



Governor Jim Gibbons'
Nevada Renewable Energy Transmission
Access Advisory Committee Phase II
Volume I Executive Summary and Report
July 1, 2009

Volume I contains the Committee's Executive Summary and Report
Volume II contains the presentations made to the Committee
Both Volumes, and all the Committee meeting minutes and agendas, can be found on the Committee's web site
<http://www.retaac.org/>

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Introduction

Nevada is blessed with some of the richest renewable resources in the world. We are also fortunate to have the full spectrum of renewable resources including geothermal, wind, solar and even biomass. Very few other regions in the world are so lucky. There are enough megawatts of renewable resources in Nevada to easily fulfill our renewable electricity needs and the needs of our surrounding states.

Developing these resources will bring billions of dollars in investment capital to the state. It will diversify our economy, create thousands of high-paying jobs, help protect our pristine high desert environment and reduce our water use. However, without the transmission necessary to get the electricity generated by these projects to markets none of these resources will be tapped.

Nevada's Governor Jim Gibbons recognized the critical role transmission plays in the development and protection of our state's resources. To help identify and remove the barriers to transmission he created the Renewable Energy Transmission Access Advisory Committee (RETAAC). This report contains the findings and recommendations of that committee. The members of the Committee thank the Governor for the opportunity to serve our great state and look forward to working with government and industry to build the transmission lines that will unleash the economic power represented by our states bountiful renewable resources.

Executive Summary

Background

On June 12, 2008, Governor Jim Gibbons signed an Executive Order creating the second phase of RETAAC to further the committee's initial efforts as described in the RETAAC Phase I Report dated December 31, 2007. The committee was charged with: (i) determining power potential for the renewable energy zones designated by the first phase; (ii) the review of environmental, land use and permitting constraints; (iii) the identification of potential construction corridors that could avoid these constraints, and (iv) the review of potential revenue needs for construction, among other duties.

In establishing the Phase II Committee, the governor stated that: "...the first RETAAC committee made a recommendation to initiate Phase II to define the environmental and physical feasibility issues, costs and potential financing mechanisms associated with the recommended 14 transmission routes. This [Phase II] committee will implement this recommendation."

The nineteen (19) Phase II committee members were appointed by the Governor under the chairmanship of Daniel (Dan) Schochet. They included representation from key interest groups who were given the task of working together to recommend the mechanisms finance and construct the additional transmission lines to access the state's vast renewable energy resources for the benefit of the citizens of Nevada.

To implement the objectives of RETAAC Phase II, the committee created Study Groups with the following assignments:

1. *Environmental and Land Use Constraints:* The Environmental and Land Use Constraints Study Group consisted of members of state and federal agencies with interest and oversight of these issues, along with volunteers from industry and advocacy groups. The study group was tasked with providing information on these issues which could be used in prioritizing and analyzing the feasibility of constructing the proposed transmission lines to the renewable energy zones. ***After evaluating available secondary data collected for this project and consulting with representatives from land management agencies, no fatal flaws were identified for the proposed interconnections.***
2. *Renewable Energy Zone Prioritizations:* The Renewable Energy Zone Prioritization Study Group was tasked with: a) developing a method for prioritizing the zones defined in RETAAC Phase I, and the transmission links that serve these zones; and b) presenting these recommendations to RETAAC Phase II. The methodology developed resulted in a matrix which employed four evaluation criteria: (i) renewable energy potential; (ii) cost of transmission construction; (iii) transmission environmental impact; and (iv) other system benefits from

transmission. ***This matrix served as the basis for the analysis by the Economic Feasibility Study Group.***

3. ***Economic Feasibility:*** The Economic Feasibility Study Group was tasked with answering the critical questions including: (i) how much does a transmission line developer need to charge for the use of the transmission line to recover the construction costs and operating and maintenance expenses including a sufficient return on the investment; (ii) how much are the resource developers willing to pay for the use of the transmission line; and (iii) are the renewable resource providers still competitive after recovering the cost of delivering their energy to load centers. ***The results of this analysis indicates that certain transmission lines could charge economically acceptable fees for the use of the transmission lines and that these fees could recover the costs, if the transmission line usage were fully subscribed.***

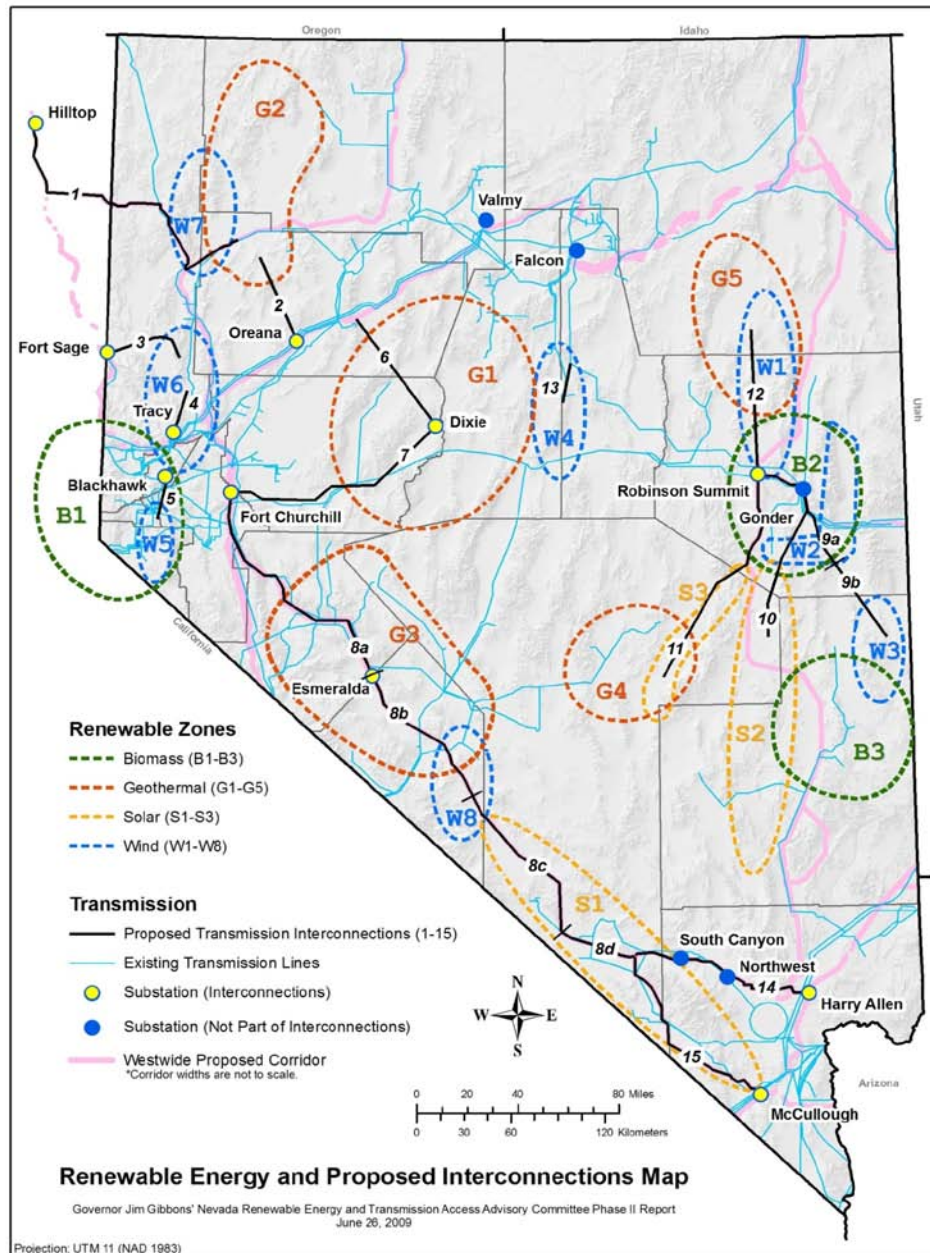
4. ***Transmission for Export:*** The Export Study Group was tasked with identifying existing transmission facilities and proposed transmission projects that could be used to export energy from Nevada's renewable resources to adjacent states. This task assumed that such export would in essence be in addition to the needs of Nevada load serving utilities and would also result in economic benefit to the citizens of the state. ***The results indicate that a significant market exists in California, Arizona and elsewhere for Nevada's renewable energy and that the transmission paths are feasible.***

5. ***Feasibility Criteria:*** The Feasibility Criteria Study Group, which consisted of representatives of: (i) publically owned and investor owned utilities; (ii) representatives of the Public Utility Commission of Nevada; (iii) the committee chairman; and (iv) the Governor's Energy Advisor, was tasked with drafting the recommendations for the RETAAC approval.

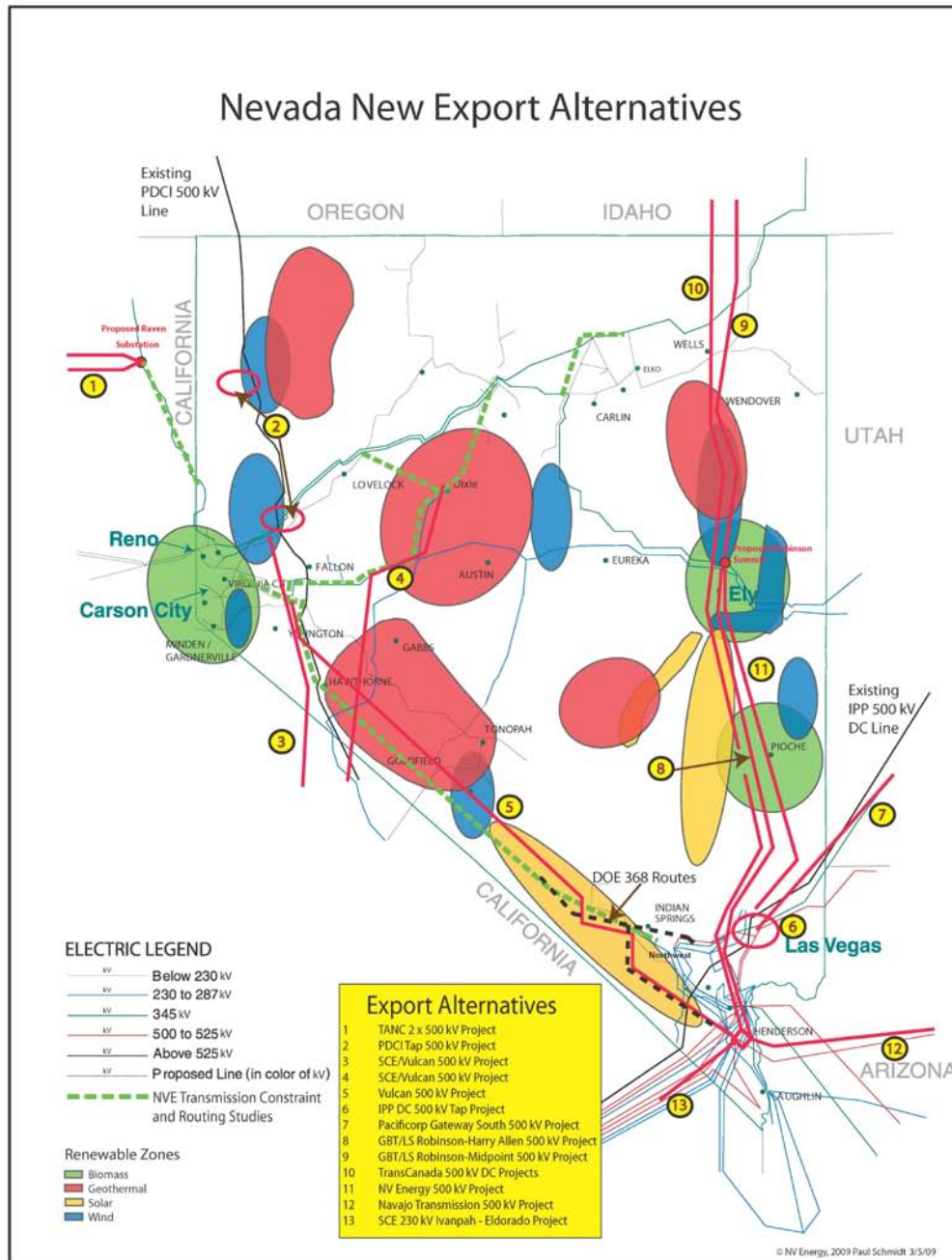
Findings

The chapters in this report are the work product of their respective Study Groups. These highly detailed, technical work products contain findings and recommendations which are generalized and summarized here.

The first principal finding is a map showing what are believed to be the state's most economically viable renewable energy zones and the transmission necessary to access the electricity believed to be contained within those zones.



New transmission lines necessary to export the electricity contained in the zones were also identified.



The final principal finding ranks the economic feasibility of the transmission needed to access each prioritized renewable energy zone.

ECONOMIC FEASIBILITY AND RENEWABLE ENERGY ZONE PRIORITY (REZP) RANKINGS

Transmission Segment	Zone	Terminals	Construction Cost (\$million)	Economic Feasibility Ranking	REZP Ranking
8D+14	S-1	Harry Allen	\$358.0	1	1
9A	W-2	Robinson	\$118.1	2	1
2	G-2	Oreana	\$26.8	3	4
9A+9B	W-3	Robinson	\$176.9	4	3
8D+15	S-1	McCullough	\$417.3	5	4
5	W-5	Blackhawk	\$18.8	6	7
10	S-2	Robinson	\$221.7	7	7
8A	G-3	Ft. Churchill/Blackhawk	\$163.3	7	10
12	G-5	Robinson	\$81.9	9	11
4	W-6	Tracy	\$47.0	10	7
7	G-1	Ft. Churchill/Blackhawk	\$167.5	11	4
13	W-4	Frontier	\$55.2	12	16
3	W-6	Ft. Sage	\$58.9	13	11
12	W-1	Robinson	\$81.9	14	11
11	G-4	Robinson	\$112.5	15	16
8A+8B	W-8	Ft. Churchill/Blackhawk	\$216.0	16	20
6	G-1	Oreana	\$120.9	16	11
8A+8B+8C	S-1	Ft. Churchill/Blackhawk	\$127.9	18	15
1	G-2	Hilltop	\$82.4	18	16
8C+8D+14	W-8	Harry Allen	\$131.5	20	16
8C+8D+15	W-8	McCullough	\$131.5	21	20

Recommendations

To finance and construct the additional transmission lines as recommended and prioritized by the Study Groups, RETAAC Phase II makes the following recommendations:

1. Renewable energy access to the Nevada transmission grid is facilitated by providing the state with a robust and reliable statewide transmission system, which serves all load customers from all available and potential generation sources. This is the surest way to promote the access to the grid by renewable energy resources.
2. The tax exempt bond financing mechanism, under consideration by the Governor's office, and other such mechanisms, should be encouraged to develop a financing program which can substantially reduce the cost of constructing new transmission lines and facilities and thus enhance their economic feasibility. However; regardless what the driving technical, regulatory, or siting issues are, establishing a mechanism to repay the investment is critical before any plan can move forward with the construction of these transmission lines and associated facilities.
3. The Public Utilities Commission of Nevada, as the primary utility regulatory agency in the state, to the extent possible, should employ flexibility so as to encourage new renewable transmission construction for in state use and export to adjacent states by:
 - Considering the impacts of local and statewide economic development as an element in the planning and approval of new transmission,
 - Encouraging flexibility in financing of new transmission construction; and
 - Considering the requirements of the state's utilities to meet Nevada's Portfolio Standard mandate when evaluating proposed new transmission construction projects.
4. New renewable transmission should be designed and constructed by entities that have the financial capacity, the expertise, and the understanding of local and regional Nevada issues as well as the experience to design, permit, construct and integrate these facilities into the existing grid.
5. The state should create a functional entity, which will serve as a "one stop shop" to assist potential transmission providers in working with local, state, federal agencies and tribal lands in overcoming the permitting and siting constraints and barriers so as to expedite the construction of the required new transmission lines and facilities.

6. The state of Nevada should work with new and existing state and federal statutes, as well as seek additional resources to further the recommendations of this report.

Limitations to Analysis

This report should provide useful information to developers on the general location of transmission lines which are needed to connect recognized renewable energy zones to the existing transmission grid.

The interconnections identified in this report represent electrical interconnections needed to bring renewable generation from large zones of renewable energy potential to the existing electrical grid. Due to the relative size and shapes of the renewable energy zones, the interconnections identified as part of this report should be viewed as general, as no specific generation sources have been mapped.

The constraint analysis included transmission lines only and the renewable energy zones were not screened or modified based on potential constraints for renewable energy development. While similar, constraints for transmission lines can differ from those for generation facilities and this analysis does not account for these differences. Therefore, this report should be used for the identification of potential transmission line constraints only, and not for potential constraints to generation development which must be examined on a project specific basis.

No transmission line routing has been completed as part of this report; rather the interconnections were evaluated based on available secondary data from federal and state agencies gathered as part of Phase I and Phase II of the RETAAC. In order for routes to be fully evaluated, engineering must be completed to determine a feasible route from a construction perspective and resource studies must be completed to evaluate the impacts from the construction and operation of the proposed transmission lines. Resources such as biological, cultural, land use and visual will play important roles in developing viable routes for these interconnections. These studies should be conducted at a more refined mapping scale which would allow for impacts of the proposed facilities on resources to be evaluated in more detail so that specific mitigation and routing alternatives could be identified.

Obtaining right-of-way for any of the interconnections would require a federal action from a land management agency and would therefore be subject to the National Environmental Policy Act and other federal regulations. As part of the National Environmental Policy Act process and the required environmental analysis, route alternatives would most likely be identified and analyzed due to potential impacts. These alternatives could vary significantly in length and design which, depending on the alternative chosen by the agency, could affect the cost of permitting and construction. In addition, mitigation measures which are not identified in this report will most likely be proposed based on impacts analyzed in the National Environmental Policy Act document. Additional mitigation measures could also significantly affect the cost of permitting and construction interconnections.

Chapter I Environmental and Land Use Constraints

The Environmental and Land Use Study Group's analysis began with routing for proposed interconnections which would avoid intersecting Level 1 Constraint zones (wilderness areas, etc. as defined in RETAAC Phase 1) where construction of transmission would be prohibited. Use was made of the federally designated West-wide Corridor for which a Programmatic Environmental Impact Statement was completed late in 2008. The assumed centerlines of the proposed routes were then analyzed using Geographic Information Systems (GIS) to determine the length of the proposed interconnection transmission lines that would intersect environmental and land use constraints of a Level 2 Constraint and lower. These constraint levels were as defined in RETAAC Phase I with the exception of United States Forest Service Inventoried Roadless Areas which were moved from a Level 1 Constraint to a Level 2 Constraint in Phase II.

The interconnection centerlines were analyzed for miles of intersections with areas of constraint regarding impacts to protected wildlife species and land management using the most current occurrence mapping from state and federal agencies. Intersections with military air space restrictions were determined. Further the overall interconnection length, length over 6000 feet above sea level and length crossing slope of greater than 20% was determined. The ratings of all these factors contributed to the cost analysis and feasibility of construction and were included in the work done by the Economic Feasibility Study Group.

Originally, thirteen interconnection segments were proposed to access nineteen renewable energy zones. The Transmission Study Group then identified the substation interconnection points that would be, on initial review, the termination of the transmission line based on the best transmission planning practices. The number of proposed interconnection segments increased to fifteen, with two interconnection segments subdivided into discreet segments to represent the transmission interconnection methodology and to remove the prejudice that significantly long lines would introduce. These proposed interconnection line segments are illustrated in the maps represented in Figures 1 through 3 (pages 31, 32 and 33), along with constraints, land use and other elements of the Study Group's analysis. Out of caution, wildlife areas of concern are not depicted on the maps.

The Environmental and Land Use Study Group found all interconnections, as proposed, could be constructed with proper avoidance and mitigation measures. The Study Group used the analysis to rate each line segment with an overall value indicative of the type of constraint encountered and the group's sense of the difficulty in avoiding or mitigating that constraint. These values are broad based and largely deferential to the expertise within the group. The ratings were provided to allow for some equality of comparison to other elements of consideration in determining feasibility of construction. The results of the centerline analyses and the segment ratings are provided in the spreadsheet shown as Table 1 (page 16).

It is the intent of the Study Group that the maps compiled in this effort be made available to the public in an interactive form via www.retaac.org. The compilation of information and its analysis serves first the RETAAC goals but secondarily, this information will prove beneficial to energy developers, researchers, and interstate agency cooperation.

Methodology

This study documents the evaluation of electrical interconnections needed to connect renewable energy zones identified in Phase I of RETAAC to existing transmission lines and substations in the state electric grid. Existing transmission lines less than 230kV were not considered in the analysis, as extra high voltage transmission lines and their substations provide the greatest opportunity for new transmission to utilize existing corridors, although lines of <230 kV are represented on the maps in Figures 1 and 2 of this chapter (pages 31 and 32 respectively). This Study Group did not evaluate the capacity on existing transmission lines or the electrical feasibility of connecting the proposed interconnections with the existing transmission system, but only the environmental and land use constraints along the proposed interconnections.

The electrical interconnections identified in the Phase I RETAAC Report were evaluated based on the land management constraints over which they pass. This Phase II Report expands on the analysis in Phase I through review of specific management constraints by agency personnel. Mitigation measures which may be required to lessen the impacts to certain resources are also discussed in this report. In addition to the land management agencies, other agencies/groups contributed resource constraints and concerns as they relate to the construction and operation of transmission lines. Issues related to renewable energy generation are not analyzed in this report.

Geographic Information Systems Analysis

The Nevada Bureau of Mines and Geology conducted centerline analysis and mapping using GIS for this report. The work completed included the following:

- A spreadsheet “centerline analysis” of constraints in various categories along the proposed transmission segments (Table 2, pages 27-30);
- A schematic Nevada base map showing the existing transmission with capacity and substations (simplified) and the proposed transmission interconnects and substations (Figure 1, page 31);
- A schematic Nevada base map showing: county boundaries, identified renewable energy zones, proposed transmission interconnects and substations, existing transmission and substations (simplified), and the approved West-wide Corridors (Figure 2, page 32);
- A more elegant Nevada constraints map on shaded relief showing county boundaries, renewable energy zones, the approved West-wide corridors, the proposed transmission segments and interconnects, and the identified areas of environmental and land use constraints. Constraint levels are discussed below (Figure 3, page 33); and

- A suite of interactive Web maps, linked according to proposed transmission interconnections permitting examination of each at larger scale with selected layers to be posted at www.retaac.org.

Interactive Web maps

A total of 19 Web maps were produced using the CartoGraph™ software which supported the collection and sharing of the geospatial datasets itemized above amongst the study group participants. (For details see the www.retaac.org Web site). “Stripped down” versions of these Web maps were subsequently uploaded to Google® Maps for use outside the study group. Using either CartoGraph or Google Maps users can pan and zoom around the maps, turning on/off layers as suits their interest. Web printouts can also be made. The following datasets were included in the Google maps which are publicly available:

- Proposed transmission segments provided by study group;
- Proposed and existing substations provided by NV Energy;
- Simplified existing transmission from NBMG Map 141;
- Renewable energy zones from RETAAC Phase I report; and
- Constraint regions from RETAAC Phase I report with updates from participating agencies in Phase II.

Interconnection Realignment

The thirteen interconnections identified in Phase I were reviewed and, based on certain criteria, some interconnections were modified. The criteria used to determine whether an interconnection would be modified included the following:

- Avoiding Level 1 Constraints;
- Utilizing corridors authorized through the West-wide Energy Corridor Programmatic Environmental Impact Statement; and
- Existing and expected electric grid connection points and substations.

Level 1 Constraints identified in the Phase I Report represent the highest constraints and would occur where legal status or designation would prohibit or most likely prohibit the construction and operation of transmission lines. These constraints include Wilderness, Wilderness Study Areas, BLM Instant Study Areas, Forest Service Recreation Areas, and Forest Service Research Natural Areas. Interconnections which crossed any areas identified as Level 1 Constraints were modified to avoid these areas. Efforts were made to keep the modified interconnections as short as possible while avoiding Level 1 Constraints.

In Phase II of RETAAC, the United States Forest Service made a general change to the constraint mapping completed in the Phase I RETAAC Report. The Phase I Report classified Forest Service Roadless Areas as a Level 1 Constraint, however, due to new direction on the agency's commitment to renewable energy they have requested that Roadless Areas be considered a Level 2 Constraint. (See further discussion in USFS section below.) While this change to the mapping does not affect the location of any of the interconnections, it is reflected in the resource mapping.

The West-wide Energy Corridor Programmatic Environmental Impact Statement was prepared by the United States Department of Energy, the BLM, the United States Forest Service, and the Department of Defense. This Programmatic Environmental Impact Statement provides the information and analyses to allow each agency to amend its respective land use plans by designating a series of varied width energy corridors thereby giving guidance in siting new transmission corridors. The Final Programmatic Environmental Impact Statement was completed in November 2008 and includes corridors for the State of Nevada. The corridors identified in the Programmatic Environmental Impact Statement were considered transmission line siting opportunities and were compared to the interconnections from the Phase I report. Those interconnections which are located adjacent to, or in the vicinity of these utility corridors were moved to be within these corridors.

Utility representatives reviewed the proposed points of interconnection to the existing grid as they relate to the renewable energy zones and modified four interconnections to reflect more accurate connection points at existing substations. These modifications are described below for each affected interconnection.

Nine of the thirteen interconnections identified in the Phase I Report of RETAAC were modified based on one or more of the criteria described Table 1 below. In addition, two new interconnections (14 and 15) were added to allow transmission into northern Las Vegas, interconnection (8) was split into four interconnections to allow for renewable energy zones located in the center of the interconnection to deliver power to either the north or south systems, and interconnection (9) was split into two interconnections to better serve specific renewable energy zones.

TABLE 1: INTERCONNECTION REALIGNMENT

Interconnection	Avoided Level One Constraint	Moved within Proposed West-wide Utility Corridor (Proposed Corridor)	Moved to Grid Connection Point
1	Yes	(16-24, 16-104, and 15-104)	
3	Avoided Pyramid Lake		
6	Yes		
7	Yes		
8	Yes	(17-18, 18-224, and 224-225)	Split into 8a through 8d to better serve renewable energy zones
9	Yes		Moved to Robinson Summit Substation and split into 9a and 9b to better serve renewable energy zones.
10	Yes		Moved to Robinson Summit Substation
11	Yes	110-223	Moved to Robinson Summit Substation
12	Yes	44-110	Moved to Robinson Summit Substation

Modifications were made to the interconnections described above and specific land management constraints identified in the Phase I report were reviewed by the members of the Environmental and Land Use Study Group. Land management designations and wildlife data were updated, where necessary, and new wildlife data was provided by Nevada Department of Wildlife and United States Fish and Wildlife Service. The new data was assigned constraint levels and the modified interconnections were used to obtain updated centerline reports. Both the land management and the wildlife constraint levels were reviewed and discussed by the Study Group. The severity and extent of constraints along the interconnections were considered and an overall rating was assigned to each segment by member consensus. The interconnection segment ratings are shown in Table 2 (pages 27-30).

