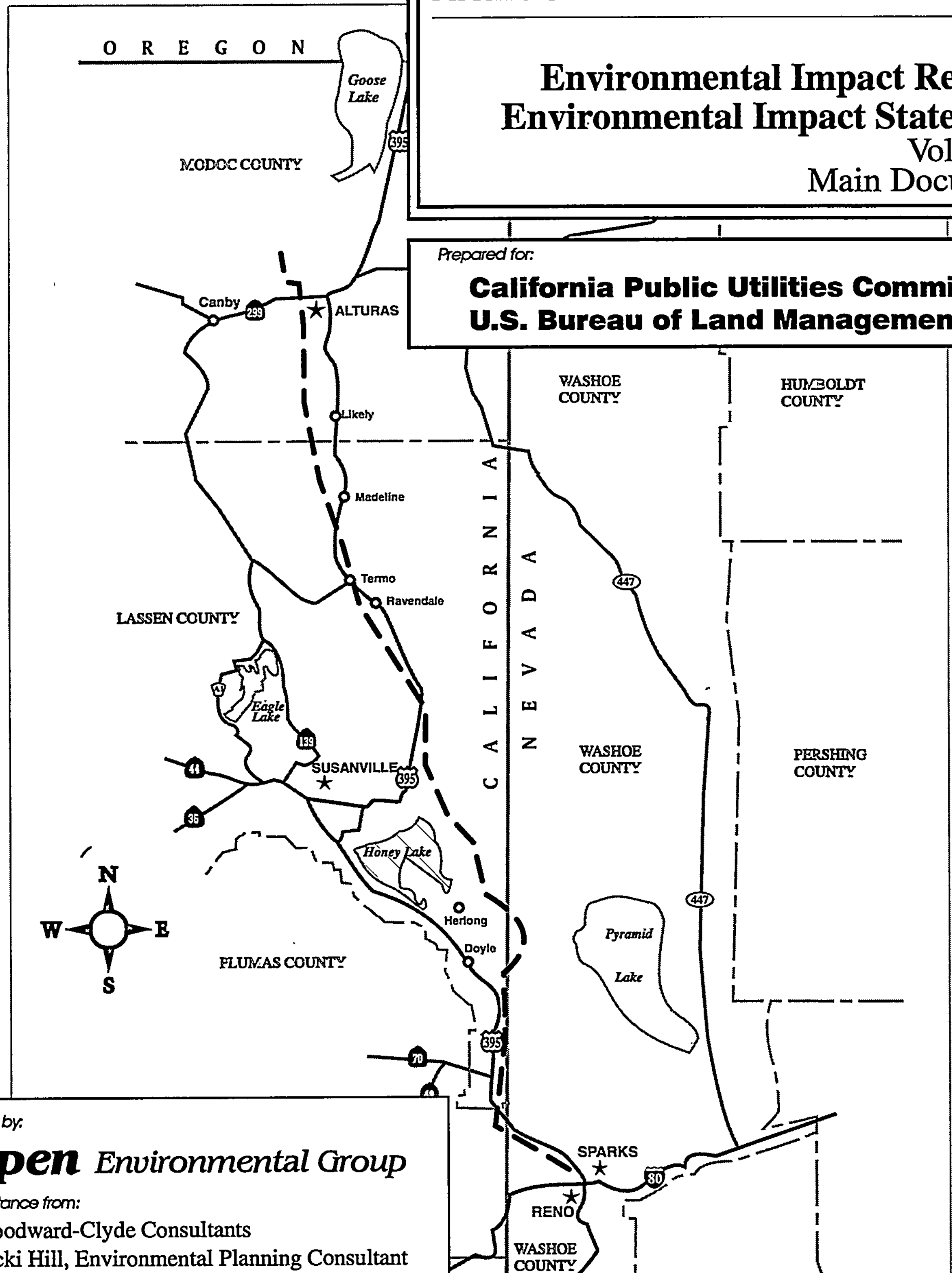
Sierra Pacific Power Company
Alturas Transmission Line Project

Final
Environmental Impact Report/
Environmental Impact Statement
Volume I
Main Document

Prepared for:

California Public Utilities Commission
U.S. Bureau of Land Management



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- Utility System Efficiencies
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U.S. BLM Case # CACA-31406

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BASE MAPS

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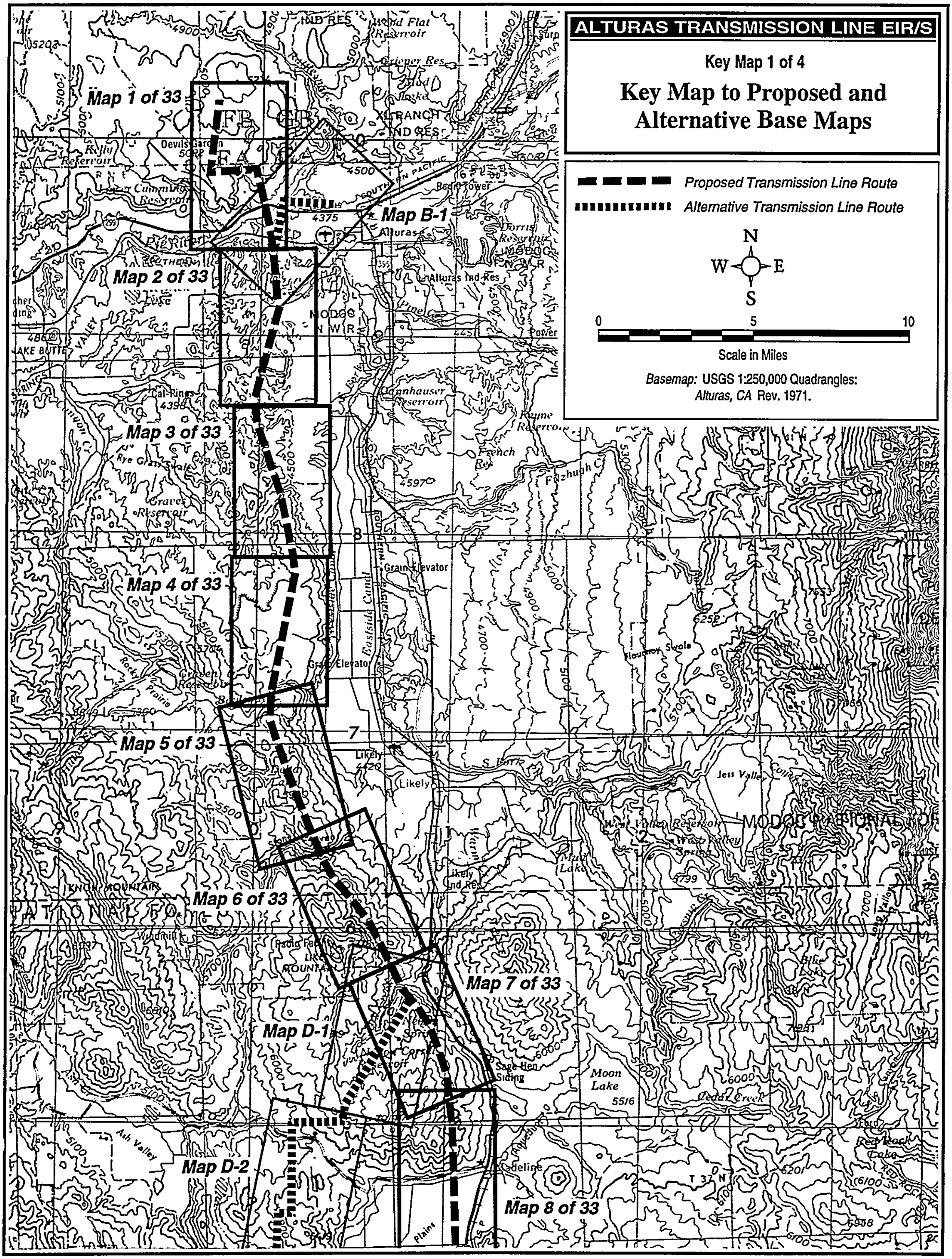
3) 3 pages of maps for Alternative Segment D
4) 2 pages of maps for Alternative Segment F
5) 2 pages of maps for Alternative Segment G
6) 1 map for Alternative Segment I
7) 4 pages of maps for Alternative Segment J
8) 5 Pages of maps for the Alternative Segment ESVA
9) 1 map for Alternative Segment M
10) 4 pages of maps for Alternative Segment P
11) 1 map for Alternative Segments S and U
12) 1 map for Alternative Segment Z
13) 1 map for Alternative Segment WCFG
14) 1 map for Alternative Segment X-East

Note: These detailed maps of the Proposed route and alternative alignments are based on topographic maps prepared by the U.S. Geological Survey (USGS). The base maps are only as current as the last update by the USGS, and may not reflect all of the features now present. However, the EIR/S analysis is intended to consider all existing features. Please refer to the "Environmental Baseline and Regulatory Setting" sections in each issue area for current information.


ALTURAS TRANSMISSION LINE EIR/S
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Proposed Transmission Line Route
Alternative Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles:
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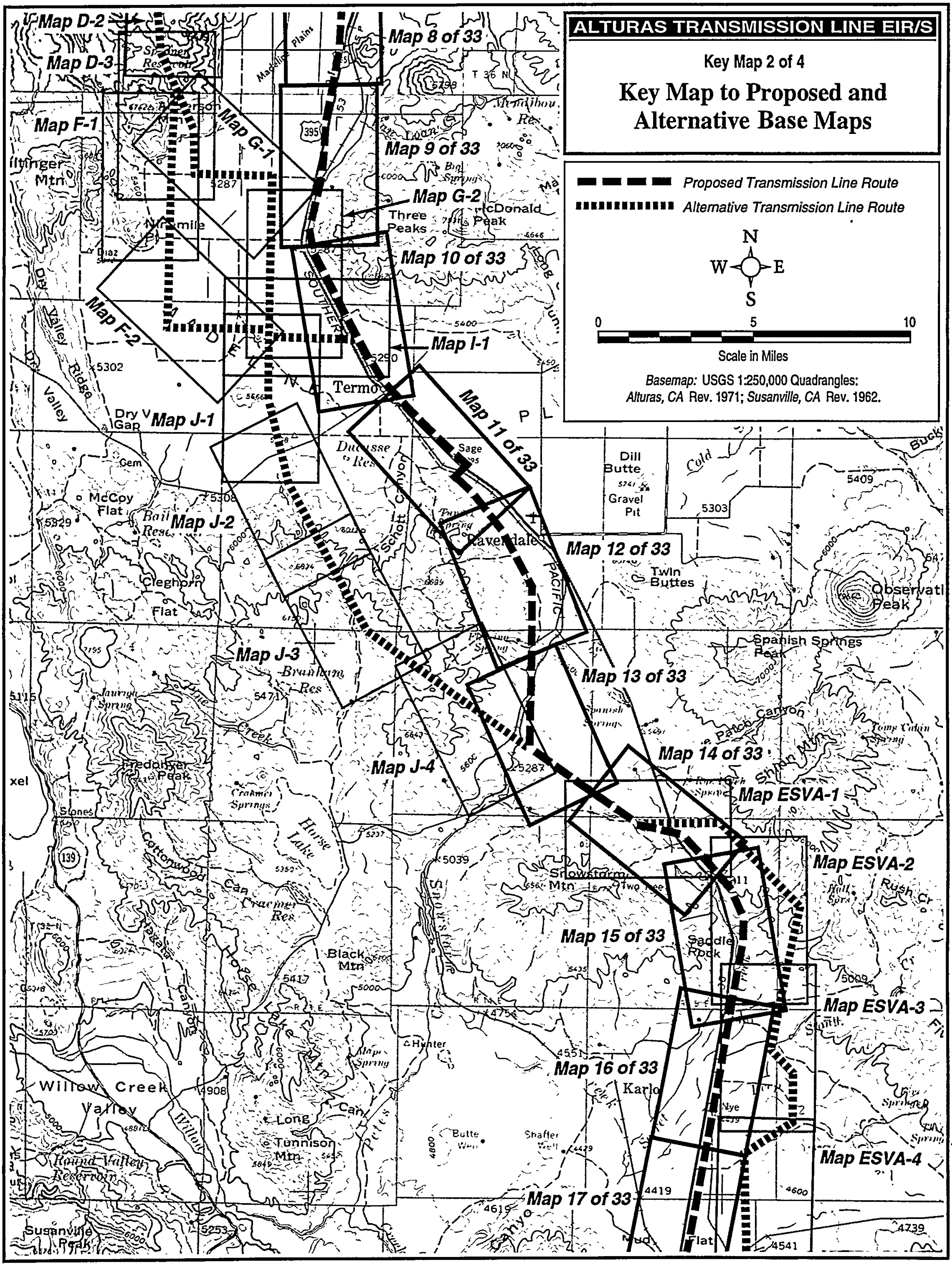
Likely
Moon Lake
Madeline


ALTURAS TRANSMISSION LINE EIR/S
Key Map 2 of 4
Key Map to Proposed and Alternative Base Maps
Proposed Transmission Line Route
Alternative Transmission Line Route
N
W
E
S
0
5
10
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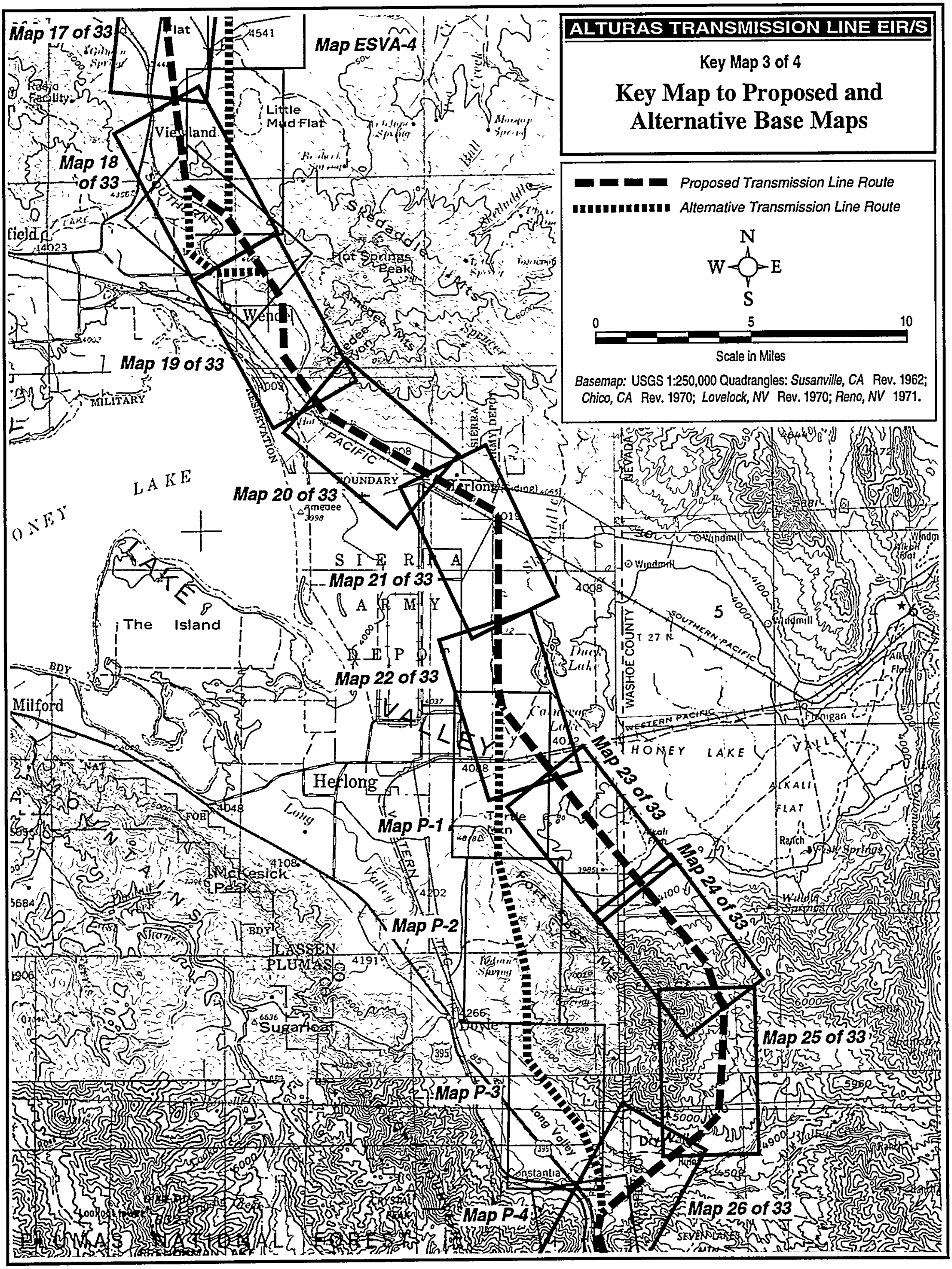
Termo
Ravendale
Dill Butte
Gravel Pit
Twin Buttes
Observation Peak
Spanish Springs Peak
Snowstorm Mtn
Saddle Rock
Black Mtn
Hunter
Karlo
Nye
Willow Creek Valley
Long Tunnison Mtn
Susanville Peak
Fredonyer Peak
McCoy Flat
Cleghorn Flat
Dry Valley Ridge
Gem
Horse Lake
Flat


ALTURAS TRANSMISSION LINE EIR/S
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Key Map to Proposed and Alternative Base Maps
Proposed Transmission Line Route
Alternative Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev. 1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1971.
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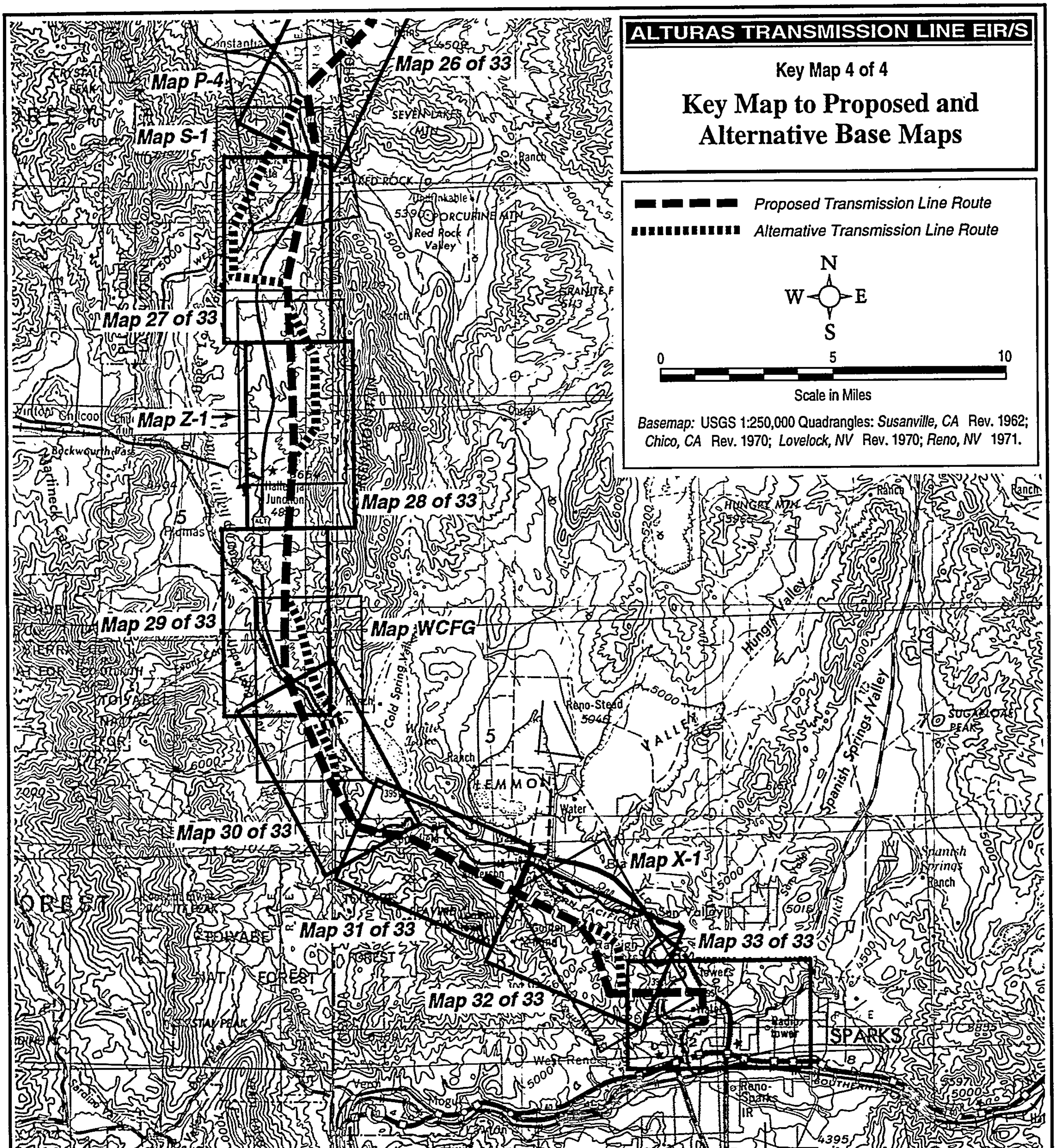
Viewland
Hot Springs Peak
Wendel
Herlong
The Island
Milford
McKesick Peak
Sugarloaf
Doyle
Constantia
Long Valley
HONEY LAKE VALLEY
ALKALI FLAT
WASHOE COUNTY
SOUTHERN PACIFIC
WESTERN PACIFIC
SIERRA ARMY DEPOT
PLUMAS NATIONAL FOREST


ALTURAS TRANSMISSION LINE EIR/S
Key Map 4 of 4
Key Map to Proposed and Alternative Base Maps
Proposed Transmission Line Route
Alternative Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev. 1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1971.
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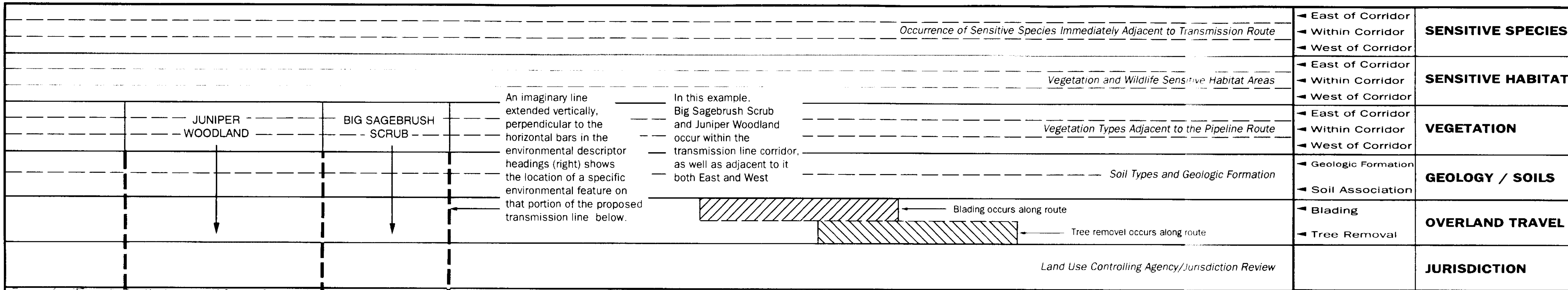
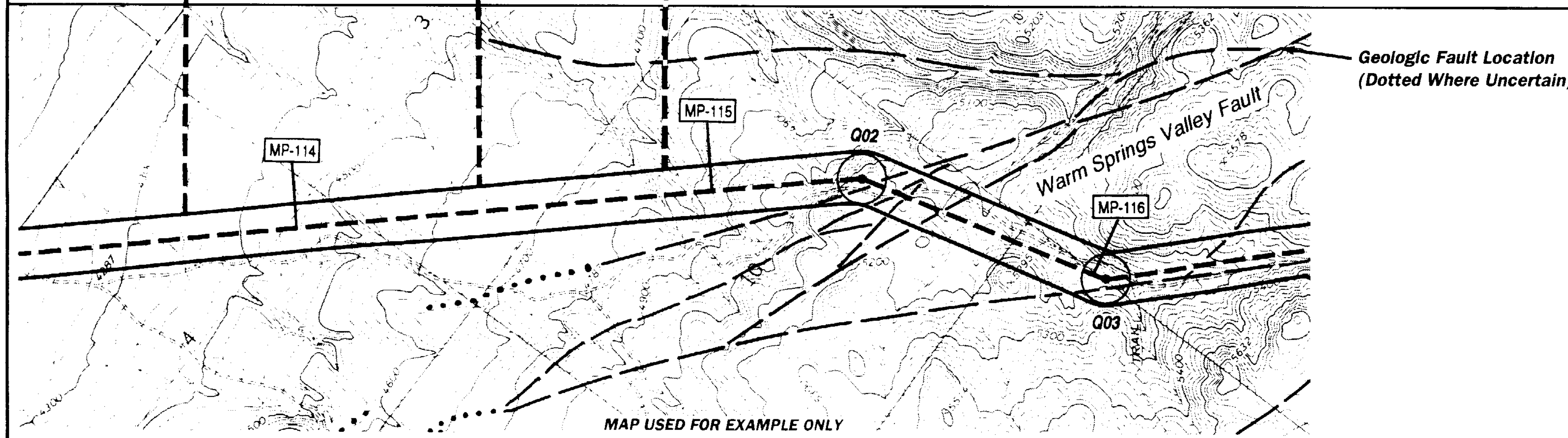
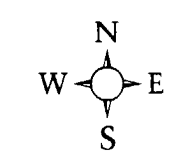
SEVEN LAKES MTN
RED ROCK
PORCUPINE MTN
Red Rock Valley
Beckwourth Pass
Chilcoot
Plumas
Hallelujah Junction
HUNGRY MTN
Hungry Valley
Spanish Springs Valley
Spanish Springs Ranch
Cold Spring Valley
Reno-Stead
LEMMON VALLEY
SUGARLOAF PEAK
West Reno
SPARKS
RENO
Reno International
Radio tower
Verdi
Mogul
TOIYABE
NATIONAL
FOREST
CRYSTAL PEAK





KEY

- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Proposed Route Mile Marker
- Alternative Segment (Mapped)
- Other Alternative Segment



0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s):

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Index Map For Proposed and Alternative Transmission Line Route Maps

SENSITIVE SPECIES

AAB	Altered Andesite Buckwheat *(Eriogonum robustum)*
CLB	Clay-loving Buckwheat *(Eriogonum collinum)*
CS	Cusick's Stickseed *(Hackelia cusickii)*
DL	Dwarf Lousewort *(Pedicularis centranthera)*
DOU	Doublet *(Dimeresia howellii)*
FS	Falcate Saltbush *(Atriplex gardneri var. falcata)*
GPP	Green Prince's Plume *(Stanleya viridiflora)*
HL	Henderson's Lomatium *(Lomatium hendersonii)*
HM	Holmgren's Skullcap *(Scutellaria holmgreniorum)*
HPFM	Hard-Podded Freckled Milk Vetch *(Astragalus lentiginosus var. chartaceus)*
LL	Lilliput Lupine *(Lupinus uncialis)*
LLSP	Lance-leaved Scurf-pea *(Psoralidium lanceolatum)*
NEP	Nelson's Evening Primrose *(Camissonia minor)*
PB	Prostrate Buckwheat *(Eriogonum prociduum)*
PCEP	Pine Creek Evening Primrose *(Camissonia boothii)*
PL	Purple Loco *(Astragalus agrestis)*
RL	Raven's Lomatium *(Lomatium ravenii)*
SM	Spiny Milkwort *(Polygala subspinosa)*
SMV	Suksdorf's Milk-vetch *(Astragalus pulsiferae var. suksdorfii)*
TA	Twin Arnica *(Arnica sororia)*
VD	Volcanic Daisy *(Erigeron elegantulus)*

VEGETATION

Altered Andesite
Alturas Volcanic Gravel
Big Sagebrush Scrub
Chenopod Scrub
Disturbed/Cultivated
Juniper Woodland
Low Sagebrush Scrub
Montane Meadow
Mud Flat
Rabbitbrush Scrub
Sagebrush/Bitterbrush Scrub
Silver Sagebrush Scrub
Stabilized/Partially Stabilized Dunes
Yellow Pine Forest

CUMULATIVE PROJECTS

CUM-5 Cumulative Project (Refer to Table B.5-1)

SENSITIVE RECEPTORS

(Refer to Table C.8-1 in Land Use section)

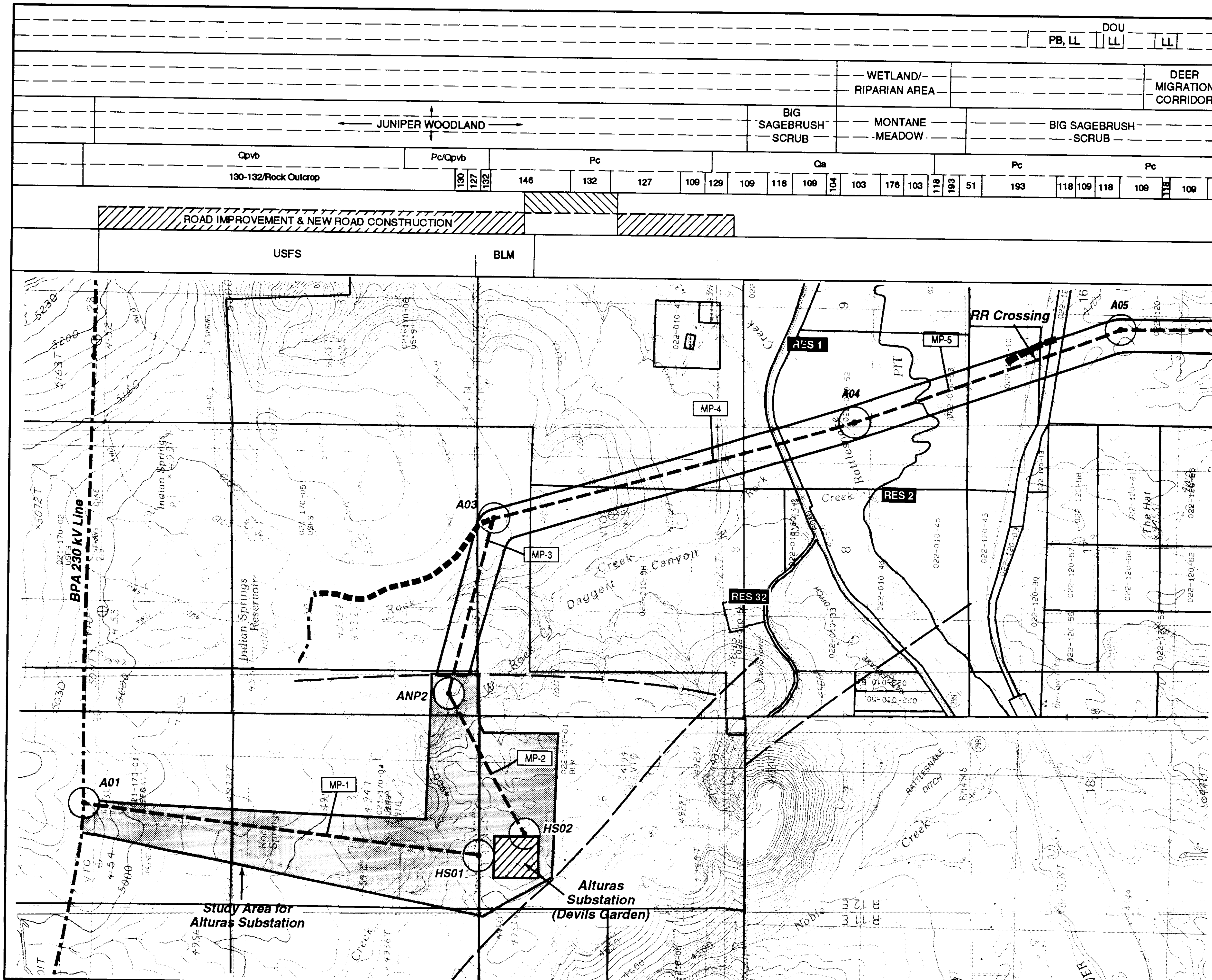
REC 1 Recreation Area
REL 1 Religious
RES 1 Residential
HIS 1 Historical Marker

GEOLOGY

Geologic Formations (Refer to Table C.6-1 & C.6-2)
Soil Associations (Refer to Appendix G Tables)

ROADS

New Access Road
Upgrade of Existing Roads



◄ East of Corridor
◄ Within Corridor
◄ West of Corridor

SENSITIVE SPECIES

◄ East of Corridor
◄ Within Corridor
◄ West of Corridor

SENSITIVE HABITAT

◄ East of Corridor
◄ Within Corridor
◄ West of Corridor

VEGETATION

◄ Geologic Formation
◄ Soil Association

GEOLOGY / SOILS

◄ Blading
◄ Tree Removal

OVERLAND TRAVEL

JURISDICTION

KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

E
N S
W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Alturas, CA* 1990; *Big Sage Reservoir, CA* 1990.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

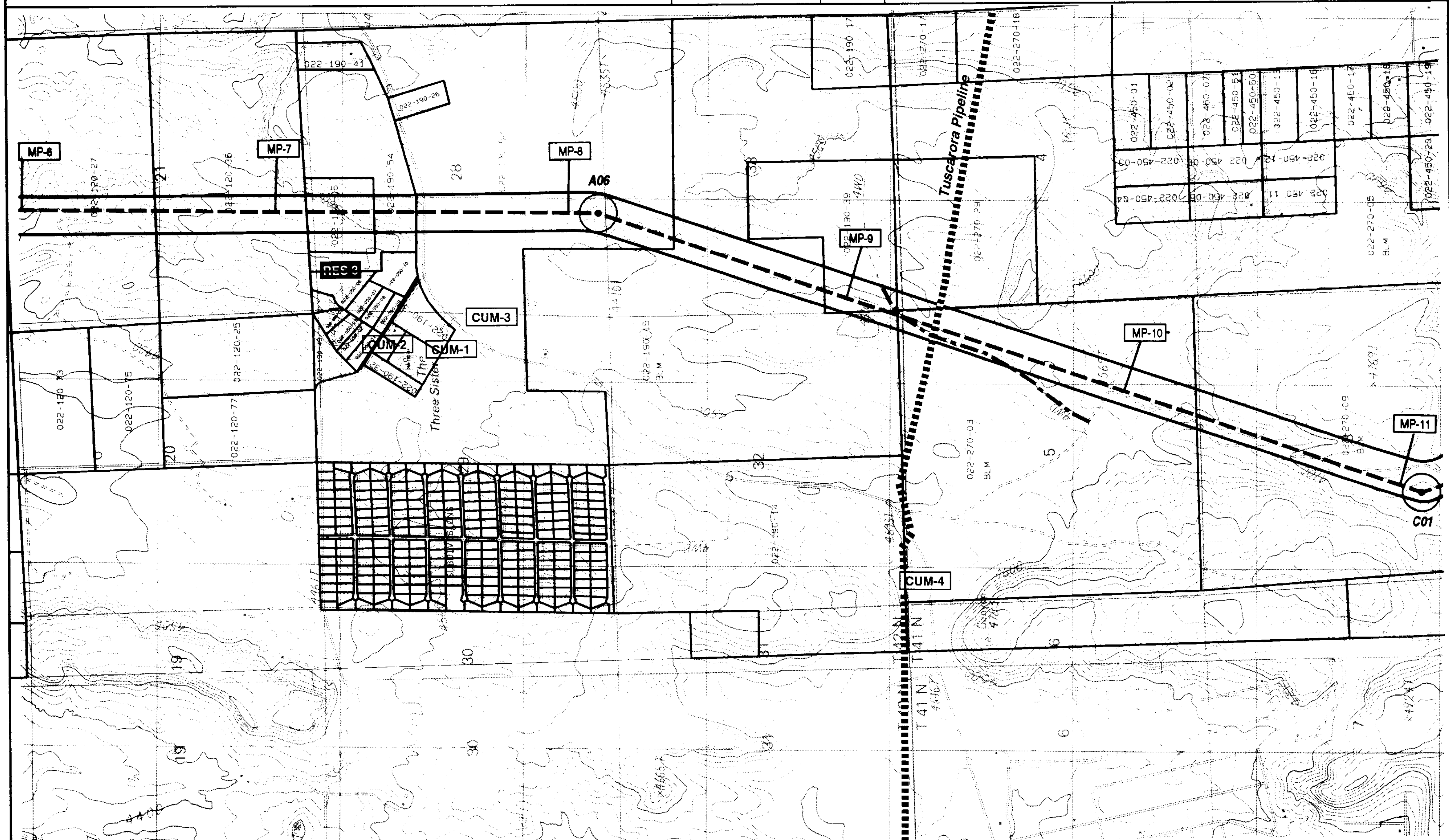
ALTURAS TRANSMISSION LINE EIR/S

Map 1 of 33

Proposed Route

[Segment A]

SENSITIVE SPECIES	East of Corridor / Within Corridor / West of Corridor: DOU; DOU; DOU; DOU; PB, SMV; SMV; HL; HL; HR
SENSITIVE HABITAT	East of Corridor / Within Corridor / West of Corridor: MULE DEER WINTER USE; DEER MIGRATION CORRIDOR; WETLAND
VEGETATION	East of Corridor / Within Corridor / West of Corridor: BIG SAGEBRUSH SCRUB; ALTURAS VOLCANIC GRAVELS; BIG SAGEBRUSH SCRUB; JUNIPER WOODLAND; MONTANE MEADOW; ALTURAS VOLCANIC GRAVELS
GEOLOGY / SOILS	Geologic Formation: Pc; Pc; Pc; Pc; Pc. Soil Association: 118; 151; 109; 151; 118; 194; 151; 109; 128; 194; 128; 193; 194; 193; 118; 150; 118; 193; 118
OVERLAND TRAVEL	Blading / Tree Removal
JURISDICTION	BLM; BLM; BLM



KEY

- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000 Scale in Feet

0 1/2 1 Scale in Miles

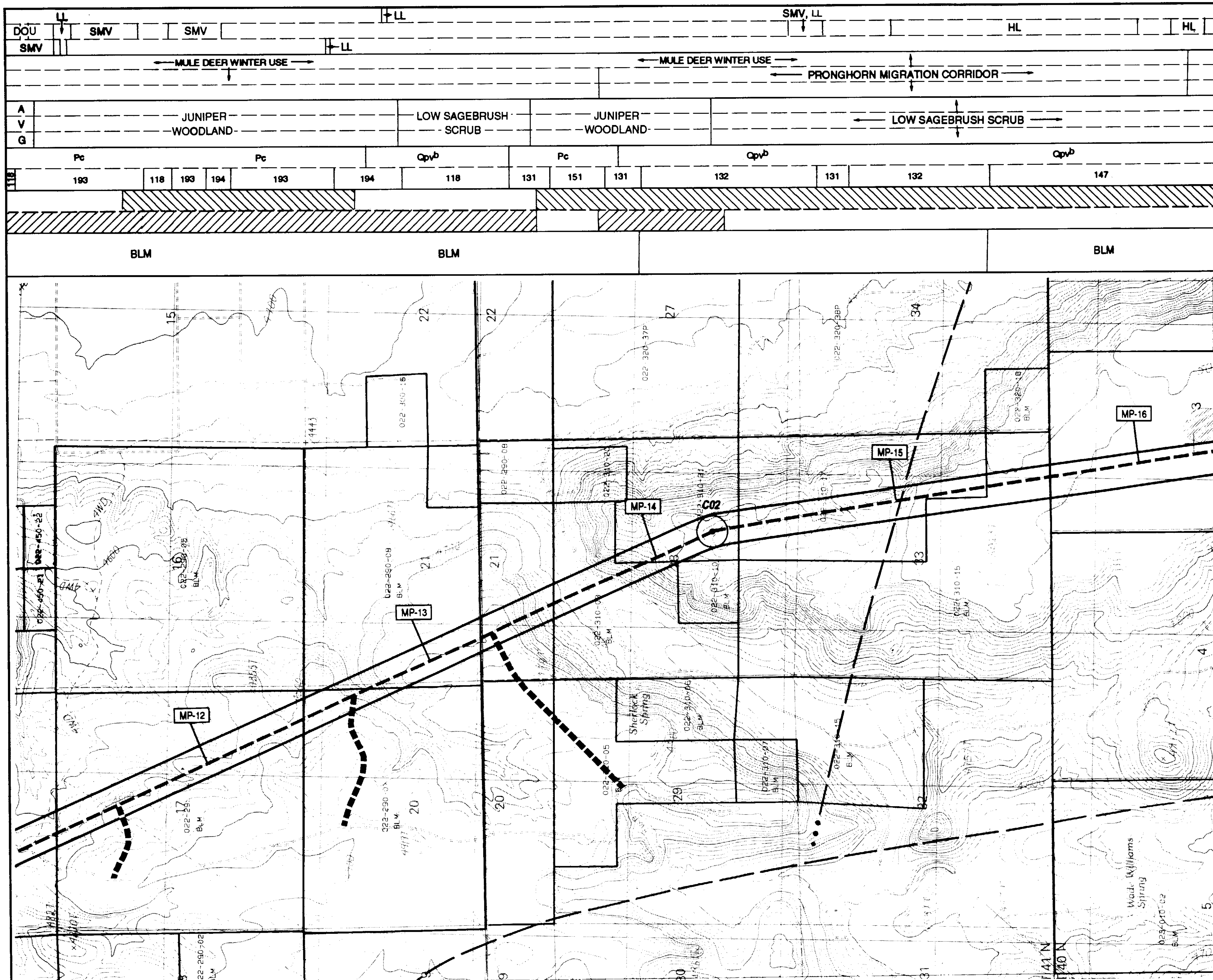
BASEMAP: USGS 7.5 Minute Quadrangle(s): *Alturas, CA 1990; Infernal Caverns, CA 1990.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Proposed Route

[Segment A & C]



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

Scale in Feet: 0, 2000, 4000

Scale in Miles: 0, 1/2, 1

BASEMAP: USGS 7.5 Minute Quadrangle(s): ***Infernal Caverns, CA 1990.***

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

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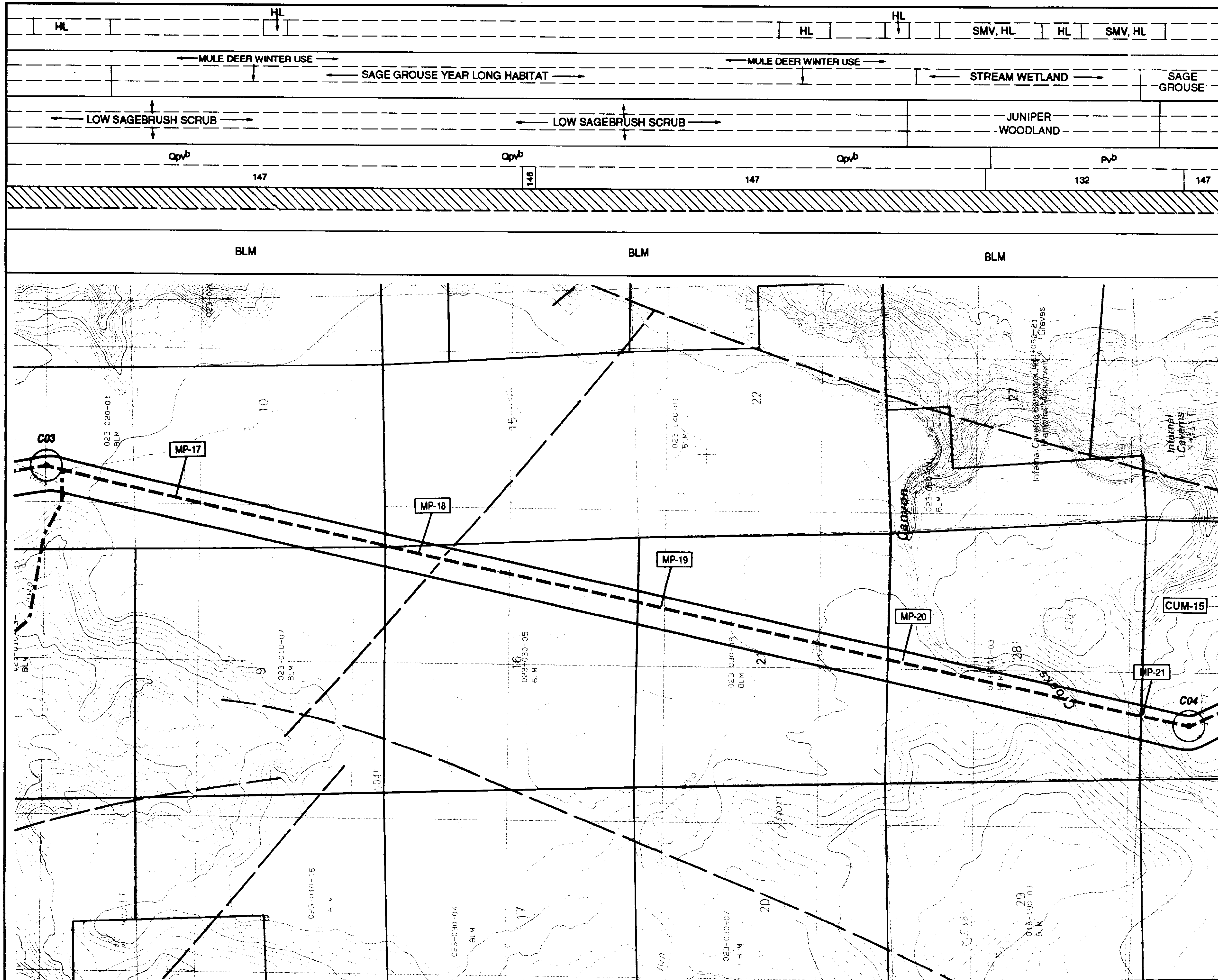
Proposed Route

[Segment C]



East of Corridor
Within Corridor
West of Corridor

SENSITIVE SPECIES

East of Corridor
Within Corridor
West of Corridor

SENSITIVE HABITAT

East of Corridor
Within Corridor
West of Corridor

VEGETATION

Geologic Formation
Soil Association

GEOLOGY / SOILS

Blading
Tree Removal

OVERLAND TRAVEL

JURISDICTION

KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

E
N S
W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Infernal Caverns, CA 1990; Likely, CA 1990.*

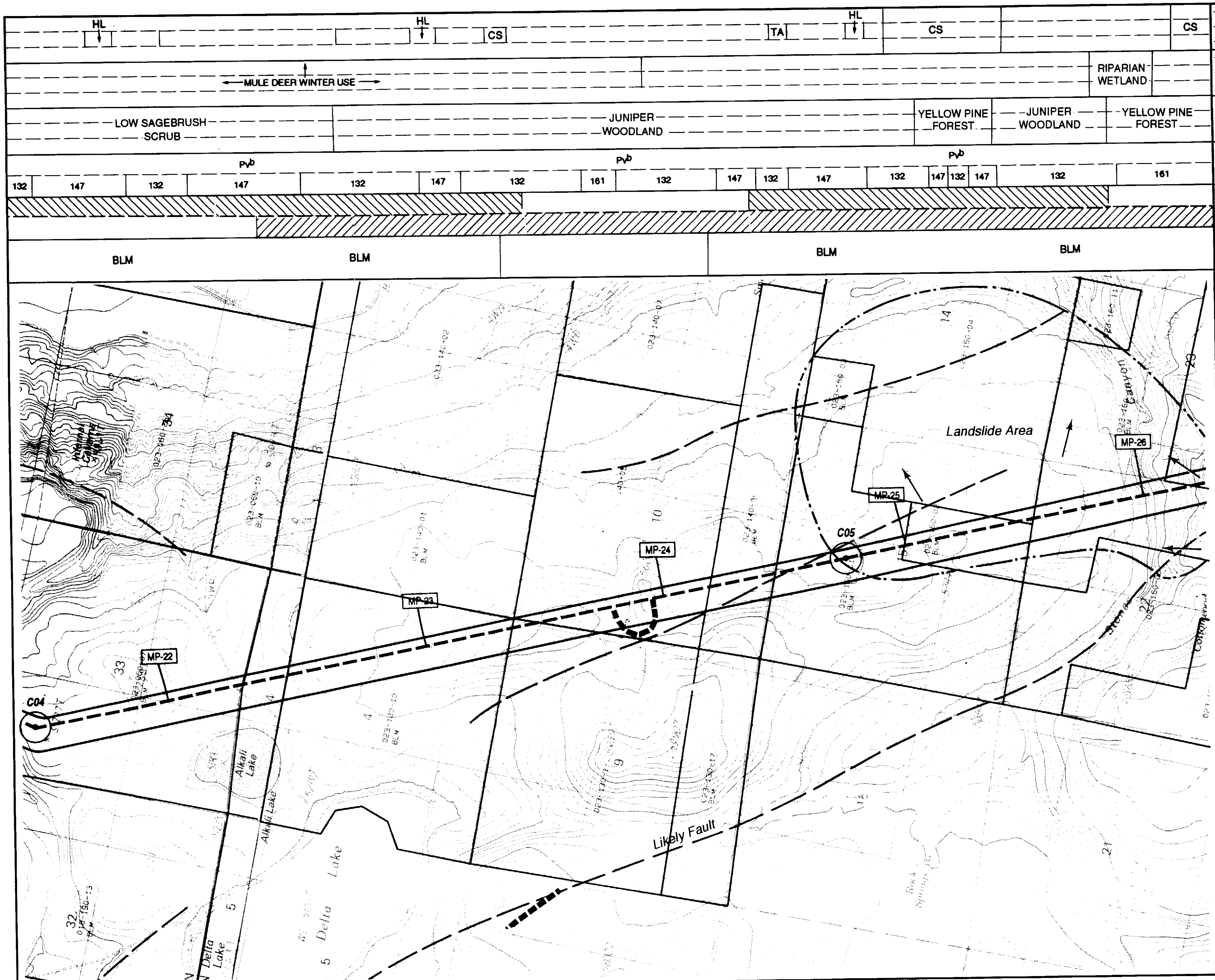
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map 4 of 33

Proposed Route

[Segment C]



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): ***Likely, CA 1990.***

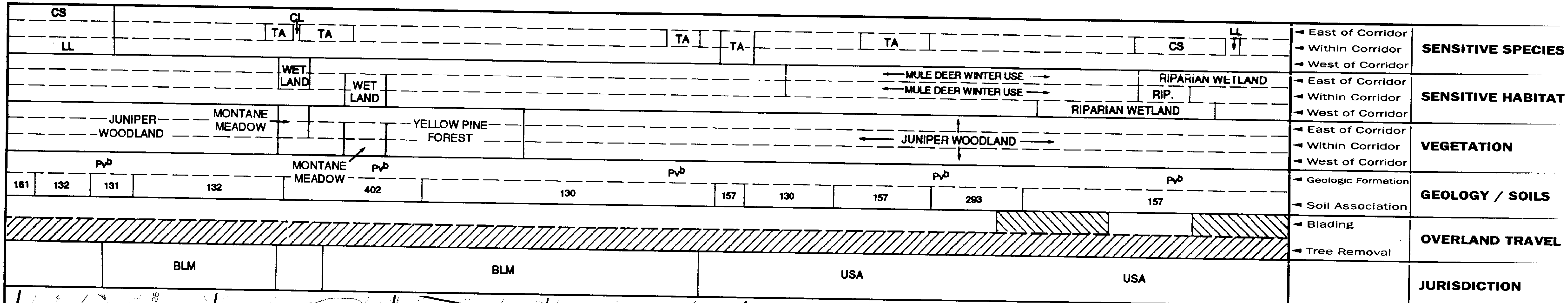
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

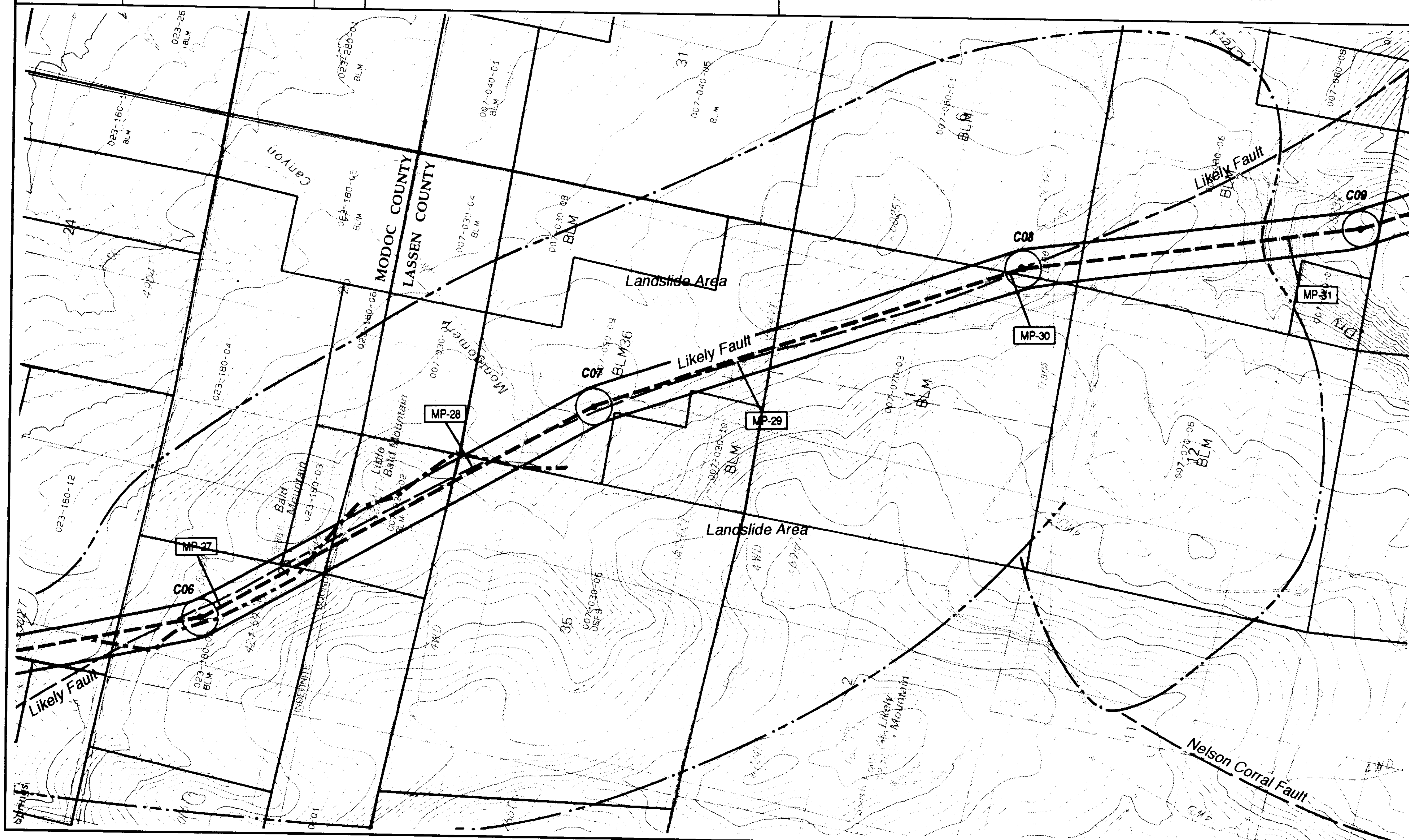
ALTURAS TRANSMISSION LINE EIR/S

Map 5 of 33

Proposed Route

[Segment C]





KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Holbrook Canyon, CA 1990, Likely, CA 1990, Madeline, CA 1975.*

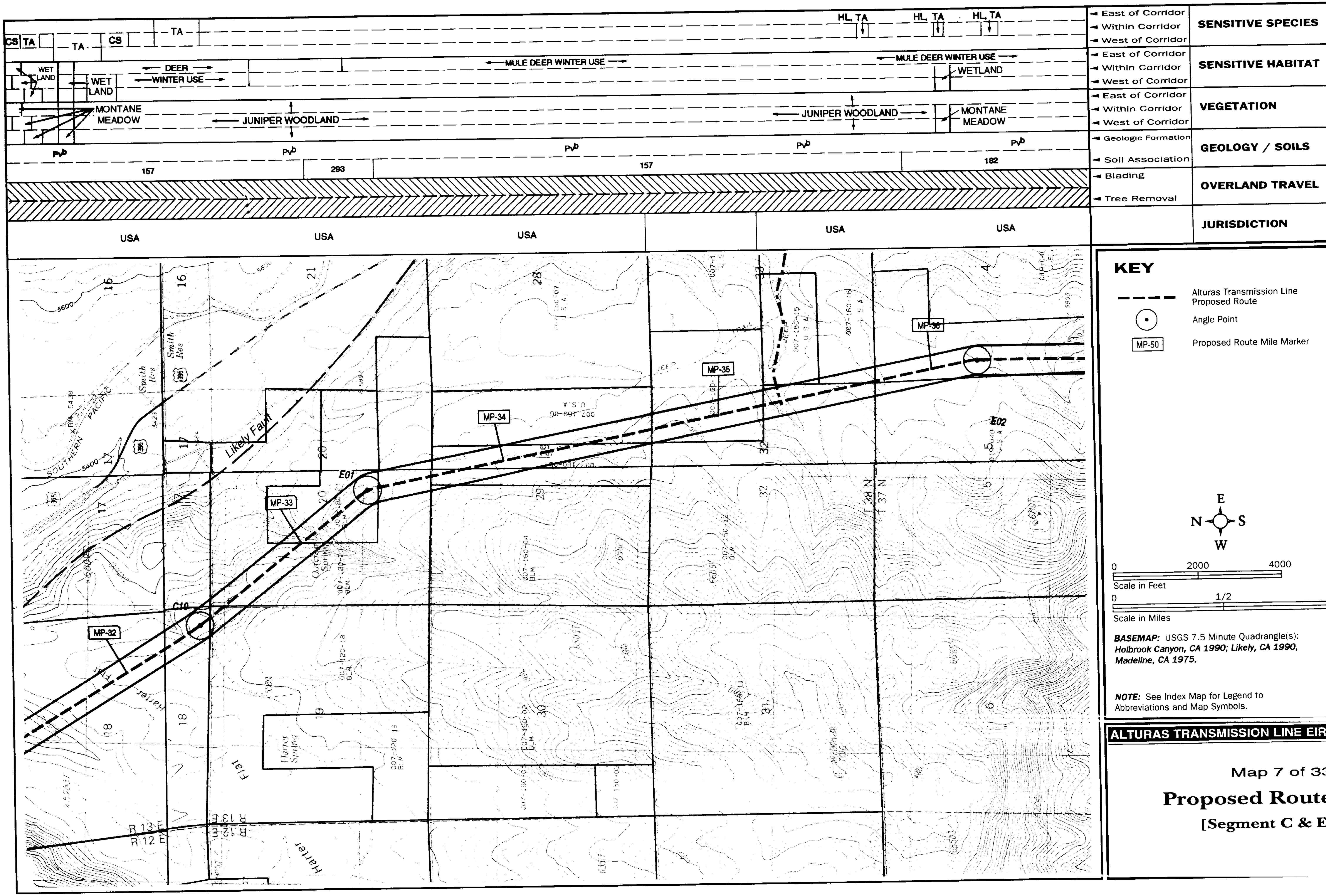
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

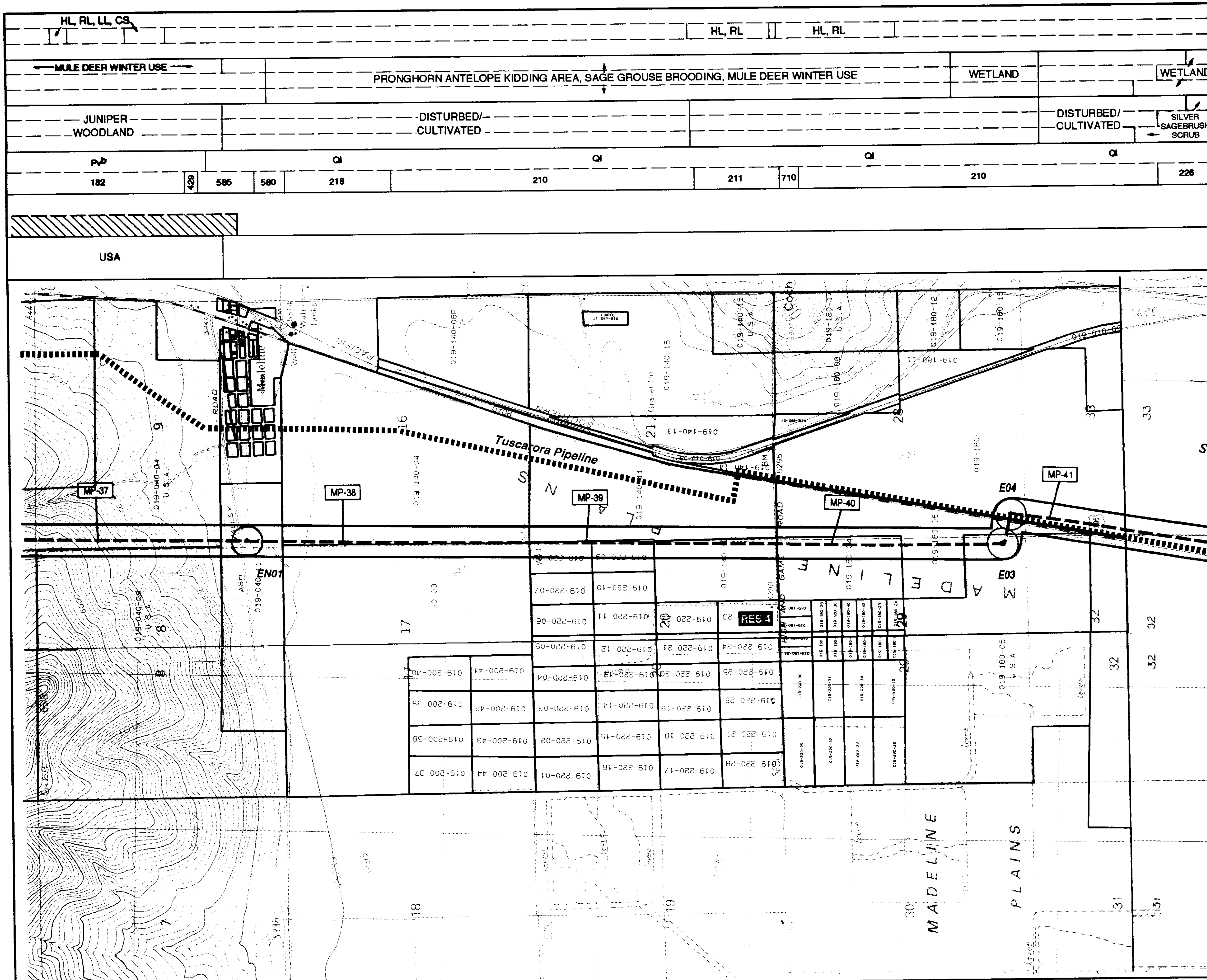
ALTURAS TRANSMISSION LINE EIR/S

Map 6 of 33

Proposed Route

[Segment C]


SENSITIVE SPECIES
SENSITIVE HABITAT
VEGETATION
GEOLOGY / SOILS
OVERLAND TRAVEL
JURISDICTION
East of Corridor
Within Corridor
West of Corridor
Geologic Formation
Soil Association
Blading
Tree Removal
CS TA TA CS TA
HL, TA HL, TA HL, TA
WET LAND
WET LAND
DEER WINTER USE
MULE DEER WINTER USE
MULE DEER WINTER USE
WETLAND
MONTANE MEADOW
JUNIPER WOODLAND
JUNIPER WOODLAND
MONTANE MEADOW
Pvb
157 293 157 182
USA USA USA USA USA
KEY
Alturas Transmission Line Proposed Route
Angle Point
MP-50
Proposed Route Mile Marker
E N S W
0 2000 4000
Scale in Feet
0 1/2 1
Scale in Miles
BASEMAP: USGS 7.5 Minute Quadrangle(s): Holbrook Canyon, CA 1990; Likely, CA 1990, Madeline, CA 1975.
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.
ALTURAS TRANSMISSION LINE EIR/S
Map 7 of 33
Proposed Route
[Segment C & E]
MP-32
MP-33
MP-34
MP-35
MP-36
C10
E01
E02
Likely Fault
SOUTHERN PACIFIC
Smith Res
Harter Flat
R 13 E
R 12 E
T 38 N
T 37 N
JEEP TRAIL



East of Corridor / Within Corridor / West of Corridor	SENSITIVE SPECIES
East of Corridor / Within Corridor / West of Corridor	SENSITIVE HABITAT
East of Corridor / Within Corridor / West of Corridor	VEGETATION
Geologic Formation / Soil Association	GEOLOGY / SOILS
Blading / Tree Removal	OVERLAND TRAVEL
	JURISDICTION

KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Anderson Mountain, CA 1989; Holbrook Canyon, CA 1990; Madeline, CA 1975; McDonald Peak, CA 1989.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

