

# SWAT EVSG WORK PLAN

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August 5, 2010\*  
Draft V2.1

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## INTRODUCTION

At least 14 new transmission line additions are proposed to terminate in the Eldorado Valley in by 2020.

The EVSG's (Eldorado Valley Study Group) purpose is to provide a conceptual framework for a coordinated expansion of the transmission infrastructure within the Eldorado Valley area. The EVSG will work with the appropriate transmission owners, operators, developers, land agencies and generators to discuss overall uses and collaboration for the Eldorado Valley. The final report will be distributed to all members of SWAT, appropriate transmission owners, operators, developers, land agencies, land managers, generators, interconnection parties and WECC subregional planning groups. The study will start by creating alternative development concepts followed by power flow and short circuit analysis.

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After some conceptual plans for the Eldorado Valley have been agreed to, the EVSG will provide an informal update to the Eldorado Valley land managers of the potential direction the Eldorado Valley transmission development. For the purpose of this document, the Eldorado Valley area represents portions of southern Nevada encompassing the following existing substations and associated transmission facilities:

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1. Eldorado Substation
2. Mead Substation
3. McCullough Substation
4. Marketplace Substation

Transmission infrastructure within the immediate area of these substations will be included within the analysis as required.

A schedule to complete all the work detailed in this work plan is included as Figure 2.

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## PROPOSED PROJECTS

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The Proposed Projects that the EVSG has identified to be included in this analysis are listed below and can be seen in Figure 1. In addition, this list of Proposed Projects with the pertinent details for each can be found in Appendix A :

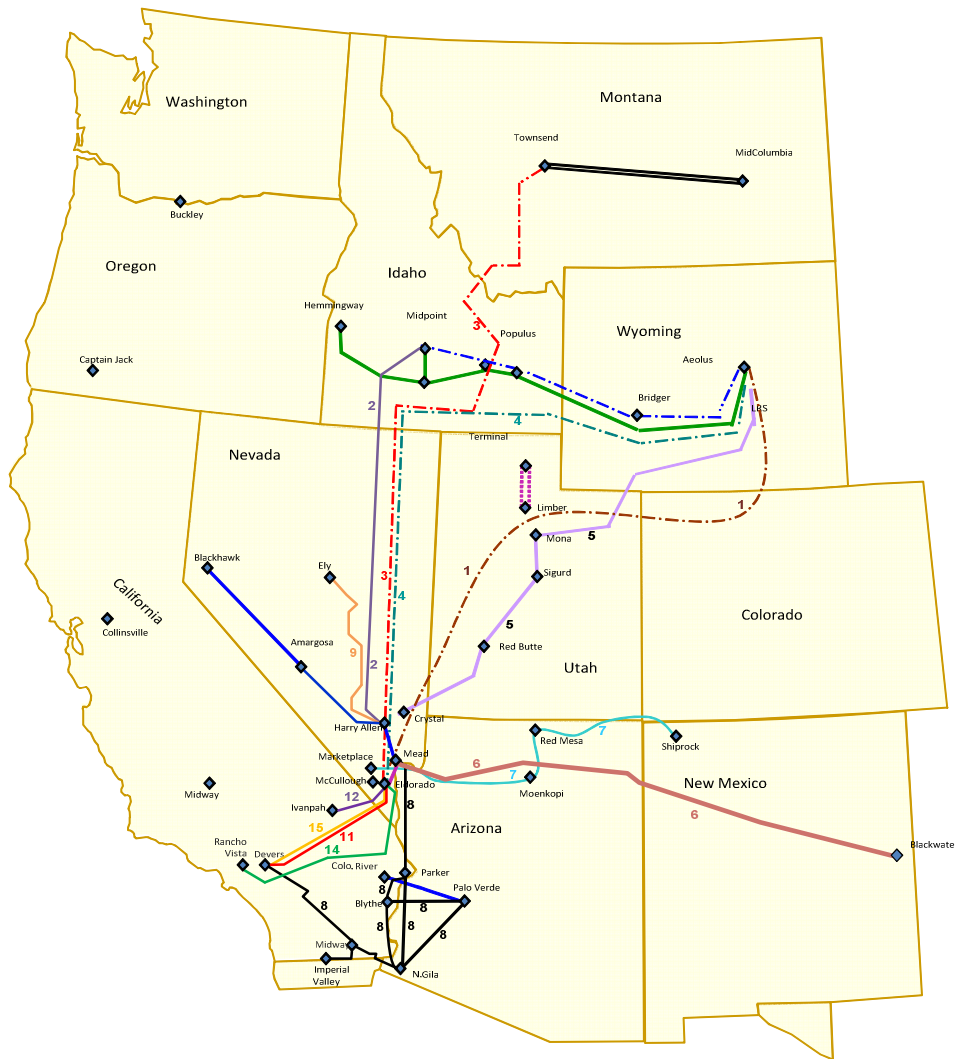
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|--|--|
| 1. TransWest Express (TWE) (WECC Phase 2 – (Ph2))                              | 9. ON Line Project (NV Energy) (Ph2)                                     |
| 2. Southwest Intertie Project/<br>Southern Nevada Intertie Project (LSP) (Ph2) | 10. TCP Project (NV Energy/WAPA.) (Pre-PCR)                              |
| 3. Chinook (TransCanada) (Ph1)   | 11. Pony Express (Eldorado Valley to Devers) (Pre-PCR)                   |
| 4. Zephyr (TransCanada) (Ph1)  | 12. Eldorado - Ivanpah 220 kV (Pre-PCR.)                                 |
| 5. Gateway South (PacifiCorp) (Ph2)  | 13. Anova Project (Pre-PCR)  |
| 6. Santa Fe (CLEP?) (Pre-Project Coord. Review – (Pre PCR))                    | 14. LV – LA Transmission Project (Energy Capital Partners/PDS) (Pre-PCR) |
| 7. Navajo Transmission Project (NTUA)(Ph2)                                     | 15. Eldorado – Devers DC Line (Pre-PCR)                                  |
| 8. SMRT Elements, various (WAPA) (Pre-PCR)                                     | 16. Solar Express (RETCO)(Pre-PCR) (Pre-PCR)                             |