Centerline Analysis

This analysis determined the number and extent of various constraint levels and other resources encountered by each proposed transmission interconnection segment. The process used in the centerline analysis was: 1) create a collection of GIS datasets, which are listed below; 2) spatially intersect all the elements in this collection by the centerline of each of the proposed transmission

segments in turn; and 3) tabulate the count and overall length of such intersections, together with particular attributes of the intersected elements as appropriate, e.g. minimum elevation and/or slope. The spatial intersection was performed in ESRI® ArcGIS software; the tabulation in Microsoft® Excel.

The following datasets were input to the centerline analysis:

- Proposed transmission segments, i.e. “centerlines”, provided by sub-group;
- Nevada digital elevation model provided by Nevada Bureau of Mines and Geology;
- Constraint levels based on land management designations from RETAAC Phase I report with applicable updates provided by the participating agencies;
- Land ownership/tenure from RETAAC Phase I report, with 2008 updates from participating agencies; and
- Wildlife range areas and nesting sites for selected species provided by Nevada Department of Wildlife and United States Fish and Wildlife Service.

Constraints

Military Analysis

Military airspace training and ground source radar restrictions as provided to RETAAC I were reviewed specific to proposed interconnection centerline analysis. **The Air Force Western Regional Office was contacted and the Study Group was advised that ground source radar would not be a constraint on transmission location.** However, airspace training routes would need to be analyzed. Approximately 56% of the state is affected by military airspace restriction. Many of these defined training paths have existing transmission corridors. Project coordination is needed to understand specific transmission line constraints associated with proposed interconnections.

Airspace training flight paths were provided in 100 ft, 200 ft, and 500 ft levels of constraint. The centerline analysis of the proposed interconnects found that all but two, line segments 2 and 6, pass through defined zones with a 200 ft ceiling for possible airspace interference. Interconnections proposed and analyzed are assumed to be 200 – 500 kV lines. These line structures typically do not exceed 200 ft in height. Interconnection construction should be kept to less than 200 ft height and consultation with the military authorities is advised.

Three proposed interconnections have intersections with defined military flight paths with a 100 ft ceiling to interference. These are line segments 8c and 8d and its alternative route line segment 14. Military training operations are initiated in this area from Creech Air Force Base, Nellis SAR and Nellis Air Force Base. More restrictive airspace requirements may exist in specifically sensitive training areas. Additionally, line segment 10 passes under a 100 ft ceiling flight path for 1.5 km on its southern tip. This intersection could be avoided by rerouting or shortening the length of line. Transmission lines built

along these paths would be required to keep structure height less than 100 ft and consultation with the military authorities is advised.

Slope Analysis

A general slope analysis was completed for each segment using GIS. Based on general utility industry construction experience, slope was grouped into two categories: less than 20 percent and greater than 20 percent. A high constraint was assigned to those segments which cross areas greater than 20 percent slope due to typical difficulties associated with construction and maintenance activities in this terrain. Transmission lines located on steep slopes can require more disturbance area from access roads due to slope stabilization and switchbacks and structure pads and footprints.

Land Management Constraints

The Study Group consisted of members representing the major land management agencies in Nevada. Their expertise and data was essential to the completion of the analysis. The constraints map constructed in RETAAC Phase I was reviewed and updated using the most recent information on land management. RETAAC Phase I categorization of constraint levels remained intact in Phase II with the exception of change by United States Forest Service on Roadless Areas. The constraint level intersections for the proposed interconnection segments were evaluated by the Study Group members and a Land Use Rating was assigned by consensus.

- Level 1 (Fatal Flaw) – This represents the highest constraint and would occur where legal status or designation would prohibit or most likely prohibit the construction and operation of transmission lines. Level 1 includes Wilderness, Wilderness Study Areas, Bureau of Land Management Instant Study Areas, Forest Service Recreation Areas, and Forest Service Research Natural Areas.

Management agencies prohibit the construction of transmission facilities in the areas listed above. Clarification for Forest Service Recreation Areas and Forest Service Research Natural Areas was received through phone conversations with the Forest Service. It should be noted that existing transmission lines may be located in some of the designated areas listed above. Typically this occurs when an area is designated after transmission facilities have been constructed. This does not typically lower the constraints associated with siting additional transmission facilities through these areas.

- Level 2 (High Constraint) – These areas are determined to be less suitable for transmission lines because of unique, highly valued, or protected resources, ownership, and significant potential conflicts with the construction and operation of transmission lines. This level includes Native American Properties (Bureau of Indian Affairs), United States Forest Service inventoried Roadless Areas and Bureau of Land Management National Conservation Areas.

Routing and siting transmission lines across tribal lands, Indian Trust Assets or near sensitive Native American resources can be a lengthy process subject to complicated and costly

negotiations between various parties with interest to these lands. These lands were therefore assigned a high constraint. A high constraint was also assigned to the National Conservation Areas however these areas should be evaluated on an individual basis to determine specific restrictions.

- Level 3 (Moderate Constraint) – These are areas with potential effects to valued resources, resources assigned special status; or conflict with use. This level includes privately owned land, Areas of Critical Environmental Concern, Military Managed Lands, and National Trails.

Privately owned land was assigned a moderate constraint due to the potential for difficulties with obtaining easements. Areas of Critical Environmental Concern were assigned a moderate constraint due to the wide range of sensitive resources for which Areas of Critical Environmental Concern can be designated. These resources (i.e. desert tortoise, geologic significance) may not preclude the authorization of rights-of-way for the construction and operation of transmission lines, but may require negotiation of additional mitigation measures. These areas should be evaluated on an individual basis with the appropriate land manager to determine specific restrictions. Military managed lands were assigned a moderate constraint due to existing plans to build renewable projects and associated transmission on military lands. National Trails can typically be mitigated when siting transmission lines.

- Level 4 (Low Constraint) – These are areas of minimal resource conflicts. This level includes state and federally managed lands where specific constraints were not identified.
- Level 5 (Unresolved) – These areas are designated as “administrative restriction” by land management agencies. Site specific review of these should be conducted to determine constraints associated with transmission lines.

Areas designated “Administrative Restriction” were found to include lands managed by the following agencies:

- U.S. Fish & Wildlife Service
- Department of Defense
- National Park Service
- BLM
- State of Nevada

While not all lands managed by the agencies listed above are included in “Administrative Restriction”, these areas should be evaluated on an individual basis with the appropriate land manager to determine specific restrictions.

Wildlife constraints were analyzed with the centerline analysis using detailed information and current status maps from wildlife management agency Study Group members. The intersection of interconnection segments with wildlife constraints were rated in terms of impact and mitigation options

and given a Wildlife Rating value by consensus. These maps are not reproduced in this report in an abundance of caution for protection of sensitive areas.

Information on the RETAAC process as contributed to by the U.S. Forest Service, the U.S. Fish and Wildlife Service and the Nevada Department of Wildlife are provided below. Please refer to Appendix I for agency specific avoidance and mitigation recommendations.

Nevada Division of Wildlife

The Nevada Department of Wildlife's mission, in part, is "to protect, preserve, manage and restore wildlife and its habitat for their aesthetic, scientific, educational, recreational, and economic benefits to citizens of Nevada and the United States..." Nevada Division of Wildlife is the state agency responsible for the restoration of wildlife habitat and management of fish and wildlife resources and while it does not provide jurisdictional approval for proposed transmission line projects unless located on land owned or managed by Nevada Division of Wildlife, it works closely with federal land management agencies to provide input on the agencies' land management decisions. Nevada Division of Wildlife participated in the RETAAC process and provided GIS resource data and technical assistance with wildlife and habitat concerns for the construction and operation of transmission lines.

The impacts to wildlife from power line construction and operation can be grouped into three general categories:

- Loss of habitat on a temporary or permanent basis due to removal of vegetation and other habitat features, occupancy by a project component, erosion or invasion by weedy species. A specific kind of loss is fragmentation. This is when a large contiguous area of habitat is transected by a linear feature which effectively creates two smaller habitat areas separated by a band of unusable or high jeopardy ground. Conversion to a vegetative community lacking the values of the original plant community can also be classified as a loss because it can no longer support either the numbers or diversity of the pre-project wildlife occupants.
- Creating disturbances that could lead to avoidance (of water sources or other habitat components), nest abandonment, loss of habitat use, increased predation susceptibility and decreased productivity. These disturbances are usually temporary and occur during construction and maintenance activities when workers or the public are present. These disturbances are also the result of creating access to areas that were fairly isolated in the pre-project condition. New access or facilitated access from surface smoothing and vegetation removal are contributors.
- Mortality due to an incident occurring during construction and operation (from vehicles, site contamination, obstacles, holes and trenches), collision with project components (towers and wires), electrocution, loss of habitat, and advantages provided to predators.

NDOW provides the following recommendations for project proponents proposing to construct and operate transmission lines in the State of Nevada.

In addition to compliance with applicable federal, state, and local laws and regulations, Nevada Division of Wildlife recommends the use of best management practices to reduce wildlife impacts from proposed transmission line projects. The following general mitigation measure categories could be considered in proposed projects to reduce impacts to wildlife:

- Avoidance or exclusion
- An area is excluded all or in part from project siting.
- A resource can be spanned or avoided by project components including structures, towers, access roads and similar disturbances.
- Project components can be relocated.
- All or a portion of the project may need to be surveyed for the presence or absence of a species or habitat in order to identify areas to avoid. Surveys of suitable habitat should occur to coincide with the presence of the wildlife species of issue.
- Buffer zones may be created to protect a suitable area around a habitat feature to prevent disturbance.
- Seasonal restrictions
- Construction, maintenance and other specific activities may be prohibited in specific areas at specific times of the year, including but not limited to nesting, lambing, kidding, spawning, and/or migration.
- Timing restrictions may also coincide with poor surface travel conditions.
- Revegetation and reclamation
- Revegetation (with plant species that benefit wildlife) of areas that were temporarily disturbed during the construction or operational phases of the project.
- Replacement of vegetative communities that are anticipated to be lost on a permanent basis due to occupancy by project components or blading of existing vegetation to facilitate construction activities. Replacement can occur in already disturbed areas of the project or in areas immediately adjacent to the project.
- Reclaiming (recontouring) of areas (such as bladed temporary access roads and crane pads) disturbed during construction or operation.
- Revegetation of disturbed areas to prevent the establishment of weedy plant species.
- Treatment of any established noxious weed populations to prevent their spread.
- Design modifications

- Application of design modifications to prevent bird electrocutions.
- Addition of devices applied to the power line to reduce impacts caused by perching, nesting, and collision.
- Use of tubular steel as opposed to lattice construction in areas of issue to reduce perching, nesting and entrapment of raptors, ravens and other large birds.
- Compensation for loss
- Compensation by replacement or offset for temporary or permanent loss of habitat or wildlife individuals incurred by projects as a result of construction or operational activities.

Nevada Division of Wildlife recommends mitigation measures to help facilitate the protection of specific wildlife species. Mitigation measures would be analyzed in detail during the proposed project planning and specific measures applicable to protection of certain species would be developed.

Recommendations on specific mitigations are included in Appendix I. For more information on go to www.ndow.org.

Bureau of Land Management

The Nevada Bureau of Land Management administers approximately 48 million acres of public land in Nevada, or approximately 67 percent of Nevada's land base. The multiple-use mission of the Bureau of Land Management includes authorizing and managing activities such as mineral development, energy production, recreation, and grazing, while conserving natural, historical, cultural, and other resources on public lands. The Bureau of Land Management's objective is to meet public needs for use authorizations such as right-of-ways, permits, leases, and easements while avoiding or minimizing adverse impacts to other resource values. Under the Federal Land Policy and Management Act Bureau of Land Management manages multiple resources and uses, including energy and minerals; timber; forage; recreation; wild horse and burro herds; fish and wildlife habitat; wilderness areas; and archaeological, paleontological, and historical sites.

BLM participated in Phase I of the RETAAC report, providing input and statewide GIS data for the lands it manages. As a cooperator in Phase II of the Environmental and Land Use section of the RETAAC report, BLM assisted with the development of constraint levels and modification of electrical interconnections identified in Phase I to avoid Level 1 Constraints. Bureau of Land Management also cooperated in the effort to rate each of the proposed interconnections as they relate to land management and biological constraints. The results of this effort are shown in Table 2 (pages 27-30).

Any of the proposed interconnection segments which cross Bureau of Land Management managed lands will need Bureau of Land Management approval before they can be constructed. In order to grant a right-of-way for a proposed action such as a transmission line, Bureau of Land Management must comply with federal regulations such as the National Environmental Policy Act, Endangered Species Act, National Historic Preservation Act, and others. This will require an environmental review and a study of potential impacts from the proposed project.

Bureau of Land Management was a lead federal agency in the identification of major utility corridors on federal lands in 11 western states through the development of a Programmatic Environmental Impact Statement. The West-wide Energy Corridor Programmatic Environmental Impact Statement was finalized in November 2008 and can be found at <http://corridoreis.anl.gov/documents/fpeis/index.cfm>.

U.S. Forest Service

The Humboldt - Toiyabe National Forest provided GIS and related input into the RETAAC Phase I report. More extensive participation in the multi-agency collaborative process of the Phase II Environmental and Land Use sub-group provided the opportunity to make adjustments to prospective transmission routes which should minimize potential future land and resource management siting conflicts. Also during this effort the constraint level for Inventoried Roadless Areas on National Forest lands was changed from constraint Level 1 to Level 2. Agency direction for IRAs in Nevada is provided under the 2001 Roadless Conservation Rule.

United States Forest Service commitment to support the development and transmission of energy resources is consistent with Presidential Executive Order 13212, which states, "...increased production and transmission of energy in a safe and environmentally sound manner is essential." The Executive Order further directs agencies to, "...take appropriate actions that will increase the production, transmission, or conservation of energy." Specific goals and objectives for the agency is provided in "USDA Forest Service Strategic Plan 2007-2012", which states "...Goal 2. Provide and Sustain benefits to the American people...Objective 2.3 Help meet energy resource needs."

Each proposed energy transmission project would also require a formal, Agency-approved project right-of-way that would contain project-specific requirements. The granting of a right-of-way would require a prior project-specific environmental and engineering review. Generally, the local administrative offices (United States Forest Service national forest) will address energy transport within the boundaries of their administrative areas.

The land use planning process serves as the means to formally allocate right-of-way areas on federally administered lands. The land use planning process is different for each agency, and the following highlights how the United States Forest Service conducts land use planning.

Land management plans guide the United States Forest Service in fulfilling its responsibilities for stewardship of the National Forest System. Land management plans are generally strategic and contain desired conditions, objectives, and guidance for project and activity decision making in the plan area, usually a national forest. Forest land management plans may be amended by Forest Supervisors.

However, the amendment of land use plans would not authorize parties to proceed with any site specific projects, or to carry out any activities in areas within the corridors, and accordingly will not result in any on-the-ground impacts that may significantly affect the quality of the environment. If individual projects are sited, any applications for such projects would be subject to environmental review under applicable statutes, including but not limited to the Clean Water Act, Endangered Species Act, National Historic Preservation Act and others.

Consistent with this direction, in 2008 the United States Forest Service was a cooperating federal agency on the *Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Lands in the 11 Western States* led by the Bureau of Land Management and Department of Energy. This document includes a thorough discussion of Bureau of Land Management and Forest Service siting and National Environmental Policy Act procedures. Refer to Chapter I of this Programmatic Environmental Impact Statement for more details and a list of considerations for this process, available at <http://www.corridoreis.anl.gov/eis/guide/index.cfm#vol1>.

Specific proposed interconnection considerations include:

- Segment 9 follows the right-of-way of an existing 230kv power line through the Ward Mountain Management Area on the Ely Ranger District. Potential expansion of lines within this utility corridor would not be inconsistent with Forest-wide or Management Area specific direction from the Humboldt Forest Plan.
- Segment 11 includes a right of way of an existing 230kv power line, within the White Pine Management Area, on the Ely Ranger District. Potential expansion of lines within this utility corridor would not be inconsistent with Forest-wide or Management Area specific direction from the Humboldt Forest Plan. Particular consideration would need to be given to the adjacent Red Mountain Inventoried Roadless Area (15-13) near the existing utility corridor north of Highway 6, and to the nearby Wilhoites Inventoried Roadless Area (15-22) south of the existing utility corridor in the section of right of way south of Hwy 6.

For more information on the Toiyabe-Humboldt Forest go to <http://www.fs.fed.us/r4/htnf/>

U.S. Fish & Wildlife Service

The U.S. Fish & Wildlife Service participated in the RETAAC process and provided technical assistance regarding fish and wildlife resources. The following information was provided by the United States Fish and Wildlife Service within the jurisdiction of the Nevada Fish and Wildlife Office (Service) as it relates to the transmission planning process and the trust resources for which the Service is responsible. The following information is submitted pursuant to the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*), Migratory Bird Treaty Act (MBTA; 16 U.S.C. 703), and the Bald and Golden Eagle Protection Act (BGEPA; 16 U.S.C. 668). Wetlands are afforded protection under Executive Orders 11990 (wetland protection) and 11988 (floodplain management), as well as section 404 of the Clean Water Act (CWA). Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act, as amended (FWCA; 48 Stat. 401, 16 U.S.C. 661 *et seq.*), and the Fish and Wildlife Act of 1956, as amended (FWA; 70 Stat. 1119, 16 U.S.C. 742a-742j). Comments and recommendations from the Service are based on the information RETAAC has provided as well as our current knowledge of the fish and wildlife resources in Nevada. However, based on ever-changing biological information and the possibility that the proposed power lines may not be constructed for several years, the Service recommends project proponents contact their office when site-specific information is known to ensure compliance with current conservation measures and the laws and executive orders cited above.

Power lines and power line construction can have both direct and indirect effects on wildlife and plant species as well play an influential role in cumulative and synergistic impacts. Habitat loss, degradation, fragmentation, and conversion are all apparent concerns. Further power lines may facilitate the alteration of natural predator-prey dynamics or lead to direct mortality during construction and operation. Impact significance, however, will vary by species, with some being more easily avoided or minimized than others through proper project design. Early coordination with state and federal agencies is encouraged and will limit costly delays.

The cumulative impacts of renewable energy projects, including solar, wind, biomass, and geothermal energy, across Nevada on listed, sensitive, and other wildlife and plant species and a variety of ecosystems may be of a magnitude never before observed or anticipated. The potential wide-spread loss, degradation, or fragmentation of habitats outside special management areas due to direct, indirect, or cumulative effects of numerous large-scale renewable energy projects and associated infrastructure on public lands places threatened and endangered species at lower probability of recovery and increased risk of extirpation or extinction. Additionally, it potentially raises the level of threat to sensitive species to the point where listing may be warranted. Therefore, it is critical that the siting and analysis of transmission infrastructure be evaluated at a landscape level concurrent with siting and analysis of associated energy generation facilities and a thorough assessment of the environmental impacts should be conducted.

Based on the general location of the potential transmission corridors, assumptions can be made as to the likely species and habitats that will be affected by development and these were considered in the sub-group wildlife impact review process. For every project specific development, however, a general framework of project review will be to first avoid potential impacts, then minimizes impacts, and lastly appropriately mitigate impacts.

Other interconnection specific concerns and USFWS recommendations for avoidance and mitigation are included in Appendix I. For more information go to www.fws.gov.

Results

Results from the interconnection segments analysis are summarized in Table 2 (pages 27-30). The centerline analysis considered geography, topography, land use, and wildlife constraints. Geography includes the overall length of the electric interconnection segment and the length of the segment which falls within utility corridors designated in the West-wide Energy Corridor Final Programmatic Environmental Impact Statement. Topography constraints, or slope analyses, are used for general construction difficulty identification. As described in the Slope Analysis section, slopes of 20 percent or greater were identified as a high constraint. Sections of interconnection segments which are located higher than 6000 feet above sea level were also identified. Land use constraints were documented based on the levels identified in the RETAAC Phase I report, with updates made based on input from agency personnel.

Wildlife constraints were determined by Nevada Division of Wildlife and United States Fish and Wildlife Service and were derived from data provided to the Study Group by these agencies. Due to the sensitive

nature of wildlife location data, this information is treated as confidential and is not provided in this report. The results of this analysis are presented in the table as a wildlife rating of high, moderate, or low constraint (corresponding to a numerical ranking of 1, 2, 3 respectively). The land use rating is based on the constraints and specific concerns of the land management agencies. The overall segment rating takes into account the severity and extent of both the land use and wildlife constraints. Significant factors which influenced the overall segment rating are listed for each interconnection segment. Higher overall ratings indicate higher constraints and a greater potential for wildlife and/or land management issues with permitting transmission lines along the specific electric interconnection. This report did not include analysis outside of the specific electric interconnection and the ratings relate only to the interconnection alignment.

After evaluating available secondary data collected for this project and consulting with representatives from land management agencies, no fatal flaws were identified for these proposed interconnections.

The results of this sub-group's analysis were provided to the construction feasibility sub-group for incorporation into a comprehensive analysis of factors affecting feasibility of construction for each proposed interconnection.

Additional details from this Study Group can be found in Appendix I.

Next Steps

This report should provide insight into the types of issues expected and potential mitigation measures required along the electrical interconnections; however these issues cannot be fully identified and quantified until a land use planning process is begun with the appropriate agencies. Permitting an electrical interconnection identified in this report will require engaging those agencies with the responsibility of granting authorization for right-of-way on land under their management. While both federal and state agencies participated in the completion of Phase II of this RETAAC Report, there will likely be other agencies which will require coordination with and approval from for the construction of the types of large scale electric transmission lines identified in this report. Early coordination with land management agencies is critical to completing a successful planning and permitting project in a timely manner.

TABLE 2: PROPOSED INTERCONNECTIONS CENTERLINE ANALYSIS AND CONSTRAINT RATINGS (1-4)

Proposed Interconnection Segment		1	2	3	4	5
Geography						
Miles overall		131.3	37.4	33.6	19.6	16.8
Miles in WestWide corridors		109.8	.1			
Topography						
Miles ≥6000' ASL		21.3	4.2	3.0	9.5	.0
Miles ≥20% Slope		10.0	6.1	8.6	7.1	4.2
Miles <100' AGL (towers)						
Miles <200' AGL (towers)		4.7		31.7	6.1	
		4.7		31.7	4.6	
Landuse Constraints						
Level 1	Wilderness, WSA, ISA, etc.					
Level 2	BIA, NCA, Roadless, WMA, etc			21.8	8.9	
Level 3	ACEC, Military, Private, etc.	21.7	8.2	4.1	2.9	10.8
Level 4	Other State and Federal lands	52.8	29.2	7.7	7.9	6.0
Level 5	Administrative restrictions					
Level Unassigned	Open water, outside Nevada	56.8				
	Total	131.3	37.4	33.6	19.6	16.8
	Landuse Rating	High	Low	High	High	Mod
	Wildlife Rating	High	Mod	Low	Mod	Low
	Overall Segment Rating	H-1	L-3	H-1	H-1	M-2
	Major Rating Factors	Sage Grouse & Black Rock NCA	n/a	Tribal lands	Tribal lands	Virginia City proximity

TABLE 2: PROPOSED INTERCONNECTIONS CENTERLINE ANALYSIS AND CONSTRAINT RATINGS (2-4)

Proposed Interconnection Segment		6	7	8a	8b	8c	8d
Geography							
Miles overall		53.8	102.6	98.1	62.3	73.7	31.4
Miles in WestWide corridors		.0	9.7	90.6	61.8	69.1	31.4
Topography							
Miles ≥6000' ASL		5.8	4.3	2.3	6.6		
Miles ≥20% Slope		9.9	7.9	6.7	4.0	1.7	.3
Miles <100' AGL (towers)							
Miles <200' AGL (towers)		53.8	83.0	49.5	47.8	73.7	31.4
		53.8	83.0	49.5			155.1
Landuse Constraints							
Level 1	Wilderness, WSA, ISA, etc.						
Level 2	BIA, NCA, Roadless, WMA, etc			4.4			
Level 3	ACEC, Military, Private, etc.	5.4	30.0	1.0	.3	3.4	.0
Level 4	Other State and Federal lands	48.4	72.5	92.7	62.1	70.3	31.4
Level 5	Administrative restrictions						
Level Unassigned	Open water, outside Nevada						
	Total	53.8	102.6	98.1	62.3	73.7	31.4
	Landuse Rating	Low	Mod	High	High	High	High
	Wildlife Rating	Low	Mod	Mod	High	High	High
	Overall Segment Rating	L-1	M-2	H-1	H-1	H-1	H-1
	Major Rating Factors	n/a	DOD land	Tribal land	Desert Tortoise on south end of segment	Military airspace and Desert Tortoise	Military airspace and Desert Tortoise

TABLE 2: PROPOSED INTERCONNECTIONS CENTERLINE ANALYSIS AND CONSTRAINT RATINGS (3-4)

Proposed Interconnection Segment		9a	9b	10	11	12
Geography						
Miles overall		54.2	41.9	88.2	97.1	60.9
Miles in WestWide corridors		29.9		27.0	38.7	4.8
Topography						
Miles ≥6000' ASL		54.2	23.0	53.9	49.8	60.9
Miles ≥20% Slope		6.8	.8	8.4	3.8	5.9
Miles <100' AGL (towers)					1.3	
Miles <200' AGL (towers)		5.3	27.0	13.0	29.7	25.7
		28.5		13.0	29.7	25.7
Landuse Constraints						
Level 1	Wilderness, WSA, ISA, etc.					
Level 2	BIA, NCA, Roadless, WMA, etc	.4		1.2		
Level 3	ACEC, Military, Private, etc.	2.7		5.2	.6	1.1
Level 4	Other State and Federal lands	51.1	41.9	81.5	96.5	59.8
Level 5	Administrative restrictions	.0		.0		
Level Unassigned	Open water, outside Nevada			.3		
	Total	54.2	41.9	88.2	97.1	60.9
	Landuse Rating	Low	Low	Mod	Mod	Low
	Wildlife Rating	High	High	High	High	High
	Overall Segment Rating	H-1	H-1	M-2	M-2	M-2
	<i>Major Rating Factors</i>	<i>High Wildlife but low land management issues</i>	<i>High Wildlife but low land management issues</i>	<i>Existing corridor crossing WMA</i>	<i>High Wildlife and proximity to Roadless area</i>	<i>High Wildlife but low land management issues</i>

TABLE 2: PROPOSED INTERCONNECTIONS CENTERLINE ANALYSIS AND CONSTRAINT RATINGS (4-4)