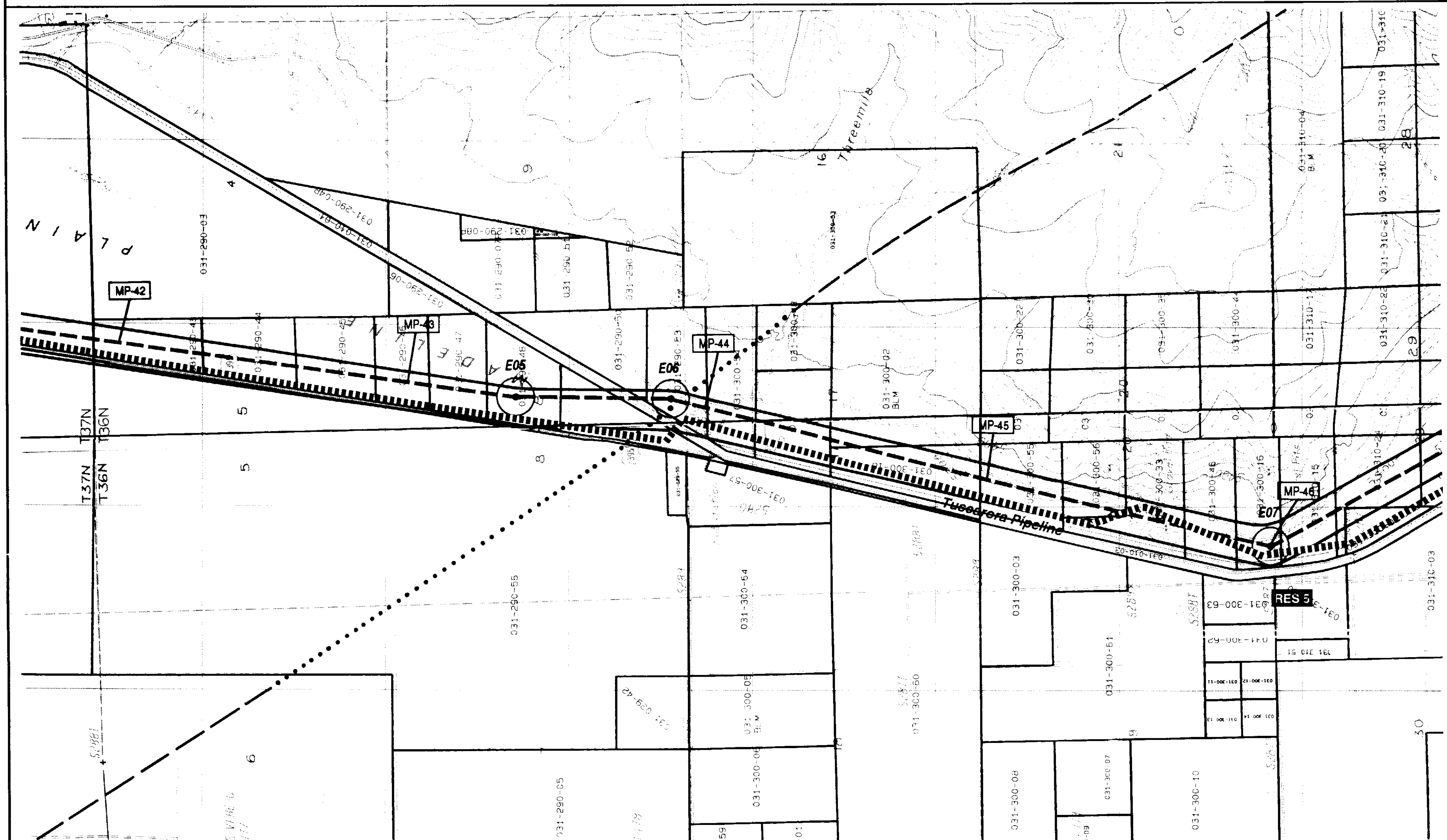
ALTURAS TRANSMISSION LINE EIR/S

Map 8 of 33

Proposed Route

[Segment E]

BIG GAME USE AREA / WETLANDS; PRONGHORN SUMMER RANGE; PRONGHORN SUMMER RANGE	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
SILVER SAGEBRUSH SCRUB; BIG SAGEBRUSH SCRUB	East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Ql, Ql, Qtg, Ql, Ttwl, Ql, Ql	Geologic Formation	**GEOLOGY / SOILS**
226, 210, 710, 585, 210, 585, 430, 585, 710	Soil Association	
	Blading / Tree Removal	**OVERLAND TRAVEL**
		JURISDICTION



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N S E W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Anderson Mountain, CA 1989; McDonald Peak, CA 1989.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

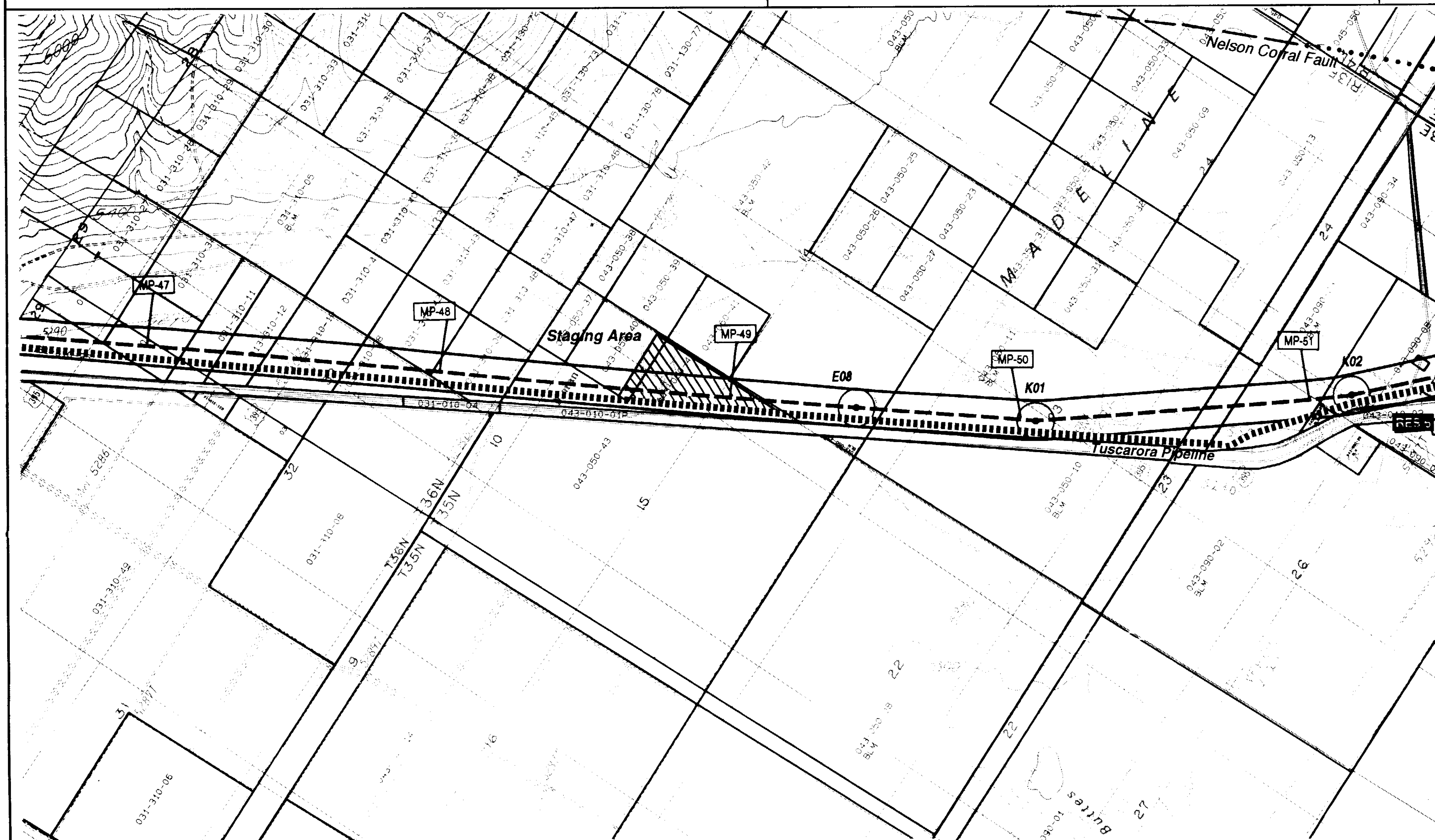
ALTURAS TRANSMISSION LINE EIR/S

Map 9 of 33

Proposed Route

[Segment E]

SENSITIVE SPECIES	East of Corridor / Within Corridor / West of Corridor	HL, RL; HL, RL; VD; VD; PL; PL; PL
SENSITIVE HABITAT	East of Corridor / Within Corridor / West of Corridor	PRONGHORN SUMMER RANGE, MULE DEER MIGRATION AREA; PRONGHORN SUMMER RANGE
VEGETATION	East of Corridor / Within Corridor / West of Corridor	BIG SAGEBRUSH SCRUB; BIG SAGEBRUSH SCRUB
GEOLOGY / SOILS	Geologic Formation	Ql; Ql; Ql; Ql; Tdrb; Ql
	Soil Association	710; 210; 710; 585
OVERLAND TRAVEL	Blading / Tree Removal	
JURISDICTION		USA; USA; USA



KEY

- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Proposed Route Mile Marker

Scale in Feet: 0, 2000, 4000

Scale in Miles: 0, 1/2, 1

BASEMAP: USGS 7.5 Minute Quadrangle(s): ***Anderson Mountain, CA 1989; Cleghorn Flat, CA 1989; McDonald Peak, CA 1989; Termo, CA 1989.***

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

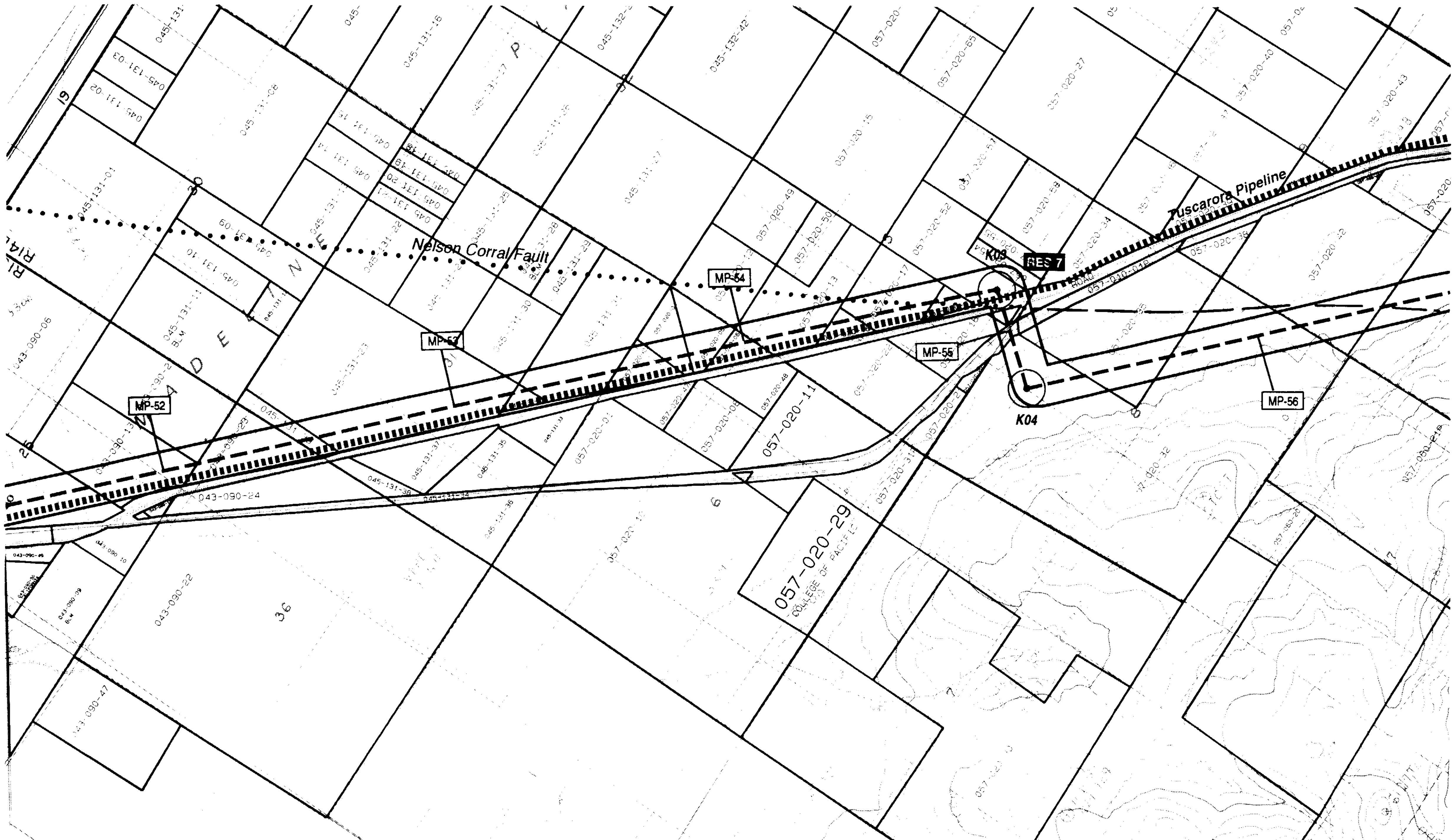
ALTURAS TRANSMISSION LINE EIR/S

Map 10 of 33

Proposed Route

[Segment E & K]

◄ East of Corridor / ◄ Within Corridor / ◄ West of Corridor	HL, RL	CLB	HL, RL		**SENSITIVE SPECIES**
◄ East of Corridor / ◄ Within Corridor / ◄ West of Corridor	PRONGHORN SUMMER RANGE	WETLAND	PRONGHORN SUMMER RANGE	PRONGHORN SUMMER RANGE	**SENSITIVE HABITAT**
◄ East of Corridor / ◄ Within Corridor / ◄ West of Corridor	BIG SAGEBRUSH SCRUB	SILVER SAGEBRUSH SCRUB		BIG SAGEBRUSH SCRUB	**VEGETATION**
◄ Geologic Formation	Ql	Ql	Ql Ql	Tfpr	**GEOLOGY / SOILS**
◄ Soil Association	585 210 710 210 710	210		495	
◄ Blading / ◄ Tree Removal					**OVERLAND TRAVEL**
					JURISDICTION



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *McDonald Peak, CA 1989; Termo, CA 1989.*

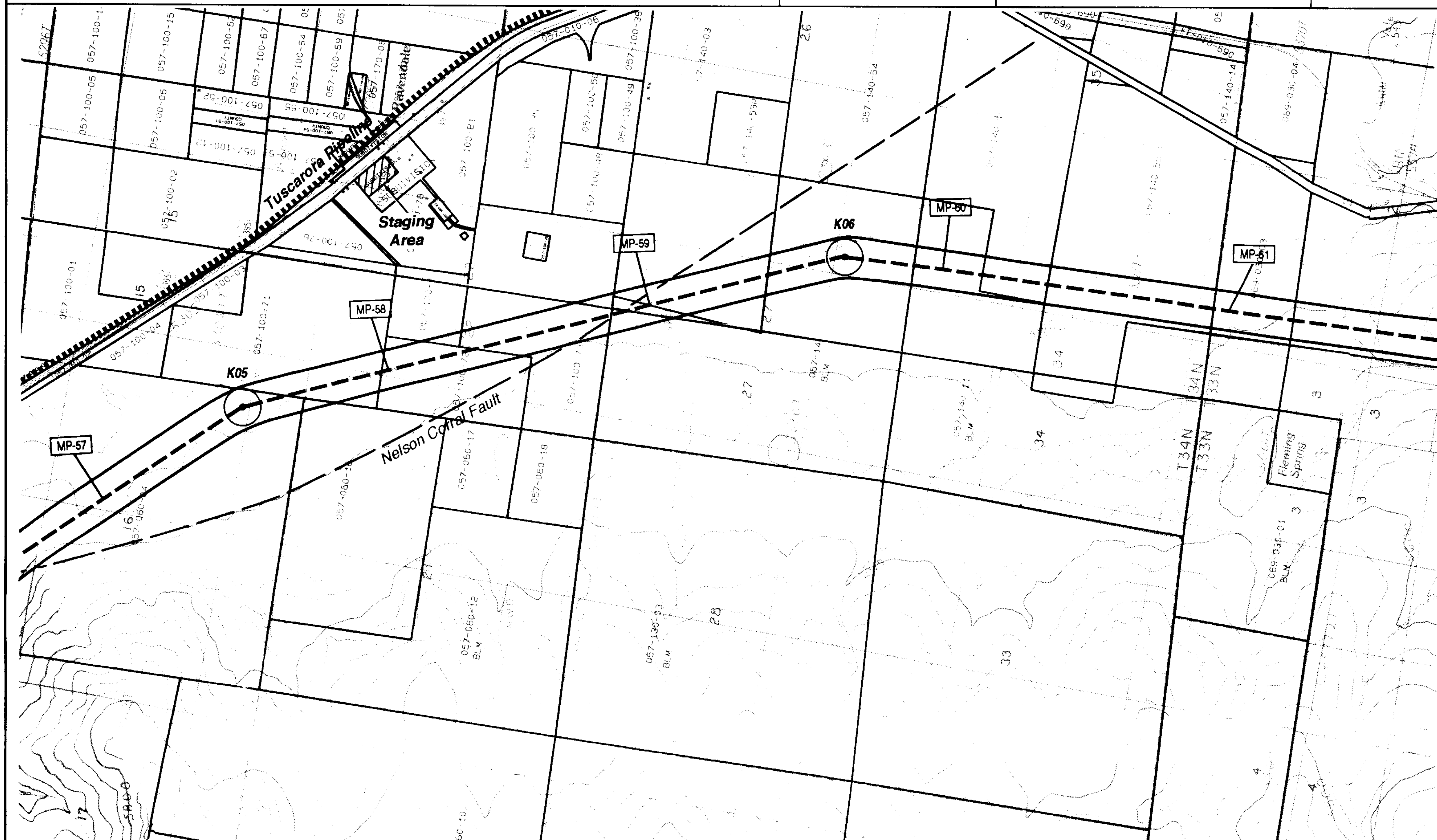
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Proposed Route

[Segment K]

	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
PRONGHORN SUMMER RANGE; PRONGHORN SUMMER RANGE	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
BIG SAGEBRUSH SCRUB; BIG SAGEBRUSH SCRUB	East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Tfpr; Tfpr; Tfpr; Tfpr; Twra	Geologic Formation	**GEOLOGY / SOILS**
405; 210; 495; 588; 495; 304	Soil Association	
	Blading / Tree Removal	**OVERLAND TRAVEL**
BLM; BLM		**JURISDICTION**



KEY

- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Ravendale, CA 1989; Snowstorm Mountain, CA 1989; Snowstorm Mountain West, CA 1989; Termo, CA 1989.*

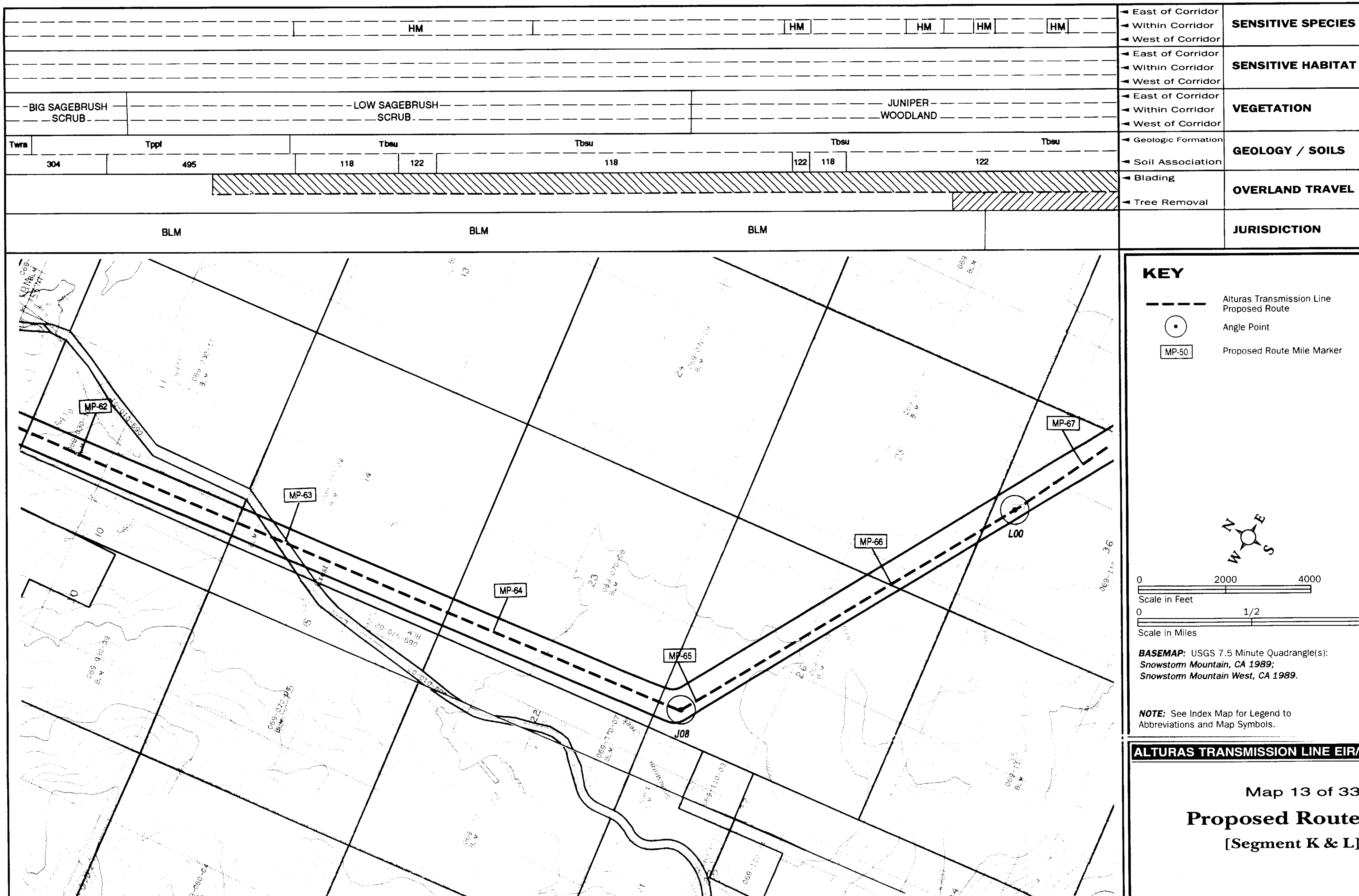
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map 12 of 33

Proposed Route

[Segment K]

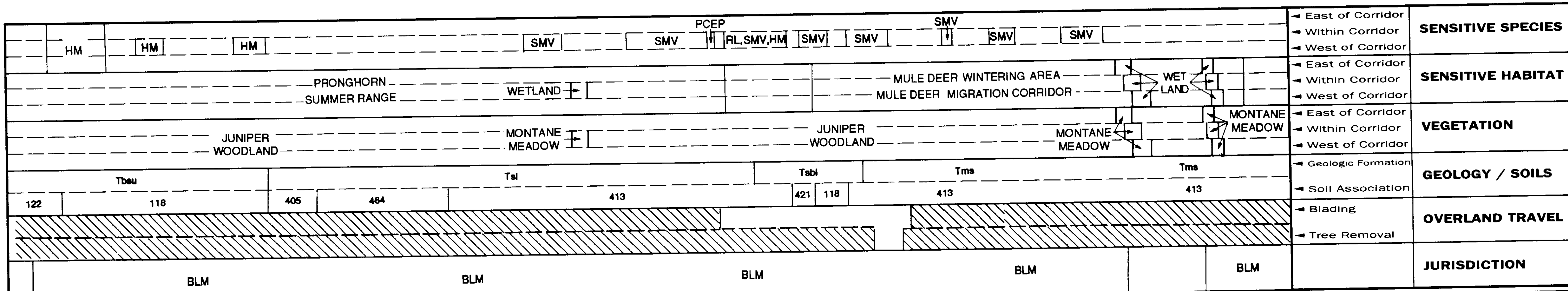


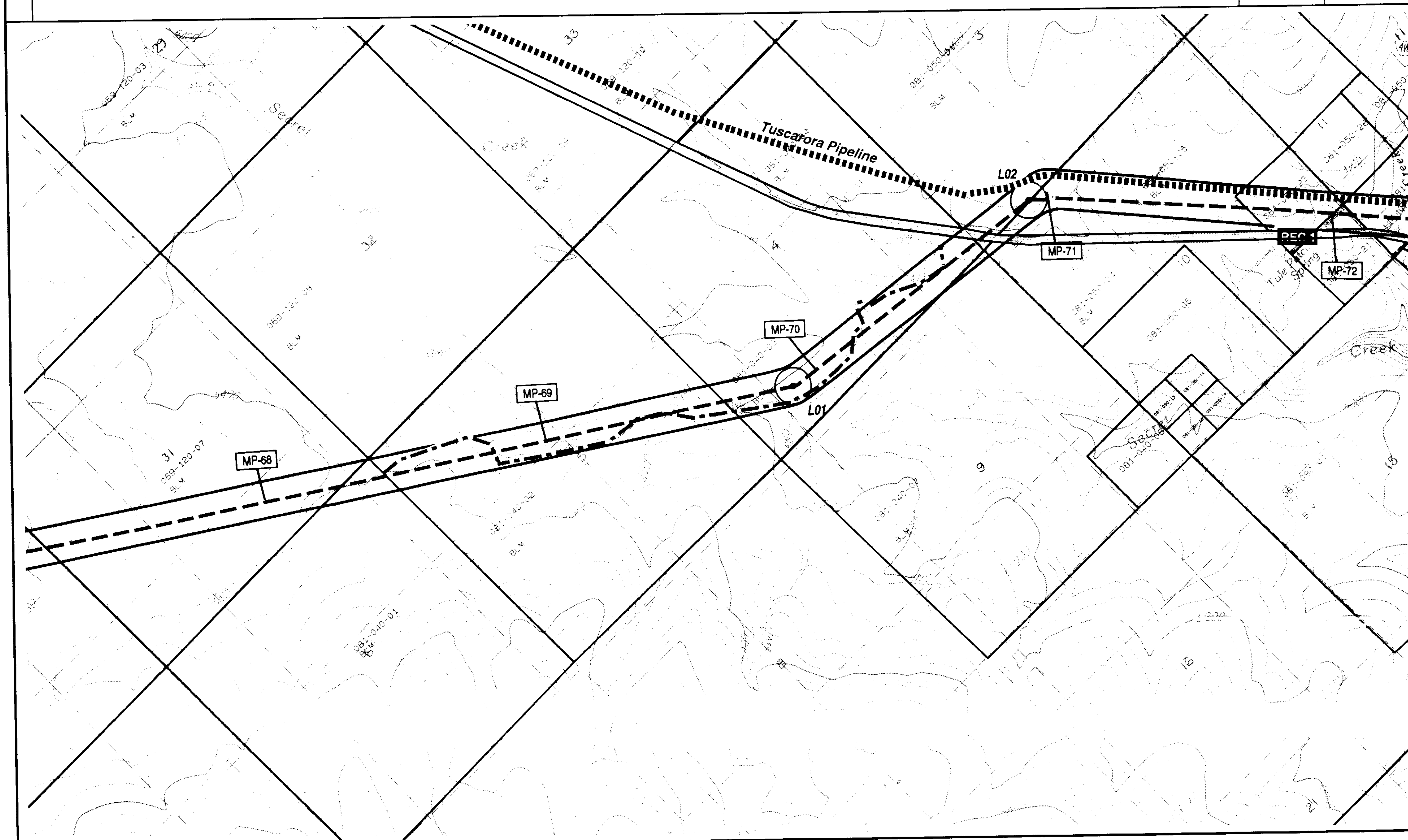
ALTURAS TRANSMISSION LINE EIR/S

Map 13 of 33

Proposed Route

[Segment K & L]





KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Five Springs, CA 1989; Karlo, CA 1989; Snowstorm Mountain, CA 1989; Snowstorm Mountain West, CA 1989.*

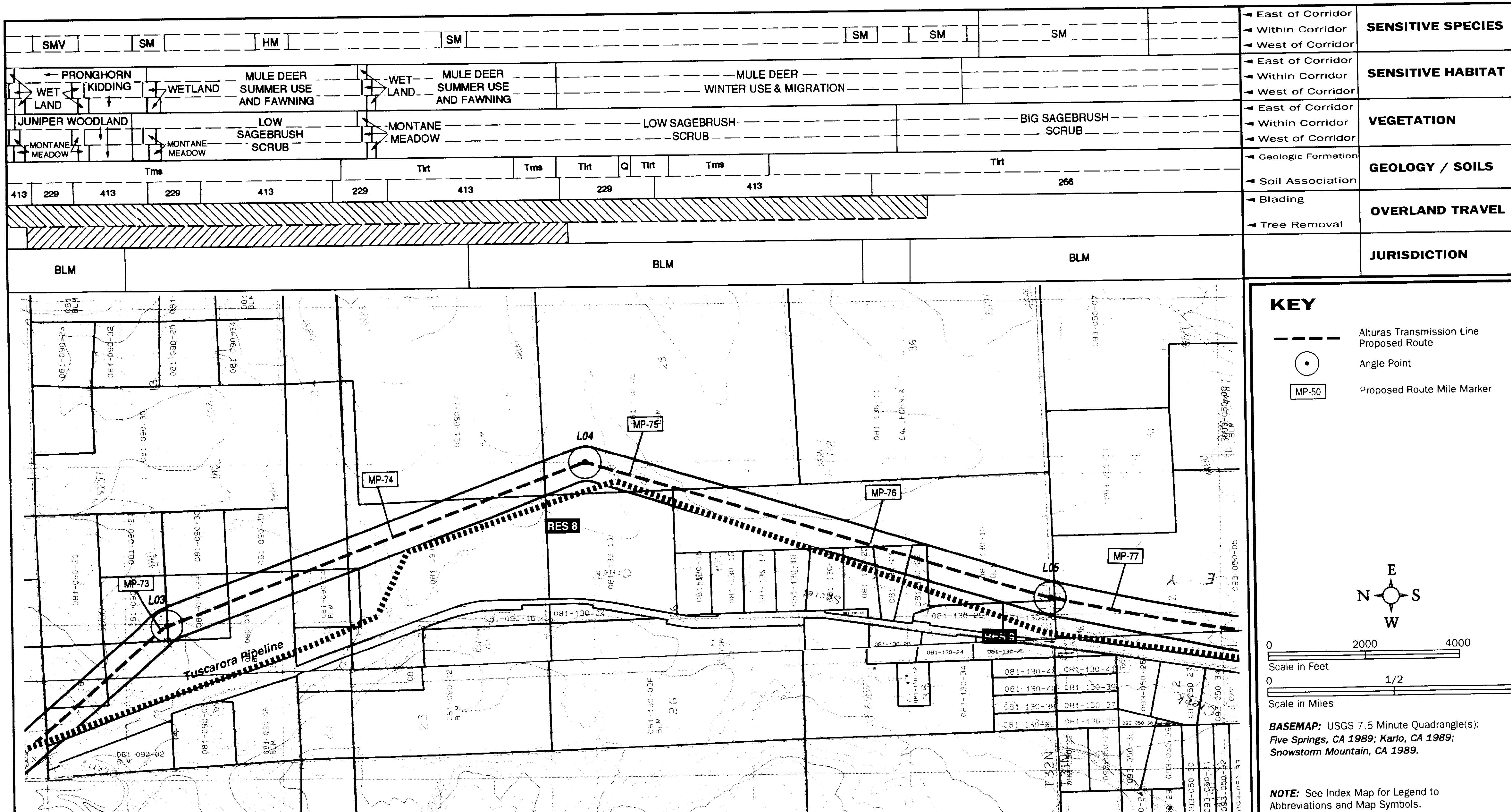
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map 14 of 33

Proposed Route

[Segment L]

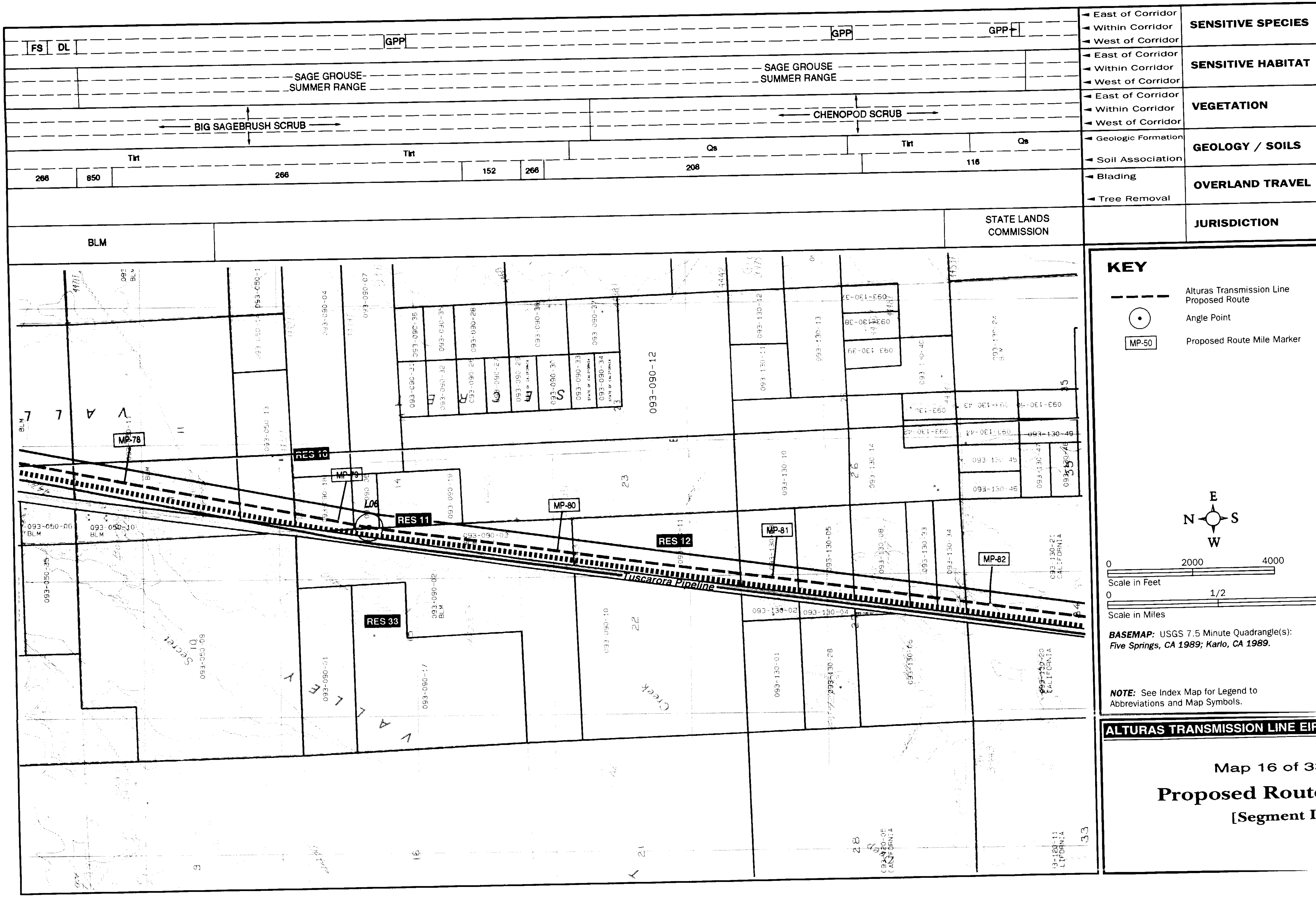


ALTURAS TRANSMISSION LINE EIR/S

Map 15 of 33

Proposed Route

[Segment L]



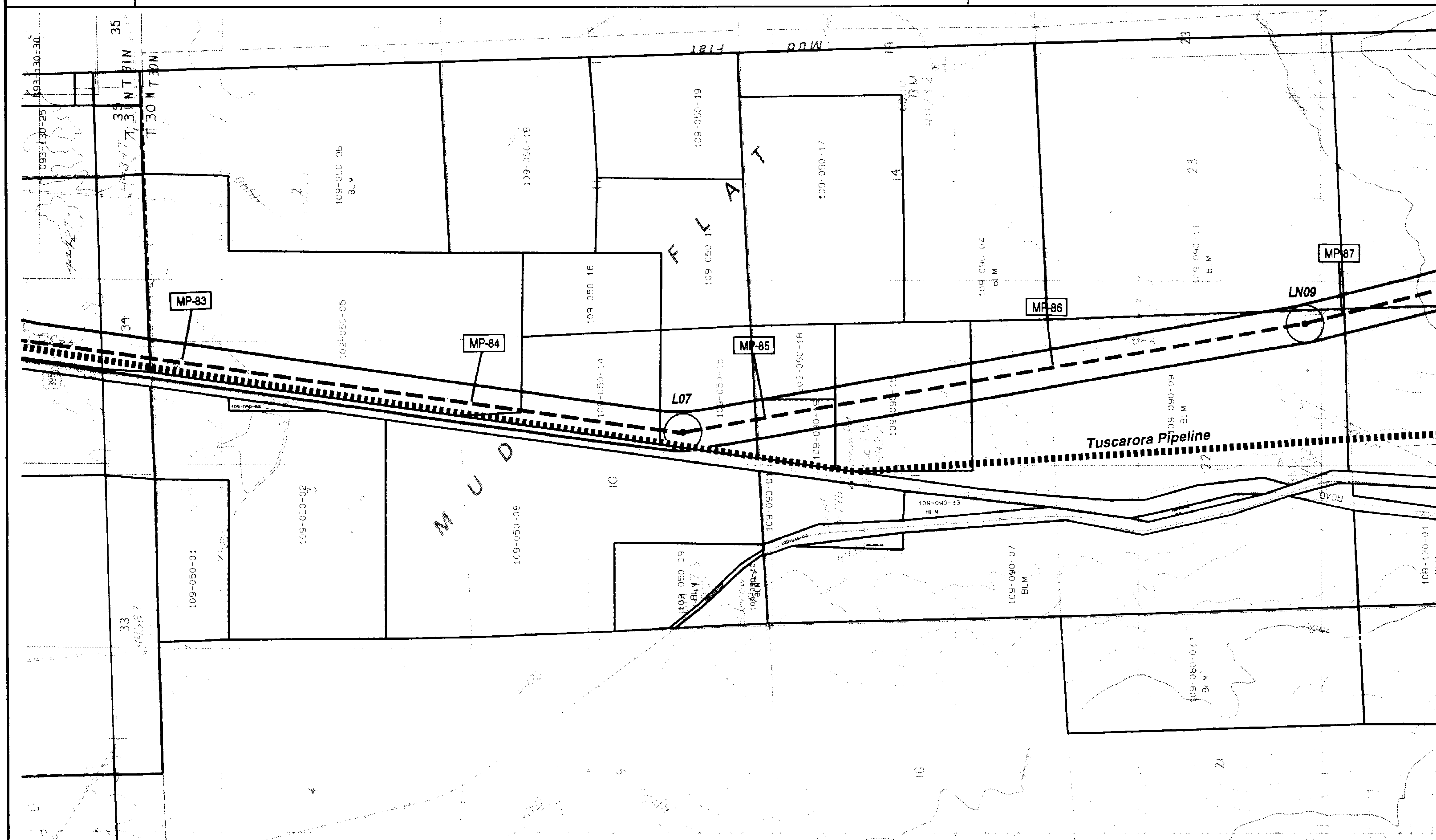
ALTURAS TRANSMISSION LINE EIR/S

Map 16 of 33

Proposed Route

[Segment L]

SENSITIVE SPECIES (East of Corridor / Within Corridor / West of Corridor)	SM; SM
SENSITIVE HABITAT (East of Corridor / Within Corridor / West of Corridor)	PRONGHORN ANTELOPE KIDDING & YEAR LONG USE AREA
VEGETATION (East of Corridor / Within Corridor / West of Corridor)	CHENOPOD SCRUB; MUD FLAT; LOW SAGEBRUSH SCRUB
GEOLOGY / SOILS – Geologic Formation	Qs; Tlrt; Qhl; Tlrt; Tvb; Tvsa
GEOLOGY / SOILS – Soil Association	116; 144; 205; 210; 185; 135; 177; 186
OVERLAND TRAVEL (Blading / Tree Removal)	
JURISDICTION	S.L.C.; BLM; BLM



KEY

- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Proposed Route Mile Marker

E N S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Five Springs, CA 1989; Karlo, CA 1989, Little Mud Flat, CA 1988; Shaffer Mountain, CA 1988.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

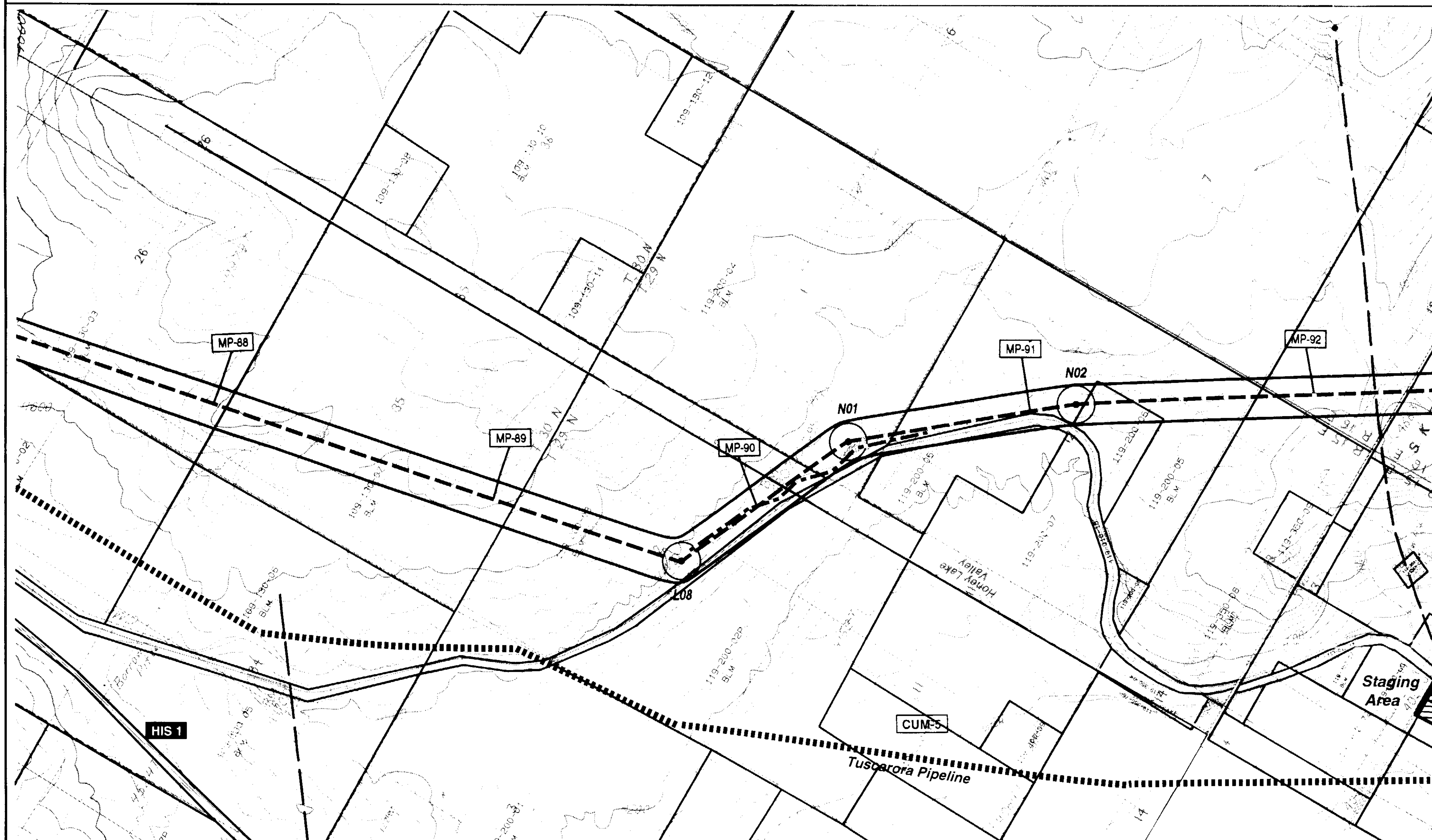
ALTURAS TRANSMISSION LINE EIR/S

Map 17 of 33

Proposed Route

[Segment L]

SENSITIVE SPECIES (East of Corridor / Within Corridor / West of Corridor)	SM — SM — SM
SENSITIVE HABITAT (East of Corridor / Within Corridor / West of Corridor)	PRONGHORN KIDDING, YEAR LONG USE AREA — PRONGHORN WINTER USE AREA
VEGETATION (East of Corridor / Within Corridor / West of Corridor)	LOW SAGEBRUSH SCRUB — BIG SAGEBRUSH SCRUB — CHENOPOD SCRUB — DISTURBED/ CULTIVATED
GEOLOGY / SOILS — Geologic Formation	Tvsa — Tvsa — Twa — Qlg — Twa
GEOLOGY / SOILS — Soil Association	185 — 186 — 185 — 380 — 185 — 310 — 125 — 185 — 125 — 185
OVERLAND TRAVEL (Blading / Tree Removal)	
JURISDICTION	BLM — BLM — BLM



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): ***Little Mud Flat, CA 1988; Shaffer Mountain, CA 1988; Wendel, CA 1988; Wendel Hot Springs, CA 1988;***

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

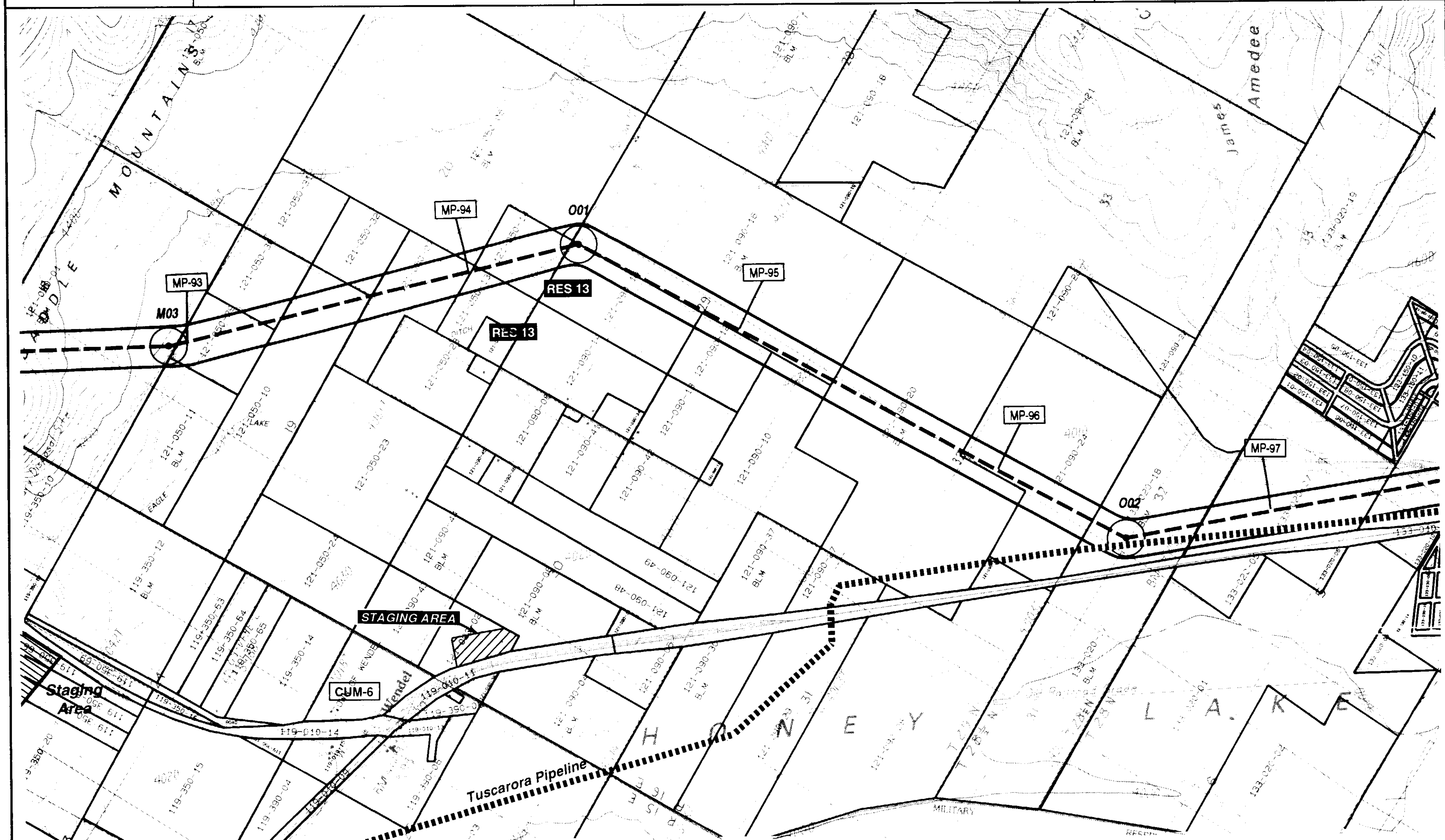
ALTURAS TRANSMISSION LINE EIR/S

Map 18 of 33

Proposed Route

[Segment L & N]

NEP · NEP	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
PRONGHORN WINTERING	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
DISTURBED/CULTIVATED · STABILIZED/PARTIALLY STABILIZED DUNES · CHENOPOD SCRUB · CHENOPOD SCRUB · ALKALI MEADOW · CHENOPOD SCRUB	East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Twa · Ql · Qd · Ql · Ql · Ql · Qle · Ql	Geologic Formation	**GEOLOGY / SOILS**
185 · 310 · 380 · 365 · 360 · 290 · 360	Soil Association	
	Blading / Tree Removal	**OVERLAND TRAVEL**
BLM · BLM · BLM · BLM		**JURISDICTION**



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Little Mud Flat, CA 1988; Wendel, CA 1988.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

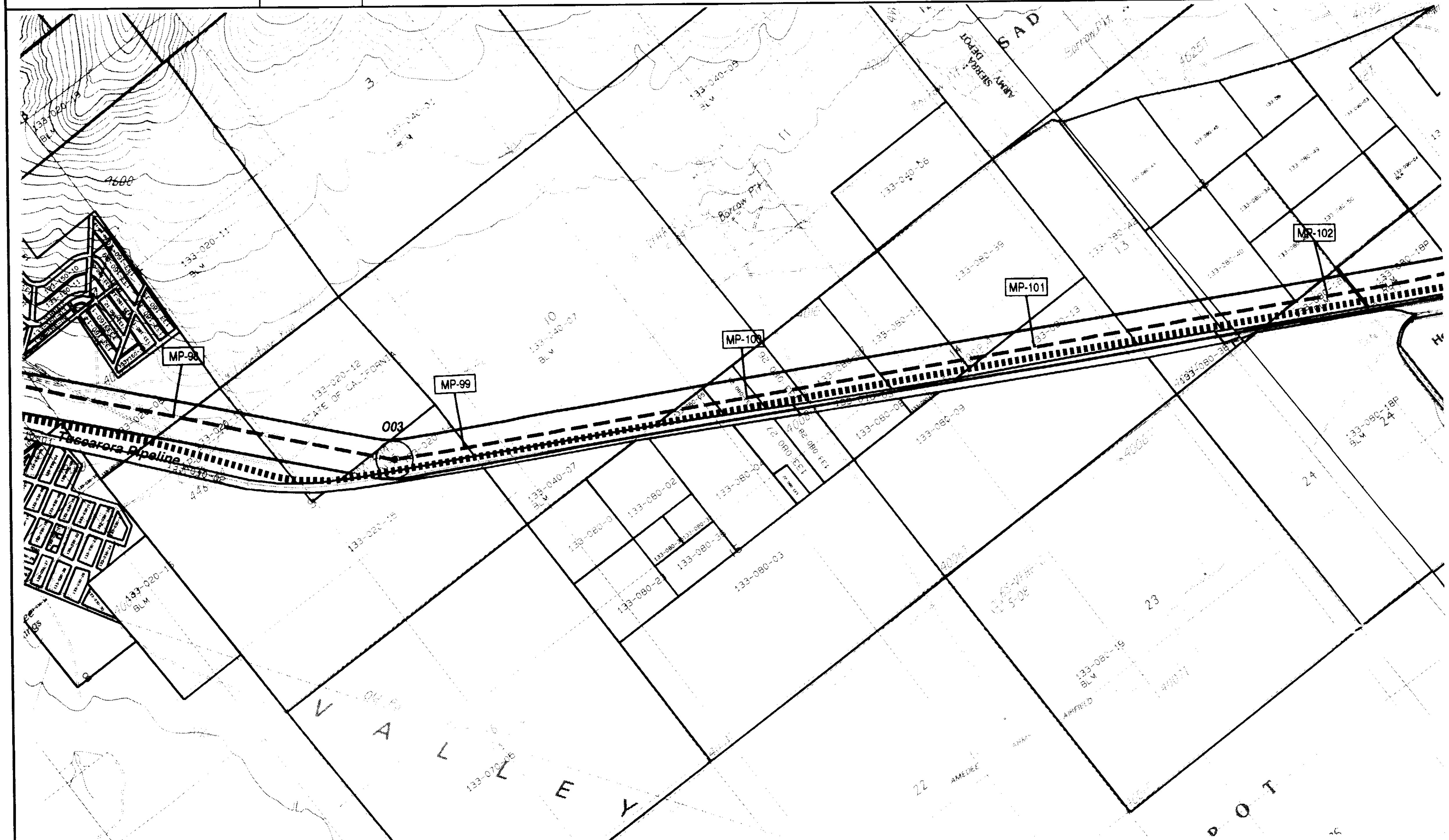
ALTURAS TRANSMISSION LINE EIR/S

Map 19 of 33

Proposed Route

[Segment N & O]

SENSITIVE SPECIES	East of Corridor	
	Within Corridor	
	West of Corridor	
SENSITIVE HABITAT	East of Corridor	
	Within Corridor	
	West of Corridor	
VEGETATION	East of Corridor	
	Within Corridor	CHENOPOD SCRUB; CHENOPOD SCRUB
	West of Corridor	
GEOLOGY / SOILS	Geologic Formation	Ql; Ql; Ql; Qle; Qle; Qle
	Soil Association	360; 380; 360; 361; 360; 325; 330
OVERLAND TRAVEL	Blading	
	Tree Removal	
JURISDICTION		STATE OF CALIFORNIA; BLM



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Spencer Creek, CA 1988; Wendel, CA 1988.*

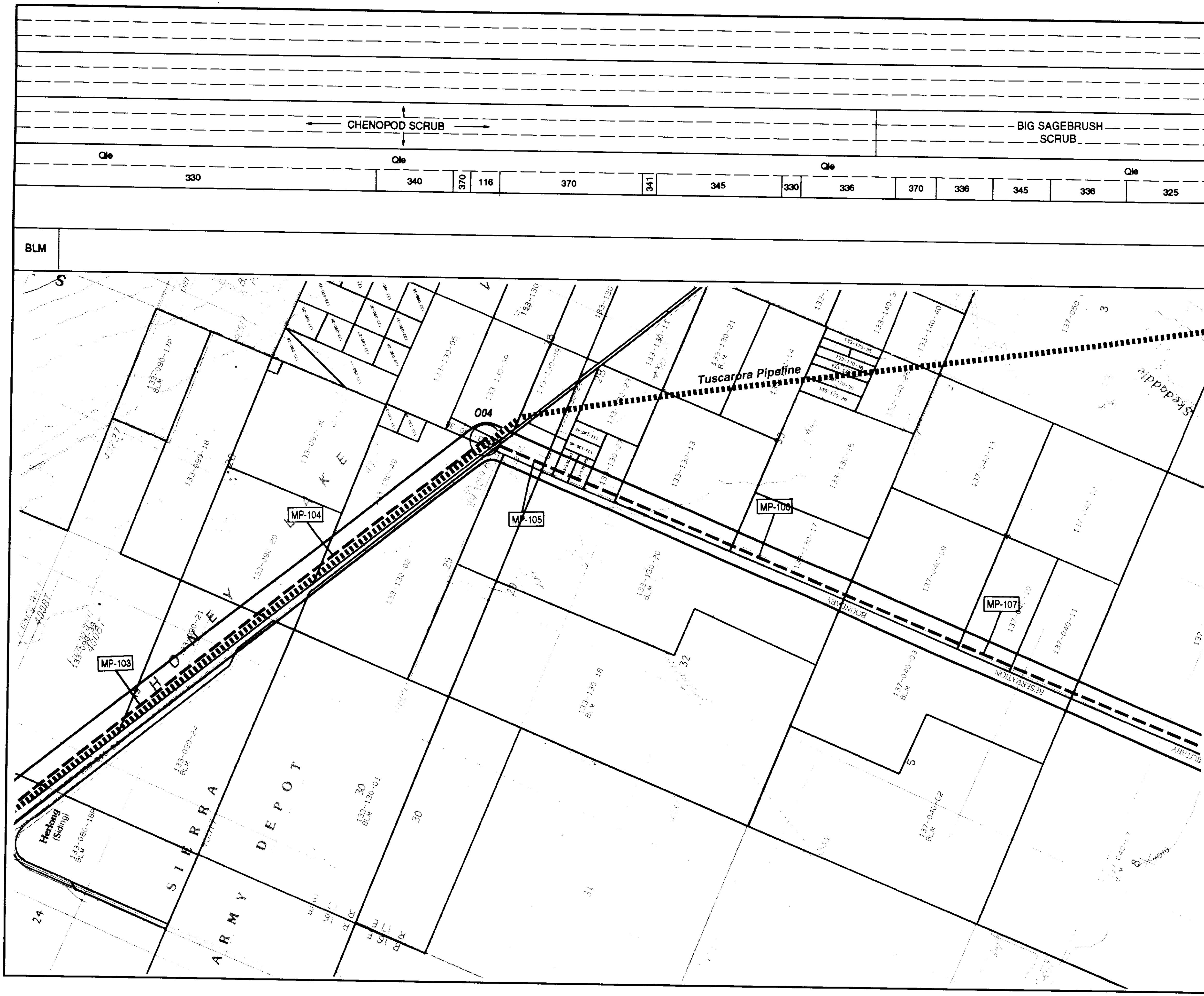
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map 20 of 33

Proposed Route

[Segment O]



East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Geologic Formation / Soil Association	**GEOLOGY / SOILS**
Blading / Tree Removal	**OVERLAND TRAVEL**
	JURISDICTION

KEY

- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Proposed Route Mile Marker

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s):
Calneva Lake, CA 1988;
Spencer Creek, CA 1988.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

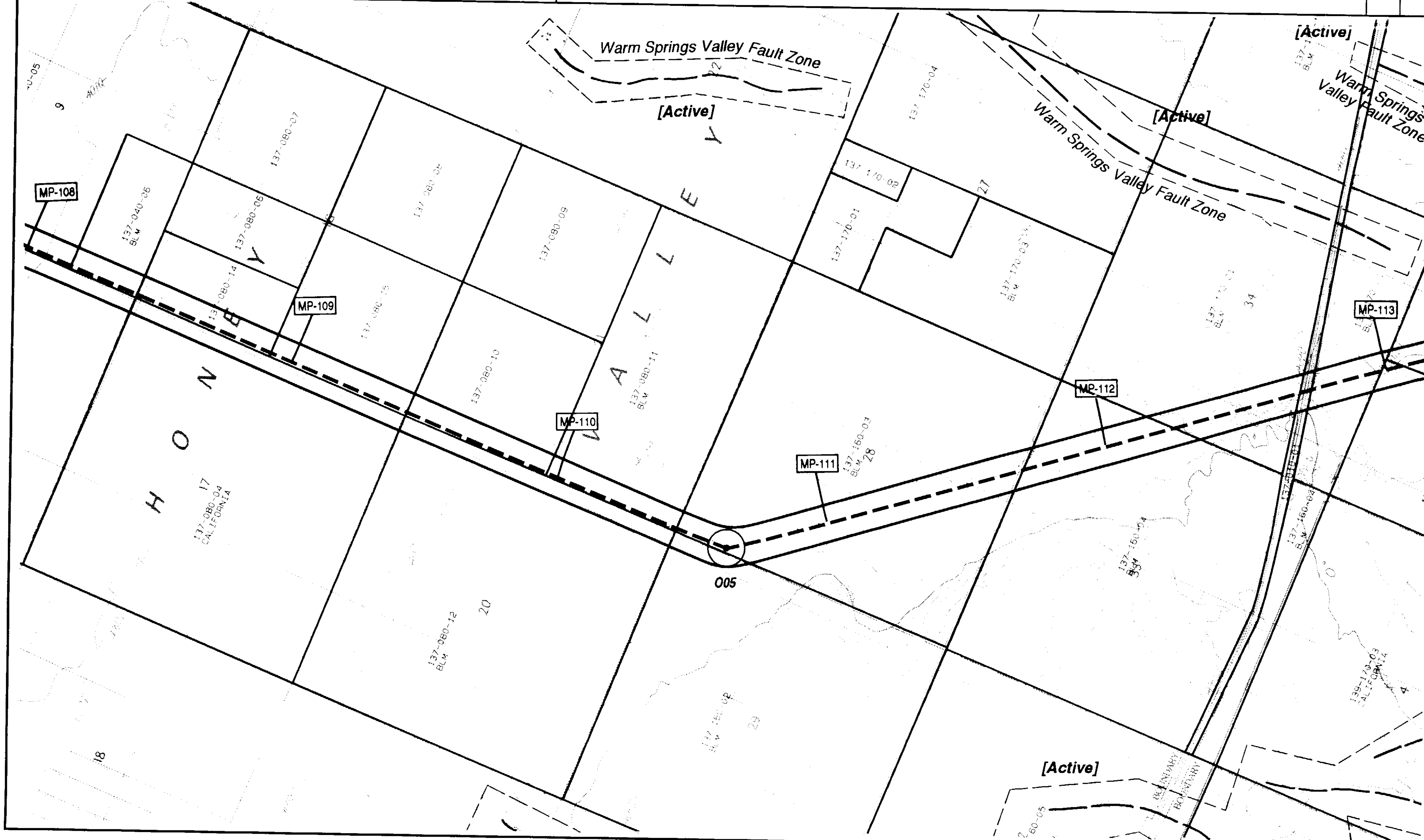
ALTURAS TRANSMISSION LINE EIR/S

Map 21 of 33

Proposed Route

[Segment O]

LLSP	◄ East of Corridor / ◄ Within Corridor / ◄ West of Corridor — **SENSITIVE SPECIES**
	◄ East of Corridor / ◄ Within Corridor / ◄ West of Corridor — **SENSITIVE HABITAT**
BIG SAGEBRUSH SCRUB — STABILIZED/PARTIALLY STABILIZED DUNES — BIG SAGEBRUSH SCRUB	◄ East of Corridor / ◄ Within Corridor / ◄ West of Corridor — **VEGETATION**
Qle Qle Qle Qle Qd Qle	◄ Geologic Formation — **GEOLOGY / SOILS**
325 372 345 365 358 365 358 365 314 365 345 369	◄ Soil Association
	◄ Blading / ◄ Tree Removal — **OVERLAND TRAVEL**
BLM BLM BLM BLM	**JURISDICTION**



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Calneva Lake, CA 1988.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

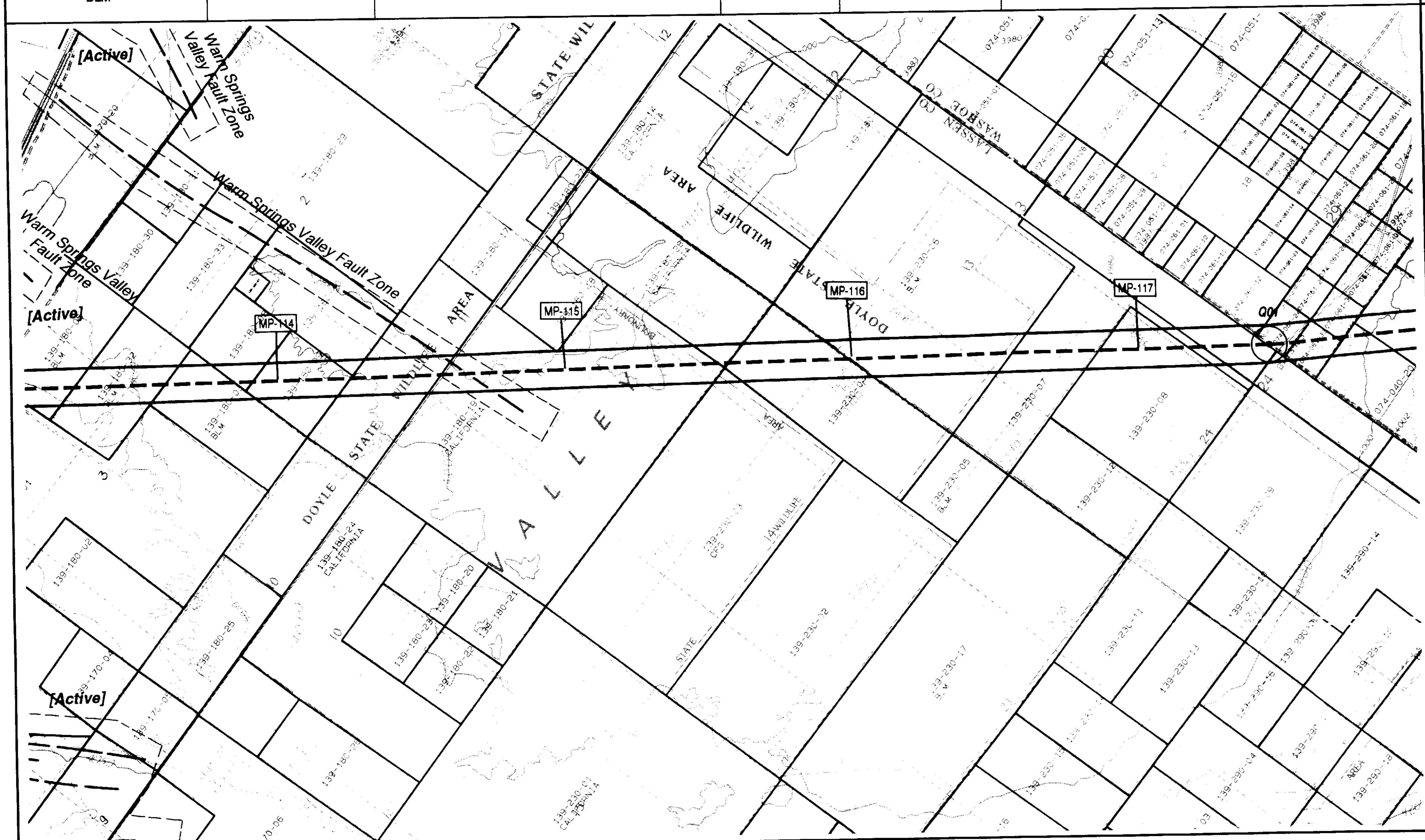
ALTURAS TRANSMISSION LINE EIR/S

Map 22 of 33

Proposed Route

[Segment O]

