BEFORE THE PUBLIC UTILITIES COMMISSION 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

DOCKET NO. 09A-325E

IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO (A) FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE SAN LUIS VALLEY TO CALUMET TO 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

TESTIMONY OF DEAN APOSTOL

ON BEHALF OF

WESTERN RESOURCE ADVOCATES

October 28, 2009

Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.

A. My name is Dean Apostol. My business address is MIG, 815 SW 2nd Ave., Suite 200, Portland, OR 97204. I am a Senior Landscape Architect and Restoration Ecologist.

Q. WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A. I am a professional landscape architect and natural resources planner with more than thirty-one years of experience, including a career focus on scenic resource analysis, ecological restoration, and watershed assessment. This experience includes analyzing visual impacts from large scale energy projects and proposing avoidance and mitigation measures. I was chief landscape architect for the Mt. Hood National Forest from 1991 to 1996. I presently work at MIG Associates, a planning and landscape architecture consulting firm with offices in California and Oregon. I teach as an adjunct professor at Portland State University and the University of Oregon. More information about my qualifications is contained in my resume, attached to this testimony as Appendix A.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to suggest low-impact siting and mitigation measures to minimize the scenic impacts associated with the proposed San Luis Valley to Calumet to Comanche transmission project.

Q. DID YOU PERFORM A VISUAL IMPACT ANALYSIS FOR THE ENTIRE PROPOSED ROUTE?

A. No, but I did analyze the portion of the route from Alamosa in the west to a few miles east of La Veta Pass. This section was chosen because it is believed to be the area that poses the most significant scenic impacts, and is an area of concern to local property owners and residents of the San Luis Valley. While there are existing scenic impacts in this area as a result of transportation,

telecommunication, rural housing development, and railroad corridors, a new transmission line can introduce new impacts. The observations, conclusions and mitigation strategies in this testimony can, generally, be applied to minimizing visual and scenic impacts in other parts of the proposed transmission line.

Q. COULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?

A. Yes. I evaluated potential impacts to scenic resources and have proposed possible avoidance and mitigation measures. There is no question that the landscape in the vicinity of the proposed transmission line is highly scenic. The combination of vegetation diversity, landform variability, and dominant mountains creates a unique and highly valued landscape setting. Existing human modifications to the natural landscape are generally small scale and not overly intrusive outside of local towns. Siting and building an above ground, high voltage transmission line through this area will have unavoidable visual impacts. The proposed corridor that the transmission line will be located within parallels a major state highway and traverses private ranch land and rural housing areas. My professional judgement is that scenic impacts can be partly avoided, and otherwise minimized if care is taken in right-of-way selection, corridor design, tower design, and other mitigation measures are employed by project developers.

The measures I recommend are:

1. Use the south edge of the proposed corridor.
2. Take advantage of micro topography (swales and low hills) to hide the line from key viewpoints to the greatest extent practicable.
3. Where possible, co-locate the transmission lines with other telecommunication, transportation, local electrical transmission and/or railroad corridors. Avoid crossing through highly visible undisturbed natural areas.

4. Properly weigh the short-term higher costs that may be necessary to mitigate scenic impacts against the longer-term benefits gained by preserving sense of place, high-quality scenic views and the local/regional tourist and recreation economy.
5. Keep the line away from the highest quality scenic features.
6. Focus mitigation strategies in areas viewed by large numbers of people.
7. Choose tower designs that best fit the conditions. Choose low profile towers where the line is crossing open land, and taller, more slender towers to cross over low forest.
8. Minimize color contrast by using dark, low reflectivity towers and attachments.
9. Minimize clearing and ground disturbance, especially in forested areas.
10. To the extent that a transmission line can straddle low growing vegetation, massive clearing can be avoided, which also avoids the clear-cut strip effect that is common where power lines cross through tall forest.
11. Where possible, eliminate existing local utility poles and lines by consolidating with the new towers.

Q. HOW FAMILIAR ARE YOU WITH THE LANDSCAPE IMPACTED BY THE PROPOSED TRANSMISSION PROJECT?

A. I traveled to San Luis Valley and visited the proposed transmission route the week of August 4, 2009. In order to inform and focus my field analysis, in July 2009 my firm developed a GIS analysis of the proposed route and estimated potential visibility of the transmission lines. My August 2009 visit included stops at over 30 locations to view and photograph existing landscape conditions. I also researched ecological conditions of the area, reviewing multiple publications and descriptions to help understand how the visual character of the land is shaped by the landscape ecology.

Q. WHY ARE THE VISUAL IMPACTS OF THE PROPOSED PROJECT IMPORTANT?

A. The San Luis Valley to Calumet to Comanche transmission project is approximately 100 miles long and would run between the San Luis Valley and Pueblo, Colorado. The San Luis Valley is a high desert ecosystem framed by majestic peaks of the southern Rocky Mountains, including the Sangre de Cristo and San Juan Ranges. Desert shrub and wet meadow conditions dominate the valley floor, except where irrigated agriculture has displaced them. As elevations increase, vegetation transitions to pinyon pine & juniper woodland, and then aspen, spruce-fir forests. These eventually give way to subalpine and alpine ecosystems at the highest elevations. Each vegetation type has its own visual character.

The landscape of the San Luis Valley and La Veta Pass is a highly valued area for its scenic qualities. These include the mountainous terrain of the Sangre de Cristo Range, the complex and variable natural vegetation patterns, the lush wetlands fed by groundwater discharging from Great Sand Dunes National Park, and the relatively undeveloped character of the area. The scenic quality of the region presumably contributes to the local quality of life and provides economic value (tourism) for local communities. The scenic qualities of this region are unique and establish a strong sense of place and identity. People are drawn to places where they can experience authentic natural and cultural landscapes. The San Luis Valley and the surrounding region exhibit a strong visual coherence that provides a clear identity and sense of place. Landscapes with these qualities are increasingly rare as modern development has altered scenic conditions and degraded unique local identities. Long-time residents appear to sense and cherish the outstanding beauty of this area and have shown they are protective of it. Some or most of the landscape that the proposed line crosses is considered highly scenic and/or culturally significant, in part due to the historic nature of early Spanish land grants and settlement patterns. There are multiple public and private viewpoints in the valley, particularly State Highway 160, which parallels much of the proposed transmission line

alignment. One national park is also near the proposed route. The surrounding landscape includes open rangeland, irrigated farms, woodlands, and spectacular mountains, including the Spanish Peaks, Blanca Peak, Mt. Maestra, and other nearby peaks of the Sangre de Cristo Range.

Q. HOW WILL THE PROJECT AFFECT THE REGION'S IMPORTANT SCENIC QUALITIES?

A. Scenic impacts are best measured qualitatively instead of quantitatively. The degree of impact ultimately depends on the decisions made with respect to right-of-way selection, design, and mitigation measures selected and implemented by project developers. If the least impactful route is chosen, good design principles followed, and if all reasonable mitigation measures are implemented, then although the valued scenic qualities of the area will be somewhat impacted, that impact will be within a range acceptable to most people. The most outstanding scenic features, particularly views of high mountains, should remain intact as viewed from key public viewpoints.