Proposed Interconnection Segment		13	14	15	Total
Geography					
Miles overall		17.3	78.9	85.1	1184.4
Miles in WestWide corridors			78.8	85.1	636.9
Topography					
Miles ≥6000' ASL		7.2			306.1
Miles ≥20% Slope		3.7	1.8	3.1	100.8
Miles <100' AGL (towers)			42.3	55.8	99.4
Miles <200' AGL (towers)		17.3	35.4	2.1	537.3
		16.3	35.4		
Landuse Constraints					
Level 1	Wilderness, WSA, ISA, etc.				0.0
Level 2	BIA, NCA, Roadless, WMA, etc				36.7
Level 3	ACEC, Military, Private, etc.	.1	3.0	12.9	113.4
Level 4	Other State and Federal lands	17.2	53.5	72.2	954.7
Level 5	Administrative restrictions		22.4		22.5
Level Unassigned	Open water, outside Nevada				57.2
	Total	17.3	78.9	85.1	1184.4
	Landuse Rating	Low	High	High	
	Wildlife Rating	Mod	High	High	
	Overall Segment Rating	M-2	H-1	H-1	
	<i>Major Rating Factors</i>	<i>na</i>	<i>ACEC, Desert Tortoise, military airspace</i>	<i>Military airspace and Desert Tortoise</i>	

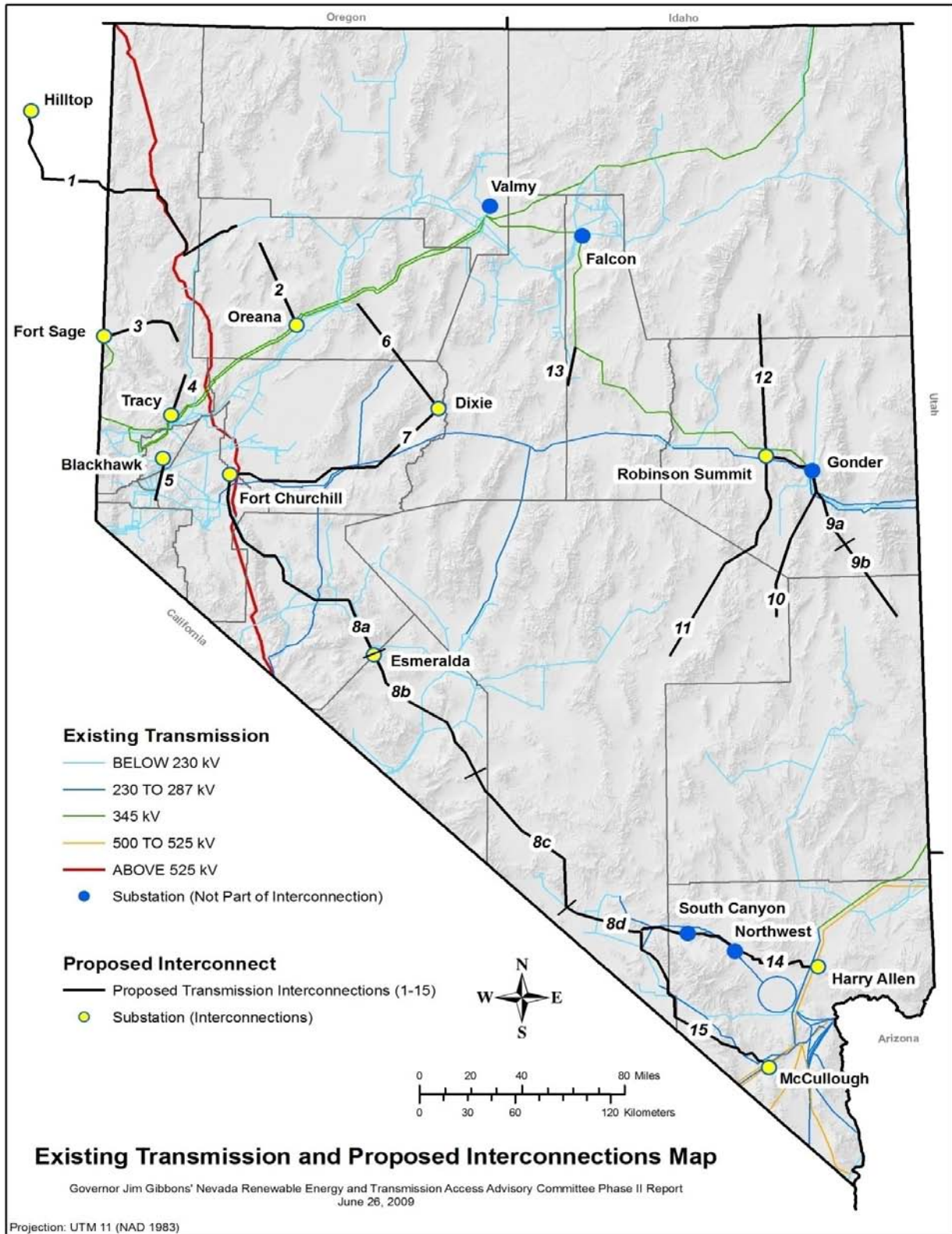


FIGURE 1

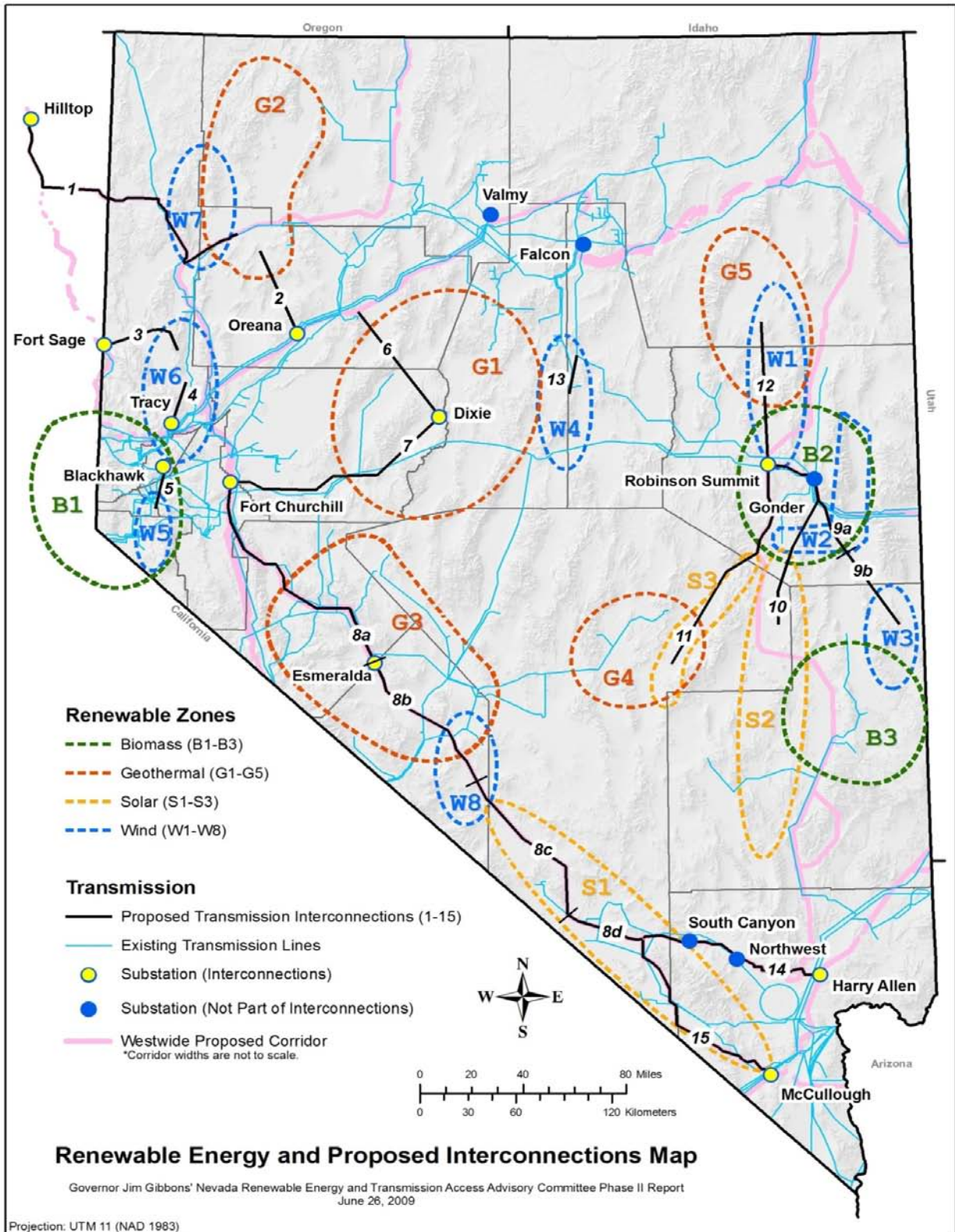


FIGURE 2

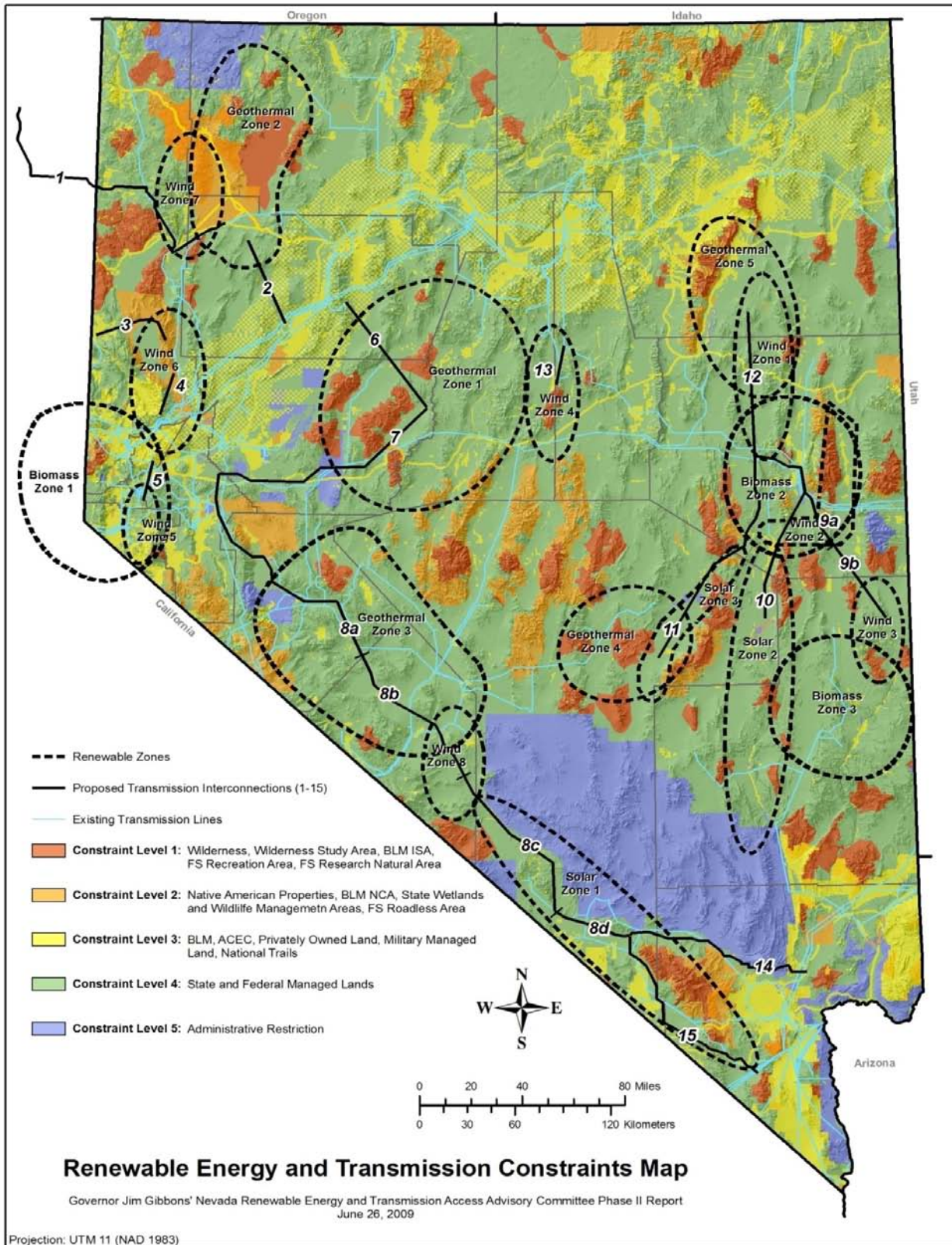


FIGURE 3

Chapter II Renewable Energy Zone Prioritization

To prioritize the state’s renewable energy zones, the Renewable Energy Zone Prioritization Study Group identified four evaluation criteria:

- Renewable energy potential
- Cost of transmission construction
- Transmission environmental impact
- Other system benefits from transmission

The spreadsheet in Table 5 (page 39) utilizes the criteria to prioritize the zones identified in Renewable Energy Zones and Transmission Prioritization map (Figure 2 page 32). It cross-references the map showing alphanumerically coded renewable energy zones and transmission line segments. “Rating and weighting”, a method commonly used to make comparisons by numerical scoring, was applied to each zone and segment, for each criterion. The four criteria were weighted equally by assigning to each the number “3”. Other system benefits were split into two sub-criteria, “System Reliability”, and “Transmission Utilization”, each with a weight of 1.5.

Each of the zones and associated transmission segments were rated by the study group from 1 to 3 for each criterion, with 3 being the highest/most favorable rating. The guideline used to select zone and segment ratings for each criterion is noted on the bottom of Table 5 (page 39). A spreadsheet formula in the cells automatically multiplies the numerical rating by each criterion’s weight to produce weighted scores. The scores for each zone and segment are totaled in a column at the right. The higher scores indicate a higher priority zone. In the last column on the right side of the matrix the zones and associated links were ranked using the total weighted scores, with lower numbers indicating higher ranking and higher overall score. Tie scores resulted in equal rankings.

Other data, such as line segment length, voltage, estimated cost of lines and associated facilities, and megawatt limit of line segments was included in the spreadsheet to aid the evaluation process. A more detailed spreadsheet can be found in Appendix II.

Renewable Energy Potential Ratings

With respect to Renewable Energy Potential represented in Table 6 (page 40), no estimate of potential megawatts in each of the resource zones was available from any authoritative source for the study group to adopt. However, maps depicting concentrations of geothermal, solar and wind resources data for Nevada were available which, when examined for each zone provide a reasonable basis for assigning ratings for the resource zones for each type of resource. These resource maps were used during Phase I of RETAAC by the respective study groups in delineating the resource zones. Based on this information, during Phase I zones were drawn to encompass areas of the state where potential for commercially viable renewable resources was thought to exist.

During Phase II additional source data were sought to aid in rating relative potential of each zone. These data include the sources shown in Table 3 below, which in the case of California’s Renewable Energy Transmission Initiative study and the NVE Transmission OASIS web sites are expressed in megawatts, and in the case of Bureau of Land Management’s web site, the amount (square miles) of federal land being sought for potential development. While these data can be used as indicators of renewable capacity potential, it should be noted that resource estimates not based on actual site-specific measurements at a given location are inherently imprecise and uncertain. Furthermore, there are a great many other factors that can adversely impact development suitability at a particular location, such as: fragmented land ownership, biological, cultural and local land use concerns, visual resource impairment, and military air space and radar constraints. Such factors very often cause sites which otherwise possess good resource potential to not be commercially developable.

Less geographically concentrated geothermal, solar and wind resources are known to exist outside of the defined zones. Thus, although the zones capture the areas of highest resource concentration, they do not constitute the state’s total renewable energy development potential.

TABLE 3: SOURCES OF DATA INDICATING LOCATION/CONCENTRATION OF NEVADA’S RENEWABLE ENERGY RESOURCES

Type of Resource	USGA Geo Resource Map	RETI Geo EX Map	RETI B&V Site ID & Screening	Utility OASIS Interconnect Studies	BLM Site R/W & Lease	NVE 2007-08 RFP Responses (1)	NREL Resource Maps
Geothermal	X	X		X	X	X	X
Solar			X	X	X	X	X
Wind			X	X	X	X	X

Notes:

(1) Confidential bid information. All other sources are publicly available.

Zone Resource Ratings Criteria

“3” A rating of “3” indicates a significant concentration of high quality resources, extensive leases/right-of-ways acquired by developers and numerous potential sites under active development.

“2” A rating of “2” indicates strong resource potential, and moderate amount of development activity underway.

“1” A rating of “1” resource mapping indicates technical potential in some portions of the zone, some testing underway and/or limited development interest to date

Tables 7, 8 and 9 (pages 41, 42, and 43 respectively) compile data available from the information sources noted in Table 6 (page 40) correlated to the zones. These data are also displayed in chart form. From the spreadsheet and charts it is clear which zones should be assigned the highest rating of “3” - geothermal zones 1 and 3, wind zones 2 and 6, and solar zone 1. This data, augmented by visual inspection of the maps on pages 31, 32, and 33 provided additional support for the relative resource ratings assigned to the zones.

Environmental and Land Use Ratings

In the case of environmental impact ratings, the Environment and Land Use Study Group systematically evaluated each of the proposed transmission interconnection segments associated with the zones, using environmental constraint maps previously produced by RETAAC and state and federal agencies, and the knowledge of its participants.

Potential transmission interconnects as proposed in RETAAC Phase I were re-aligned to avoid areas determined by the sub-group to be a Level 1 Constraint area, i.e. areas closed to development by statute or law. A centerline analysis was performed on each proposed transmission segment.

The centerline analysis tabulated the length of the interconnection that intersected constraint areas rated Level 2 through 5, i.e. developable subject to site specific review and mitigation strategies. Then the federal and state agencies met to evaluate these areas and determine if the area had a high (3) or low (1) wildlife and land management impact. The agencies used separate numbers for the wildlife rating and the land management rating, and then used those numbers to determine the final environmental impact rating value by consensus of the entire Study Group. Those numbers were included as input to the priority matrix that was completed by the Feasibility Group. That rating matrix was included in the RETAAC II Report.

Transmission Ratings

The transmission data incorporated into the spreadsheet, and the ratings of Transmission Cost, System Reliability, and Transmission Utilization were provided by NV Energy's Transmission group.

Transmission costs were developed by NV Energy's Transmission Department utilizing the following methodology.

Cost estimates to construct new transmission lines were developed based on line lengths determined by the environmental group. Voltages were selected based upon the available voltages at the connection point and the possible MW's developed. Lines were estimated at a \$/mile cost by voltage. Collector substations had a set cost at each voltage level and the line terminal at the interconnection point was determined to be either "easy" or "difficult" with an associated cost at each voltage level. The line and terminal costs were estimated based on similar projects that have been constructed or estimated for construction recently. The assumed costs are shown in the table below.

TABLE 4: ASSUMED COSTS

kV	Line Cost \$/Mile
120	\$ 400
230	\$ 600
345	\$ 850
500	\$ 1,400

kV	Complex Sub \$/Mile	Simple Sub \$/Mile	Collector Sub \$/Mile
120	\$ 20,000	\$ 2,000	\$ 10,000
230	\$ 30,000	\$ 2,500	\$ 15,000
345	\$ 50,000	\$ 5,000	\$ 25,000
500	\$ 70,000	\$ 7,500	\$ 35,000

Unless otherwise noted there are no additional system upgrade costs included in the line estimates. Prior to construction of any of these projects the system would need to be studied to determine all required network upgrades. It should be noted that cost of identified segments is not indicative of total cost of transmission. Several segments may need to be constructed for delivery of the renewable generation into the load centers.

Megawatt limit of line and system configuration was estimated based on the interconnection location and its surrounding system. The Transmission Cost score was determined by adding up the line and terminal costs and dividing by the megawatt limit.

This information along with the following scores was provided to the Renewable Energy Zone Prioritization Study Group for use in their prioritization matrix.

Transmission Cost Score

- “3” – Least Expensive 1/3rd of projects.
- “2” – Middle 1/3rd of projects.
- “1” – Most Expensive 1/3rd of projects.

System Reliability Score

- “3” – A system line between two existing points
- “2” – Part of a planned system line.
- “1” – Radial line.

Transmission Utilization Score

“3” – Interconnection location has good transmission available.

“2” – Interconnection location is near good transmission.

“1” – Interconnection location is far from good transmission.

Findings

Several line segments warrant careful consideration for advancing from routing studies to proposals for construction, providing that a sufficient amount of actual renewable energy projects within the zones linked by the segments are willing to make firm financial commitments to completion of their projects.

RENEWABLE ENERGY ZONE PRIORITIZATION													
Transmission Segments	Zones in Segment	(3) Renewable Energy Potential		(3) Cost to Build Transmission ³		(3) Transmission Environmental Impact		(3) Other System Benefits ³				Wtd Total	Rank
		Score	Wtd Score	Score	Wtd Score	Segment Score	Wtd Score	System Reliability		Transmission Utilization			
								Score	Wtd Score	Score	Wtd Score		
1	G-2	2	6	1	3	1	3	1	1.5	3	4.5	18	16
2	G-2	2	6	2	6	3	9	1	1.5	2	3	25.5	4
3	W-6	2	6	2	6	1	3	1	1.5	3	4.5	21	11
4	W-6	2	6	3	9	1	3	1	1.5	3	4.5	24	7
5	W-5	1	3	3	9	2	6	1	1.5	3	4.5	24	7
6	G-1	3	9	1	3	1	3	2	3	2	3	21	11
7 ¹	G-1	3	9	2	6	2	6	2	3	1	1.5	25.5	4
8A ¹	G-3	3	9	2	6	1	3	2	3	1	1.5	22.5	10
8A+8B ¹	W-8	1	3	1	3	1	3	2	3	1	1.5	13.5	20
8A+8B+8C	S-1	3	9	1	3	1	3	2	3	1	1.5	19.5	15
8C+8D+14	W-8	1	3	1	3	1	3	3	4.5	3	4.5	18	16
8C+8D+15	W-8	1	3	1	3	1	3	1	1.5	2	3	13.5	20
8D+14	S-1	3	9	3	9	1	3	3	4.5	3	4.5	30	1
8D+15 ⁵	S-1	3	9	3	9	1	3	1	1.5	2	3	25.5	4
9A ²	W-2	3	9	3	9	2	6	1	1.5	3	4.5	30	1
9A+9B ²	W-3	2	6	3	9	2	6	1	1.5	3	4.5	27	3
10 ²	S-2	1	3	3	9	2	6	1	1.5	3	4.5	24	7
11 ²	G-4	1	3	1	3	2	6	1	1.5	3	4.5	18	16
12	W-1	1	3	2	6	2	6	1	1.5	3	4.5	21	11
12	G-5	1	3	2	6	2	6	1	1.5	3	4.5	21	11
13	W-4	1	3	2	6	2	6	1	1.5	1	1.5	18	16

Number in parenthesis indicates the weight attributed to the criteria, rating is high to low with s
Line configuration (voltage and terminals) will be re-evaluated prior to constru-
W-7 within an NCA - removed per BL

- 1=MW limit includes the line from Ft Churchill to Blackhawk that is part of the 7th amendment to the 2C
- 2=Line configuration may allow optimization if OnLine is in service prior to renewable development
- 3=Assumes OnLine Transmission line completed
- 4= West tie would be developed in stages as actual renewable project development warrants or supports the need for and cost justification of such segments
- 5= Currently limited to 600 MW. Netwrk upgrades of \$50 Million are assumed to provide deliverability

Zone Resource Ratings

- 1=Resource mapping indicates technical potential in some parts of the zone, and some testing underway. Limited development activity to date
- 2=Indication of strong resource potential, and moderate amount of development activity underway.
- 3=Significant concentration of high quality resources. Extensive leases/right-of-ways acquired by developers. Umerous potential sites under active

Transmission Cost Score

- 1= Most expensive 1/3
- 2= Middle 1/3
- 3= Least Expensive 1/3

Environmental Impact Score.

- 1= Significant alternatives, avoidance and miti
- 2= Considerable avoidance, mitigation or minc
- 3= Minimal mitigation, avoidance and/or altem

System Reliability Score

- 1= Radial line
- 2= Part of system line
- 3= System line (between two existing points)

Transmission Utilization Score

- 1= Far from good transmission
- 2= Near good transmission
- 3= At good transmission

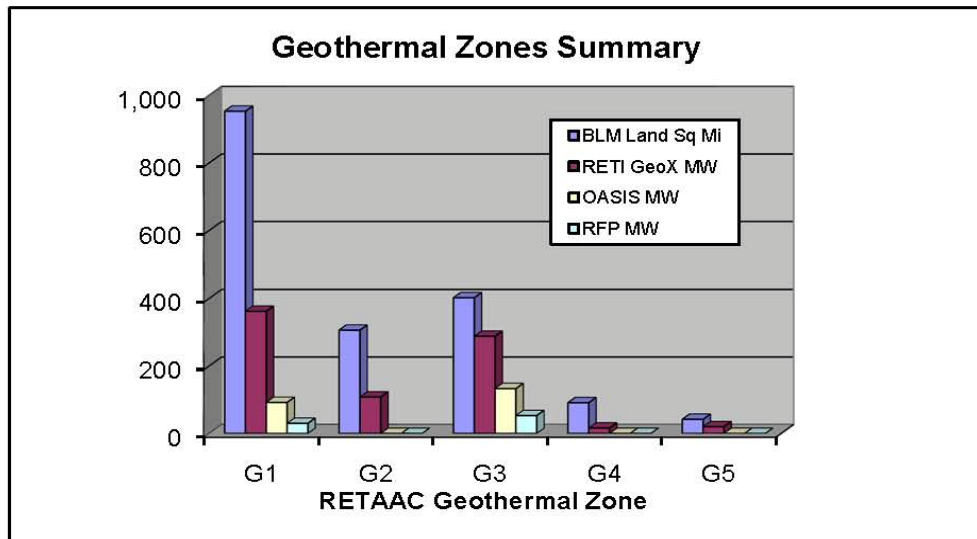
TABLE 5

Indicators of Possible MW Potential for RETAAC Zones (N.B. Lack of MW number for a zone reflects absence of data; it does not mean that resource potential is zero.)