SENSITIVE SPECIES (East of Corridor / Within Corridor / West of Corridor)	NEP
SENSITIVE HABITAT (East of Corridor / Within Corridor / West of Corridor)	
VEGETATION (East of Corridor / Within Corridor / West of Corridor)	BIG SAGEBRUSH SCRUB — STABILIZED/PARTIALLY STABILIZED DUNES — BIG SAGEBRUSH SCRUB
GEOLOGY / SOILS — Geologic Formation	Qle — Qle — Qle — Qp — Qs — Qa
GEOLOGY / SOILS — Soil Association	369 — 345 — 369 — 125 — 345 — 369 — 345 — 383 — 630
OVERLAND TRAVEL (Blading / Tree Removal)	
JURISDICTION	BLM — BLM — BLM



KEY

- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Proposed Route Mile Marker

Scale in Feet: 0 — 2000 — 4000

Scale in Miles: 0 — 1/2 — 1

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Calneva Lake, CA 1988; Doyle, CA 1988; Stateline Peak, NV 1981.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

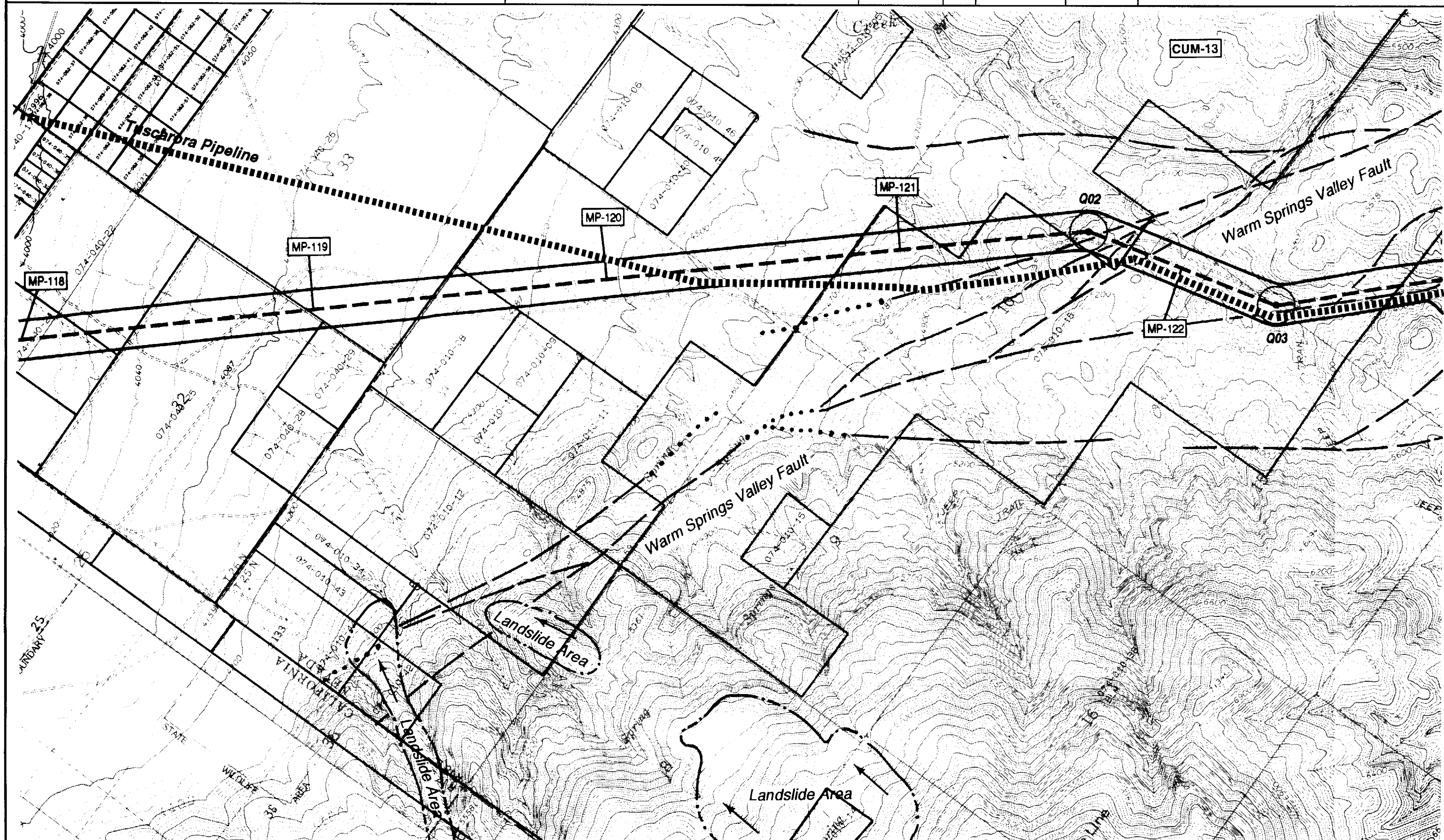
ALTURAS TRANSMISSION LINE EIR/S

Map 23 of 33

Proposed Route

[Segment O & Q]

SENSITIVE SPECIES	East of Corridor / Within Corridor / West of Corridor	LLSP
SENSITIVE HABITAT	East of Corridor / Within Corridor / West of Corridor	BIG SAGEBRUSH SCRUB; BIG SAGEBRUSH SCRUB
VEGETATION	East of Corridor / Within Corridor / West of Corridor	DEER MIGRATION CORRIDOR
GEOLOGY / SOILS	Geologic Formation	Qa; Qc; Qa; Qc; Qa; Tt; Tba; Tt
	Soil Association	630; 610; 620; 372; 373; 372; 373
OVERLAND TRAVEL	Blading / Tree Removal	
JURISDICTION		BLM; BLM; BLM



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): ***Doyle, CA 1988; Stateline Peak, NV 1981.***

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

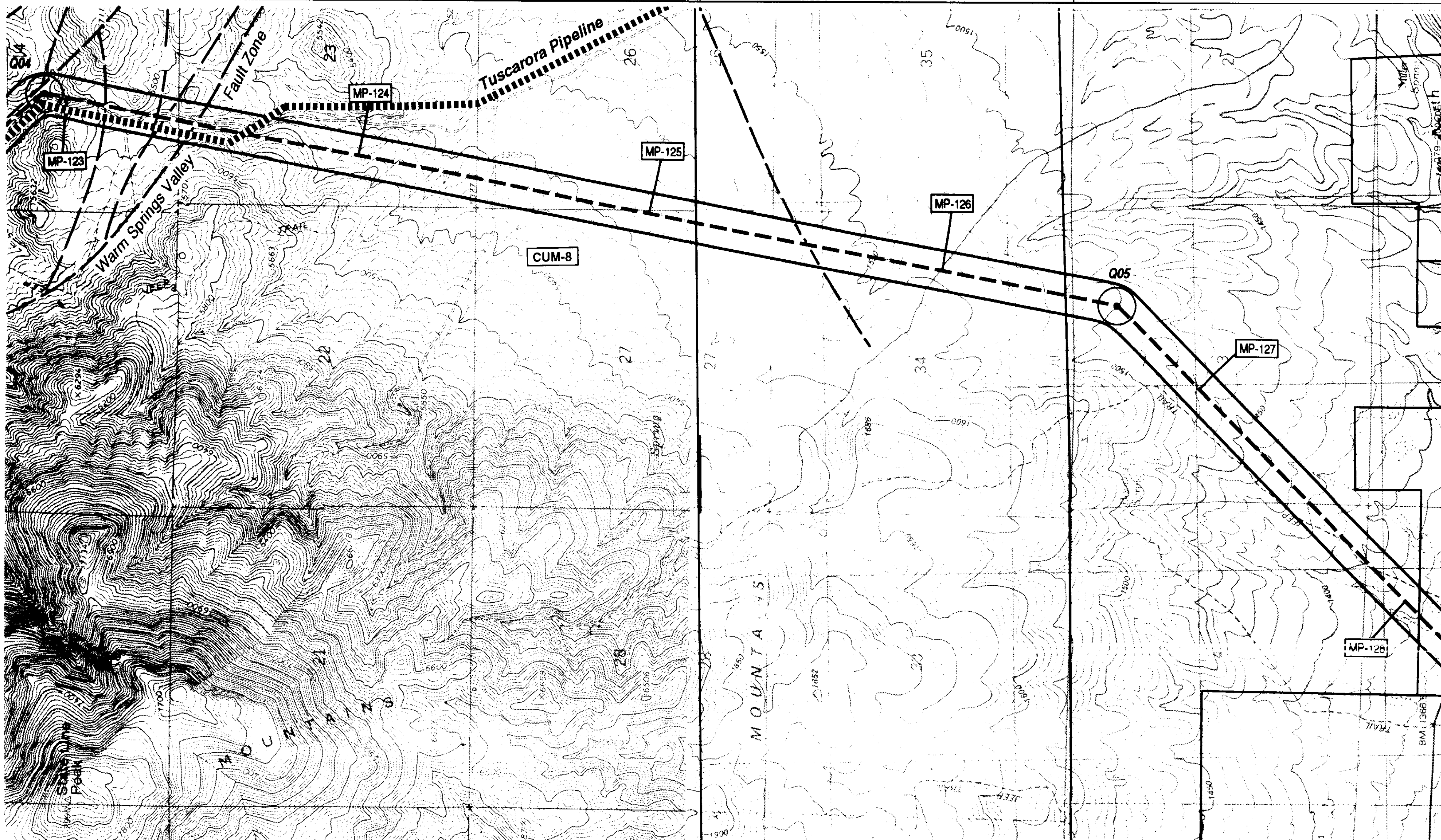
ALTURAS TRANSMISSION LINE EIR/S

Map 24 of 33

Proposed Route

[Segment Q]

	East of Corridor / Within Corridor / West of Corridor	SENSITIVE SPECIES
BIG SAGEBRUSH SCRUB — JUNIPER WOODLAND — JUNIPER WOODLAND	East of Corridor / Within Corridor / West of Corridor	SENSITIVE HABITAT
	East of Corridor / Within Corridor / West of Corridor	VEGETATION
Tl, Twt, Tl, Ttb, Tl, Twt, Tl, Ttb, Tl, Twt, Qa, Qa, Qa, Tsv, Qa	Geologic Formation	GEOLOGY / SOILS
373, 790, 676, 585, 674, 176	Soil Association	
	Blading / Tree Removal	OVERLAND TRAVEL
BLM, BLM, BLM, BLM		JURISDICTION



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000

Scale in Feet

0 1/2 1

Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Constantia, CA 1977; Dogskin Mountain, NV 1979; Stateline Peak, NV 1981.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

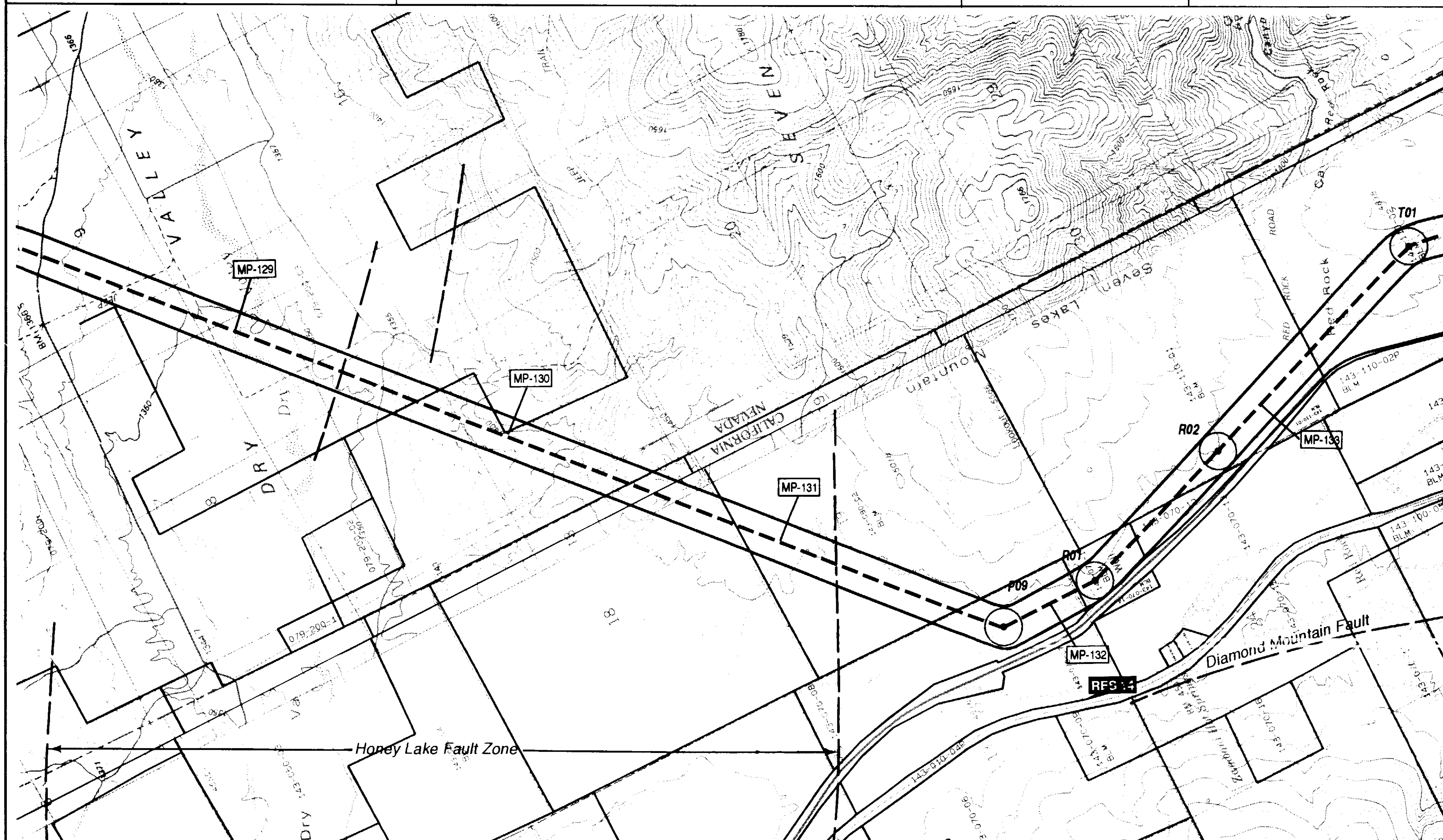
ALTURAS TRANSMISSION LINE EIR/S

Map 25 of 33

Proposed Route

[Segment Q]

SENSITIVE SPECIES	East of Corridor / Within Corridor / West of Corridor	
SENSITIVE HABITAT	East of Corridor / Within Corridor / West of Corridor	DEER WINTERING RANGE; MIGRATION CORRIDOR; WETLAND
VEGETATION	East of Corridor / Within Corridor / West of Corridor	BIG SAGEBRUSH SCRUB; RABBITBRUSH /MONTANE MEADOW; BIG SAGEBRUSH SCRUB; JUNIPER WOODLAND; BIG SAGEBRUSH SCRUB; MONTANE MEADOW; BIG SAGEBRUSH SCRUB
GEOLOGY / SOILS	Geologic Formation	Qa; Qa; Tvr; Kgd; Th3; Qc; bb; Th_1
	Soil Association	176; 460; 620; 470; 230; 460; 230; 482; 591; 482; 591; 482; 591; 895; 872; 682; 872; 682; 674; 597; 682; 674; 682; 674; 682; 674; 688; 682
OVERLAND TRAVEL	Blading / Tree Removal	
JURISDICTION		BLM; BLM; BLM



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): ***Constantia, CA 1977; Dogskin Mountain, NV 1979; Stateline Peak, NV 1981.***

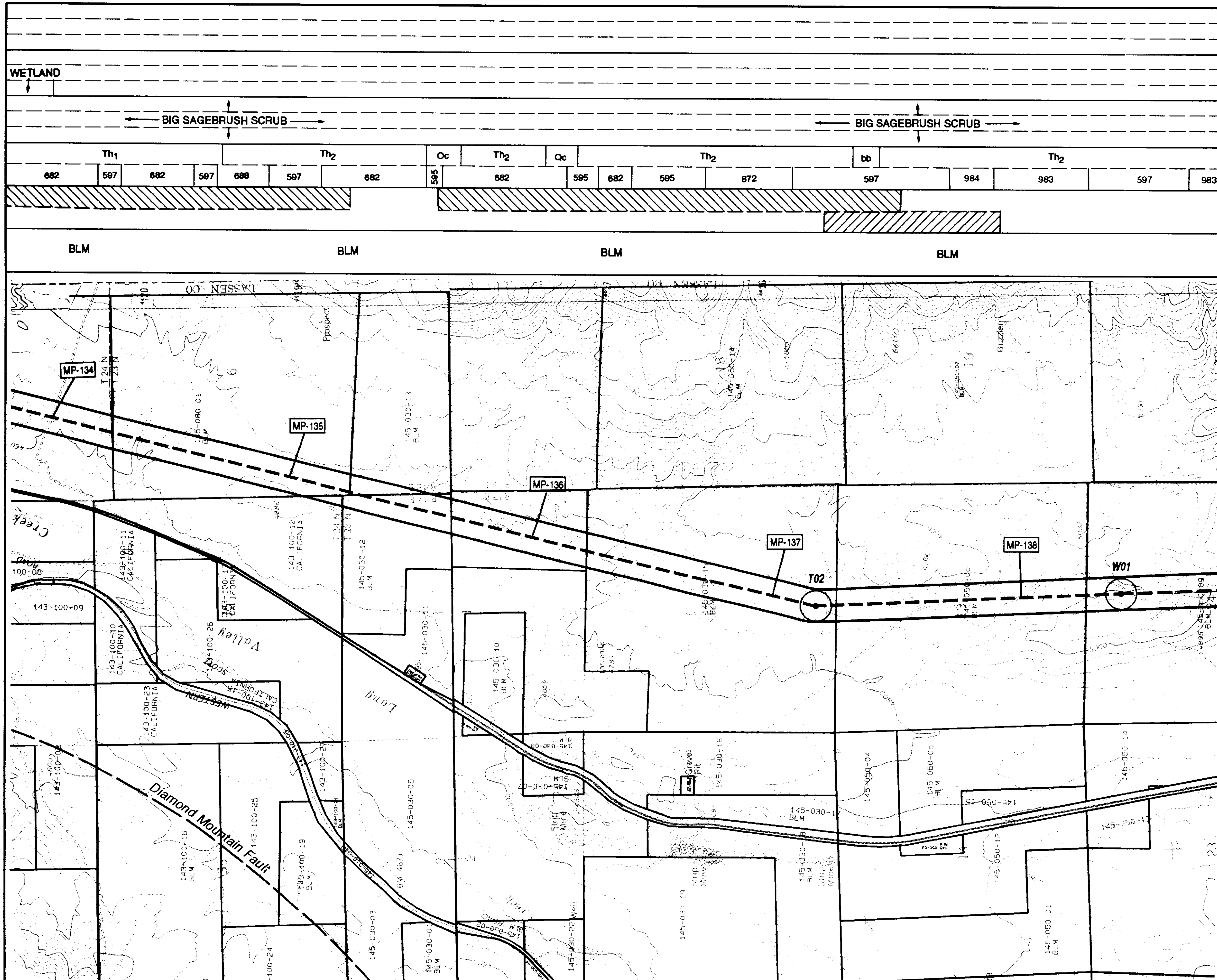
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map 26 of 33

Proposed Route

[Segment Q & R]



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Beckwourth Pass, CA 1975; Constantia, CA 1977.*

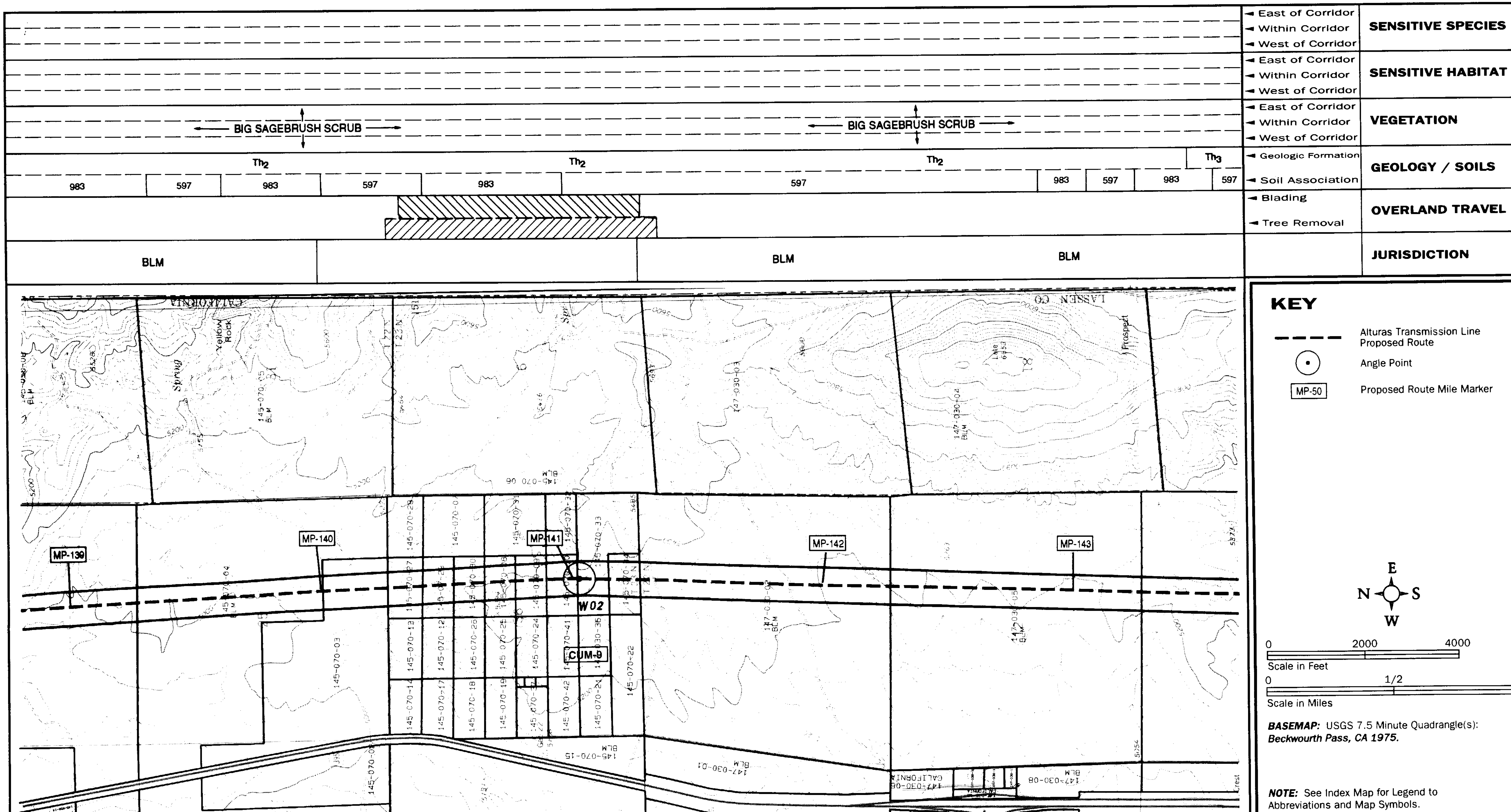
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map 27 of 33

Proposed Route

[Segment T & W]

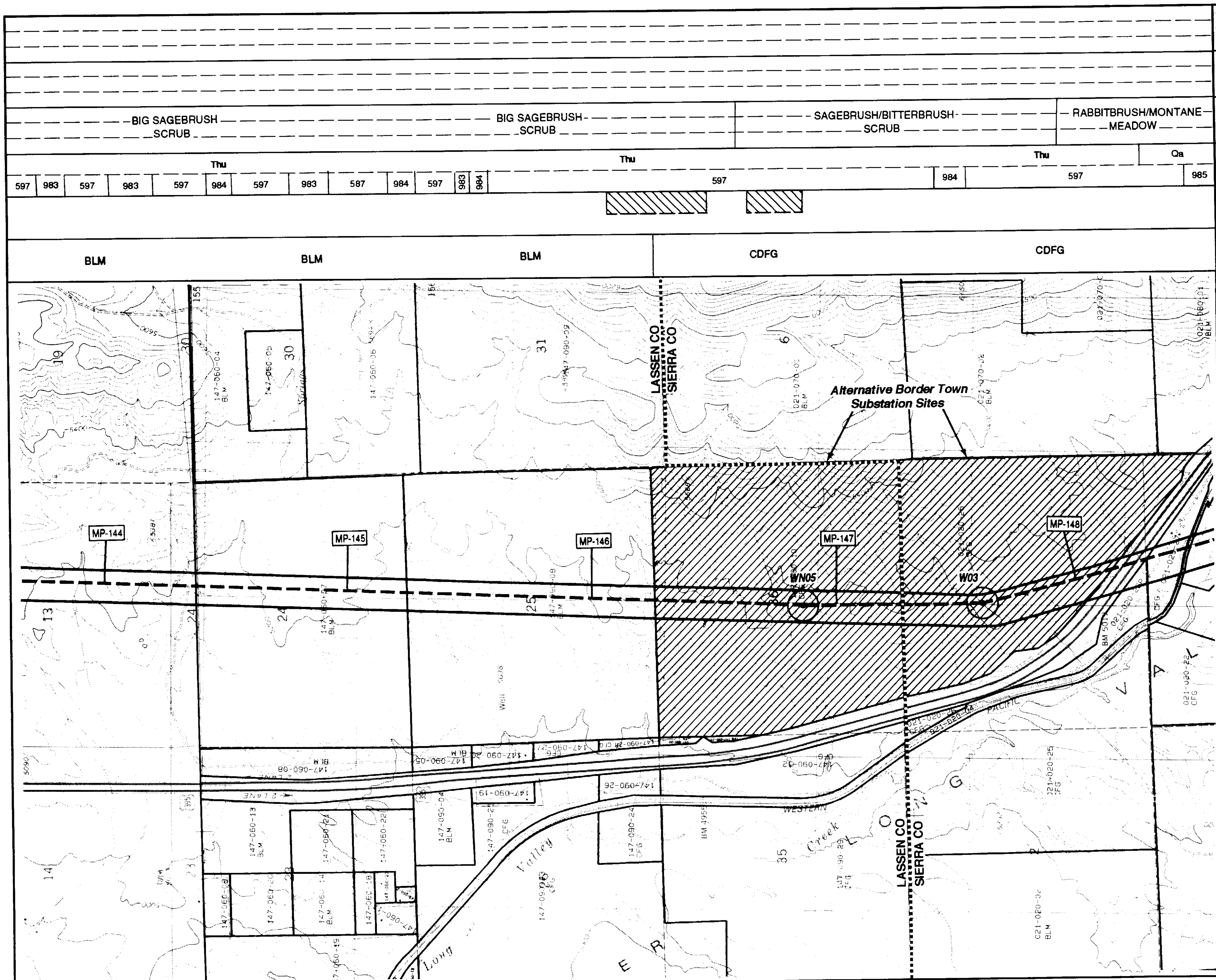


ALTURAS TRANSMISSION LINE EIR/S

Map 28 of 33

Proposed Route

[Segment W]



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s):
Beckwourth Pass, CA 1975;
Evans Canyon, CA-NV 1978.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

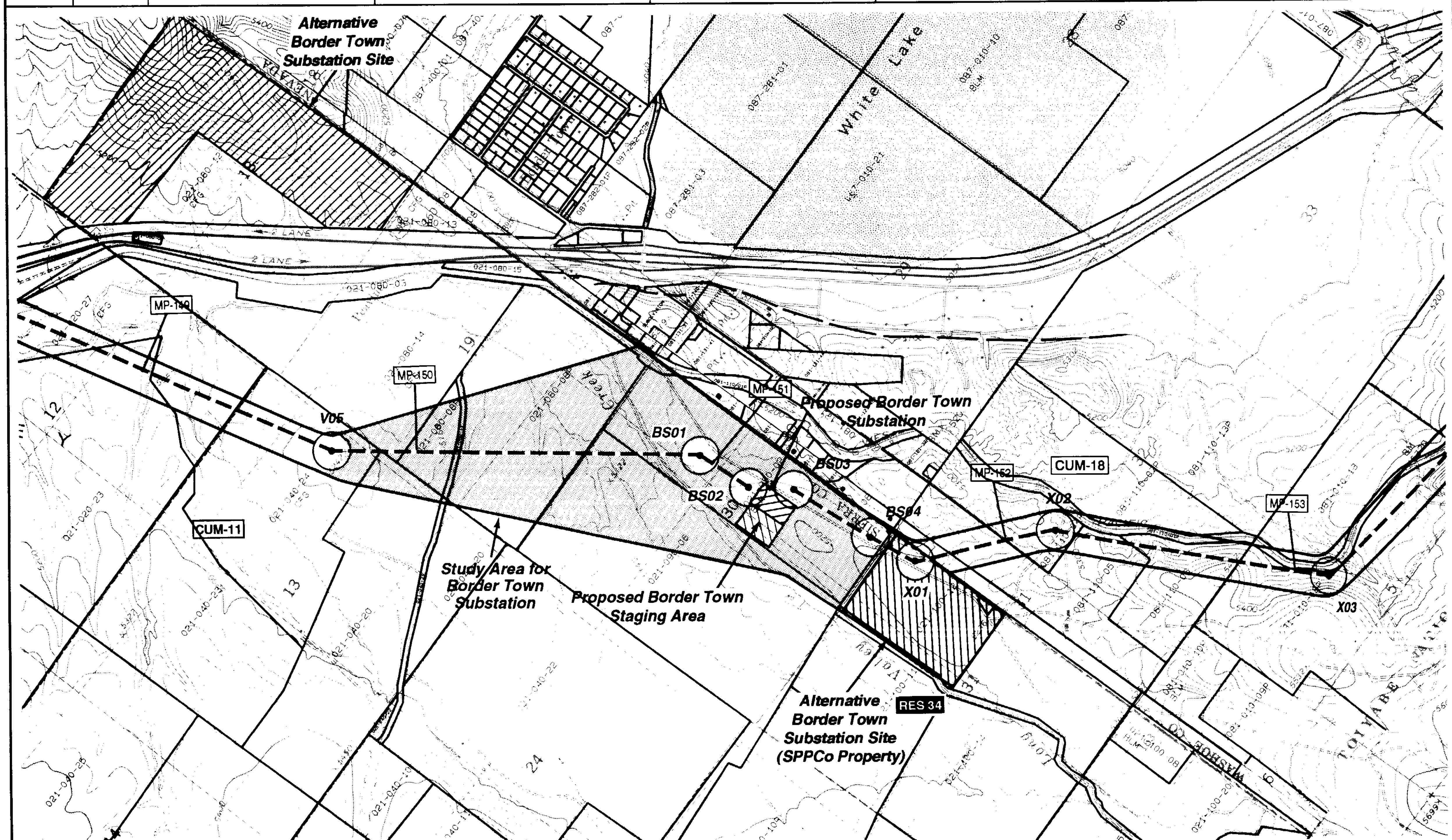
ALTURAS TRANSMISSION LINE EIR/S

Map 29 of 33

Proposed Route

[Segment W]

												East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
	WETLAND		WETLAND								WETLAND	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
LOW SAGEBRUSH SCRUB		MONTANE MEADOW	LOW SAGEBRUSH SCRUB	MONTANE MEADOW	LOW SAGEBRUSH SCRUB		SAGEBRUSH/BITTERBRUSH SCRUB				MONTANE MEADOW	East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Qld		Qa	Thu	Qa	Thu		Ts		Mzv	Ts	Mzvs	Geologic Formation	**GEOLOGY / SOILS**
984 985 986		987 986	597	986 987 986	988 989 986		585 251 730 251		980	251	662	Soil Association	
												Blading / Tree Removal	**OVERLAND TRAVEL**
CDFG		CDFG			BLM								**JURISDICTION**



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Evans Canyon, CA-NV 1978; Reno NW, NV 1982; Verdi, NV, 1982.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

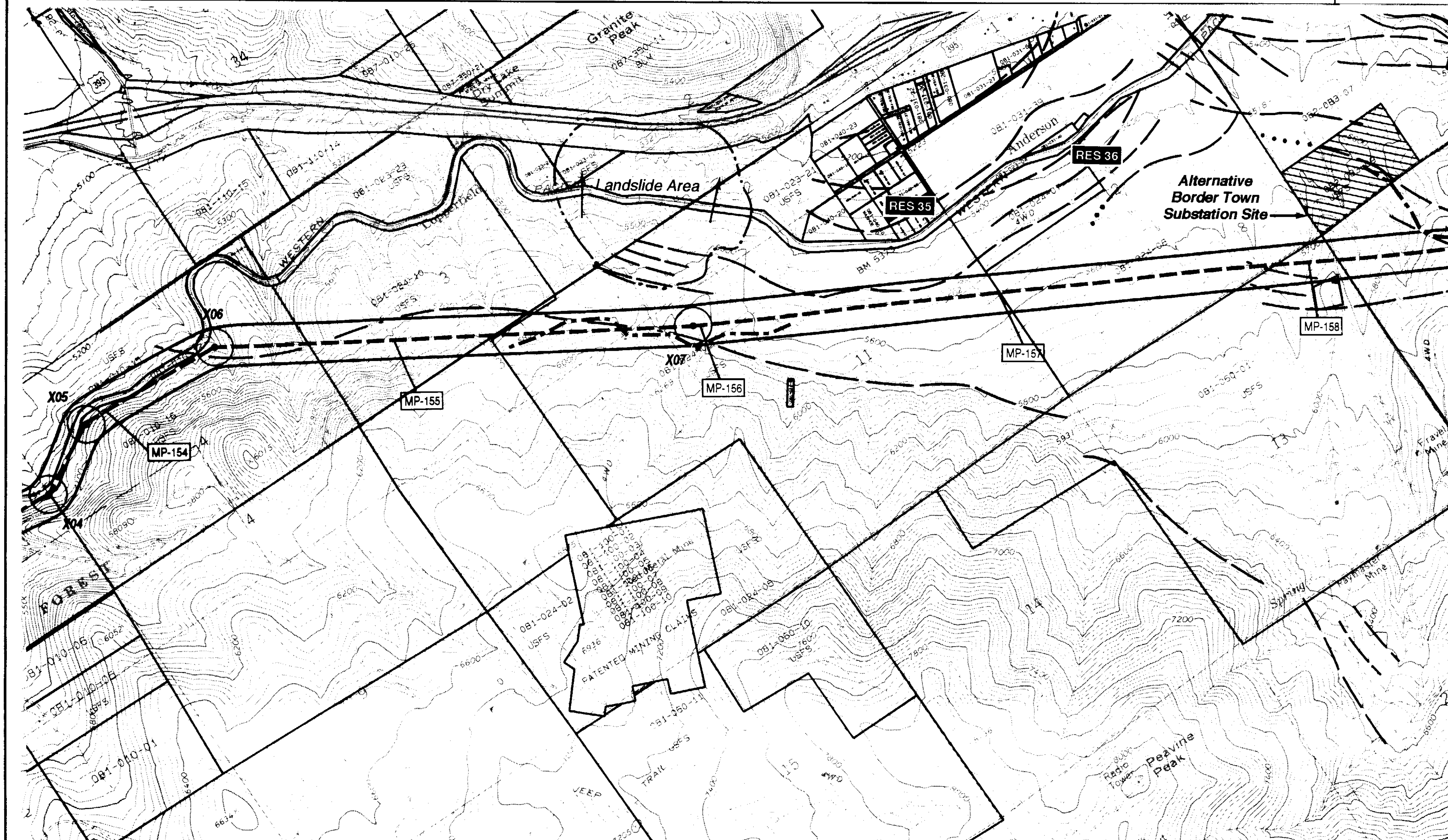
ALTURAS TRANSMISSION LINE EIR/S

Map 30 of 33

Proposed Route

[Segment W & X]

SENSITIVE SPECIES	East of Corridor	
	Within Corridor	
	West of Corridor	
SENSITIVE HABITAT	East of Corridor	
	Within Corridor	
	West of Corridor	
VEGETATION	Within Corridor	SAGEBRUSH/BITTERBRUSH SCRUB; BIG SAGEBRUSH SCRUB; BIG SAGEBRUSH SCRUB
GEOLOGY / SOILS	Geologic Formation	Mzvs; Ts; Mzvl; Qpf; Ts; Qpf; Qfy; Qfo; Qfy; Qfo; Qpf; Mzp
	Soil Association	662; 514; 930; 664; 930; 663; 982; 251; 982; 252; 982; 891; 482; 663; 182; 251; 482; 664; 370; 664; 251; 890; 252; 890; 252; 890
OVERLAND TRAVEL	Blading	
	Tree Removal	
JURISDICTION		USFS



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Reno NW, NV 1982; Verdi, NV, 1982.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

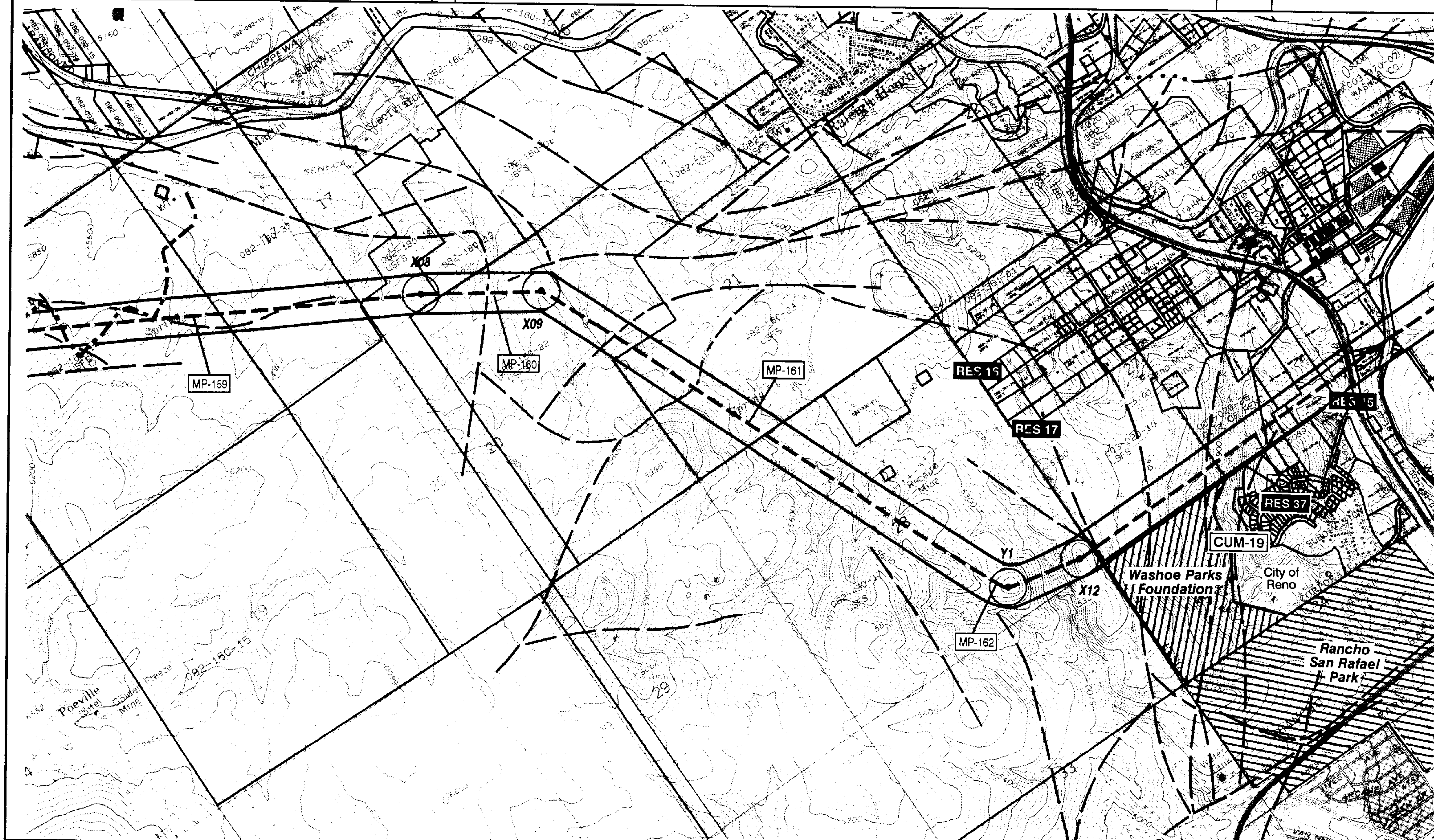
ALTURAS TRANSMISSION LINE EIR/S

Map 31 of 33

Proposed Route

[Segment X]

SENSITIVE SPECIES (East of Corridor / Within Corridor / West of Corridor)	AAB; AAB; AAB
SENSITIVE HABITAT (East of Corridor / Within Corridor / West of Corridor)	STREAM
VEGETATION (East of Corridor / Within Corridor / West of Corridor)	BIG SAGEBRUSH SCRUB; ALTERED ANDESITE; BIG SAGEBRUSH SCRUB; ALTERED ANDESITE; BIG SAGEBRUSH SCRUB; DISTURBED
GEOLOGY / SOILS: Geologic Formation	Mzp; Qal; Mzp; Mzgd; Mzv; Qa; Ta; Ta; Ta
GEOLOGY / SOILS: Soil Association	890; 901; 890; 282; 901; 281; 900; 880; 281; 880; 281; 280; 281; 900; 880; 900; 231; 882; 880; 900; 901; 190; 311; 871; 881; 880; 991; 280
OVERLAND TRAVEL (Blading / Tree Removal)	
JURISDICTION	USFS; USFS; USFS; USFS; CITY OF RENO



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

N E S W

Scale in Feet: 0, 2000, 4000

Scale in Miles: 0, 1/2, 1

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Reno, NV 1982; Verdi, NV, 1982.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

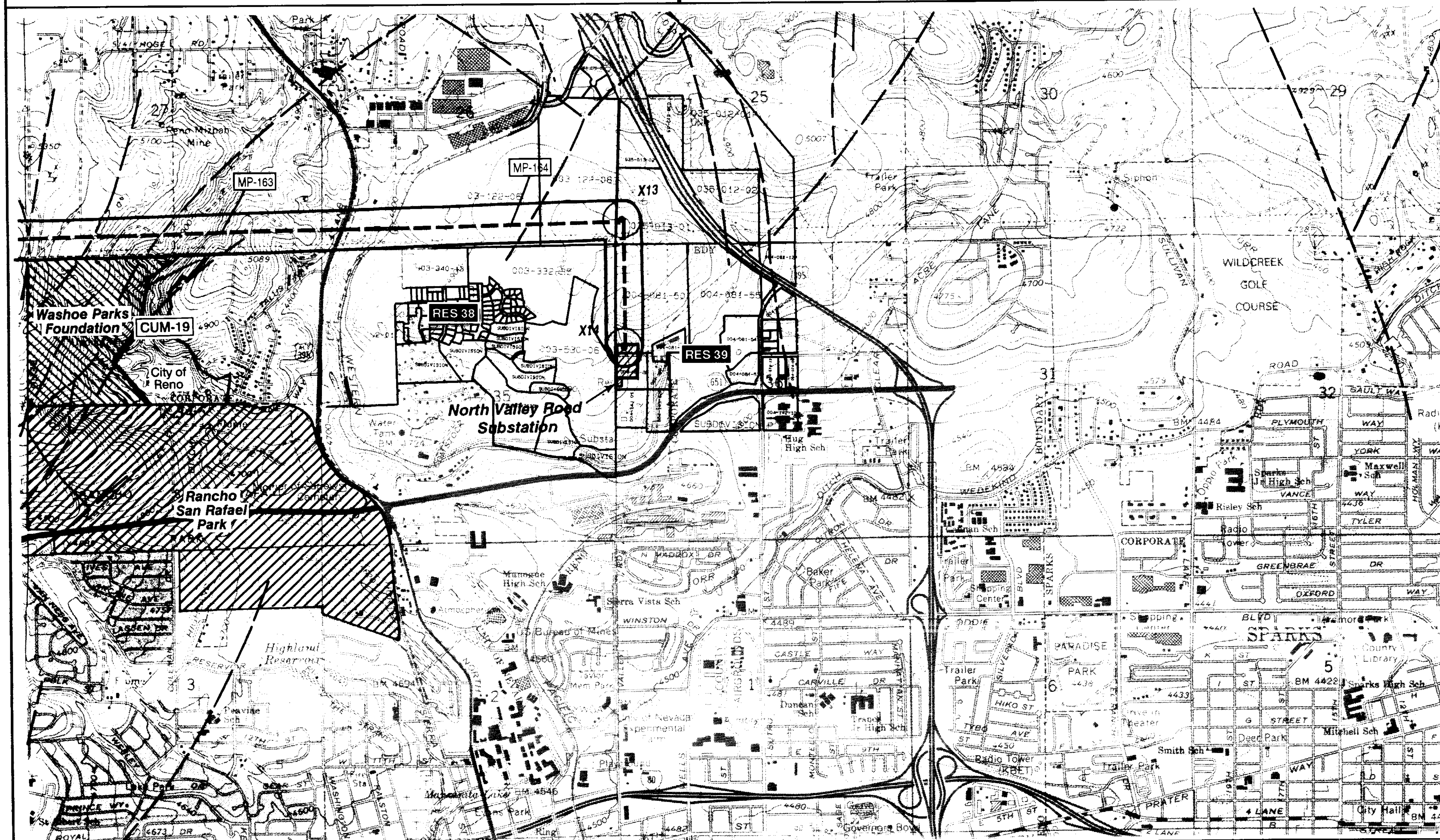
ALTURAS TRANSMISSION LINE EIR/S

Map 32 of 33

Proposed Route

[Segment X & Y]

		East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
		East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
BIG SAGEBRUSH SCRUB		East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Ta · Ta · Ta See Sheet 32 · 191 · 190 · 310		Geologic Formation / Soil Association	**GEOLOGY / SOILS**
		Blading / Tree Removal	**OVERLAND TRAVEL**
			JURISDICTION



KEY

- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Proposed Route Mile Marker

N / W / E / S

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): ***Reno NW, 1982.***

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map 33 of 33

Proposed Route

[Segment X]

East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Geologic Formation / Soil Association	**GEOLOGY / SOILS**
Blading / Tree Removal	**OVERLAND TRAVEL**
	JURISDICTION

KEY

- Alternative Segment (Mapped)
- Other Alternative Segment
- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Mile Marker

W N S E

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

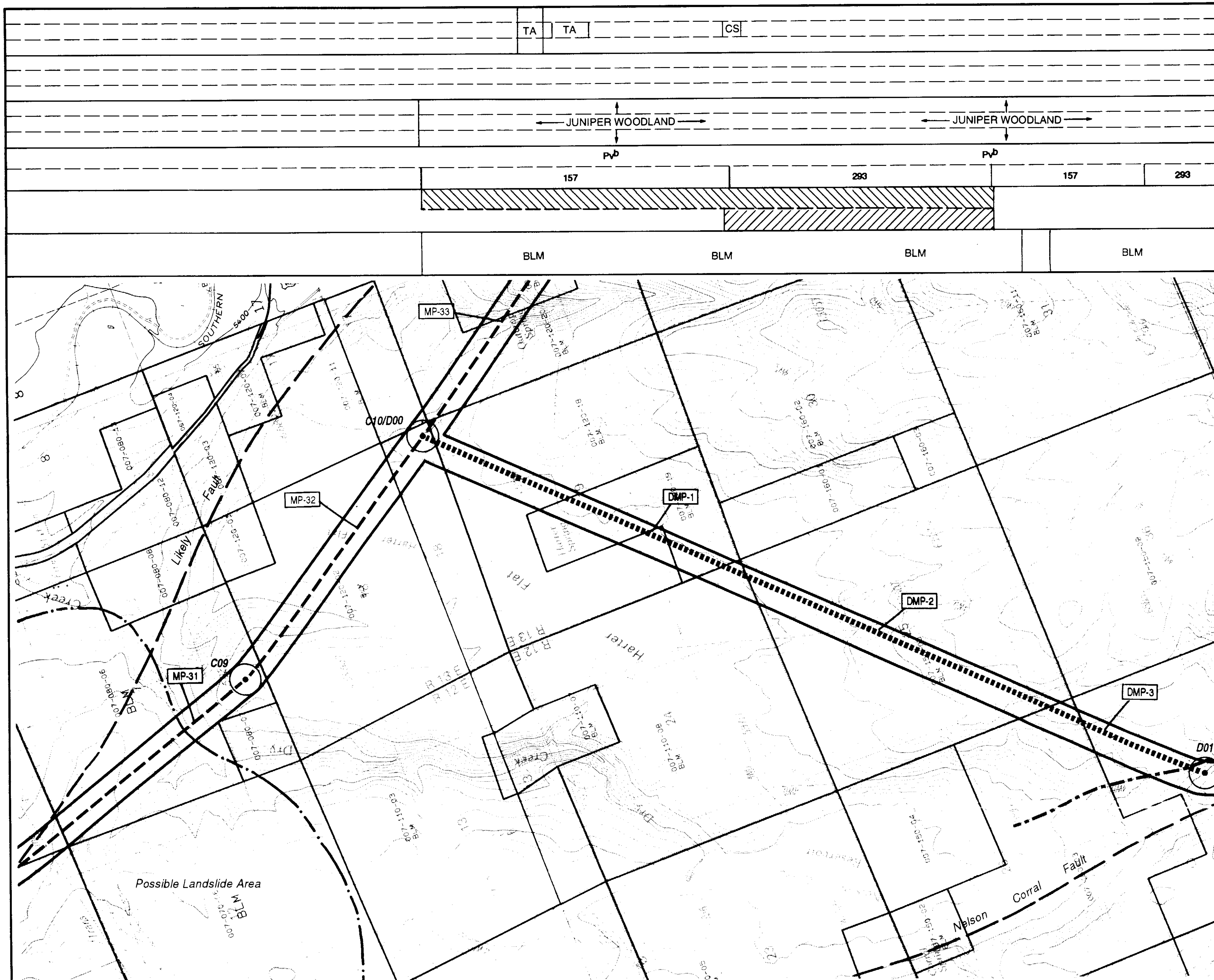
BASEMAP: USGS 7.5 Minute Quadrangle(s):
Alturas, CA 1990;
Mahogany Ridge, CA 1990.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map B-1

Alternative Segment
[Segment B]



East of Corridor
Within Corridor
West of Corridor
SENSITIVE SPECIES

East of Corridor
Within Corridor
West of Corridor
SENSITIVE HABITAT

East of Corridor
Within Corridor
West of Corridor
VEGETATION

Geologic Formation
Soil Association
GEOLOGY / SOILS

Blading
Tree Removal
OVERLAND TRAVEL

JURISDICTION

KEY

Alternative Segment (Mapped)
Other Alternative Segment
Alturas Transmission Line Proposed Route
Angle Point
MP-50 Mile Marker

0 2000 4000
Scale in Feet
0 1/2 1
Scale in Miles

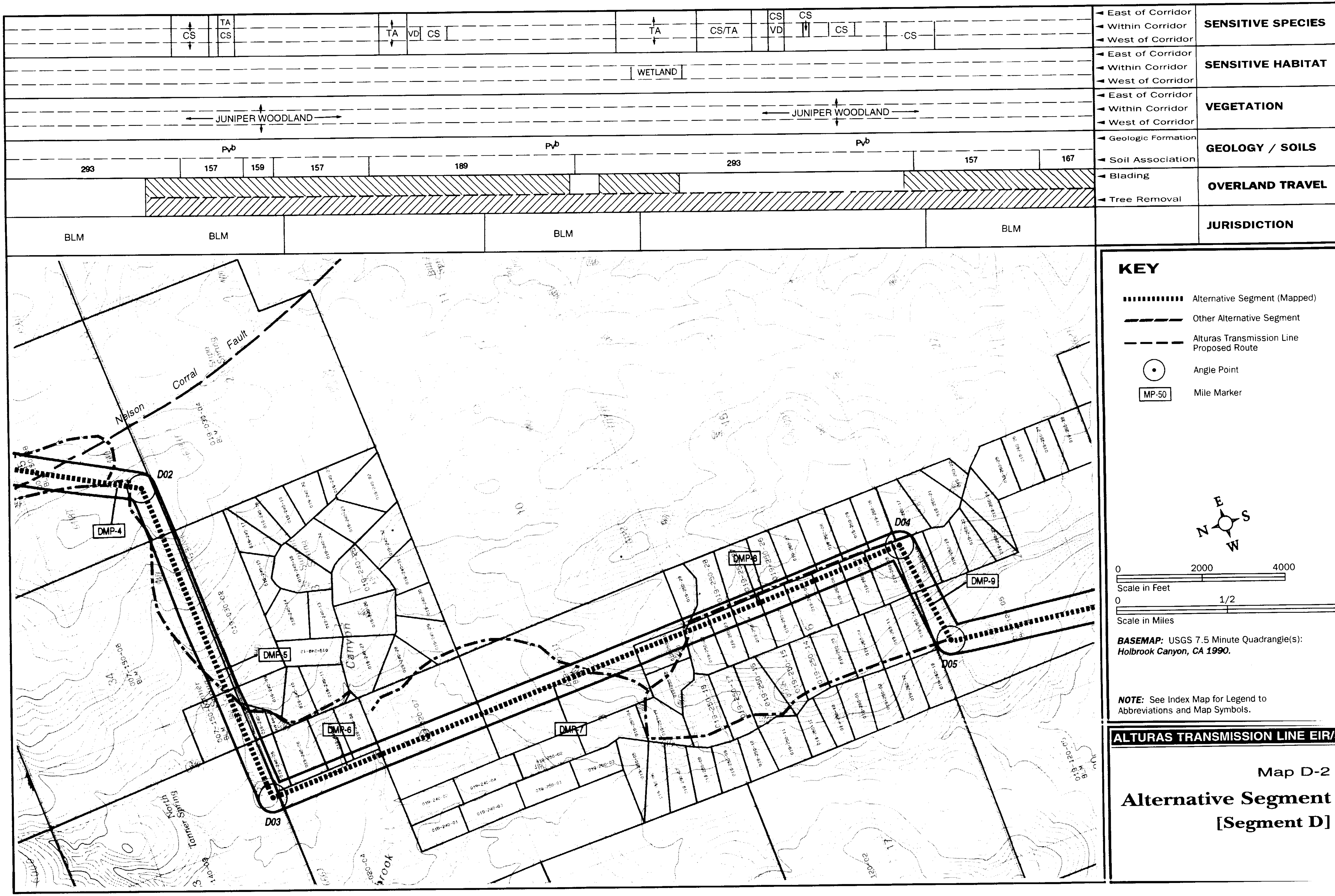
BASEMAP: USGS 7.5 Minute Quadrangle(s):
Holbrook Canyon, CA 1990;
Likely, CA 1990;
Tule Mountain, CA 1980.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

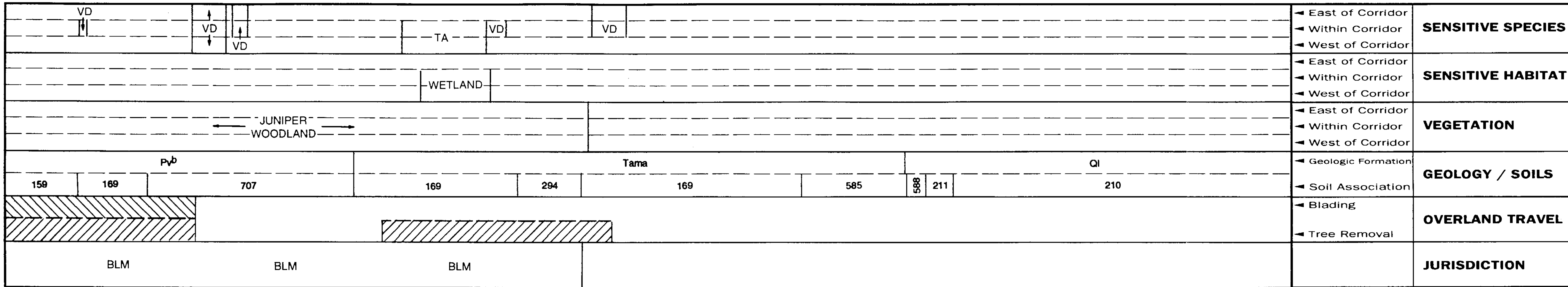
ALTURAS TRANSMISSION LINE EIR/S

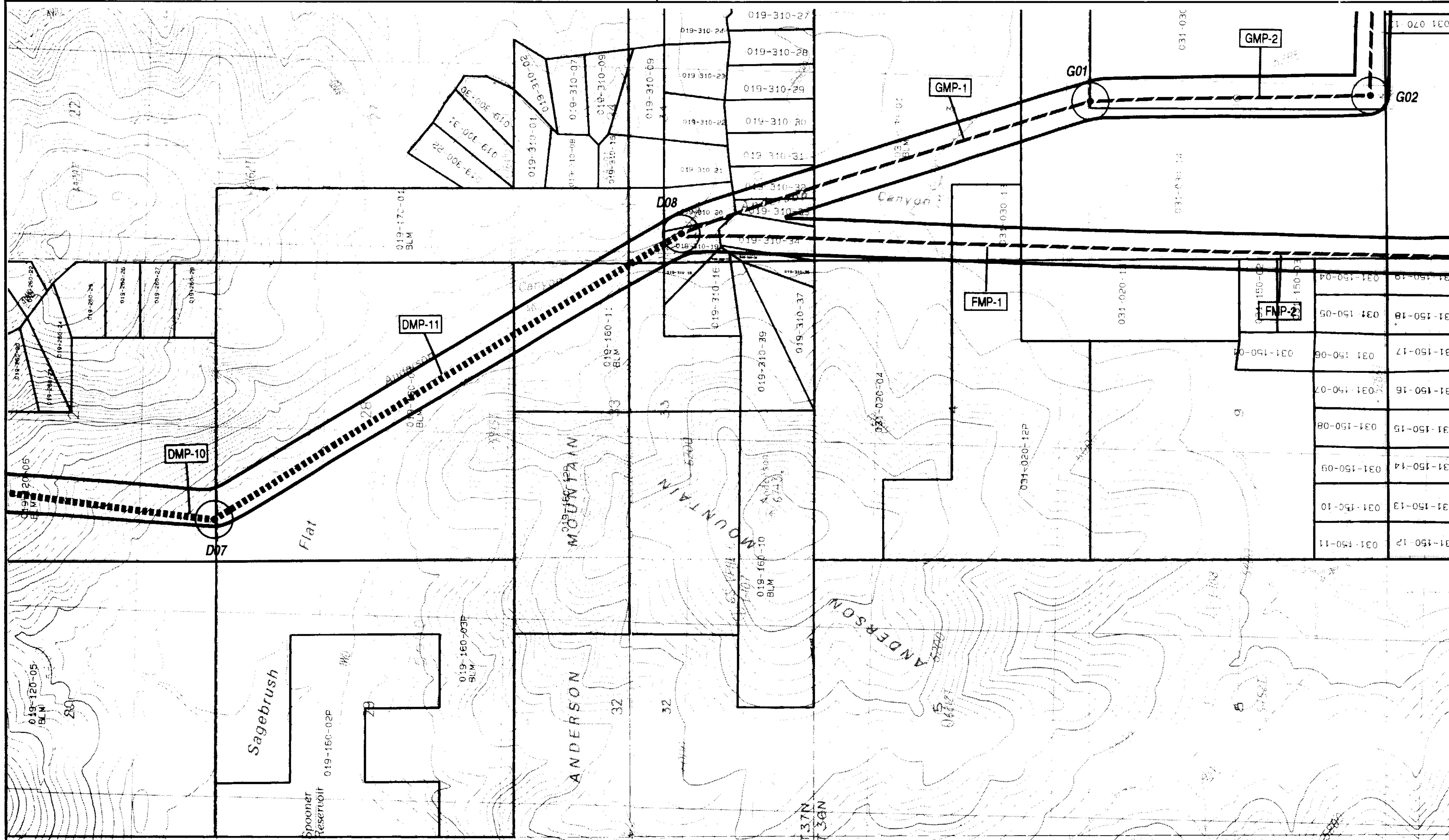
Map D-1

Alternative Segment [Segment D]



SENSITIVE SPECIES
SENSITIVE HABITAT
VEGETATION
GEOLOGY / SOILS
OVERLAND TRAVEL
JURISDICTION
East of Corridor
Within Corridor
West of Corridor
Geologic Formation
Soil Association
Blading
Tree Removal
CS
TA
VD
CS/TA
WETLAND
JUNIPER WOODLAND
Pvb
293
157
159
189
167
BLM
KEY
Alternative Segment (Mapped)
Other Alternative Segment
Alturas Transmission Line Proposed Route
Angle Point
MP-50
Mile Marker
0
2000
4000
Scale in Feet
1/2
1
Scale in Miles
BASEMAP: USGS 7.5 Minute Quadrangle(s): Holbrook Canyon, CA 1990.
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.
ALTURAS TRANSMISSION LINE EIR/S
Map D-2
Alternative Segment [Segment D]
Nelson Corral Fault
D02
D03
D04
D05
DMP-4
DMP-5
DMP-6
DMP-7
DMP-8
DMP-9
North Tanner Spring
Canyon





KEY

- Alternative Segment (Mapped)
- Other Alternative Segment
- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s):
Anderson Mountain, CA 1989;
Holbrook Canyon, CA 1990.