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**FIGURE 1 – PROPOSED PROJECTS TO BE EVALUATED IN THE ELDORADO VALLEY**

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**OBJECTIVES**

The primary objectives of the Study Group are:

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- Identify current facilities in Eldorado Valley area; physical locations, equipment ratings, ownership, and ultimate layouts (or potential interconnection points for multiple projects looking to terminate at these facilities)
- Identify and develop a database of new or upgrade transmission projects intending to interconnect into the facilities within the Eldorado Valley.

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- Create a map of the Eldorado Valley area showing land ownerships with general locations of facilities and transmission line corridors.
- Identify physical and technical constraints to the expansion of existing facilities in the Eldorado Valley area.
- **Develop a conceptual plan for the Eldorado Valley that logically incorporates all of the Proposed Projects and can be staged.**
- Perform a high level technical analysis to examine potential interactions and impacts with the various projects proposed to interconnect within the area.
- A high level Eldorado Valley short circuit study will be conducted
- Recognizing that the timing of the interconnections will vary, develop a strategy for the staged development of the Eldorado Valley area transmission facilities.

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In addition to these objectives, the EVSG will conduct its business as follows:

- SWAT EVSG meetings will be open to all stakeholders and conducted in accordance with critical energy infrastructure information (CEII) regulations, FERC Standards of Conduct, and Transmission Provider Standards of Conduct. The meetings provide an open forum for transmission project sponsors to introduce specific transmission projects to interested stakeholders and potential partners.
- Because the existing transmission system represents Critical Energy Infrastructure Information, there may be a need for members to execute Nondisclosure Agreements with the existing facility owners.

## **WORK PLAN**

Based on the objectives of the study group, the following Work Plan is proposed. It is broken into four sections. The Sections are listed below:

1. Data Collection
2. Conceptual Design Development
3. High level power flow studies
4. Eldorado Valley area short circuit study
5. Report

### **Section 1 – Data Collection**

The following data will be collected and consolidated for the Eldorado Valley.