Source:	RETI/GeothermEx estimates in and near zones*(Sept. 2008)						No RETI data for RETAAC wind zones*								RETI/BLM est. (Sept. 2008)										
	Western NV			Eastern Nv			Eastern NV			Other	Western NV			Other	Southern NV										
Zone	G1	G2	G3	G4	G5		W1	W2	W3	W4	W5	W6	W7	W8	S1	S2	Non-zone								
Counties - parts of	Churchill Lander Pershing	Pershing Humboldt	Mineral Esmeralda Nye	Nye	Elko Pine	White	Elko White Pine	White Lincoln		Lander Eureka	Storey Douglas Lyon	Washoe Pershing Lyon	Washoe Pershing Humboldt	Esmeralda Nye	Nye Clark	Nye Lincoln	Other Clark								
Megawatts	16	12	16	8	12	8	No wind Competitive Renewable Energy Zones identified in RETI (BLM wind applications in Clark County identified on map but not classified as CREZ)								436		907								
	16	12	12	8	8																		718		889
	24	8	8																				723		114
	20	8	100																				28		1084
	12	8	8																				197		130
	20	16	8																				184		126
	12	8	32																				86		446
	180	16	40																				907		303
	12	12	32																				889		29
	8	8	16																						73
	8		8																						901
	8		8																						
Zone Total:	362	108	288	16	20																		4,168		3,206
RETI NV Total:	1,475														Southern NV: 18,650										
Source:	Transmission interconnection study queue in zones*(OASIS web site Sept. 2008)																								
Megawatts	32		10				149					150			175		312								
	30		21				149					80					166								
	30		10				100					150					240								
			10				250					100					140								
			32				200					150					60								
			50									102													
Zone Total:	92		133				848					712			175		918								
OASIS NV Total:	570						1,962								1,833										
Source:	NVE RFP responses for potential projects in zones* (Sept. 2008)																								
Megawatts	30		63				150								500		539								
															250		600								
															173		140								
																	72								
	30		63				150								923		1,351								
Indicative Resource Megawatts*	400	100	300				800					700			4,000		3,000								
Source:	Estimated land area of BLM leases and R/W applications in zones* (from Geocommunicator web site)																								
Area (Sq. Miles)	953	306	402	91	42	32	70	56	10	51	110	55	13	275	16										

* Zone areas only, not the entire state

TABLE 6

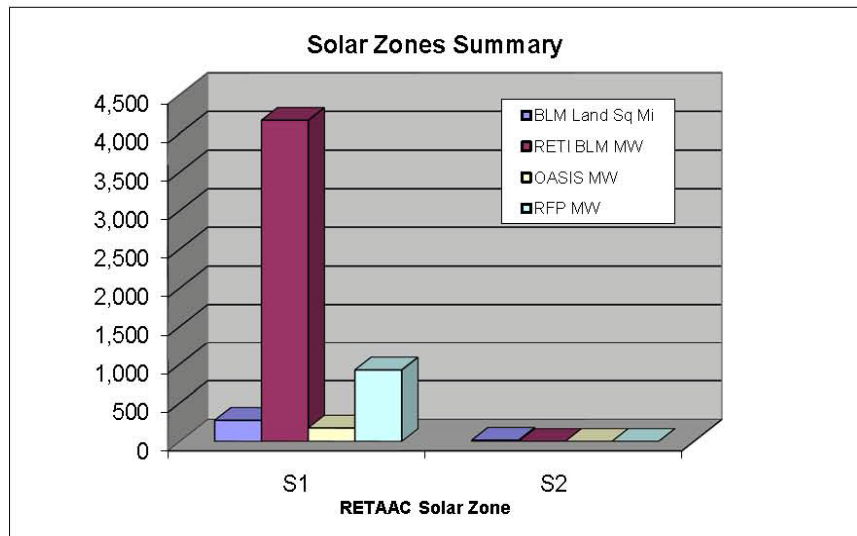


Geothermal Zones	G1	G2	G3	G4	G5
Land (Est'd Sq Mi)	953	306	402	91	42
RETI GeoX MW	362	108	288	16	20
OASIS MW	92	0	133	0	0
RFP MW	30	0	53	0	0
Est. MW Range:	350-400	100-150	250-300	50-100	50-100

Resource potential within zones G1 - G5 is estimated at 800 to 1,100 MW.
 Resource potential is only one of multiple factors that determine project viability. Therefore it is likely that a substantial portion of these potential resources is undevelopable.

April 23, 2009

TABLE 7



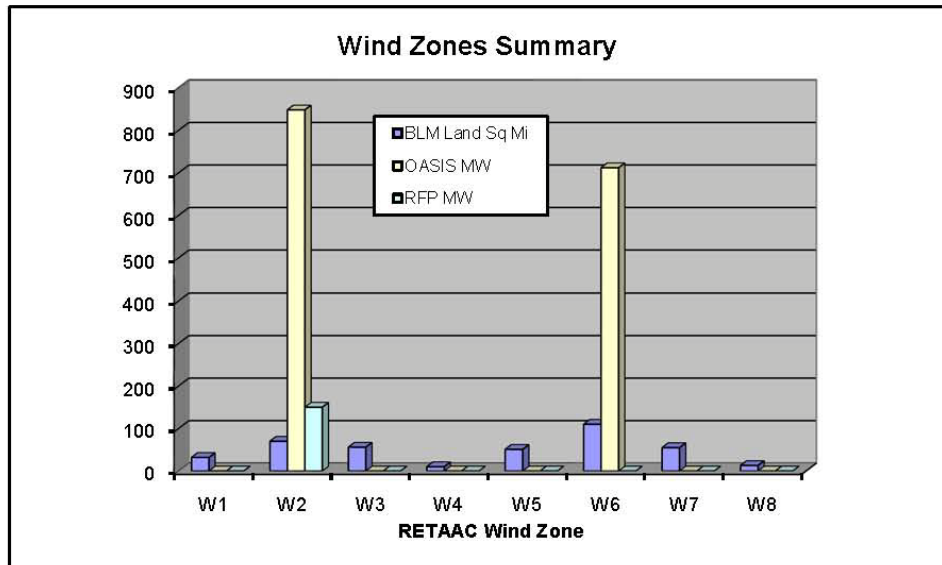
Solar Zones	S1	S2
BLM Land Sq Mi	275	16
RETI BLM MW	4,168	0
OASIS MW	175	0
RFP MW	923	0
Est. MW Range:	4-5,000	UNK

UNK = Unknown. Further examination needed for basis of MW estimate.

Resource range for zone S1 is 4,000 to 5,000 MW. Resource potential is only one of multiple factors that determine project viability. Therefore it is likely that a substantial portion of these potential resources is undevelopable.

April 23, 2009

TABLE 8



Wind Zones	W1	W2	W3	W4	W5	W6	W7	W8
BLM Land Sq Mi	32	70	56	10	51	110	55	13
OASIS MW	0	848	0	0	0	712	0	0
RFP MW	0	150	0	0	0	0	0	0
Est. MW Range:	50-100	800-900	300-400	50-100	50-100	500-700	50-100	0

Resource range for zones W1 - W8 is estimated at 1,800 to 2,400 MW. Resource potential is only one of multiple factors that determine project viability. Therefore it is likely that a substantial portion of these potential resources is undevelopable.

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TABLE 9

Chapter III Economic Feasibility

Construction of a transmission line is a capital intensive project. Thus, one of the critical questions that must be addressed is the economic feasibility of a transmission project. Economic feasibility is based on supply and demand questions including:

- How much does a transmission line developer need to charge for use of the transmission line to recover the construction costs and operating and maintenance expenses including sufficient return on the investment?
- How much are renewable resource developers willing to pay for use of the transmission line to deliver energy to load centers?
- Are renewable resources still competitive after recovering the cost of delivering energy to load centers?

This chapter attempts to shed some light on these economic feasibility issues from the transmission provider's perspective (i.e., supply-side analysis) as well as the renewable resource provider's perspective (i.e., demand-side analysis).

As is typical in this type of long-term future projection (45 years) analysis, significant simplifying assumptions are required. The cost information presented herein is provided in two different cost formats.

In the first format, the costs of transmission lines are presented on a fixed cost basis, i.e. a dollar per megawatt (\$/MW) month charge that would be applicable to all firms transmission subscribers/users regardless of throughput. The second format presents the costs of the same lines on a throughput, or dollar per megawatt hour (\$/MWh) basis so that transmission users can get a relative sense of how much the transmission lines examined here may add to their generation costs.

It should be noted, however, that while transmission capacity charges (\$/MW-month) from the transmission provider's perspective and delivery/transmission costs (\$/MWh) from the renewable developer's perspective are calculated in the following two sections, these figures should not be viewed as likely charges/costs. They vary significantly when a different set of assumptions is used. What is certain is that, regardless of the methodology used to present the cost of transmission, transmission developers must recover their costs (including an appropriate return on investment) or the line will not get built.

The purpose of this chapter is not to identify the specific costs of any particular line or to suggest a pricing methodology, but to provide an indication of transmission projects which may be more economically feasible than others. The results are provided under Economic Feasibility Ranking Table 15 Ranking by Economic Feasibility, page 51.

It should be noted that development of more reliable figures will be plausible only when the economic feasibility of an individual project is closely evaluated, which requires, for example, knowledge on the actual demand for transmission capacity, construction cost information specific to the transmission demand, as well as financial information specific to the transmission developer.

Transmission Provider’s Perspective (Supply-Side Analysis)

Methodologies and Assumption

Transmission developers’ ability and willingness to construct and operate a transmission line depends largely upon the availability of prospective buyers (i.e., renewable resource developers) as well as financing capability. Two types of financing are assumed. One is 100 percent bond financing with federal income tax exemption, perhaps issued by a non-profit, 501(c)3 organization. The other is bond/stock financing. The table below summarizes financial and depreciation assumptions for each financing scenario.

TABLE 10: FINANCIAL AND DEPRECIATION ASSUMPTIONS

	Bond Financing	Bond/Stock Financing
Depreciation	45 years	45 Years
Tax Depreciation	NA	20 Years
O&M Expenses	0.7 % of Capital Cost	0.7 % of Capital Cost
O&M Exp. Escalation Factor	2.5% Annually	2.5% Annually
Share of Debt	100 %	60 %
Interest on Debt	7 %	7 %
Share of Common Stock	0 %	40 %
Return on Common Stock	NA	11 %
Discount Factor	7 %	8.6 %
Marginal Tax Rate	NA	35 %

Based on the assumptions described above, the 45 year revenue requirements in present value for each transmission project are first calculated. Next, the monthly transmission capacity charge, which is needed to meet the revenue requirements, is obtained with the additional assumption that there are sufficient renewable resources to meet the megawatt limit of the line. The cost estimates and the megawatt limit for each transmission project are reported in the Renewable Energy Zone Prioritization Study Group Report.

Results

There exist many different pricing methodologies to develop a series of prices to meet the 45-year revenue requirements in present value. However; it appears unreasonable to assume that the monthly charge of a transmission line remain constant for the 45-years or decrease over the years. Accordingly, the monthly charges reported in the table below are assumed to increase by 1.5 percent on an annual basis.¹ The monthly rates are reported in the order of lower rates to higher rates.

¹The annual revenue requirement for each project decreases over time as the rate base becomes smaller. Therefore, the only pricing that matches each year’s annual revenue requirement is a series of prices which decrease over time. However, such declining pricing is not practical. The pricing assumed in this report generates revenues slightly short of the required revenue for the first several years and recoup the

TABLE 11: TRANSMISSION MONTHLY RATES

Case of 100 % Utilization of the megawatt limit (with 1.5 % annual increase)

Transmission Segment	Zone	Terminals	Construction Cost (\$million)	Length (Miles)	MW Limit	Bond Financing	Bond/Stock Financing
						Monthly Rate (MW)	Monthly Rate (MW)
9A	W-2	Robinson	\$118.1	54	1,000	\$670	\$940
8D+14	S-1	Harry Allen	\$358.0	110	3,000	\$680	\$960
9A+9B	W-3	Robinson	\$176.9	96	1,000	\$990	\$1,410
5	W-5	Blackhawk	\$18.8	17	100	\$1,060	\$1,500
8D+15	S-1	McCullough	\$417.3	116	2,000	\$1,180	\$1,670
10	S-2	Robinson	\$221.7	128	1,000	\$1,250	\$1,770
4	W-6	Tracy	\$47.0	20	200	\$1,320	\$1,880
2	G-2	Oreana	\$26.8	37	100	\$1,510	\$2,140
13	W-4	Frontier	\$55.2	17	200	\$1,560	\$2,210
3	W-6	Ft. Sage	\$58.9	34	200	\$1,660	\$2,360
8A	G-3	Ft. Churchill/Blackhawk	\$163.3	98	500	\$1,840	\$2,610
12	W-1	Robinson	\$81.9	61	250	\$1,840	\$2,620
12	G-5	Robinson	\$81.9	61	250	\$1,840	\$2,620
7	G-1	Ft. Churchill/Blackhawk	\$167.5	103	500	\$1,890	\$2,680
8A+8B	W-8	Ft. Churchill/Blackhawk	\$216.0	160	500	\$2,430	\$3,450
8A+8B+8C	S-1	Ft. Churchill/Blackhawk	\$273.9	234	500	\$3,080	\$4,370
8C+8D+14	W-8	Harry Allen	\$127.9	184	200	\$3,600	\$5,110
8C+8D+15	W-8	McCullough	\$131.5	190	200	\$3,700	\$5,250
11	G-4	Robinson	\$112.5	97	150	\$4,210	\$5,990
6	G-1	Oreana	\$120.9	54	150	\$4,500	\$6,440
1	G-2	Hilltop	\$82,.4	131	100	\$4,630	\$6,580

Observations

First, the bond/stock financing leads to much higher monthly rates (approximately 40 percent) than the bond financing. This result was expected because of a higher return required under the bond/stock financing and federal income tax implications associated with the bond/stock financing. Second, the monthly rates vary widely, ranging from \$670 to \$4,630 under the bond financing (from \$940 to \$6,580 under the bond/stock financing). Third, compared with NV Energy’s current transmission rates (i.e., \$2,840/megawatt/month for North and \$1,400/megawatt/month for South), there are some transmission lines whose rates appear reasonable when the transmission capacity was fully utilized.

Sensitivity Analysis of Demand for Transmission

As discussed above, several simplifying assumptions were necessitated to calculate the monthly rates presented in Table 11. A change in these assumptions will inevitably produce different rates. Among them, the most crucial assumption is that there would be sufficient demand for transmission capacity up to the megawatt limit of each line (i.e., 100 percent realization of the “assumed/potential” megawatt). While the voltage (kV) of each transmission project, which is one of the major determinants of the capacity (megawatt limit) of a transmission line, was selected based on renewable energy potential

revenue shortfall in later years. It should be noted that this is one of many pricing methodologies and it is almost certain that a different transmission provider will adopt different pricing.

(megawatt) for each renewable energy zone, each zone may not have sufficient demand to fully utilize the transmission capacity (megawatt limit). Consequently, the transmission developers may have to increase the transmission capacity monthly rate so that they will receive sufficient revenue stream to meet the revenue requirements for providing the transmission service.

Consider, for example, there are only 700 megawatts of renewable resources realized in Zone W- 2, instead of the megawatt limit of 1,000 megawatts. In this case, the monthly rate under the bond financing for Transmission Segment 9A, which is connected to Zone W-2 from Robinson Terminal, needs to be raised to \$957 (\$670 divided by 0.7) from \$670. This increase is necessary for the transmission developer to cover the costs of transmission service for that segment. Similarly, under the bond/stock financing, the monthly rate of \$940 needs to be raised to \$1,343 (\$940 divided by 0.7) for the same transmission segment. Below is an exemplary table for the case of 70 percent realization of the potential (i.e., megawatt limit) for each renewable energy zone.

TABLE 12: TRANSMISSION MONTHLY RATES

Case of 70 % Utilization of the megawatt limit (with 1.5 % annual increase)

Transmission Segment	Zone	Terminals	Construction Cost (\$million)	Length (Miles)	MW	Bond Financing	Bond/Stock Financing
						Monthly Rate (MW)	Monthly Rate (MW)
9A	W-2	Robinson	\$118.1	54	700	\$957	\$1,343
8D+14	S-1	Harry Allen	\$358.0	110	2,100	\$971	\$1,371
9A+9B	W-3	Robinson	\$176.9	96	700	\$1,412	\$2,014
5	W-5	Blackhawk	\$18.8	17	70	\$1,514	\$2,143
8D+15	S-1	McCullough	\$417.3	116	1,400	\$1,686	\$2,386
10	S-2	Robinson	\$221.7	128	700	\$1,786	\$2,529
4	W-6	Tracy	\$47.0	20	140	\$1,886	\$2,686
2	G-2	Oreana	\$26.8	37	70	\$2,157	\$3,057
13	W-4	Frontier	\$55.2	17	140	\$2,229	\$3,157
3	W-6	Ft. Sage	\$58.9	34	140	\$2,371	\$3,371
8A	G-3	Ft. Churchill/Blackhawk	\$163.3	98	350	\$2,629	\$3,729
12	W-1	Robinson	\$81.9	61	175	\$2,629	\$3,743
12	G-5	Robinson	\$81.9	61	175	\$2,629	\$3,743
7	G-1	Ft. Churchill/Blackhawk	\$167.5	103	350	\$2,700	\$3,829
8A+8B	W-8	Ft. Churchill/Blackhawk	\$216.0	160	350	\$3,471	\$4,928
8A+8B+8C	S-1	Ft. Churchill/Blackhawk	\$273.9	234	350	\$4,400	\$6,243
8C+8D+14	W-8	Harry Allen	\$127.9	184	140	\$5,143	\$7,300
8C+8D+15	W-8	McCullough	\$131.5	190	140	\$5,286	\$7,500
11	G-4	Robinson	\$112.5	97	105	\$6,014	\$8,557
6	G-1	Oreana	\$120.9	54	105	\$6,429	\$9,200
1	G-2	Hilltop	\$82.4	131	70	\$6,614	\$9,400

For a different realized megawatt figure other than the 70 percent, the monthly rate in each zone can be easily calculated in the same manner, using the ratio of the “realized/utilized” megawatt relative to the “potential/assumed” megawatt (i.e., megawatt limit).

Renewable Resource Developers' Perspective (Demand-Side Analysis)

Methodologies and Assumptions

Most renewable resources are located outside load centers and renewable resource developers need to have access to transmission lines connected to such load centers. Thus, in addition to the construction cost of a renewable energy plant, a renewable resource developer must consider the availability of transmission lines as well as the cost of delivering the energy to load centers. Since the delivery/transmission cost per megawatt hour (i.e., a transmission capacity payment divided by total electricity in megawatt hour carried over the line for a given time period) needs to be recovered as part of the delivered energy price, a high delivery cost would make its products unattractive in load centers. This may make a renewable energy project, which may look promising otherwise, economically unfeasible.

To investigate this issue (of how much renewable resource developers pay to deliver one megawatt hour of electricity from its source to load centers), each transmission line is first identified whether it carries geothermal, wind or solar. Next, for each type of renewable resource, the following capacity factor is assigned: 90 percent for geothermal plants; 30 percent for wind plants; and 37 percent for solar plants. The capacity factors vary depending upon project technology and location. As such, those capacity factor figures should be viewed for estimation purposes only.

Results

The table below reports the delivery/transmission cost to renewable resource developers for each renewable zone, which is based on the capacity factor of the respective renewable resource. Note that the delivery/transmission costs reported in Table 13 (page 49) correspond to the transmission capacity rates (\$/megawatt) reported in Table 11 (page 46). They are reported in the order of lower costs to higher costs.

TABLE 13: DELIVERY/TRANSMISSION COST

Case of 100 % Utilization of the megawatt Limit (with 1.5 % annual increase)

Transmission Segment	Zone	Terminals	Length (Miles)	MW Limit	Capacity Factor	Bond Financing	Bond/Stock Financing
						Delivery Cost (MWh)	Delivery Cost (MWh)
2	G-2	Oreana	37	100	90%	\$2.30	\$3.25
8D+14	S-1	Harry Allen	110	3,000	37%	\$2.51	\$3.57
8A	G-3	Ft. Churchill/Blackhawk	98	500	90%	\$2.80	\$3.98
12	G-5	Robinson	61	250	90%	\$2.80	\$3.99
7	G-1	Ft. Churchill/Blackhawk	103	500	90%	\$2.88	\$4.08
9A	W-2	Robinson	54	1,000	30%	\$3.07	\$4.30
8D+15	S-1	McCullough	116	2,000	30%	\$4.38	\$6.19
9A+9B	W-3	Robinson	96	1,000	30%	\$4.53	\$6.43
10	S-2	Robinson	128	1,000	37%	\$4.62	\$6.54
5	W-5	Blackhawk	17	100	30%	\$4.83	\$6.83
4	W-6	Tracy	20	200	30%	\$6.03	\$8.60
11	G-4	Robinson	97	150	90%	\$6.41	\$9.12
6	G-1	Oreana	54	150	90%	\$6.84	\$9.80
1	G-2	Hilltop	131	100	90%	\$7.05	\$10.01
13	W-4	Frontier	17	200	30%	\$7.13	\$9.77
3	W-6	Ft. Sage	34	200	30%	\$7.57	\$10.77
12	W-1	Robinson	61	250	30%	\$8.40	\$11.97
8A+8B	W-8	Ft. Churchill/Blackhawk	160	500	30%	\$11.10	\$15.77
8A+8B+8C	S-1	Ft. Churchill/Blackhawk	234	500	37%	\$11.41	\$16.19
8C+8D+14	W-8	Harry Allen	184	200	30%	\$16.43	\$23.33
8C+8D+15	W-8	McCullough	190	200	30%	\$16.90	\$23.97

Observations

First, renewable energy zones with geothermal resources become more attractive when capacity factors are considered. This is due to the higher capacity factor of geothermal resource relative to the capacity factors for wind and solar resources. Second, the delivery/transmission costs vary widely among the renewable energy zones, ranging from \$2.30 to \$16.90 per megawatt hour under the bond financing (from \$3.25 to \$23.97 under the bond/stock financing). Third, there are some transmission segments whose delivery costs appear reasonable when the transmission capacity was fully utilized.

Sensitivity Analysis of Demand for Transmission

The delivery/transmission costs provided in Table 13 assumed that there is sufficient demand for transmission capacity up to the megawatt limit of each transmission project. However, as discussed above, this assumption may be unrealistic.

Consider, for example, there are only 700 megawatts of renewable resources realized in Zone W-2, instead of 1,000 megawatts projected (as the megawatt limit of that transmission segment). In this case, as shown in Table 12 (page 47), the monthly rate for Transmission Segment 9A, which is connected to Zone W-2 from Robinson Terminal, needs to be raised to \$957 under the bond financing and \$1,343 under the bond/stock financing. As a result, the delivery/transmission cost per megawatt hour for that

segment will increase to \$4.39 under the bond financing (\$3.07 divided by 0.7) and \$6.14 under the bond/stock financing (\$4.30 divided by 0.7).

Below is an exemplary table for the case of 70 percent realization/utilization of the “assumed/potential” (i.e., megawatt limit) for each renewable energy zone. Note that the delivery/transmission costs reported in Table 14 correspond to the transmission capacity rates (megawatt) reported in Table 12 (page 47).

TABLE 14: DELIVERY/TRANSMISSION COST
Case of 70 % Utilization of the megawatt limit (with 1.5 % annual increase)

Transmission Segment	Zone	Terminals	Length (Miles)	MW	Capacity Factor	Bond Financing	Bond/Stock Financing
						Delivery Cost (MWh)	Delivery Cost (MWh)
2	G-2	Oreana	37	70	90%	\$3.29	\$4.64
8D+14	S-1	Harry Allen	110	2,100	37%	\$3.59	\$5.10
8A	G-3	Ft. Churchill/Blackhawk	98	350	90%	\$4.00	\$5.69
12	G-5	Robinson	61	175	90%	\$4.00	\$5.70
7	G-1	Ft. Churchill/Blackhawk	103	350	90%	\$4.11	\$5.83
9A	W-2	Robinson	54	700	30%	\$4.39	\$6.14
8D+15	S-1	McCullough	116	1,400	37%	\$6.26	\$8.84
9A+9B	W-3	Robinson	96	700	30%	\$6.47	\$9.19
10	S-2	Robinson	128	700	37%	\$6.60	\$9.34
5	W-5	Blackhawk	17	70	30%	\$6.90	\$9.76
4	W-6	Tracy	20	140	30%	\$8.61	\$12.29
11	G-4	Robinson	97	105	90%	\$9.16	\$13.03
6	G-1	Oreana	54	105	90%	\$9.77	\$14.00
1	G-2	Hilltop	131	70	90%	\$10.07	\$14.30
13	W-4	Frontier	17	140	30%	\$10.19	\$14.43
3	W-6	Ft. Sage	34	140	30%	\$10.81	\$15.39
12	W-1	Robinson	61	175	30%	\$12.00	\$17.10
8A+8B	W-8	Ft. Churchill/Blackhawk	160	350	30%	\$15.86	\$22.53
8A+8B+8C	S-1	Ft. Churchill/Blackhawk	234	350	37%	\$16.30	\$23.13
8C+8D+14	W-8	Harry Allen	184	140	30%	\$23.47	\$33.33
8C+8D+15	W-8	McCullough	190	140	30%	\$24.14	\$34.24

For a different realized MW other than the 70 percent figure, the delivery/transmission cost for renewable resource developers in each zone can be easily obtained in the same manner, using the ratio of the “realized” megawatt relative to the “potential/assumed” megawatt (i.e., megawatt limit).

Economic Feasibility Ranking

Methodologies and Assumptions

As discussed above, the dollar figures provided were developed specific to certain conditions and they do not represent actual monthly transmission capacity rates (\$/megawatt) or delivery/transmission costs (\$/megawatt hour). Development of more reliable figures will be plausible only when the economic feasibility of an individual project is closely evaluated, which requires, for example, knowledge

of the actual demand, construction cost information specific to the transmission demand as well as financial information specific to the transmission developer. Rather, the purpose of this chapter is more modest. It is to identify transmission projects which may be more economically feasible than others.

The table below ranks the proposed transmission projects by the transmission provider’s perspective (where they are ranked from the lowest monthly transmission capacity charge to the highest charge) and the renewable resource developer’s perspective (where they are ranked from the lowest delivery cost of one megawatt hour to the highest cost). The overall ranking (i.e., Economic Feasibility Ranking) was developed by giving the same weight to the transmission provider’s cost perspective and the renewable resource developer’s cost perspective. The table also includes the Renewable Energy Zone Priority (“REZP”) ranking for reference purposes.

TABLE 15: RANKING BY ECONOMIC FEASIBILITY

Trans. Segment	Zone	Terminals	Construction Cost (\$million)	Trans. Provider’s Perspective Ranking	Resource Developer’s Perspective Ranking	Economic Feasibility Ranking (scores)*	REZP Ranking
8D+14	S-1	Harry Allen	\$358.0	2	2	1 (4)	1
9A	W-2	Robinson	\$118.1	1	5	2 (6)	1
2	G-2	Oreana	\$26.8	8	1	3 (9)	4
9A+9B	W-3	Robinson	\$176.9	3	7	4 (10)	3
8D+15	S-1	McCullough	\$417.3	5	6	5 (11)	4
5	W-5	Blackhawk	\$18.8	4	9	6 (13)	7
10	S-2	Robinson	\$221.7	6	8	7 (14)	7
8A	G-3	Ft. Churchill/Blackhawk	\$163.3	11	3	7 (14)	10
12	G-5	Robinson	\$81.9	12	3	9 (15)	11
4	W-6	Tracy	\$47.0	7	10	10 (17)	7
7	G-1	Ft. Churchill/Blackhawk	\$167.5	14	4	11 (18)	4
13	W-4	Frontier	\$55.2	9	14	12 (23)	16
3	W-6	Ft. Sage	\$58.9	10	15	13 (25)	11
12	W-1	Robinson	\$81.9	12	16	14 (28)	11
11	G-4	Robinson	\$112.5	19	11	15 (30)	16
8A+8B	W-8	Ft. Churchill/Blackhawk	\$216.0	15	17	16 (32)	20
6	G-1	Oreana	\$120.9	20	12	16 (32)	11
8A+8B+8C	S-1	Ft. Churchill/Blackhawk	\$127.9	16	18	18 (34)	15
1	G-2	Hilltop	\$82.4	21	13	18 (34)	16
8C+8D+14	W-8	Harry Allen	\$131.5	17	19	20 (36)	16
8C+8D+15	W-8	McCullough	\$131.5	18	20	21 (38)	20

*Note that the first number presented in this column is the overall ranking. The second number in parenthesis is the total economic feasibility score, which is the sum of the transmission developer’s perspective ranking and the renewable resource developer’s perspective ranking. Accordingly, a project with a smaller total score ranks higher than a project with a larger total score.