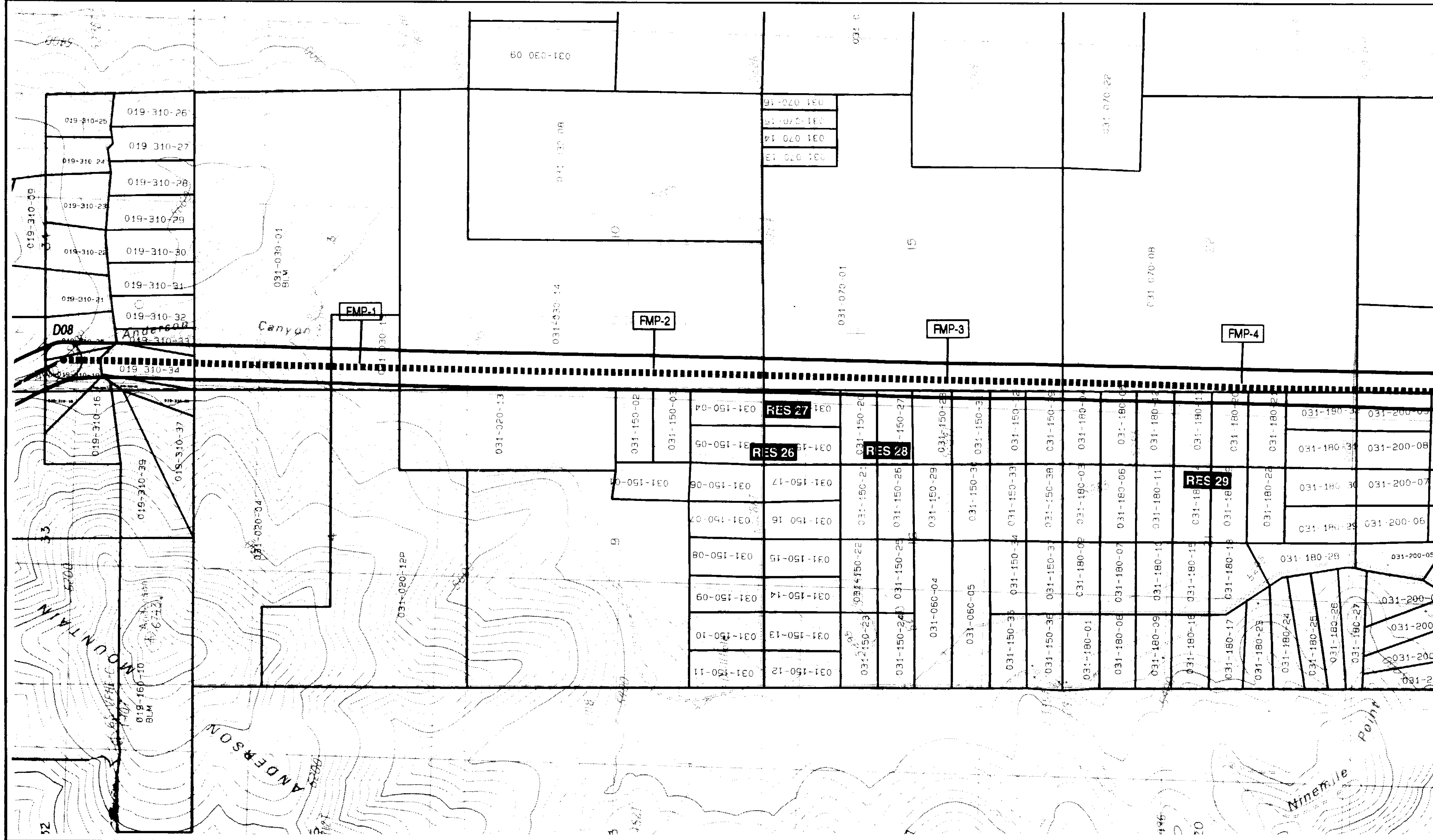
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map D-3

Alternative Segment
[Segment D]

TA	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
PRONGHORN SUMMER RANGE; PRONGHORN SUMMER RANGE	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
BIG SAGEBRUSH SCRUB; SILVER SAGEBRUSH SCRUB; SILVER SAGEBRUSH SCRUB	East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Tama; Ql; Ql; Ql / 284; 169; 585; 588; 211; 210; 210; 210	Geologic Formation / Soil Association	**GEOLOGY / SOILS**
	Blading / Tree Removal	**OVERLAND TRAVEL**
		JURISDICTION



KEY

Alternative Segment (Mapped)

Other Alternative Segment

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): ***Anderson Mountain, CA 1989; Mahogany Ridge, CA 1990.***

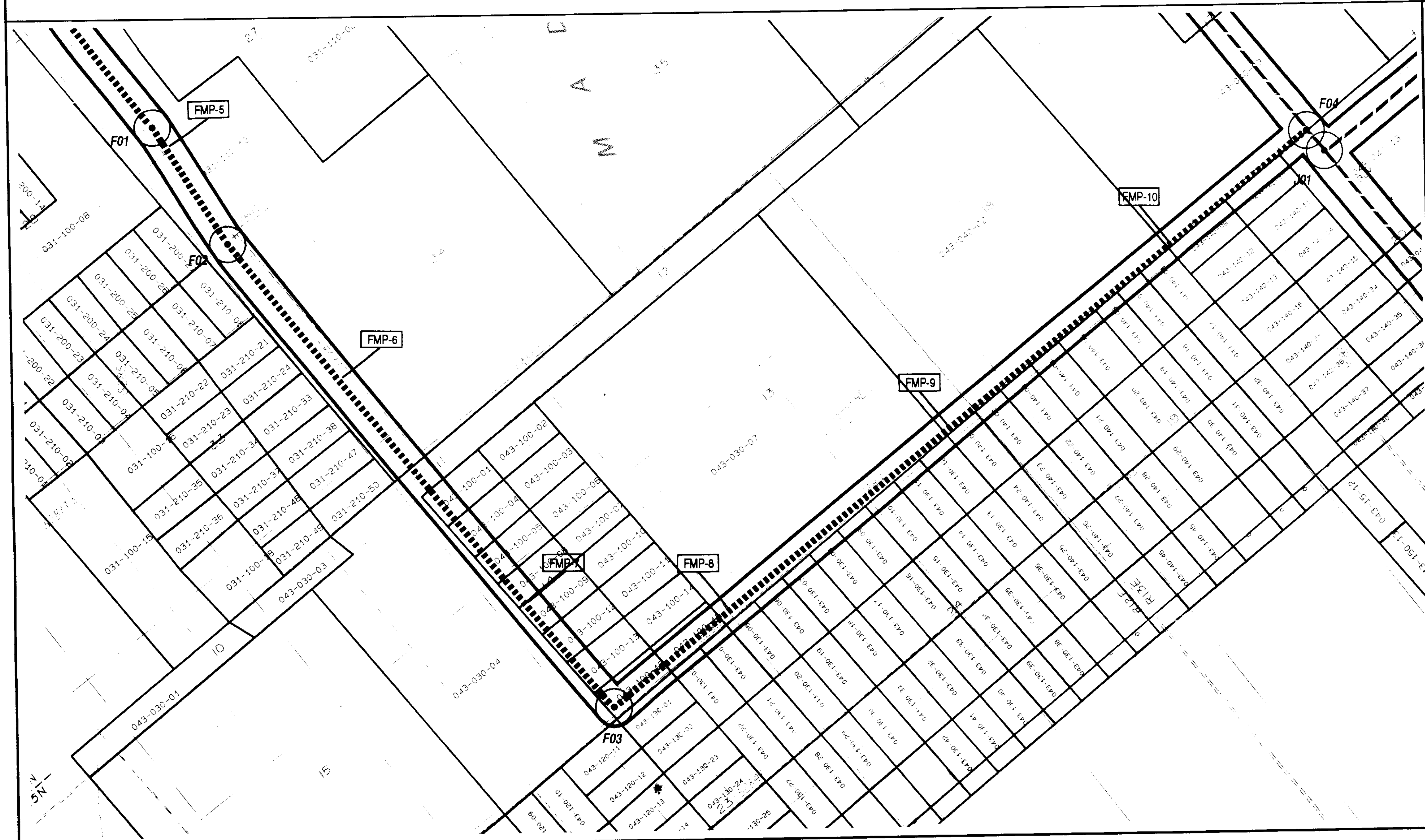
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map F-1

Alternative Segment [Segment F]

SENSITIVE SPECIES	East of Corridor / Within Corridor / West of Corridor	PL	PL	PL
SENSITIVE HABITAT	East of Corridor / Within Corridor / West of Corridor	PRONGHORN SUMMER RANGE	PRONGHORN SUMMER RANGE	PRONGHORN SUMMER RANGE
VEGETATION	East of Corridor / Within Corridor / West of Corridor	SILVER SAGEBRUSH SCRUB	SILVER SAGEBRUSH SCRUB	SILVER SAGEBRUSH SCRUB
GEOLOGY / SOILS	Geologic Formation	Ql	Ql	Ql / Ql
	Soil Association	210	210	210 / 210
OVERLAND TRAVEL	Blading / Tree Removal			
JURISDICTION				



KEY

- Alternative Segment (Mapped)
- Other Alternative Segment
- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

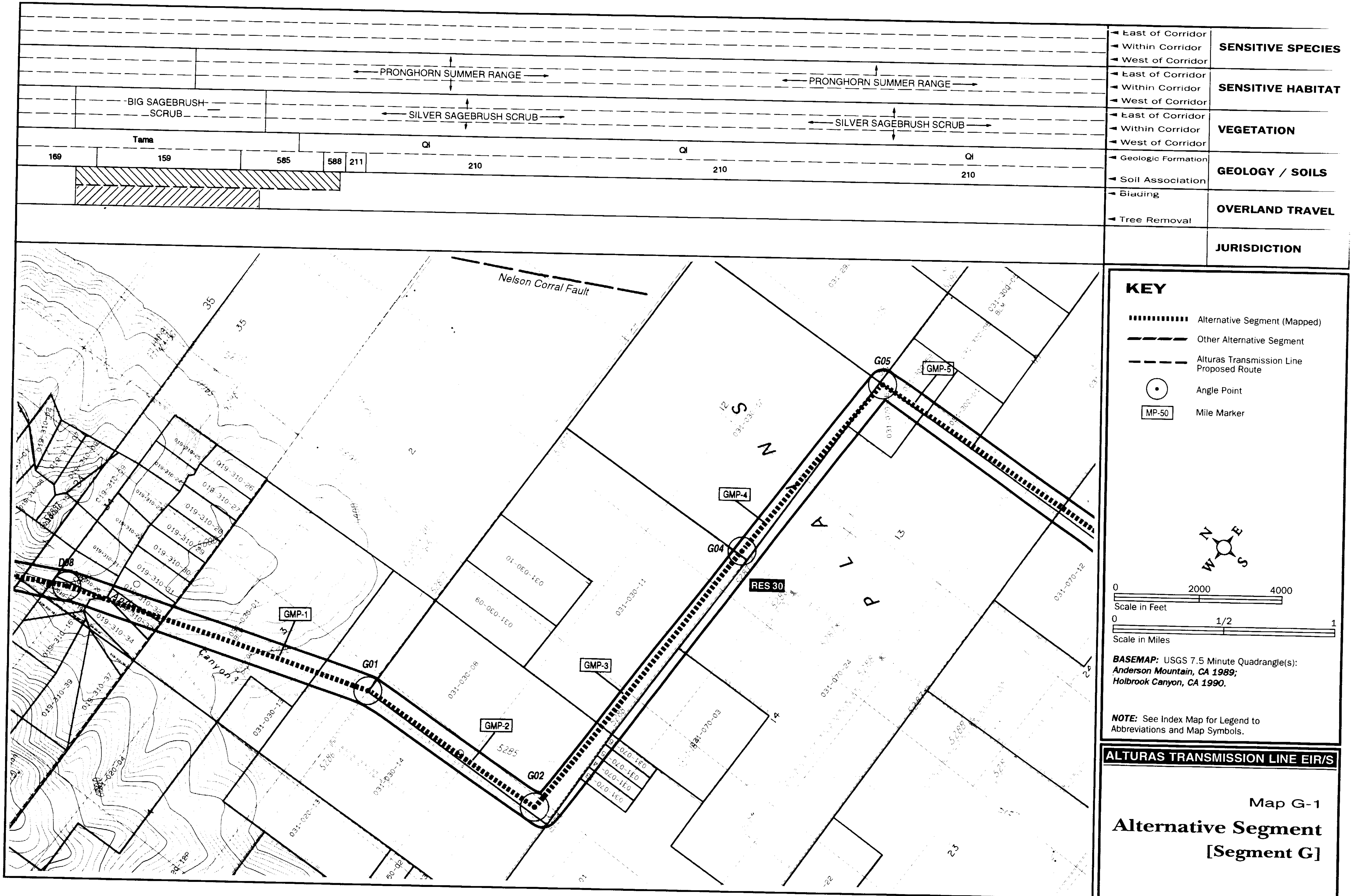
BASEMAP: USGS 7.5 Minute Quadrangle(s):
Anderson Mountain, CA 1989;
Cleghorn Flat, CA 1989.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map F-2

Alternative Segment
[Segment F]



KEY

- Alternative Segment (Mapped)
- Other Alternative Segment
- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Mile Marker

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s):
Anderson Mountain, CA 1989;
Holbrook Canyon, CA 1990.

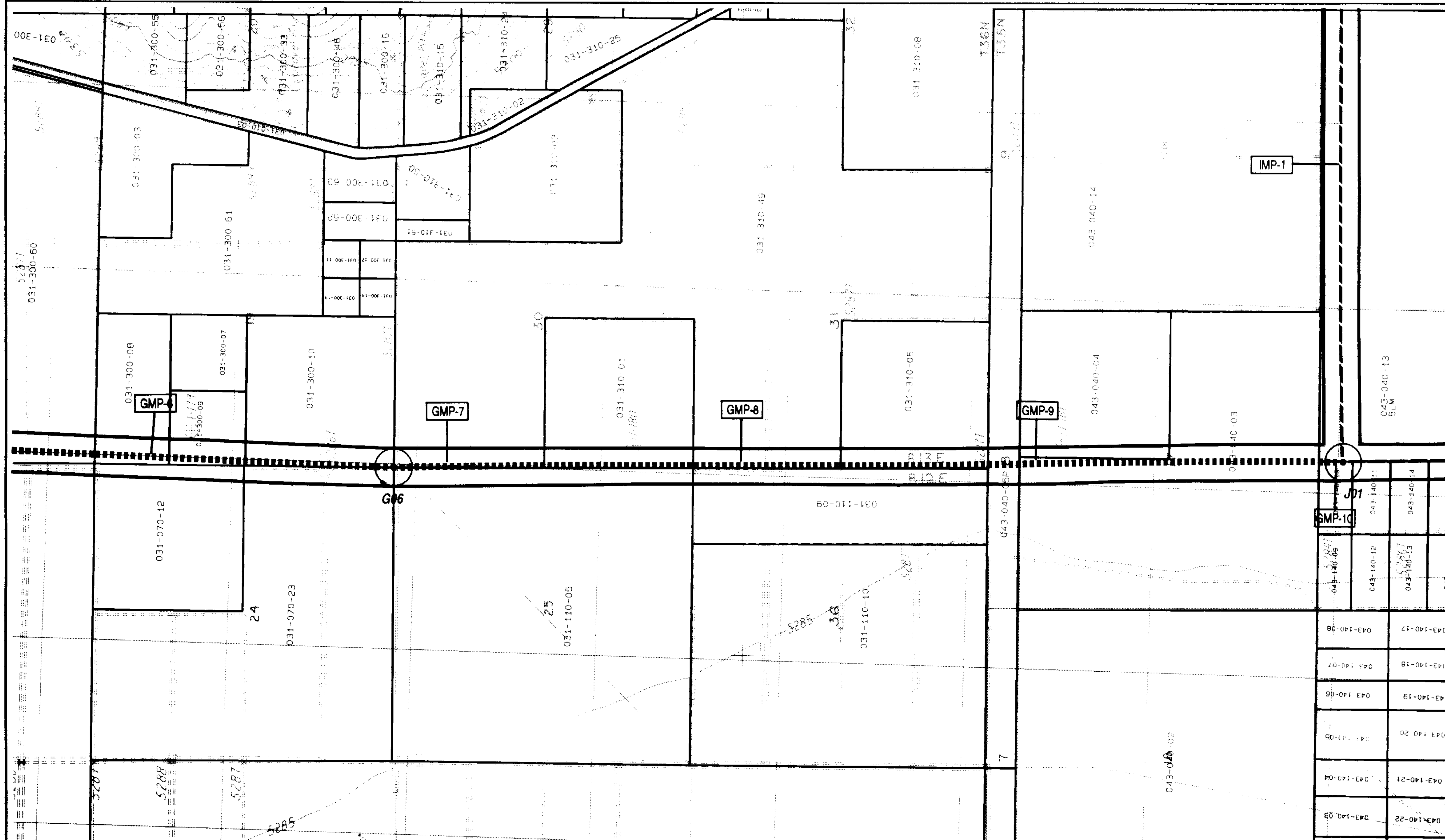
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map G-1

Alternative Segment
[Segment G]

—PL—	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
PRONGHORN SUMMER RANGE · PRONGHORN SUMMER RANGE · PRONGHORN SUMMER RANGE	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
SILVER SAGEBRUSH SCRUB · SILVER SAGEBRUSH SCRUB · SILVER SAGEBRUSH SCRUB	East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Ql 210 · Ql 210 · Ql 210 · Ql 210	Geologic Formation / Soil Association	**GEOLOGY / SOILS**
	Blading / Tree Removal	**OVERLAND TRAVEL**
		JURISDICTION



KEY

Alternative Segment (Mapped)

Other Alternative Segment

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Mile Marker

E
N S
W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

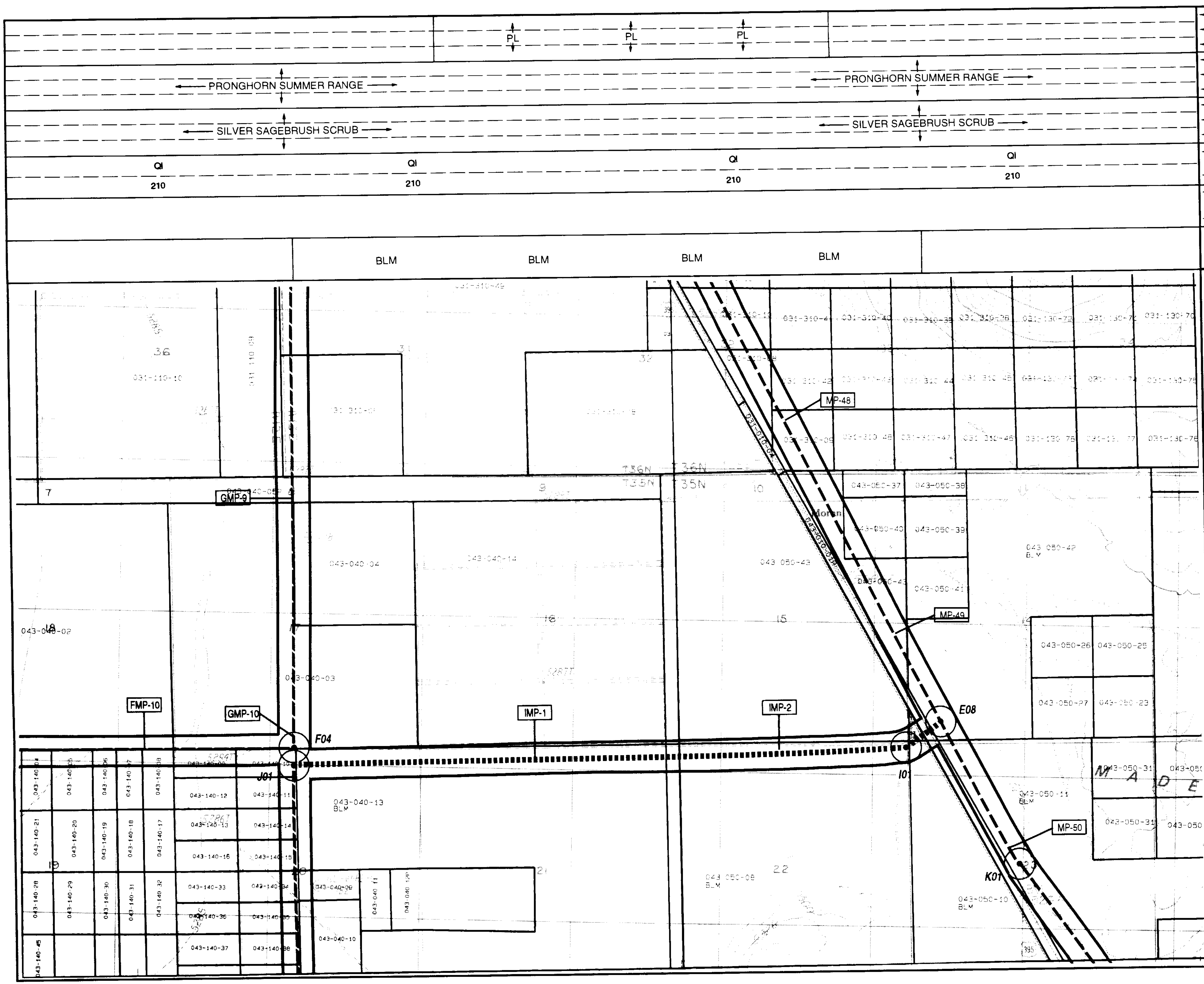
BASEMAP: USGS 7.5 Minute Quadrangle(s): ***Anderson Mountain, CA 1989.***

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map G-2

Alternative Segment [Segment G]



KEY

- Alternative Segment (Mapped)
- Other Alternative Segment
- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Mile Marker

N
W E
S

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

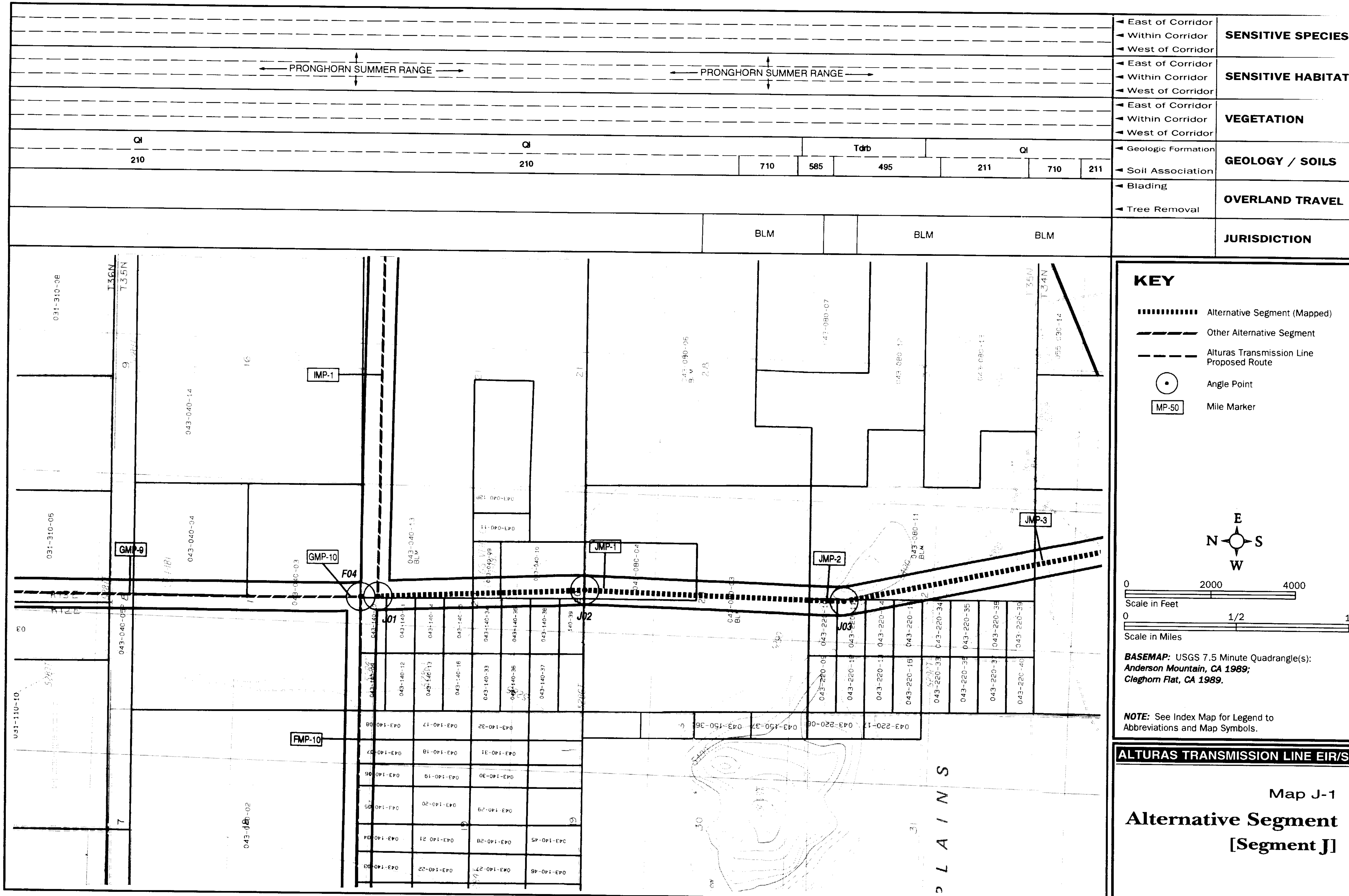
BASEMAP: USGS 7.5 Minute Quadrangle(s):
Anderson Mountain, CA 1989;
Mc Donald Peak, CA 1989.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

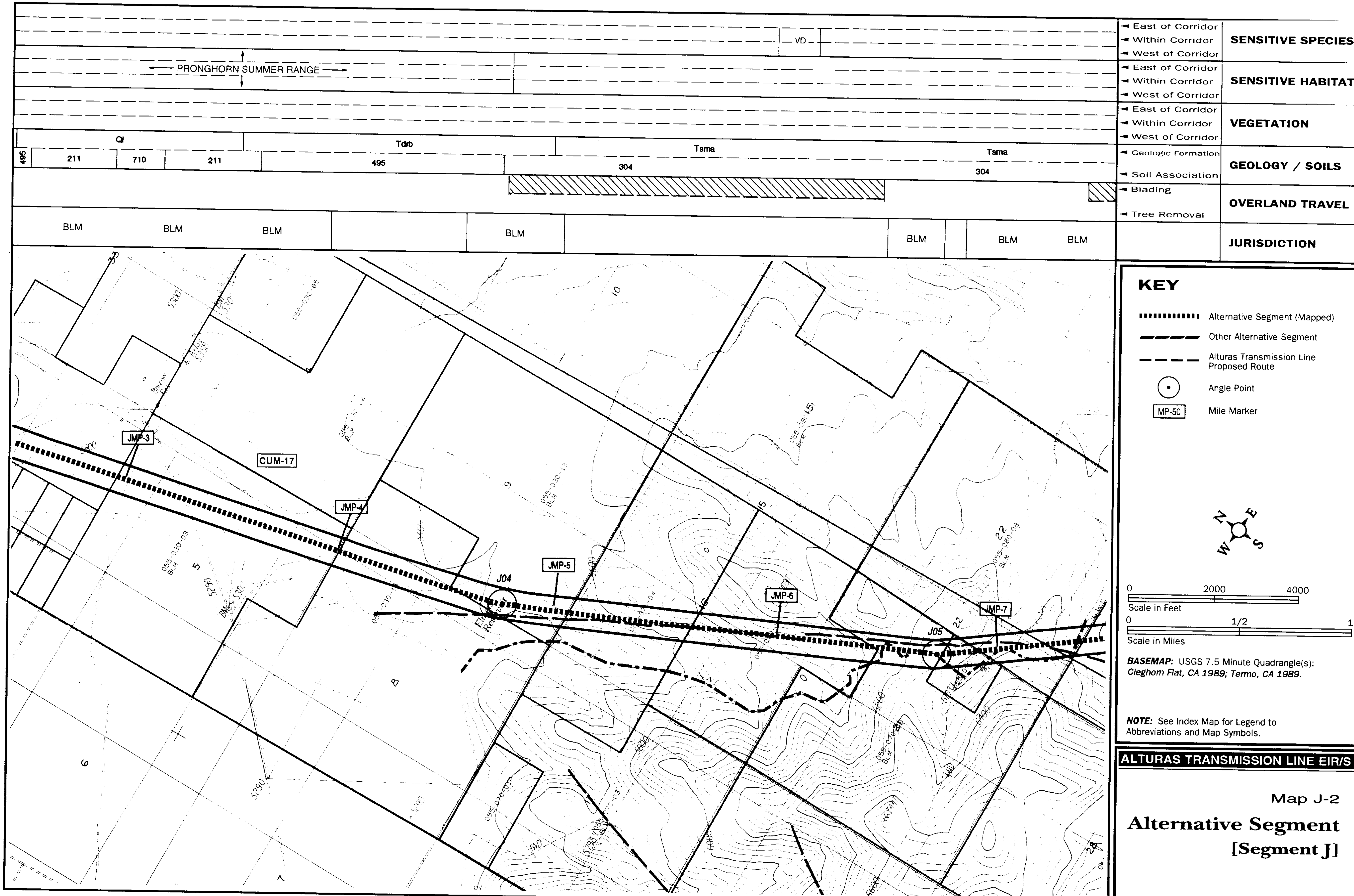
ALTURAS TRANSMISSION LINE EIR/S

Map I-1

Alternative Segment
[Segment I]



East of Corridor
Within Corridor
West of Corridor
SENSITIVE SPECIES
PRONGHORN SUMMER RANGE
PRONGHORN SUMMER RANGE
East of Corridor
Within Corridor
West of Corridor
SENSITIVE HABITAT
East of Corridor
Within Corridor
West of Corridor
VEGETATION
Ql
Ql
Tdrb
Ql
210
210
710
585
495
211
710
211
Geologic Formation
Soil Association
GEOLOGY / SOILS
Blading
Tree Removal
OVERLAND TRAVEL
BLM
BLM
BLM
JURISDICTION
KEY
Alternative Segment (Mapped)
Other Alternative Segment
Alturas Transmission Line Proposed Route
Angle Point
MP-50
Mile Marker
E
N
S
W
0
2000
4000
Scale in Feet
0
1/2
1
Scale in Miles
BASEMAP: USGS 7.5 Minute Quadrangle(s):
Anderson Mountain, CA 1989;
Cleghorn Flat, CA 1989.
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.
ALTURAS TRANSMISSION LINE EIR/S
Map J-1
Alternative Segment
[Segment J]
IMP-1
GMP-9
GMP-10
F04
J01
JMP-1
J02
JMP-2
J03
JMP-3
FMP-10
T36N
T35N
T34N
PLAINS



KEY

- Alternative Segment (Mapped)
- Other Alternative Segment
- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Mile Marker

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Cleghom Flat, CA 1989; Termo, CA 1989.*

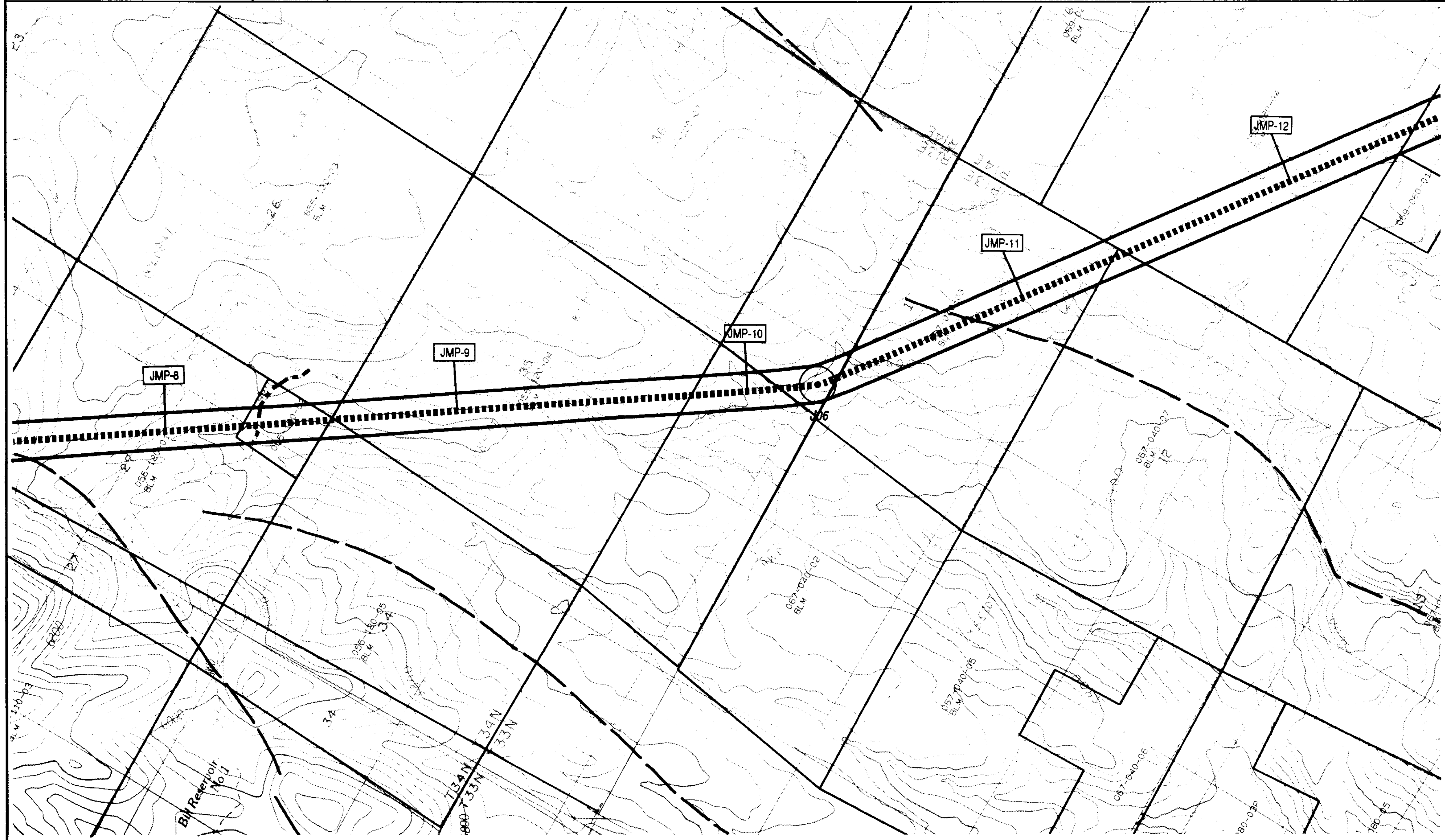
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map J-2

Alternative Segment [Segment J]

						◄ East of Corridor ◄ Within Corridor ◄ West of Corridor	**SENSITIVE SPECIES**
						◄ East of Corridor ◄ Within Corridor ◄ West of Corridor	**SENSITIVE HABITAT**
						◄ East of Corridor ◄ Within Corridor ◄ West of Corridor	**VEGETATION**
Tsma		Twra	Twra		Tppf	◄ Geologic Formation ◄ Soil Association	**GEOLOGY / SOILS**
304		304	304		304	◄ Blading ◄ Tree Removal	**OVERLAND TRAVEL**
BLM BLM		BLM BLM	BLM	BLM	BLM		**JURISDICTION**



KEY

Alternative Segment (Mapped)
Other Alternative Segment
Alturas Transmission Line Proposed Route
Angle Point
MP-50 Mile Marker

0 2000 4000
Scale in Feet
0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s):
Snowstorm Mountain, CA 1989;
West of Snowstorm Mountain, CA 1989;
Termo, CA 1989.

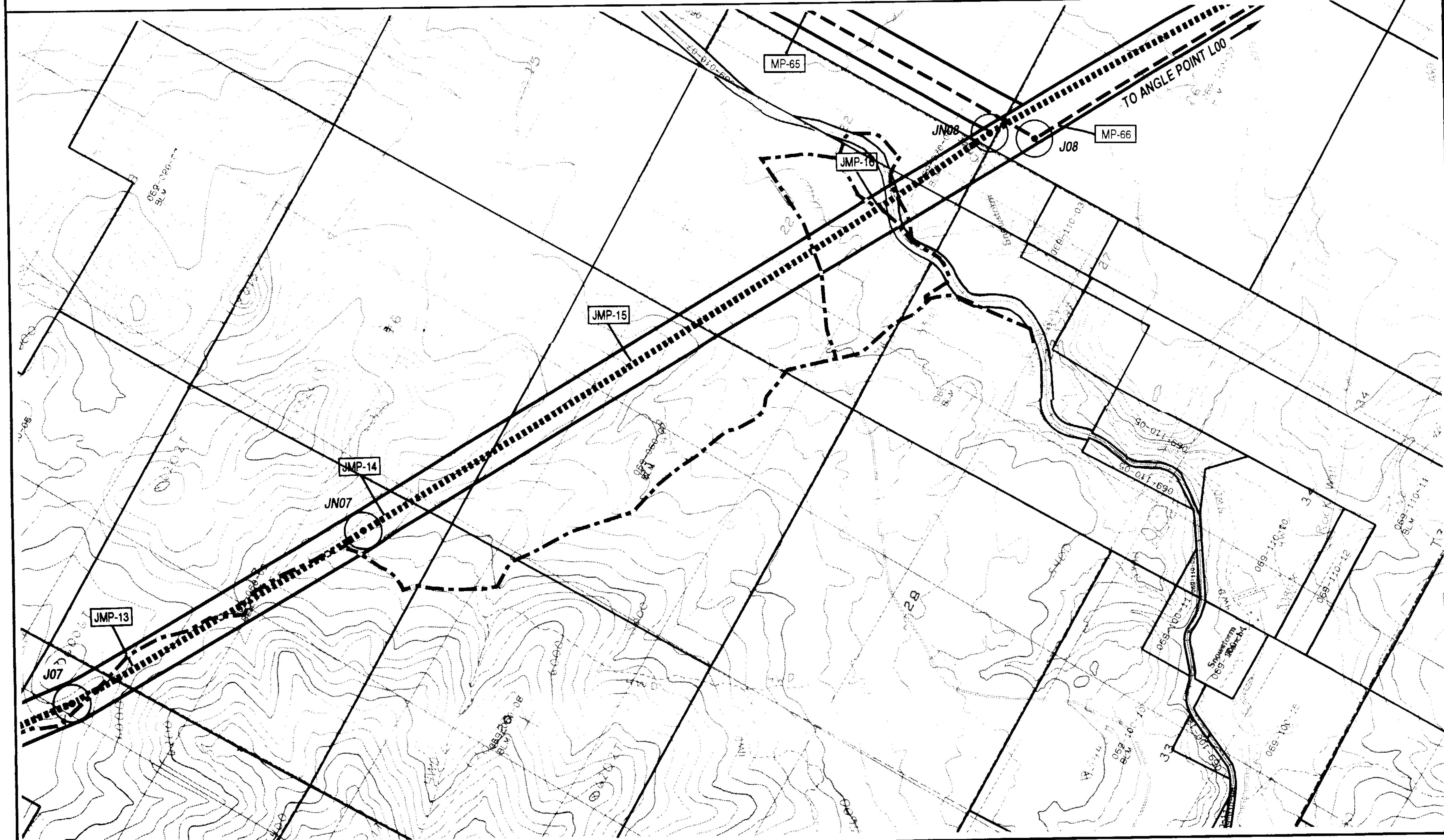
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map J-3

Alternative Segment
[Segment J]

SENSITIVE SPECIES	East of Corridor / Within Corridor / West of Corridor	SMV; SMV
SENSITIVE HABITAT	East of Corridor / Within Corridor / West of Corridor	PRONGHORN SUMMER RANGE; PRONGHORN SUMMER RANGE
VEGETATION	East of Corridor / Within Corridor / West of Corridor	
GEOLOGY / SOILS	Geologic Formation	Tppf; Thfp; Tppf/Thfp; Thfp; Tppf; Tsbu; Tsbu
	Soil Association	304; 166; 495; 118; 122
OVERLAND TRAVEL	Blading / Tree Removal	
JURISDICTION		BLM; BLM; BLM; BLM; BLM



KEY

- Alternative Segment (Mapped)
- Other Alternative Segment
- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Mile Marker

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

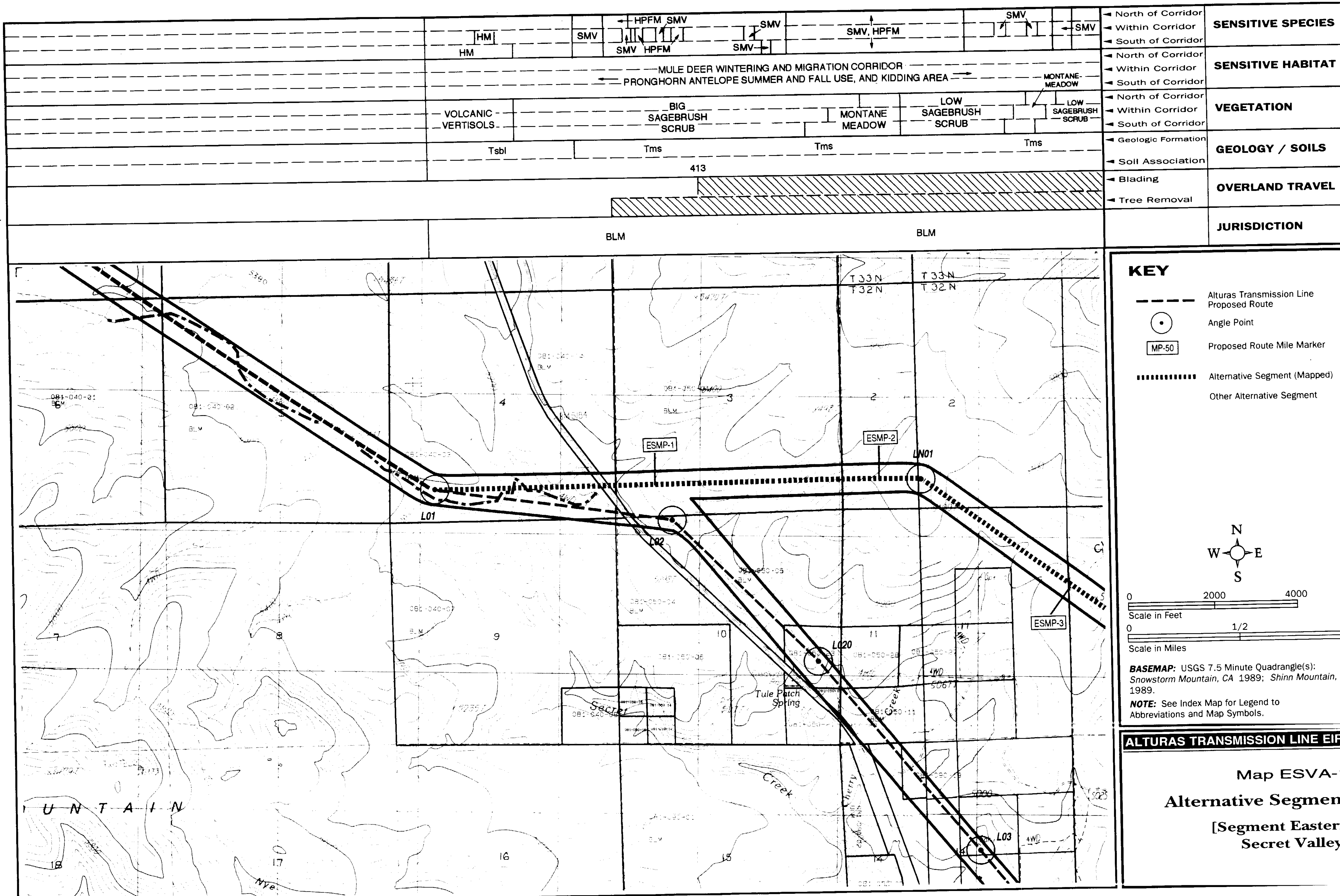
BASEMAP: USGS 7.5 Minute Quadrangle(s):
Snowstorm Mountain, CA 1989;
West of Snowstorm Mountain, CA 1989.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map J-4

Alternative Segment [Segment J]

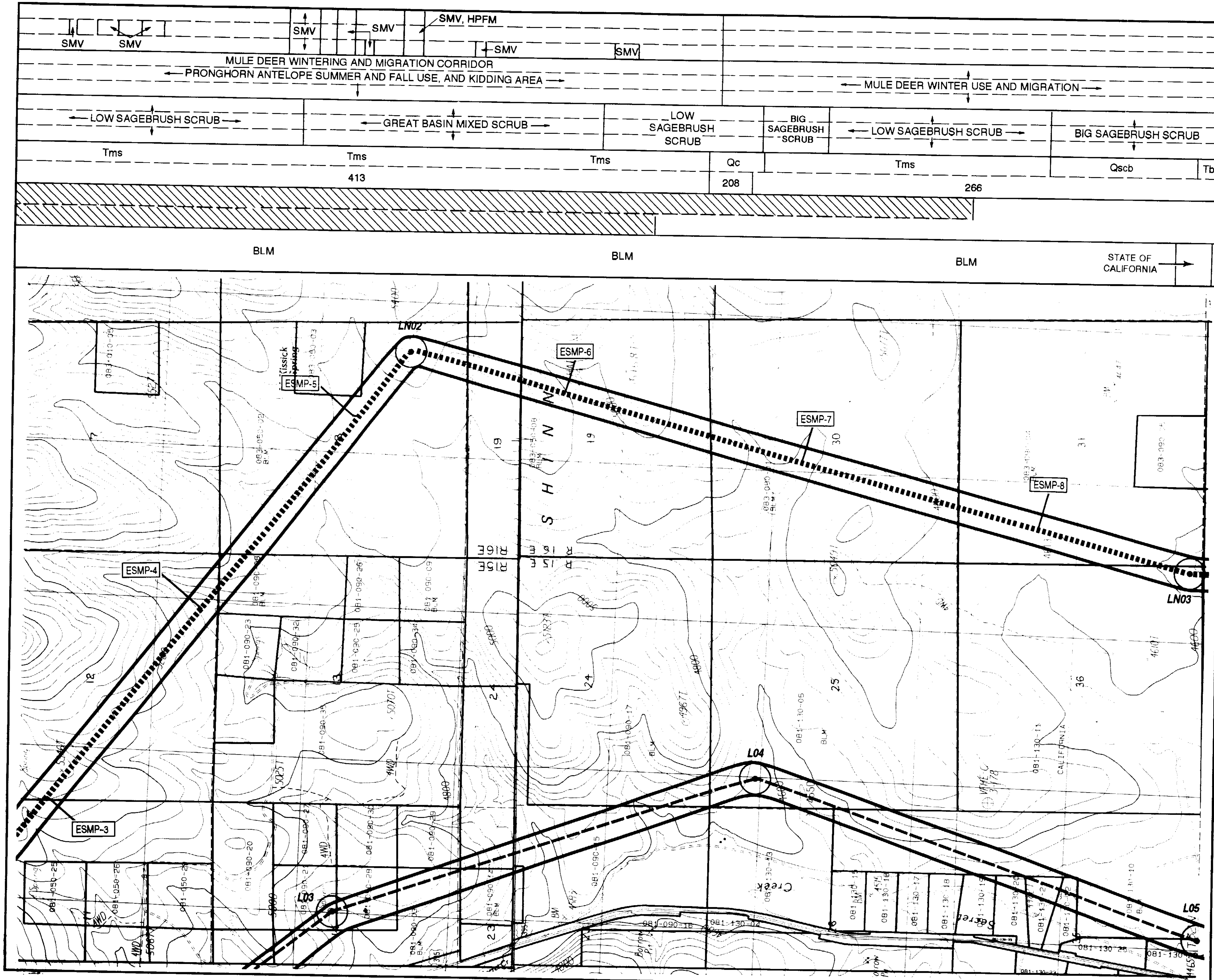


ALTURAS TRANSMISSION LINE EIR/S

Map ESVA-1

Alternative Segment

[Segment Eastern Secret Valley]



East of Corridor Within Corridor West of Corridor	**SENSITIVE SPECIES**
East of Corridor Within Corridor West of Corridor	**SENSITIVE HABITAT**
East of Corridor Within Corridor West of Corridor	**VEGETATION**
Geologic Formation Soil Association	**GEOLOGY / SOILS**
Blading Tree Removal	**OVERLAND TRAVEL**
	JURISDICTION

KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

Alternative Segment (Mapped)

Other Alternative Segment

E N S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Five Springs, CA* 1989; *Shinn Mountain, CA* 1989.

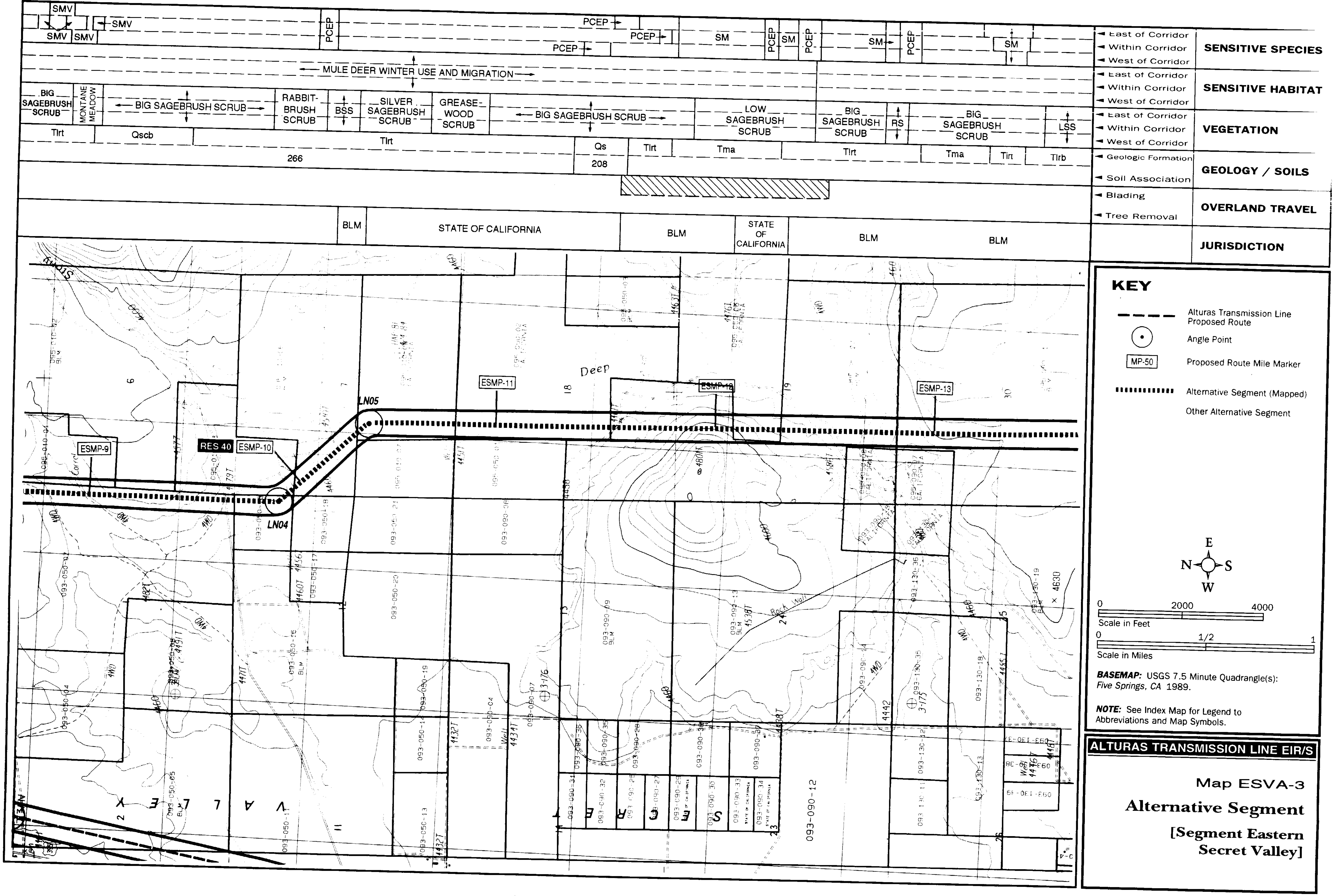
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

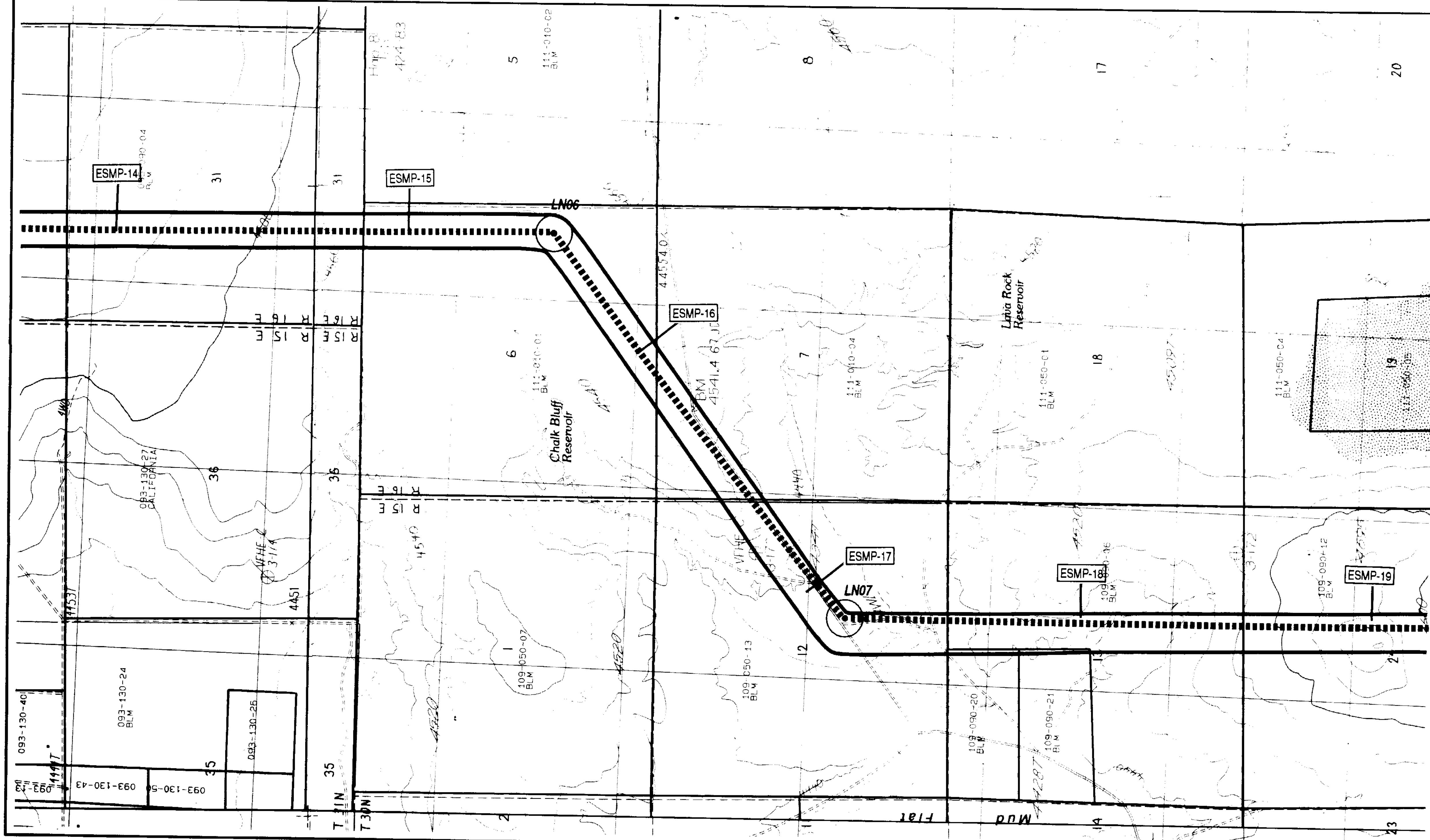
Map ESVA-2

Alternative Segment

[Segment Eastern Secret Valley]


SENSITIVE SPECIES
SENSITIVE HABITAT
VEGETATION
GEOLOGY / SOILS
OVERLAND TRAVEL
JURISDICTION
East of Corridor
Within Corridor
West of Corridor
Geologic Formation
Soil Association
Blading
Tree Removal
SMV
PCEP
SM
MULE DEER WINTER USE AND MIGRATION
BIG SAGEBRUSH SCRUB
MONTANE MEADOW
RABBIT-BRUSH SCRUB
BSS
SILVER SAGEBRUSH SCRUB
GREASEWOOD SCRUB
LOW SAGEBRUSH SCRUB
RS
LSS
Tlrt
Qscb
Qs
Tma
Tlrb
266
208
BLM
STATE OF CALIFORNIA
KEY
Alturas Transmission Line Proposed Route
Angle Point
MP-50
Proposed Route Mile Marker
Alternative Segment (Mapped)
Other Alternative Segment
ESMP-9
ESMP-10
ESMP-11
ESMP-12
ESMP-13
RES 40
LN04
LN05
Deep
Rock Wall
E
N
S
W
0
2000
4000
Scale in Feet
1/2
1
Scale in Miles
BASEMAP: USGS 7.5 Minute Quadrangle(s): Five Springs, CA 1989.
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.
ALTURAS TRANSMISSION LINE EIR/S
Map ESVA-3
Alternative Segment
[Segment Eastern Secret Valley]

PCEP; PCEP; PCEP, SM; SM; RL; SM; PCEP, SM; SM; PCEP; SM; PCEP	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
PRONGHORN ANTELOPE KIDDING AND YEAR LONG USE AREA	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
LOW SAGEBRUSH SCRUB; BIG SAGEBRUSH SCRUB; GREAT BASIN MIXED SCRUB; LOW SAGEBRUSH SCRUB	East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Tlrb; Tlrb; Tlrb; Tlrt; Tvsa; Tvsa	Geologic Formation	**GEOLOGY / SOILS**
266; 203; 186; 205; 186	Soil Association	
	Blading / Tree Removal	**OVERLAND TRAVEL**
		JURISDICTION



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

Alternative Segment (Mapped)

Other Alternative Segment

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Five Springs, CA* 1989; *Little Mud Flat, CA* 1989.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

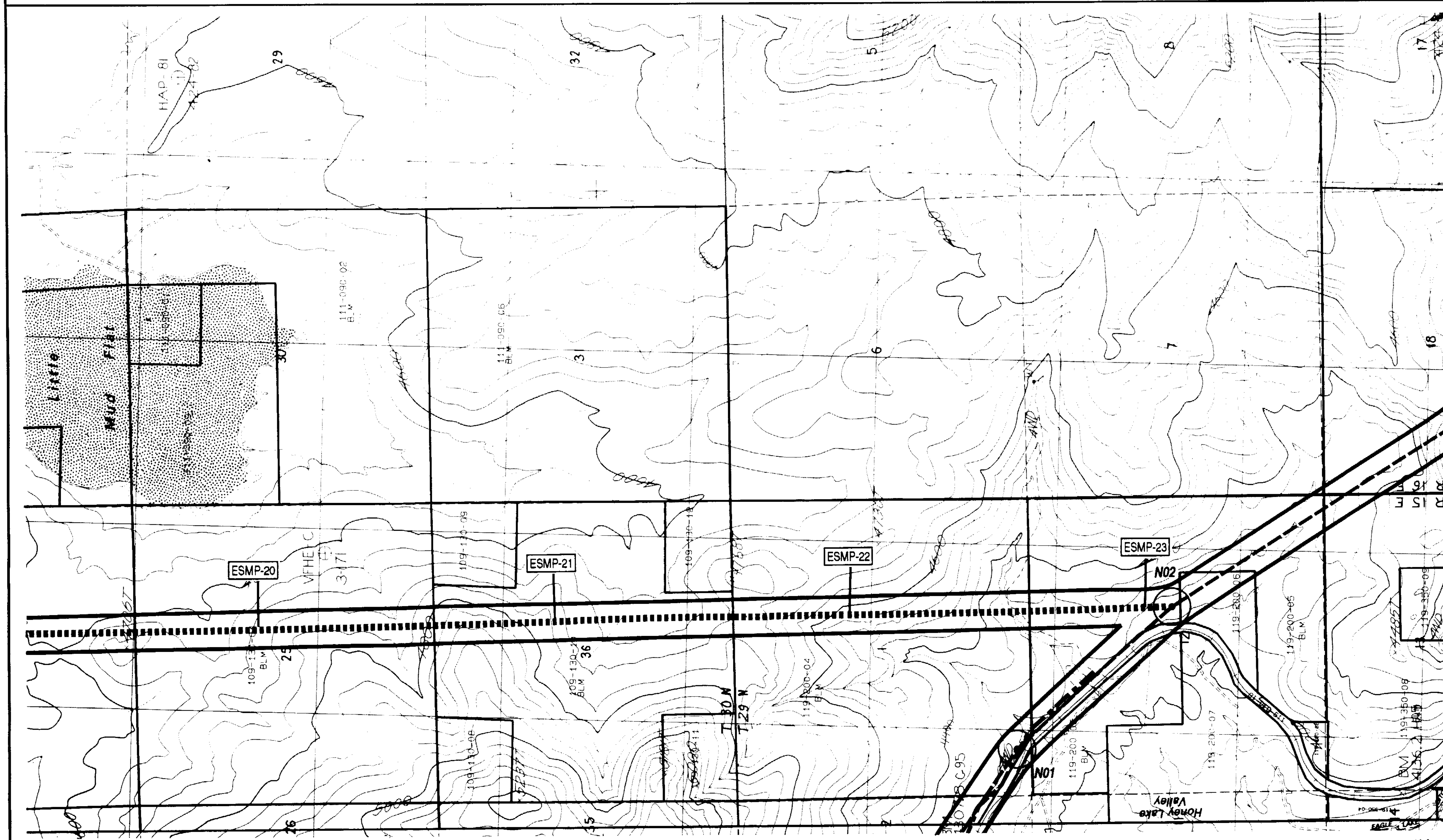
ALTURAS TRANSMISSION LINE EIR/S

Map ESVA-4

Alternative Segment

[Segment Eastern Secret Valley]

SENSITIVE SPECIES	East of Corridor	SM
	Within Corridor	SM; PCEP; SM; SM
	West of Corridor	
SENSITIVE HABITAT	East of Corridor	
	Within Corridor	PRONGHORN ANTELOPE KIDDING AND YEAR LONG USE AREA
	West of Corridor	
VEGETATION	East of Corridor	
	Within Corridor	LOW SAGEBRUSH SCRUB; DISTURBED
	West of Corridor	
GEOLOGY / SOILS	Geologic Formation	Tvsa; Tvsa; Tvsa; Twa
	Soil Association	186; 185
OVERLAND TRAVEL	Blading	
	Tree Removal	
JURISDICTION		BLM; BLM; BLM



KEY

Alturas Transmission Line Proposed Route

Angle Point

MP-50 Proposed Route Mile Marker

Alternative Segment (Mapped)

Other Alternative Segment

E N S W

0 2000 4000

Scale in Feet

0 1/2 1

Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Little Mud Flat, CA* 1989.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

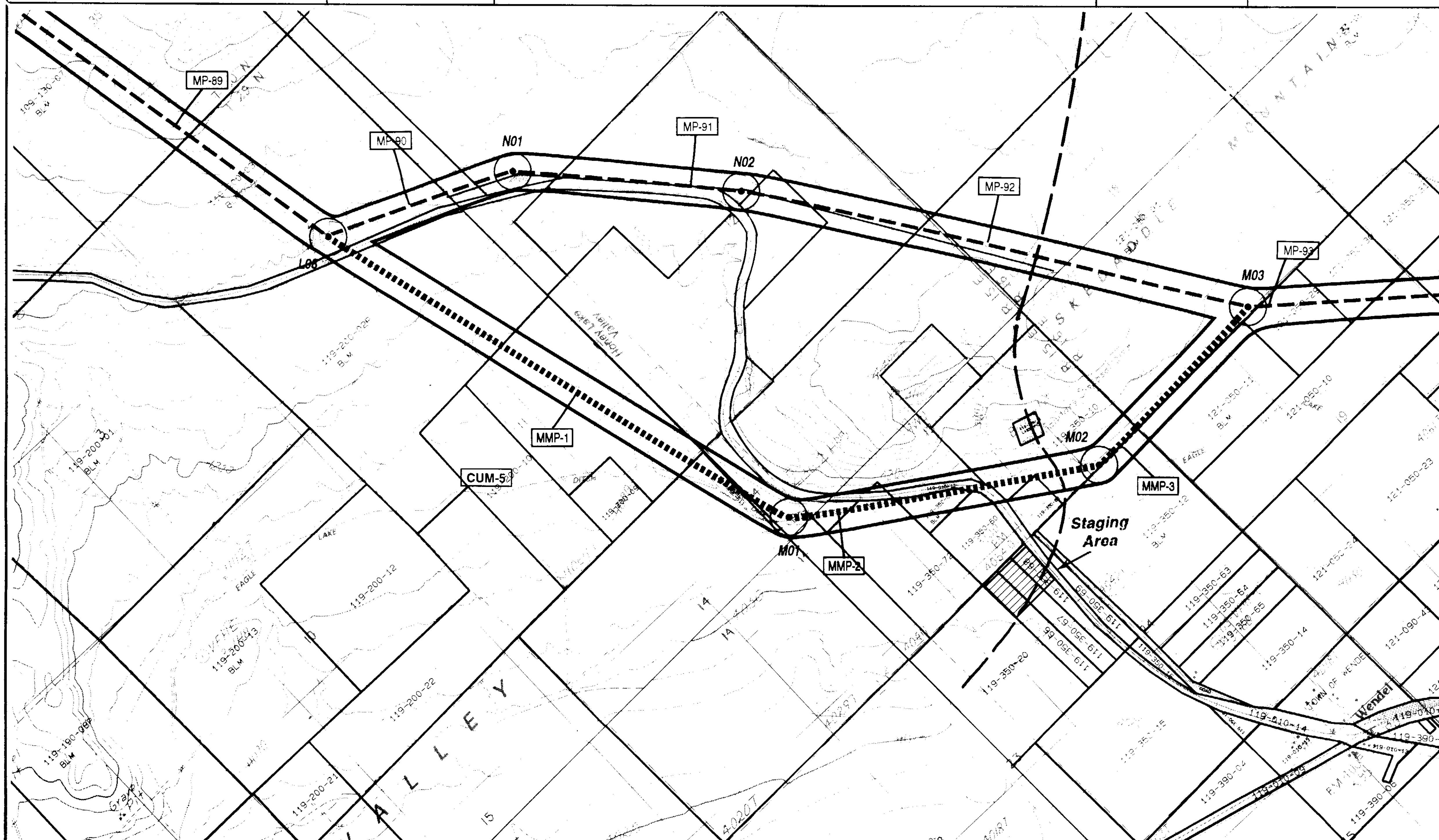
ALTURAS TRANSMISSION LINE EIR/S

Map ESVA-5

Alternative Segment

[Segment Eastern Secret Valley]

