburg segments of the Project are reasonable.<sup>20</sup>

1. The Projected Noise Levels for the San Luis Valley – Calumet Segment Are Reasonable.

The projected noise levels for the San Luis Valley – Calumet 230 kV double-circuit line are depicted in Figure 3 of RLP-2, which is attached to Exhibit 22.<sup>21</sup> To show the effect of

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<sup>18</sup> Such a determination is necessary to avoid civil action claims under the reasoning by the Colorado Supreme Court in *Pub. Serv. Co. v. Van Wyk*, 27 P.3d 377 (Colo. 2001).

<sup>19</sup> As a preliminary matter, Tri-State has complied with the requirements of 4 CCR §§ 723-3102(c)-(d). Tri-State hired a noise and magnetic field specialist, Dr. Robert Pearson, who conducted computer studies showing the potential noise and magnetic field levels from the transmission lines on the Project in accordance with the rules. (Ex. 22, 8:23-10:4 (noise); 17:14-19:9 (EMF).) In addition, in the testimony of Tri-State witnesses Dr. Pearson, Mark J. Murray, and Steven Mundorff, Tri-State described the techniques it will employ relating to cost-effective noise mitigation and prudent avoidance of EMF. (Ex. 17, 8:3-10 (routing away from residential areas); Ex. 19 at 18-19 (noise mitigation), 19-20 (prudent avoidance); Ex. 22, 8:14-22 (noise mitigation); 17:3-13 (prudent avoidance).)

<sup>20</sup> Tri-State incorporates by reference those portions of Public Service's Statement of Position relating to the projected noise levels associated with the Calumet – Comanche segment of the Project.

<sup>21</sup> For a description of the components of the graph in Figure 3, see Exhibit 22, page 10, lines 8 through 15.

changing weather, the model considers two conditions, fair and rain, within a 150 foot wide right-of-way. (Ex. 22, 10:8-9, 7:19-8:5 (discussing effect of weather on audible noise), 10:16-18.) Given the fact that audible noise increases with elevation, Tri-State used a conservative approach and modeled the audible noise using an elevation of 9,413 feet, the highest elevation of the La Veta Pass, where noise would be at its highest levels. (Ex. 22, RLP-2, Fig. 3; Ex. 22, 6:16-18, 6:24-7:4.)

The highest audible noise projected for this segment at the edge of the right-of-way ranges from 25.5 dBA in fair weather to 50.5 dBA in wet weather. (Ex. 22, 10:19-21; Ex. 22, RLP-2 Fig. 3.) The audible noise levels at lower elevations of the segment will be lower. (Ex. 22, 10:23-11:2.) The nearest home to the proposed line over La Veta Pass in the currently proposed routes is 1,770 feet away. (Tr. V, 389:2-11.) Thus, noise levels at all homes along the San Luis Valley – Calumet Segment will be below 50 dBA.

2. The Projected Noise Levels for the Calumet – Walsenburg Segment Are Reasonable.

The projected noise levels for the Calumet – Walsenburg transmission corridor are depicted in Figure 4 of RLP-2, which is attached to Ex. 22.<sup>22</sup> Because the Calumet – Walsenburg segment will be located in the same right-of-way as two existing transmission lines, Tri-State projected noise levels for all three of the lines within the 350 foot wide corridor. (Ex. 22, 11:5-11, 11:16.) The model used the corridor's average elevation and took into account both fair and wet weather conditions. (Ex. 22, 7:6-9, RLP-2 Fig. 4.)

The highest noise levels at the eastern edge of the right-of-way will range from 19.5 dBA in fair weather to 44.5 dBA in wet weather. (Ex. 22, 12:3-5; Ex. 22, RLP-2 Fig. 4.) The highest

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<sup>22</sup> For a description of the components of the graph in Figure 4, see Exhibit 22, page 10, lines 8 through 15.

audible noise levels at the western edge of the right-of-way will range from 15.9 dBA in fair weather to 40.9 dBA in wet weather. (Ex. 22, 12:5-7; Ex. 22, RLP-2 Fig. 4.)

3. The Projected Noise Levels Are Less than Common Noise Levels and Are Within the Range of Noise Levels the Commission Has Previously Determined to Be Reasonable.