Observations

The rankings by the Economic Feasibility and by the Renewable Energy Zone Priority are highly correlated. The first ten transmission projects ranked by the Economic Feasibility are also ranked high by the Renewable Energy Zone Priority. Based on this observation, it appears possible to develop a priority

list of the proposed transmission projects. It also appears possible to develop a priority list of the proposed transmission projects for each renewable resource type separately.

Chapter IV Transmission for Export

Nevada's existing transmission facilities and proposed transmission projects could be used to export energy from Nevada renewable resources to adjacent states. Proposed transmission projects include those that originate in Nevada as well as regional transmission projects that pass through the state. Existing transmission facilities include those owned by NV Energy as well as transmission owned by others.

These lines are assessed with respect to: 1) expected demand for renewable energy from adjacent states; 2) a list of obstacles that are preventing development of transmission for exporting renewable energy; 3) a list of opportunities available to the Nevada renewable resource development industry; and 4) recommendations for addressing export limitations that are affecting the development of Nevada's renewable resource industry.

Proposed Transmission Projects

Table 16 (page 54) below lists the proposed transmission projects that would directly or indirectly allow export of renewable energy from Nevada to adjacent states. The location and routing of each of these projects is identified on Figure 4 the Nevada New Export Alternatives map (page 55).

TABLE 16: PROPOSED TRANSMISSION FACILITIES

Project Name	Export Destination	Description
PDCI 500 kV DC Taps	CA	Tap Locations: NW and W. Central Nevada
IPP 500 kV DC Taps	CA	Southern NV (North or South of LV)
TransCanada 500 kV DC – Zephyr,	SW	Wyoming to South of Las Vegas
TransCanada 500 kV DC – Chinook	SW	Montana to South of Las Vegas
LS Power North 500 kV	NW	Robinson Summit to Midpoint (ID)
LS Power South 500 kV	SW	Robinson Summit to South of Las Vegas
TANC 2 x 500 kV	CA	Raven (CA) to N. CA ²
SCE/Vulcan 500 kV (Dixie Valley)	CA	Dixie Valley to Bishop
SCE/Vulcan 500 kV (W. NV)	CA	Fernley to Bishop
Vulcan 500 kV (W. Intertie)	CA	Yerington to Jean
SCE 2 x 230 kV (Ivanpah)	CA	Ivanpah to El Dorado Substation
Navajo Nation 500 kV NTP	SW	Four Corners (NM) to Marketplace Sub. (NV)

² Transmission facilities developed by TANC will allow Nevada renewable resource developer's access to Northern California. An interconnection of NV Energy's Alturas line to the Raven Substation is required to allow access. Note: NV Energy is completing routing studies that include a route for a 345 kV transmission facility from its electric system to the Raven Substation. Development of a new transmission project in this route would provide additional transmission capacity from to northern California.

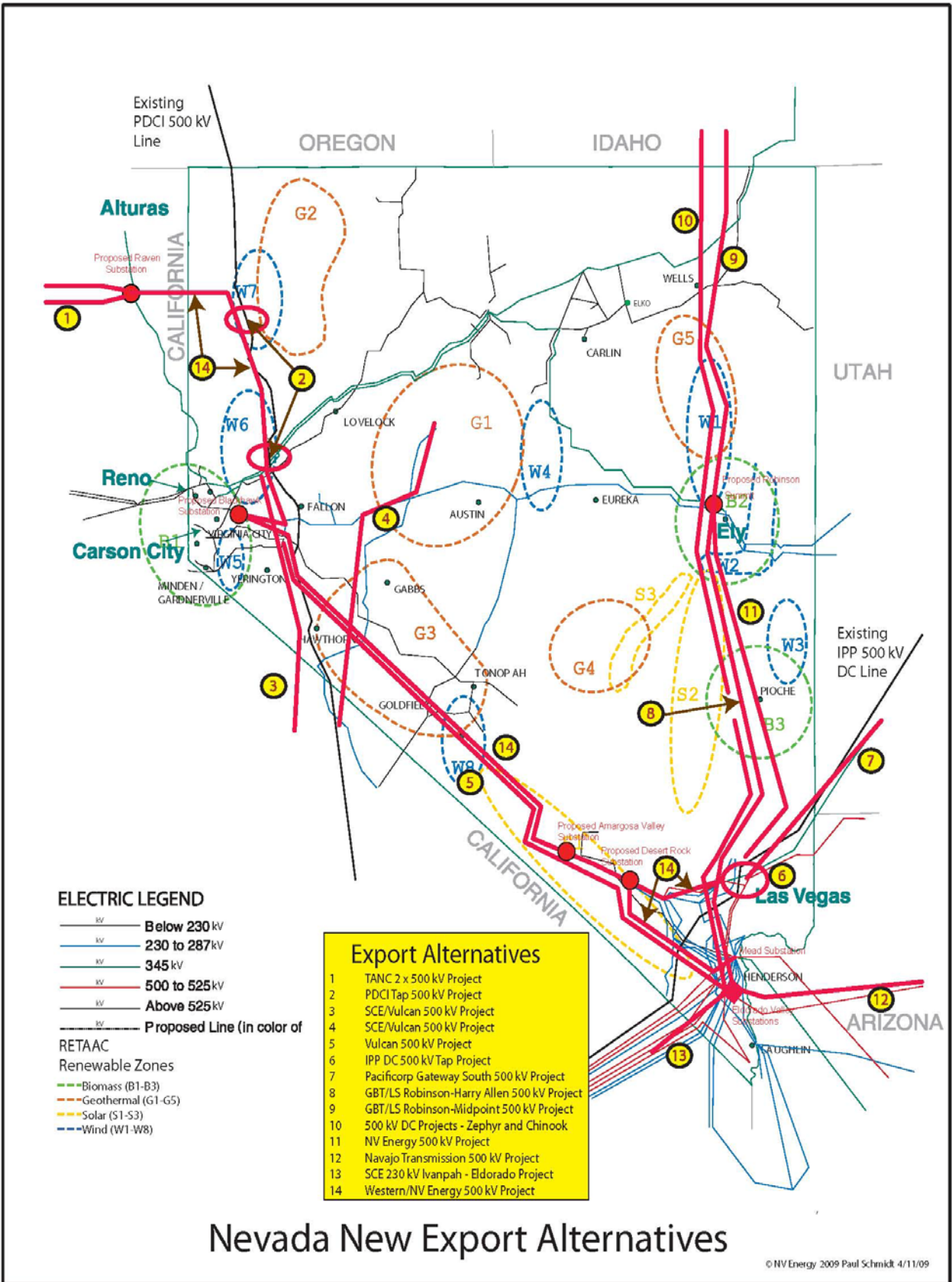


FIGURE 4

The following transmission projects provide export opportunities for Nevada renewable resource developers. The location and routing of each of these projects is identified on Figure 4 (page 55).

TransCanada 500 kV DC Zephyr Project: TransCanada's Zephyr Transmission Line Project (Zephyr) is a proposed 1,100 mile (1,760 km), 500 kilovolt (kV) high voltage direct current (HVDC) transmission project that will originate in Wyoming and terminate in Nevada. The project would link 3,000 megawatts of primarily wind generation resources with loads in the Southwestern United States³. The Federal Energy Regulatory Commission issued an Order Authorizing Proposals and Granting Waivers in Docket No. ER09-433-000 on February 19, 2009.

TransCanada 500 kV DC Chinook Project: TransCanada's Chinook Transmission Line Project (Chinook) is a proposed 1,000 mile (1,600 kilometer), 500 kV HVDC transmission project that will originate in Montana and terminate in Nevada. The project would link 3,000 MW of primarily wind generation resources with loads in the Southwestern United States⁴. The Federal Energy Regulatory Commission issued an Order Authorizing Proposals and Granting Waivers in Docket No. ER09-432-000 on February 19, 2009.

NV Energy ON Line 500 kV Transmission Project: NV Energy proposes to develop a North/South intertie located in eastern Nevada (White Pine, Lincoln, and Clark Counties). The project is expected to have an initial rating of 600 – 800 MW and is describe as scalable in the NPC resource plan amendment filed on March 7, 2009. The project will allow the transfer of renewable energy from Northern Nevada to Southern Nevada.

Southern California Edison ("SCE")/ Vulcan Power 500 kV Transmission Project: SCE/Vulcan proposes to develop 263 miles of 500 kV transmission line that will originate near Bishop, California, heading north to a point where it would branch into two lines both heading north. One of the branches would terminate near Fernley, Nevada and the other near Salt Wells. An additional 15 mile 230 kV transmission line would be installed from Salt Wells to the Dixie Valley corridor. The project is intended to provide a transmission path for Nevada renewable resources to southern California.

Vulcan Power Company 500 kV Transmission Project: Vulcan Power proposes to develop a 347-mile 500 kV transmission line that will originate near Yerington, Nevada, pass through Lyon, Mineral, Esmeralda, Nye, and Clark Counties, and end near Jean, Nevada. The project will be used to deliver energy from renewable resources located in western Nevada to the Southwest.

Navajo 500 kV Transmission Project: The Navajo Nation proposes to develop a 470 mile 500 kV transmission line that will originate near Farmington, New Mexico, pass through northern Arizona, and terminate south of Las Vegas, Nevada. The expected rating of this project is 1200 MW with anticipated flow capacity to the Phoenix Market of 800-1000 MW and anticipated flow capacity to the Las Vegas and California market of 200-400 MW.

Great Basin Transmission 500 kV Transmission Project: The Project is a proposed aboveground 500-kVac transmission line stretching more than 500 miles (805 km) between southern Idaho and southern Nevada. The project will provide as much as 1850 megawatts of north-to-south transmission capacity and 1850 megawatts of south-to-north transmission capacity. It will provide a new energy pathway

³ Source: http://www.transcanada.com/company/zephyr_chinook.html

⁴ Ibid.

connecting the existing high-voltage transmission infrastructure near Twin Falls, Idaho, and the existing systems in northern Nevada and the Las Vegas, Nevada, area. It will provide direct interconnection and viable access to multiple transmission providers in the West, which may include Arizona Public Service, Idaho Power, Los Angeles Department of Water and Power, Nevada Power, PacifiCorp, Salt River Project, Sierra Pacific Power, Southern California Edison and Western Area Power Administration. Southwest Intertie Project is being developed in phases⁵. The Nevada Commission has processed GBTs request for a permit to construct the first phase of this project and has issued an order indicating that it will issue a permit to construct once GBT has obtained all the necessary permits for this project.

The Transmission Agency of Northern California (“TANC”) 2 x 500 kV Project: This project does not originate in Nevada and is primarily being constructed to deliver renewable resources located in northern California to California municipal utilities. Interconnection of the Alturas line or a new 345 kV or larger transmission line will allow deliveries of energy from Nevada renewable resources to Northern California.

SCE 2-230 kV Transmission Project: SCE intends to construct a double circuit 230 kV transmission line from the vicinity of Ivanpah to the El Dorado substation. The project is being constructed to allow delivery of renewable energy from large solar projects that are to be constructed in southern Nevada and southern California. Existing capacity on regional transmission paths will be used to move the energy from its source to California.

Two DC Taps of the Pacific DC Intertie (PDCI): Two locations for tapping the existing PDCI 500 kV DC line are shown on Figure 4 (page 55). These proposed locations were selected by previous conventional energy developers. The locations of any future taps for development of renewable energy resources would most likely be selected based upon proximity to renewable resources and access to NV Energy’s transmission system. There appears to be available capacity on this line. Based upon 2007 historical data showing usage of this line, there is a significant amount of capacity available on this line that could be used for export of renewable energy. However, contractual arrangements for the capacity of this line were not investigated.

DC Tap of the Intermountain Power Project (IPP): The tap location was selected previously by NV Energy as an option for increasing its import capability. The locations of any future taps for development of renewable energy resources would most likely be selected based upon proximity to renewable resources and access to NV Energy’s transmission systems. Based upon 2007 historical data showing usage of this line, there is a significant amount of capacity available on this line that could be used for export of renewable energy. However, contractual arrangements for the capacity of this line were not investigated.

Existing Transmission Facilities

Table 17 (page 58) lists the existing Nevada interties and their respective export capacity ratings. The export ratings and location of these interties are identified on Figure 5 the Existing Nevada Export Alternatives Map (page 59).

⁵ Source: http://tdworld.com/overhead_transmission/great_basin_rfp_southwest_intertie_1208/

TABLE 17: EXISTING TRANSMISSION FACILITIES

Intertie	Export Capability (MW)	Destination
Alturas Intertie 345 kV	300	NW
PGE Intertie 120 kV	120	CA
SCE Intertie 55 kV	17	CA
Dixie Valley 230 kV	Limited	CA
Valmy-Midpoint Intertie 345 kV	262	NW
Gonder-IPP 230 kV & Gonder- Sigurd 230 kV Intertie	235	UT
Harry Allen –Red Butte 345 kV Intertie	300	UT
North Las Vegas Intertie	0-800	SW
South Las Vegas Intertie	3800	SW
Regional Transmission Path to CA	Variable	SW
Regional Transmission Path to AZ	Variable	SW

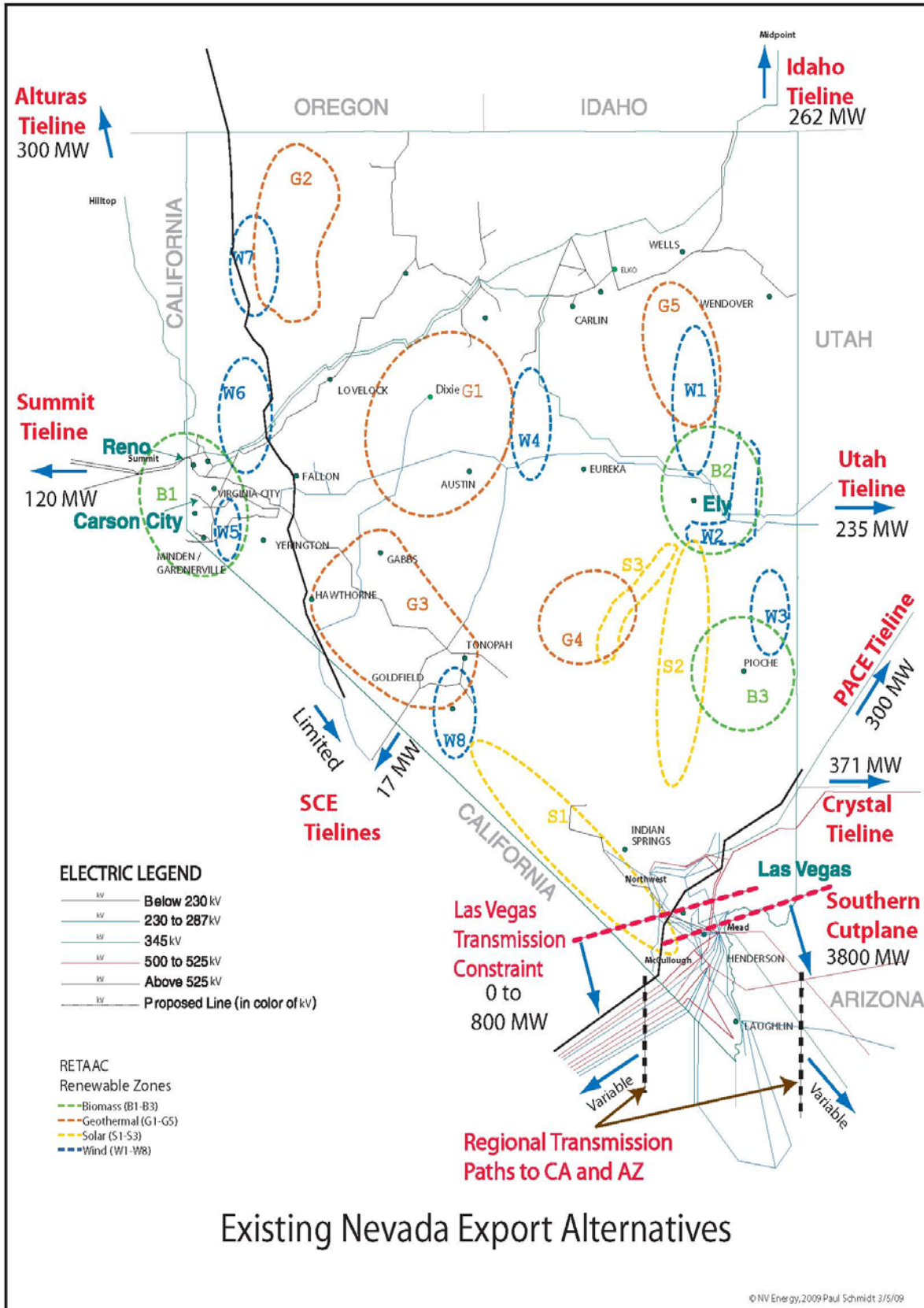


FIGURE 5

General Information Regarding Nevada Interties: The export capability limits listed in Table 17 (page 58) are non-simultaneous export values and it should not be assumed that these export amounts are available at all times. The NV Energy OASIS site or other OASIS sites on adjacent electric systems should be checked to determine the transmission capacity that is available on these interties.

North Las Vegas and South Las Vegas Interties: The path rating of the 500 kV North Las Vegas Intertie is approximately 3,000 megawatts. However, most of the capacity across this path is unavailable as it is being used by NV Energy retail customers or by other NV Energy transmission customers. The North Las Vegas Intertie is identified as the “Las Vegas Transmission Constraint” on the Existing Nevada Export Alternatives map (Figure 5 page 59). The export capability amount listed in Table 17 (page 58) for this intertie is the amount of capacity currently expected to be available for export or other purposes.

Regional Transmission Paths to California and Arizona: The export value for the Regional Transmission Paths to California and Arizona are listed as “Variable” in Table 17 (page 58). However, the path ratings for these paths are very large and the paths are expected to have ample capacity to allow exports to California and Arizona. The regional transmission projects on the Existing Nevada Export Alternatives map (Figure 5 page 59) that are routed through southern Nevada are intending to tie into substations located south of Las Vegas. A tie in south of Las Vegas provides access to the Southwest Market (i.e., California, Arizona and Nevada).

Assessment of Demand for Renewable Energy from Adjacent States

California

California’s current Renewable Portfolio Standard is 20 % by 2010. However, California is considering a 33% Renewable Portfolio Standard by 2020 and is investigating the development of numerous in-state and out of state renewable energy zones, including Renewable Energy Zones located in Nevada, to meet existing or proposed Renewable Portfolio Standard requirements. The “Out of State” Case in California’s 33% implementation analysis assumes a potential of 34 terawatts of energy routed to California from or through Nevada by 2020.⁶ This is the equivalent to approximately 12,900 megawatts of capacity from wind or Concentrated Solar Power resources assuming a 30 % capacity factor. It is clear that California has a need for and is investigating development of Nevada renewable energy resources as several transmission projects have been proposed by California investor owned utilities that would allow access to renewable energy resources in Nevada.

Arizona

Arizona’s Renewable Portfolio Standard requires investor owned utilities to secure 15% of their projected retail energy sales from renewable resources by 2025 of which 30% must come from distributed generation. Salt River Project has voluntarily set goals to comply with the Renewable Portfolio Standard requirements that are consistent with those of the investor owned utilities. Given these requirements, the potential for imports of energy from out of state renewable resources is estimated to be about 4.9 terawatt hours⁷. This equates to about 1,900 MW of capacity from wind or

⁶ Aspen/E3 December Presentation to CPUC regarding net renewable open position based on 33% implementation;

⁷ Estimates developed by applying AZ RPS requirements to 2020 retail sales projections for SRP, APS, TEP. Estimate does not include offset due to existing renewable resources.

Concentrated Solar Power resources assuming a 30% capacity factor. Arizona Public Service's resource planners have expressed preference for Concentrated Solar Power resources over remotely located wind resources⁸ and, Concentrated Solar Power potential is high in Arizona. Imports from Nevada to Arizona are not likely to reach levels listed above given Arizona's Renewable Portfolio Standard requirements and a state preference for Concentrated Solar Power. However, Arizona utilities have secured renewable energy from sources that are located outside of the state.

Idaho

Idaho does not currently have a renewable portfolio standard. Four-fifths of Idaho's energy is produced by hydroelectric facilities. Further, Idaho is known to have significant wind, geothermal, and solar renewable resource potential and is likely to be a renewable energy exporter. Demand by Idaho for renewable energy generated in Nevada is likely to be very limited.

Utah

In March 2008, the Utah governor signed SB 202, which provides that 20 percent of an electrical corporation's or municipal electric utility's adjusted retail electric sales beginning in the year 2025 come from qualifying renewable resources, if cost effective. For determining renewable energy requirements, retail electric sales are adjusted to exclude zero-carbon sources of energy such as nuclear resources and clean coal. Cost-effectiveness is determined by the municipality's legislative body. The Utah law is considered a "goal" rather than a mandate as there are no penalty provisions. In addition the limits on annual renewable energy increases are small. There is existing transmission capacity in Nevada that can be used to deliver energy from renewable resources in Nevada to Utah (Harry Allen Red Butte 345 kV, Gonder –IPP 230 kV and Gonder to Sigurd 230 kV). Utah demand for renewable energy generated in Nevada is uncertain and likely small in the near term.

Oregon

Oregon's Renewable Portfolio Standard requires utilities to supply 25% of retail energy sales by 2025. Of this amount, 5% must be secured by 2011, 15% by 2015, 20% by 2020 and 25% by 2025. Oregon utilities can acquire "bundled" or "unbundled" Renewable Energy Credits from out-of-state sources. Unbundled Renewable Energy Credits can be secured from anywhere in the Western Electricity Coordinating Council footprint. Bundled Renewable Energy Credits must come from resources located in Western Electricity Coordinating Council regions within the US borders. There is existing transmission capacity in Nevada that can be used to deliver energy from renewable resources in Nevada to Oregon (Alturas 345 kV to Malin). Potential demand from Oregon for bundled and unbundled Renewable Energy Credits and a means to deliver bundled Renewable Energy Credits.

Demand from Other States in the Western Interconnection

Demand for Nevada renewable resources from other states in the Western Interconnection that are not listed above (i.e., Washington, Montana, Wyoming, Colorado and New Mexico) is expected to be very limited. These states either have abundant renewable resource potential or are geographically located in areas that would limit access by Nevada renewable developers. In addition, all states in the West

⁸ Presentation by Paul Smith, APS at TEPPC Resource Planning Seminar, Phoenix Arizona, February 2, 3, 2009.

appear to be interested in developing in-state renewable resources to improve local economic conditions.

Obstacles and Threats for Development of Transmission Export Options

Transmission constraints in Northern Nevada: Nevada's primary market for sustaining a renewable export industry is California. Unfortunately, very little transmission capacity exists to move energy from renewable resources located in high density renewable energy zones in Nevada to California. Deliveries from Northern Nevada are constrained by limited export capacity available on Northern Nevada/Northern California interties.

Transmission constraints in Southern Nevada: The transmission situation in southern Nevada is more complicated. First, NV Energy transmission systems are not directly interconnected. Consequently, renewable resources that are connected to the northern transmission system cannot be delivered to southern Nevada. And, even if such an interconnection did exist, constraints in Southern Nevada, namely the Las Vegas Constraint identified on the map in Figure 4 (page 55), would limit deliveries of renewable energy to a marketable location (the substations south of Las Vegas) on the Western Interconnection.

Proposed projects that would interconnect NV Energy's electric system, namely, the NV Energy ON Line project and LS Power's Great Basin Transmission Project, only solve part of the export problem. A transmission project that allows access across the Las Vegas Constraint would still be required to provide meaningful access to out of state energy markets in the Southwest.

LS Power has recently increased the scope of its project to include a segment of transmission that would allow access across this constraint. Without such access, the Great Basin Transmission Project would have stranded capacity. It should be noted that in NV Energy's recently filed ON Line Amendment, the ON Line project is described as having an initial capacity limit of 600 megawatts but is scalable to a capacity level of 2,000 megawatts. After accounting for NV Energy's retail customer transmission capacity requirements of this line and existing export limits on the Las Vegas Constraint, the initial capacity of ON Line does not significantly increase export opportunities through the Las Vegas Constraint.

Renewable resources located south of Las Vegas do not need to pass through the Las Vegas Constraint but, they will require transmission to a substation that will allow access to the Southwest energy market. The SCE 2 x 230 KV project from Ivanpah to El Dorado Substation is an example of such a transmission project.

Development of regional transmission projects will limit Nevada's access to Southwest markets: Most of the major regional transmission projects that are considering routes through, or interconnections in, Nevada assume a south of Las Vegas interconnection point that allows access to the Southwest energy market. It is apparent that regional project developers are assuming that they will be able to use existing transmission capacity on lines that are connected to major southern Nevada substations to deliver power to Southwest energy markets. While there are few details available regarding how they intend to get their projects routed through the severely environmentally constrained Las Vegas area, it is clear that interconnection of these proposed projects will limit Nevada renewable resource developer's

access to Southwest energy markets by providing competition for existing transmission capacity from southern Nevada to other Southwest energy markets.

California timeframe for meeting its Renewable Energy Portfolio requirements: As discussed above, California is the most likely market for Nevada's renewable export industry. In order to comply with current and potential Renewable Portfolio Standard requirements, California is actively assessing development of renewable energy zones in California and throughout the West. California's Renewable Energy Zone selection process will likely be a competitive process and will be influenced by such factors as cost and time requirements to develop a Renewable Energy Zone. California's local Renewable Energy Zone development process is expected to take approximately 7 to 10 years. To the extent that development of Renewable Energy Zones in Nevada can beat these time frames, the Nevada renewable export industry will improve its chances for supply renewable energy to California.

Commonly Known Obstacles

- Interstate agreements for developing regional transmission projects issues;
- Environmental permitting & siting issues;
- Transmission financing issues;
- Cost allocation issues; and
- State regulatory issues;

Opportunities

California's current and future demand for renewable resources: Nevada renewable resource developers will be competing against resources from Renewable Energy Zones in California and in other states for a share of the renewable energy needed to comply with California's Renewable Portfolio Standard requirements. California's efforts to meet existing and proposed Renewable Portfolio Standard requirements will reward out-of-state developers that can timely and cost effectively develop resources to help meet the state's milestones. California is currently behind on meeting its statutory required targets and will be hard pressed to meet the new requirements which are likely to be implemented.