SM	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
PRONGHORN YEAR ROUND AREA; PRONGHORN WINTER RANGE AREA; PRONGHORN WINTER RANGE AREA	East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
SAGEBRUSH/ BITTERBRUSH SCRUB; SAGEBRUSH/ BITTERBRUSH SCRUB	East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Tvsa; Qlg; Ql; Ql	Geologic Formation	**GEOLOGY / SOILS**
185; 380; 310; 380; 310/380; 185/360; 185	Soil Association	
	Blading / Tree Removal	**OVERLAND TRAVEL**
BLM; BLM		**JURISDICTION**



KEY

- Alternative Segment (Mapped)
- Other Alternative Segment
- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

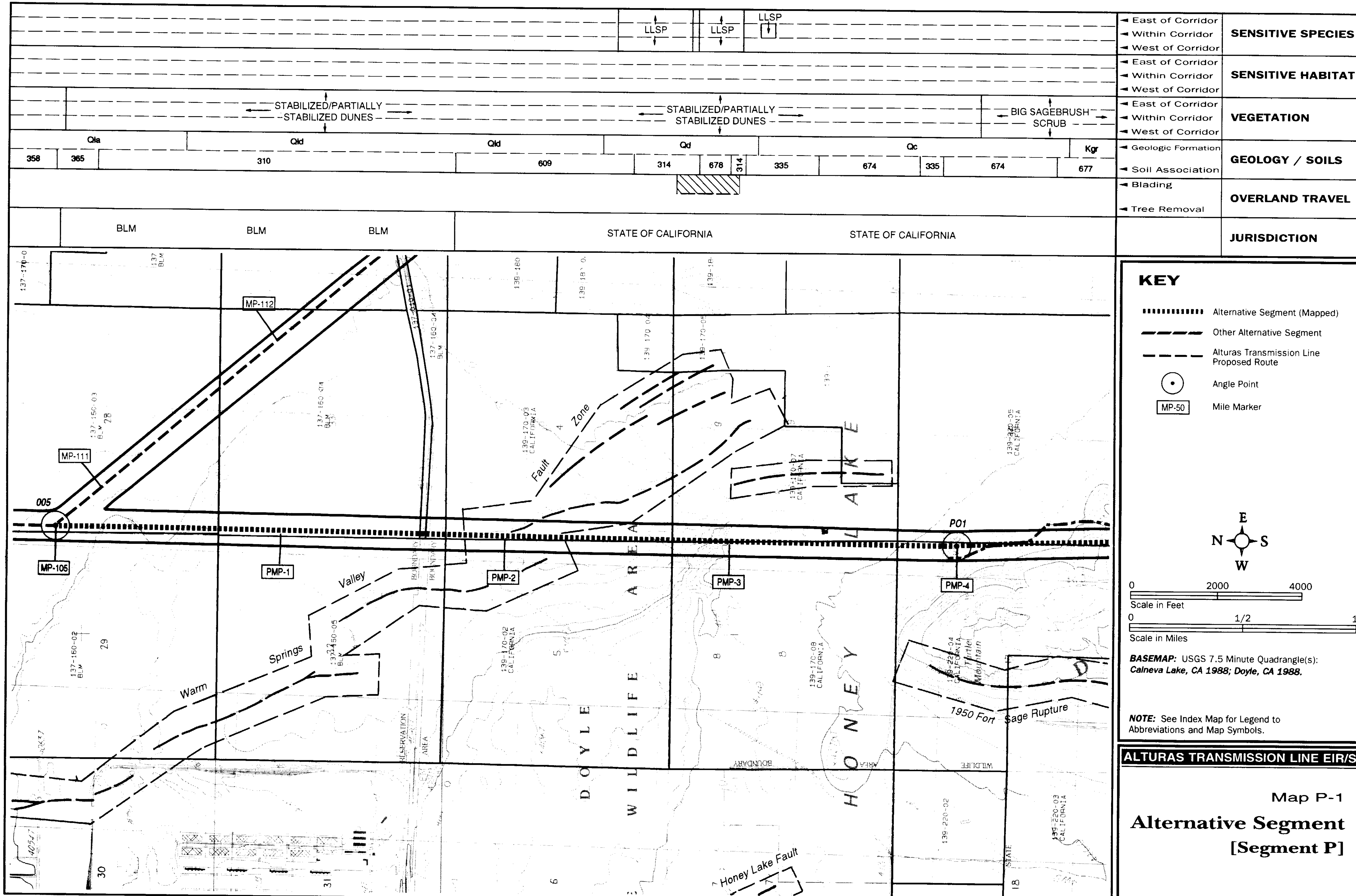
BASEMAP: USGS 7.5 Minute Quadrangle(s):
Little Mud Flat, CA 1988; Shaffer Mtn, 1988; Wendel, CA 1988; Wendel Hot Springs, CA 1988.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map M-1

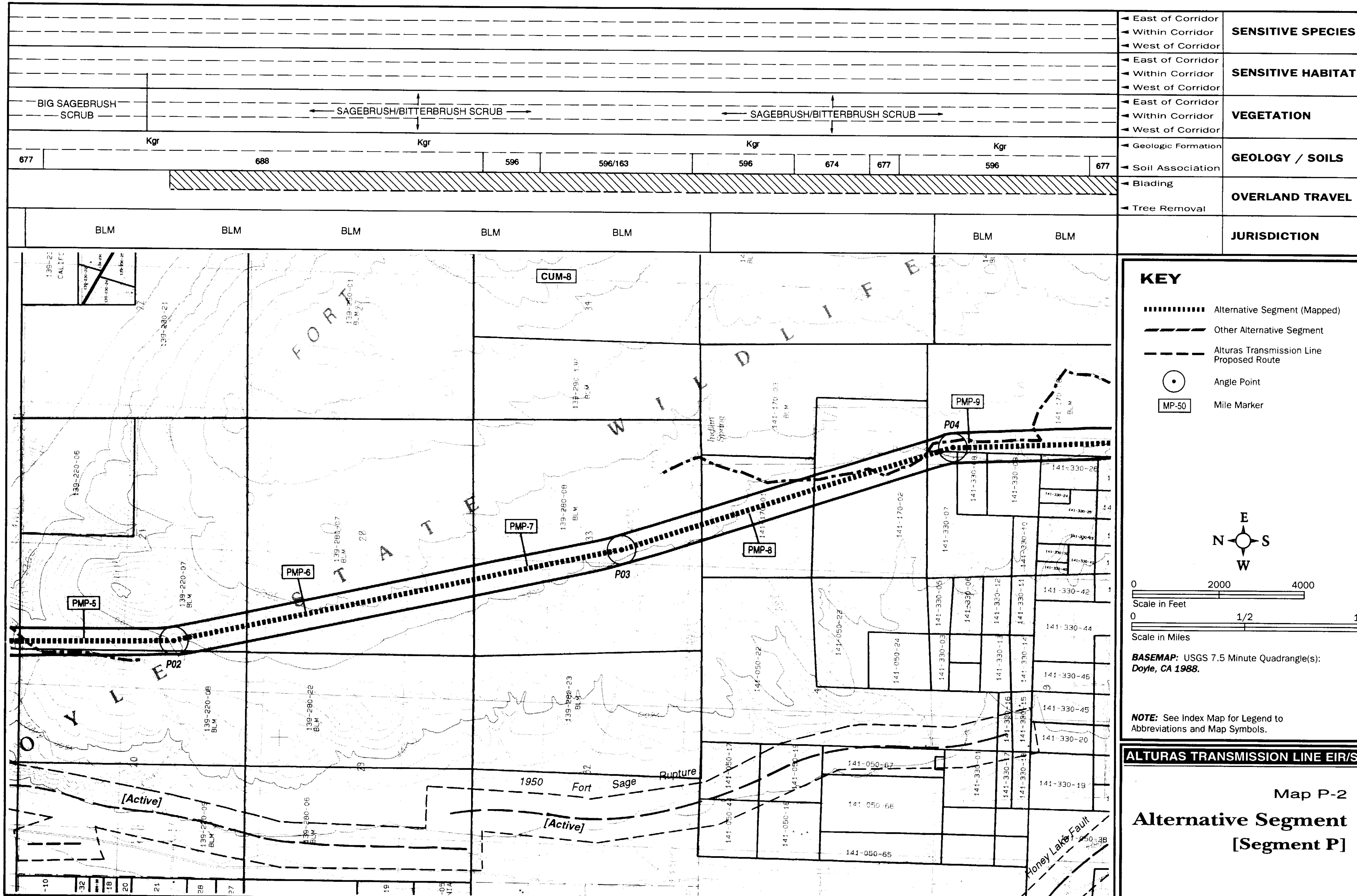
Alternative Segment [Segment M]



ALTURAS TRANSMISSION LINE EIR/S

Map P-1

Alternative Segment [Segment P]

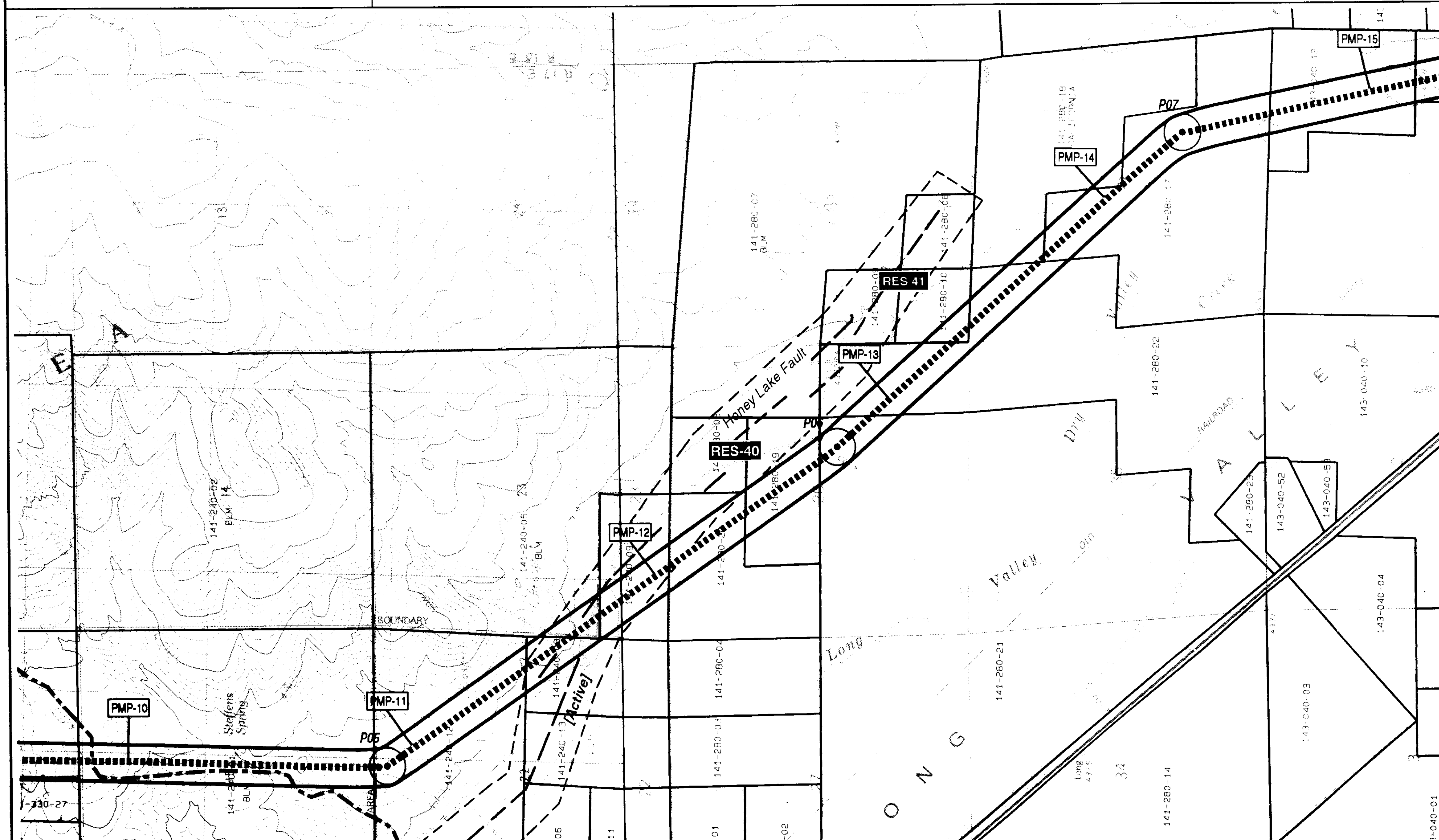


ALTURAS TRANSMISSION LINE EIR/S

Map P-2

Alternative Segment [Segment P]

East of Corridor / Within Corridor / West of Corridor	**SENSITIVE SPECIES**
East of Corridor / Within Corridor / West of Corridor	**SENSITIVE HABITAT**
SAGEBRUSH/BITTERBRUSH SCRUB; MONTANE MEADOW; MONTANE MEADOW — East of Corridor / Within Corridor / West of Corridor	**VEGETATION**
Geologic Formation: Kgr; Qc; Qa; Qa; Tw — Soil Association: 308; 596; 677; 674/677; 674; 385; 860; 860/384; 860; 384; 860; 474; 384; 860; 585	**GEOLOGY / SOILS**
Blading / Tree Removal	**OVERLAND TRAVEL**
BLM; BLM; BLM; BLM	**JURISDICTION**



KEY

- Alternative Segment (Mapped)
- Other Alternative Segment
- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

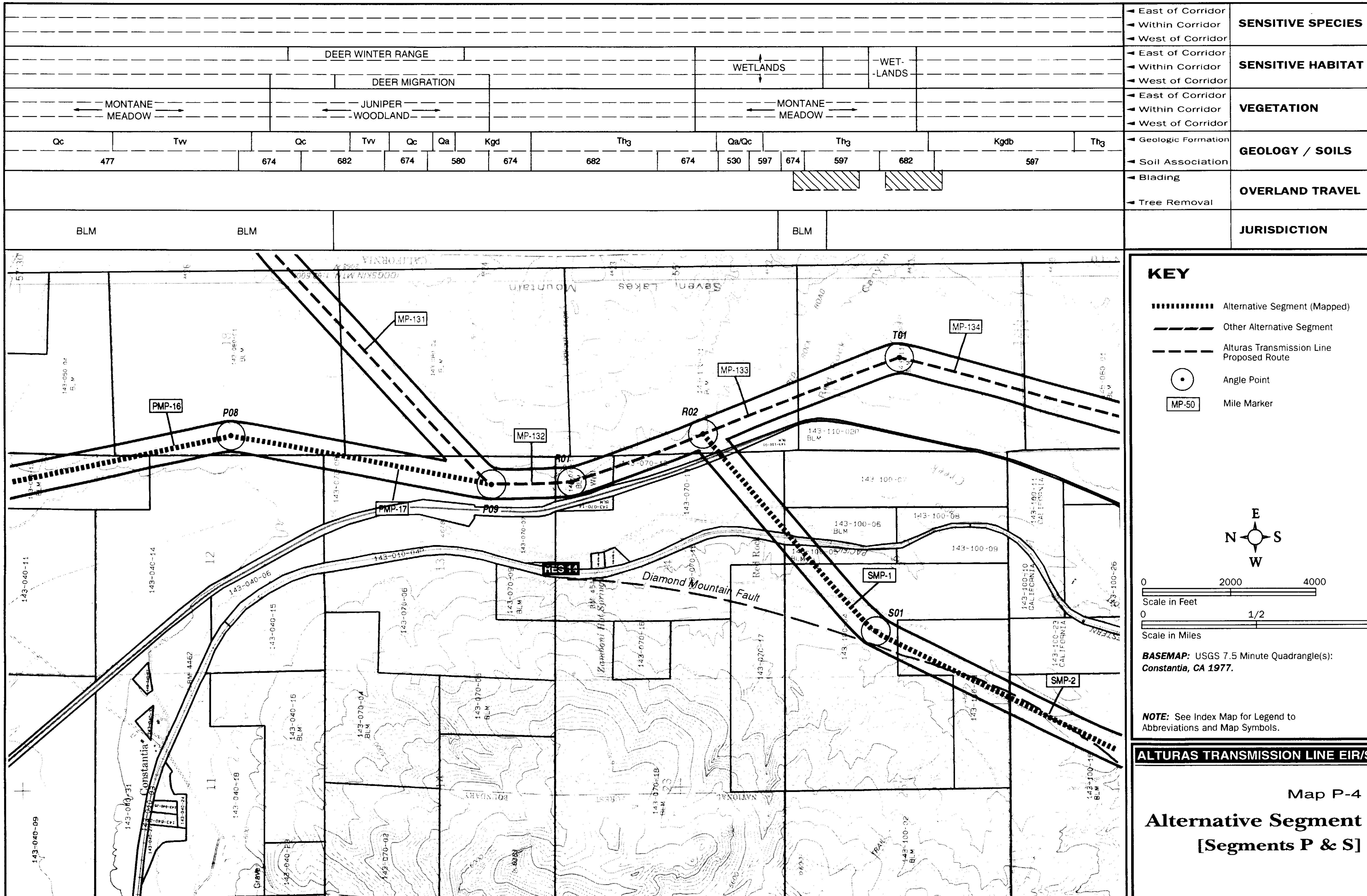
BASEMAP: USGS 7.5 Minute Quadrangle(s): ***Constantia, CA 1977; Doyle, CA 1988.***

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

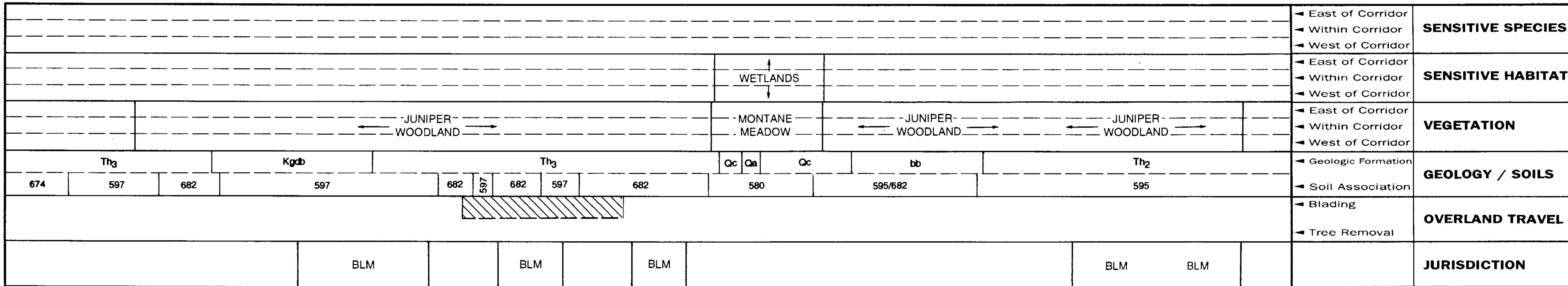
ALTURAS TRANSMISSION LINE EIR/S

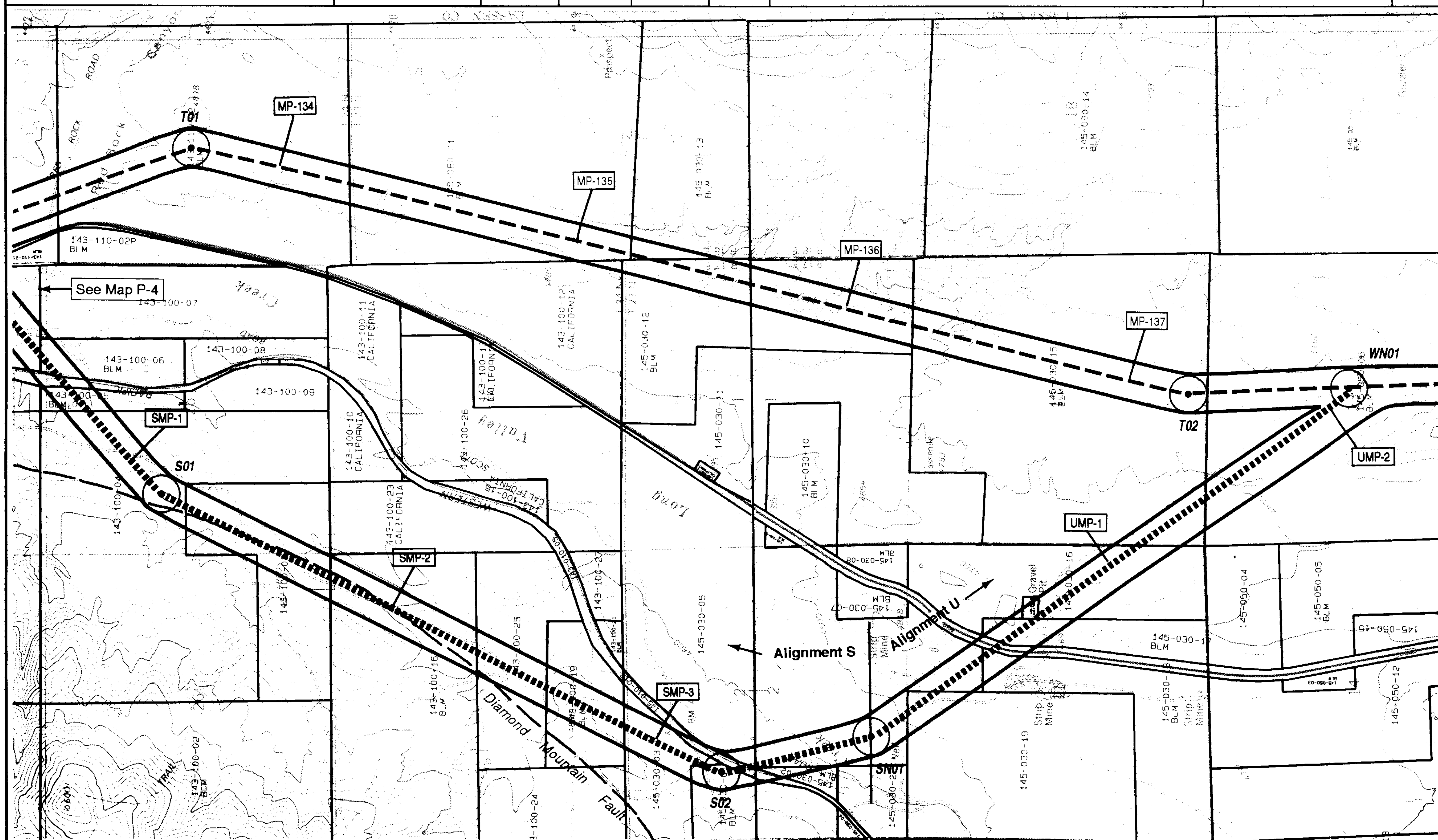
Map P-3

Alternative Segment [Segment P]



SENSITIVE SPECIES
East of Corridor
Within Corridor
West of Corridor
SENSITIVE HABITAT
DEER WINTER RANGE
DEER MIGRATION
WETLANDS
WET-LANDS
VEGETATION
MONTANE MEADOW
JUNIPER WOODLAND
MONTANE MEADOW
GEOLOGY / SOILS
Geologic Formation
Soil Association
Qc Tvv Qc Tvv Qc Qa Kgd Th3 Qa/Qc Th3 Kgdb Th3
477 674 682 674 580 674 682 674 530 597 674 597 682 597
OVERLAND TRAVEL
Blading
Tree Removal
JURISDICTION
BLM BLM BLM
MP-131
MP-132
MP-133
MP-134
PMP-16
PMP-17
SMP-1
SMP-2
P08
P09
R01
R02
T01
S01
RES 14
Diamond Mountain Fault
Seven Lakes Mountain
Constantia
KEY
Alternative Segment (Mapped)
Other Alternative Segment
Alturas Transmission Line Proposed Route
Angle Point
MP-50 Mile Marker
N E S W
0 2000 4000
Scale in Feet
0 1/2 1
Scale in Miles
BASEMAP: USGS 7.5 Minute Quadrangle(s): Constantia, CA 1977.
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.
ALTURAS TRANSMISSION LINE EIR/S
Map P-4
Alternative Segment [Segments P & S]





KEY

- Alternative Segment (Mapped)
- Other Alternative Segment
- Alturas Transmission Line Proposed Route
- Angle Point
- MP-50 Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

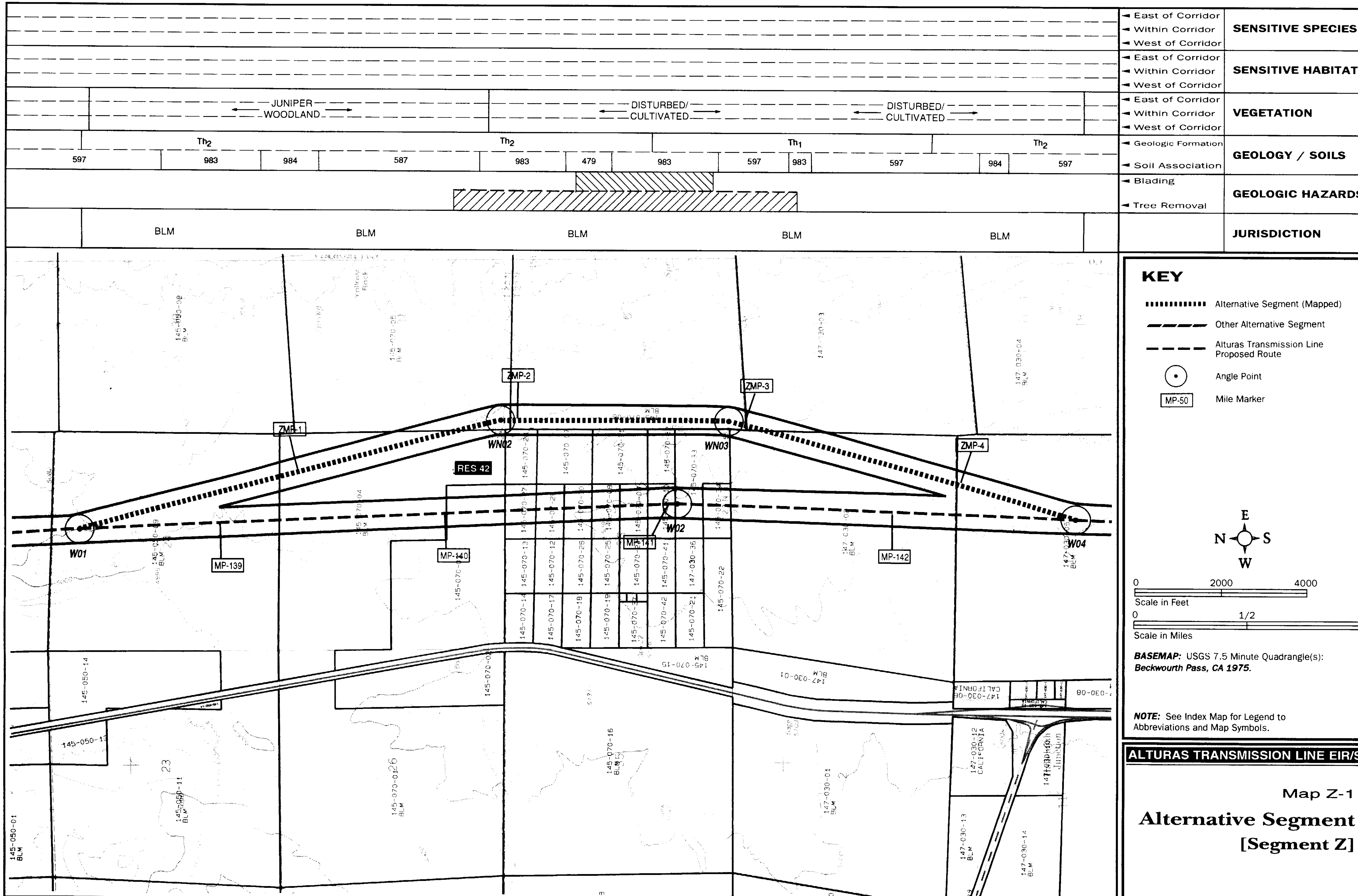
BASEMAP: USGS 7.5 Minute Quadrangle(s):
Constantia, CA 1977;
Beckwourth Pass, CA 1975.

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map S-1

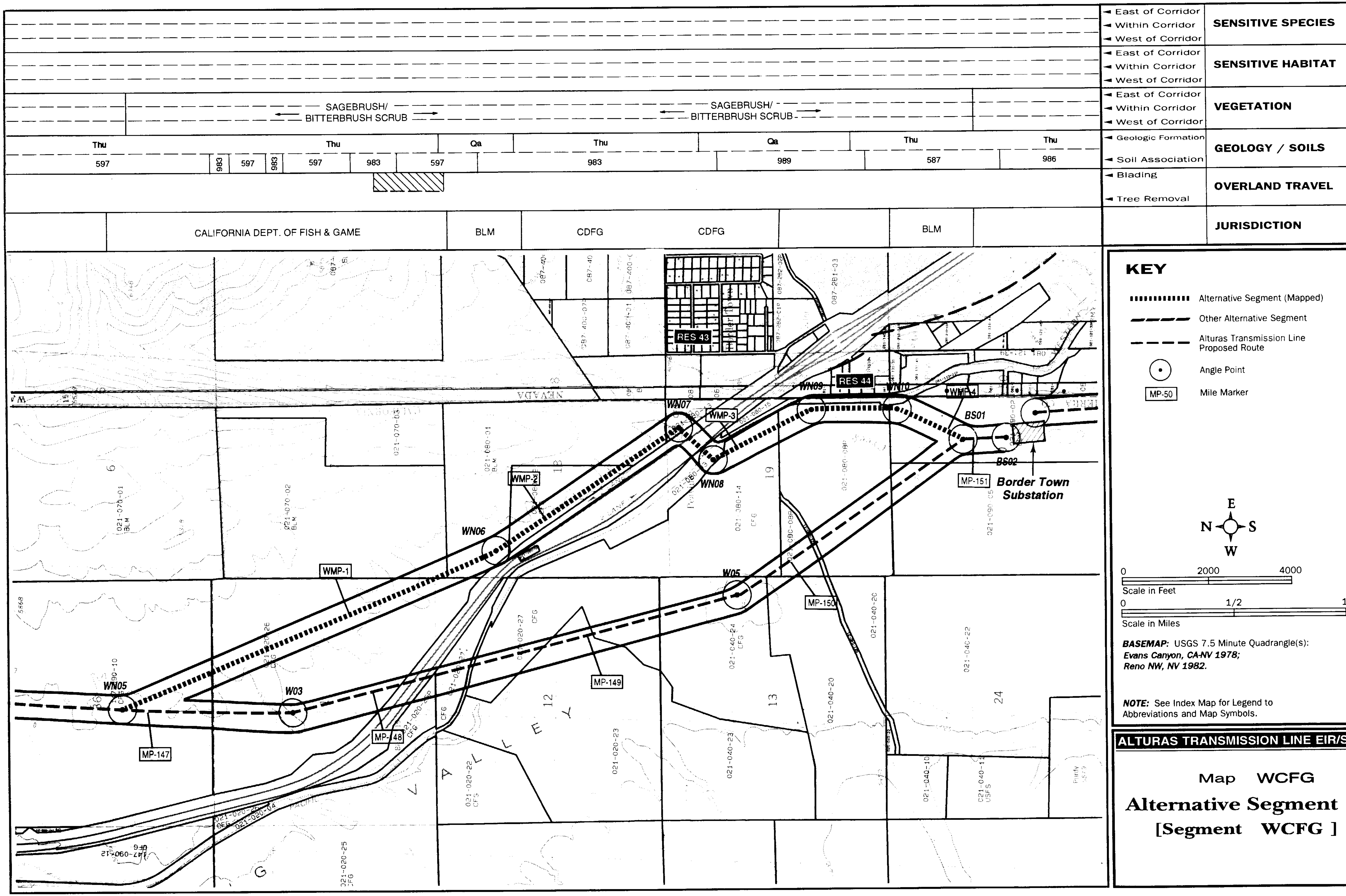
Alternative Segment [Segments S & U]



ALTURAS TRANSMISSION LINE EIR/S

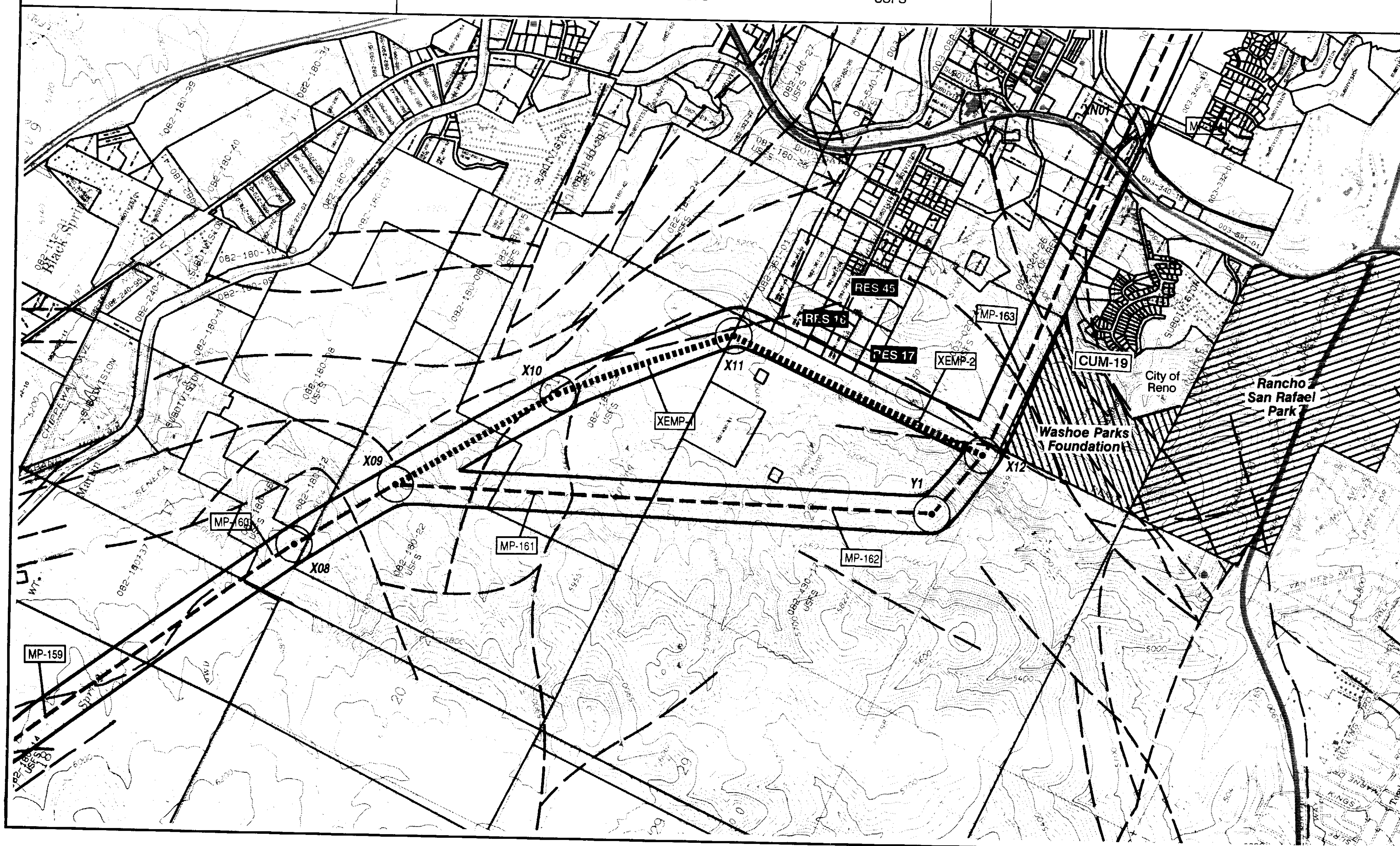
Map Z-1

Alternative Segment [Segment Z]



SENSITIVE SPECIES
SENSITIVE HABITAT
VEGETATION
GEOLOGY / SOILS
OVERLAND TRAVEL
JURISDICTION
East of Corridor
Within Corridor
West of Corridor
Geologic Formation
Soil Association
Blading
Tree Removal
SAGEBRUSH/ BITTERBRUSH SCRUB
SAGEBRUSH/ BITTERBRUSH SCRUB
Thu
Thu
Qa
Thu
Qa
Thu
Thu
597
983
597
983
597
983
597
983
989
587
986
CALIFORNIA DEPT. OF FISH & GAME
BLM
CDFG
CDFG
BLM
KEY
Alternative Segment (Mapped)
Other Alternative Segment
Alturas Transmission Line Proposed Route
Angle Point
MP-50
Mile Marker
0
2000
4000
Scale in Feet
0
1/2
1
Scale in Miles
BASEMAP: USGS 7.5 Minute Quadrangle(s):
Evans Canyon, CA-NV 1978;
Reno NW, NV 1982.
NOTE: See Index Map for Legend to Abbreviations and Map Symbols.
E
N
S
W
RES 43
RES 44
WN05
WN06
WN07
WN08
WN09
WN10
W03
W05
BS01
BS02
WMP-1
WMP-2
WMP-3
WMP-4
MP-147
MP-148
MP-149
MP-150
MP-151
Border Town Substation
ALTURAS TRANSMISSION LINE EIR/S
Map WCFG
Alternative Segment
[Segment WCFG]

AAB	East of Corridor / Within Corridor / West of Corridor	SENSITIVE SPECIES
	East of Corridor / Within Corridor / West of Corridor	SENSITIVE HABITAT
ALTERED ANDESITE; ALTERED ANDESITE	East of Corridor / Within Corridor / West of Corridor	VEGETATION
Ta; Ta; Ta	Geologic Formation	GEOLOGY / SOILS
281; 900; 880; 281; 331; 280; 331; 901	Soil Association	
	Blading / Tree Removal	OVERLAND TRAVEL
USFS; USFS; USFS		JURISDICTION



KEY

Alternative Segment (Mapped)
Other Alternative Segment
Alturas Transmission Line Proposed Route
Angle Point
MP-50 Mile Marker

N E S W

0 2000 4000
Scale in Feet

0 1/2 1
Scale in Miles

BASEMAP: USGS 7.5 Minute Quadrangle(s): *Reno, NV 1967; Verdi, NV 1982.*

NOTE: See Index Map for Legend to Abbreviations and Map Symbols.

ALTURAS TRANSMISSION LINE EIR/S

Map X-1

Alternative Segment

[Segment X East]

PART A. INTRODUCTION/OVERVIEW

A.1 INTRODUCTION/BACKGROUND

The Proposed Project for this study is the construction, operation, and maintenance of the Alturas Transmission Line, as proposed by Sierra Pacific Power Company (SPPCo or Applicant). The Applicant's Proposed Project would extend a 345,000 volt (345 kV) overhead electric power transmission line approximately 165 miles from Alturas, California, to Reno, Nevada. The proposal also includes the construction of two new electrical substations, one northwest of Alturas, California, and one just west of Border Town, California, near the California-Nevada state line. The existing SPPCo North Valley Road Substation in Reno would be improved to allow for the tie-in of the new 345 kV line. The Proposed Project would also require a two-mile, 230 kV transmission line from the interconnection point with the Bonneville Power Administration's existing 230 kV line to the Alturas Substation.

The Lead Federal and State Agencies responsible for preparing this Environmental Impact Report/ Statement for the Proposed Project are the U.S. Department of the Interior, U.S. Bureau of Land Management (BLM), and the California Public Utilities Commission (CPUC), respectively. On February 8, 1993, SPPCo submitted a preliminary application to the BLM for a right-of-way for the Alturas Transmission Line Project. On April 19, 1993, the BLM notified SPPCo that the completion of an Environmental Impact Statement (EIS), in accordance with the National Environmental Policy Act (NEPA), would be required to process the application.

On November 9, 1993, SPPCo filed an application with the CPUC for a Certificate of Public Convenience and Necessity (CPCN) to construct and operate the Alturas Transmission Line Project. In response to subsequent requests from the CPUC, SPPCo filed supplemental information on January 19 and February 10, 1994. The CPUC accepted SPPCo's application as complete on February 14, 1994, and informed the Applicant that an Environmental Impact Report (EIR), in accordance with the California Environmental Quality Act (CEQA), would be required to process the application. Pursuant to Rule 17.1 of the CPUC Rules of Practice and Procedure, SPPCo also submitted a Proponent's Environmental Assessment (PEA) for the Proposed Project, dated October 1993. SPPCo filed additional supplemental information on May 27, 1994, and amended its application on October 4, 1994.

As stated above, the CPUC and BLM are the lead State and Federal agencies for compliance with CEQA and NEPA, respectively. The purpose of this joint CEQA/NEPA document, referred to as the EIR/S, is to assess the potential environmental impacts that would result from the construction, operation, and maintenance of the Alturas Transmission Line. The impact analysis is accompanied by the identification of feasible mitigation measures which, if incorporated into the project, would avoid or minimize impacts. This EIR/S also assesses alternatives to the Proposed Project and identifies and analyzes those with the potential to further eliminate or minimize impacts. This document was prepared under the direction of the CPUC and BLM, and is provided for review by the public and by government agencies as required under provisions of CEQA and NEPA.

This document considers comments made by agencies and the public during the scoping period, which began with the issuance of the Notice of Preparation/Notice of Intent on March 17, 1994, and continued through May, 1994. During the scoping process, the CPUC and the BLM conducted four public meetings to receive input on the environmental issues associated with the Proposed Project and the alternatives that should be considered.

On March 3, 1995, the Draft EIR/S was released for a 60-day comment period and the public was invited to comment on the document. Four public workshops to present the document were held in March 1995. Based on requests from the public, the comment period was extended an additional 30-days to June 2, 1995. Written comments directed to the Lead Agencies were received, and four public hearings were held in April 1995 to receive oral and written comments. This Final EIR/S, which will be circulated to the public, responds to the comments received with both specific responses to each comment received, and text modifications and/or additions (text changes/additions are denoted by bars in the right margin, with the exception of new sections such as Responses to Comments [Part H], Appendices E.6 - E.10, and C.14, Impacts on Minority and Low-Income Communities). Table A-1 summarizes the public participation process for this EIR/S.

A.2 READER'S GUIDE TO THIS DOCUMENT

This EIR/S is organized as follows:

VOLUME I - MAIN DOCUMENT

Executive Summary: A summary description of the Proposed Project, Project alternatives, and their environmental impacts. Impact Summary Tables are provided that tabulate the impacts and mitigation measures for the Proposed Project and alternative scenarios.

Part A (Introduction/Overview): An overview of the public agency use of the EIR/S and a discussion of the purpose and need for the project.

Part B (Project and Alternative Descriptions): Detailed descriptions of the proposed Alturas Transmission Line Project, the alternatives considered but eliminated from further analysis, the alternative projects and alignments analyzed in Part C, and the scenario used for the analysis of cumulative impacts.

Part C (Environmental Analysis): A comprehensive analysis and assessment of impacts and mitigation measures for the Proposed Project, cumulative scenario, the No Project Alternative, and alternative projects. This part is divided into main sections for each environmental issue area (e.g., Air Quality, Biology, Geology, etc.) which contain the environmental setting, impacts, and cumulative effects of the Proposed Project and each alternative. Resource data collected for each issue area were entered into a Geographic Information System and are illustrated on the project base maps (see end of Volume I). At the end of each issue area analysis, a detailed Mitigation Monitoring Program is provided.

Table A-1 EIR/S Public Participation Process Summary

Date	Item
March 17, 1994	Notice of Preparation (NOP) of Draft EIR issued by the CPUC*
March 30, 1994	Notice of Intent (NOI) to prepare a Draft EIS issued by the BLM*
April 1994	Notice of Public Scoping Meetings published in the following local newspapers: • Lassen County Times • The Mountain Messenger • Modoc County Record • Reno Gazette Journal
April 24, 1994	NOI published in the Federal Register
May 17- 25, 1994	Public scoping meetings to determine the scope of the EIR/S held in Susanville, Alturas, Reno/Sparks, and Loyalton area
May 27, 1994	End of public scoping period/scoping comments due (see Appendix B, Scoping Report for resutls)*
January 27, 1995	Project Newsletter mailed out to project mailing list (1400 people)
February 28 - March 12, 1995	Publication dates for notice on release of Draft EIR/S, Informational Workshops and Public Hearings in: • Lassen County Times • Reno Gazette Journal • Modoc County Record • The Sacramento Bee • The Mountain Messenger
March 3, 1995	Draft EIR/S released for public review* • Notice of Completion of the EIR/S issued by the CPUC • Notice of release of Draft EIR/S/Notice of Informational Workshops and Public Hearings sent to property owners within 600 feet of the transmission line
March 9, 1995	Notice of Availability of Draft EIR/S issued by the EPA and BLM and published in the Federal Register
March 13 - 16, 1995	Informational Workshops on the Draft EIR/S in Alturas, Susanville, Loyalton, and Reno/Sparks area
April 17 - 20, 1995	Public Hearings on the Draft EIR/S in Alturas, Susanville, Loyalton, and Reno/Sparks area
April 27, 1995	Notice of 30-day Extension of Draft EIR/S Public Review Period mailed out to project mailing list (1700 people)
April 30 - May 4, 1995	Publication date for notice of 30-day extension of Draft EIR/S public review period in: • Lassen County Times • Reno Gazette Journal • Modoc County Record • The Sacramento Bee • The Mountain Messenger
June 2, 1995	End of 60-day public review period for Draft EIR/S
November 1995	Final EIR/S released* • Notice of Availability of Final EIR/S issued by the EPA and BLM, mailed out to project mailing list (1720 people), and published in the Federal Register • Notice of Determination for Final EIR/S issued by the CPUC

* Project documents were made available for public viewing, upon their release, at the following document repository sites:

Modoc County Library
212 W. 3rd St.
Alturas, CA 96101

Lassen County Library
225 S. Roop St.
Susanville, CA 96130

Loyalton City Hall
210 Front St.
Loyalton, CA 96118

Washoe County Library
4001 S. Virginia St.
Reno, NV 89502

CPUC
505 Van Ness Avenue
San Francisco, CA 94102

BLM - Susanville District
705 Hall Street
Susanville, CA 96130

BLM - Susanville District
Alturas Resource Area Office
708 W. 12th Street
Alturas, CA 96101-3102

BLM - Lahontan Resource Area
1535 Hot Springs Road, # 300
Carson City, NV 89706

Toiyabe National Forest
1200 Franklin Way
Sparks, NV 89431

Modoc National Forest
800 West 12th St
Alturas, CA 96101

Part D (Comparison of Alternatives): A discussion of the environmentally superior alternative and summary of the relative advantages and disadvantages of the Proposed Project and alternatives.

Part E (Additional Long-Term Implications): A discussion of short-term use versus long-term maintenance and enhancement of the environment, irreversible environmental changes, and growth-inducing impacts.

Part F (Proposed Mitigation Monitoring, Compliance and Reporting Plan): A tabulation of the Mitigation Monitoring Program for the Proposed Project, including a discussion of the organization of the Program, roles and responsibilities, and general monitoring procedures.

Base Maps: Illustrate the alignment of the Proposed Project and resources within the study corridor. Base maps were included as Appendix C in the Draft EIR/S.

VOLUME II - COMMENTS AND RESPONSES

Part G (Comments): Each comment received on the Draft EIR/S is categorized and presented.

Part H (Responses to Comments): A response to each comment received is provided.

VOLUME III - APPENDICES

APPENDIX A - Glossary, Preparers, Contacts

- Glossary/Abbreviations
- List of Preparers of this Document and Their Qualifications
- Persons and Organizations Consulted
- Distribution List for EIR/S

APPENDIX B - Scoping and Noticing

- Scoping Report
- List of Commenters
- LMUD Public Notice

APPENDIX C - Segment/Structure Coordinate Summary

APPENDIX D - Air Quality

APPENDIX E - Biological Resources

- Biological Assessment
- Bird Collision Report
- Community and Habitat Restoration Plan
- No Structure Zone Biological Resources

- Access Road Survey Summary
- East Secret Valley Biological Survey Report
- Plant Community Survey Report
- Waterfowl Survey Summary
- Winter Raptor Survey Summary
- Greater Sandhill Crane Survey Summary

APPENDIX F - Geology and Soils

APPENDIX G - Noise

APPENDIX H - Visual Contrast Rating Forms

APPENDIX I - Cultural Resources

- Access Road Survey Summary
- Historic Properties Treatment Plan Summary

A.3 CPUC REGULATORY PERSPECTIVE

The CPUC regulates the services and rates of privately-owned, intrastate utilities and transportation companies which offer services to the public, including the transmission of electricity. Much of the CPUC's regulation is carried out through judicial and legislative style processes under the direction of an Administrative Law Judge (ALJ) and, ultimately, the Commissioners. Like a court, the ALJ and Commissioners may take testimony, issue decisions and orders, cite for contempt, and subpoena witnesses or records. The Commissioners' decisions and orders may be appealed only to the California Supreme Court.

SPPCo's request for CPUC authority will move through the standard CPUC decision processes, as defined in the CPUC Rules of Practice and Procedure, the Public Utilities Code and CPUC General Orders (GOs). CPUC GO 131-C, since amended to GO 131-D, requires utilities to seek Commission authorization (in the form of a Certificate of Public Convenience and Necessity, or CPCN) for proposed transmission facilities greater than 200 kV. The purpose of the CPCN process is to enable the CPUC to make a determination regarding the need for the project and to evaluate the project's proposed design and engineering, compliance with all applicable laws, and impact on the environment.

Under the California Public Utilities Code, no electric utility may begin construction of any line, plant, or system addition, without first obtaining a CPCN from the CPUC stating that the present or future public necessity requires or will require such construction. The Applicant must demonstrate that the Proposed Project is technically feasible, cost-effective, complies with all applicable laws, ordinances, rules, and regulations, and that it will not interfere with the operation of any nearby or competing utility.

The assigned Administrative Law Judge conducted a Pre-Hearing Conference on February 6, 1995, to initiate the CPUC's formal CPCN process. The purpose of the Pre-Hearing Conference was to identify the interested parties, the positions of the parties, the scope of issues to be addressed, and other procedural matters. Following the Pre-Hearing Conference, the assigned Administrative Law Judge set the following schedule for the filing of prepared testimony and conducting evidentiary Hearings. The Applicant was directed to file its prepared testimony on March 30, 1995. All other interested parties were directed to file their prepared testimony by May 4, 1995. Responses to testimony were to be served by May 15, 1995. Evidentiary hearings were held from May 22, 1995 through May 25, 1995 and again on June 1, 1995.

For development projects which require discretionary approval from a state agency, CEQA requires agencies to prepare and certify an EIR that assesses the potential environmental impacts of the Proposed Project and alternatives. The CPUC, as Lead State Agency, shall be responsible for ensuring compliance with all requirements of CEQA. Since the Proposed Project also requires federal discretionary approval, the CPUC is preparing this EIR/S jointly with the BLM to ensure that both parties have the information required to understand the environmental consequences of the project, and take actions that protect, restore and enhance the environment. The preparation of this EIR/S has run parallel with the CPCN process described above.

The CPUC will use the results of the Final EIR/S as an element in the review of SPPCo's application for a CPCN. A CPCN is granted only if the CPUC finds that the evidence produced regarding technical feasibility, financing, rates, demand, cost-effectiveness, existing facilities and service, environmental impacts, and other issues demonstrates that a project is required by the public convenience and necessity. The Commission's discretionary decision on the Proposed Project will not be issued until the Commission has had opportunity to review and certify the Final EIR/S. If the Proposed Project is found to have any significant impacts that cannot be mitigated, then the CPUC may either deny the application or approve the project and adopt a statement of overriding considerations.

A.4 BLM REGULATORY PERSPECTIVE

The Proposed Project and routing alternatives identified for the proposed Alturas Transmission Line Project would cross federal lands managed by the BLM, USFS and Sierra Army Depot (SIAD). These agencies manage federal property falling under their respective jurisdictions in accordance with numerous Federal land management laws, including the Federal Land Policy and Management Act. In addition, the project would interconnect to the Bonneville Power Administration, (BPA), U.S. Department of Energy. This Federal agency transmits electric power to the Pacific Northwest in accordance with the Bonneville Project Act 1937. (See Section A.6.9.1) These agencies must comply with the requirements of NEPA, 42 USC 4321, et seq., and related requirements under 40 CFR 1500-1508.

As required by NEPA, an EIS will be included in every recommendation or report on proposals significantly affecting the quality of the human environment. The proposed Alturas Transmission Line Project falls under this NEPA category. In accordance with regulations under 40 CFR 1501.5, the BLM (Eagle Lake Resource Area) has been designated as the Lead Federal Agency for the preparation of this EIR/S, with the USFS, SIAD and BPA acting as cooperating agencies. The BLM, as Lead Federal

Agency, shall be responsible for ensuring compliance with all requirements of NEPA and Council on Environmental Quality regulations under 40 CFR 1500, as well as the procedures outlined in the Forest Service Handbook 1909.15, Environmental Policy and Procedures Handbook.

The Alturas Transmission Line Project will require approval of a right-of-way (ROW) grant, plan amendments, and special use permit before any construction could occur. The BLM will use the results of the EIR/S as an element in the review of SPPCo's application for a ROW grant across BLM lands. Although the BLM has lead responsibility for federal agencies in the preparation of this EIR/S, the BLM, USFS, SIAD and BPA will issue separate approvals for the Proposed Project, in the form of Records of Decision (ROD). These RODs must state what the decision was, identify all alternatives considered in reaching the decision, specify the alternative or alternatives considered to be environmentally superior, and state whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not. The BLM, USFS and SIAD will coordinate their respective RODs to ensure that the same preferred agency alternative is selected, with compatible mitigation measures. The RODs of the BLM, USFS and BPA are subject to a formal appeal process. In addition, the USFS Modoc National Forest could use this EIR/S in its decision process for a plan amendment to their Modoc National Forest Land and Resource Management Plan. Similarly, the USFS Toiyake National Forest could use this EIR/S for amending the Toiyabe National Forest Land and Resource Management Plan for lands recently acquired from Granite Corporation.

A.5 AGENCY USE OF THIS DOCUMENT

This EIR/S has been prepared to meet the needs of local, state, and federal permitting agencies in considering SPPCo's application for the Alturas Transmission Line Project. This document reflects comments and concerns made by agencies and the public during the scoping process and the Notice of Preparation/Notice of Intent comment periods (March through May, 1994), and oral and written comments received on the Draft EIR/S. Based on the comments received on the Draft, this Final EIR/S has been prepared to respond to, address, and incorporate, as appropriate, the comments received on the Draft. The EIR/S does not make recommendations regarding the approval or denial of the project; it is purely informational in content.

As discussed in Sections A.3 and A.4, the CPUC and BLM are the Lead State and Federal Agencies for compliance with CEQA and NEPA, respectively, with the USFS, SIAD and BPA acting as a federal cooperating agencies. The CPUC, BLM, USFS, SIAD, and BPA will be required to take initial, but separate actions on the EIR/S and the project; each agency will determine the adequacy of the Final EIR/S and, if adequate, will certify the document. Subsequent to certification of the Final EIR/S, the CPUC, BLM, USFS, SIAD, and BPA will issue separate decisions on the pending transmission line applications. The U.S. Army Corps of Engineers will also use this EIR/S for its permit decisions.

This EIR/S will also be utilized by State agencies (i.e., California Department of Fish and Game, California State Lands Commission, State [California and Nevada] Historic Preservation Offices, etc.) to evaluate the project for their permit decisions. State agencies with permitting authority over the project are referred to as responsible or trustee agencies. Given that a portion of the Proposed Project is located within the State of Nevada, an additional document will need to be prepared to satisfy the requirements of the Nevada Utility Environmental Protection Act (UEPA).

Because of the statewide interest in utility regulation, CPUC jurisdiction preempts any county discretionary permitting authority over the Proposed Project (Cal. Const., Art. XII, 8). Although local cities and counties do not have discretionary authority over the Proposed Project, the Lead Agencies consider local city and county planning policies in their review of the project. Furthermore, the CPUC encourages utilities to cooperate with local jurisdictions to the extent practicable. The counties and cities will maintain ministerial permit authority over non-electrical components of the Proposed Project.

As specified in the Mitigation Monitoring Program in Part F of this EIR/S, the noted Federal, State, and local agencies will have their respective roles in reviewing and approving specific mitigation documents or agreements for the Proposed Project.

Table A-2 presents a summary of potential federal, state and local permits and authorizations required for the Proposed Project.

A.6 PURPOSE AND NEED FOR THE PROJECT

Section A.6, Purpose and Need for the Project, provides an overview of the necessity for the Proposed Project as stated by the Applicant. As described in Section A.3, the CPUC CPCN process was conducted in parallel to the preparation of this EIR/S. The regional, electrical transmission network and SPPCo system are provided as background information. This section provides a synopsis of information reviewed relating to the Proposed Project and Alternatives. The purpose of this review was to independently verify all facts and assertions regarding the purpose and need of the Proposed Project, as presented by the Applicant, SPPCo. Section A.7, References, contains a list of all studies, memoranda, etc., reviewed as well as persons contacted.

To help explain the terms and acronyms of the electric utility industry used in this document, a glossary of technical terms is provided in Subsection A.6.10. A general glossary is provided in Appendix A.

A.6.1 REGIONAL TRANSMISSION NETWORK OVERVIEW

A.6.1.1 Electric Power Network Overview

The electrical network that interconnects utilities in the western United States, Canada, and Mexico is said to be the largest machine ever constructed. Essentially all utilities in this network are connected either directly or indirectly. This network provides a means for these utilities to buy, sell, or exchange power or electrical services that improve the reliability of service to their respective customers.

Table A-2 Summary of Potential Federal, State, and Local Permits and Authorizations

Concern	Action Requiring Permit Approval or Review	Agency	Permit Required or Approval	Statutory Authority
FEDERAL				
NEPA Compliance	Encroachment upon BLM lands	U.S. Bureau of Land Management	Approval of right-of-way Grant, Plan Amendments	NEPA, 42 USC 4321 et. seq.; FLPMA, 43 USC 1701 et. seq.
NEPA Compliance Biological Resources Designation of Right-of-Way Corridor	Encroachment upon Forest Service lands	U.S. Department. of Agriculture, Forest Service, Toiyabe & Modoc National Forest	Special Use Permit, Easement, or Land Exchange, Forest Land and Resource Management Plan Amendment	NEPA, Council of Environmental Quality Regulation - Forest Service Handbook 1909.15
Land Use	Encroachment upon Sierra Army Depot lands	U.S. Army Corps of Engineers	Approval of Easement of right-of-way	
Biological Resources - Wetlands	Encroachment upon wetlands	U.S. Army Corps of Engineers	Endangered Species Act Compliance Section 404 Permits	Endangered Species Act, Executive Order 11990 (Protection. of Wetlands)
Safety	Encroachment upon public air fields	Federal Aviation Administration	Obstruction Notice Part 77	
Utility Operations	Intertie to BPA System	Bonneville Power Administration (BPA), U.S. Dept. of Energy	Record of Decision	Bonneville Project Act of 1937 NEPA
STATE OF CALIFORNIA				
Public convenience and necessity CEQA Compliance	Project Construction	Public Utilities Commission	Certificate of Public Convenience and Necessity	CPUC Rules of Practice & Procedure, Public Utilities Code, CPUC Gen. Orders; CEQA (Public Resource Code Sections 21000 et. seq.)
Biological Resources	Alteration of the natural state of any stream	Department of Fish & Game	Stream Alteration Agreement (1601 and 1603)	California Fish and Game Code Sections 1600-1607
Biological Resources	Removal of merchantable timber	Department of Forestry	Timber Harvest Permit, Timber Alternation Permit	
Cultural Resources	Project Construction	State Historic Preservation Office	National Historic Preservation Act Compliance	National Historic Preservation Act, Section 106
Water Quality	Project Construction	Regional Water Quality Control Board	Discharge Permit or Waiver	Porter Cologne Calif. Water Code Section 13000 et. seq.
Land Use	Encroachment upon navigable water ways of school lands	State Lands Commission	Lease or Permit	Public Resource Code Section 6301
Transportation	Encroachment within, under, or over state highway right-of-way	Department of Transportation	Encroachment or Crossing Permit, Native American Heritage Community Notice	California Streets & Highways Code, Sections 660-734

Concern	Action Requiring Permit Approval or Review	Agency	Permit Required or Approval	Statutory Authority
STATE OF NEVADA				
Nevada UEPA Compliance	Project Construction	Public Service Commission	Nevada UEPA Permit	Nevada UEPA
Biological Resources	Alternation of natural state of any stream	Division of Wildlife	Stream Alteration Permit	
Water Quality	Project Construction	Division of Environmental Protection	NPDES Surface Area Disturbance Permit	
Cultural Resources	Project Construction	State Historic Preservation Office	National Historic Preservation Act Compliance	National Historic Preservation Act, Sect. 106
Transportation	Encroachment within, under, or over state highway right-of-way	Department of Transportation	Encroachment or Crossing Permit	
CALIFORNIA MUNICIPALITIES				
Land Use	Project construction of non-electrical components	Alturas/Modoc County Planning Departments	Building/Grading Permits	Alturas/Modoc County General Plan & Zoning Ordinance
Land Use	Project construction of non-electrical components	Lassen County Planning Department	County Road Encroachment Permit, Building/Grading Permits	Lassen County General Plan & Zoning Ordinance
Land Use	Project Construction of non-electrical components	Sierra County Planning Department	Building/Grading Permits	Sierra County Plan & Zoning Ordinance
Air Quality	Project Construction	Modoc County APCD Lassen County APCD Northern Sierra County APCD	Consistency with Fugitive Dust, Emission Rules	Federal Clear Air Act California Clean Air Act
NEVADA MUNICIPALITIES				
Land Use	Project construction of non-electrical components	Washoe County Dept. of Development Review	Grading Permits, Regional Plan Conformance	Regional Plan
Land Use	Project construction of non-electrical components	City of Reno Community Development Department	Special Use Permit	General Plan & Zoning Ordinance
Air Quality	Project Construction	Washoe County Bureau of Air Quality, Washoe County of Air Pollution Control Agency, Truckee Meadows Air Basin	Consistency with Fugitive Dust, Emission Rules	Federal Clean Air Act California Clean Air Act

The network is divided into control areas which may consist of one or more utilities with one utility designated the primary operator of each area. The control area operator typically owns most or all of the transmission facilities in the area. There may be other utilities embedded inside the control area that rely on the control area operator for transmission service to transmit power from an outside source. A large utility may have responsibilities to transmit power to its own retail customers and to smaller utilities or wholesale customers (transmission service customers). The transmission of power over a utility's transmission system for another entity is called "wheeling." Sections A.6.1.2 and A.6.1.3 discuss the control area in which SPPCo operates.

The simple, traditional utility system consisted of power generation within the utility service area (native generation), transmission lines to bring the generated power to major customer clusters (or load centers) and distribution lines to distribute the power to customers. As utilities became large and began interconnecting with one another, sources of power from other areas became cheaper alternatives to native generation and utilities began transporting purchased power into their service areas on the transmission network (this activity is known as power importing). Later, wanting to take advantage of the marketplace, smaller utilities began to seek access to the major transmission ties as a source of power. More recently, new laws have allowed independent power producers to sell their power to other utilities through the transmission network.

Network interconnections offer benefits beyond the sale and purchase of power between utilities. These interconnections also allow utilities to share responsibilities to provide reliable service to their respective customers. For example, if a particular utility's supply facilities fail, an interconnection agreement with another utility could provide for an emergency backup power source to serve customers while the system is being restored.

Interconnections also allow utilities to take advantage of diversity in regional customer demands. The best example of this diversity benefit is that which occurs between the regions of Pacific Northwest and the Pacific Southwest. The Pacific Northwest has a preponderance of hydroelectric generation which peaks in output with water run-off from the snow melt during the spring and summer. The Pacific Southwest customer demands are highest during much of this period with air conditioning loads, providing a natural need for this abundance of power. During the winter when the Northwest demand peaks due to heating requirements, hydroelectric power output is down. However, Southwest winter demand is low, so much of the southwest coal, gas and nuclear generation is available for export to the Northwest. The 500 kV Pacific AC Intertie and the 1000 kV Pacific DC Intertie were built in the 1960's to transmit power back and forth during these periods and take advantage of this diversity. Other projects later followed to increase this capability.

The interdependence of utilities was further solidified in 1992 when Congress passed the Energy Policy Act of 1992, requiring utilities who own transmission facilities to provide access to those utilities who do not have transmission facilities. This access allows utilities without transmission facilities to connect to needed resources outside their respective areas. However, transmission-owning utilities are not responsible for constructing new transmission facilities required to respond to requests for transmission service.

A.6.1.2 Western Systems Coordinating Council

The Western Systems Coordinating Council (WSCC) is a voluntary alliance of over 80 electric utilities and affiliates in fourteen western states, and portions of Canada and Mexico. These member utilities provide electrical service to approximately 59 million people. WSCC is one of nine reliability councils formed in the United States to address national concerns regarding the reliability of the interconnected bulk power system and the ability to operate these systems without widespread failures in electric service. Among its members are the Proposed Project proponent, SPPCo, and the utility to which the Proposed Project would interconnect, the Bonneville Power Administration (BPA). Figure A.6-1 illustrates the WSCC service area and major transmission facilities within it.