The projected noise levels for the San Luis Valley – Calumet and Calumet – Walsenburg segments are within the range of noise levels commonly experienced on a daily basis. For example, the average noise level of a typical living room is 50 dBA. (Ex. 22, 12:24 (citing the EPRI AC Transmission Line Reference Book—200 kV and Above, Third Edition Technical Report).) The projected maximum noise levels for the segments as measured at the edge of the right of way during wet weather conditions would be similar to that of a typical living room. (*Id.* at 13:9-13; Ex. 22, RLP-2, Figs. 3 and 4.) In fair weather, the maximum projected noise level for the segments will range from 15.9 dBA to 25.5 dBA. (Ex. 22, 13:18-21; Ex. 22, RLP-2 Figs. 3 and 4.) These levels are comparable to the noise levels inside a broadcasting studio (20 dBA) or in a bedroom at night (30 dBA). (Ex. 22:13:2-4 (citing the EPRI AC Transmission Line Reference Book—200 kV and Above, Third Edition Technical Report).)

Additionally, the projected noise levels are within the range of noise levels the Commission has previously found to be reasonable on similar projects. In the Comanche – Daniels Park 345 kV Transmission Project, the Commission determined that a noise level of 55 dBA at the edge of the right-of-way for Public Service’s Midway to Daniels Park transmission line was reasonable for that project. (*See* Docket No. 05A-072E, Decision No. C06-1101 at 11-12, Aug. 29, 2006; Ex. 22, 14:6-11.) As discussed by Dr. Pearson, unlike the Project proposed here where the nearest residences are some distance away from the transmission lines, the Midway to Daniels Park transmission line has some residences located very near the edge of the

right-of-way. (Ex. 22, 14:8-10.) More recently, in the Pawnee-Smoky Hill 345 kV Transmission Project, the Commission determined audible noise levels ranging from 47.4 dBA to 51.5 dBA were reasonable at a point 25 feet from the edge of the right-of-way. (See Docket No. 07A-421E, Decision No. C09-0048 at 19-23, Feb. 26, 2009; Ex. 22, 14:11-21.) By comparison, here, the projected noise levels will be substantially less than these levels in fair conditions and comparable to or less than these levels in wet conditions at the edge of the right-of-way. (Ex. 22, 14:15-21.) Thus, the noises levels for the Project are well within the reasonable noise levels the Commission has previously approved in other similar cases. (Compare Decision No. C06-1101 at 11-12, Decision No. C09-4408 at 19-23 *with* Ex. 22, RLP-2 Figs. 3 and 4.)<sup>23</sup>

**B. The Projected Magnetic Field Levels Are Reasonable.**

The record in this matter makes clear that Tri-State has studied the potential impact of magnetic fields generated by the Project and that Tri-State will employ various prudent avoidance techniques as set forth in 4 CCR § 723-3102(d). Accordingly, the Commission should make specific findings establishing a reasonableness level of 150 mG for magnetic field exposure at the edge of the right-of-way for all segments of the Project.<sup>24</sup>

1. The Projected Magnetic Field Levels Are Reasonable For the Project.

Tri-State projected magnetic field levels using three power flow cases: Case No. 1 with no generation; Case No. 2 with 2,000 MW of total injection (1,000 MW to the San Luis Valley

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<sup>23</sup> Tri-State also notes that the Project's projected noise levels are consistent with the default noise levels the Commission has proposed in Docket No. 09R-904E. Furthermore, Colorado statutes provide certain acceptable noise levels for general activities based on zoning and time of day. (See C.R.S. § 25-12-103(1); *see also* Ex. 22, 15:5-17.) While the noise levels set forth in Section 25-12-103(1) do not legally apply to the Project, they are a useful reference. (See C.R.S. § 25-12-103(12) (granting Commission authority to determine what constitutes reasonable noise levels for transmission facilities on a case-by-case basis).) The projected noise levels for the Project are well within the range of acceptable noise levels imposed by section 25-12-103(1). (Ex. 22, 15:18 – 16:2; RLP-2, Figs. 3 and 4.)