Regional transmission projects: As seen in the Table 16 (page 54) there are a number of proposed regional transmission projects (TransCanada-Zephyr, Chinook) that pass through Nevada but, as currently proposed, do little to help develop Nevada's renewable export industry. These projects are being developed to deliver energy from renewable resources located in Wyoming and Montana to the Southwest energy market – California is the primary target. The interconnection point in Nevada for these projects is south of the Las Vegas. It provides no access for in-state renewable developers and will likely reduce the availability of transmission capacity on existing lines from southern Nevada to the Southwest energy markets. The Nevada renewable resource development industry may be able to influence regional project developers to consider adding interconnections at points on electric systems located in Northern Nevada. This will allow another means for northern Nevada resource developers to access the Southwest energy markets.

American Recovery and Reinvestment Act of 2009: The American Recovery and Reinvestment Act and other existing Acts have provisions that promote development of renewable resources and transmission

projects to access these resources. These provisions could be of assistance in developing a renewable energy export industry in Nevada and should be investigated and used where possible.

Federal transmission bills and other energy bills: Senate Majority Leader Harry Reid introduced the Clean Renewable Energy and Economic Development Act that would give the federal government authority to grant permits for new electric transmission lines. The bill provides a regulatory framework for the development of a national network of high-voltage power lines that would transmit electricity from remotely located wind, geothermal and solar farms to energy-hungry urban areas.⁹ Other bills, such as the bill proposed by Senator Bingaman would require a national RPS standard.

The Acting Federal Energy Regulatory Commission Chairman: Jon Wellinghoff, a former Nevada Consumer Advocate and renewable and energy efficiency proponent, is currently the acting Federal Energy Regulatory Commission Chairman. Mr. Wellinghoff is aware of Nevada's renewable resource situation and transmission limitations.

Development of renewable resources south of Las Vegas: Renewable resources that are developed in locations that have or can get direct access to the substations located south of Las Vegas currently have greater export opportunities than renewable resources located elsewhere in the state. The reason for this is that there is available transmission capacity on existing transmission lines from Nevada to Southwest energy markets. As regional projects interconnect in southern Nevada, this opportunity will likely be diminished.

Nevada's Location: Nevada is located in the path between major renewable energy producing zones and California, the state with the greatest need for renewable energy.

⁹ Andy Stone, Forbes.com, Source: <http://www.forbes.com/2009/03/09/energy-harry-reid-business-energy-superhighway.html>

Chapter V Feasibility Criteria

The advent of the state's renewable portfolio legislative mandate poses new challenges to renewable developers, regulatory agencies and to the state's utilities. In particular the electricity grid was developed over time to serve the large sparsely populated surface area of Nevada with two concentrated populated load centers (Clark County and Washoe County) with a number of mineral and mining related areas in between.

With wind and geothermal resource areas remotely located in Northern Nevada and the best solar resources similarly remotely located in Southern Nevada, the challenges to providing access to the power for these resources are: (i) constructing feeder transmission lines to allow the renewable energy zones to reach the existing regional grids in the northern and southern parts of the state; and (ii) constructing the north south transmission lines to bring wind and geothermal energy to Southern Nevada's load centers and solar energy to Northern Nevada.

In the face of these challenges, the Feasibility Criteria Study Group recognizes that Nevada's load serving utilities, consisting of the state's municipal utilities as well as the investor owned utility, are performing a credible service in providing economical and reliable electricity to the ratepayers in the State of Nevada. Going forward, the Study Group proposes the following:

1. The state's load serving entities have constructed many miles of transmission lines and millions of dollars worth of facilities to serve their electricity customer base. The existing renewable projects in the state have made use of these facilities. It is therefore obvious that renewable energy access to the Nevada transmission grid is also facilitated by providing the state with a robust and reliable statewide transmission system that serves all load customers from all available and potential generation sources. This is one of the surest ways to promote access to the grid by renewable energy resources. The continued improvement of the state wide grid should be encouraged. Measures such as the "ON Line" and the "Western Corridor Line" currently proposed by NV Energy are to be encouraged.
2. Nevada's load serving utilities and entities, which have the expertise, the understanding of the Nevada local and regional issues as well as the experience to plan, design, site, route, permit, construct and integrate these lines and facilities into the existing grid, are the obvious choice to construct the expanded renewable transmission grid. However other entities with comparable levels of expertise should be encouraged to participate.
3. To avoid the undue delays in siting and permitting new renewable transmission the state [or Governor's office] should create a task oriented functional entity, which will serve as a "one-stop-shop" to assist the utilities in working with local, state and federal agencies in overcoming the permitting and siting constraints and barriers so as to expedite the construction of the required new transmission lines and facilities.

4. The tax exempt bond financing mechanism under consideration by the Governor's office should be encouraged to develop a financing program which can substantially reduce the cost of constructing new transmission lines and facilities and thus enhance their economic feasibility. Other mechanisms include access to American Recovery and Reinvestment Act 2009 funding, should be encouraged for financing new transmission construction.
5. The Public Utilities Commission of Nevada, as the primary utility regulatory agency in Nevada, should employ, to the extent it is legally mandated, regulatory flexibility to:
 - Improve renewable energy access by enabling new transmission to be developed both for in state use and for export to adjacent states (with export activities making appropriate contributions to the recovery of the cost of constructing these transmission lines and facilities)
 - Consider the impacts of the local and statewide economic development as an element in the planning and approval of new transmission
 - Allowing for flexibility in financing of new transmission; and
 - Considering the requirements for meeting Nevada's RPS in evaluating the need for proposed new transmission construction.
6. New legislation should be encouraged, if necessary, to provide the standards for transmission for renewable energy to be considered as part of the resource planning process, environmental review process, or rate recovery process, to change the ground rules that the Public Utilities Commission of Nevada must follow to employ regulatory flexibility from what the legislature mandates is limited.

Chapter VI Committee Creation, Members

Governor's Executive Order



EXECUTIVE ORDER BY THE GOVERNOR

ESTABLISHING THE NEVADA RENEWABLE ENERGY TRANSMISSION ACCESS ADVISORY COMMITTEE (PHASE II)

WHEREAS, Nevada currently imports more than half of its electricity; and

WHEREAS, Nevada is blessed with an abundance of renewable energy resources and development of our renewable energy resources will help reverse Nevada's dependence on imported electricity; and

WHEREAS, renewable energy has the potential to provide economic development opportunities for Nevada's rural communities, diversify the state's economy, create high-paying jobs and create many other public benefits for the citizens of Nevada; and

WHEREAS, encouraging the development of renewable energy industries and renewable energy policies will help reduce cost of energy and also help reduce greenhouse gas emissions; and

WHEREAS, Nevada's renewable portfolio standard (RPS) requires that by the year 2015, twenty percent of the total electricity sold in this State by a provider of electric service (as defined in NRS 704.7808), must come from renewable energy systems and energy efficiency measures. Renewable energy development has accelerated with the implementation of the RPS; and

WHEREAS, renewable energy is in many instances located in areas without developed transmission infrastructure and renewable energy development requires reliable transmission access; and

WHEREAS, I established the Nevada Renewable Energy Transmission Access Advisory Committee (RETAAC) by an executive order on May 9, 2007; and

WHEREAS, the purpose of the RETAAC was to: (1) Identify locations where renewable energy can be commercially developed, ranking them based on size and viability and comparing them to Nevada's energy needs and demand; (2) Assess existing and planned transmission access to these locations; and (3) Make recommendations for additional transmission lines; and

WHEREAS, the RETAAC finalized their report on December 31, 2007 and presented their recommendations to the Governor on January 24, 2008; and

WHEREAS, the RETAAC examined geothermal, solar, wind and biomass potential using the best available databases and models, compared available transmission access to these renewable energy zones and overlaid areas of constraint on the resulting three maps; and

WHEREAS, the RETAAC made the following three recommendations: (1) The Governor's Office should support the construction of thirteen transmission lines and collector systems to enable access for renewable energy development in each of the identified Renewable Energy Zones; (2) The Governor's Office should support the construction of a transmission line to connect the state's northern and southern electric grids of sufficient capacity to provide Nevada Power with their non solar renewable energy requirements from the abundant geothermal and wind resources in northern Nevada and provide Sierra Pacific Power access to the abundant solar resources in southern Nevada; and (3) Phase II of the RETAAC should be initiated to define the environmental and physical feasibility issues, costs and potential financing mechanisms associated with the recommended transmission routes; and

WHEREAS, Article 5, Section 1 of the Nevada Constitution provides that "The supreme executive power of this State, shall be vested in a Chief Magistrate who shall be Governor of the State of Nevada."

NOW, THEREFORE, I, Jim Gibbons, Governor of the State of Nevada, by virtue of the power and authority vested in me by the Constitution and laws of the State of Nevada do hereby order and create the Nevada Renewable Energy Transmission Access Advisory Committee Phase II (RETAAC II). The RETAAC II shall: determine the power potential capacity for each renewable energy zone that is available for commercial development; investigate environmental, land use, and permitting constraints; identify routes that can accommodate immediate construction of transmission lines while avoiding constraint areas; determine the cost and revenue structure of transmission lines based on supply curves; identify and rank the lines that are feasible to build; address the possible financing mechanisms to build these transmission lines and collector systems; and provide related policy recommendations. The RETAAC II shall follow the open meeting law. The RETAAC II shall consist of an appropriate number of members as determined by the Governor and who serve at the pleasure of the Governor. The Committee shall submit a final report and recommendation to the Governor by July 31, 2009.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Nevada to be affixed at the State Capitol in Carson City this 12th day of June, in the year two thousand eight.





By the Governor: Governor of the State of Nevada



Secretary of State of Nevada

Deputy

Committee Members

Chairman

Daniel Schochet, Vice President, Ram Power, Inc.

Vice-Chairman

Mario Villar, Executive Transmission, NV Energy

Members

George Caan, Executive Director Colorado River Commission of Nevada	Dianne Cornwall, Director Nevada Department of Business and Industry
Alan Coyner, Administrator Nevada Division of Minerals	Leo Drozdoff, Administrator Nevada Division of Environmental Protection
Thomas Fair, Renewable Energy Executive NV Energy	Dr. Hatice Gecol, Governor's Energy & Science Advisor and Director Office of the Governor, Nevada State Office of Energy
Dr. Jason Geddes, Environmental Services Manager City of Reno	Mark Harris, Resource Planning Engineer Public Utilities Commission of Nevada
Thomas Husted, CEO - Valley Electric Association Representing Nevada's rural electric utilities	Joseph Johnson, Legislative Co-Chair Toiyabe Chapter of Sierra Club
Scott Krantz, Director Energy Management Southern Nevada Water Authority	Lt. Gov. Brian Krolicki, Chairman Commission on Economic Development
Amy Lueders, Associate State Director BLM Nevada	Kenneth Mayer, Director Nevada Division of Wild Life
Edward Monnig, Forest Supervisor Humboldt-Toiyabe National Forest	Christy Morris, Vice President Land and Permitting Ram Power, Inc.
Christopher G. Nielsen, General Counsel Office of the Governor	Dr. Yasuji Otsuka, Senior Economist Public Utilities Commission of Nevada
Rebecca Wagner Commissioner, Public Utilities Commission of Nevada	

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Appendix I Agency Specific Avoidance and Mitigation Recommendations

Nevada Division of Wildlife

Sage Grouse

These measures are based on a paper entitled “Guidelines to manage sage grouse populations and their habitats” by John Connelly et al (2000). NDOW recommends these guidelines be interpreted on a project specific basis as not all may apply.

Avoid building power lines and other tall structures that provide perch sites for raptors within 3km of recognized habitats. If these structures must be built or presently exist, the lines should be buried or poles modified to prevent use as raptor perch sites.

For non-migratory populations (NDOW will need to provide information regarding the migratory nature of populations, but it should be assumed that the populations are non-migratory unless otherwise advised) protect suitable habitats within 5km from all occupied leks from disturbance (including overland travel).

For migratory populations, breeding habitats within 18km of leks should be protected from disturbance (including overland travel)

In areas of large-scale habitat loss (such as in Nevada) all remaining habitat should be protected from loss or degradation. This should be interpreted to mean that loss should be replaced or offset and degraded habitat should be restored.

Suppress wildfires in all sage grouse habitats. Land-managing agencies should be providing these habitats with prioritized treatment for suppression. Projects working within sage grouse habitats should have a fire prevention and suppression plan in order to be prepared to minimize/prevent fire impacts to sage grouse habitat.

Energy-related facilities should be located greater than 3.2km from active leks. Human activities (construction, operation, or maintenance) within view of 0.5km from leks should be minimized during the early morning and late evening hours when birds are expected to be present.

Mule Deer

“Crucial Mule Deer Winter Range” should be considered high priority avoidance areas with general winter range still a high priority (but not as high as “crucial”) and avoided

Loss of Mule Deer habitat should be replaced in kind with on-site or offsite compensation

Construction activities should not occur during Mule Deer migration in areas identified as Mule Deer migration corridors

Construction timing restrictions may be applied to areas in close proximity to fawning areas and other seasonally significant life-cycle use areas

Pronghorn Antelope

Construction timing restrictions may be applied to areas in close proximity to pronghorn kidding areas and other seasonally significant life-cycle areas

Loss of pronghorn habitat should be replaced in kind with on-site or offsite compensation

Bighorn Sheep

Construction timing restrictions may be applied to areas in close proximity to lambing and other seasonally significant of life cycle areas

Loss of Bighorn Sheep habitat should be replaced in kind with on-site or offsite compensation

Migratory Birds

Migratory birds (which include all bird species in Nevada with the exception of Pigeons or Rock Dove, House Sparrow and European Starlings) are protected by the Migratory Bird Treaty Act as enforced by the U.S. Fish and Wildlife Service. Additional detail can be found in the U.S. Fish and Wildlife Service, below.

If nesting habitat is anticipated for disturbance or removal during the nesting season, a preconstruction nest survey may be required within 2 weeks of disturbance. Occupied nests will not be disturbed and will be protected with a buffer zone.

Guy-less construction is encouraged. If guy wires are used, they should be marked to reduce bird and other wildlife collisions.

Transmission lines crossing wetlands, open water or rivers should be marked to reduce the threat of collision by waterfowl, shorebirds and other flocking bird species.

Raptor Nests

Raptors, as migratory birds, are protected by the Migratory Bird Treaty Act. Eagles are also protected by the Bald and Golden Eagle Protection Act. Both laws prohibit "taking".

A preconstruction raptor nesting survey should be conducted in a 1-mile radius from anticipated project activity areas. A buffer zone will be identified to protect active nests. Nests should not be disturbed. A monitor may be required to ensure that activities do not disturb the nesting birds.

Fisheries

There are a number of federally protected fish species in Nevada including Lahontan Cutthroat Trout, Cui-ui Sucker, Bull Trout and others. It is recommended that a pre-application contact is made with the Nevada Department of Wildlife and the U.S. Fish and Wildlife Service to obtain information regarding the presence of fish species that will be afforded protection in waterways within the proposed project.

Small Mammals and Reptiles

Both long-term impacts from habitat loss and fragmentation and short-term impacts from construction activities are anticipated. Desert Tortoise, a federally and state protected species falls within this group. A Habitat Conservation Plan provides specific project related requirements including a mitigation fee.

Field surveys will need to be conducted in known habitats of listed or sensitive species such as Desert Tortoise, Banded Gila Monster, and Pygmy Rabbit among others.

Critical habitat may need to be avoided

Construction BMPs such as vehicle speeds, staying on existing access roads and minimization of disturbance may be required.

Revegetation of temporary use areas may be required.

Wildlife Management Areas

A majority of the Wildlife Management Areas were obtained under the direction that the land would be used primarily for the purpose of providing habitat to wildlife. Power lines can potentially pose both an electrocution and collision threat to waterfowl and birds in general. In addition, these areas provide some of the small amount of open water for waterfowl and have been designated as "Important Bird Areas". In order to maintain the property for these primary uses, restrictions on their use for power lines will need to be observed. The Department will also have concerns regarding the placement of above-ground power lines in the immediate areas surrounding the Wildlife Management Areas that are in place to support waterfowl and flocking birds.

Project component siting may (under unusual circumstances) be allowed within Wildlife Management Areas through an easement from Nevada State Lands and permission from the Nevada Department of Wildlife. Pre-application contact is encouraged to avoid a project amendment.

Time of year access may be restricted in the Wildlife Management Areas during hunting seasons.

If the primary focus of the Wildlife Management Area is waterfowl or shorebird management, power lines may need to be strategically located and/or marked to reduce the threat of collisions.

US Fish and Wildlife Service

Invasive Weeds

As with all projects that require surface disturbance, there is a high potential for introduction and spread of non-native, invasive weeds. The spread of invasive species is known to alter fire ecology and increase frequency of wildfire. Changes in plant community composition caused by non-native plants and recurrent fire can negatively affect species such as greater sage grouse (*Centrocercus urophasianus*) and desert tortoise (*Gopherus agassizii*) by altering habitat structure and available forage.

All possible measures should be taken to prevent the introduction or further proliferation of invasive species. All future projects should incorporate stipulations and mitigation measures specific to revegetation, and restoration efforts for impacts to wildlife and plant habitats. For instance, revegetation seed mixes should be comprised of native plant species and non-native species that will *not* naturalize; monitoring programs and contingency plans should be developed that identify appropriate success criteria; and adaptive management programs should be implemented. Most importantly, however, every effort should be taken to prevent initial establishment of invasive species and development should not be allowed in large, contiguous blocks of high quality sagebrush and Mojave Desert habitats. In addition to avoiding ecologically-sensitive lands, the Service recommends that project-specific development maintain sufficient flexibility such that previously disturbed lands or existing corridors are used to the greatest extent possible.

Trust Resources that may be affected by Transmission Facilities:

The Service has responsibility under a number of Federal laws, treaties, executive orders, and memoranda of agreement, for the conservation and management of fish and wildlife resources. Some of these same authorities also require other Federal agencies and their non-Federal representatives to consider, avoid, or minimize adverse impacts to fish and wildlife resources and their habitats. To ensure resources are afforded adequate consideration and protection, Federal agencies are often required to consult with the Service regarding potential impacts their actions may have on fish and wildlife resources. When reviewing proposed actions of other agencies, the Service normally focuses on three broad categories of trust resources: (1) threatened, endangered, and candidate species, (2) migratory birds, and (3) wetlands and riparian areas.

Desert Tortoise

Desert tortoise, a species listed as threatened under the Act, occurs in proximity to line segments 8 and 14. Linear construction projects can negatively affect populations of this species and studies suggest that differences in the extent and severity of the threat are related to the scale of the project, the ability of crews to avoid disturbing burrows, and timing of construction to avoid peak activity periods of tortoises. In addition to the discrete disturbance points formed by towers and lines, maintenance roads and repeated operations can: 1) introduce continuous sources of disturbance; 2) exacerbate predation by ravens on desert tortoises by providing perch and nesting substrates; and 3) provide potential sites for invasion of exotic species. Rights-of-way can cause habitat destruction and alteration where vegetation is minimal, possibly increasing mortality, directly or indirectly.

Direct impacts to the desert tortoise include permanent and temporary losses of habitat due to construction and maintenance activities. It will be necessary to rehabilitate these areas; however, revegetation in arid environments is extremely difficult and there will be a temporal lag (more than 10 years) before these areas may provide suitable habitat. Typical measures to help minimize these impacts include: 1) flag work areas so that unauthorized habitat removal does not occur; 2) minimize the amount of bladed areas needed during installation and construction of the facilities; 3) restore temporary disturbance areas after construction is complete; and 4) close and reclaim construction access roads not needed for maintenance activities to avoid unauthorized access by the public.

In addition, desert tortoises may be killed or injured by vehicles and equipment in the project area. Construction equipment and vehicles and blasting during construction could crush and injure tortoises or collapse burrows if not found during tortoise clearance surveys. Tortoises that wander into the project area could also fall into holes or trenches from which they are unable to escape. The following measures are typically applied to reduce these potential effects to desert tortoises: 1) conduct tortoise clearance surveys within the project area; 2) enforce a 25 miles per hour (mph) speed limit on project access roads; 3) cease project activities that may endanger a tortoise until it is moved out of harm's way by an authorized desert tortoise biologist; 4) provide a tortoise education program to workers; 5) cover construction holes left open overnight; and 6) restrict vehicles and equipment to the work area boundaries and designated areas.

The resulting indirect impacts to the desert tortoise may include the risk of death, injury, or lower reproductive potential through increased predation and degradation and fragmentation of the habitat surrounding the project area. Typical measures intended to minimize these impacts include: 1) implementing a litter-control program; 2) installing perch deterrents on transmission line power poles; and 3) providing a tortoise education program to workers.

The project may degrade habitat in the surrounding landscape by introducing non-native weeds or plants into the project area, which later spread into the surrounding desert, increasing fuel loads for wildfires and competing with native forbs and shrubs. The following measures should help reduce these potential effects to desert tortoise habitat: 1) controlling noxious weeds in the project area, and 2) restoring all temporary disturbance areas.

Plant Species

Various species of rare plants occur in proximity to most proposed line segments. These species are protected under the Act, listed as sensitive by the Nevada Natural Heritage Program (Heritage), or listed as critically endangered by the State of Nevada under Nevada Revised Statutes (NRS; 527.260-.300). Plant species on the state's critically endangered list are afforded considerable protections, as no member of their kind may be removed or destroyed at any time by any means except under special permit issued by the State Forester (NRS 527.270). Many of the species for which the Service is concerned are endemic to Nevada and extremely limited in distribution. Typical measures intended to avoid disturbance of rare plants may include: 1) surveys prior to any ground disturbing activities; and 2) flexibility in site-specific alignment, access roads, and tower placements.

Fish Species

As with rare plants, numerous fish species in Nevada are protected under the Act, listed as sensitive by the Heritage Program, or variously recognized by state and federal agencies. As with the rare plants, many of the fish species are endemic to the state and extremely limited in distribution. Several of the species are associated with specific, unique spring systems. Typical measures intended to avoid disturbance to fish species and aquatic systems may include: 1) implementation of a hazardous materials handling protocol; 2) prevention of soil erosion and general water quality degradation; and 3) flexibility in site-specific alignment, access roads, and tower placements.

Migratory Birds

The Service is charged with conservation responsibilities and management authority for migratory birds under the MBTA and all projects should be evaluated for potential impacts to migratory birds. Migratory birds should be assumed to nest along the entirety of all transmission line segments. Under the MBTA, nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed, as such destruction may be in violation of the MBTA. Typical measures intended to avoid potential impacts to migratory birds during the breeding season include: 1) perform land clearing or other surface disturbance associated with proposed projects outside the avian breeding season; and 2) conduct nesting surveys coupled with avoidance stipulations prior to disturbance.

There is also the potential of avian collision and electrocution hazard from transmission lines. Power line electrocutions are a cause of mortality in raptors and other migratory birds. Electrocutions may cause power outages that inconvenience customers, spark wildland and forest fires, and result in lost revenue. Typical measures intended to avoid and reduce the potential of collisions and electrocutions include: 1) design modifications to power lines and poles found in the Avian Protection Plan (APP) Guidelines (www.aplic.org); and 2) utilize visual flight diverters.

Construction of new structures has been shown to pose a unique threat to certain bird species. Holes, gaps, or hollow spaces in the proposed facilities or structures could cause cavity-nesting migratory birds to enter and become entrapped in these spaces; holes as small as 0.75 inch in diameter could trap birds. Typical measures recommend to limit this form of mortality include: 1) closure of gaps or narrow open hollow spaces in proposed facilities or structures to prevent bird entry; 2) use of solid posts to mark boundaries at construction sites; and 3) placement of rivets, bolts or nuts in any exposed holes near the top of structures to prevent raptors and other migratory birds from getting their feet trapped.

The bald eagle (*Haliaeetus leucocephalus*) may occur in proximity to line segments 3, 4, 5, 7, 8, 9, 10, 12, and 13. On August 8, 2007, the bald eagle was removed from the Federal list of threatened and endangered species (72 FR 37346). Bald eagles along with golden eagles (*Aquila chrysaetos*) will continue to be protected under the BGEPA and the MBTA. Both of these laws prohibit killing, selling or otherwise harming eagles, their nests, or their eggs. The bald eagle remains listed as endangered in the State of Nevada.

The Service has developed the National Bald Eagle Management Guidelines (Guidelines) to advise landowners, land managers, and others when and under what circumstances the protective provisions of the BGEPA may apply to their activities. These documents and more information about the bald eagle are available on the Service's website at <http://www.fws.gov/migratorybirds/baldeagle.htm>. A variety of human activities can potentially interfere with bald eagles, affecting their ability to forage, nest, roost, breed, or raise young. The Guidelines are intended to help people minimize such impacts to bald eagles, particularly where they may constitute "disturbance", which is prohibited by the BGEPA.

Species of Concern

The Nevada Fish and Wildlife Service Office no longer compiles a species of concern list. Most of the species for which they have concern are on the sensitive species list for Nevada maintained by the Heritage Program. Instead of maintaining their own list the Service has partnered with Heritage and rely

on them to provide distribution data and information on the conservation needs for sensitive species to agencies and project proponents. During site specific project analyses, the Service encourages project proponents to contact Heritage at 901 South Stewart Street, Suite 5002, Carson City, Nevada 89701-5245, 775-684-2900 for a list of sensitive species that occur within project areas. In order to avoid future conflicts, the Service recommends considering these sensitive species early in project planning and exploring management alternatives that provide for their long-term conservation. In particular, the Service has concerns regarding the following non-listed, sensitive species:

Pygmy rabbit (*Brachylagus idahoensis*) may occur in proximity to proposed line segments 6, 7, 9, 10, 11, 12, and 13. On January 8, 2008, the Service published a substantial 90-day finding on a petition to list the pygmy rabbit as threatened or endangered under the Act, thus initiating a status review of the species. The outcome of this review will be a determination of whether the pygmy rabbit warrants protection under the Act. The species is considered a sagebrush obligate and occurs in association with several sagebrush habitats in the Great Basin. Draft survey guidelines have been developed for this species and are available upon request from the Nevada Fish and Wildlife Office. They encourage surveys of any proposed project areas for pygmy rabbits prior to any ground disturbing activities and to consider the needs of this species as project planning and implementation proceeds. In Nevada, the Bureau of Land Management (BLM) State Director has directed all field office staff to address the pygmy rabbit in all future land use plan revisions. Accommodating the needs of this species will likely prove feasible as long as flexibility is maintained in site-specific transmission alignments.

The greater sage-grouse, a species listed as sensitive by the Heritage Program and managed by the Nevada Department of Wildlife (NDOW), occurs in proximity to line segments 1, 2, 4, 6, 7, 9, 10, 11, 12, and 13. On February 26, 2008, the Service initiated a status review of the species, which will aid the Service in determining whether or not the species warrants listing as threatened or endangered under the Act. Sage grouse are considered a sagebrush obligate species and the Western States Sage and Columbian Sharp-tailed Grouse Technical Committee, under direction of the Western Association of Fish and Wildlife Agencies, has developed and published guidelines to manage and protect sage grouse and their habitats in the Wildlife Society Bulletin (Connelly *et al.* 2000; <http://ndow.org/wild/sg>). The Service recommends that these guidelines be incorporated into project planning. On a more local level, the Sage Grouse Conservation Plan for Nevada and Portions of Eastern California was completed in June 2004. The Plan is available online at: <http://www.ndow.org/wild/sg/plan/index.shtm>. The Service encourages project proponents to adopt all appropriate management guidance from this Plan as transmission planning in Nevada continues to move forward.