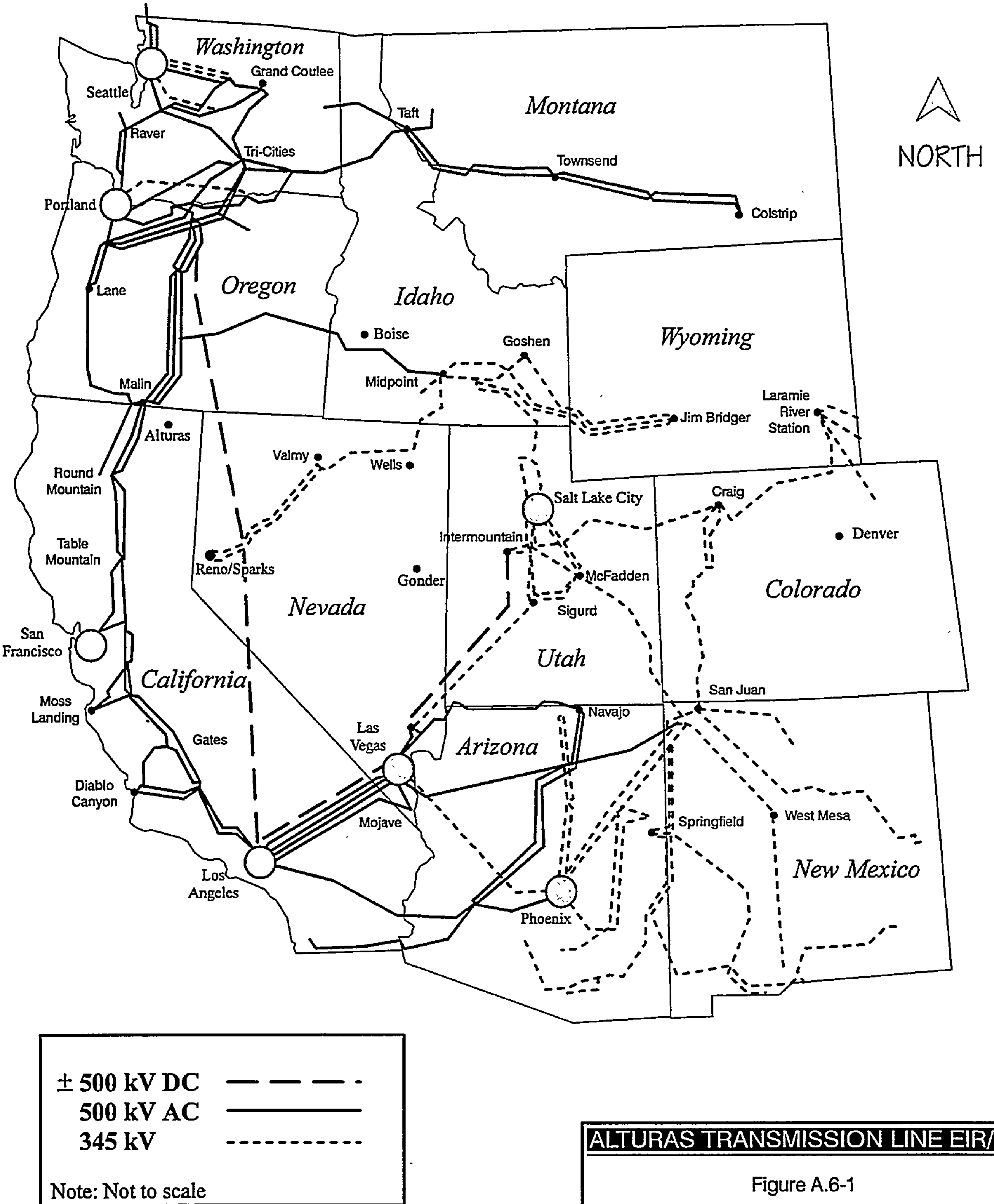
The WSCC is divided into four major areas: (1) the Northwest Power Pool Area, (2) the Rocky Mountain Power Area, (3) the Arizona-New Mexico Power Area and (4) the California-Southern Nevada Power Area. These four areas are interconnected with extra high voltage transmission facilities to interconnect the diverse set of resources and customer demand characteristics unique to each area. The WSCC provides a means for its members to coordinate plans with one another to enhance system reliability and efficiency for all.

WSCC is organized into committees and groups which set guidelines for its members to follow. Planning, design and operational reliability criteria are established and regularly updated. Procedures for regional planning and project review are established for study groups to evaluate and determine capabilities of (or "rate") future projects and determine their potential effects on other members.

Anytime a WSCC member proposes an interconnection with another control area, there is the possibility of significant impacts on other members. WSCC has established programs and procedures which allow members to evaluate new projects and their impacts on others, and how the proposed interconnection should be operated. WSCC has established a special study group for such an evaluation of the Proposed Project. SPPCo, Idaho Power Company (IPC), BPA, Pacific Gas and Electric Company (PG&E), Washington Water and Power (WWP), Pacific Power and Light and Utah Power and Light (PacifiCorp), Deseret Generation & Transmission, the Sacramento Municipal Utility District, Nevada Power Company and Portland General Electric Company are WSCC members who are participating in this study.

The WSCC study is divided into two preconstruction phases. The first phase of the study addressed the import capacity improvement potential of the Proposed Project and was completed in December 1993. Potential impacts on other utilities were identified and recommended for further study.

The second phase of the study addressed the impact of the Proposed Project on the operation of WSCC member utilities. The study was performed by SPPCo with participation of the utilities in the WSCC Group. Its results show conformance to WSCC criterion with no adverse impacts to other utilities. The Phase II study was completed in February 1995. The study concluded that the Proposed Project will have 300 MW of bi-directional transfer capability. SPPCo has determined that this will increase the total SPPCo import capability from 360 MW to about 660 MW.



ALTURAS TRANSMISSION LINE EIR/S

Figure A.6-1

Western Systems Coordinating Council Regional Transmission Network

Source: Western Systems Coordinating Council

A.6.1.3 Northwest Power Pool

The Northwest Power Pool (NPP) is one of the four subgroups of the WSCC. It consists of twenty utilities located in the northwest United States and western Canada (including SPPCo and BPA). The pool has established an operating manual which sets forth a program for coordinated operations in this area, where power generation is predominantly hydroelectric.

A.6.1.4 Legislative Framework

In September 1988, the State of California passed what is known as the Garamendi Bill (Senate Bill No. 2431). This bill declared, among all other things, that where there is a need to construct additional transmission capacity, agreement among all interested utilities on the efficient use of that capacity will be pursued and priorities for planning and developing new transmission facilities were set forth. Section C.8 of this EIR/S includes an analysis of the consistency of the Proposed Project with Senate Bill 2431.

A.6.2 SIERRA PACIFIC POWER COMPANY (SPPCo) SYSTEM OVERVIEW

SPPCo is an investor-owned electric, gas, and water utility based in Reno, Nevada. As an electric utility it is engaged in the generation, purchase, transmission, distribution and sale of electric energy. SPPCo serves over 250,000 retail customers in northern Nevada and Northeastern California with a service territory of over 50,000 square miles. Approximately 84 percent of SPPCo's customer base is in Nevada, with the remaining 16 percent or approximately 40,000 customers located in California. Figure A.6-2 illustrates the SPPCo service area. In addition, SPPCo provides transmission service or "wheels" to loads embedded within SPPCo's control area. These transmission customers include BPA (for delivering power to the Wells Rural Electric Company [Wells] and Harney Electric Cooperative, Inc. [Harney]), and to Mt. Wheeler Power (for delivering power to Ely and Eureka, Nevada).

To fully understand the operation of the SPPCo system it is important to have a basic understanding of its geography. SPPCo is divided into five districts: Reno, Eastern, Tahoe, Carson and South Eastern. Its major customer concentration is in the Reno District, which consists of a mix of residential, gambling/casino, hotel, commercial and industrial customers. Mining is a major energy user in the Eastern District. Recreational energy use dominates the Tahoe District, and the Carson and South Eastern Districts are primarily rural areas with a lesser influence on the make-up of SPPCo's customer base. Figure A.6-3 is an illustration of the SPPCo area customer winter peak demands (loads) for the 1992/93/94 time frame. As illustrated by Figure A.6-3, approximately 72 percent of SPPCo's load is in the Reno/Carson/Tahoe area.

Figure A.6-4 illustrates the interconnection of the SPPCo system to the WSCC system through the following transmission lines:

- The 230 kV line from Gonder to PacifiCorp (merger of Pacific Power and Light, and Utah Power and Light)
- The 230 kV line from Gonder to Intermountain Power Project (IPP)
- The two 55 kV lines to Southern California Edison Company (SCE)
- The two 120 kV lines and one 60 kV to PG&E
- The 345 kV line from Humboldt to IPC.

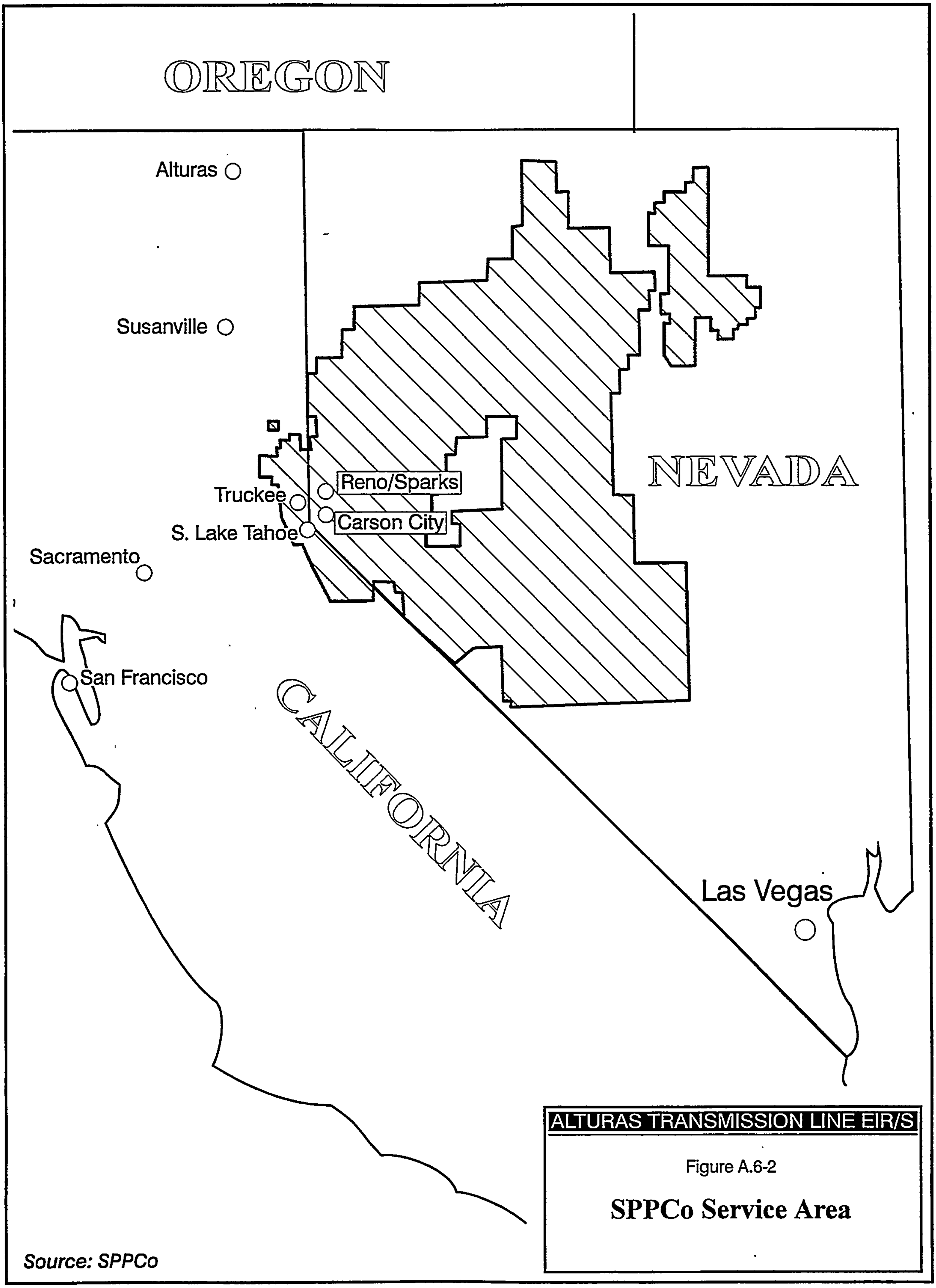


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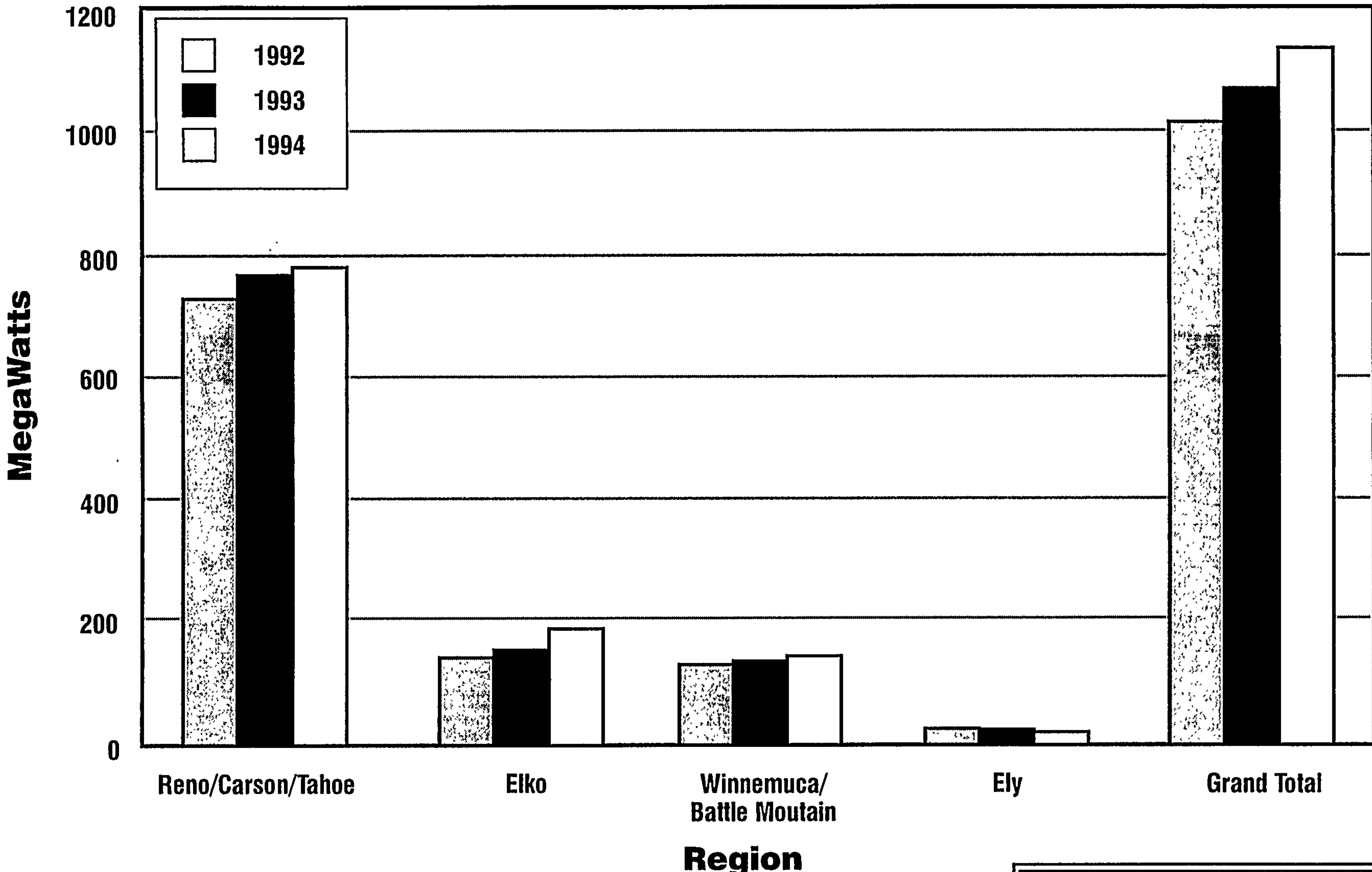
Figure A.6-2

SPPCo Service Area



Source: SPPCo

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Figure A.6-3

1992-1994 Winter Peak Loads

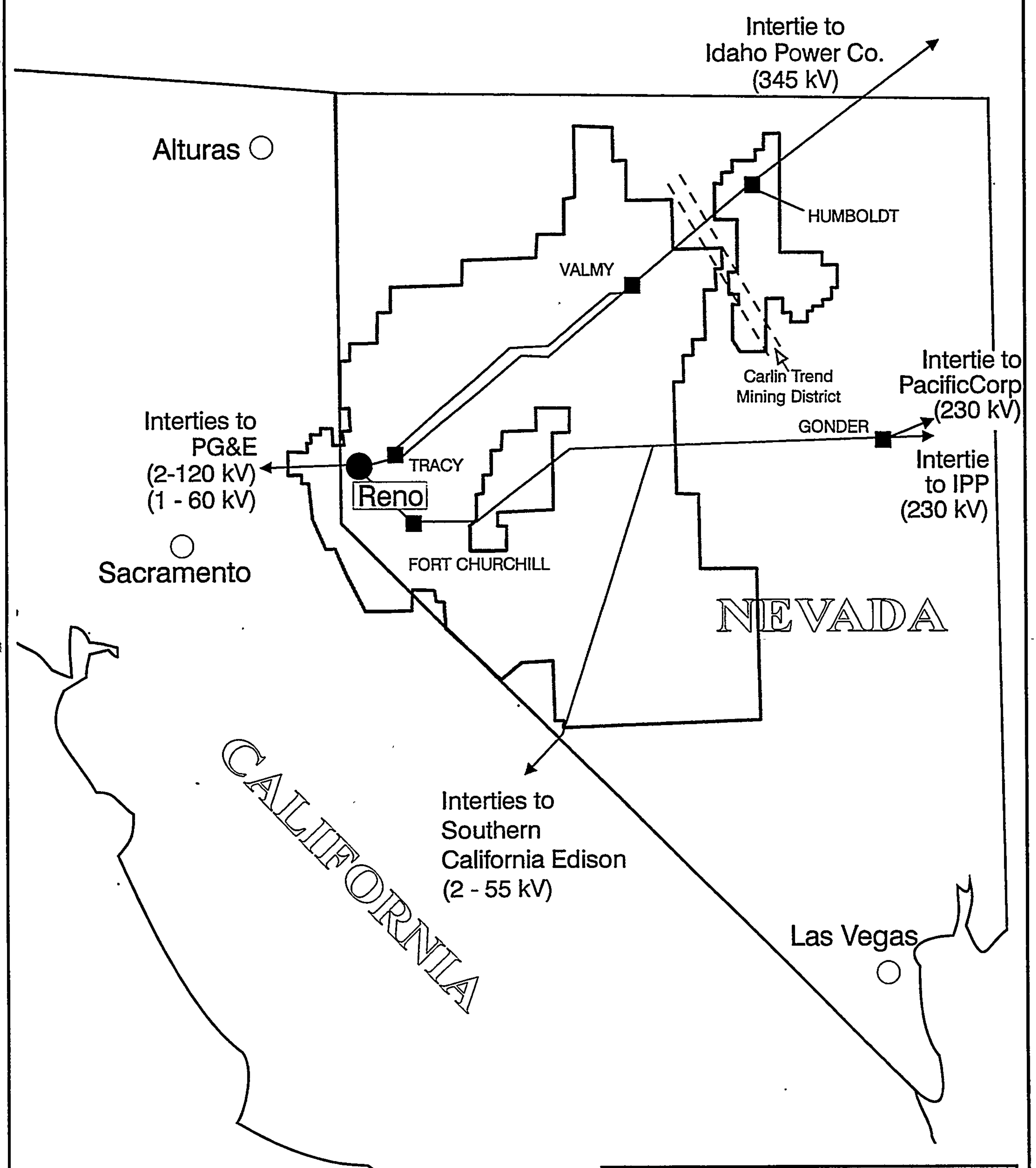

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Figure A.6-4

SPPCo Transmission System and Utility Interconnections

The most significant interconnection is the 345 kV line from Humboldt to the northeast with IPC. Major electrical generation supplies come internally from Valmy, Tracy and Fort Churchill and externally on the IPC interconnection.

The subsections below describe SPPCo's system, leading up to the installation of the Proposed Project scheduled for a 1997 on-line date.

A.6.2.1 SPPCo System Demand/Load

SPPCo sold approximately 6500 gigawatt-hours (gWhs) in 1993 and sold over 6700 gWh in 1994. The 1993 system peak demand was 1074 megawatts (MW) and in 1994 it increased to 1130 MW. As discussed in Section A.6.2 and illustrated on Figure A.6-3, about 72% of SPPCo's system load is in the Reno/Carson/Tahoe area. In its 1993 Electric Resource Plan (ERP), submitted to the Public Service Commission of Nevada (PSCN), SPPCo forecasted an average demand growth rate of 4.31 percent and an average sales growth rate of 4.81 percent for the years 1993 to 1997. The 1995 - 2014 Electric and Gas Integrated Resource Plan (1995 IRP) forecast for demand growth decreased slightly and SPPCo is now expected to supply 1319 MW of capacity in the summer of 1997. Table A-3 presents SPPCo's projected growth in demand through the year 1997 according to the 1995 IRP. These forecasted amounts of capacity and energy include expected sales to SPPCo wholesale customers.

Table A-3 SPPCo Actual and Forecasted Demand and Sales

Year		1993[1]	1994[1]	1995[2]	1996[2]	1997[2]
Summer Peak Demand	MW	1074	1130	1183	1242	1319
	Growth (%)	1.0%	5.2%	4.7%	5.0%	6.2%
Winter Peak Demand	MW	1065	1099	1216	1271	1331
	Growth (%)	0.8%	3.2%	10.6%	4.5%	4.7%
Energy Sales	(gWhs)	6478	6763	7258	7755	8186
	Growth (%)	4.7%	4.4%	7.3%	6.8%	5.6%

[1] Actual
[2] Forecast based on 1995 IRP. (Approved by NPSC, September 1995)

SPPCo loads peak at approximately the same level in the winter and summer during extreme temperatures. For instance, in 1993, SPPCo peaked at 1074 MW in the summer and 1065 MW in the winter.

Residential loads accounted for approximately 26 percent of SPPCo sales in 1994 Mining also accounted for about 26 percent of SPPCo total sales. Casino, gambling and hotels accounted for approximately 11 percent of sales. According to the 1995 IRP, residential sales are expected to grow at a rate of 2.6 percent per year, while casino related loads are expected to grow at 2.2 percent in the near term 1995-1999. The 1995 IRP forecasted mining to grow at a 10.7 percent annual rate from 1994 to 1999 which makes it the largest sector in SPPCo's customers.

Mining is also the fastest growing sector of SPPCo customers. In 1992, mining only accounted for about 11 percent of total sales, but by 1997 it is expected to grow to about 32 percent of sales. Various current proposals for a tax on mining operations on federal lands could, if passed, dampen this growth. The proposed tax has decreased from an assessment of 12.5 percent on gross revenues to 3.5 percent on net revenues (the budget proposal is still in the House Resource Committee). In addition, the price of gold has risen from $330 to approximately $375 per ounce, mitigating the potential loss to profits. Finally, a major mining facility served by SPPCo on federal lands has been granted a land patent under current law which allows expansion through the year 2000. Another major mining facility has also filed a similar injunction to gain their pending land patents under existing law. These grants should solidify these mining businesses' plans to continue their operational expansions.

Because of a series of dry years, irrigation energy loads have also experienced rapid growth. However, irrigation accounts for a relatively small percentage of total sales and is expected to return to average levels as typical weather conditions return. Other sectors of SPPCo's customer sales have grown and are expected to continue growing at relatively constant rates.

Geographically, growth is expected to be most prevalent in the Eastern District where mining in the Carlin Trend area is predominant (see Figure A.6-4). Residential loads, especially in the Sparks, Spanish Springs, and Stead areas are also experiencing higher than average growth.

A.6.2.2 SPPCo's Supply System

SPPCo supplies its electrical customers with power from three sources: internal self-owned generation, non-utility owned generation purchases (generated within SPPCo's service area), and external system purchases (imports) through the five transmission interconnections. The summer peak is the critical period for SPPCo to meet its customer demands as opposed to the winter peak, because many of SPPCo's power plants are derated during high ambient temperatures, resulting in a decrease in allowed power generation levels. According to the 1995 IRP, SPPCo customers demands during the summer of 1995 were met with the resources as summarized in Table A-4.

To meet the expected total growth in customer demands through the summer of 1997, SPPCo has added two combustion turbines at Tracy (Clark Mountain No. 3 and 4), providing an additional 138 MW of native generation for the summer peak. The Piñon Pine Power Plant Project (planned for operation in the spring of 1997) will add another 89 MW of summer-rated capacity. Short-term firm purchases from outside the SPPCo area are expected to provide the remaining capacity requirement to meet SPPCo's demand. These purchases would be made possible by the additional transmission capability of the Proposed Project.

SPPCo has submitted and received approval of its 1995 IRP. This plan assumes that the merger with WPP will not occur. As part of the IRP approval, the PSCN approved SPPCo's request to not seek approval to fill SPPCo's identified electric need in 1998 of 138 MW of summer rated capacity (two combustion turbines at Fort Churchill power plant). Figure A.6.5 illustrates SPPCo supply plans through

Table A-4 SPPCo Supply System Summer 1995

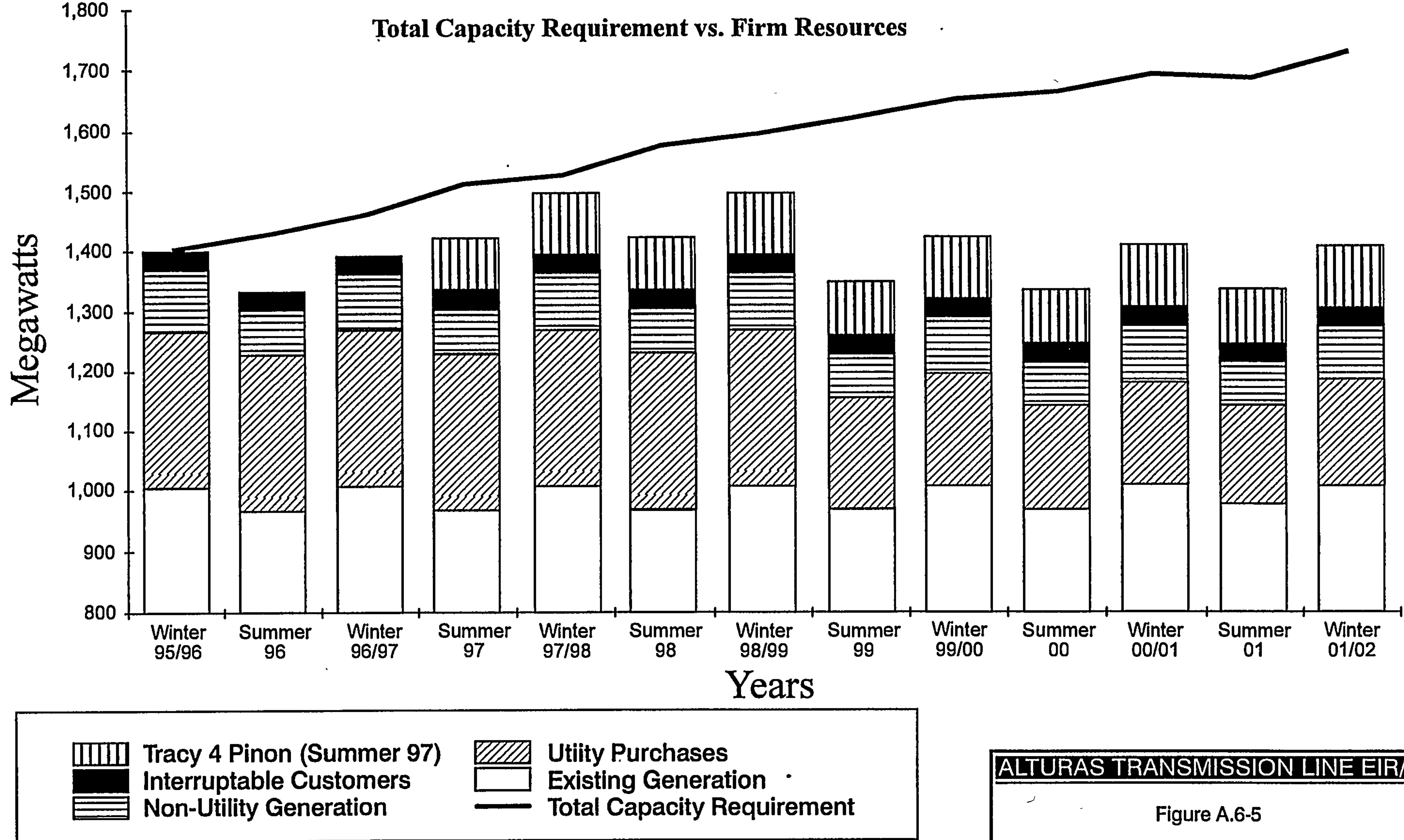
Power Source		Megawatts (MW) Supplied
Internal SPPCo-owned generation	Steam turbine generation (MW) - Tracy Units 1-3 (244 MW) - Fort Churchill (226 MW) - Valmy Units 1-2 (SPPCo share) (265 MW)	735
	Combustion turbine generation - Tracy Units (20 MW) - Winnemucca (14 MW) - Clark Mountain (Tracy) (138 MW)	172
	Diesel generation (26 units, various locations)	46
	Hydroelectric generation (6 units, various locations)	11
Non-utility generation		81
External system purchases		262
	TOTAL	1307

the winter of 2001-2002 according to the IRP's stipulations. With the additional import capacity provided by the Proposed Project, SPPCo plans to utilize short-term firm purchases to defer the construction of the Fort Churchill combustion turbines and "Greenfield" Power Plant; however, permitting and siting activities would continue. SPPCo will file an amendment to the 1995 IRP once the merger decision is approved. With the merger, SPPCo could possibly defer new generation planned for 1998 and beyond, by integrating resources with WPP.

SPPCo's interconnections have varying capabilities to import and export power depending on certain system conditions. SPPCo's total ability to import or export is limited to a simultaneous rating which depends on conditions in neighboring systems in accordance with WSCC operating criteria. The current simultaneous import capability for the SPPCo system is limited to 360 MW and the current simultaneous export capability is zero.

A.6.2.3 Wheeling Loads

SPPCo also supplies transmission wheeling services to wholesale customers. These customers are utilities which are imbedded in the SPPCo system in northern Nevada and eastern California. Power is supplied to these customers from others who are outside the SPPCo service area. These utilities contract with SPPCo for the use of its transmission system to transmit or "wheel" power over the SPPCo transmission lines. Table A-5 lists these wholesale customers, along with their respective past contracted use of the SPPCo system and their requested use for summer and winter through 1997.



Note 1: Capacity Requirements Includes Planning Reserve
Note 2: Existing Resources Reduce by 75 MW in 1999 plus 15 MW in 2000

Source: SPPCo, IRP, 1995, (considering PSCN approval of SPPCo's decision to not fill its identified electric need in 1998 of 138 MW).

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Figure A.6-5

Projected SPPCo System Loads vs. Existing Supplies

Table A-5 SPPCo Wheeling Demands

Summer Peak Wheeling Demand (MW)	1993[1]	1994[1]	1995[2]	1996[2]	1997[2]
Mt. Wheeler	27.1	27.7	38	100	100
Harney Electric	28.6	30.4	30	35	35
Wells Rural Electric[3]	37.8	34.4	69	72	75
Truckee Donner Public Utility District	0	0	7	7	19
Total	93.5	92.5	144	214	229
Growth (%)	5.7%	(1.1%)	55.7%	55.6%	6.7%
Winter Peak Wheeling Demand (MW)					
Mt. Wheeler	24.5	21.1	64	82	82
Harney Electric	0	10.1	10	25	25
Wells Rural Electric[3]	40.5	60.2	73	76	77
Truckee Donner Public Utility District	0	0	7	28	29
Total	65.0	91.4	154	211	213
Growth (%)	3.7%	40.6%	68.4%	37.0%	.9%

[1] Actual
[2] Forecast based on 1995 IRP
[3] Wells Rural Electric loads are forecasted to exceed their 65 MW wheeling agreement with Sierra. The additional load will be serviced by Sierra generation until the Alturas Project is constructed.

A.6.2.4 SPPCo System Limitations

SPPCo's existing transmission system limits its capability to serve existing and forecasted customer loads in accordance with the criteria which SPPCo has established for itself based on WSCC criteria. These limitations result from a lack of transmission capability and affect SPPCo's wholesale and retail customer groups. For native load (retail) customers, these limitations result in reduced reliability and more expensive electricity since SPPCo has limited access to more economic power supplies. Transmission service (wholesale) customers experience a lack of import capability and reduced reliability from these limitations, in turn affecting their respective customers. More detailed discussions of how these limitations relate to the purpose and need of the Proposed Project are provided in the following sections. These limitations manifest themselves in four ways:

- Currently about two-thirds of SPPCo's power supply funnels through Tracy Substation which is located approximately 15 miles east of Reno. The power flows through Tracy predominately from east to west supplying primarily the Reno, Lake Tahoe, Sparks and northern valley areas. For a utility of SPPCo's size this represents a very high reliance on one system source for power supply. A major system disturbance at or east of the Tracy Substation could cause extensive and possible long-term service disruptions for those customers west of Tracy. As the loads grow in these areas, this exposure will be exacerbated without the development of additional system sources separate from Tracy.

- By 1997, growth in the Reno/Lake Tahoe area is expected to require reinforced transmission facilities from the generation and import sources in the eastern part of the SPPCo area. Additional transmission facilities will also be needed to accommodate anticipated growth in the North Valley area north of Reno.

- The growth in the SPPCo service area is requiring the addition of new resources. Because of existing import restrictions, modifications to the current system to satisfy growth are limited to the addition of native generation. New import capacity is expected to open access to less expensive power resources outside the

SPPCo area. This access to additional markets is expected to reduce power cost to native customers (see Figure A.6-5).

- Due to a lack of transmission capability, today's operational procedures would require SPPCo to automatically cut off service to a wholesale service customer (Wells), if the 345 kV intertie to Idaho fails. Additional service requested by Mt. Wheeler Power will have the same restrictions. Firm power requests by Truckee Donner Public Utility District (TDPUD) and Harney cannot be accommodated with existing facilities.

SPPCo addresses its system limitations through a state regulatory process. SPPCo is required by the State of Nevada to file an ERP with the PSCN every three years. This plan includes a 19 year forecast of SPPCo's customer electric power demand and energy consumption. The ERP integrates conservation and load management measures, and presents an approach to obtain supplies of electricity through new facilities to meet these customer needs. After subjecting the ERP to a public process of review, discovery, and hearings, the PSCN issues an "Opinion and Order" either accepting the plan or specifying the portions of the plan it deems inadequate. The Opinion and Order provides the mandate for action until it is either revised in an amendment or replaced by the next ERP three years later. SPPCo has addressed the limitations discussed in this section in its 1993 ERP, dated April 1, 1993; the PSCN has approved this plan. In 1995, SPPCo combined its ERP with its gas forecast and with PSCN approval, filed the 1995 IRP. The PSCN approved the 1995 IRP in September, 1995.

A.6.3 PROPOSED PROJECT OBJECTIVES AND DESIGN

Transmission facilities are typically constructed to satisfy one or more of three primary goals: (1) to transmit generation to the transmission grid or customer load centers, (2) to improve the reliability of delivering power to a certain area or customer group, and/or (3) to interconnect two different systems or control areas to take advantage of inter-utility operations and exchanges.

For each stated goal, an analogy can be drawn to road construction . In fact, transmission maps resemble road maps (see Figure A.6-1 which shows the transmission lines in the WSCC system):

- An example of the first of these goals would be a transmission line built to integrate a new suburban development with the existing utility system, or connecting a new remote generation plant to the system. An analogy might be building a new road to a new suburban area, manufacturing plant or industrial center.

- The second goal involves "beefing up" the existing system to accommodate changes throughout the system, resulting in creation of a weakness or "bottleneck" in serving power to customers. This would be similar to making an existing highway into a freeway or widening a bridge to eliminate traffic congestion.

- An example of the third goal would be a transmission line built over a significant distance so that two utility or utility groups could be connected to one another. Construction of a new freeway across the desert to connect two population centers provides a comparison to this objective.

The Proposed Project's objectives, which are discussed in more detail below, fall into both the second and third categories of the above goals.

Transmission facilities can be needed to improve system performance or reliability of service, or inter-connect generation to load. These justifications are not achieved with cost/benefit analysis, but rather with technical studies showing need and least cost analysis. The Proposed Project's purpose and need has been justified based primarily on improving system reliability and performance. However, it also has the potential for realizing positive economic benefits.

A.6.3.1 Primary Objectives

In its PEA, SPPCo specified several objectives and benefits of the Proposed Project. For the purpose of this analysis, the Applicant-specified objectives have been grouped as either primary objectives, or as secondary objectives and benefits. The primary objectives of the Proposed Project are those considered critically necessary for SPPCo to operate as a viable utility within prudent utility practices. The secondary objectives and benefits of the Proposed Project are not considered principal to the Proposed Project justification, nor do they satisfy critical needs.

The three primary objectives of the Proposed Project are:

- **Increased SPPCo Import Capacity.** The Proposed Project would provide a direct interconnection to BPA in the Pacific Northwest; SPPCo is currently indirectly interconnected to BPA via IPC and PacifiCorp. This tie would allow SPPCo to increase its import capability rating from 360 to 660 MW. This increase in import capability would improve SPPCo's ability to serve its retail and wholesale customers, and provide SPPCo with more efficiency and flexibility in operating its system. This attribute of the project would also offer economic benefits.

- **Improve Reliability and Security to Customers East of the Tracy Substation.** The Proposed Project would also open up an existing transmission bottleneck into the Reno/Lake Tahoe area. Currently, most of SPPCo's power sources are to the east and the predominant flow is from east to west through Tracy Substation into the Reno/Lake Tahoe area. During high customer demand, the east to west flow on the existing transmission lines are forecasted to become overstressed. This condition could lead to an outage on the transmission system resulting in a disruption of power to the area. The Proposed Project would provide a strong system source on the western side of the system and into the Reno/Lake Tahoe area relieving the stressed condition. This objective would satisfy reliability and performance needs.

  Additionally, the Tracy Substation is a major point source for supply to SPPCo's western customers. Continuing to add supply through this source could eventually jeopardize the security of the electricity supply for customers east of Tracy. A catastrophic event at Tracy Substation or involving one or more of its major elements could result in long-term and wide-spread outages.

- **Provide Additional Access to Pacific Northwest Power Market.** The Proposed Project would increase the access for SPPCo to the Pacific Northwest power market. The increased import capability would allow SPPCo to increase its participation in the NPP where, during the spring and summer, there can be many opportunities to purchase hydroelectric power. This attribute of the project is predicted to offer economic benefits.

The manner in which the primary objectives of the Proposed Project satisfy the needs of SPPCo is discussed in more detail in Sections A.6.4, A.6.5 and A.6.6.

A.6.3.2 Secondary Objectives and Benefits

The Proposed Project offers secondary (or indirect) objectives and/or benefits to SPPCo which are not considered principal justifications of the project, nor do they satisfy critical needs. These are:

- New transmission service
- Export benefits
- Communication benefits
- PG&E upgrade deferrals
- Lassen Municipal Utility District (LMUD) interconnection.

These secondary objectives and benefits of the Proposed Project are discussed in more detail in Section A.6.7.

A.6.3.3 Proposed Project Design

The Proposed Project design has certain features that would accommodate the various objectives and benefits of the project. The project can be divided into four major components, each of which are incorporated into the design of the Proposed Project to satisfy certain project objectives and/or to realize certain benefits.

- 345 kV transmission line
- Alturas Substation
- Border Town Substation
- North Valley Road Substation additions.

SPPCo conducted technical and economic studies to select the optimal voltage level and conductor size for the line. These studies revealed that the optimum voltage is 345 kV. The size of the conductor was determined through engineering analysis. Voltage and system performance were the determining factors for the selection of the conductor. Electrical losses, environmental considerations (such as audible noise and electric and magnetic fields), operations and maintenance considerations were also evaluated.

The amount of power that will be allowed to flow over the Proposed Project is determined by the WSCC study group as discussed in Section A.6.1.2. The maximum capacity of the line will vary and depend on the direction of flow on the Alturas line and the conditions and power flowing throughout the entire WSCC system. The WSCC group has determined that the maximum capacity of the line will be 300 MW. Another important measurement of the Proposed Project is how much import and exports capacity it adds to the SPPCo system. The SPPCo has determined that the Proposed Project will add up to 300 MW of import and export capacity to SPPCo's current capabilities of 360 MW and 0 MW, respectively.

The Alturas Substation would interconnect the project to BPA which would help satisfy several project needs and benefits including: (1) direct access to the Pacific Northwest power market and (2) the benefits associated with operational advantages of being interconnected to the NPP. In addition, this interconnection potentially would have the merit of additional transmission paths to WWP for the proposed merger of SPPCo and WWP (see Section A.6.9.3).

A phase shifter and reactors would be added to the transmission line to control the power flows of the line and enhance the capability of the line, respectively. SPPCo has proposed to install the phase shifter and reactors at the Border Town location because the estimated cost would be approximately $3 to $9 million less than if these components were installed at the North Valley Road Substation. Also, SPPCo believes the Border Town area would provide a convenient location (approximately 12 to 15 miles northwest of Reno) for a substation to accomodate the potential growth in the North Valley area. Additionally, from a system planning standpoint, it is prudent to place the phase shifter as close as possible to the edge of the area to which their control is relevant; Border Town is at the edge of SPPCo's service area. Since SPPCo is expecting growth to the north of North Valley Substation, these new loads should be planned to tie into the SPPCo system south of the phase shifter. The equipment at Border Town is sized appropriately to allow approximately 300 MW of power to flow over the line.

The North Valley Road Substation (located within the City of Reno, near the northwest city limit) was selected as an interconnection point for the project to the SPPCo system because it provides a needed strong second source to the Reno/Lake Tahoe area from the west, satisfying one of the project's primary objectives of improved service reliability to the Reno/Lake Tahoe area. Interconnecting the Proposed Project to the east of the Reno/Sparks area at the Tracy Substation would require substantial upgrades and/or new construction of transmission facilities on SPPCo's 120 kV system west of Tracy, while exacerbating reliability concerns associated with placing the majority of SPPCo's power supply in one corridor (see Section A.6.2.4).

A.6.4 INCREASED IMPORT CAPACITY BENEFITS

Increasing the import capability of the SPPCo system is the most fundamental objective of the Proposed Project. All other SPPCo needs satisfied by the project and benefits of the project result from increasing the import capability or are circumstantial to the project's design. System studies performed by SPPCo and other neighboring members of WSCC show that the import capability of the Northern Nevada Control Area, of which SPPCo is the operator, would increase from 360 MW to 660 MW after operation of the Proposed Project begins (see Section A.6.1.2).

As illustrated on Figure A.6-4, SPPCo is currently interconnected to five neighboring utilities:

- IPC in Idaho
- PacifiCorp (Utah Power & Light) in Utah
- PG&E in northern California
- Los Angeles Department of Water and Power (LADWP) through the IPP in eastern Nevada
- SCE in southern California.

Because of system constraints, SPPCo's import capability is currently limited to 360 MW, even though the sum of the capability of all these interconnections is much greater. Since power flows unconstrained throughout the WSCC grid, all WSCC members must adhere to prescribed local limits to avoid disrupting the system elsewhere. An action by one utility on the grid will affect, at least infinitesimally, all other utilities on the grid. Very complex system analyses are continuously performed and updated by WSCC member groups to ensure that each utility knows the system limits which prevent adverse affects on other members. A set of the limits for each of several system scenarios establishes a control area's ability to import or export power. Individual import levels at the various interconnection points can vary during a set of conditions, but may not exceed the limits set by the WSCC study group.

A set of such limits is a product of the analysis performed by WSCC members participating in the WSCC joint study of the Proposed Project. This group examined several scenarios to determine which system conditions would have the most significant impacts on the operations of existing WSCC utilities' facilities. In the analysis of the Proposed Project, the most critical system condition occurs during light customer demand in the fall and when northern California is importing power from the Northwest.

As other WSCC system changes materialize the import capability rating will be re-determined by the WSCC group evaluating the project between now and when the Proposed Project is approved and constructed. By increasing the import capability, the Proposed Project is expected to provide SPPCo with the following system needs:

- Improve existing inadequate transmission service requirements
- Allow purchases from neighboring utilities
- Respond to long-term emergencies
- Reduce generation reserve requirements.

Improve Transmission Service. Currently SPPCo's import capability is inadequate to meet the requirements of its transmission service customers. Under the 1992 Energy Policy Act, SPPCo is obligated to respond to requests for transmission service from embedded utility customers and attempt to provide the requested service, if feasible. SPPCo is also obligated by California Senate Bill 2431 to seek agreement with all other utilities on the efficient use of the construction of new transmission capacity.

The Proposed Project would provide BPA an alternative wheeling path for service to its customers. Wells and Harney are customers of BPA within SPPCo's control area, and are subject to power interruptions due to limitations on SPPCo's transmission system. Currently, Wells needs 65 MW of transmission services and Harney needs 30 MW . These needs are expected to increase over time as shown in Table A-4. The Proposed Project would accommodate these needs. By having a direct connection between SPPCo and BPA, these BPA customers could purchase transmission service from SPPCo instead of purchasing transmission service from IPC (as is currently done). The agreements and operational feasibility for these potentially less expensive and more direct services have not been fully developed.

Mt. Wheeler Power is also a transmission customer of SPPCo, with present requests for additional service. A recent requested increase of approximately 60 MW of transmission service to serve a large mining customer and the accompanying domestic customers is conditioned with possible interruptions. An increase in import capability would allow SPPCo to provide this service without the interruption clause.

Truckee Donner Public Utility District (TDPUD) has recently contracted with SPPCo for 7 MW of transmission service. The Proposed Project will allow TDPUD to increase its transmission service to 19 MW.

Without the Proposed Project, SPPCo would not be able to serve the increased needs of its existing wheeling customers.

Purchases from Neighboring Systems. The Proposed Project's increase in import capability would also allow additional purchases from neighboring utilities. The greatest benefit from new purchases is projected to be from utilities in the Pacific Northwest (Section A.6.6 expands on this project objective). However, the Proposed Project would allow SPPCo to make additional purchases from neighboring utilities in other areas, including California, Arizona, Utah and other utilities through the interconnected WSCC grid.

Emergency Response. The increase in import capacity resulting from the Proposed Project would also allow SPPCo to respond to long-term emergencies, while adhering to WSCC and the National Electric Reliability Council (NERC) criteria. An extended outage of the Valmy Power Plant is an example of such an emergency. An outage of one of the Valmy generators for several months would cause a major deficiency in SPPCo resources and would likely result in inadequate power supplies, requiring expensive spot market purchases from other utilities. Without adequate power supplies, SPPCo would not be able to meet WSCC and NERC operating criteria, whereas expensive spot market purchases could impact the economic health of the entire SPPCo control area. Through additional access to suppliers, because of the increased import capability, the Proposed Project would result in SPPCo control area operations that meet prudent criteria set by WSCC and NERC, while ensuring the economic integrity of SPPCo's control area.

Reduced Generation Reserves. The increase in import capability provided by the Proposed Project could also mean a reduction in generation reserve requirements. This benefit to SPPCo would equate to reduced costs of planning for and operating generation to maintain WSCC criteria. WSCC criteria call for its members to maintain two types of reserve generation: (1) planning reserves and (2) operating (or spinning) reserves.

Planning reserves are standby generation capacity over and above the demand requirements of a utility that insures an adequate level of service. WSCC calls for its member utilities to plan for reserve generation capacity equal to its largest generation unit, plus five percent of its customer load responsibility. Since the Proposed Project would directly interconnect SPPCo to the NPP, in accordance with WSCC operating criteria, SPPCo could be allowed to eliminate the five percent of its customer load responsibility from reserve requirements. For SPPCo this amount equates to approximately 40 MW of capacity. SPPCo is planning to take advantage of this opportunity to reduce its generation requirements and has conservatively calculated a savings of six to 12 million dollars for the first 15 years of project operation.

WSCC criteria also require member utilities to have standby generation readily available during real-time operations (these are known as spinning reserves). This spinning reserve generation is actually on line, but is not delivering power. It is ready to take on customer load almost instantaneously in the case other supplies fail. The WSCC criteria requires SPPCo to have spinning reserves equal to one half of its largest source, a generator at the Valmy Power Plant. This equates to 69 MW of spinning reserves. With the addition of the Proposed Project, SPPCo could reduce is spinning reserves requirement by again taking advantage of being directly connected to the NPP. WSCC criteria allows two or more control areas to combine or share spinning reserve requirements. By being able to share the largest source requirement with fellow pool members, the spinning reserve requirement could be reduced to a percentage of customer load served. This percentage calculates to approximately 21 MW; therefore the Proposed Project would allow operation at the lower level, saving 48 MW (69 MW minus 21 MW) in spinning reserve. SPPCo estimates this saving in spinning reserves to be worth five to ten million dollars for the first 15 years of project operation.

A.6.5 IMPROVED RELIABILITY AND SECURITY TO THE CUSTOMERS WEST OF TRACY SUBSTATION

SPPCo is experiencing a transmission limitation in the Reno/Lake Tahoe area (Sparks, Reno, etc) west of Tracy Substation which, with forecasted growth in demand, will jeopardize system performance in the summer of 1997. This limitation is created by the existing lines having to transmit increasing amounts of power from major generation sources east of Reno to growing loads in the Reno/Lake Tahoe area. The major resources to the east include the imports from IPC, and the Valmy and Tracy Power Plants.

SPPCo has identified that the Proposed Project would improve service and reliability to the Reno/Lake Tahoe area west of Tracy Substation in three ways:

- Improved system security for customers west of Tracy
- Improved reliability when the East Tracy-North Valley Road 345 kV line is out of service
- Improved voltage control (support during peak periods)

These improvements are discussed in more detail below.

Improved System Security. System security is the ability to withstand various unexpected disturbances. With a large percentage of SPPCo's power supply funneling east to west through Tracy Substation, a major system disturbance at or east of the Tracy Substation could cause extensive possible long-term service disruptions for those customers west of Tracy in the Reno, Lake Tahoe, Sparks and northern valley areas. A catastrophic event occurring at or near the Tracy Substation or along the Tracy-Valmy transmission line corridor such as an explosion, fire, or some sort of natural disaster could cause long-term supply problems for customers west of the Tracy Substation. These problems could have adverse economic, health, and/or safety implications resulting from long-term power supply shortages to a large urban area. As customer demand increases west of Tracy, and if additional resources are channeled through Tracy Substation, SPPCo system security could worsen. The Proposed Project would provide an additional supply source which would improve system security for these customers in case of a catastrophic event.

Improved Reliability. The primary transmission line into Reno transmitting power from the eastern resources is the 345 kV line from East Tracy Substation to North Valley Road Substation. In addition to this primary 345 kV line, there is a network of smaller 120 kV lines that also transmit power into Reno from the east. When the East Tracy-North Valley Road 345 kV line is out of service, the other smaller lines must be able to carry the additional burden to serve the Reno/Lake Tahoe area to adhere to SPPCo's reliability criteria. This criterion prohibits allowing a potential condition in which an outage of one line causes another line to be overloaded. The 120 kV line extending from Tracy Substation to Spanish Springs Substation is projected to exceed its design power carrying capability (current rating) with an outage of the 345 kV line by the summer of 1997. If uncorrected, this condition could cause damage to the line, or to avoid line damage it could result in an interruption of service to the Reno/Lake Tahoe area.

One solution to this problem would be to build additional transmission from the east into Reno. However, as previously discussed (improved system security), this solution does not compare favorably to the Proposed Project, which would solve the problem in a different way. The Proposed Project would provide a source of power to the Reno area from a different direction: it would tie into the North Valley Road Substation from the northwest and provide a source of emergency power imports from the NPP during emergencies such as the outage described above. This emergency power supply could be utilized under pool agreements to serve loads in the Reno/Lake Tahoe area during the potential outage, offsetting power flowing from the eastern resources, long enough to restore the outage. This contingency condition would occur when no power was being transmitted on the Proposed Project.

If SPPCo happened to be importing power on the Proposed Project during the above described disturbance, the power flowing on the lines into Reno from the east could be relatively low due to the supply from the Proposed Project offsetting flow from the east. In this case the outage of the 345 kV East Tracy-North Valley Road line may not require emergency actions.

The need for a second strong source west of Tracy is one objective which is driving the timing of the Proposed Project. SPPCo power flow analysis for the system, with the most current load forecast and generation plan, shows that this potential overload contingency can occur in the summer of 1997. Therefore, the Proposed Project would need to be in service before SPPCo's summer peak, which can occur as early as June.

The alternative to the Proposed Project to provide this needed reliability enhancement would be to build or upgrade additional transmission lines. A 120 kV line from East Tracy Substation (approximately 15 miles east of Reno) to Silver Lake Substation (located northwest of Reno in the North Valley area) would alleviate the overload contingency and cost $9.1 million. A 345 kV line from East Tracy to Silver Lake would also solve the problem for $24.1 million. These lines would also satisfy the need for additional service into North Valley. However, these transmission facility additions would not increase the import capacity of the SPPCo system, improve system security for customers east of Tracy, or provide additional access to the Pacific Northwest power market.

Voltage Control. The Proposed Project would also help maintain voltages at prescribed levels in the Reno/Lake Tahoe area. In order to maintain system voltages at prescribed levels, reactive power must be altered as demand fluctuates. Reactive power is a component of power production that is not sold, but is critical to the operation of an electrical system. By increasing the reactive power supply to an area, voltages levels can be bolstered or supported. Conversely, by decreasing the reactive supply, voltage levels can be brought down. During peak loads, the transmission of reactive power from generation plants can be very inefficient, resulting in voltage decline. Capacitors can be installed closer to the loads and supply needed support in areas where reactive power is deficient. The Proposed Project would provide a needed source of reactive power support in the Reno/Lake Tahoe area during the contingency outage of one of the 345 kV Valmy-East Tracy transmission lines. SPPCo could avoid installing capacitors in the Reno/Lake Tahoe area as a result of the Proposed Project and save approximately $1.5 million. This need is expected to arise sometime between the years 2000 and 2008.

A.6.6 ACCESS TO MORE ECONOMICAL POWER MARKETS

The Proposed Project would increase SPPCo's access to the Pacific Northwest and other economic spot or economy energy markets. By directly interconnecting to the NPP, combined with the increase in import capability discussed in Section A.6.4, SPPCo would be able to increase its participation in the NPP where there can be many opportunities to access relatively inexpensive hydroelectric power supplies during the spring and summer, depending upon the transmission capacity available on the BPA 230 kV line. Depending on regional need and availability, spot market power could come from any area. This attribute of the project enhances the economic benefits of the Proposed Project.

Since BPA transmits power generated by hydroelectric facilities in the Pacific Northwest, the most direct access to this hydroelectric power is through a direct interconnection to the BPA system. Indirect interconnections to BPA through IPC, PacifiCorp via the Utah intertie, and others would not provide the same degree of access to this power market as would the Proposed Project, since wheeling charges would be incurred (IPC, PacifiCorp, etc. would charge SPPCo for the transport of power on their systems) and transmission capacity may not be as readily available.

The project would be expected to increase SPPCo's import capability from 360 to 660 MW. This increased capability could be fully or partially utilized throughout the year to purchase power from NPP members through one of three types of purchases:

- Non-firm purchases
- Short-term firm purchases
- Long-term firm purchases.

Non-Firm Purchases. Non-firm purchases are made through agreements in which power deliveries have limited or no assured availability. A non-firm purchase might come from a hydroelectric power supply in the years where there is an abundance of water supply from precipitation. This power cannot be guaranteed for delivery on a continuous basis. The Pacific Northwest, with its predominant hydroelectric power base, can be a significant market for non-firm purchases.

Many opportunities for non-firm purchases are expected to be available from less expensive sources through the additional import capability supplied by the Proposed Project. SPPCo estimates cost savings of between $5 to $33 million as a result of non-firm economy energy purchases for the first 15 years of the project operation.

Firm Purchases. Firm power purchases are contracted, either on a short- or long-term basis, and are intended to have assured availability to the purchaser. Long-term purchases of power are made under contracts extending for several years. Currently, SPPCo is using its 360 MW import capability to purchase 262 MW from PacifiCorp, IPC and Tri-State G&T. These purchases are long-term and have the terms as shown in Table A-6.

Table A-6 Long-Term Power Purchases by SPPCo

Supplier	Amount of Purchase	Contract Expiration
Idaho Power Company	90 MW	1999
PacifiCorp	74 MW	2021
PacifiCorp	75 MW	2009
Tri-State G&T Coop	23 MW	2008
TOTAL	262 MW	

As these long-term contracts run out and SPPCo's load growth introduces the need for more long-term purchases, SPPCo will look to less expensive sources. Increased access to more sources enhances the opportunity for savings.

During the summer and winter peak load periods, SPPCo purchases short-term (from one week to a few months) in order to maintain its operating reserve requirements. Again, increased access to more short-term sources enhances SPPCo's opportunity for savings.

SPPCo estimates savings of between $6 to $46 million in firm purchases as a outcome of access to additional power markets resulting from the Proposed Project for the first 15 years of project operation.

A.6.7 SECONDARY OBJECTIVES AND BENEFITS

The Proposed Project would offer other secondary or indirect benefits to SPPCo which are not considered principal justifications of the project, and would not satisfy critical needs. These are:

- New transmission service
- Export benefits
- Communication benefits
- PG&E upgrade deferrals
- LMUD interconnection.

A.6.7.1 New Transmission Service

In addition to the immediate transmission needs of Wells, Harney, TDPUD and Mt. Wheeler, discussed in Section A.6.4, SPPCo has identified other potential transmission service (wheeling) needs. PG&E is expected to request to transmit power into SPPCo's area (wheeling-in services) to LMUD, if the LMUD interconnection is built. PacifiCorp, Nevada Power Company, and SCE have each inquired about wheeling through the SPPCo system. Independent power producers are also expected to request wheeling services within, outside and into the SPPCo system. The value of these services has not been estimated, but the need for these wheeling-in, wheeling-out and wheeling-through services is estimated to be between 150 to 400 MW, including the services that are immediately needed. Currently, SPPCo's transmission capabilities are inadequate to meet the requests of these potential transmission service customers.

A.6.7.2 Export Benefits

SPPCo expects to realize savings from the Proposed Project by avoiding import purchases required when IPC is taking power from the Valmy Power plant on the SPPCo system. To stay within their operational limit, SPPCo must import power while power from Valmy is being transferred to IPC. These import purchases are sometimes more expensive than the cost of SPPCo generating the power itself. SPPCo estimates the first year costs of these import purchases to be almost $900,000 more expensive than self-generation. The Proposed Project is expected to eliminate the need to import power while power is being transferred to IPC and result in a $5 to $20 million savings over a fifteen-year period.

A.6.7.3 Communication Benefits

The communication systems, which are a part of the Proposed Project's design to provide remote control of substation equipment, would also provide improved control and communication functions between the Northwest Control Area and SPPCo's Control Area. This feature would increase reliability and improve operations of both control areas.

A.6.7.4 PG&E Upgrade Deferrals

Currently, SPPCo must compensate PG&E for certain improvements on the PG&E system as PG&E customer loads grow, or SPPCo loses some of its ability to import power over the PG&E interconnection. SPPCo began upgrades to the 120 kV PG&E intertie in 1991. Two upgrades have been completed to date, and one is scheduled for completion in 1996. A plan for the PG&E improvements through the year 2002 has SPPCo funding four separate upgrades to the PG&E system as shown in Table A-7. SPPCo speculates that these upgrades could be deferred or delayed with the Proposed Project, although no specific studies have been done to verify savings from these deferrals.

Table A-7 SPPCo Potential Payments for PG&E Upgrades

Year	Improvement Type	Estimated Cost (Millions)	
		Low	High
1998	Transformer addition	$9	$9
2000	Line re-conductor	$11	$14
2001	Line re-conductor	$3	$4
2002	Transformer addition	$8	$10
	Totals	$31	$37

A.6.7.5 Lassen Municipal Utility District Interconnection

LMUD is a publicly owned and operated utility in Lassen County, California, which has requested transmission service from SPPCo for access to power markets outside their service territory. LMUD has entered into a memorandum of understanding (MOU) with SPPCo, reserving 50 MW of transmission service on the Proposed Project, if the project is approved. A potential location for the future interconnection is Wendel, California. Studies have not been performed to investigate the physical effects that a LMUD interconnection would have on the Proposed Project, but SPPCo anticipates no adverse impacts. In accordance with the MOU, LMUD would be responsible for all planning, design, construction, and operation costs.

A.6.8 ALTERNATIVE SOLUTIONS TO THE PROJECT'S PURPOSE AND NEED

As required by CEQA and NEPA, this EIR/S considers several alternatives to the Proposed Project. Sections B.3 and B.4 provide detailed descriptions of these alternatives and the alternative screening rationale. This section describes how, and to what degree, each of the alternatives considered would satisfy the objectives of the Proposed Project. The environmental impacts of the alternatives are discussed in Part C.

Alternatives which have been considered in this EIR/S to satisfy some of the objectives and/or provide some of the benefits of the Proposed Project can be grouped into three categories: (1) Transmission Alternatives, (2) Generation Alternatives and (3) System Enhancements Alternatives. A summary of how these alternatives satisfy the project objectives is presented in Table A-8. The table also shows the estimated cost of each alternative, the improvement in total import capability, and the relative cost per kilowatt for improvements in import capability.

A.6.8.1 Transmission Alternatives

With the exception of Tracy-North Valley Alternatives, all of the transmission alternatives that have been considered would provide improved import capability. The alternatives which interconnect with utilities in the NPP would generally offer more benefits, since SPPCo, as a NPP member, can take advantage of reserve sharing and diversity of resource needs.

Table A-8 Summary of Project Alternatives Versus Project Objectives[a]

ALTURAS PROJECT OBJECTIVES	PROJECT ALTERNATIVES (Numbers in parentheses refer to footnotes below which provide descriptions of the alternatives.)													
	TRANSMISSION ALTERNATIVES									GENERATION ALTERNATIVES		SYSTEM ENHANCEMENT ALT.		
	Mdpt Valmy #1 (1)	Mdpt Valmy #2 (2)	Pacific DC Intertie (3)	Southern Ties (4)	LADWP Corridor (5)	Burns-Oreana (6)	French-man Tap (7)	Utah Intertie (8)	Tracy-N.Valley (9)	Piñon Power (10)	CT (11)	Series Comp (12)	DSM (13)	Cap. Banks (14)
INCREASED IMPORT CAPACITY														
Fulfill Existing Inadequate Transmission Service Requirements	Y	Y	U	P[b]	Y	Y	P	N	N	N	N	N	N	N
Allow Purchases from Neighboring Utilities	Y	Y	Y[b]	Y	Y	Y	Y	Y	N	N	N	N	N	N
Respond to Long-term Emergencies	Y	Y	Y	P[b]	Y	Y	P	N	N	P[b]	P[b]	N	N	N
Reduced Generation Reserves Requirement	Y	Y	Y	Y[b]	Y	Y	P[b]	P[b]	N	N	N	N	N	N
IMPROVED SYSTEM SECURITY AND RELIABILITY WEST OF TRACY														
Improved System Security for Customers West of Tracy	N	N	N	P[b]	Y[c]	N	N	P	N	N	P[b]	N	N	N
Improved Reliability for Customers West of Tracy	N	N	N	P[b]	Y[c]	N	N	P	Y[c]	N	P[b]	N	N	N
Improved Voltage Control (Support During Peak Periods)	U	U	U	N[b]	Y	U	N	N	Y[b]	N	N	N	N	Y
Transmission Service Facilities for New Customers in the North Valley	N	N	N	N[b]	N	N	N	N	Y	N	N	N	N	N
ACCESS TO THE PACIFIC NORTHWEST POWER MARKET														
Direct Access to BPA	N[b]	N	Y[b]	N	Y[d]	N	N	N	N	N	N	N	N	N
Access Through Other Utility[f]	Y	Y	N	U	Y[e]	Y	N	P[b]	N	N	N	N	N	N
SECONDARY OBJECTIVES AND BENEFITS														
New Transmission Service	Y	Y	Y[d]	Y	Y	Y	U	P[b]	N	N	N	N	N	N
Export Benefits	Y	Y	Y	Y	Y	Y	U	U	N	N	N	N	N	N
Communication Benefits	P[b]	P[b]	U	Y[b]	P[b]	P[b]	N	N	N	N	N	N	N	N
PG&E Upgrade Deferrals	Y[b]	Y[b]	Y[b]	U	Y[b]	Y[b]	U	U	N	N	N	N	N	N
LMUD Interconnection	N	N	N	N	N	N	N	N	N	N	N	N	N	N
COST COMPARISON[g]														
Estimated Cost ($ Million)[h]	80	80	128	66-153	220[e]	215	20	47-96	9-24	186[i]	U	6	U	1.5
Import Capability Improvement (MW)[h]	350	300	400	225	300-350	350	100	20-50	NI	NI	NI	35	NI	NI
Proportional Improvement ($/kW)	229	267	320	293-680	628-733	614	200	1100-2500	NI	NI	NI	170	NI	NI

Note: key to table on following page.