Q. WHAT ARE THE ATTRIBUTES OF THE PROPOSED PROJECT THAT CONTRIBUTE TO THIS ADVERSE EFFECT ON SCENIC QUALITY?

A. The proposed transmission line will be placed within a 200’ wide right of way somewhere within a 2-3 mile wide corridor that mostly straddles Highway 160. The height of the transmission towers may vary from 115 to 150 feet. A high voltage transmission line is a relatively high contrast feature that will be seen as a disturbance to the existing visual landscape. At present, most of the land along the route is relatively natural appearing and undeveloped, so a new intrusion of modern industrial facilities (which power lines represent) will inevitably degrade scenic quality. The major exceptions are Highway 160 and the existing homes and roads in subdivisions immediately south of the highway.

The San Luis Valley and La Veta Pass are currently mostly rural and natural appearing. Visual preference research demonstrates that people place higher value on more natural scenes, with

lower value as areas are increasingly developed. (An exception is the high value placed on some developed agricultural or urban landscapes, such as fine grained farm tapestries or historic town centers and villages). People tend to value natural landscapes like those of the San Luis Valley area for their intrinsic qualities and view newly introduced features that are contrasting in a negative light. In technical terms, an above ground high voltage transmission line introduces high contrast line, form, color, and texture to the existing landscape. These effects can be avoided in places, and mitigated in others, but they cannot be entirely eliminated. It should be noted that existing development in the area, notably roads, local utility lines, and rural housing have already negatively impacted on the scenic integrity of the area, particularly the San Luis Valley. But these impacts are not to a degree where they dominate over the natural qualities of the land.

Q. ARE THERE STANDARDS AND TECHNICAL TERMS THAT APPLY TO A SCENIC ANALYSIS?

A. Yes. Over the past four plus decades the US Forest Service, Federal Highway Administration, Bureau of Land Management, and several international land management agencies have developed a professional system for evaluating scenic quality and techniques for avoiding or mitigating impacts. This system goes under various names depending on the agency. The Forest Service uses the term "Scenic Management System" (SMS). SMS is used to determine the relative scenic quality of a landscape based on objective factors applied to local conditions. For example, within a given region landscapes with more dramatic topography, complexity in vegetation, and mystery (hidden features) are rated higher than nearby areas that are flat, simple, and completely open to view. Researchers have explored and described the elements that most people find appealing, and this closely matches intuition. It helps explain why government has chosen to protect outstanding natural resources at places like; the Grand Canyon, Yosemite, and Rocky Mountain National Park. It also explains designation of certain highway corridors as scenic byways, and the development of

amenities like scenic turnouts and viewpoints. Highway planners put these where most people will agree that the land has scenic qualities.

The Forest Service uses its system to rate landscapes as (A) outstanding, (B) typical, and (C) ordinary, based on an objective measure of local features. Areas rated (A) are usually assigned a higher level of protection that limits human caused landscape changes. Generally, the goal is to limit the amount of deviation from natural (or cultural) form, line, color, and texture in order to conserve scenic quality. Thus if a landscape is characterized by curvilinear lines, it is best to avoid introducing long straight lines, by bending a road or transmission line easement for example. If natural shapes are irregular and broken up, then creating a straight sided opening with sharp edges is not appropriate if scenic conservation is important.

Most scenic conservation systems take into account the number and sensitivity of viewers. For example, a very scenic landscape that has few viewers might not rate high for conservation in comparison to a less scenic area that has a constituency. Other important technical concepts in scenic management include: "scenic integrity," meaning the degree to which a landscape is unaltered, "distance zones," which refers to how far a view is from the viewer, and "landscape character," which refers to the particular attributes, qualities, and traits that make it identifiable or unique. The core objective of scenic conservation systems is to use planning and analysis to find optimum solutions – meaning, the appropriate level of conservation combined with strategies, tools and techniques to ensure meaningful and actual implementation.

Q. ARE THERE GENERAL PRINCIPLES THAT APPLY TO A SCENIC IMPACT ANALYSIS?

A. Yes, and more specifically there are several principles that should influence transmission line placement and design to avoid or reduce scenic impacts. The first questions to ask when seeking to reduce scenic impacts are: for whom and from which viewpoint(s)? Landscapes can usually be seen

from numerous places. As a general rule, public viewpoints with large numbers of people, or where the viewers have a reasonable expectation of an unaltered view are the places that get the highest consideration. Views from a single private residence for example, would merit less consideration.

Since the proposed transmission corridor straddles Highway 160 between Alamosa and La Veta Pass, this analysis assumed that Highway 160 may represent the most important viewer position in the area, since it appears to be the main route for both tourists and local residents There are at least two public waysides or scenic turnouts located along Highway 160, one just east of La Veta Pass and the other a few miles east of Fort Garland. The Fort Garland Historic Site (an old military fort) is also a logical location to include as a viewer position, as is the Great Sand Dunes National Park and other designated scenic roads in the area. From an ecological standpoint, it is defensible to try and co-locate transmission facilities in existing corridors like Highway 160 since there is already ground disturbance and traffic that has already disturbed the landscape and impacted natural resources. However, from a scenic conservation standpoint, it would be best to locate the transmission line away from a tourist route.

Viewing distance is important. As a general rule, the farther away a visual intrusion is from a viewer, the better. Middle ground views (from 1 to 5 miles distant) allow the viewer to experience a high amount of both coherence and context. Coherence is where a viewer can “read” the relationship between landscape elements. Context means there is enough landscape in view where a single element can be weighed against the norm. For example, a road seen within a large scale landscape is viewed differently than when the road dominates and the landscape is small. Middle ground distance views often provide both detail and context. Visual disruptions are readily apparent if they strongly contrast with natural form, line, color, and texture.

Q. FOR THE PORTION OF THE PROPOSED LINE BETWEEN ALAMOSA AND A FEW MILES EAST OF LA VETA PASS, CAN YOU PLEASE DESCRIBE THE MAIN SCENIC AND LANDSCAPE FEATURES OF THE CORRIDOR?

A. The major scenic features within and near the proposed corridor are the Sangre de Christo Mountain Range, including local peaks like Blanca Peak, Little Bear Peak, Mount Lindsey, and Elingwood Point (all over 14,000 feet in elevation). To the north the Great Sand Dunes are cradled by a bend in the mountain range. The Zapata Ranch is a scenic area of wetlands, lakes, and cottonwood groves. To the east are Mount Maestras, Silver Mountain, and Sheep Mountain. To the south is a range of low mountains with forest and scrub vegetation. Trinchera Creek and the Mountain Home Reservoir are important local features. The Alamosa National Wildlife Refuge has wetlands and seasonal ponds, as well as the visual spectacle of migrating waterfowl. The mixed aspen-conifer forests at La Veta Pass are valuable features, as are the grassy meadows along the west side of the pass.