The Service is concerned that power line segments 8 and 14, occurring in southern Nevada, may impact the banded Gila monster (*Heloderma suspectum cinctum*), a species listed as sensitive by the Heritage Program and as a protected species under Nevada State law. Per Nevada Administrative Codes 503.090 and 503.093, no persons shall capture, kill, or possess any part of protected wildlife without the prior written permission from NDOW. The Gila monster resides primarily in the Mojave desert scrub and salt desert scrub ecosystems in southern Nevada, southeastern California, southwestern Utah, and western Arizona. The Gila monster is one of only two venomous lizard species in the world. Gila monsters are difficult to locate as they spend the majority of the year in underground burrows; however, illegal collection, construction of roads, and loss of habitat continue to threaten this sensitive reptile. Given

that the Gila monster may occur within the project area, the Service encourages project proponents to minimize project impacts to any existing populations and suitable habitat for this species.

Desert National Wildlife Refuge

The Desert National Wildlife Refuge (NWR) was established in 1936 for the preservation and management of desert bighorn sheep (*Ovis canadensis nelsoni*) and their habitat. Segment 14 crosses Castle Rock Mountain and skirts the edges of the Sheep and Las Vegas mountains ranges, both important desert bighorn sheep areas that would be significantly affected by the corridor. The Mojave desert scrub habitat throughout Desert NWR provides important habitat for the recovery of the desert tortoise. The desert tortoise habitat on Desert NWR was not included as designated critical habitat because the area was already protected and managed for under existing Service laws, regulations and policies. Right-of-ways for power lines and other utilities require permanent maintenance roads which typically result in illegal use by off-highway vehicle users. Creation of illegal user-defined roads that stem from right-of-way roads also occurs and results in fragmentation and destruction of desert habitat and an increased need for law enforcement. Roads are an avenue for introducing invasive weeds which are a threat to desert habitats. Power lines provide perching structure for ravens which will have an adverse effect on desert tortoises on the Desert NWR. Ravens are known to advantageously utilize power lines to prey on tortoises. The area of the right-of-way would be removed from the public domain and would no longer function as tortoise habitat.

Segment 14 on the western side of the Desert NWR crosses directly adjacent to or very near the current headquarters at Corn Creek Field Station. Feasibility studies have determined that Corn Creek is the best suited location for a new visitor center and administrative facility serving the Desert NWR, and the Service is actively pursuing the design and construction of these facilities. The current alignment of the corridor adjacent to or within visual site of the visitor center will have significant impacts to the quality of visitation for members of the public – potentially hundreds of thousands of locals and Las Vegas tourists every year.

The Service strongly recommends that the proposed segment 14 that crosses the southern end of the Desert NWR be removed from consideration given the above-mentioned biological resources and facilities on Desert NWR that would be significantly affected. The Service recommends that segment 8 in combination with a proposed corridor through Las Vegas Valley identified in the West-wide Energy Corridor Programmatic Environmental Impact Statement (WVEC PEIS; segments 39-231) would avoid additional impacts on Desert NWR.

The National Wildlife Refuge System Administration Act of 1966, as amended (NWRSA; 16 U.S.C. 668dd-668ee) requires that these areas be administered by the Secretary of Interior through the Service. Only the Service is delegated the authority to approve uses on a national wildlife refuge. The NWRSA requires that any use of a national wildlife refuge must be compatible with refuge purposes and the mission of the National Wildlife Refuge System. The NWRSA defines a compatible use as a “...wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge.”

The Service has promulgated regulations (Code of Federal Regulations, Chapter 50 Part 29) and developed policy (Compatibility 603 FW 2, Appropriate Refuge Uses 603 FW) to implement the NWRSA's mandates on administration of refuge uses. Right-of-way regulations for national wildlife refuges define a compatible use as a use "...that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge" (50 CFR 29.21); and "no right-of-way will be approved unless it is determined by the Regional Director to be compatible" (50 CFR 29.21-1). The Compatibility policy states that uses which the Service reasonably may anticipate to reduce the quality or quantity or fragment habitats on a national wildlife refuge will not be compatible (603 FW 2 Section 2.5A). Further, a use cannot be made compatible through compensatory mitigation, and if the proposed use cannot be made compatible with stipulations, the Service cannot allow the use (603 FW 2 Section 2.11 C.).

While the programmatic establishment of energy corridors across national wildlife refuges through the WWEC Programmatic Environmental Impact Statement in and of itself does not trigger the compatibility determination requirement under the NWRSA, any future request for construction and siting of energy transmission facilities and infrastructure on a refuge would trigger reviews of appropriateness and compatibility. Should the proposed activities be determined not appropriate or not compatible, the Service could not proceed with right-of-way permitting to allow the use.

Large Scale Translocation Site

Located near Jean, Nevada and part of line segment 8, is the Large Scale Translocation Site (LSTS) for desert tortoise. The LSTS encompasses about 27,000 acres of land managed for the protection and recovery of desert tortoises by the Bureau of Land Management. For the past ten years this site has been used to translocate desert tortoise that are displaced by development in Clark County, Nevada. In addition, the LSTS is an important site for research and development of tortoise monitoring techniques. Because of the importance of this site for the recovery of the desert tortoise, the Service strongly recommends that any proposed projects avoid the LSTS.

Appendix II Renewable Energy Zone Prioritization Criteria Detail

RENEWABLE ENERGY ZONE PRIORITIZATION CRITERIA																					
Transmission Segments	Zones Contained in Segment	Terminal	kV	(3) Renewable Energy Potential		MW limit of line and system configuration ¹	(3) Cost of Transmission Construction ²						(3) Transmission Environmental Impact		(3) Other System Benefits ³				Wtd Total	Rank	
				Score	Wtd Score		Line Miles	Associated Facilities Line (\$000)	Associated Facilities Terminal (\$000)	Total (\$000)	\$/MW	Score	Wtd Score	Segment Score	Wtd Score	System Reliability		Transmission Utilization			
																Score	Wtd Score	Score			Wtd Score
1	G-2	Hilltop	120	2	6	100	131	\$ 52,400	\$ 30,000	\$ 82,400	\$ 824	1	3	1	3	1	1.5	3	4.5	18	16
2	G-2	Oreana	120	2	6	100	37	\$ 14,800	\$ 12,000	\$ 26,800	\$ 268	2	6	3	9	1	1.5	2	3	25.5	4
3	W-6	Fl Sage	345	2	6	200	34	\$ 28,900	\$ 30,000	\$ 58,900	\$ 295	2	6	1	3	1	1.5	3	4.5	21	11
4	W-6	Tracy	345	2	6	200	20	\$ 17,000	\$ 30,000	\$ 47,000	\$ 235	3	9	1	3	1	1.5	3	4.5	24	7
5	W-5	Blackhawk	120	1	3	100	17	\$ 6,800	\$ 12,000	\$ 18,800	\$ 188	3	9	2	6	1	1.5	3	4.5	24	7
6	G-1	Oreana	345	3	9	150	54	\$ 45,900	\$ 75,000	\$ 120,900	\$ 806	1	3	1	3	2	3	2	3	21	11
7	G-1	Fl Churchill/Blackhawk ⁴	345	3	9	500	103	\$ 87,550	\$ 80,000	\$ 167,550	\$ 335	2	6	2	6	2	3	1	1.5	25.5	4
8A	G-3	Fl Churchill/Blackhawk ⁴	345	3	9	500	98	\$ 83,300	\$ 80,000	\$ 163,300	\$ 327	2	6	1	3	2	3	1	1.5	22.5	10
8A+8B	W-8	Fl Churchill/Blackhawk ⁴	345	1	3	500	160	\$ 136,000	\$ 80,000	\$ 216,000	\$ 432	1	3	1	3	2	3	1	1.5	13.5	20
8A+8B+8C	S-1	Fl Churchill/Blackhawk ⁴	345	3	9	500	234	\$ 198,900	\$ 75,000	\$ 273,900	\$ 548	1	3	1	3	2	3	1	1.5	19.5	15
8C+8D+14	W-8	Harry Allen	230	1	3	200	184	\$ 110,400	\$ 17,500	\$ 127,900	\$ 640	1	3	1	3	3	4.5	3	4.5	18	16
8C+8D+15	W-8	McCullough	230	1	3	200	190	\$ 114,000	\$ 17,500	\$ 131,500	\$ 658	1	3	1	3	1	1.5	2	3	13.5	20
8D+14	S-1	Harry Allen	2x500	3	9	3000	110	\$ 308,000	\$ 50,000	\$ 358,000	\$ 119	3	9	1	3	3	4.5	3	4.5	30	1
8D+15 ⁵	S-1	McCullough	2x500	3	9	2000	116	\$ 324,800	\$ 92,500	\$ 417,300	\$ 209	3	9	1	3	1	1.5	2	3	25.5	4
9A ²	W-2	Robinson	500	3	9	1000	54	\$ 75,600	\$ 42,500	\$ 118,100	\$ 118	3	9	2	6	1	1.5	3	4.5	30	1
9A+9B ²	W-3	Robinson	500	2	6	1000	96	\$ 134,400	\$ 42,500	\$ 176,900	\$ 177	3	9	2	6	1	1.5	3	4.5	27	3
10 ²	S-2	Robinson	500	1	3	1000	128	\$ 179,200	\$ 42,500	\$ 221,700	\$ 222	3	9	2	6	1	1.5	3	4.5	24	7
11 ²	G-4	Robinson	345	1	3	150	97	\$ 82,450	\$ 30,000	\$ 112,450	\$ 750	1	3	2	6	1	1.5	3	4.5	18	16
12	W-1	Robinson	345	1	3	250	61	\$ 51,850	\$ 30,000	\$ 81,850	\$ 327	2	6	2	6	1	1.5	3	4.5	21	11
12	G-5	Robinson	345	1	3	250	61	\$ 51,850	\$ 30,000	\$ 81,850	\$ 327	2	6	2	6	1	1.5	3	4.5	21	11
13	W-4	Frontier	230	1	3	200	17	\$ 10,200	\$ 45,000	\$ 55,200	\$ 276	2	6	2	6	1	1.5	1	1.5	18	16
8A+8B+8C+8D+14 ⁴		West Tie - Harry Allen	345/2x500				344	\$ 506,900	\$ 132,500	\$ 639,400											
8A+8B+8C+8D+15 ^{4,5}		West Tie - McCullough	345/2x500				350	\$ 523,700	\$ 175,000	\$ 698,700											

Number in parenthesis indicates the weight attributed to the criteria, rating is high to low with scoring 3-1
 Line configuration (voltage and terminals) will be re-evaluated prior to construction
 W-7 within an NCA - removed per BLM

- 1= MW limit includes the line from Fl Churchill to Blackhawk that is part of the 7th amendment to the 2006 NPC IRP
- 2= Line configuration may allow optimization if ENTI is in service prior to renewable development
- 3= Assumes ENTI Transmission line completed
- 4= West tie would be developed in stages as actual renewable project development warrants or supports the need for and cost justification of such segments
- 5= Currently limited to 600 MW. Network upgrades of \$50 Million are assumed to provide deliverability of 2000 MW

- Environmental Impact score:
 - 3= Minimal mitigation, avoidance and/or alternatives
 - 2= Considerable avoidance, mitigation or minor alternatives
 - 1= Significant alternatives, avoidance and mitigation
- System Reliability Score
 - 1= Radial Line
 - 2= Part of System Line
 - 3= System Line (Between two existing points)
- Transmission Cost Score
 - 1= Most expensive 1/3
 - 2= Middle 1/3
 - 3= Least Expensive 1/3
- Transmission Utilization Score
 - 1= Far from good Transmission
 - 2= Near good Transmission
 - 3= At good Transmission

- Zone Resource Ratings
 - 1= Resource mapping indicates technical potential in some portions of the zone, and some testing underway. Limited development interest to date.
 - 2= Indication of strong resource potential, and moderate amount of development activity underway.
 - 3= Significant concentration of high quality resources. Extensive leases / right-of-ways acquired by developers. Numerous potential sites under active development

**NV Energy's Statement of Interest (SOI) Submitted in
Response to Western Area Power Administration's Request
for Interest (RFI) Dated March 4, 2009**

General Overview:

Nevada Power Company ("NPC") and Sierra Pacific Power Company ("SPPC"), both d/b/a/ NV Energy (hereinafter both referred to as NV Energy), are submitting this Statement of Interest (SOI) in response to the Western Area Power Administration's (Western) Request for Interest (RFI) dated March 4, 2009.

This SOI is intended to provide the information requested in the RFI (seeking interest from any entity or entities interested in identifying a proposed transmission project, primarily in Western's service area, and/or desiring to participate with Western and possibly others by financing, constructing or owning facilities or acquiring transmission rights or entering into long-term transmission service agreements on that project).

NV Energy submits this SOI for the potential joint development and construction of 500 kV transmission lines and associated facilities to access renewable energy resources in resource rich, but transmission deficient, geographic zones and deliver such renewable resources to loads in Nevada and potentially to California, Arizona or other markets in the Desert Southwest. The proposed facilities would extend north from the Las Vegas area along the western part of the State of Nevada, providing access to significant amounts of renewables along the way, to NV Energy's existing Blackhawk Substation in the northern part of NV Energy's system and, if desired by Western, could ultimately interconnect with a proposed Raven Substation in Northern California. The facilities also could form a loop around the Las Vegas load center to improve transfer capability and provide access to pre-identified renewable zones to California and Arizona markets. The proposal is for a phased approach to development to more closely match the demand for renewables with actual resource development. Please refer to Figure 1 for identification of the project phases described herein.

Phase I would consist of a 500 kV line extending from NV Energy's existing Harry Allen 500 kV substation to its Northwest Substation and from there northward to a new collector substation in the Amargosa Valley to access abundant solar resources in the area.

Phases II and III, though labeled sequentially in the included maps, could be interchangeable or concurrent depending on demand and Western's and NV Energy's wants and needs. Phase II could extend south from a proposed Desert Rock Station to Western's Mead substation in the Eldorado

Valley (or to other available delivery points in the area). Phase III would extend north from the Amargosa Valley to NV Energy's Blackhawk Substation for a strong connection to NV Energy's northern system.

Finally, Phase IV could be an option for extending into the Transmission Agency of Northern California's (TANC)/Western TANC Transmission Project (TTP) if Western so desired.

POTENTIAL PROJECT PHASES and RETAAC RENEWABLE ENERGY ZONES

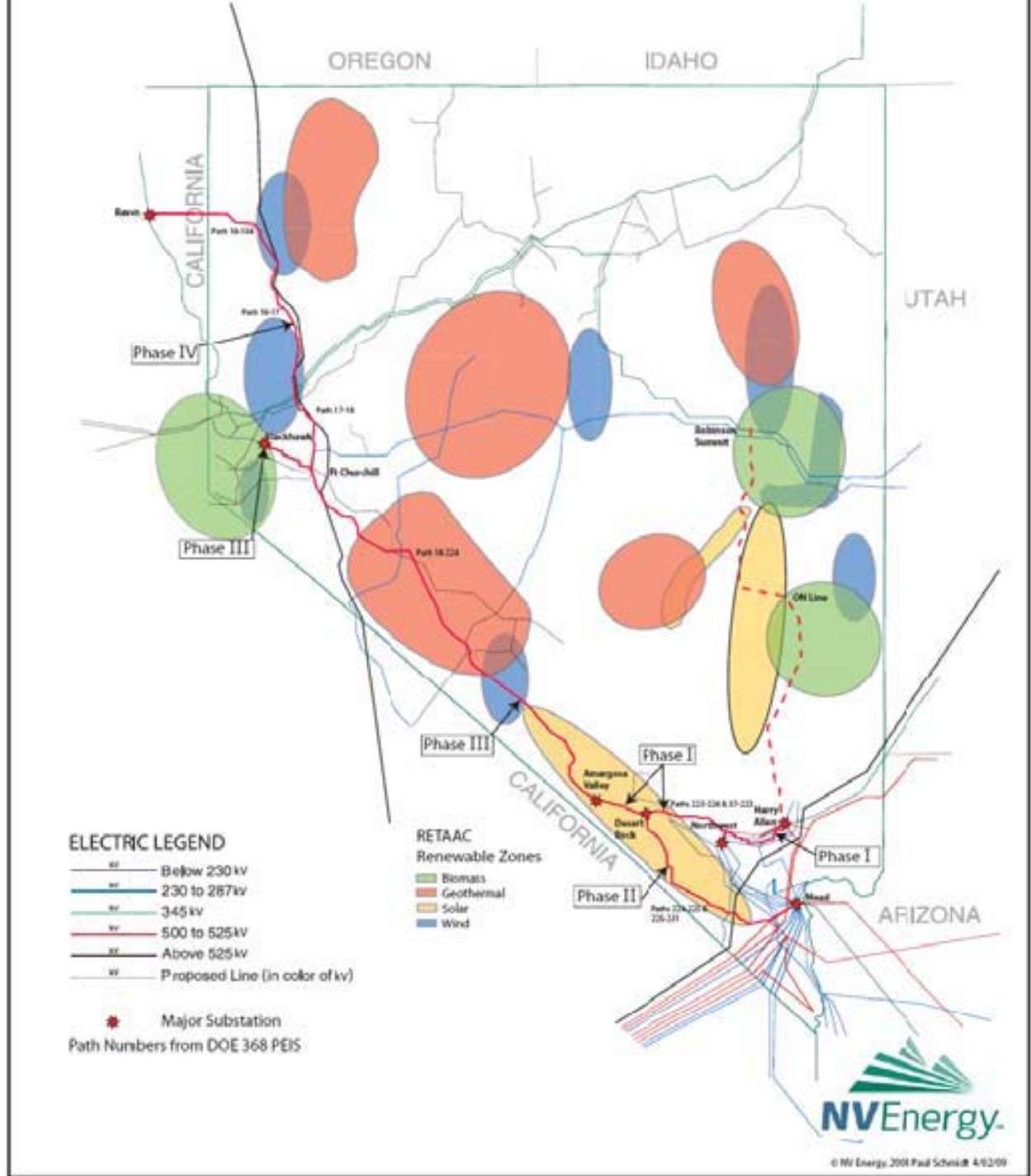


FIGURE 1

Statement of Interest (SOI):

1. Entity: NV Energy

Company Information/Background:

NV Energy, Inc. formerly Sierra Pacific Resources, is an investor-owned holding company that was incorporated under Nevada law on December 12, 1983. The company's stock is traded on the New York Stock Exchange under the symbol "NVE". NVE's mailing address is 6226 West Sahara Avenue, Las Vegas, Nevada 89146.

NVE has five primary, wholly owned subsidiaries: Nevada Power Company d/b/a NV Energy, Sierra Pacific Power Company d/b/a NV Energy, Sierra Pacific Communications, Sierra Pacific Energy Company, and Lands of Sierra. The Utilities (NPC and SPPC) operate three business segments: NPC electric, SPPC electric and SPPC natural gas. Electric service is provided to Las Vegas and surrounding Clark County, and to northern Nevada and the Lake Tahoe area of California. Natural gas service is provided in the Reno-Sparks area of Nevada. The Utilities are the major contributors to NVE's financial position and results of operations.

NPC is a public utility that generates, transmits and distributes electric energy in southern Nevada. At year-end 2008, NPC served approximately 827,000 customers in Las Vegas, North Las Vegas, Henderson, Searchlight, Laughlin and adjoining areas, including Nellis Air Force Base and the Department of Energy's Nevada Test Site in Nye County.

SPPC is a public utility that generates, transmits and distributes electric energy to approximately 366,000 customers. The service territory covers over 50,000 square miles of western, central and Northeastern Nevada, including the cities of Reno, Sparks, Carson City, Elko, and a portion of eastern California, including the Lake Tahoe area.

Transmission Facility Owners in the Vicinity of the Proposed Projects and relationship to NV Energy:

Western, NV Energy, Southern California Edison (SCE), Los Angeles Department of Water and Power (LADWP), Salt River Project (SRP), Arizona Public Service (APS), TANC, Bonneville Power Administration (BPA) & Valley Electric Association (VEA) are transmission owners in the vicinity of this proposed project. NV Energy has existing interconnections with all of these parties except TANC. NV Energy is a joint owner of the Eldorado 500 kV Transmission System with SCE, SRP and LADWP in the area south of Las Vegas. NV Energy also is a joint owner of the Navaho 500 kV Transmission System with LADWP and SRP.

NV Energy's relationship with Renewable Resource developments that may appear in Section 4 below:

Though this proposal is not specifically tied to any particular renewable resource at this time, NV Energy has executed a memorandum of understanding with one developer in one of the renewable zones accessed by the proposed facilities. NV Energy and Solar Millennium, LLC, together with its

joint venture partner MAN Ferrostaal Inc., have entered into a memorandum of understanding for potential development of one or more solar power facilities in southern Nevada. The initial project under consideration is a 250-megawatt (MW) solar trough technology plant at a site located in Nye County that includes thermal storage. Plans call for the project to be completed in 2013-14, depending on permitting, financing and other government approvals.

2. Contact Information:

Name: Brian Whalen Title: Director, Transmission System Planning Mailing Address: P.O. Box 10100
M/S S3B40 Reno, NV 89520-0024
Physical Address: 6100 Neil Road
Reno, NV 89511 Office Number: (775) 834-5875 Fax Number: (775) 834-3047 Email Address:
bwhalen@nvergy.com

Or

Name: Chris Tomchuk Title: Director, Transmission Policy and Contracts Mailing Address: P.O. Box 10100
M/S S3B40 Reno, NV 89520-0024
Physical Address: 6100 Neil Road
Reno, NV 89511 Office Number: (775) 834-5876 Fax Number: (775) 834-3047 Email Address:
ctomchuk@nvergy.com

3. Project Description:

Overview:

As shown in Figure 2 below, the Company is proposing a multifaceted project developable in stages with various ownership and transfer capabilities from the Amargosa Valley, Pahrump Valley, Eldorado Valley, West Central Nevada and Northwest Nevada to the load service areas/markets in the Desert Southwest and California.

The project could be built in phases dependent on several factors: 1) renewable portfolio standards needs of the local utilities, 2) the results of an "Open Season" process offered by Western and/or NV Energy, and 3) generation interconnection requests and transmission service requests made to NV Energy and/or Western.

The envisioned build out of these facilities would allow a transmission path from the Desert Southwest and Southern California to renewable resource rich zones that have been identified through stakeholder processes in Nevada and through the Western Governor's Association's efforts. Depending on Western's desires and needs, these facilities could ultimately tie Western's Mead substation to Western's Sierra Nevada Region and provide access to these resource rich zones and exchanges to/from other markets. The various phases are discussed below and in greater detail in Appendix A.

POTENTIAL PROJECT PHASES and RETAAC RENEWABLE ENERGY ZONES

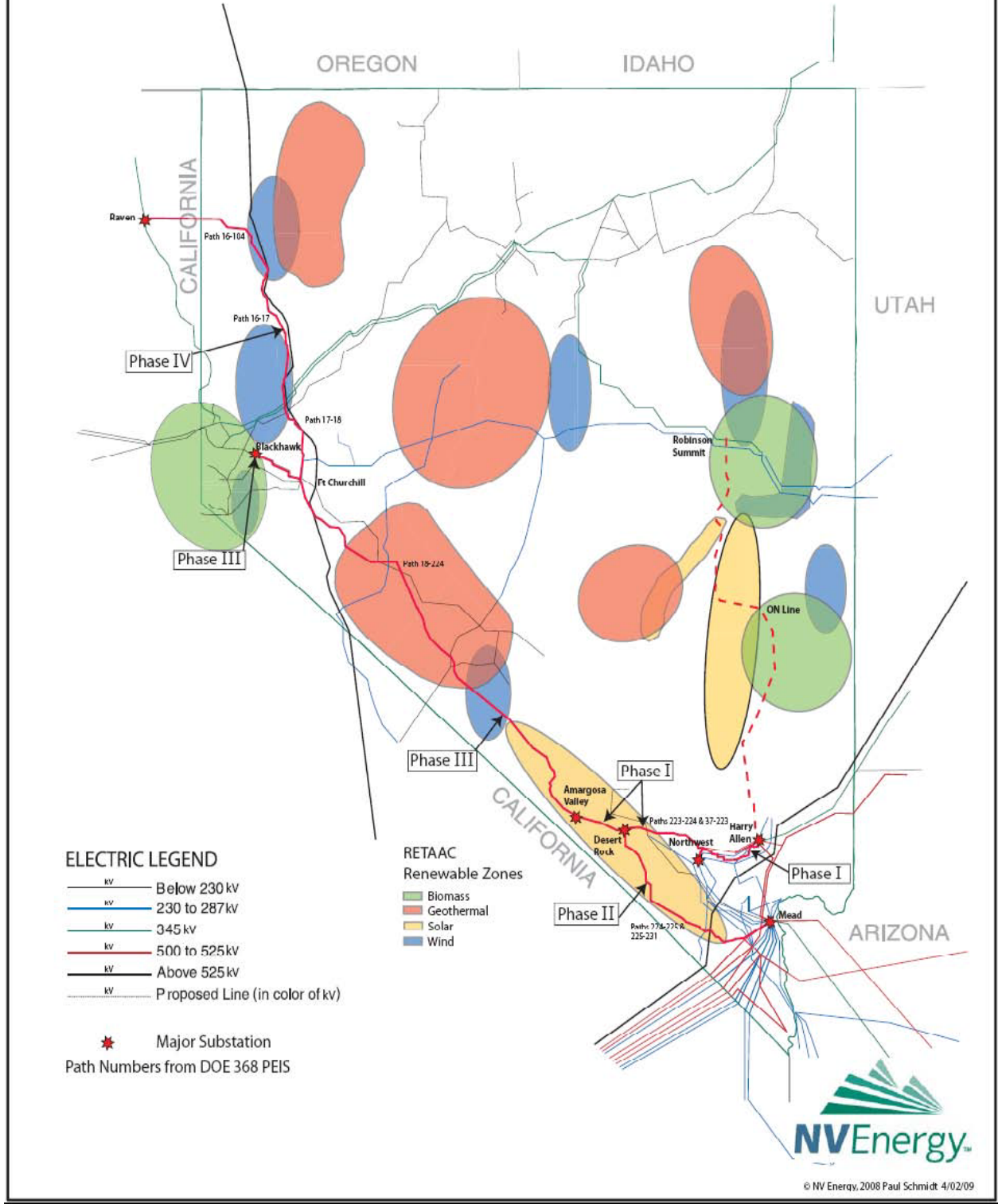


FIGURE 2

Project Details:

Phase I

Northwest Substation to Amargosa Valley Substation – 500 kV Line

Amargosa Valley Substation – 500/230 kV Collector Station

Harry Allen Substation to Northwest Substation – 500 kV Line

Overview:

The Company determined through its internal transmission planning processes that 500 kV facilities were needed to support renewable resource development in Amargosa Valley in the very near term. Since these facilities are within NV Energy's Balancing Area no additional regional study work was required.

