5.7 GEOLOGICAL RESOURCES

5.7.1 Significance Criteria

In accordance with the CEQA Guidelines, Appendix G, impacts related to geological resources would be considered potentially significant if Segments 2 and 3 of the Antelope Transmission Project would result in:

- Unstable earth conditions or changes in geologic substructures
- Disruptions, displacements, compaction, or overcovering of the soil
- Change in topography or ground surface relief features
- The destruction, covering, or modification of any unique geologic or physical features
- Any increase in wind and water erosion of soils, either on or off the site
- Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion, which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet, or lake
- Exposure of people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards

5.7.2 Assessment of Geologic Hazards

5.7.2.1 Strong Ground Shaking

During the design life of the proposed project, moderate to high levels of ground shaking are possible given the seismic setting of the project area. Design-level studies would identify the hazard levels and present engineering recommendations to support appropriate seismic designs. Substation equipment can be engineered and constructed to withstand strong motions and moderate ground deformation. For example, specific requirements for seismic design would be followed based on the Institute of Electrical and Electronic Engineers'(IEEE) 693 "Recommended Practices for Seismic Design of Substation." Strong ground shaking is considered during substation design, but is not relevant to T/L tower design because wind design criteria used, are more conservative than ground shaking considerations.

5.7.2.2 Ground Rupture

While ground ruptures and ground acceleration due to fault activity may impart significant loads onto T/L structures, loads imparted by wind on transmission structures are considered a

greater force and more likely to cause damage to these structures. Therefore, wind loads would be used as the governing force in the design of the proposed transmission structures.

5.7.2.2.1 Segment 2. The Segment 2 T/L route crosses the primary rift zone of the active San Andreas fault zone between MP 7.6 and MP 8.2. A minor branch off of the primary fault zone is also crossed at MP 4.9. Another possible branch fault, the Nadeau fault, is crossed at MP 8.2 of Segment 2 and at MP 0.1 of Segment 2, Alternative AV2. This fault is mapped as concealed in this location. These branch faults represent significantly less rupture hazard than the primary fault zone.

5.7.2.2.2 Segment 3. The active Garlock fault is crossed by the proposed Segment 3 route at MP 31.7. Alternative C crosses the fault from approximately MP 5.8 to MP 6.0. The inactive Rosamond-Willow Springs fault is crossed by the proposed 500 kV T/L and the alternative A and B routes in the Willow Springs area. This fault is not considered a fault rupture hazard.

In general, active faults with significant displacement are best mitigated by placing T/L structures outside the fault zone, where practical.

5.7.2.3 Liquefaction

Potential liquefaction hazards have been identified along the Segment 2 T/L route based on recent CGS hazard mapping. Liquefaction hazards would be evaluated during site specific design-level studies for the project. In general, liquefaction hazards in this setting for these kinds of structures can be mitigated with appropriate foundation design.

5.7.2.4 Expansive and Collapsible Soils

Engineering studies would evaluate the presence and extent of expansive or collapsible soil, if present within the proposed foundation areas of proposed structures. Standard design practices are available to mitigate these soil conditions if encountered.

5.7.2.5 Subsidence

Significant subsidence has not been documented in the project area. Design-level studies should verify this and address the potential hazard from subsidence in the Antelope and Tehachapi Valleys, if present. In general, because subsidence-related ground movements are relatively small and occur over a very wide area, they are not likely to represent a significant potential for differential settlements within or between the foundation zones of project components. Therefore, the hazard to the electrical T/Ls or substation equipment resulting from subsidence in the Antelope Valley or the Tehachapi Valley is considered remote.

5.7.2.6 Erosion

The construction of T/L structures would require grading to create pads for tower sites and grading to expand the existing access road system to reach the new tower sites. This would result in some soil disturbance and loss of vegetation that would in turn promote a short term increase in erosion. Erosion control measures and Best Management Practices would be included as part of the Construction Storm Water Pollution Prevention Plan (SWPPP), which would be implemented during construction to minimize erosion and sedimentation during grading. Access roads would be laid out to maximize use of existing access roads for the adjacent T/Ls. Design-level studies would address erosion and sediment control issues during construction and operation of the project. No significant impacts would be expected to result from this project.

5.7.3 Mitigation Measures

The following are APMs to limit geological resource related impacts to less than significant levels.

APM Geo-1. For new substation construction, specific requirements for seismic design would be followed based on the Institute of Electrical and Electronic Engineers' 693 "Recommended Practices for Seismic Design of Substation."

APM Geo-2. Prior to final design of substation foundations and T/L structure foundations, a geotechnical study would be performed to identify site-specific geologic conditions in enough detail to support final engineering.

APM Geo-3. T/L and substation construction activities would be performed in accordance with the soil erosion/water quality protection measures specified in the Construction SWPPP.