Negative scenic elements include Highway 160, local utility poles, roadside signage, dirt roads on the Trinchera Ranch, and rural subdivisions.

Q. IS THERE EVIDENCE OF LIKELY ADVERSE VISUAL IMPACTS OF THE PROPOSED PROJECT?

A. We generated several visual simulations that show what the powerlines might look like from local viewpoints. The visual simulations include 115' tall towers (H design) and 150' towers (monopole design). We assumed wood or weathering steel towers would be used to mute color contrast and mitigate visual impacts. We also assumed minimal ground disturbance, and no roads under the power lines. All photos were taken from alongside public roads, with specific locations noted on the photos. These simulations, labeled as Exhibit 1, are intended only to give an indication of the impacts, not a precise measurement of impacts.

In addition, using a GIS visibility analysis, we developed and analyzed three separate scenarios to compare how much of the overall area would be visually impacted by the transmission corridor within 20 miles distance. The three scenarios included selecting alignments at the north and south edges of the corridor, and alongside Highway 160. We analyzed visibility by determining how much total area would be able to "see" the power lines, assuming a worst case of 150' tower height:

- Powerlines following the north edge of the corridor: Visible from 582,000 acres (Exhibit 2)
- Powerlines alongside Highway 160: Visible from 318,000 acres (Exhibit 3)
- Powerlines following the south edge of corridor: Visible from 458,000 acres (Exhibit 4)

Thus, the route alongside the highway has the least amount of total visibility, with the south of highway route second. Total acres affected is simply one gauge, not necessarily the most important one. Visibility maps of each scenario are included as Exhibits 2, 3 and 4. These maps show potential visibility taking into account topography but not screening vegetation. They indicate how much of the powerline is visible from a given area by showing a color gradation, with higher visibility in red and orange.

Q. HOW WERE THESE SIMULATIONS MADE IN ORDER TO REFLECT THE LIKELY APPEARANCE OF THE PROPOSED PROJECT?

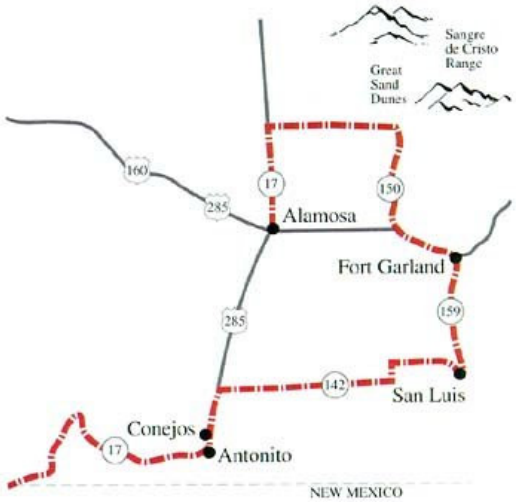
A. Photographs were taken from local places that would likely have views of the proposed project using a fixed 50 mm lens to give an accurate distance (similar to the human eye). We "Photo-shopped" simulated transmission towers and lines into the view at approximate locations based on the map showing the proposed corridor. We used tower types that match the types that will likely be used, assuming mitigation of scenic impacts is a factor.

Q. WHAT ARE SOME OF THE ADDITIONAL PRINCIPLES AND APPROACHES THAT SHOULD BE USED WHEN SITING A TRANSMISSION LINE?

A. As a primary matter, route selection is most important in terms of reducing scenic impacts. It is best to select a corridor and eventual right-of-way so they are not between the viewer and the best quality scenery (i.e. between Highway 160 and Blanca Peak). Once a general right-of-way is selected, project designers should make use of micro topography (low hills, swales, valleys) to help partially or completely hide the transmission lines from sensitive viewpoints. Visual chaos should be avoided by staying with a single tower design for as long as possible. Vegetation should be kept as natural as possible under and adjacent to the lines, clearing only that vegetation that is necessary. Replanting with appropriate species is important. Color contrasts should be muted by using natural wood poles or weathering steel.

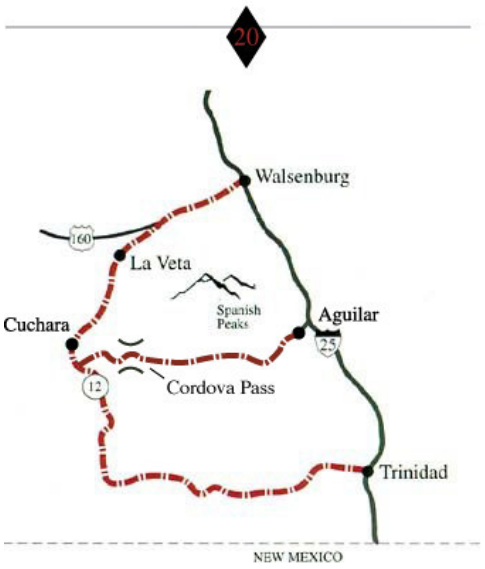
Q. ARE THERE SCENIC HIGHWAYS IN THE PROJECT LOCATION?

A. Yes, they are described and depicted below.



The above picture shows the state designated scenic highway from Antonito through Fort Garland continuing north towards Great Sand Dunes National Park. It does not include the majority of Highway 160 in the corridor proposed by the applicants. A second State Scenic Byway in the

vicinity of the proposed corridor, depicted below, is the "Highway of Legends." This runs east and south of La Veta Pass, and includes a stretch of Highway 160 between Walsenberg and La Veta. It does not include the Highway 160 between Alamosa and La Veta Pass.



Q. HOW WOULD THESE CONSIDERATIONS APPLY TO THE PROPOSED TRANSMISSION CORRIDOR BETWEEN ALAMOSA AND JUST EAST OF LA VETA PASS?

A. Much of the proposed route is across desert shrub, grassland, or farmland, but the area at La Veta Pass has large swaths of dense forest. This is an area with high vegetation and landscape feature complexity, which should be avoided if possible because areas like this tend to rate higher scenically than areas with simple patterns of vegetation.

Very flat terrain, like the Alamosa Plain is technically easy to cross, but presents visual challenges when tall towers are viewed against the sky. This creates high contrast and makes the towers stand out. Placing transmission towers in front of prominent landscape features that draw the eye (*i.e.*, Blanca Peak and other high mountains) should be avoided. Rolling landforms like those of south of Highway 160 are the most forgiving because transmission lines can dip behind low hills, or

the hills can act as a backdrop that reduces contrast. Areas that are well hidden, such as low points or troughs, are better for locating transmission lines than are visually prominent areas like ridge tops. My field visits indicated that the area south of Highway 160 has the type of terrain features that facilitate partial screening of the transmission line. The land north of Highway 160 should be avoided because it would place the line between the viewers and the important scenic features.