<sup>24</sup> Tri-State incorporates by reference those portions of Public Service's Statement of Position relating to the potential magnetic fields associated with the Calumet – Comanche segment.



and 1,000 MW to Calumet), and Case No. 3 with the lines operated at the full thermal limit of the conductors. (Ex. 22, 17:21-24.)<sup>25</sup>

a. Projected Magnetic Field Levels for the San Luis Valley – Calumet Segment

The results of the modeling for the 230 kV San Luis Valley – Calumet segment are shown in Figure 1 to RLP-2, which is attached to Exhibit 22.<sup>26</sup> The results of the modeling show that at the edge of the 150-foot wide right-of-way, the projected magnetic field levels are 1.8 mG for Case No. 1, 11.0 mG for Case No. 2, and 30.8 mG for Case No. 3. (*Id.* at 20:10-13; Ex. 22, RLP-2 Fig. 1.) The magnetic field levels produced by the transmission lines will diminish with distance. (Ex. 22, 20:19-20.) At the edge of the right-of-way, the magnetic field levels will be at or less than the typical magnetic field levels in the average home. (*Id.* at 20:20-22.)

b. Projected Magnetic Field Levels for the Calumet – Walsenburg Segment

The results of the modeling for the Calumet – Walsenburg corridor are shown in Figure 2 to RLP-2, which is also attached to Exhibit 22.<sup>27</sup> The results of the modeling show that on the eastern edge of the corridor, the magnetic field levels are 9.9 mG for Case No. 1, 17.5 mG for Case No. 2, and 59.1 mG for Case No. 3. (Ex. 22, 21:5-7; Ex. 22, RLP-2, Fig. 2.) On the western edge of the corridor, the magnetic field levels are 4.4 mG for Case No. 1, 7.3 mG for Case No. 2, and 35.1 mG for Case No. 3. (Ex. 22, 21:7-9; Ex. 22, RLP-2, Fig. 2.) Thus, the only time the projected magnetic fields of the proposed Project at the edge of the right-of-way exceed typical magnetic field levels in the average home is in Case No. 3 with the line operating at the

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<sup>25</sup> The models are based on information about the proposed design of each transmission segment, which include projected electrical power flows, operating voltage, tower configuration, conductor size and type, height and horizontal location of each conductor, conductor sag, and conductor phasing. (Ex. 22, 17:17-21.)

<sup>26</sup> For a description of the components of the graph depicted in Figure 1, *see* Exhibit 22, page 19 line 20 through page 20 line 5.

<sup>27</sup> For a description of the components of the graph depicted in Figure 2, *see* Exhibit 22, page 19 line 20 through page 20 line 5.

full thermal limit of the conductors. (Ex. 22, 20:20-22; Ex. 22, RLP-2, Fig. 2.) Since this condition will rarely occur, if at all, and given that the Case No. 3 exposure exists only at the edge of the right-of-way, the potential exposure to persons outside of the right-of-way will be substantially less.

2. The Commission Has Previously Found the Levels of Magnetic Fields Projected Here to Be Reasonable on Other Projects.

In the Comanche – Daniels Park 345 kV Transmission Project, the Commission determined that a magnetic field level of 150 mG for the Midway to Daniels Park portion of the project was reasonable. (Decision No. C06-1101 at 12.) In the Pawnee-Smoky Hill 345 kV Transmission Project, the Commission approved magnetic field levels at the edge of the right-of-way ranging from 22.71 mG to 34.58 mG. (Decision No. C09-4408 at 23-24.)

In all three cases modeled for the San Luis Valley – Calumet segment, the magnetic field levels projected at the edge of the right-of-way are less than the magnetic field levels the Commission found reasonable in the Pawnee – Smoky Hill project. (*Compare* Decision No. C09-4408 at 23-24 *with* Ex. 22, RLP-2, Cases Nos. 1-3.) In all but the most severe case modeled (full thermal limit of the conductors), the projected magnetic field levels at the edge of the Calumet – Walsenburg corridor will be less than the magnetic field levels the Commission found reasonable in the Pawnee – Smoky Hill project. (*Id.*)<sup>28</sup> However, in all cases modeled, the projected magnetic field levels at the edge of the right-of-way are lower than the 150 mG level