Facilities to be developed in Phase I are:

Permit and construct approximately seventy five (75) miles of 500 kV transmission line from the existing Northwest Substation into the Amargosa Valley past a future location for the proposed Desert Rock Station. In the Amargosa Valley construct a 500/230 kV collector station in the heart of the premium solar location in the Desert Southwest. The ultimate configuration of this substation will depend on size and location of interconnecting resources.

Permit and construct approximately thirty (30) miles of 500 kV line between the existing Harry Allen and Northwest Substations and construct associated terminal additions in Harry Allen and Northwest Substations. These facilities are located in northwest and north central Las Vegas, Nevada.

Permit and construct a 230 kV line from Northwest Substation to a new 230 kV South Canyon Substation for retail load service to the Las Vegas Valley and Valley Electric Association.

The estimated cost of this phase is \$235 million (not including South Canyon 230 kV substation costs) construction can be started in 2011, subject to permitting, with completion 24 months later, and the initial capacity will be approximately 800 MW.

Phase II

Desert Rock 500 kV Station

Desert Rock Station to Mead Substation – 500 kV Line

Overview:

Permit and construct Desert Rock Station located in the approximate area of the intersection of State Route 95 and State Route 160, and approximately one hundred and ten (110) miles of 500 kV

transmission line from Desert Rock Station to Western's Mead Substation through the Pahrump Valley.

The ultimate configuration of Desert Rock Station will depend on size and location of interconnecting resources and other considerations but is envisioned to consist of three (3) 500 kV line terminals (Desert Rock to Mead, Desert Rock to Northwest and Desert Rock to Amargosa Valley).

The estimated cost of this phase is \$214 million and construction would be dependent on Western's needs and permitting requirements. The ultimate capacity after the facilities are constructed is estimated to be 2,000 MW.

Phase III

Amargosa Valley Substation to Blackhawk Substation – 500 kV Line

Amargosa Valley Substation -500 kV Terminal

Blackhawk Substation - 500 kV Terminal

Blackhawk Substation – 500/345 kV Station

Overview:

Permit and construct approximately two hundred sixty five (265) mile - 500 kV line between Amargosa Valley Substation and Blackhawk Substation, a 500 kV line terminal in Amargosa Valley Substation, a 500 kV line terminal in Blackhawk Substation, and construct a 500/345 kV station at Blackhawk Substation.

The estimated cost of this phase is \$441 million. Construction is not expected to begin before 2013 and would depend on need, permitting, and results of an open season. The ultimate capacity after the facilities are constructed is estimated to be 2,000 MW.

Phase IV

Blackhawk Substation to Raven Substation – 500 kV Line,

Blackhawk Substation 500 kV Terminal,

Raven Substation 500 kV Terminal, and

Raven 500/345 kV Station.

Overview:

This line could interconnect the northern part of Nevada into Western/TANC's TTP Project in Northern California. If constructed by Western, it would create a tie between Western's southern system at Mead and Western's northern system in the Raven area.

Permit and construct approximately two hundred and five (205) mile - 500 kV line between Blackhawk Substation and Raven Substation, 500 kV line terminals at Blackhawk and Raven Substations, and a 500/345 kV station at Raven Substation.

The estimated cost of this phase is \$357 million. The construction would depend on Western's needs. The ultimate capacity after the facilities are constructed is estimated to be 2,000 MW.

4. Renewable Resource Description:

NV Energy has been involved in Nevada's Renewable Energy Transmission Access Advisory Committee (RETAAC) since its formation by the Governor of Nevada in May 2007. The Committee consisted of representatives from a cross section of stakeholders and issued its Phase I report in December 2007 identifying a number of high potential renewable energy zones in the State and transmission facilities that may be needed for their development. RETAAC currently is working on Phase II of its study, where it is refining the zones, identifying environmental and other constraints and applying economic and other feasibility criteria to the zones and lines. Final recommendations are expected from the Committee in July 2009.

NV Energy has received approval from the Public Utilities Commission of Nevada to conduct initial routing studies for several of the lines identified in the RETAAC work. Please refer to the green dashed lines in the Renewable Zones map (Figure 4) below (though shown as 345 kV, some of the lines can be developed at 500 kV based on need). Those initial studies are expected to be completed this year. This map depicts the renewable energy zones identified in the RETAAC work and shows various Bureau of Land Management (BLM) renewable applications as of the time it was developed (note: these change frequently). Nevertheless, the map is illustrative of the renewable potential and level of interest that has been expressed for sites along the proposed project route(s). For example, approximately 4,500 MW of 500 MW+ class solar thermal applications have been made to the BLM in Amargosa, Pahrump and Eldorado Valleys. Additional information on RETAAC may be found at <http://www.retaac.org/>

NV Energy also is developing a 500 kV line along the eastern part of the State, the One Nevada Transmission Line or ON Line project (shown as the red dashed line in Figure 4 below), which will deliver renewables and allow for other significant benefits to NV Energy's northern and southern systems. However, because of its location, ON Line will not provide transmission access along the western Nevada state border. The facilities identified in this SOI would provide that access.

Renewables Zones

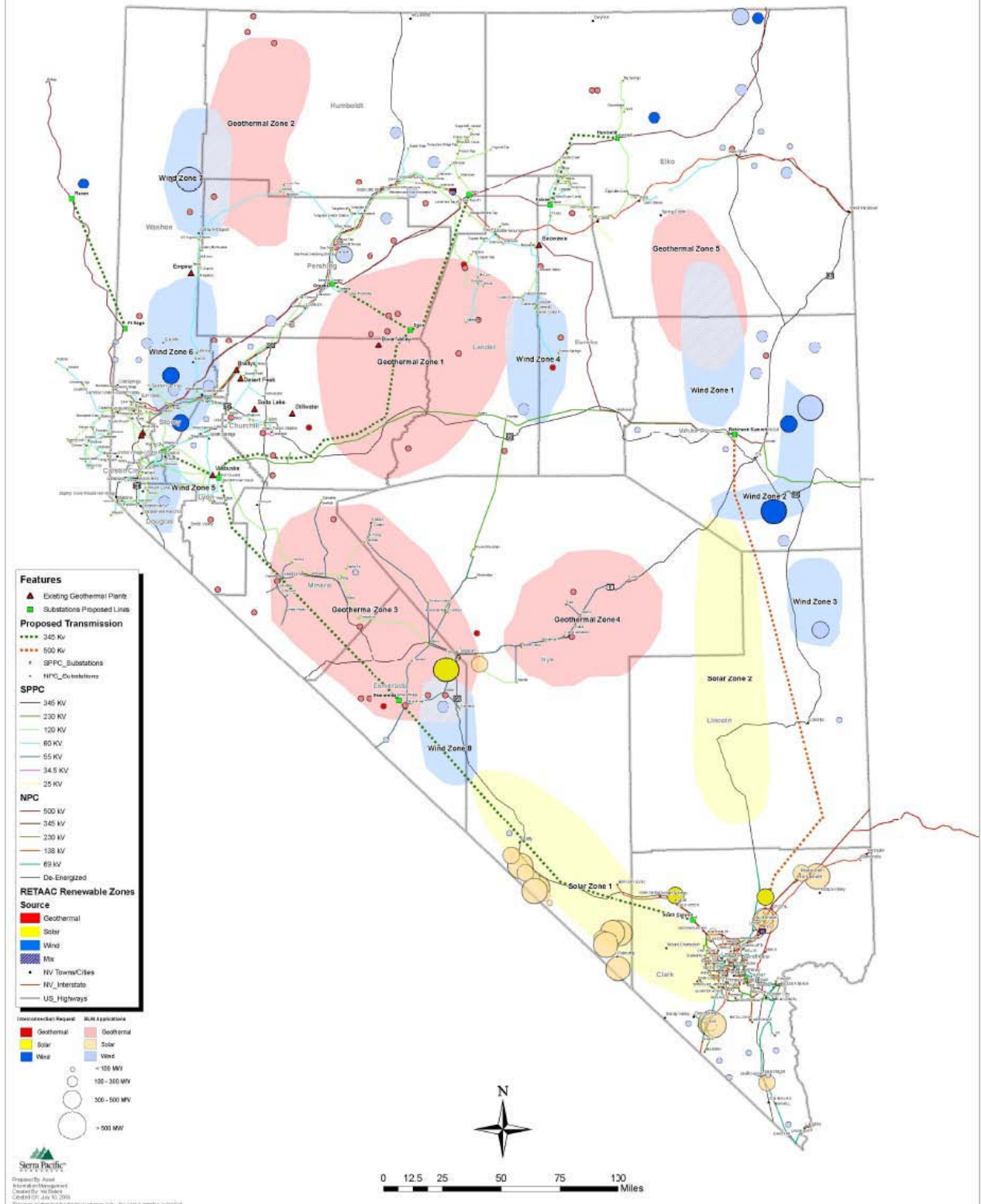


FIGURE 4

Independent from the RETAAC work, the Western Governors' Association ("WGA") also has identified the south west corner of Nevada as the premier developable solar location in the Western US. The following map (Figure 5) which is an excerpt from the WGA's Western Renewable Energy Zones Group work highlights these zones.

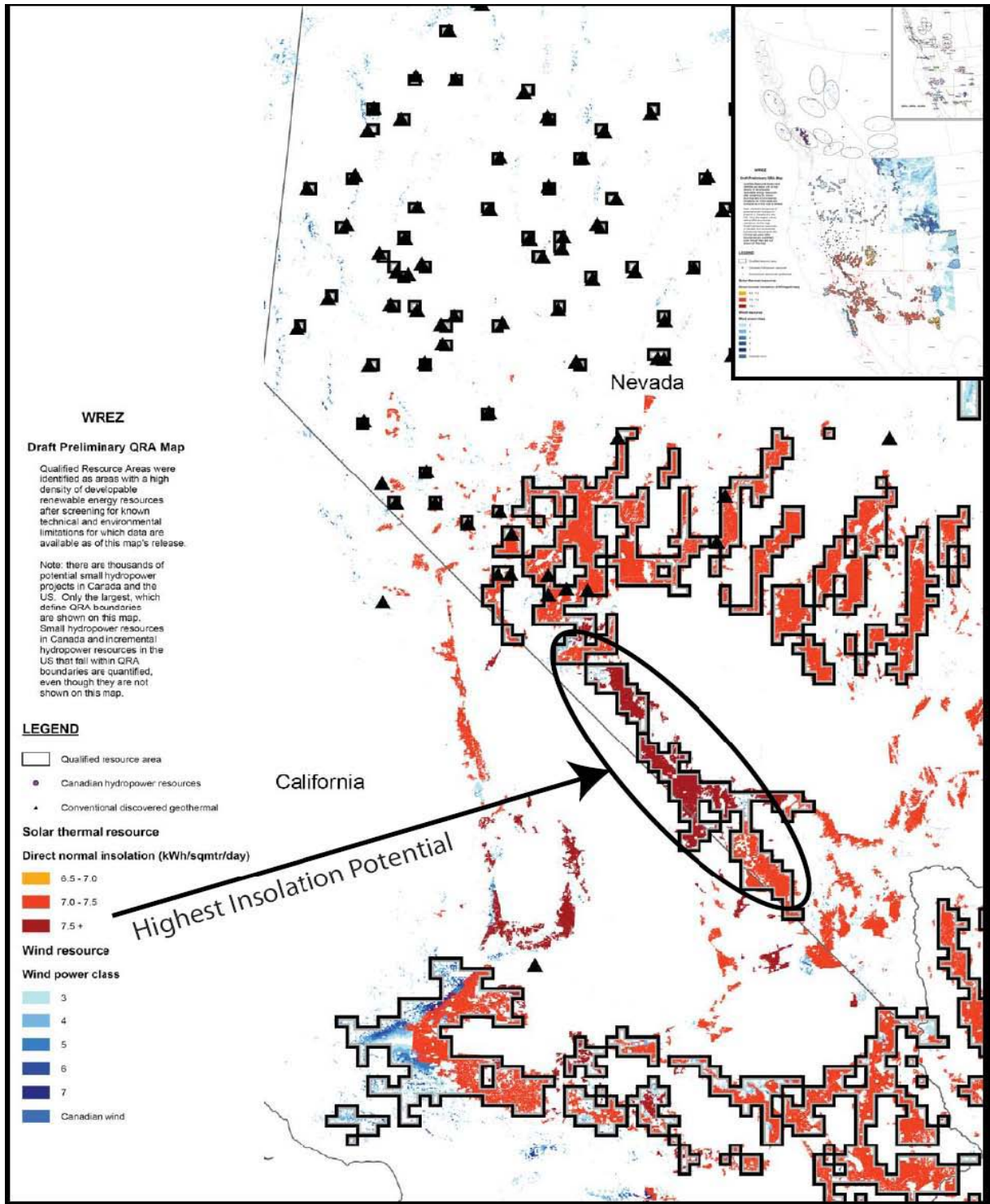


FIGURE 5

5. Interconnection Requests:

NV Energy currently has over sixty (60) renewable projects, requesting to connect approximately 8,300 MW of capacity, in its generation interconnection queue. The types of renewable resources requesting interconnection are shown below. The generation interconnection study work for these projects is in different stages.

- a. Solar (Thermal and Photovoltaic) – Approximately 4,100 MW – mainly Southern Nevada
- b. Wind – Approximately 3,750 MW – 30% in Southern Nevada - balance in Northern Nevada
- c. Geothermal – Approximately 450 MW – all in Northern Nevada.

In Section 1, NV Energy discussed the development agreement that was reached between NV Energy and Solar Millennium, LLC, project. The initial project under consideration is a 250 MW solar trough technology plant at a site located in Nye County, but is not included in the numbers above.

6. Transmission Rights and/or Transmission Service:

All of the projects in the generation interconnection queue will require transmission service of some type to move their resource from the generation site to the load. This service could be through designation as a network resource or a request for long term firm point to point transmission service.

7. Participant Roles:

NV Energy wants to examine the potential for a joint project with Western to leverage NV Energy and Western's investments for a higher benefit than would be achieved individually. NV Energy proposes that Western invest as an owner in this project and assist in permitting and siting of the facilities. Specific capacity rights percentages for the various phases are discussed in more detail in Appendix A.

8. Public Interest:

In concert with the directive given to Western by the Federal Government and NV Energy's commitment to be a renewable energy leader, this project provides opportunities for the two entities (and others) to integrate renewable resources into the transmission grid. The proposal also provides a long term solution to further renewable energy penetration into the energy market. In addition, the proposal enables renewable rich zones the opportunity to access the market and load areas in the Nevada, California and Desert Southwest while reinforcing the reliability of the overall bulk transmission system.

9. Prior Experience:

As described in Section 1 above, NV Energy has been in the utility business since the early part of the century and has added significantly to its transmission, distribution and generation assets. NV

Energy has significant experience with permitting, development and construction of major transmission lines. NV Energy has completed six (6) major transmission projects in the last twelve (12) years. These include: 100 miles of 500 kV; 350 miles of 345 kV; and 140 circuit miles of 230 kV. NV Energy is currently developing its ON Line project, a 235 mile long 500 kV line along eastern Nevada that will, among other things, allow for the transfer of Northern Nevada renewables to Southern Nevada.

NV Energy's most recent project involving Western was energized in 2007. It included approximately one hundred (100) miles of 500 kV lines that connected the Harry Allen 500 kV substation to Western's Mead 500 kV Substation as well as the Harry Allen 500 kV substation to the Northwest 500 kV Substation.

10. Financial capability:

As documented in the NV Energy latest Form 10-K Report (2008), NV Energy serves one of the fastest growing electric service territories in the United States and has successfully done so for many years. The Company financed \$1 billion in plant additions in 2006, \$1.2 billion in 2007 and \$1.5 billion in 2008.

On May 15, 2008, the rating agency Standard & Poor's raised the secured debt ratings for NPC and SPPC to BBB with a stable outlook. Moody's Investors Service affirmed equivalent debt ratings with a stable outlook in its December 2008 report. Fitch Ratings provided BBB- ratings with a positive outlook in December 2008.

NPC maintains a revolving credit facility of \$600 million, and SPPC maintains a revolving credit facility of \$350 million.

Other relevant information can be reviewed in the NV Energy 2008 Annual Report located at

<https://materials.proxyvote.com/Approved/67073Y/20090306/AR%5F36231/HTML2/default.htm>

or the NV Energy 2008 Form 10 k located at

<https://materials.proxyvote.com/Approved/67073Y/20090306/10K%5F36233/HTML2/default.htm>.

11. Participation of Other Entities:

As highlighted in Section 4 above, NV Energy has been working for an extended period of time through Nevada's RETAAC with other interested entities to identify renewable energy zones and the associated transmission needed to get the resources located in these zones to load centers. Part of the discussions at RETAAC relate to the funding/building of these lines, as the participants recognize that the needs of Nevada alone may not be sufficient to fund all of the lines necessary to access the potentially available renewable resources. This SOI is designed to address some of those concerns by providing an opportunity for renewable developers to access additional markets beyond NV Energy and for other load serving entities to have access to several renewable energy zones.

12. Other Information:

Please contact us if you need additional information or have questions on this proposal.

Appendix A – Additional Project Details

Appendix A provides additional detail for NV Energy’s Statement of Interest in different formats. Figure A-1 shows the potential Project by Phases (it is similar to the prior figures except for the deletion of the renewable zones). Figure A-2 shows the Project by Segments (Segments are not intended to relate to timing, but are used merely to tie to the cost matrix herein). Figure A-3 is a spreadsheet of the Project by Segment and Phase with the costs, line miles and other details.

FIGURE A-1

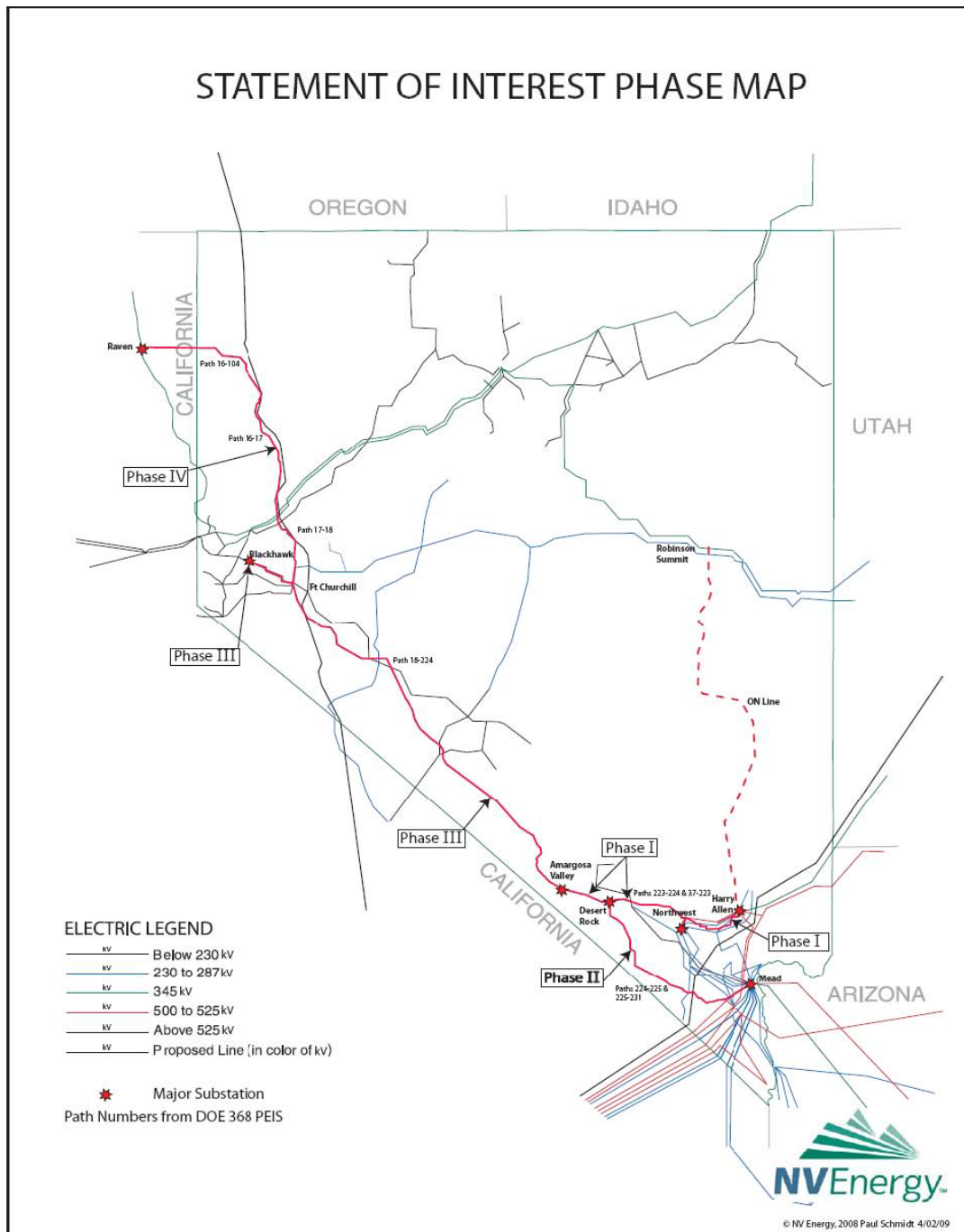


FIGURE A-2

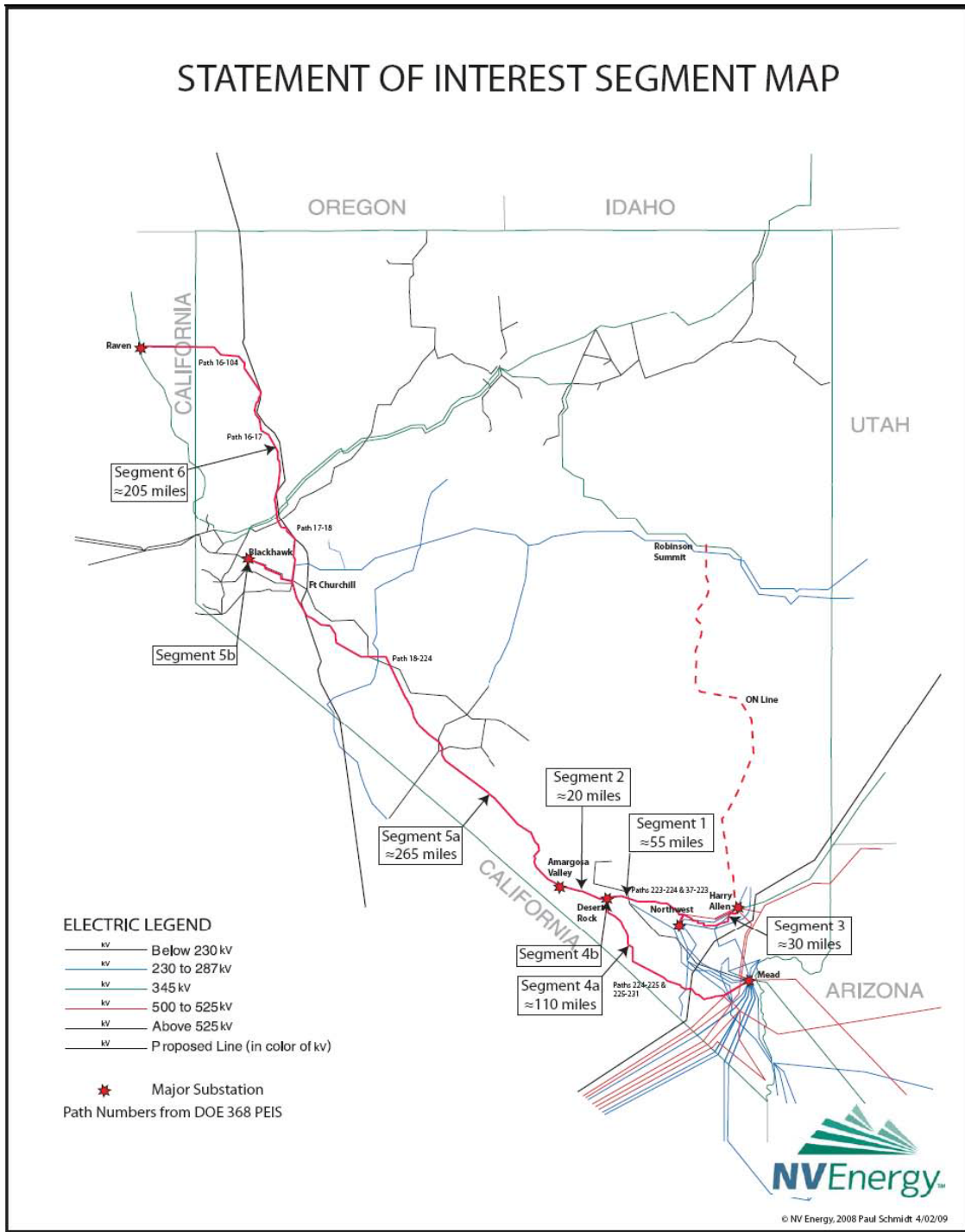


FIGURE A-3

NV Energy's Estimated Cost for Western Area Power Administration (Western) Request for Interest (RFI)															
Segment	Title	Phase	Capacity (MW)	Western's			NV Energy's			# of or Miles	Cost Per (\$mm)	Item Cost (\$mm)	Total Cost (\$mm)		
				Capacity Rights (%)	Investment (%)	Investment (\$mm)	Capacity Rights (%)	Investment (%)	Investment (\$mm)						
1	Northwest Substation to the location of Desert Rock Station - 500 kV 500 kV Line 500 kV Terminal @ Northwest 2 Location of Desert Rock Station to Amargosa Valley Substation -500 kV 500 kV Line (1) (2) Amargosa Valley Substation - Collector Station - 500/230 kV Transformer (3) 500 kV Terminal @ Amargosa Valley 3 Harry Allen Substation to Northwest Substation - 500 kV 500 kV Line 500 kV Terminals @ Harry Allen & Northwest Phase I Totals 800			0	0	\$0.0	100	100	\$85.0				\$85.0		
										55	\$1.4	\$77.0			
											1	\$8.0	\$8.0		
					0	50	\$44.0	100	50	\$44.0				\$88.0	
											20	\$1.4	\$28.0		
											1	\$50.0	\$50.0		
											1	\$10.0	\$10.0		
					0	0	\$0.0	100	100	\$62.0				\$62.0	
											30	\$1.4	\$42.0		
											2	\$10.0	\$20.0		
							\$44.0			\$191.0				\$235.0	
		4	Desert Rock Station to Mead Substation - 500 kV	II										\$164.0	
		4a	500 kV Line			100	100	\$164.0	0	0	\$0.0	110	\$1.4	\$154.0	
			500 kV Terminal @ Mead									1	\$10.0	\$10.0	
												\$50.0			
4b	Desert Rock Station -3 Terminals Mead, NW & AM			50	50	\$25.0	50	50	\$25.0	1	\$50.0	\$50.0			
	Phase II Totals		2,000			\$189.0			\$25.0				\$214.0		