If the transmission line is located near the highway, this would create strong foreground impacts because the large scale transmission towers would dominate the view. If it were located to the outer edges of the corridor (north or south,) then the impacts would occur in the middle ground as viewed from the Highway. The large scale of the transmission towers suggests that moving them farther away from the viewer is preferred. My professional opinion is that Highway 160 is the most important view corridor in the area, and that the route with the least potential impact is south of Highway 160, using distance and micro-topography to further reduce the visibility of the line.

Furthermore, if the transmission line can follow the railroad grade near La Veta Pass instead of the Highway, significant visual impacts can be avoided altogether. (The railroad grade corridor was under consideration as an alternative at one time).

Q. PLEASE DESCRIBE THE PARTS OF THE ROUTE THAT YOU SPECIFICALLY ANALYZED.

A. I analyzed the portion of the line that runs from Alamosa to a few miles east of La Veta Pass. For the purposes of this analysis, I divided the landscape into five sections that run east to west:

1. East of La Veta Pass
2. La Veta Pass
3. West of La Veta Pass
4. Along 160, east of Alamosa.
5. Alamosa Plains

Q. PLEASE DESCRIBE THE SECTION EAST OF LA VETA PASS IN DETAIL.

A. The area east of La Veta Pass along Highway 160 is a rolling, open plain dominated by desert shrub and grassland plant communities at lower elevations, transitioning to pinyon juniper in the foothills. The Spanish Peaks to the south, and Mount Maestas and Silver Mountain to the northwest, are the visually dominant land forms, reaching over 13,000 feet. The scale of the landscape is vast, with views reaching to great distances in all directions. Human features are evident, and include local utility poles and wires, signs, rural homes, and the town of La Veta to the south. However these human modifications are slight compared to the large scale natural features. Landscape variety is high, and the mountains provide a strong unifying element. There is strong visual coherence, meaning that it is easy for a viewer to make sense of what he or she is seeing, an open plain transitioning to woodland framed by mountains. These landscape patterns reinforce one another, and are aesthetically well balanced.

Using Forest Service terminology, the area east of La Veta Pass can be classified as "distinctive," which is the highest of three possible scenic quality levels. It has strong integrity in spite of some impacts caused by human modifications. A photograph representing a typical view of this section of the proposed corridor is attached to this testimony as Exhibit 5.

Q. WHAT ARE YOUR SPECIFIC MITIGATION RECOMMENDATIONS FOR THIS SECTION OF THE PROPOSED CORRIDOR?

A. Within the proposed corridor, the transmission line should be located as far south of Highway 160 as is practicable given other natural resource concerns. A south of Highway 160 location has topographic advantages including a low ridge to the south that could be used to fully screen the transmission line from Highway 160. The terrain also tends to slope down to the south, and with the low mountain backdrop a large scale transmission corridor would likely be low visibility. Locating

the transmission line near Highway 160, on the other hand, would result in more impacts to people using the highway. The open landscape character north of the highway and raised terrain would likely result in higher impacts and higher visibility.

Q. PLEASE DESCRIBE THE LA VETA PASS SECTION IN DETAIL.

A. As one travels west and nears the pass, the landscape closes in, with the view dominated by Mount Maestas to the north and Spanish Peaks to the south. The plain gives way to hills, and the open vegetation transitions to a mosaic of shrubland, woodland, and forest. Human features are less noticeable, including a few small utility poles and gravel roads, plus an occasional cabin or house. The forest shows signs of stress, evidenced by brown needles on conifer trees.

The landscape variety is high, strongly unified, and coherent. The dominant elements are low mountain ridges and hills rather than dramatic peaks, and the smaller scale views are less impressive. The quality lies somewhere between what the Forest Service would define as "distinctive" and "typical." A photograph representing a typical view of this section of the proposed corridor is attached to this testimony as Exhibit 6.

Q. WHAT ARE YOUR SPECIFIC MITIGATION RECOMMENDATIONS FOR THIS SECTION OF THE PROPOSED CORRIDOR?

A. The corridor map shows the transmission line running north of Highway 160 once it reaches the east side of La Veta Pass. The best solution in terms of minimizing scenic impacts would be to avoid routing the transmission line through the narrow pass altogether by choosing a route farther south, possibly along the existing railroad corridor. My understanding is that the CPCN application and related materials indicate the existing railroad corridor was once considered as a potential route for the transmission lines. Using it would significantly reduce scenic impacts, especially from Highway 160. The railroad route ducks behind low hills as it parallels Highway 160, and a

transmission line located here would be barely visible to most highway users. There are some private homes near the railroad that would be impacted by this route being chosen, as well as a gated community. I did not study the railroad grade in depth, especially east of La Veta Pass, but in looking at maps there do not appear to be any serious obstacles in that area.

If the line must use La Veta Pass alongside the highway, there are opportunities to use micro topography on the south side of the road to fully or partially screen the lines from highway travelers. Placing the line in a swale next to the highway, and keeping the towers low would allow highway users to look over the top of the line. If the line could be routed along old La Veta Pass Road it would be well hidden from Highway 160.

The highest scenic impact would likely be locating the transmission line north of Highway 160. The landscape here is open and elevated, and the lines would be between the viewers and Mt Maestra.

Q. PLEASE DESCRIBE IN DETAIL THE AREA WEST OF LA VETA PASS.

A. Just west of the pass, the landscape transitions into a subalpine scene of high grassy meadows flanked by aspen and conifers, with dramatic, high peaks looming over. This area has very high variety, unity, coherence, and drama. There are very few obvious man-made features, mainly low fences in the meadows, and a low radio tower made of steel.

As one continues west the landscape opens up onto a wide panorama of meadow, woodland, forest, and mountains. This is a very impressive scene that clearly merits a “distinctive” attractiveness rating.

Tucked behind a hill south of Highway 160 on Old La Veta Pass Road is the ghost town of Uptop, a turn of the century mining camp. This site has strong cultural landscape character, particularly its old buildings within a forested setting backed by Mount Maestas. Old La Veta Pass

road is south of Highway 160 and could offer an alternative route for the transmission lines that would help reduce or avoid impacts to viewers on the main highway. A photograph representing a typical view of this section of the proposed corridor is attached to this testimony as Exhibit 7.

Q. WHAT ARE YOUR SPECIFIC MITIGATION RECOMMENDATIONS FOR THIS SECTION OF THE PROPOSED CORRIDOR?

A. The lower terrain to the south of Highway 160 would be more favorable than the higher terrain to the north with respect to visual impacts. The line could be routed along the edge of the open meadow and against the woodland to help mask it against a backdrop of trees. See Exhibit 1, page 3 for an illustration. Depending on the route, shorter or taller stature poles would lessen impacts. If tall weathering steel mono pole towers were used as the line enters the forest, then shorter stature trees could be retained and visual impacts softened. If the railroad grade were used, then impacts to views with the highest integrity from Highway 160 looking north could be mostly avoided

Q. PLEASE DESCRIBE THE SECTION ALONG 160 EAST OF ALAMOSA.

A. Privately held ranchland covers over 170,000 acres. The area that includes the transmission line corridor has rolling terrain with brush and grass giving way to pinon juniper woodland and then forest. Blanca Peak, a noted fourteener, is a few miles north of Highway 160, and dominates the view in that direction.