Notes for Table A-8

Cell Entries:

Y= Yes, expected to reasonably satisfy objective or provide stated benefit; reasonable satisfaction does not necessitate 100% satisfaction.

N= Not expected to satisfy objective or provide stated benefit beyond an insignificant increment.

P= Objective or benefit expected to be partially satisfied.

U= Data unavailable to make any assessment

NI=No import capability

Alternatives:

1 Integration with the IPC Southwest Intertie Project via a Midpoint-Toano 500 kV/Toano-Carlin-Valmy 345 kV interconnection.

2 Proposed 345 kV transmission line from IPC's Midpoint Substation to SPPCo's Valmy Power Plant, via the Carlin area.

3 Interconnection to the LADWP operated Pacific Northwest-Pacific Southwest DC Intertie.

4 Interconnections to Nevada Power Company south of SPPCo. Costs in 1987 dollars.

5 Two transmission alternatives traveling within the LADWP DC corridor with connection east the North Valley Road Substation; the Nevada Alternative would originate in east Alturas (no cost data available) and the Summer Lake-Valley Road Alternative would originate at PacifiCorp's 500 kV Summer Lake Substation.

6 Interconnection from the SPPCo Oreana Substation to IPC at the Burns Substation.

7 Interconnection of SPPCo's Fort Churchill-Austin 230 kV line with SCE's 230 kV line extending to the Oxbow Geothermal generating facilities within SPPCo's service area.

8 Enhancement to the 230 kV interconnection to UP&L, which include 230 or 345 kV line additions or improvements along the Fort Churchill-Gonder corridor.

9 A 120 kV line from East Tracy Substation to Silver Lake Substation at a cost of $9.1 million or a 345 kV line from East Tracy to Silver Lake at a cost of $24.1 million.

10 The proposed 95 MW Integrated Gasification/Combined Cycle Piñon Project is being developed jointly with the U.S. Department of Energy. This project is included in SPPCo 1993 Electric Resource Plan and is included among these alternative to demonstrate its contribution to the Proposed Project's objectives.

11 Proposed Fort Churchill Combustion Turbine.

12 The addition of series compensation (capacitors installed in series with a transmission line) on the 230 kV line that interconnects SPPCo with IPP and UP&L.

13 Demand Side Management.

14 The installation of capacitors in the Reno/Lake Tahoe area.

Superscripts:

a Alternative segments to the alignment of the Proposed Project are not considered since they would not affect the ability of the Proposed Project to achieve the project objectives.

b No conclusive studies or data is available to verify the assessment.

c While the alternative could technically satisfy the objective, the feasibility of the alternative is subject to existing land use constraints. Since the alternative would need to traverse an urbanized area (City of Sparks and northern Reno area) and given the inadequate width of existing powerline corridors, the feasibility of the alternative is highly questionable. (See Section C.14 for a complete discussion.)

d Yes, Nevada Alternative only.

e Yes, Summer Lake-Valley Road Alternative only.

f The Proposed Project would provide SPPCo with direct access to the Pacific Northwest Power Market. Additional charges would be incurred if access to the Pacific Northwest Power Market required wheeling through neighboring utilities.

g The estimated cost for the Proposed Project is $120 million with an expected improvement in import capacity of 200 - 300 MW; resultant proportional improvement would be $400-600/kW.

h Many of the values in this table are rough approximations developed by SPPCo for comparison purposes only. It should be noted that the estimates come from a wide range of studies, all with different assumptions; therefore, comparisons should be made with discretion. In the case of SWIP, Midpoint-Valmy and Pacific DC Intertie, costs represent SPPCo's estimated share and are subject to negotiations and interpretation by others. Cost estimates are in 1993 dollars or as designated in the footnotes. Most values are pending review of additional information requested from SPPCo.

i 50%, or $93 million, of construction costs to be incurred by the Department of Energy.

The alternatives which interconnect with utilities in the NPP would also, in most cases, provide improved access to the Pacific Northwest power market. Since BPA transmits power generated in the Pacific Northwest, the most direct access to the spot, economic NPP energy market (e.g., hydroelectric) is through a direct interconnection to the BPA system. Therefore, interconnections to IPC, PacifiCorp via the Utah intertie, and others would not provide the same degree of access to this power market as the Proposed Project since wheeling through the noted utilities would be required. Only the Nevada Route Alternative would be directly connected to BPA.

Only those transmission alternatives which tie into the Reno area would satisfy the Proposed Project objective of providing improved reliability and improved system security for those customers west of Tracy Substation. The dominant strong source of power supply now comes over the 345 kV corridor from IPC, the Valmy Power Plant and the Tracy facilities. Many of the alternatives, such as the Midpoint-Valmy and Burns-Oreana Alternatives, would utilize this corridor and therefore, place even more of SPPCo supply on the corridor, exacerbating the current reliability condition.

A.6.8.2 Generation Alternatives

Generation alternatives could not provide direct access to the Pacific Northwest power market or directly improve import capability. However, generation additions at the proper locations could provide improved service reliability to the Reno/Lake Tahoe area. For instance, a generator located at the North Valley Road Substation might remedy the reliability problem in the Reno/Lake Tahoe area. Further, if the generation addition was an inexpensive source of power, it could diminish the benefit of access to inexpensive power in the Pacific Northwest. However, it is unlikely that new generation could compete with the inexpensive sources in the Northwest since the cost per kilowatt for native generation is expected to be substantially higher than Pacific Northwest hydroelectric power. This assumes prices will compare as they have historically and that the supplies in the Pacific Northwest will continue at current levels.

SPPCo is currently pursuing the addition of three new native generation projects: the Piñon Pine Power Plant, Fort Churchill Combustion Turbines, and the Greenfield Project (the Piñon Pine Power Plant and Fort Churchill Turbines are described in Section B.3.4.3; the Greenfield Project is described in Section E.3.3). Since the Piñon Pine Power Plant (currently under construction) is to be located at Tracy, it would place more supply on the Tracy-North Valley corridor. As a result, this generation project would not improve service reliability west of Tracy. Since the Fort Churchill Combustion Turbines would be located to the south of the Reno/Lake Tahoe area, avoiding the Tracy-North Valley corridor, they would improve service reliability. A site has not been selected for the Greenfield Project. The Fort Churchill and Greenfield projects are not scheduled to be completed until after 1998 and may be deferred if additional power purchases can be obtained with the Proposed Project, or through the proposed merger with WPP. None of the generation additions which have been considered by SPPCo would have the characteristics or timing to satisfy all of the objectives or offer the economic advantages of the Proposed Project.

A.6.8.3 System Enhancement Alternatives

System enhancement alternatives could indirectly satisfy some of the project objectives. The addition of series compensation (capacitors installed in series with a transmission line) on the 230 kV line that interconnects SPPCo with IPP and Utah could improve electrical system performance, resulting in improved import capability. But the level of improvement would be much less than that of adding a 345 kV interconnection. The installation of capacitor banks in the Reno/Lake Tahoe area would only improve the voltage performance in that area.

SPPCo has planned and implemented Demand Side Management (DSM) programs. DSM measures are designed to reduce energy consumption and the need for new generation. DSM lessens the burden of the entire system, and therefore, reduces the need for all types of utility services and indirectly alleviates the reliability concerns. As a result and to a certain degree, DSM satisfies many of the Proposed Project's objectives. However, DSM alternatives cannot offer the same magnitude of benefits as the Proposed Project (see Section B.3 for complete discussion). DSM measures implemented and planned by SPPCo have been taken into account in the ERP process assessing the need for the Proposed Project.

A.6.8.4 Alternative Combinations

Combining two or more of the alternatives described above has also been considered in the alternative analysis. The primary objectives of the Proposed Project could be met, at least partially, by combining two or more alternatives. However, combining alternatives would not satisfy all secondary benefits and objectives of the Proposed Project. For instance, combining the East Tracy to Silver Lake 345 kV transmission alternative with the Midpoint to Valmy alternative would largely satisfy the primary objectives, but would not allow a future interconnection with LMUD. Further, even though this combination would accommodate the Pacific Northwest access and interconnection, it would not afford the benefits of a direct interconnection with BPA that the Proposed Project would provide (see Section A.6.6) nor would it provide improved system security for customers east of Tracy Substation (see Section A.6.5).

A.6.9 IMPLICATION OF THE PROPOSED PROJECT FOR SPPCo AND OTHER UTILITIES SYSTEMS

A.6.9.1 BPA Operations

BPA is a power marketing agency within the U.S. Department of Energy. BPA's primary service area is the Pacific Northwest, including Oregon, Washington, Idaho, western Montana, and small parts of Wyoming, Nevada, Utah, California and eastern Montana. BPA also sells or exchanges power with utilities in California and Canada. BPA was established in 1937 as the marketing and transmission agent for power produced by the Bonneville Dam. Congress gave BPA the responsibility to supply electrical power to its utility, industrial, and other customers in the Pacific Northwest. Congress also directed BPA to build and operate high-voltage transmission lines to move electric power from hydroelectric dams, and generation plants fired by many types of fuel.

Today BPA markets power from 31 Federal dams and one nuclear plant. BPA owns and operates over 15,000 miles of transmission lines in the Pacific Northwest. These transmission lines are used by both public and private electric utilities to transmit and market power throughout the region. Almost half of all of the power used in the Northwest comes from BPA, and BPA provides about three-fourths of the region's transmission capacity. About 85 percent of the power BPA sells is hydroelectric.

SPPCo currently delivers BPA power to BPA (Wells, Harney) and Mt. Wheeler Power loads embedded within the SPPCo control area. As these loads have grown, SPPCo's existing limited import capabilities has resulted in inadequate service to these loads (see Section A.6.4). With the Proposed Project, BPA would be able to contract for more reliable service since the import capability of the SPPCo system would be increased.

The Proposed Project's Alturas Substation would also interconnect SPPCo directly to BPA. BPA power deliveries to SPPCo are currently made through the IPC and PacifiCorp systems. This direct interconnection to SPPCo could potentially give BPA closer and less expensive access to those customers within the SPPCo area by avoiding transmission service through IPC and PacifiCorp. However, agreements would have to be negotiated to realize this added benefit to the BPA customers.

The Proposed Project would also give SPPCo access to BPA's hydroelectric power during the spring and summer months, when available, assuming prices will compare as they have historically, and that the supplies continue at historical levels. BPA transmits hydroelectric power that is currently generated along the main stem of the Columbia and Snake Rivers and several major tributaries. The impacts of existing hydroelectric generation and operation alternatives are currently being evaluated by the Corps of Engineers, Bureau of Reclamation, and BPA. These Federal agencies are jointly preparing a System Operation Review (SOR) EIS on the operation of the Columbia River hydroelectric system. Impacts being addressed by the SOR EIS include navigation, flood control, recreation, hydropower generation, fish and wildlife, and irrigation.

Major changes in Columbia River system operations are being considered. Decisions regarding operation of the Columbia and Snake systems will take into account both power and non-power uses of the river system. For example, minimum flows and pool levels in the various reservoirs will be made through SOR to enhance and protect endangered salmon species. As part of the development of a multiple-use operating strategy for the hydroelectric system, the SOR EIS will evaluate the trade-offs between power and non-power uses. Balancing the multiple uses of the Federal hydroelectric facilities in the Columbia River Basin could affect hydroelectric power production. The Alturas Transmission Line would not affect or change in any way these river operation agreements. If a System Operating Strategy is adopted that causes a reduction in hydroelectric power operation or capability, BPA could need to acquire alternate resources. This, in turn, could affect the availability of low cost hydroelectric power for SPPCo. The potential for development of additional generation sources in the Pacific Northwest if hydroelectric supply decreases is discussed in Section E.3.3.

If the SOR reduces the availability of hydroelectric power, this would negate the benefit of possibly purchasing low-cost power. Other benefits, such as those associated with reserves, system security and reliability would be unaffected.

The Draft SOR EIS was released for public comment in July, 1994. The Draft EIS did not identify a preferred system operation alternative. The close of the comment period was scheduled for December 15, 1994. The Final SOR EIS is scheduled for release in December, 1995.

The BPA system in the vicinity of the northern termination of the Proposed Project has been analyzed by the WSCC study group. The study group identified operational procedures and facility installations (capacitors) in the area to improve the import capacity. The Proposed Project would not adversely affect the ability to serve load in the area.

A.6.9.2 Valmy Power Plant Operation

The Valmy Power Plant is a coal-fired steam plant which is SPPCo's largest generation resource (269 MW). The plant is half owned by SPPCo and half owned by IPC. The Proposed Project would decrease SPPCo's dependance on Valmy for system reliability, and allow greater operational flexibility and more economic operation of the plant.

Currently SPPCo operates with a risk of not being able to serve its customers with adequate reliability if there were a long-term loss of the Valmy plant. The Proposed Project would improve import capability, thus providing additional replacement options for a potential long-term outage of the plant.

SPPCo cannot currently export power from its control area because of potential system instability. Since the Valmy Power Plant is within SPPCo's system and SPPCo must transfer IPC's share of the generated power, SPPCo must also import power to insure a zero net export. SPPCo imports power much of the time, but the cost of such imports can vary greatly depending on the availability. There are times where SPPCo can generate power internally at a lower cost than it can import power. The Proposed Project would allow SPPCo to export IPC's share of generated power without having to pay for the higher cost imports.

A.6.9.3 Proposed SPPCo and Washington Water and Power (WWP) Company Merger

SPPCo and WWP in Spokane, Washington, have proposed a merger of their two utilities. SPPCo has projected supplementary savings from the Proposed Project relative to this potential merger which have a present value of $77 million. These savings would arise from sharing in the more efficient operation of generation resources for serving loads. In addition, savings would result from the planning and operation of combined reserve generation. Finally, SPPCo would gain additional economic opportunities for firm resource purchases through WWP.

The merger between SPPCo and WWP is currently undergoing an extensive approval process before the merger can be realized. The entire approval process is expected to take approximately 13 months; the procedural merger of these two utilities began in October 1994. Filings for the merger have already been made with the five affected States (Nevada, Washington, California, Idaho, and Oregon), and the Federal Energy Regulatory Commission (FERC). The two companies have received the approval of their respective stockholders. The approval process involves a series of Prehearing Conferences, Consumer Sessions, filings of testimony, hearings, and will result in decisions from the five State Public Service Commissions. In addition, approval must be obtained from FERC.

SPPCo has negotiated for two separate paths to make exchanges with WWP. One through BPA's system allows up to 90 MW of power to be transmitted from WWP to SPPCo and up to 200 MW from SPPCo to WWP. This path will require the completion of the Proposed Project. The other path, through IPC's system, will allow for a maximum of 100 MW from WWP and a maximum of 50 MW to WWP. This additional use of import capability (190 MW) is not expected to impact the other proposed uses or benefits of the Proposed Project.

The Proposed Project and the merger with WPP are complementary to one another in realizing certain benefits associated with increased import capacity. For instance, the deferral of SPPCo planned resources discussed in Section A.6.2.2 is possible with the Proposed Project's increased capability to import firm resources and is more likely with the potential integration of resources with WPP. Likewise, the sharing of generation reserve requirements are more plausible with the merger, than without.

A.6.10 GLOSSARY OF TECHNICAL TERMS AND ACRONYMS

[Note that a more complete Glossary is included in Appendix A.]

BPA
Bonneville Power Administration

Capacity
The power ability of electrical equipment measured in watts.

Control Area
A portion of the interconnected electricity system grid whose operations and procedures are controlled and managed by a single utility. This utility typically owns most of the facilities in its control area and is responsible for the physical interaction with neighboring control areas.

DSM
Demand Side Management, for example, home insulation, energy efficient appliances, etc.

ERP
Electric Resource Plan, required by the Public Service Commission of Nevada every three years.

Export Capability
The capacity or extent to which a utility or electric control area can sell electric power outside its electric system at a given time or during a given set of conditions using all available facilities.

Exports
The sale of electricity by a utility to another utility outside its electric system.

Firm Purchases
Contractual procurement of electric energy which is intended to have assured availability to the customer.

Generation
The production of electricity from other forms of energy such as combustion, falling water or thermal transfer.

Generation Capacity
Maximum electric production limit for which a generator is rated. The maximum limit fluctuates with changes in temperature or other environmental circumstances, depending on the type of machine.

gWh
Gigawatt-hours. A measure of electric energy. One million kilowatt-hours.

Harney
Harney Electric Cooperative, Inc.

Import Capability
The capacity or extent to which a utility or electric control area can purchase electric power from outside its electric system at a given time or during a given set of conditions using all available facilities.

Imports
The purchase of electricity by a utility from another utility outside its electric system.

IPC
Idaho Power Company

IPP
Intermountain Power Project

IRP
The 1995-2014 Electric and Gas Integrated Resource

kV
Kilovolt. A measure of electric voltage, one thousand volts. Household current is supplied at 120 volts.

LADWP
Los Angeles Department of Water and Power

LMUD
Lassen Municipal Utility District

Load Centers
Major areas of electricity consumption such as large cities or large industrial facilities.

MW
Megawatt. A measure of electric power. One thousand kilowatts or one million watts. A standard light bulb is 60 - 100 watts.

Native Generation
Electricity generation within a utility service area.

NERC
National Electric Reliability Council

Non-firm Purchases
Electric energy purchases having limited or no assured availability.

Non-utility Owned Generation
Generation which is possessed by an entity not in the business for the sale of electricity at retail.

NPP
Northwest Power Pool

Operating (or Spinning) Reserves
As required by WSCC Operating Criteria, WSCC member utilities must have standby generation, actually on-line, but not delivering power, to insure an adequate level of service.

PG & E
Pacific Gas and Electric Company

Planning Reserves
As required by WSCC Operating Criteria, WSCC member utilities must have standby generation capacity, in addition to existing demand requirements, to insure an adequate level of service.

Pool Agreements
Agreements among utility alliance members (e.g., NPP) for the sharing of resources or satisfaction of operation and reliability criteria.

Power
The time rate of transferring energy (expressed in watts).

PSCN
Public Service Commission of Nevada

Rating
Maximum operation limit of transmission or generation facilities, as established by WSCC and/or NPP operating and reliability criteria guidelines. Utility facilities and interconnections can be rated either for individual or simultaneous operation, where simultaneous operations take into consideration collective WSCC or NPP utilities.

Reactive Power
A component of power production that is not sold.

SCE
Southern California Edison Company

Self-owned or Utility-Owned Generation
Generation which is possessed by a utility.

SOR
System Operation Review for BPA hydroelectric power generation operations.

SPPCo
Sierra Pacific Power Company

System Security
The ability of the bulk power electric system to withstand sudden disturbances such as an electric short circuit of unanticipated loss of system components.

TDPUD
Truckee Donner Public Utility District

Transmission Service Customers
Wholesale electricity utilities or other entities which pay for the use of another utility's facilities to transmit electric power from one point to another.

USFS
U.S. Forest Service

Wells
Wells Rural Electric Company

Wheeling
An electric operation wherein transmission facilities of one system are utilized to transmit power of another system. Power can be wheeled in, through, or out of a utility system.

WSCC
Western States Coordinating Council

WWP
Washington Water and Power Company

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PART B. DESCRIPTION OF PROPOSED PROJECT, ALTERNATIVES, AND SCENARIO FOR ANALYSIS OF CUMULATIVE IMPACTS

B.1 INTRODUCTION

Part B of this Environmental Impact Report/Environmental Impact Statement (EIR/S) provides a description of the project as proposed by the Applicant, Sierra Pacific Power Company (SPPCo), referred to as the Proposed Project. Section B.2 presents the general parameters of the Proposed Project and a description of project components.

Based on the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), this EIR/S also considers reasonable alternatives to the Proposed Project. Section B.3 describes the screening process that was used to identify the alternatives analyzed fully in this EIR/S. It also identifies the alternatives eliminated from further consideration, and explains the rationale for their elimination. Section B.4 describes in detail each of the alternatives that are analyzed in this document.

Section B.5 presents the scenario used for analysis of cumulative impacts. In presenting this scenario, the various other projects likely to have impacts in combination with the Proposed Project and/or Project Alternatives are identified and described.

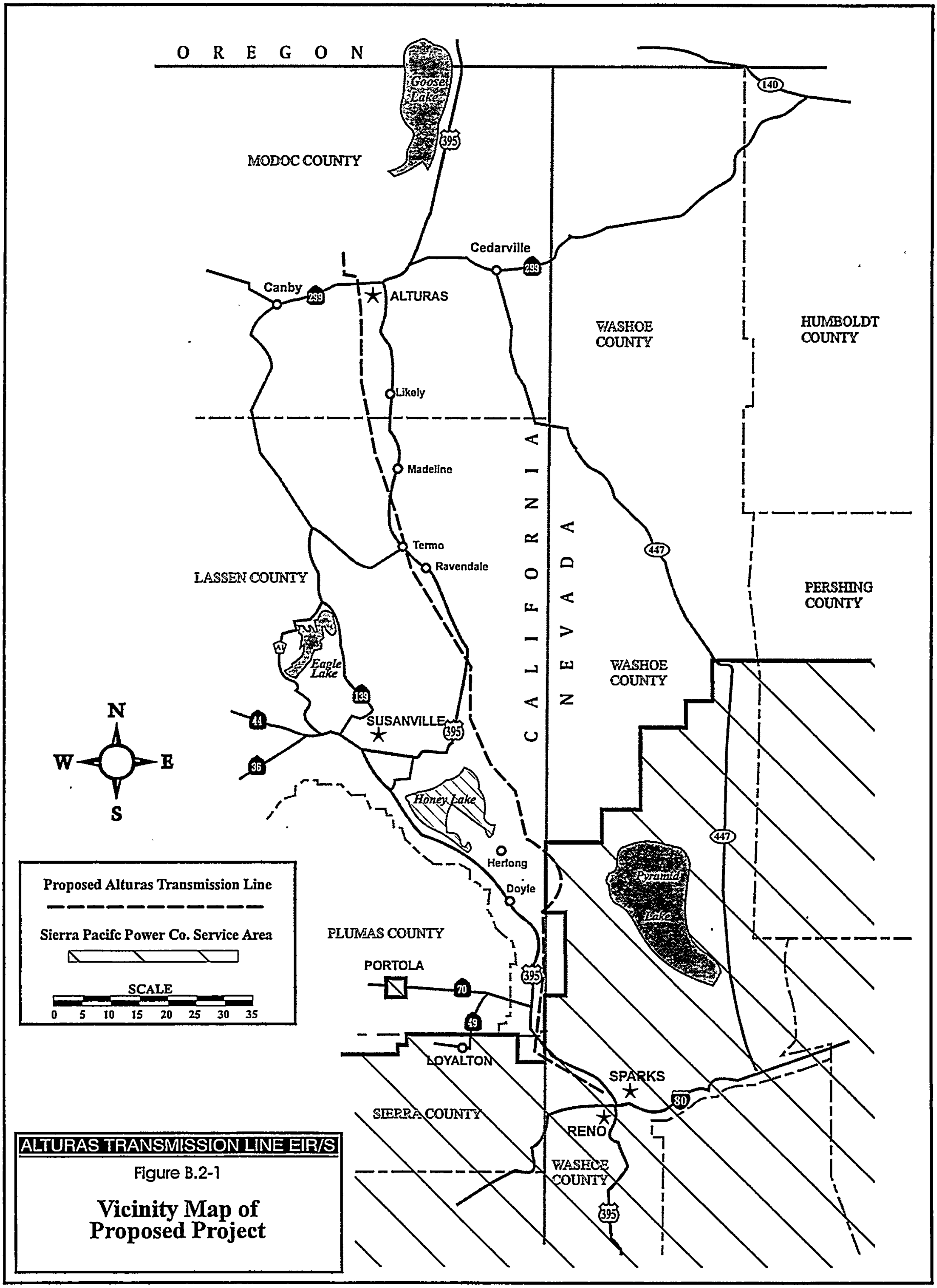
Please note that Part A of the EIR/S addresses the purpose and need for the Proposed Project, the approvals and permits required, and the associated regulatory context.

B.2 PROPOSED PROJECT DESCRIPTION

This Section presents an overview of the Proposed Project (Section B.2.1), describes the components of the Proposed Project (Section B.2.2), provides a description of planned construction (Section B.2.3), describes operation and maintenance procedures (Section B.2.4), and presents potential accident scenarios (Section B.2.5).

B.2.1 OVERVIEW OF THE PROPOSED PROJECT

SPPCo has proposed to construct and operate a 345,000 volt (345 kV) overhead electric power transmission line from the vicinity of Alturas, California to Reno, Nevada. The line would connect SPPCo's electrical system with the Bonneville Power Administration (BPA) and PacifiCorp systems in Oregon and Washington; a two mile, 230 kV segment connecting the Proposed Project to BPA's existing 230 kV line is included as part of the Proposed Project. The proposed transmission line route is approximately 165 miles long; Figure B.2-1 is a map showing the route and vicinity of the Proposed Project, as well as the service area of SPPCo.



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-1

Vicinity Map of Proposed Project

The majority of the Proposed Project (approximately 140 miles) would travel in a general north-south direction through northeastern California, starting a few miles northwest of the City of Alturas to the California-Nevada state line near Border Town, Nevada. From Border Town, the line would travel in a southeasterly direction until it reaches Reno, Nevada. Within California, the line would traverse Modoc, Lassen, and Sierra Counties; within Nevada, the project would traverse Washoe County. Table B-1 provides a summary of the approximate miles of transmission line within each California and Nevada County.

Table B-1 Project Route Summary

County	Transmission Line Mileage within County
CALIFORNIA	
- Modoc	27.5
- Lassen	106.6
- Sierra	4.5
California Subtotal	138.6
NEVADA	
- Washoe	26.2
Nevada Subtotal	26.2
TOTAL CA & NEVADA	164.8

The proposed 345 kV transmission line would be suspended from 70- to 130-foot structures (depending on terrain), spaced on average, about every 1,200 feet; the two mile, 230 kV portion would use structures about 80-85 feet tall, spaced approximately every 700 feet. Approximately 730 structures would be required. The suspended line would include three pairs of conductor cables and two shield wires, one of which would also contain a fiber-optic cable. The project as proposed would include construction of two new substations in California, one northwest of Alturas and one in Sierra County, California just west of Border Town, Nevada. In addition, SPPCo's existing North Valley Road Substation north of Reno would be expanded. Minor modifications would also be made to substations owned by the BPA and by PacifiCorp in southern Oregon and northeastern California.

The Applicant originally proposed 100- to 130-foot structures for transmission line suspension in the Proponents Environmental Assessment. Subsequently, SPPCo modified the range in structure heights from 100- to 130-feet to 70- to 130-feet to address any possible structure height that may be required for the project. For example, a 70-foot structure may be desirable for ridge-tops with steep canyons on each side of the ridge. Given the required minimum conductor ground clearance of 34 feet, structures must be at least 70 feet in height. SPPCo estimates that 70-foot structures would comprise less than 5% of the total number of structures to be used on the project.

B.2.2 PROPOSED PROJECT COMPONENTS

Table B-2 summarizes the various components of the Proposed Project. These components are discussed in detail in the following sections which address the proposed route, transmission line facilities, substation facilities, and communication facilities.

Table B-2 Summary of Proposed Project Components

Proposed Route and Right-of-Way • Route Length: 165 miles • Tap Point: Bonneville Power Administration 230 kV line, northwest of Alturas, CA • Termination Point: SPPCo North Valley Road Substation, Reno, NV • Right-of-Way (ROW) Width: 160 feet (120 feet from BPA 230 kV line to Alturas Substation, 140 feet from Angle Point X13 to North Valley Road Substation, • Total ROW Acreage: 3,200 acres (not including substations, construction access roads and staging areas)
Transmission Line Facilities (345 kV line) • Voltage: 345 kV (230 kV from BPA 230 kV line interconnect to Alturas Substation) • Conductors: 3 pairs of 1-inch diameter current-carrying wires (stranded aluminum/steel) • Minimum Conductor Distance from Ground: 34 feet at 130°F (SPPCo Design Specification) • Shield Wires: 1 pair of 3/8 - 3/4-inch diameter wires, one containing fiber-optic cable • Structure Types: - Tubular steel H-frame structures for straight sections of route - Guyed 3-pole tubular steel structures for "angle points," where line changes direction - Wood H-frame structures from BPA 230 kV line interconnect to Alturas Substation - Single-pole steel structures from Angle Point X-13 west to North Valley Road Substation. • Structure Heights: 70 - 130 feet • Approximate Average Distance between Structures: 1,200 feet (700 feet in wood H-frame section, 800 feet in single-pole section) • Total Number of Structures: approximately 730
Substation Facilities • Alturas Substation (new), Devils Garden Site, Alturas, CA Area: - Developed acreage: 10.5 acres (approx. 695 x 535 feet fenced, plus access road and 3 feet outside fence) - Functions: voltage transformation and control, switching/circuit protection, communications • Border Town Substation (new), Sierra County, CA, near Border Town, NV: - Developed acreage: 11.8 acres (approx. 790 x 430 feet fenced, plus access road, 3 feet outside fence, and berm area for visual screening) - Functions: power flow control (magnitude, direction), switching/circuit protection, voltage control, communications • North Valley Road Substation (existing), Reno, NV: - Expansion of developed acreage: 1.7 acres (340 x 128 ft. fenced, plus additional earthwork), added to existing 340 x 490 feet (4-acre) site - Functions: voltage transformation and control, switching/circuit protection, communications • Existing Sites of Other Minor Substation Additions: - Bonneville Power Administration Malin and Warner Substations
Communications Facilities • Systems: Optical Ground Wire, Power Line Carrier System, VHF/UHF Radio • Functions: communications for fault detection, line protection, system control and data acquisition SCADA), two-way voice communication • Communication facilities: Five communications sites to house fiber optic communications equipment, one installed at each substation and two communication sites (Herlong & Termo)
Construction Facilities • Access Roads: new access roads (2.5 miles), permanant overland travel routes (3.4 miles), upgrade existing roads (28.6 miles), temporary overland travel routes requiring blading (77.6 miles) • Staging Areas: 7 total (5 used by Tuscarora Pipeline; one adjacent to Border Town Substation; one at Ohm Place-Reno) (approx. 100 acres total)

B.2.2.1 Proposed Route and Right-of-Way Characteristics

This Section provides an overview of the proposed routing of the Alturas Transmission Line Project, a discussion of the Route Refinement Process conducted by SPPCo, and a summary of future easement classifications for the project right-of-way (ROW).

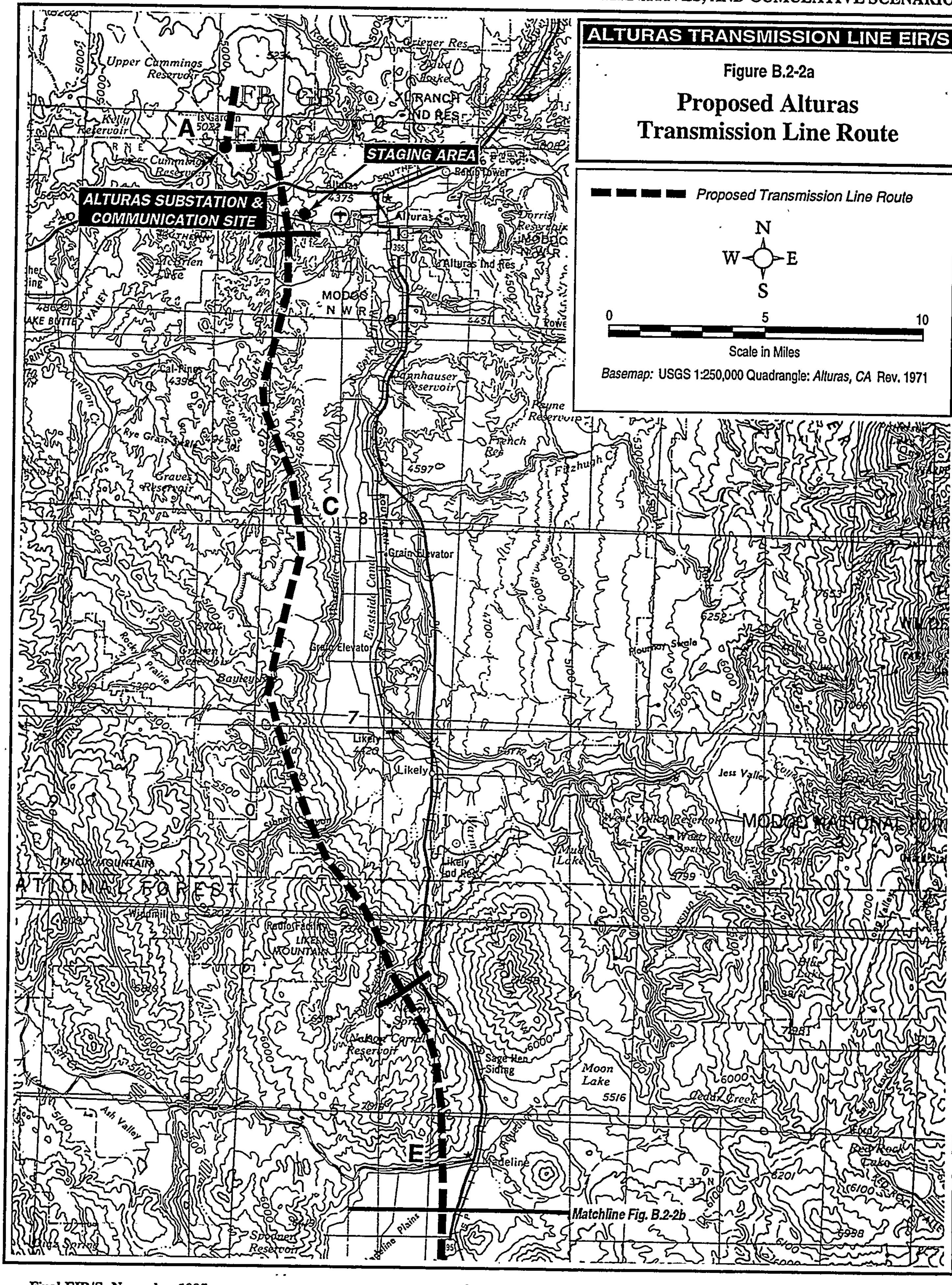
Project Routing Overview. Figure B.2-2(a-d) presents the Applicant's proposed transmission line route from north to south. More detailed base maps are provided at the end of Volume I. In it's application, SPPCo presented the Proposed Project as a linear series of Segments (A, C, E, K, L, N, O, Q, R, T, W, X, Y), where each segment is defined by a series of angle points (the locations where the line changes direction; e.g., CØ1, CØ2, etc.). This nomenclature has been carried forward in this EIR/S.

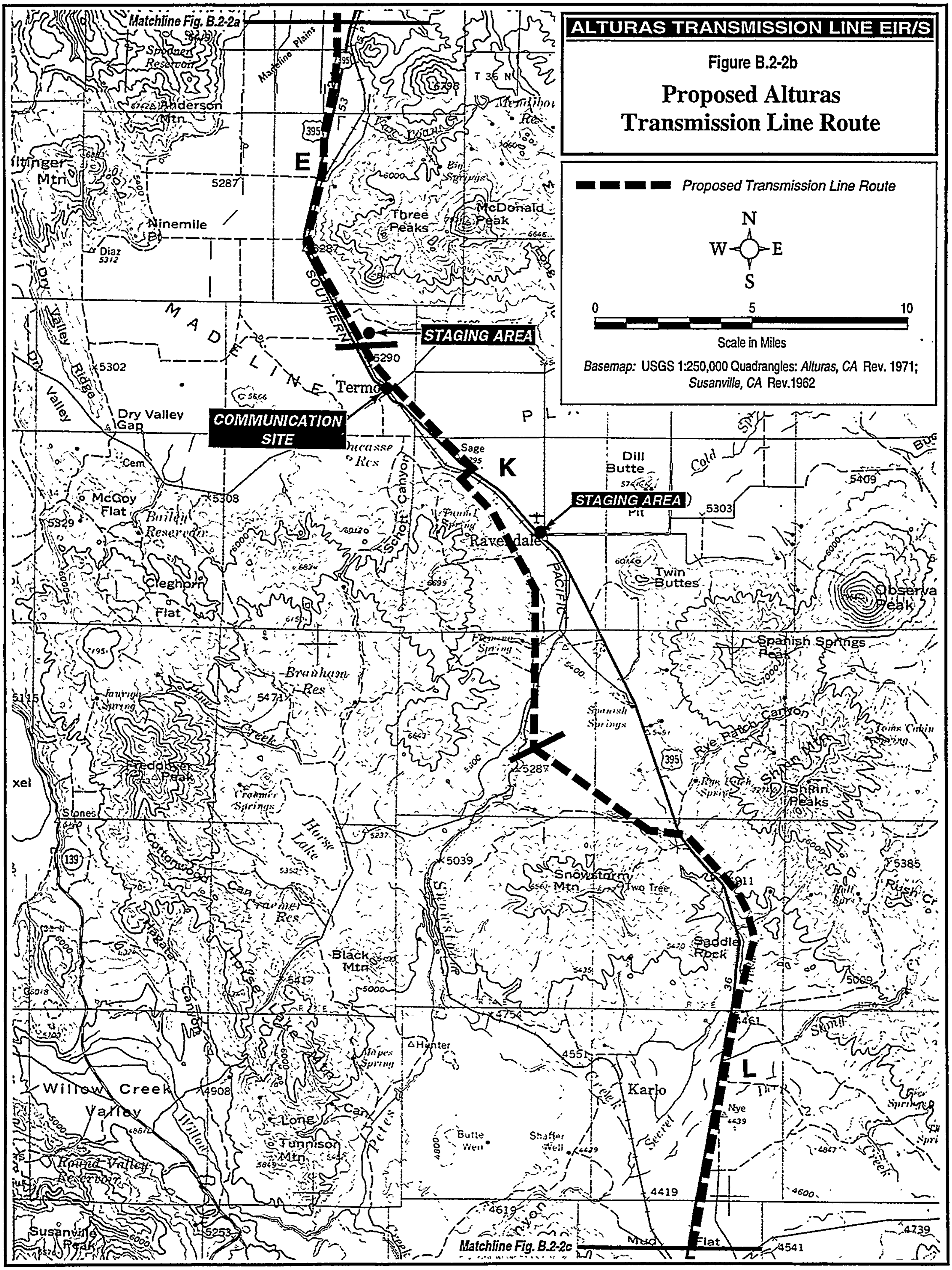
The proposed 165-mile route originates just northwest of Alturas at a tap point on the existing Bonneville Power Administration 230 kV transmission line. From the tap point, a double circuit 230 kV line would be constructed for connection to the proposed Alturas Substation (Devils Garden site). Traveling south from the substation a 345 kV line would be constructed that crosses Highway 299 west of Alturas, and would run along a plateau well to the west of U.S. 395 until approaching U.S. 395 approximately three miles south of Madeline. Figure B.2-2a illustrates this portion of the proposed route.

The 345 kV line would cross to the east side of U.S. 395, paralleling the route of the proposed Tuscarora Gas Pipeline through the Madeline plains (see base maps, at the end of Volume I, for Tuscarora Gas Pipeline routing). The line route would then cross over well to the west side of U.S. 395 in the vicinity of Ravendale, crossing back over to the east side of U.S. 395 near Saddle Rock. The line would closely parallel U.S. 395 to the vicinity of Smoke Creek Ranch Road, where it would leave U.S. 395 heading south/southeast to the east side of Wendel, then south along the eastern boundary of Sierra Army Depot. Figures B.2-2b and B.2-2c illustrate this portion of the proposed route.

The proposed transmission line route would then go around the east side of the Fort Sage Mountains, then again paralleling U.S. 395 along the western foothills of the Petersen Mountain Range (east of U.S. 395). The route would cross U.S. 395 and connect to the proposed Border Town Substation site located within Sierra County, California, southwest of U.S. 395 near Border Town, Nevada. As shown in Figure B.2-2d, from the substation, the proposed route would follow along the northern and eastern flanks of Peavine Peak where it would turn east, paralleling two existing overhead power lines, and travel to the proposed transmission line's connection with SPPCo's existing North Valley Road Substation in northern Reno.

Between Alturas, California, and Reno, Nevada, the land ownership along the Proposed Project route consists of approximately 44% private land and 56% public land. The public portion includes lands of the Department of Interior, U.S. Bureau of Land Management (BLM), the U.S. Forest Service (USFS), the California Department of Fish and Game (CDFG), California State Lands Commission, and the Sierra Army Depot (U.S. Army). Private lands include open range lands and some residential and agricultural uses, including parcels of land ranging from a few acres to large ranch holdings.


ALTURAS TRANSMISSION LINE EIR/S
Figure B.2-2a
Proposed Alturas Transmission Line Route
Proposed Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangle: Alturas, CA Rev. 1971
STAGING AREA
ALTURAS SUBSTATION & COMMUNICATION SITE
A
C
E
Matchline Fig. B.2-2b
Upper Cummings Reservoir
Alturas
Likely
Grain Elevator
Eastside Canal
Moon Lake
Madeline
MODOC NATIONAL FOR
NATIONAL FOREST


ALTURAS TRANSMISSION LINE EIR/S
Figure B.2-2b
Proposed Alturas Transmission Line Route
Proposed Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Alturas, CA Rev. 1971; Susanville, CA Rev.1962
Matchline Fig. B.2-2a
Matchline Fig. B.2-2c
STAGING AREA
STAGING AREA
COMMUNICATION SITE
E
K
L
Termo
Ravendale
Sage
Dill Butte
Twin Buttes
Three Peaks
McDonald Peak
Observation Peak
Spanish Springs Peak
Snowstorm Mtn
Saddle Rock
Karlo
Nye
Shinn Peaks
Dry Valley Gap
McCoy Flat
Cleghorn Flat
Willow Creek Valley
Black Mtn
Long
Tunnison Mtn
Susanville Peak
Ninemile
Anderson Mtn
Spooner Reservoir
Madeline Plains
Horse Lake
Hunter
Mud Flat
SOUTHERN
PACIFIC
5287
5290
5302
5308
5303
5409
5287
5039
4911
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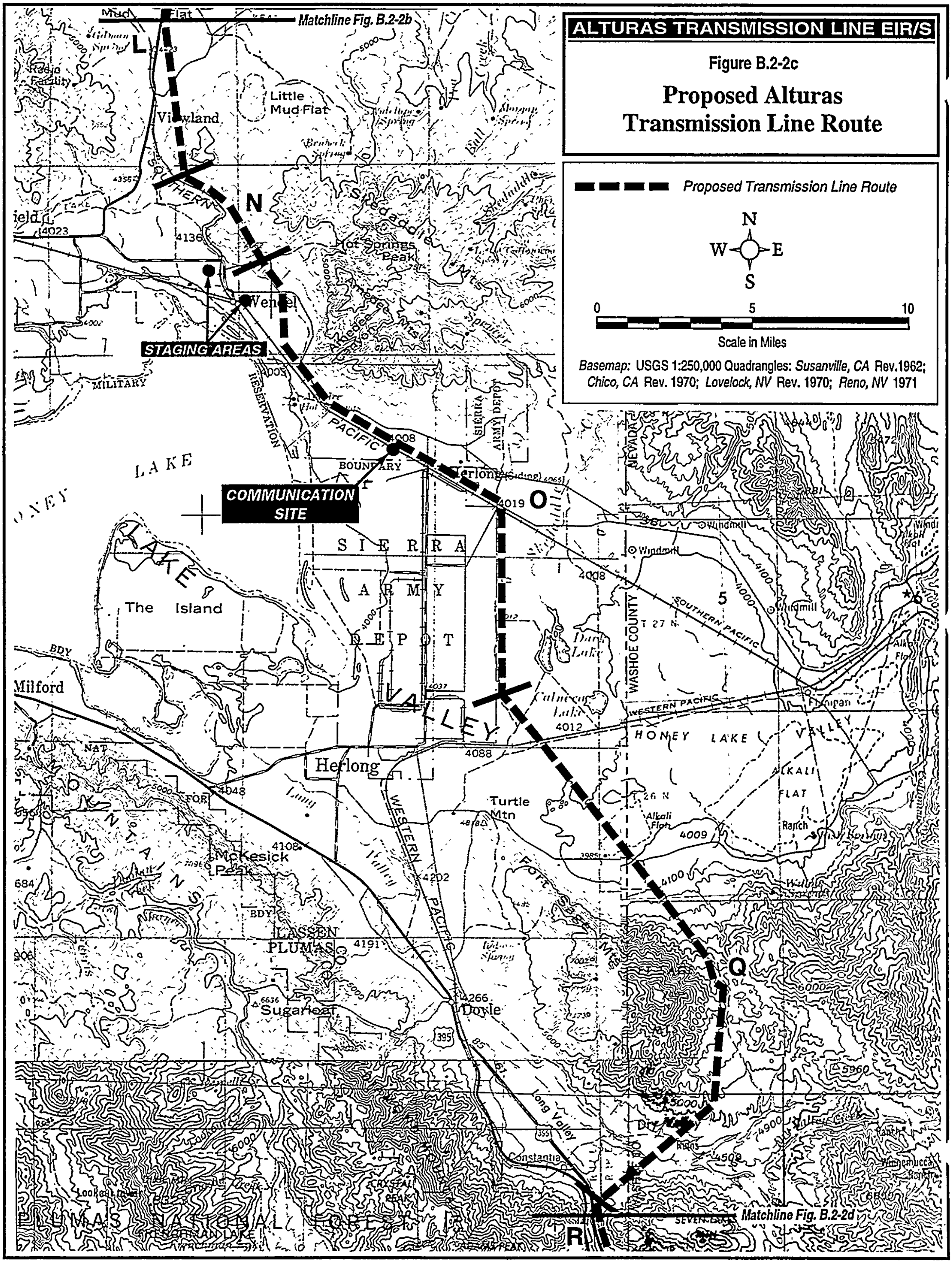
ALTURAS TRANSMISSION LINE EIR/S
Figure B.2-2c
Proposed Alturas Transmission Line Route
Proposed Transmission Line Route
N
W
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0
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10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev.1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1971
Matchline Fig. B.2-2b
Matchline Fig. B.2-2d
L
N
O
Q
R
STAGING AREAS
COMMUNICATION SITE
Little Mud Flat
Viewland
Wendel
Hot Springs Peak
SIERRA ARMY DEPOT
The Island
Milford
Herlong
Turtle Mtn
McKesick Peak
LASSEN
PLUMAS
Sugarloaf
Doyle
Constantia
HONEY LAKE VALLEY
WASHOE COUNTY
SOUTHERN PACIFIC
WESTERN PACIFIC
Long Valley
PLUMAS NATIONAL FOREST

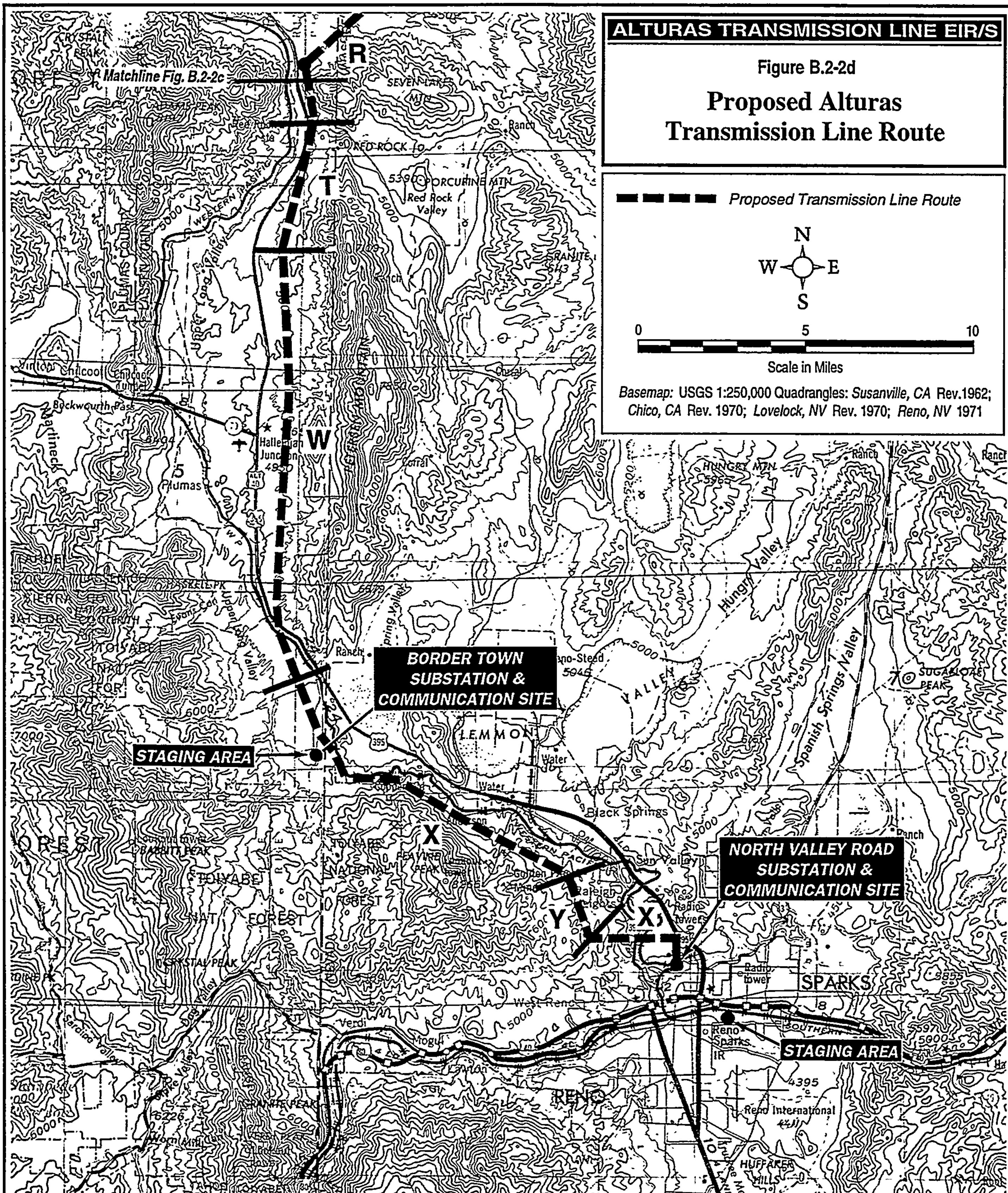


Figure B.2-2d
Proposed Alturas Transmission Line Route

Route Refinement Process. The ROW for the Proposed Project would generally be 160 feet wide. In their applications to the California Public Utilities Commission (CPUC) and BLM, SPPCo proposed a 660-foot wide study corridor for the 165-mile length of the project route with the centerline located at 330-feet, bisecting the corridor. In the preparation of this EIR/S, the 660-foot corridor was studied for each issue area. In addition, a 660-foot corridor was studied for each proposed alternative segment to the project route (see Section B.4). As baseline setting information was generated for the project and alternative study corridors, it was entered into a Geographic Information System (GIS) developed for this EIR/S. The base maps at the end of Volume I, illustrate this baseline setting information.

In July 1994, SPPCo made a request to the CPUC and BLM that the GIS baseline data developed for this EIR/S be provided, with basic interpretive services, to assist SPPCo in refining its proposed centerlines and angle points within the 660-foot survey corridors (referred to as the "Route Refinement Process"). During the week of October 11 through 14, the Aspen Team, under the supervision of the CPUC and BLM, provided displays of GIS-mapped resources relative to SPPCo's proposed route and route segment alternatives. These displays identified the resources mapped and indicated their relative sensitivities per an informal rating system developed by the Aspen Team, in consultation with the CPUC and BLM. Resources mapped included biological resources, wildlife habitat, cultural resources, geologic hazards, hydrologic resources, and sensitive land uses. In addition to providing the GIS displays, the Aspen Team provided limited services in describing the nature of the mapped resources in response to SPPCo questions.

SPPCo utilized the Route Refinement Process for selecting the Proposed Project and alternative segment centerlines and angle points within the 660-foot study corridors based on their weighing of the environmental constraints with respect to their design considerations. The centerline and angle point locations are illustrated on the base maps included at the end of Volume I. Angle point coordinates and segment lengths are summarized on a spreadsheet included as Appendix C.

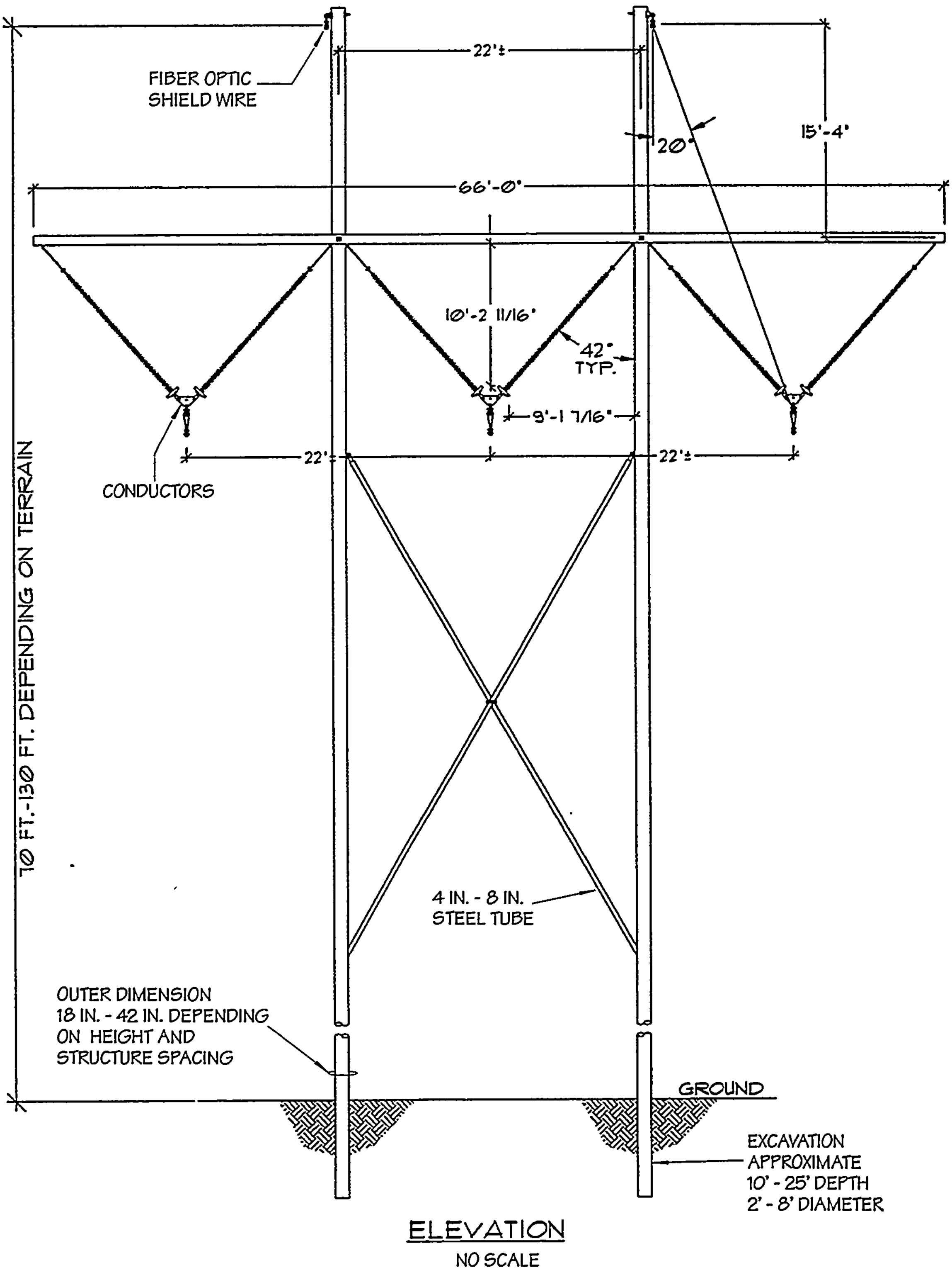
SPPCo used the Route Refinement Process to identify the mapped resources that could be easily avoided (with appropriate protective flagging in the field) and those that they would commit to avoiding (through establishment of exclusion zones or through routing of construction access). The biological resources to be avoided are summarized on a spreadsheet included as Appendix E.4; no structure zones have been identified for cultural resources, but given the confidential nature of this information, these no structure zones have not been included in this EIR/S. All exclusion zones will be identified and flagged in the field prior to project construction, subject to Lead Agency and designated environmental monitor(s) verification. Construction and related activities would be restricted to specific areas only. Any operation in unspecified areas, including unauthorized access routes, would be prohibited. If during construction additional resources are discovered (e.g. expanded or new plant communities because of varying precipitation patterns, undiscovered subsurface cultural resources, etc.), all applicable mitigation measures presented in this EIR/S will be implemented, in the event the resources can not be avoided.

ROW Easement Classifications. For the portion of the Proposed Project to be routed on Federal lands, SPPCo would obtain a non-exclusive grant of ROW from the BLM and a non-exclusive ROW or permit from the USFS. In addition, the Modoc and Toiyabe National Forests might designate the ROW traversing their respective lands as utility corridors through their plan amendment processes (the growth inducement aspect of designated utility corridors is discussed in Section E.3 of this EIR/S). An easement would also be obtained from the U.S. Army for the portion of the route traversing Sierra Army Depot lands. These Federal agencies would reserve control of the ROW within Federal lands by maintaining the right to permit non-interfering uses within the ROW. For private lands, SPPCo intends to acquire exclusive transmission line easements that would be recorded in the respective counties in California and Nevada. Additional land uses within the 160-foot ROW that do not conflict with the safe operation of the line (e.g., cattle grazing) could be allowed depending upon jurisdictional constraints.

B.2.2.2 Transmission Line Facilities (Lines and Structures)

SPPCo has proposed the use of tubular steel structures to support the power lines along the route. H-frame and single-pole structures would be used for the straight portions of the proposed route. Wood H-frame structures would only be used from BPA's 230 kV line to the Alturas Substation. Single-pole structures would be used from Angle Point X13 west to SPPCo's North Valley Road Substation. Steel H-frame structures would be used along the remainder of the proposed route, except at "angle points" (places where line changes direction). The H-frame structures would consist of two steel or wood poles embedded in the ground and connected by a cross-beam (creating the "H" shape); the single-pole structure would involve the embedment of one steel pole into the ground or concrete footing. The steel H-frame structures would vary in height from 70 to 130 (80-85 feet for wood H-frame structures) feet depending on the terrain being crossed; the height of single-pole structures would range from 110 to 130 feet. The average span between structures along the straight portion of the route would be approximately 1,200 feet (700 feet in wood H-frame section, 800 feet in single-pole section). Guyed three-pole structures would be used at "angle points" (places where the line changes direction). Like the H-frame structures, these structures would also vary from 70 to 130 feet in height. Schematic drawings of the proposed transmission structures appear in Figures B.2-3a and B.2-3b (H-frame structures), B.2-4 (single-pole structures), and B.2-5 (angle point structures).

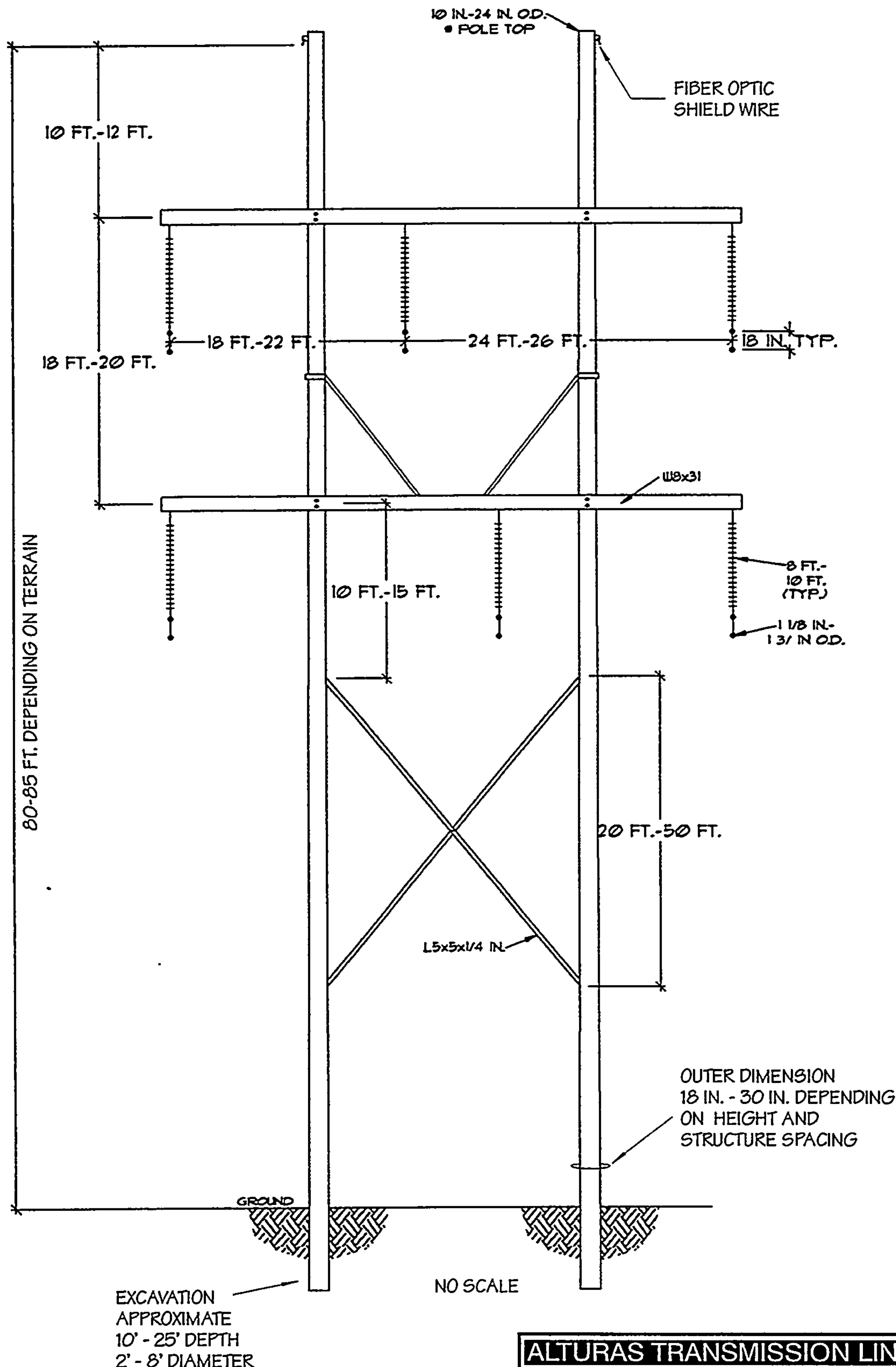
Structures would support six non-specular (non-reflecting), stranded aluminum/steel conducting wires approximately one inch in diameter and two "shield" wires. Minimum conductor ground clearance would be 34 feet. SPPCo is currently proposing the use of twin 795 aluminum conductors, steel reinforced (ACSR) (one-inch diameter). While detailed design of the Alturas Project might require the use of twin 954 ACSR conductors (approximately 1.2 inch diameter), the use of these larger conductors would require only a minor increase in structure heights (the range in structure heights would not change) and structure wall thicknesses. In addition, as discussed in Section C.10, no appreciable increase in electric and magnetic field (EMF) strengths would be experienced. "Shield wires" are stranded steel wires (3/8 - 3/4 inch diameter located at the tops of the uprights) that protect the line from lightning strikes. One of the shield wires would consist of a stranded steel wire which would contain a fiber optic cable inside it. The line would be designed to meet or exceed the loading requirements of the CPUC's General Order 95 (GO95) and the National Electrical Safety Code (NESC).