- A. Map of the Eldorado Valley area showing the 200 kV and above substations and lines to include ownership
  - 1) Existing System
  - 2) (Currently) Planned System (i.e. ultimate layouts for existing facilities)

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- 3) Currently Planned local Eldorado Valley generation, both renewable and non-renewable generation
- B. Simplified single-line drawings of the Eldorado Valley area showing the facilities and their ratings
  - 1) Existing System
  - 2) Currently Planned System (i.e. ultimate one-lines for existing facilities)
- C. Map of the Eldorado Valley area showing land ownership with general locations of facilities and corridors
  - 1) Existing System
- D. Transmission Project data, including planned interconnection locations, project status and timing, system models, load and resource assumptions, etc.
- E. Collect West of River flows. The recent historical flows for the WOR system will be reviewed for informational purposes. The WOR system is broken into two components: the northern and southern. For evaluation purposes, the WOR total flow and both northern and southern flow components need to be collected. It should be noted that historical flows are not a predictor of the future use of the WOR system.
- F. SWAT Short Circuit Study.

**Section 2 – Conceptual Plan Development**

Based on the data collected ~~and the proposed projects, alternative development scenarios will be considered. One or more alternative will be chosen for power flow and short circuit evaluation as described in Section 2 and 3. Attention will be give to the following as the as the alternatives are considered:~~

- a) ~~proposed principles of development;~~
- b) ~~the need to accommodate variations in project timing; and~~
- c) ~~reliability.~~

~~Products of this work will include;~~

- A. ~~map of the Eldorado Valley area showing conceptual plans for the alternatives, with various project groupings;~~
- B. ~~simplified single-line drawings of the Eldorado Valley area to represent the alternatives; and~~
- C. ~~one or more alternatives to take forward to load flow and short circuit analysis per Sections 2 and 3.~~

**Section 3 – High Level Power Flow Studies**

Once the data from the maps, drawings and historical flows are determined and before the initial power flow work can begin the assumptions that can affect the results need to be agreed upon. The following assumptions are examples of what some of the assumptions could be but aren't limited to these.

**Study Assumptions (requiring review and agreement):**

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- A. This is a non-simultaneous study.
- B. The amount of existing generation in and near the local Eldorado Valley area scheduled west needs to be decided on. Two possible options are minimum and/or economic dispatch.
- C. The amount of existing generation in and near the local Hassayampa area (is this part of the Eldorado Valley area?) scheduled west needs to be decided on. Two possible options are minimum and/or economic dispatch.
- D. Once the historical WOR flows have been evaluated, the initial WOR flow needs to be agreed upon.
- E. The order in which new projects will be added to increase the WOR flow. Three possible options are:
  - a) Based on current timings (by status in WECC? available modeling data, gen. assumptions?)
  - b) Based on most probable (I'm not certain this would be a fruitful exercise by the group.)
  - c) Study all on a prorate basis based on size of the project
- F. The order in which new projects will be added to increase WOR capacity.
- G. Determine if there is a likelihood that with a massive increase in renewable energy growth in California may result in the reversal of flow over time from west to east.

Once the above and other pertinent assumptions have been decided upon, then the high level power flow studies can begin. The following is a proposed list of power flow study work.

- 1) Create a base case incorporating the agreed to assumptions from 3.B, 3.C and 3.D above. Compare the three WOR flows in the new case and check against the historical flows for reasonableness with the EVSG.
- 2) Using the WOR rating as the benchmark, add the new projects per the agreed to assumptions from 3.E above and their schedules to California until the WOR flow is equal to the rating. (would we be analyzing versus steady state flows, n-1 contingencies, n-2 contingencies?)
- 3) Using the various cases (logical groupings of projects) from 2) above, start running the sensitivity cases agreed to from 3.F above. As the facilities are added from 3.F above, determine the impact (increased or decreased) on the WOR. The impact will be based on whether the new facilities increases or decreases the rating based on the relative comparability of the similarity of the impact of the critical outages on the critical elements.

#### **Section 4 – Eldorado Valley Short Circuit Study**

It is understood that the short circuit problem in the Eldorado Valley is severe and as such should be added as one of the objectives of the Work Plan. The current SWAT short circuit study should be completed by the end of July, 2010. Using the paired cases established in items 2 and 3 above, run short circuit analysis to determine the short circuit strength at each level. Develop conceptual mitigation plans (new equipment, split busses, reactors, etc.) to meet the various short circuit levels.

#### **Section 5 – Report**

Report on the key findings from the analysis to be used by facility owners, project proponents, and other SWAT and WECC members.

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SCHEDULE

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