To the south is a chain of low hills and mountains. There are some human modifications in this area, particularly numerous unsurfaced roads, and what appears to be a fire break cut across a long, low ridge. The scale of the view is quite large. There is variety and unity, but the road network south of Highway 160, utility poles and lines, and a scattering of homes and out-buildings lowers the overall scenic integrity in this area. The Mountain Home reservoir is a water feature that adds some visual interest in this arid landscape. Overall, the ranch landscape south of Highway 160 rates B, or

"typical." For a few miles south of south of Highway 160, to the east of Fort Garland, there is an extensive network of roads and associated infrastructure serving the residential homes in subdivisions including the Sangre de Cristo Ranches and neighboring subdivisions.

The area north of Highway 160 has much higher scenic integrity, and with Blanca Peak in view, rates "distinctive." Blanca Peak and several nearby peaks higher than 14,000 feet in elevation are at the south end of a long mountain ridge of the Sangre de Christo Range. The landscape around this ridge is rolling, with sagebrush vegetation. There is very little development or visual disturbance north of Highway 160 between Alamosa and La Veta Pass. This is the most scenically intact area within the proposed transmission corridor. A photograph representing a typical view of this section of the proposed corridor is attached to this testimony as Exhibit 8.

Q. WHAT ARE YOUR SPECIFIC MITIGATION RECOMMENDATIONS FOR THIS SECTION OF THE PROPOSED CORRIDOR?

A. In this location, it would be preferable to stay south of Highway 160 across the open, rolling terrain. Placing the power line to the north would put it between highway viewers and Blanca Peak, as well as the other peaks and broader mountain range. To the south, there are multiple opportunities to use terrain, including low points and hills, and the existing railroad grade to partially or completely screen the transmission line from most viewers along Highway 160. Lessening visual impacts to the north of Highway 160 to travelers and residents with this strategy, however, would likely create greater impacts to residents of existing housing subdivisions in the immediate area of the line. Depending on micro topography features south of Highway 160 and the type of rolling hill terrain between the highway and the residential subdivisions, there may be opportunities to avoid and/or lessen visual impacts to local residents, future lot developers and recreational users. Using shorter stature H-frame poles made from wood or corten steel should be considered in this area to help reduce impacts. Also removing existing local utility poles and co-locating those lines with the new

transmission line would further reduce impacts. See Exhibit 1, page 3 for an illustration of how a low scenic impact transmission line could be located in this area.

Q. PLEASE DESCRIBE THE ALAMOSA PLAINS SECTION OF THE ROUTE.

A. From Fort Garland, a small historic settlement of a few hundred people that consists of one to two story buildings to Alamosa, the landscape becomes table top flat, framed by low hills to the south and high mountains to the north. Human modifications: individual homes, rural subdivisions, signs, utility poles, and farms dominate the landscape character south of Highway 160. To the north the Sangre de Cristo Range is dominant, and cultural features are much fewer and less intrusive. The Great Sand Dunes National Park is visible along the base of the mountains east of Highway 150, fifteen miles to the north.

I rated the landscape south of Highway 160 (C), or "ordinary," and the landscape to the north (A), or "distinctive." This is based on a combination of factors, including land form, views of mountains, vegetation complexity, and the amount of existing development. A photograph representing a typical view of this section of the proposed corridor is attached to this testimony as Exhibit 9.

Q. WHAT ARE YOUR SPECIFIC MITIGATION RECOMMENDATIONS FOR THIS SECTION OF THE PROPOSED CORRIDOR?

A. Scenic impacts in this section would be greatly reduced by placing the transmission line as far to the south of Highway 160 as is practicable. There may be wetlands and other natural resources in this area that could limit how far south the transmission line is placed. The low terrain and existing landscape modifications, however, are much more favorable to line placement than the relatively undisturbed and highly scenic area north of the highway. Using low stature H-frame poles would minimize the framing of the structures against the skyline.

Q. WHAT IS YOUR OVERALL OPINION REGARDING THE VISUAL IMPACT OF THE PROPOSED TRANSMISSION LINE?

A. There is no question that a new high voltage, above ground transmission line will have negative visual impacts to the study area wherever located in the proposed corridor. However, there are ways to potentially avoid – in some places – and minimize in others – these impacts, as follows:

- Keep the transmission right-of-way as far south of Highway 160 as possible to minimize impacts to the greatest number of people and the tourist economy.
- Use low stature poles made of natural wood or weathering steel where crossing open vegetation and flat terrain.
- Use tall mono poles made of weathering steel where crossing through woodland or forest, and retain shorter stature trees underneath the lines to the greatest practicable extent.
- Remove existing local poles and use the new ones for local lines where possible to lessen cumulative visual impacts.
- If possible, use the railroad grade instead of following Highway 160 to get across La Veta Pass .
- Minimize vegetation clearing and ground disturbance.

Above all, the line should be located, wherever possible, in the lowest impact area. It is important that this project be considered a multiple objective design project, not simply an engineering project. My professional opinion is that the proposed project's visual impacts can be substantially mitigated by following the recommendations in this testimony.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

Appendix A

Dean Apostol
Project Manager/Senior Landscape Architect
MIG, Inc.
815 2nd Avenue, Suite 200
Portland, OR 97204
ph: (503) 297-1005 | fx: (503) 297-3195

Education
Bachelor of Science, Landscape Architecture, Iowa State University
Graduate Coursework, Geography, Portland State University

Professional Registrations
Landscape Architect: Oregon, #173

Qualifications
Dean Apostol has over 30 years of experience in environmental analysis, landscape design and ecological restoration, including forested uplands, oak woodlands, grasslands, riparian and tidal wetland areas. He is a regional and national expert on scenic resource analysis and conservation, and has served as an expert witness on several projects. Prior to joining MIG, Mr. Apostol managed a sole-proprietorship practice. Some of Mr. Apostol's previous projects include the evaluation of scenic impacts from forest practices in Washington, wind energy proposals in the Columbia Gore National Scenic Area, scenic character analysis for new communities, and mitigation of scenic impacts from highway development. He was also a landscape architect for Mount Hood National Forest for 11 years, where he developed management plans for scenic byways, historic trails, and wild and scenic rivers. While at the Forest Service Mr. Apostol published *Forest Landscape Analysis and Design*, a book that describes a method for integrating planning and ecology over large forested areas. He managed multiple scenic resource conservation projects, from wild and scenic rivers to ski areas. Mr. Apostol has also published *Restoring the Pacific Northwest: The Art and Science of Ecological Restoration in Cascadia* in 2006, the leading text on the practice of ecological restoration in the Northwest region. He co-authored chapters on landscape scale and riparian restoration, and provided technical editing for the entire book. He also co-authored *Designing Sustainable Forest Landscapes* (Taylor and Francis Press, 2008). This text integrates conservation of forest scenery with forest ecology for temperate regions. Mr. Apostol continues to write, lecture and teach at the University of Oregon and Portland State University on natural resource and restoration topics.