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<sup>28</sup> Case No. 3 is the only instance in which the Project exceeds the magnetic field levels approved in the Pawnee – Smoky Hill project. Case No. 3, however, depicts operation at the full thermal limit of the conductors, which is very unlikely to occur. (Ex. 22, 22:3-7.) Even then, at its full thermal limits, the magnetic field levels would only exceed the magnetic field levels of the Pawnee – Smoky Hill project by only 1 mG on one side of the corridor. (*Id.*)

the Commission determined to be reasonable for the Midway – Daniels Park line. (*Compare* Decision No. C06-1101 at 12 *with* Ex. 22, RLP-2 Cases Nos. 1-3.)<sup>29</sup>

Accordingly, and pursuant to the evidence presented in this matter, the Commission should make specific findings that the projected noise levels for the Project are reasonable, and establish a reasonableness level of 150 mG for magnetic field exposure for all segments of the Project.

## VII. CONCLUSION

Tri-State and Public Service have shown that the Project meets the present and future convenience and necessity of the citizens of Colorado. The Project is required to increase transmission system reliability and load serving capacity. The Project will enhance the reliability and performance of the southern Colorado electric transmission system by providing additional transmission service to both Tri-State's Members and Public Service's customers in the San Luis Valley. It will also eliminate the existing remedial action scheme and improve Tri-State's ability to serve loads between Pueblo and northeast New Mexico. Furthermore, the Project will accommodate new resources by relieving transmission constraints in the region and will provide opportunities for the development of approximately 1500 MW of additional generation in the region.

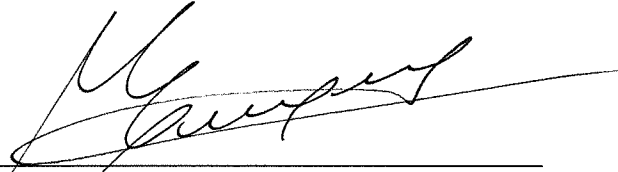
For the foregoing reasons, Tri-State respectfully requests that the Commission enter an Order granting Tri-State's and Public Service's Applications for Certificates of Public Convenience and Necessity for their respective participation in the Project, and that the Commission make specific findings that the projected noise levels for the Project are reasonable,

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<sup>29</sup> The public utilities commissions of two states, Florida and New York, have set magnetic field exposure limit values. (Ex. 21, 24:10-11; Ex. 22, 22:15-16.) In Florida, a range from 150 to 250 mG is acceptable for transmission lines ranging in voltage from 69 to 500 kV. (Ex. 21, 24:11-13; Ex. 22, 22:19.) In New York, a magnetic field value of 200 mG is acceptable regardless of the voltage. (Ex. 21, 24:13-14; Ex. 22, 22:19.)

and establish a reasonableness level of 150 mG for magnetic field exposure for all segments of the Project.

Dated this 25th day of February, 2010.



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Thomas J. Dougherty, #30954  
Tamara F. Goodlette, #35775  
E. Martín Enriquez, #38886  
Rothgerber Johnson & Lyons LLP  
1200 17th Street, Suite 3000  
Denver, Colorado 80202  
(303) 623-9000  
Facsimile: (303) 623-9222  
Email: [tdougherty@rothgerber.com](mailto:tdougherty@rothgerber.com)  
Email: [tgoodlette@rothgerber.com](mailto:tgoodlette@rothgerber.com)  
Email: [menriquez@rothgerber.com](mailto:menriquez@rothgerber.com)

Kenneth V. Reif, #10666  
Tri-State Generation & Transmission Association,  
Inc.  
P.O. Box 33695  
Denver, Colorado 80233  
(303) 452-6111  
Facsimile: (303) 254-6007  
Email: [kreif@tristategt.org](mailto:kreif@tristategt.org)

***Attorneys for Applicant Tri-State Generation and  
Transmission Association, Inc.***

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Statement of Position of Tri-State Generation and Transmission Association, Inc. was served on this 25th day of February, 2010, via email on all parties on this service list:

Gregory E. Sopkin  
Squire, Sanders and Dempsey L.L.P.  
[gsopkin@ssd.com](mailto:gsopkin@ssd.com)

Paula Connelly  
Robin Kittel  
David McGann  
Xcel Energy Services Inc.  
[bill.dudley@xcelenergy.com](mailto:bill.dudley@xcelenergy.com)  
[paula.connelly@xcelenergy.com](mailto:paula.connelly@xcelenergy.com)  
[robin.kittel@xcelenergy.com](mailto:robin.kittel@xcelenergy.com)  
[david.w.mcgann@xcelenergy.com](mailto:david.w.mcgann@xcelenergy.com)

William Levis, Director  
Frank Shafer, Financial Analyst  
Office of Consumer Counsel  
[bill.levis@dora.state.co.us](mailto:bill.levis@dora.state.co.us)  
[frank.shafer@dora.state.co.us](mailto:frank.shafer@dora.state.co.us)

Chris Irby  
Stephen W. Southwick  
Office of Attorney General  
[chris.irby@state.co.us](mailto:chris.irby@state.co.us)  
[stephen.southwick@state.co.us](mailto:stephen.southwick@state.co.us)

Victoria Mandell  
Lowrey Brown  
Penny Anderson  
Steve Michel  
John Nielsen  
Western Resource Advocates  
[lbrown@westernresources.org](mailto:lbrown@westernresources.org)  
[vmandell@westernresources.org](mailto:vmandell@westernresources.org)  
[penny@westernresources.org](mailto:penny@westernresources.org)  
[smichel@westernresources.org](mailto:smichel@westernresources.org)  
[jnielsen@westernresources.org](mailto:jnielsen@westernresources.org)

Mark Davidson  
Michelle Brandt King  
Thorvald A. Nelson

Kathleen O'Riley  
Louann Jamieson  
Judith Johnson  
Holland & Hart LLP  
[madavidson@hollandhart.com](mailto:madavidson@hollandhart.com)  
[mbking@hollandhart.com](mailto:mbking@hollandhart.com)  
[tnelson@hollandhart.com](mailto:tnelson@hollandhart.com)  
[koriley@hollandhart.com](mailto:koriley@hollandhart.com)  
[ljamieson@hollandhart.com](mailto:ljamieson@hollandhart.com)  
[jajohnson@hollandhart.com](mailto:jajohnson@hollandhart.com)

Stan Gray  
Babcock Brown  
[stan.gray@patternenergy.com](mailto:stan.gray@patternenergy.com)

George W. Hardie  
Babcock Brown  
[George.Hardie@patternenergy.com](mailto:George.Hardie@patternenergy.com)

David Hettich  
Gary Energetics  
[david@samgaryjr.com](mailto:david@samgaryjr.com)

Thomas T. Farley  
Petersen & Fonda, P.C.  
[tfarley@petersen-fonda.com](mailto:tfarley@petersen-fonda.com)

Betsy Mecom  
Bar Nothing Ranches  
[betsy@barnothingranch.com](mailto:betsy@barnothingranch.com)

Timothy J. Flanagan, Esq.  
Fowler Schlimberg & Flanagan PC  
[t\\_flanagan@fsf-law.com](mailto:t_flanagan@fsf-law.com)

Sarah W. Benedict  
Russell W. Kemp  
James J. Killean  
Ireland, Stapleton, Pryor & Pascoe, P.C.  
[sbenedict@irelandstapleton.com](mailto:sbenedict@irelandstapleton.com)

[rkemp@irelandstapleton.com](mailto:rkemp@irelandstapleton.com)  
[jkilllean@irelandstapleton.com](mailto:jkilllean@irelandstapleton.com)

Timothy R. Macdonald  
Holly E. Sterrett  
Jacek A. Wypych  
Matthew J. Douglas  
Arnold & Porter LLP  
[timothy.macdonald@aporter.com](mailto:timothy.macdonald@aporter.com)  
[holly.sterrett@aporter.com](mailto:holly.sterrett@aporter.com)  
[jacek.wypych@aporter.com](mailto:jacek.wypych@aporter.com)  
[matthew.douglas@aporter.com](mailto:matthew.douglas@aporter.com)