Experience

- Blue Ridge Pipeline Scenic Impact Assessment
  Columbia River Gorge, Oregon

- Forest Park and Powell Butte Wildfire Risk Reduction Project
  Portland, Oregon

- Skamania County Wind Energy Impact Expert Testimony
  Stevenson, Washington

- Windy Ridge Scenic Impact Review and Recommendations
  Columbia River Gorge, Washington

- Washington Forest Scenic Impact Analysis
  *Washington State**

- City of Damascus Scenic Inventory and Town Plan
  *Damascus Oregon**

- Skagit River Transmission Corridor Scenic Mitigation Review
  *Seattle, Washington**

- Clackamas River Hydro Re-Licensing Project Scenic Assessment
  *Mount Hood National Forest, Oregon**

- Clackamas Wild and Scenic River Plan
  *Mount Hood National Forest, Oregon**

- State Highway 35 Scenic Viewshed Plan
  *Mount Hood National Forest, Oregon**

**Work performed prior to joining MIG.*

Site: 4, US Hwy 160 & CR 442 junction, looking west

Before

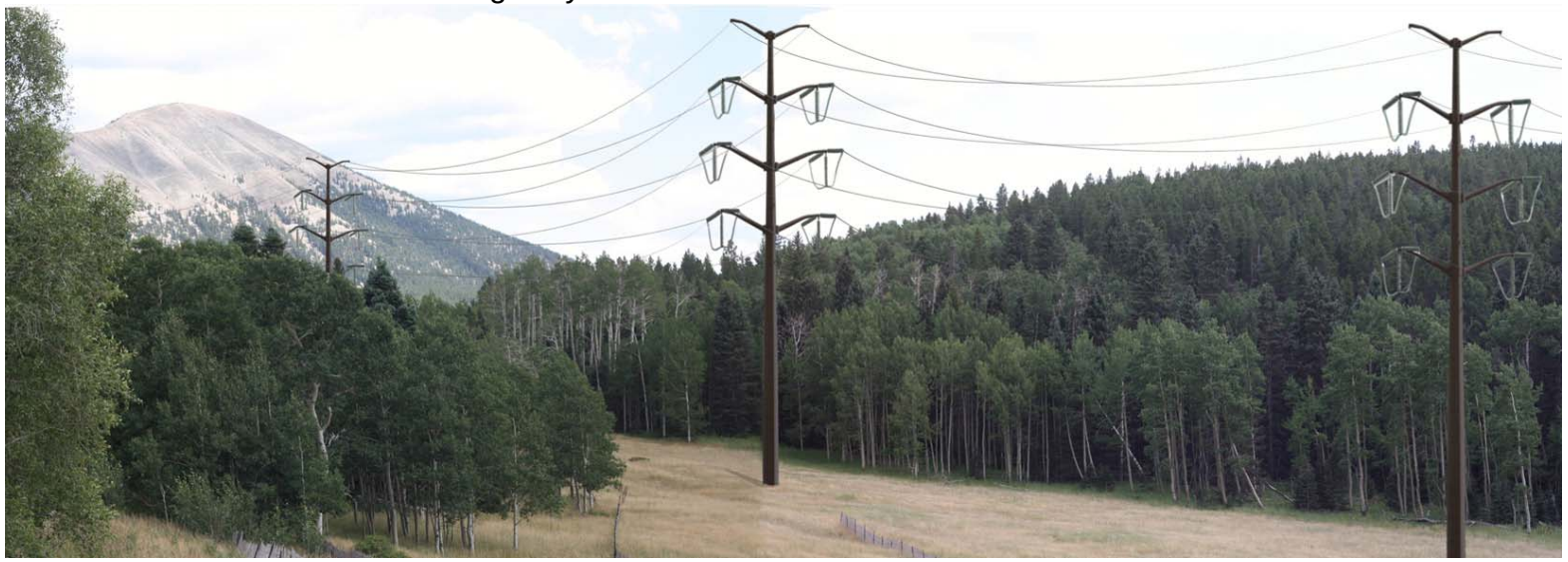
After: transmission line south of Highway 160

150 ft weathering steel monopoles

Site: 6, US Hwy 160 west of La Veta Pass Road, looking east

Before

After: transmission line south of Highway 160



150 ft weathering steel monopoles.

Site: 18, US Hwy 160 east of Fort Garland, looking south

Before

After: transmission line south of Highway 160

115 ft H Poles

Site: 21, US Hwy 160 & Hwy 150 Intersection west of Blanca, looking east

Before

After: transmission line alongside Highway 160

115 ft H Poles

Site: 27, Taos Rd 1.5 miles South of Hwy 160 and Ft. Garland, looking west

Before

After: transmission line south of Highway 160

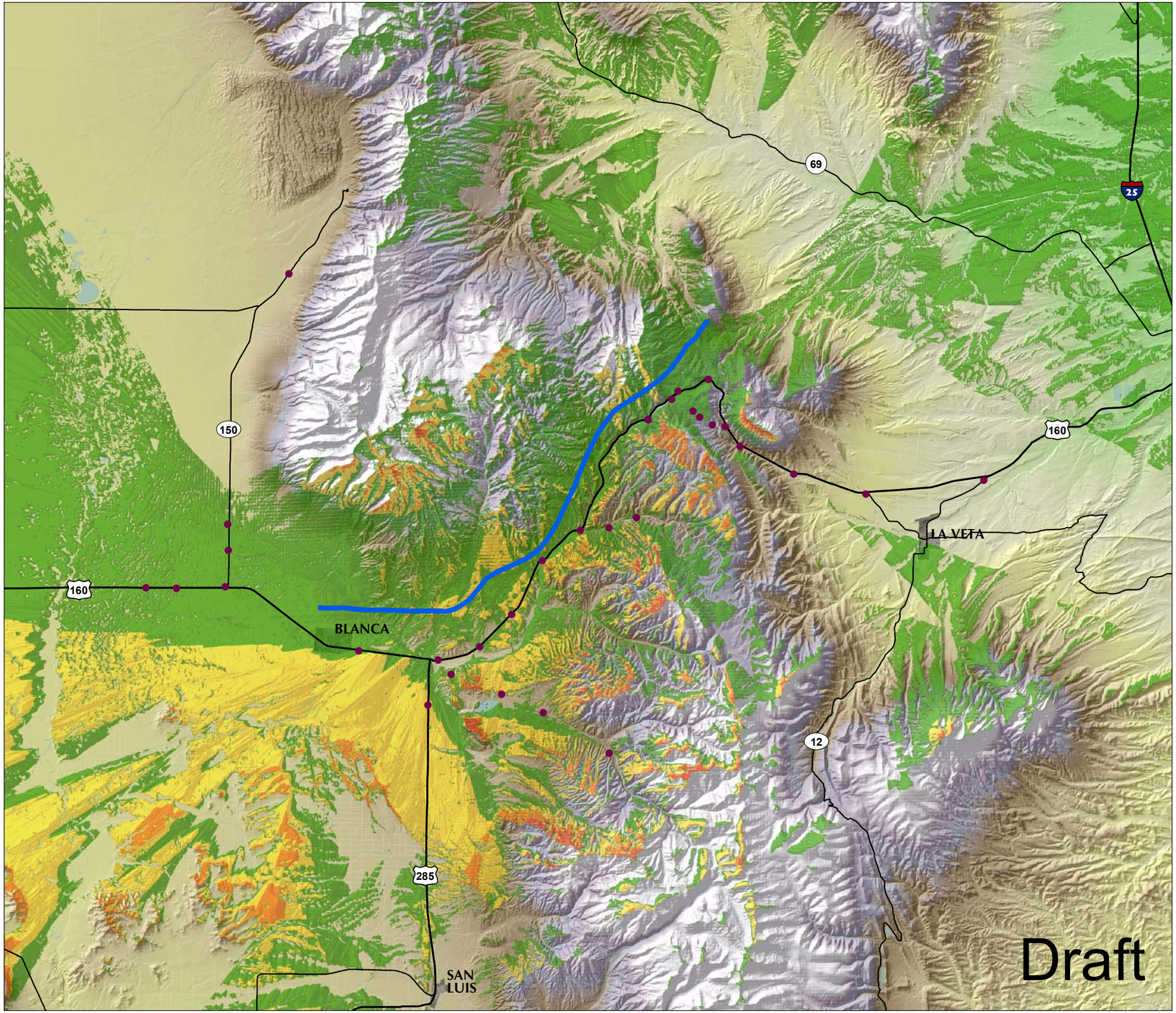
115 ft H Poles

Site: 29, Trinchera Ranch Road & Beekman, looking east

Before

After: transmission line south of Highway 160

115 ft H Poles



San Luis-Pueblo Transmission Line Scenic Assesment

San Luis Valley, Colorado

North Corridor Boundary Viewshed Analysis 150ft Transmission Line Height

North Corridor Visible Hit Rate

- 1 - 250
- 251 - 500
- 501 - 750
- 751 - 1,132

- Site Tour Stop
- North Corridor Boundary Line
- City
- Major Roads
- Minor Roads
- River/Stream
- Waterbody

Approximate Total Viewable Area
582,457 Acres

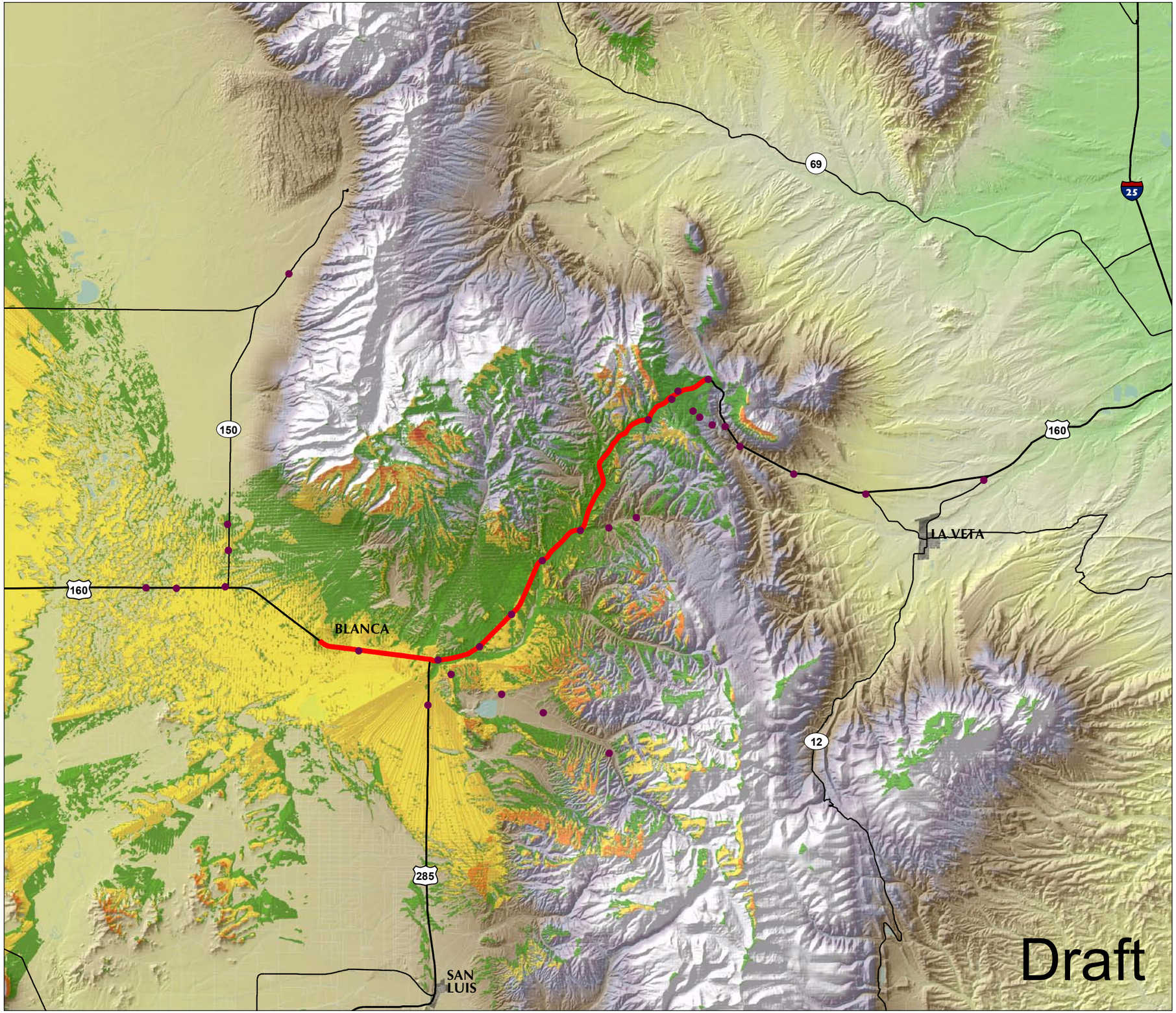
Note: viewable area measured within map extent

N

0 5 10 Miles

M I G

September 2009 I Data Source: USGS, ESRI, Department of Transportation and Preliminary Alternative Corridors Map



San Luis-Pueblo Transmission Line Scenic Assesment

San Luis Valley, Colorado

US Hwy 160 Viewshed Analysis 150ft Transmission Line Height

US Hwy 160
Visible Hit Rate

- 1 - 250
- 251 - 500
- 501 - 750
- 751 - 1,174

- Site Tour Stop
- US Hwy 160
- City
- Major Roads
- Minor Roads
- River/Stream
- Waterbody