Craig Cox  
Interwest Energy Alliance  
[cox@interwest.org](mailto:cox@interwest.org)

Ronald Lehr  
[rllehr@msn.com](mailto:rllehr@msn.com)

Elizabeth Tormoen Hickey  
[lisahickey@coloradolawyers.net](mailto:lisahickey@coloradolawyers.net)

Charles R. Sisk  
Colorado Springs Utilities  
Kenneth J. Burgess  
Brett A. Johnson  
Deputy City Attorney - Utilities Division  
[csisk@csu.org](mailto:csisk@csu.org)  
[kburgess@csu.org](mailto:kburgess@csu.org)  
[bajohnson@csu.org](mailto:bajohnson@csu.org)

Matt Futch  
Jeff Lyng  
Morey Wolfson  
Governor's Energy Office  
[matt.futch@state.co.us](mailto:matt.futch@state.co.us)  
[jeff.lyng@state.co.us](mailto:jeff.lyng@state.co.us)  
[morey.wolfson@state.co.us](mailto:morey.wolfson@state.co.us)

Jerry W. Goad, Sr. Ass't Attorney General  
Natural Resources/Environmental Section  
[jerry.goad@state.co.us](mailto:jerry.goad@state.co.us)

Michael J. Santisi  
Office of the Attorney General  
[michael.santisi@state.co.us](mailto:michael.santisi@state.co.us)

Melvanna Rhetta-Fair  
Business & Licensing/Dept. of Law  
[melvena.rhetta-fair@state.co.us](mailto:melvena.rhetta-fair@state.co.us)

Richard P. Noland  
James E. Guy  
[richard.noland@sutherland.com](mailto:richard.noland@sutherland.com)  
[james.guy@sutherland.com](mailto:james.guy@sutherland.com)

Derek A. Dyson  
Seth T. Lucia  
Duncan Weinberg Genzer & Pembroke PC  
[dad@dwgp.com](mailto:dad@dwgp.com)  
[stl@dwgp.com](mailto:stl@dwgp.com)

Isaac H. Kaiser  
[ikaiser@bw-legal.com](mailto:ikaiser@bw-legal.com)

Thomas Barenberg  
c/o Split Rail Fence Co.  
[tbarenberg@splitrailfenceco.com](mailto:tbarenberg@splitrailfenceco.com)

Bruce G. Smith  
Darling Milligan Smith & Lesch PC  
[bsmith@dmsl-law.com](mailto:bsmith@dmsl-law.com)

Daniel Pike  
Colorado Open Lands  
[dpike@coloradoopenlands.org](mailto:dpike@coloradoopenlands.org)

William M. Silberstein  
Christopher S. Jensen  
Isaacson Rosenbaum, P.C.  
[bsilberstein@ir-law.com](mailto:bsilberstein@ir-law.com)  
[cjensen@ir-law.com](mailto:cjensen@ir-law.com)

Ron D. Velarde  
[ron.velarde@state.co.us](mailto:ron.velarde@state.co.us)

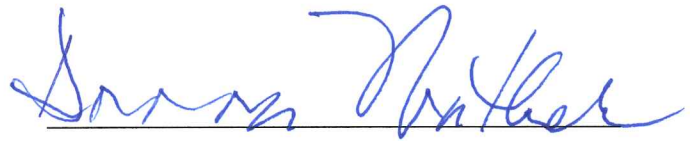
Anthony E. Velarde  
[anthonyvelarde@msn.com](mailto:anthonyvelarde@msn.com)

Dale Hutchins  
[dale.hutchins@state.co.us](mailto:dale.hutchins@state.co.us)

Chere Mitchell  
[chere.mitchell@dora.state.co.us](mailto:chere.mitchell@dora.state.co.us)

Inez Dominguez  
Public Utilities Commission Staff  
[inez.dominguez@dora.state.co.us](mailto:inez.dominguez@dora.state.co.us)

John Reasoner, PUC Advisory Staff  
[john.reasoner@dora.state.co.us](mailto:john.reasoner@dora.state.co.us)

A handwritten signature in blue ink, appearing to read "John Reasoner", written over a horizontal line.