Approximate Total Viewable Area
319,518 Acres

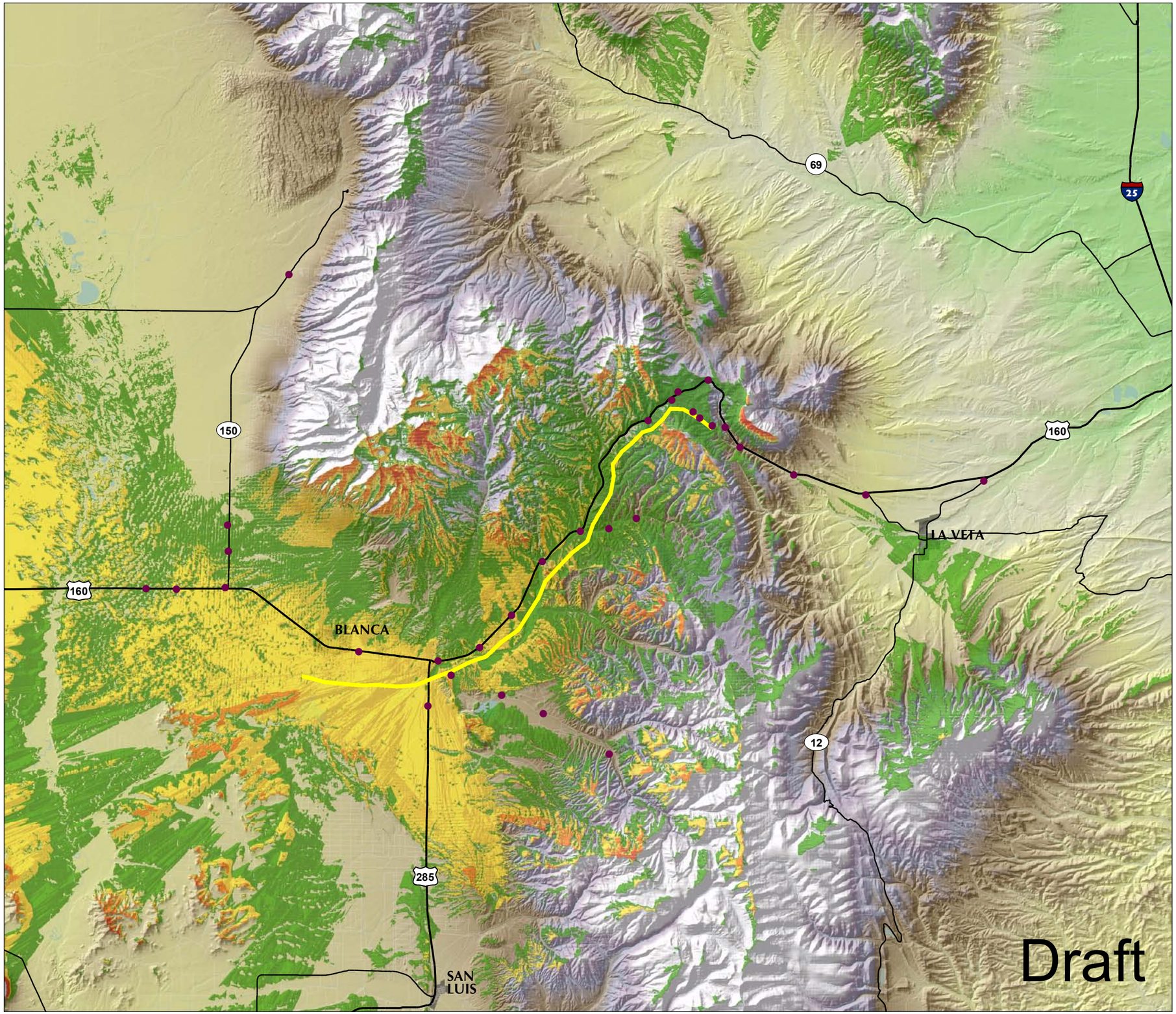
Note: viewable area measured within map extent

N

0 5 10 Miles

MIG

September 2009 | Data Source: USGS, ESRI, Department of Transportation and Preliminary Alternative Corridors Map



San Luis-Pueblo Transmission Line Scenic Assesment

San Luis Valley, Colorado

South Corridor Boundary Viewshed Analysis
150ft Transmission Line Height

South Corridor Visible Hit Rate

- 1 - 250
- 251 - 500
- 501 - 750
- 751 - 1,232

- Site Tour Stop
- South Corridor Boundary Line
- City
- Major Roads
- Minor Roads
- River/Stream
- Waterbody

Approximate Total Viewable Area
458,365 Acres

Note: viewable area measured within map extent

N

0 5 10 Miles

M I G

September 2009 I Data Source: USGS, ESRI, Department of Transportation and Preliminary Alternative Corridors Map

Exhibit 5

Landscape east of La Veta Pass. State Highway 160 is on the upper right.

Exhibit 6

La Veta Pass. View is looking southeast to Spanish Peaks from Old La Veta Pass Road.

Exhibit 7

West of La Veta Pass, looking southeast towards Spanish Peaks

Exhibit 8

Rolling terrain east of Alamosa and Blanca. View is looking south to Trinchera Ranch development.

Exhibit 9

Flat landscape of the Alamosa Plain, looking east along Highway 160.

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO

DOCKET NO. 09A-324E

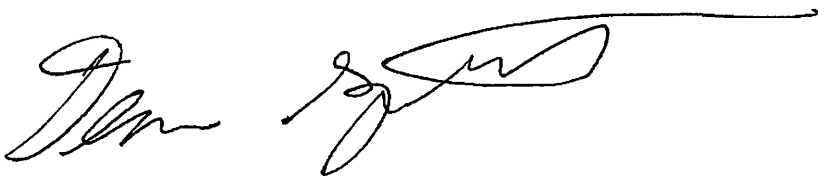
IN THE MATTER OF THE APPLICATION OF TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION, INC., (A) FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE SAN LUIS VALLEY-CALUMET-COMANCHE TRANSMISSION PROJECT, (B) FOR SPECIFIC FINDINGS WITH RESPECT TO EMF AND NOISE, AND (C) FOR APPROVAL OF OWNERSHIP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

DOCKET NO. 09A-325E

IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO (A) FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE SAN LUIS VALLEY TO CALUMET TO 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

AFFIDAVIT OF DEAN APOSTOL

COMES NOW Dean Apostol, of proper age and duly sworn, and states that the attached Testimony in the above-captioned matter was prepared by him or under his supervision and control and that it is true and correct to the best of his knowledge and belief, and would be the same if given orally under oath.



Dean Apostol

STATE OF COLORADO)
) ss.
COUNTY OF BOULDER)

SUBSCRIBED AND SWORN to before me this 20th day of October 2009. Witness my hand and official seal.

My commission expires: 12/28/2012

Notary Public

OFFICIAL SEAL
JANET DIERINGER
NOTARY PUBLIC-OREGON
COMMISSION NO. 435244
MY COMMISSION EXPIRES DEC. 28, 2012