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-3a

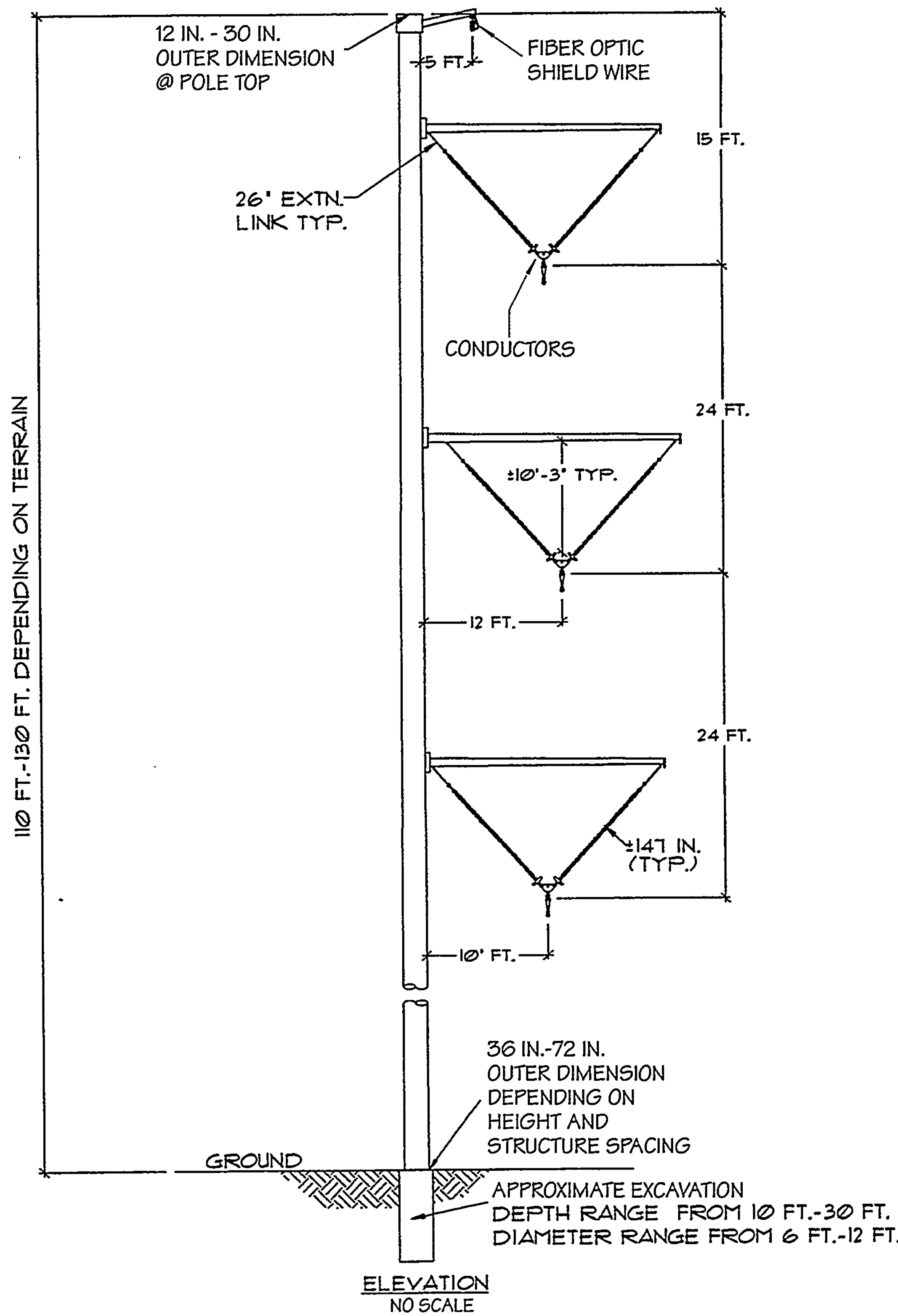
345 kV Steel H-Frame Structure



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-3b

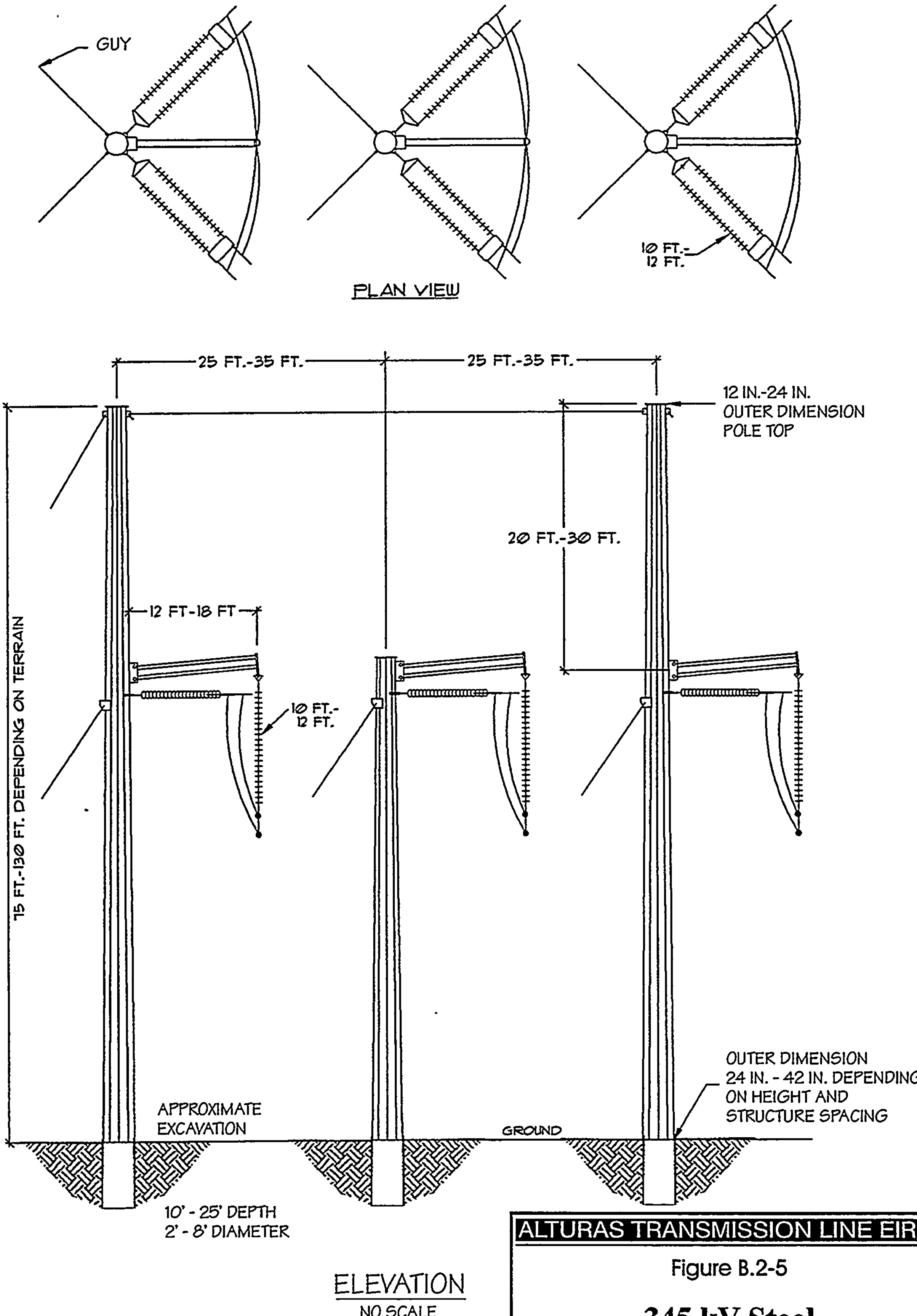
230 kV Double Circuit Wood H-Frame Structure



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-4

345 kV Steel Single Pole Structure



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-5

345 kV Steel
3-Pole Angle Structure

In selecting the type of structure to use for the transmission line, SPPCo considered structural engineering factors, including the structures' ability to support the conductors and shield wires placed on them. SPPCo also considered factors including cost, aesthetics, public safety, ease of assembly and erection, performance, and flexibility/strength. All systems were evaluated based on CPUC GO95 Loading Requirements. Five different structure configurations were evaluated based on their relative cost, aesthetics, maintenance, electrical characteristics, and reliability. The structure types evaluated by SPPCo were:

- Rectangular Laminated Wood H-Frame Structure
- Tubular Steel H-Frame Structure (see Figure B.2-3)
- Guyed Delta Steel Lattice Structure
- Four-legged self supporting Lattice Steel Structure
- Single Shaft Tubular Steel Structure

As a result of this analysis, SPPCo selected the tubular steel H-frame as the preferred structure for the Proposed Project. Further, SPPCo proposes the use of self-weathering, Corten steel (dark, rust-like finish) and non-specular conductors to mitigate the visual impacts of the structures. Since BPA is responsible for the design of the Proposed Project from BPA's 230 kV line to the Alturas Substation, BPA selected the use of wood H-frame structures for this portion of the project alignment.

B.2.2.3 Proposed Substation Facilities

The proposed interconnection of the new transmission line to the BPA system in the north and SPPCo system near Reno would include the design and construction of two new electrical substations, and additions to an existing substation. The first new substation is called Alturas Substation, to be located northwest of Alturas, CA. The second new substation is called Border Town Substation, located in Sierra County, California, approximately 15 miles northwest of Reno. The southern end of the new line would terminate at SPPCo's existing North Valley Road Substation, located north of Reno, Nevada.

The designs for each substation are still preliminary at this time. However, based upon analysis of comparable existing substations, the type and size of equipment and structures can be described. Preliminary drawings have been made to show the proposed layouts and the size of the property that might be required. Upon completion of planning studies, the designs would be finalized and any needed changes could, for instance, change the proposed number of switches and circuit breakers or change the transformer ratings, etc. Figure B.2-6 is a "one-line diagram" illustrating the connection of the proposed transmission line and substations upon completion of construction.

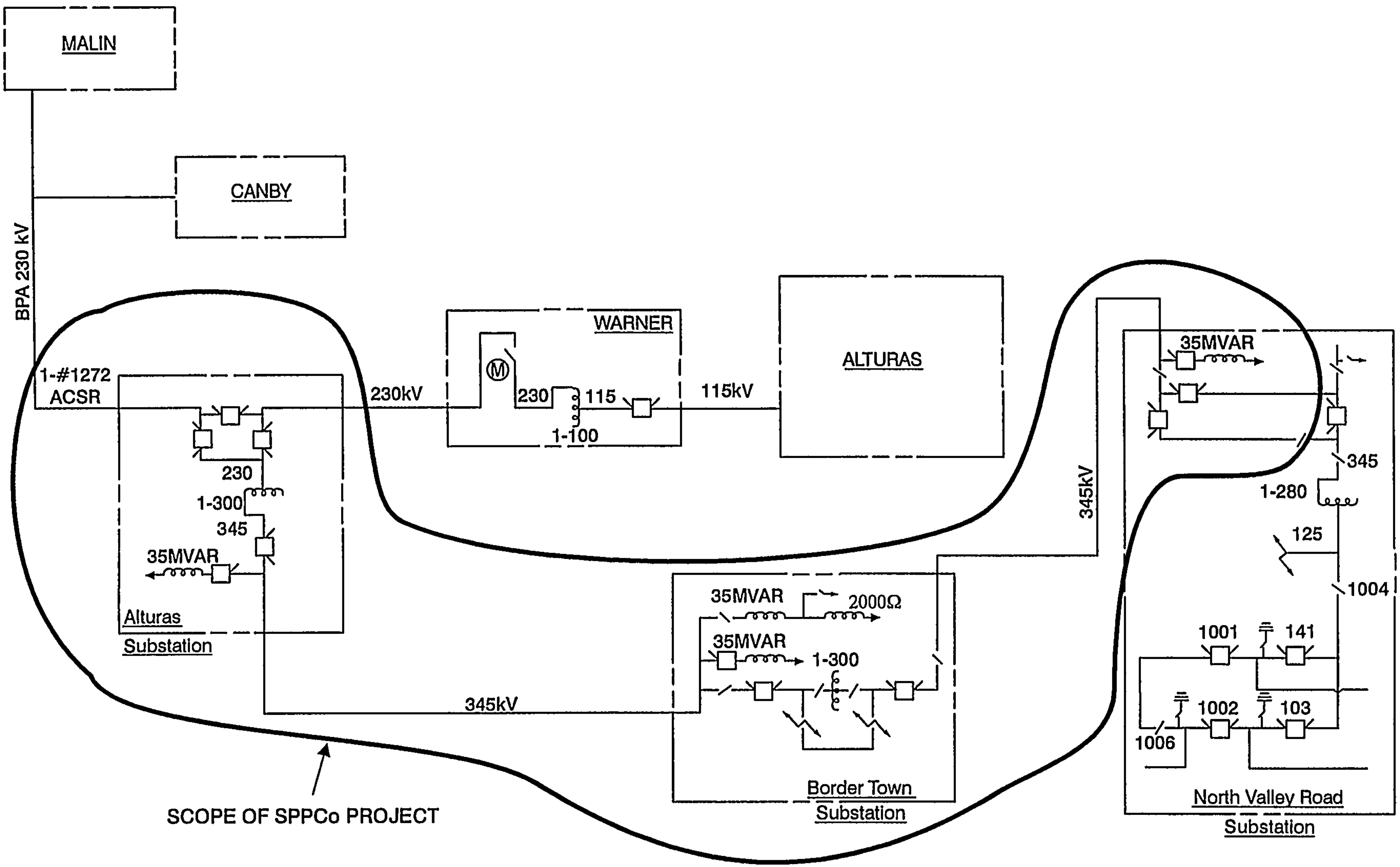
Landscaping around the perimeter of the Border Town Substation is proposed by the Applicant. At the Alturas Substation site, SPPCo proposes to preserve existing vegetation adjacent to the County Road to provide visual screening.

Alturas Substation

The Alturas Substation would be located at the northern end of the Proposed Project, approximately five miles northwest of Alturas. The purpose of the Alturas Substation is to interconnect the north end of the transmission line to the BPA. SPPCo evaluated several possible sites for this substation and has proposed the Devils Garden site shown in Figure B.2-7. This figure also illustrates the study area addressed in selecting the preferred substation location. This northern substation site is located a few miles southwest of BPA's Warner Substation. The Devils Garden site is approximately 16 acres (925 feet by 760 feet). The area of disturbance for the Alturas Substation is estimated to be approximately 10.5 acres. SPPCo proposes to locate the substation and any cut and fill areas that fall outside of the substation fencing within the Devils Garden site boundaries in such a manner that environmental impacts are minimized. BPA's existing Malin to Warner 230 kV line would be folded into the Alturas Substation for connection to the Alturas 345 kV line. This interconnection would require transmission line switching equipment and a transformer to increase voltage from 230 to 345 kV. The transformer size is presently estimated to be 300 mega volt amp (MVA), 230-345 kV. On the 230 kV side of the transformer, line switching equipment would consist of three 230 kV breakers connected in a ring configuration. In this configuration, any of the three breakers can be removed from service for maintenance, repair, or replacement, without interruption of either the BPA or SPPCo lines. Figure B.2-8 presents plan view and elevation schematics of the equipment proposed for this substation.

On the 345 kV side of the transformer, one 345 kV breaker would be required for transmission line switching. In addition, one shunt reactor (inductor) would be required to control voltage at the Alturas Substation. A shunt reactor is an electrical device, similar to a power transformer, used to add inductance to a circuit. The inductance offsets line shunt capacitance and reduces the voltage at the terminal. The shunt reactor is estimated to be 35 mega volt amp reactive (MVAR), 345 kV, and would require one 345 kV breaker for switching.

This new substation would include a control building containing protective relays, communication equipment, and metering equipment. The substation would have a perimeter security fence installed. Three inches of substation gravel would provide electrical isolation of personnel operating and maintaining equipment within the substation. Tubular steel structures would be used to support equipment, conductors, and switches at a safe height to permit personnel, vehicles, and equipment to operate and maintain all substation equipment. These structures would be painted to blend with surrounding features. In addition, a 40 to 50 foot tall microwave structure would be required to communicate with BPA's system at Happy Camp.

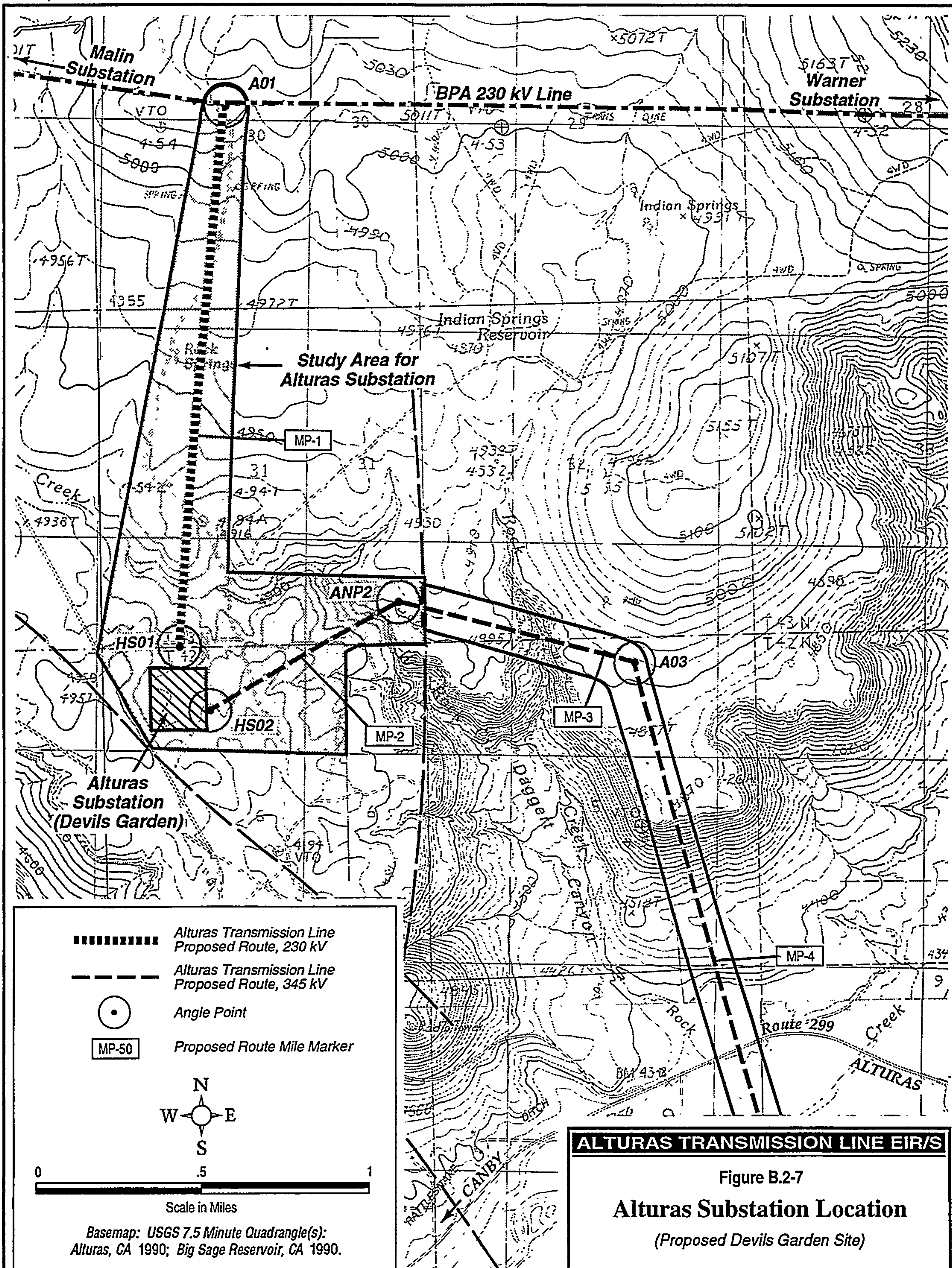


Source: SPPCo

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-6

One-Line Diagram

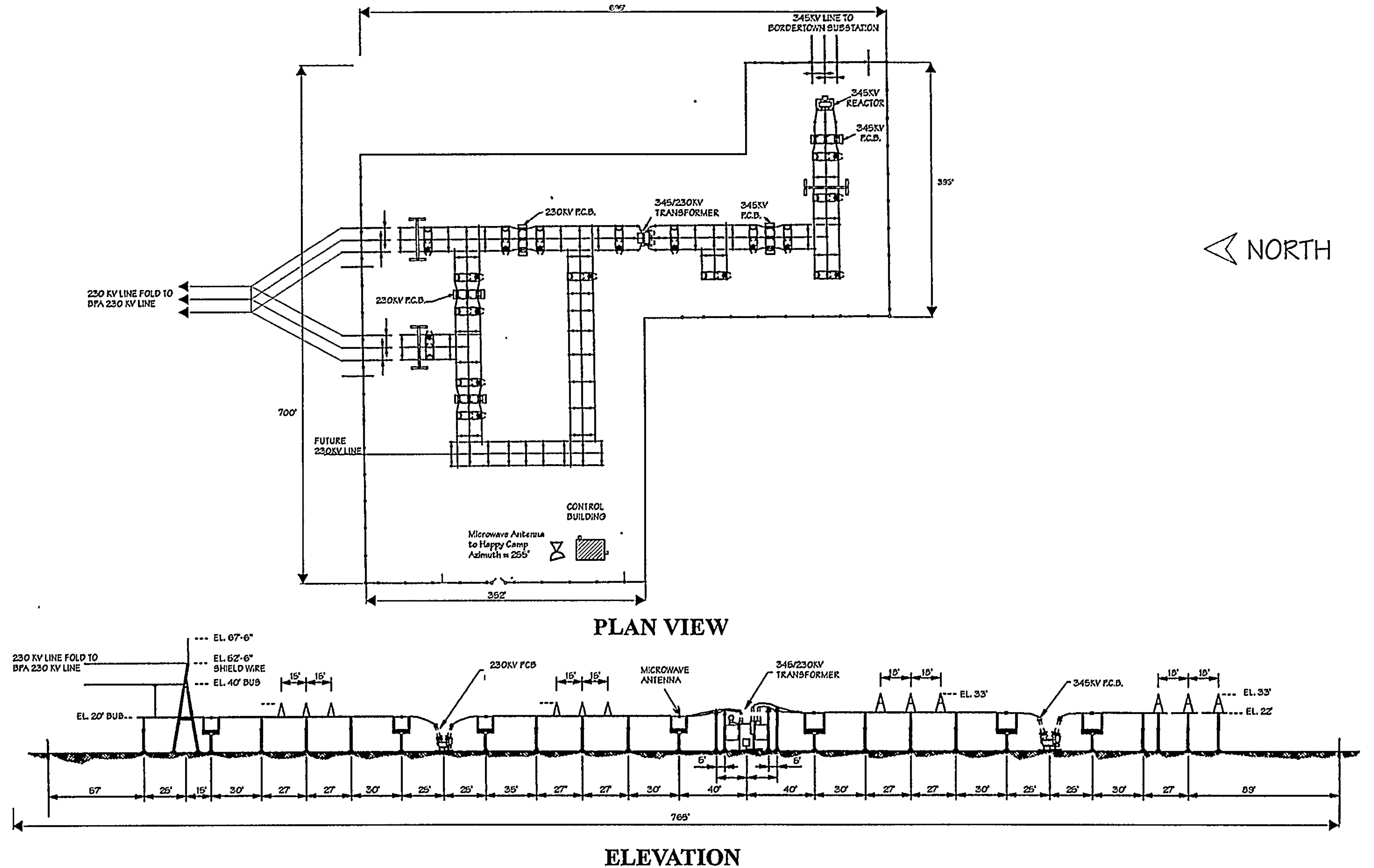


ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-7

Alturas Substation Location

(Proposed Devils Garden Site)



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-8

**Alturas Substation
Plan View and Elevation**

Border Town Substation

The Border Town Substation would be the second of the two new substations proposed for the project. This substation would be located in California on property currently owned by the BLM, west of the "Border Town Interchange" on U.S. Highway 395, approximately 15 miles northwest of Reno. Figure B.2-9 shows the location of the substation site and its boundaries (790 feet by 430 feet). In addition the boundary of the study area addressed in selecting the preferred substation location is illustrated on Figure B.2-9.

SPPCo is proposing the construction of the Border Town Substation in lieu of expansion of the North Valley Road Substation, since Border Town is less expensive (an estimated savings of 4 to 10 million dollars) and provides SPPCo the flexibility for future interconnects given the additional area available. SPPCo has incorporated the future installation of a second 345 kV phase shifter into the substation design, to meet future reliability and potential phase angle capacity needs. Section E-3, Growth-Inducing Impacts of the Proposed Project, discusses the potential for future expansions at the Border Town Substation and the growth-inducement implications.

Phase angle regulation would be required at the Border Town Substation to control power flow over the transmission line; to accomplish this, a phase angle regulating transformer (phase shifter) would be required. Phase angle regulating transformers are commonly used to control the flow of electric power over transmission lines. Both the magnitude and direction of power flow can be controlled by varying the phase angle between the input and output voltages on the transformer. Based on preliminary studies, the size of the phase angle regulating transformer is presently estimated to be 300 MVA, 345 kV, allowing for a 300 MW transfer capacity as discussed in Section A.6.3.3.. Figure B.2-10 presents plan view and elevation schematics of the equipment proposed for this substation.

In addition to the phase angle regulating transformer, transmission line switching equipment would be installed. Transmission line switching would be handled by two 345 kV circuit breakers, with disconnect switches. Two shunt reactors (inductors) would be installed at the Border Town Substation to control voltage. Each would be rated 345 kV; each is estimated to be 35 MVAR in size, and one of the reactors would be switched by a 345 kV breaker. Transmission lines would be terminated in A-frame structures to provide the required vertical electrical clearances from equipment and energized buswork (aluminum tubing connecting the transformers inside the substation).

The station would require a control building with protective relays, communications equipment, metering equipment, a perimeter security fence, substation gravel, painted tubular steel structures to blend with surrounding features, and two distribution line extensions useable for station power.

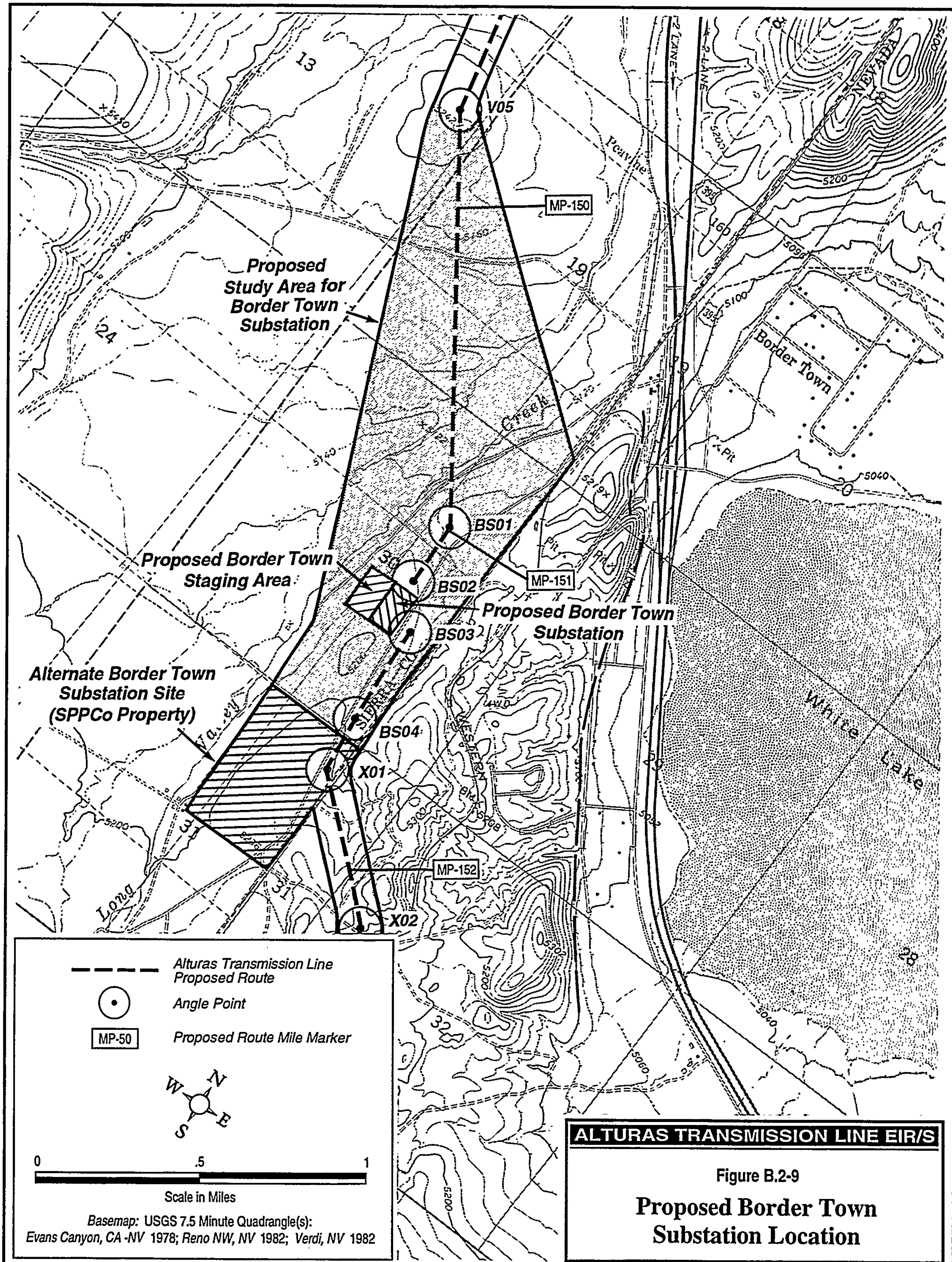
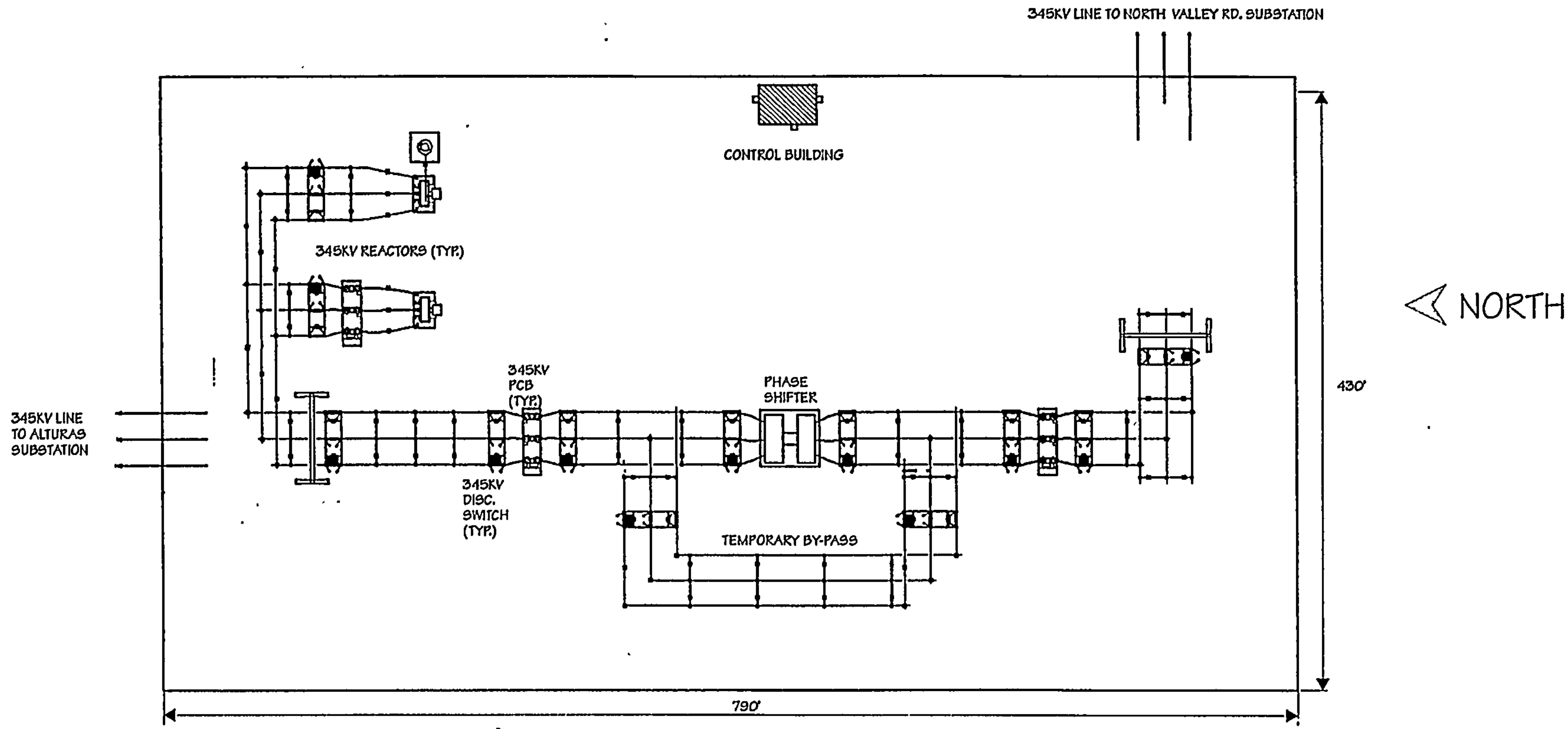
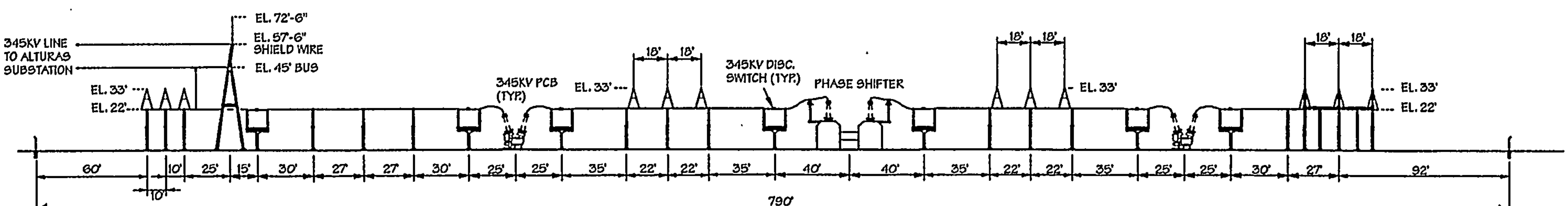


Figure B.2-9

Proposed Border Town Substation Location



PLAN VIEW



ELEVATION

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-10

Border Town Substation Plan View and Elevation

Additions to the North Valley Road Substation

North Valley Road Substation is an existing 345/120 kV substation owned and operated by SPPCo. The termination of the Alturas Transmission line Project at this substation would interconnect the southern end of the Proposed Project to SPPCo's system. Figure B.2-11 shows the parcel and facility boundaries for the expanded North Valley Road Substation. The fenced substation pad would be expanded approximately 128 feet, on property presently owned by SPPCo. The size of North Valley Road Substation, including all required additions, is estimated to be approximately 618 feet by 340 feet. Figure B.2-12 presents plan view and elevation schematics of the existing and proposed new equipment at the North Valley Road Substation.

Transmission line switching equipment consisting of two 345 kV circuit breakers would be added. A shunt reactor would be used to control voltage. A third 345 kV breaker would be used to switch the shunt reactor.

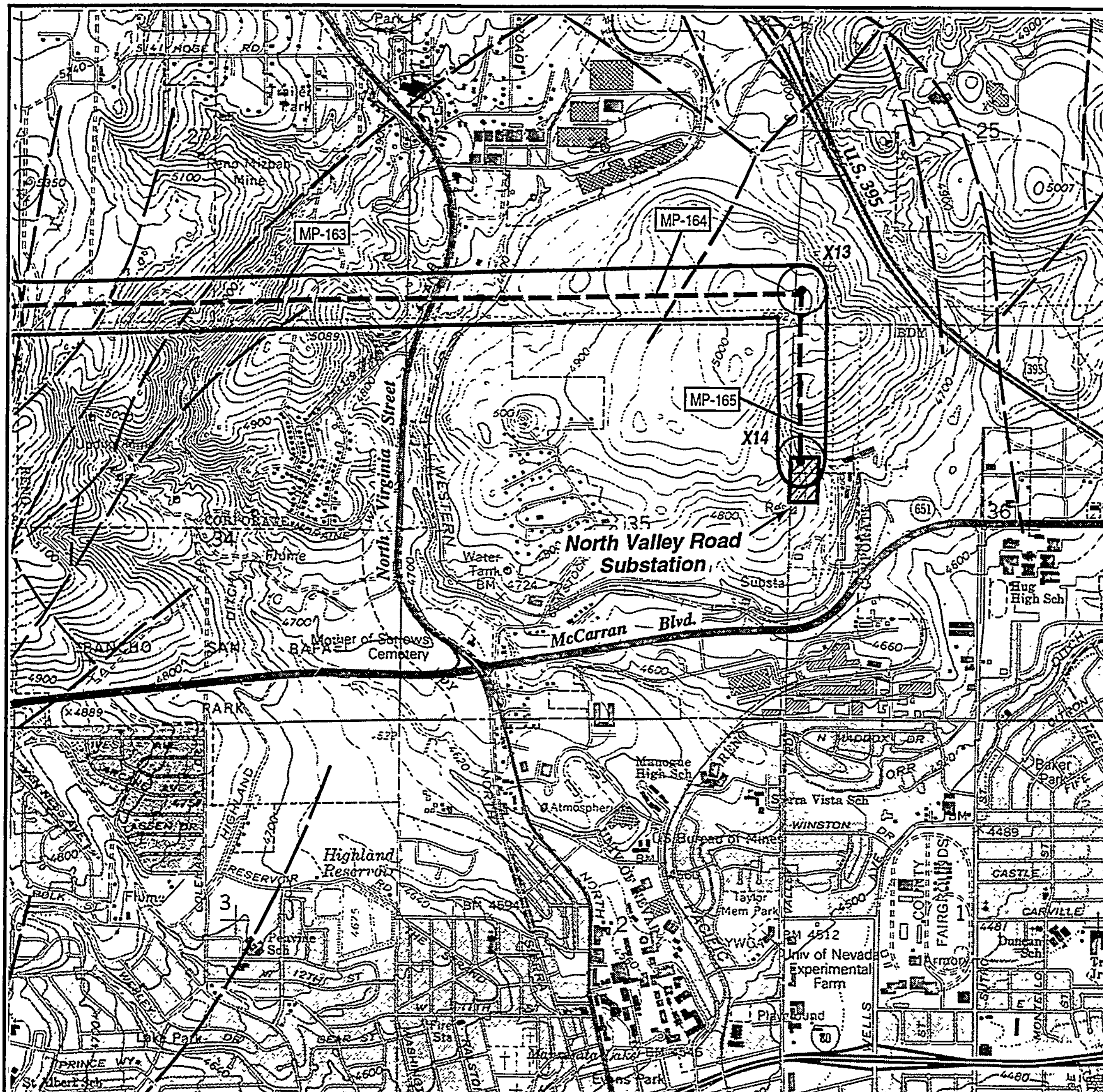
Other Substation Additions

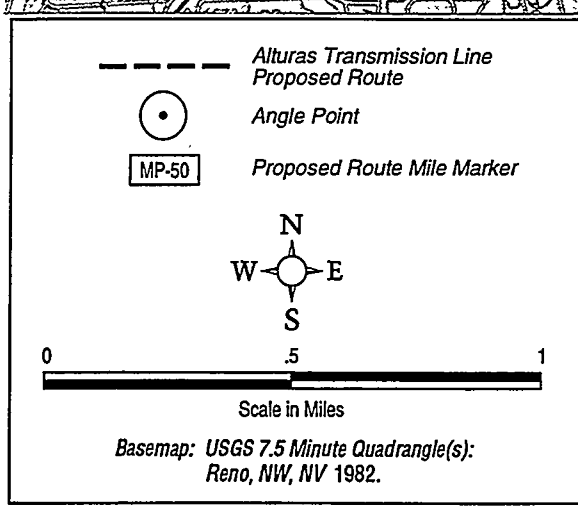
Other substation work includes adjusting or modifying relays and controls to enhance protection schemes as required at the Warner and Malin Substations owned by BPA. These modifications would not require an expansion of the facilities; no earth work would occur, nor would there be any increase in the EMFs associated with these facilities.

B.2.2.4 Communication Facilities

The Applicant is proposing to use a fiber optic system for communications needs, along with a fault detection information system and provisions for communication between construction or maintenance personnel. The three systems provide for communication of direct transfer trip (automatic interruption of power flow) information and protection of the transmission line, monitoring of system operation through a System Control and Data Acquisition (SCADA) process, and for necessary construction and operational communications for maintenance personnel to ensure the safety of the public and SPPCo employees. These functions would be served by the three systems described below:

Optical Ground Wire (OPGW) is a relatively new technology, but is becoming widely used throughout the utility industry because of its ability to provide reliable communications. OPGW would be used instead of one of the standard shield wires; the fibers that carry communications information would be located inside of the aluminum/steel cables that are strung along the top of the transmission structures for the purpose of preventing lightning from striking electrical conductors and taking the current from a lightning strike safely into the ground. Therefore, the OPGW serves both as a shield wire and a communication medium. SPPCo's proposed system would include extra fibers for back-up communications (transmitting transfer trip information if other systems fail) and possibly for lease to other

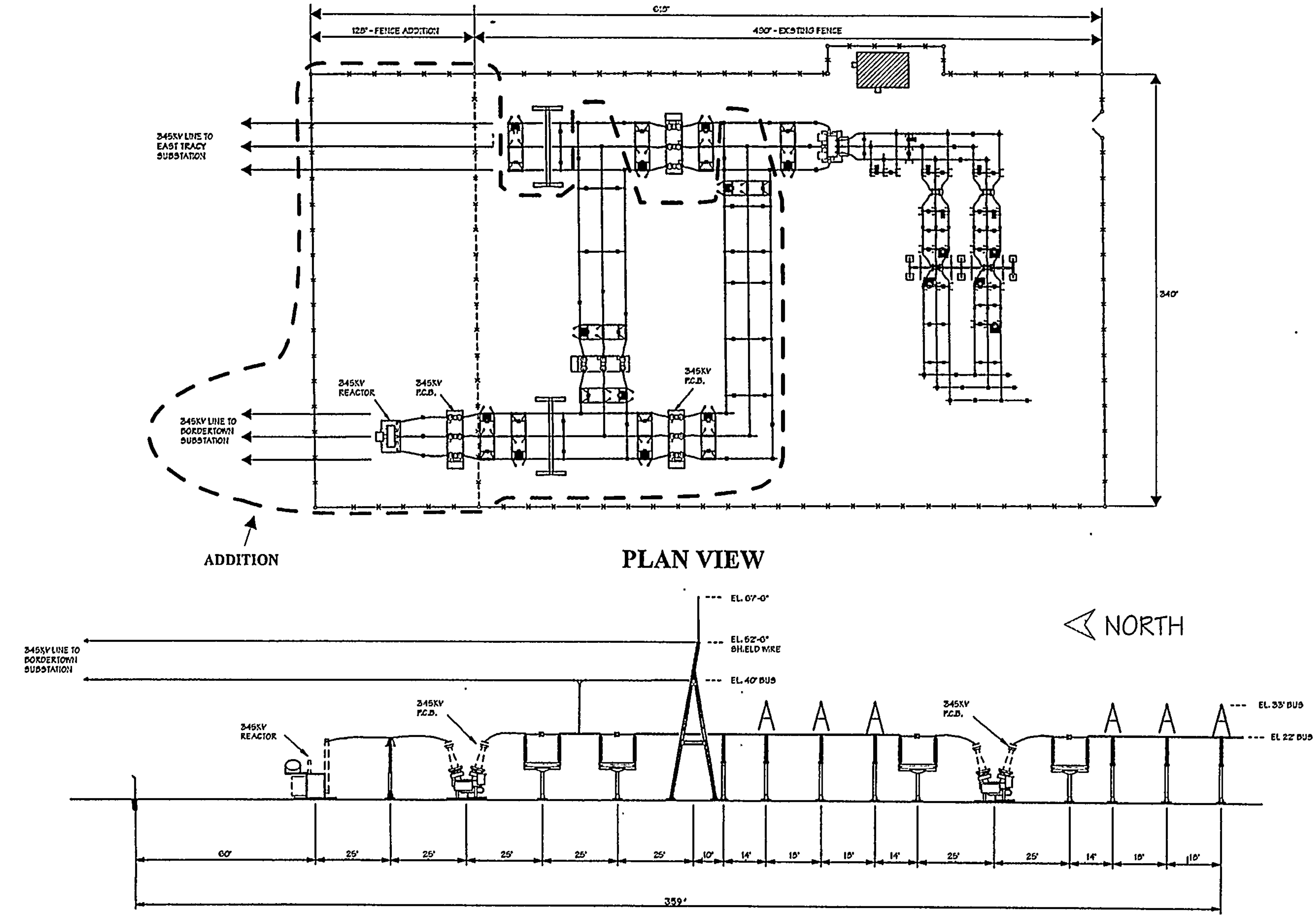




ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-11

North Valley Road Substation Location



ELEVATION

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-12

North Valley Road Substation Plan View and Elevation

users. SPPCo anticipates that five communication sites would be required to house the fiber optic communications equipment along the Alturas transmission line. As illustrated on Figures B.2-2a-d, the proposed communication sites include: (1) North Valley Road Substation, (2) Border Town Substation, (3) Herlong (approximate), (4) Termo (approximate), and (5) Alturas Substation. The equipment located at the substation sites would be located inside the substation buildings. Communication equipment at the Herlong and Termo locations would be located adjacent to the transmission line within the 160-foot ROW. SPPCo expects that at each of these two locations, a cinder block or prefabricated, bullet-proof fiberglass building would be erected on concrete pads. Each building would be approximately 10'W x 16'L x 8'H, painted tan in color, and centered within a chain-link, fenced area encompassing about 1200 square feet (30 feet by 40 feet). The exact location of the communications sites is highly dependent upon the line length from the Alturas to Border Town Substations (estimated at 148.5 miles) and the proximity to usable distribution power. Current technology dictates the distance between the communication sites which house the fiber optic repeater equipment at an approximate, maximum distance of 50 miles. Until the transmission route is finalized, SPPCo is unable to finalize the exact location of the non-substation, communication sites. In addition, if the overall line distance increases significantly, it may be necessary to relocate the two non-substation sites to include a third intermediate site. All non-substation, communication sites would be located within the 160-foot ROW.

Telecommunications facilities will be required to operate and maintain the interconnection between the Proposed Project and BPA. These facilities will provide communications between the proposed Alturas Substation and the existing BPA substations (Warner & Malin). The existing six circuit radio system is presently "at capacity" and unable to provide for the additional circuit requirements, necessary for this project. SPPCo proposes replacement of this system with one that would provide for current and projected circuit requirements in coordination with BPA. SPPCo has negotiated and received confirmation from existing users at Happy Camp (approximately 25 1/2 miles west of the Alturas Substation site), for shared use of their microwave site. BPA is proposing to collocate with an existing site user, a new narrow band, point to point microwave radio repeater at Happy Camp Radio Station site. The microwave radio would link from the new Alturas Substation via Happy Camp to the existing Captain Jack Substation. The building would be 3.04 m (10ft) x 6.08 m (20 ft) block structure with a new microwave tower and engine generator with propane tank as backup electricity. Access to the site would be 2-3 times a year, plus additional emergency access. BPA would utilize existing microwave radio sites at Captain Jack Substation and Warner Substation. BPA would retain and use the existing UHF radio links from Warner Substation via Happy Camp to Buck Butte. For mobile radio coverage, there is an existing VHF repeater at Happy Camp in the PH&E radio building.

The SCADA system consists of remote computers located at substations. These computers would continuously provide information to SPPCo on the quantities of power transmitted through the line, as well as the control and status indication of circuit breakers and switches in the substations. SCADA communications would be also provided by the fiber optic wires.

In addition to the fiber optic system, SPPCo would employ the **Power Line Carrier System** to provide system fault detection information. Circuit breakers at each end of the transmission line and at the Border Town Substation would be controlled by this equipment in order to protect the line. This system would work by superimposing a very low frequency radio carrier, usually in the 60 KHz range, onto the power line through a coupling capacitor. Transfer trip information (when power flow is interrupted) would be sent to the Reno Control Center from the fault detection/trip initiation equipment. SPPCo would also use the fiber optic system as a backup system to communicate the transfer trip signals from the designated points along the transmission line.

Two-way Communications would be required for construction and maintenance personnel. It would be provided by cellular phones or VHF/UHF two-way radio system. A conventional VHF or UHF two-way radio system could be used, utilizing the following existing mountain-top transmission/repeater sites: (1) Peavine Peak located northwest of Reno, Nevada; (2) Antelope Mountain located northeast of Susanville, California; and (3) Likely Mountain located south of Alturas, California. These sites are existing radio sites for other public services and have been classified as "electronic mountain-top sites" by the appropriate federal and state agencies. SPPCo doesn't anticipate that any physical enhancements to the existing sites would be required since sufficient room exists for SPPCo to rent space from the resident entities. These sites would be in direct line-of-sight to the proposed fiber optic repeater sites allowing for an "uplink" from the valley floor repeater sites to the mountain-top communication sites.

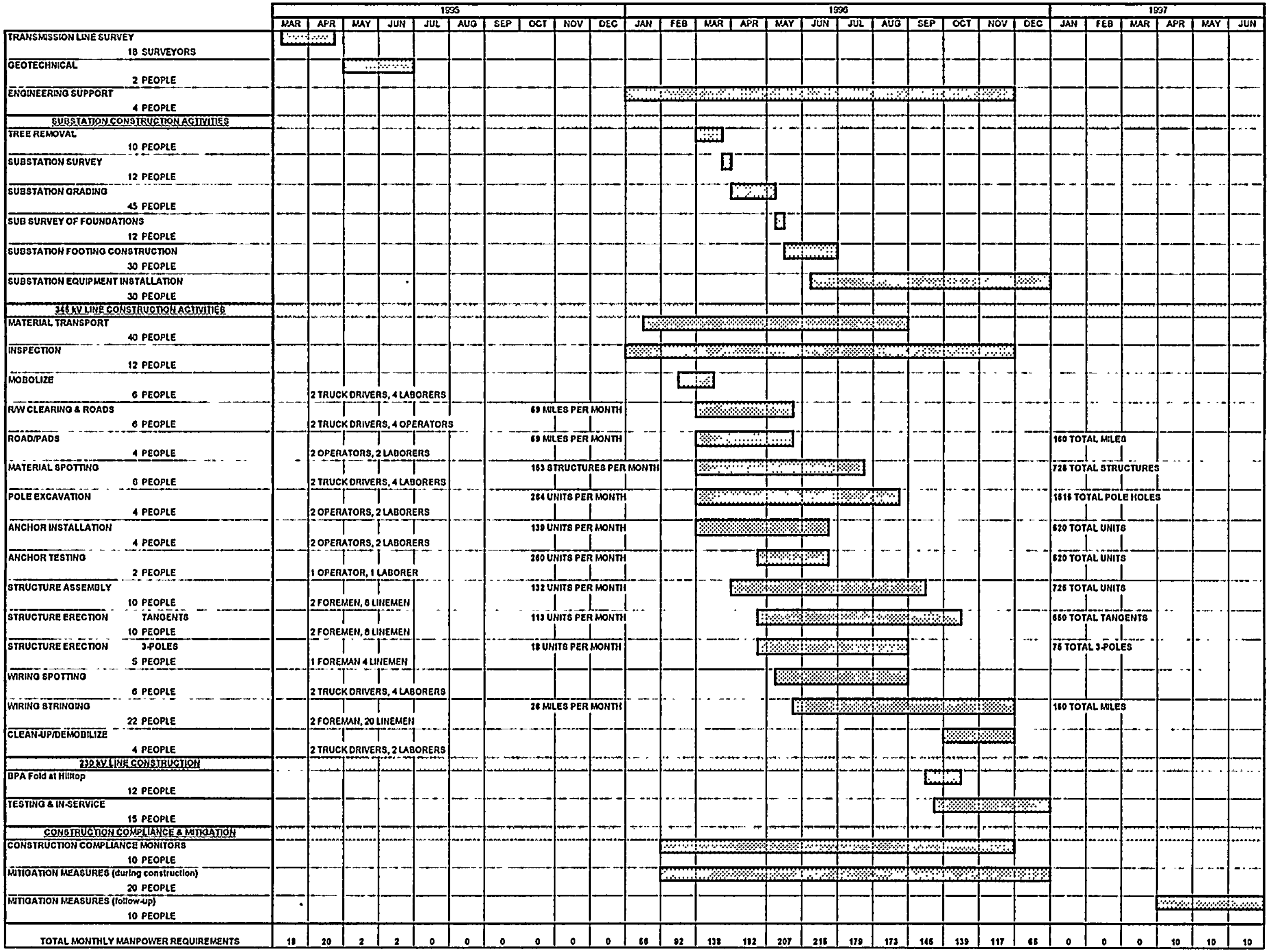
B.2.3 PROPOSED PROJECT CONSTRUCTION

This section includes presentation of an estimated construction schedule, description of transmission line and substation construction processes, discussion of anticipated construction employment, and requirements for construction materials, equipment, and staging areas.

As discussed in this section, Part C (Environmental Analysis), and Part F (Proposed Mitigation Monitoring, Compliance, and Reporting Program), SPPCo would be required to provide various plans that describe the specific techniques and procedures to be utilized in the construction, operation, and maintenance of the Proposed Project.

B.2.3.1 Construction Schedule

SPPCo has prepared a Construction Schedule for the Proposed Project (see Figure B.2-13). Construction activities would occur over an estimated 9-month period. Assuming that the environmental review process and permitting would be finalized in the first quarter of 1996, construction would start in March 1996, with material transport and inspection, and end with system testing, expected to be completed in December, 1996. Substation construction would begin in March 1996, and continue through December, 1996. Transmission line construction would occur from early-March through late-November 1996, including clean-up and demobilization. The fold-in (loop-in) of the Alturas Transmission Line into the



Source: SPPCo

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-13

Project Construction Schedule

BPA system would occur during September/October, 1996. System testing would be done during the fourth quarter of 1996. Mitigation compliance monitors would be present during all aspects of construction, in addition to post-construction mitigation effectiveness reviews.

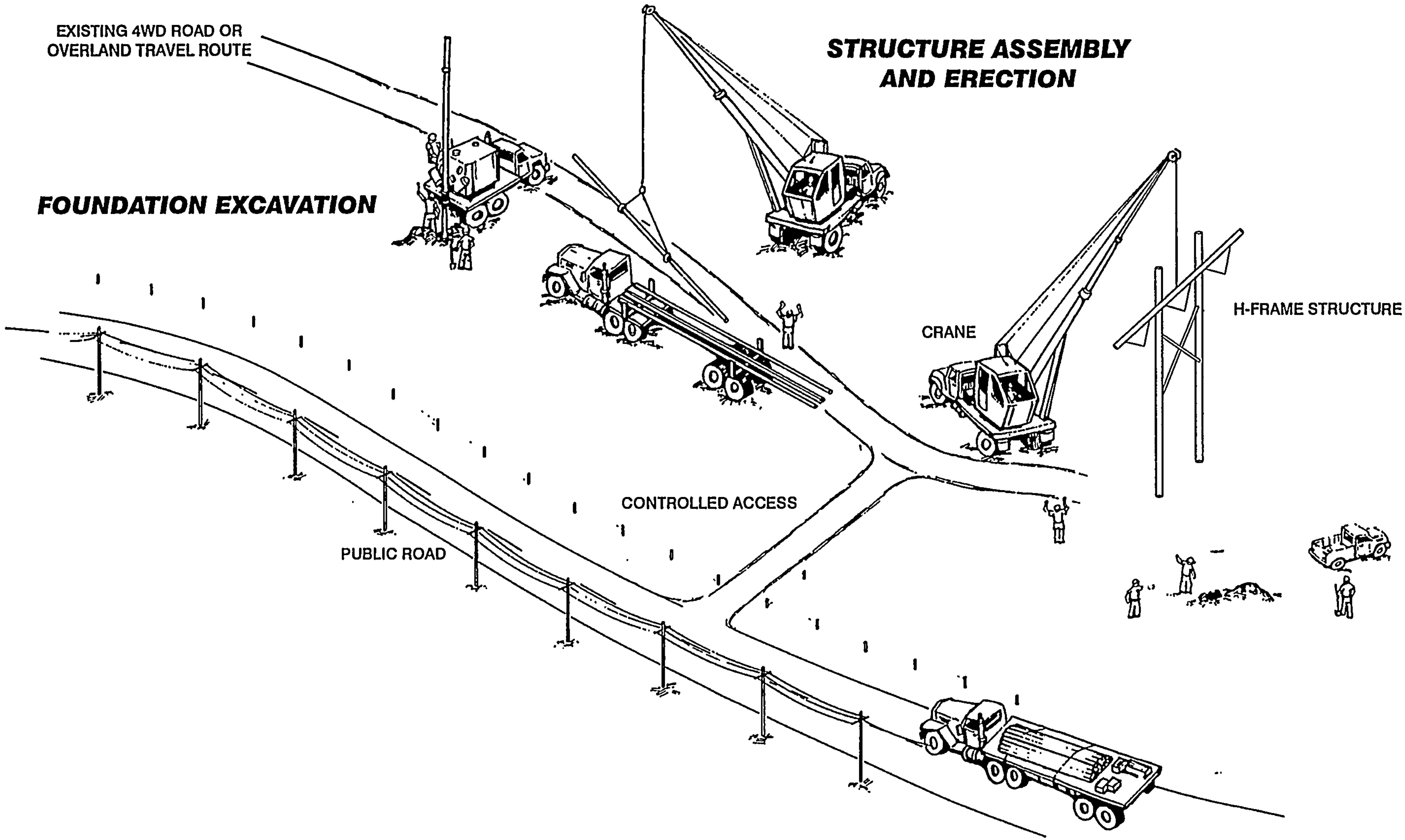
B.2.3.2 Transmission Line Construction

Construction of the proposed 345 kv, 165-mile long transmission line would include the permanent installation of an estimated 730 structures to be spaced approximately every 1,200 feet on average (800 feet apart on single-pole section); the 230 kV segment would include wood H-frame structures approximately 80-85 feet high, spaced about every 700 feet, from the existing BPA 230 kV line to the Alturas Substation. In addition, about 100 temporary sites would be designated about every 9000 feet for wire setup; the wire setup sites would be located within the 160-foot project ROW. Approximately 18,000 square feet of land, on average, would be disturbed at each structure setup site and 7,500 square feet at each wire setup site. Table B-3 summarizes the expected area of disturbance for the various project components (structures, substation, wire setup sites, etc). Figures B.2-14a and B.2-14b depict typical construction procedures for installation of transmission line structures and wires. At the direction of private property owners and land management agencies, SPPCo would install gates and other obstacles to aid in restricting access to the ROW. The phases involved in the construction of transmission lines are described in the following paragraphs.

Right-of-Way (ROW) Preparation. ROW preparation would involve: (1) the identification of exclusion zones; (2) providing designated access roads and overland travel paths for constructing 730 structures and conductor stringing purposes including the identification of turnaround points, and (3) clearance of vegetation to accommodate necessary travel within the specified areas of the 16-foot ROW and line clearance requirements.

SPPCo would be required to conduct pre-construction surveys (all testing and flagging activities) under the direction and supervision of the Lead Agencies and designated construction monitor(s) before commencing construction. Following the preconstruction surveys, exclusion zones would be established through consultation with the Lead Agencies and their designated environmental monitor(s) who would review and approve each exclusion zone on a case by case basis. Construction and related activities would be prohibited within the exclusion zones and restricted to specified areas only. Environmental monitor(s) would be present during all phases of project construction to ensure that the integrity of the exclusion zones is maintained and that all construction-related activities occur in specified areas. In the event exclusion zones can not be avoided by construction activities, the mitigation measures presented in this EIR/S would be implemented.

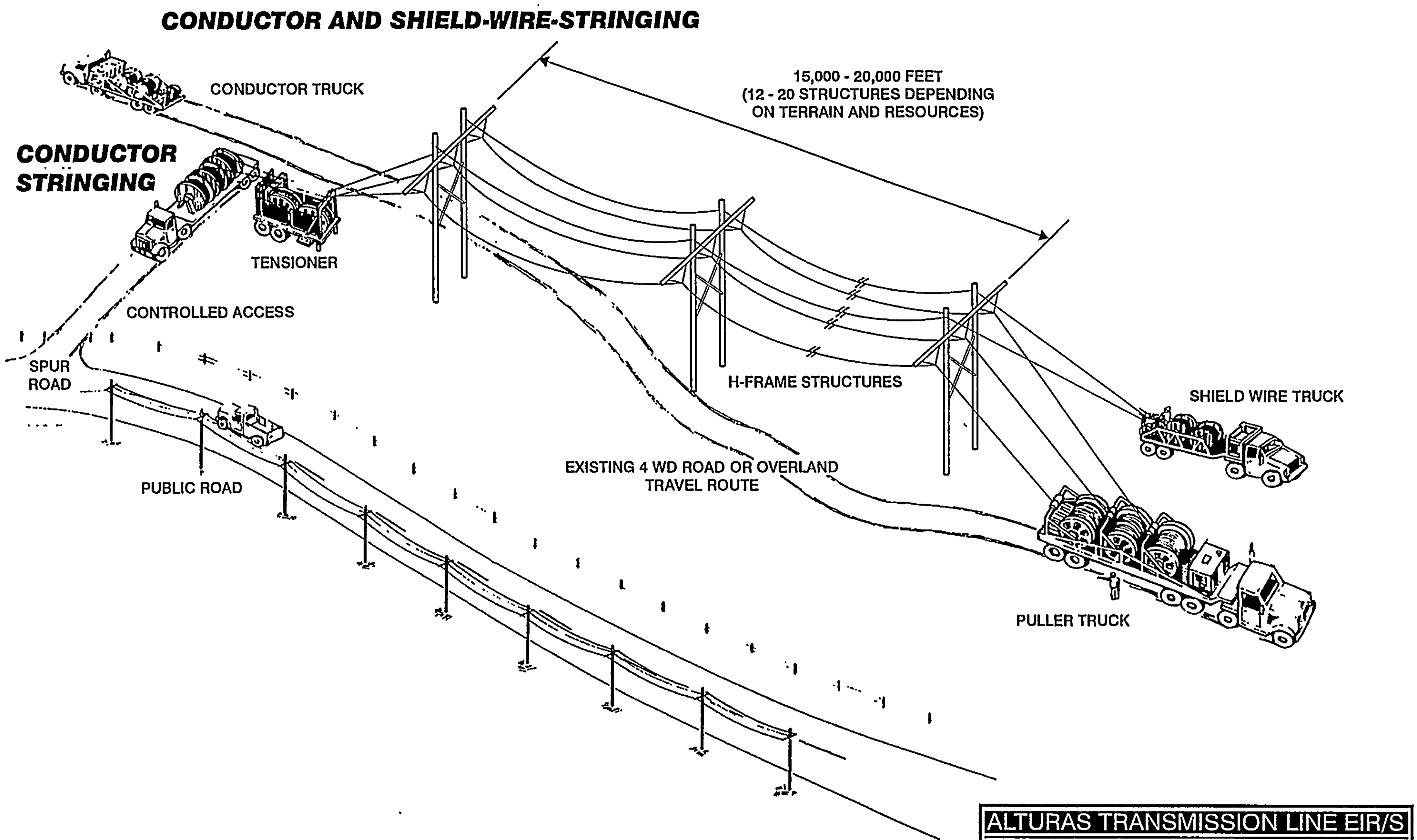
To access and travel within the ROW, SPPCo proposes to utilize existing roads, upgrade existing roads, construct new access roads, and use overland travel. Table B-4 provides a summary of the location of



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-14a

Transmission Line Construction Procedures: Structure Erection



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-14b

Transmission Line Construction Procedures: Wire Stringing

Table B-3 Construction Activities: Estimated Area of Disturbances

Impact	Permanent (acres)	Temporary (acres)	Non-bladed Overland Travel (acres)
Alturas Substation	10.5	7.5	0
Structure setup (730 X 0.41 acre)[a]	0	299.3	0
Structure footings (730 X 0.0013 acre)[b]	0.9	0	0
Wire setup (100 X 0.17 acre)[c]	0	17.2	0
Communication facilities (2 X 0.03 acre)[d]	0.06	0.02	0
Border Town Substation[e]	11.8	0.0	0
Border Town Staging Area	0.0	8.8	0
Permanent New Roads (29,300 ft X 15 ft)[f]	10.1	0	0
Upgrade existing roads (45,100 ft X 5 ft)[g]	0	5.2	0
Intermittent blading (274,900 ft X 15 ft)[h]	0	094.7	0
Non-bladed overland travel access[i]	0	0	113.4
TOTALS	**33.4**	**432.7**	**113.4**

[a] Based on an estimated total of 730 structures requiring an estimated average of 18,000 square feet for setup at each location. The estimated number of each structure type that would be constructed and the associated area of disturbance required for their construction are summarized below:

Structure Type	No. of Structures	Est. Area of Disturbance (ft^2)
Single Pole	10	15,000
3 Pole Guyed	89	22,000
H-Frame 230kV	18	15,000
H-frame, 345 kV	613	17,500
Avg. Est. Area of Disturbance (weighted by no. of structures)		18,000

[b] Based on a maximum pole radius of 1.75 feet plus an estimated 1.25 feet of additional permanent impact around the base of the pole for a total radius of 3 feet (28 square feet) multiplied by two poles.

[c] Based on the estimated footprint or 7500 sq. ft. as described in Part B (Project Description) of the EIR/S.

[d] Based on description of the proposed construction of two communication sites outside of the substation facilities that will occupy approximately 1,200 square feet (0.03 acre) and involve the temporary disturbance of an estimated 400 square feet around the perimeter of these sites as described in Section B.2.2.4 of Project Description (Part B) of the EIR/S.

[e] Based on the total area specified by the Applicant.

[f] Based on the total length of new roads and permanent overland travel routes proposed for construction outside and inside the 660-foot study corridor as described by the Applicant (July 10, 1995). Area of impact is calculated by multiplying the length of the proposed access roads by the average width of the disturbed area (10 foot wide vehicle lane plus 5 additional feet of width for side-cast material) and converted to acres (1 acre/43,560 square feet).

[g] Based on the total length of existing roads proposed for upgrades outside and inside the 660-foot study corridor as described by the Applicant (July 10, 1995). Area of impact is calculated by multiplying the length of the proposed access roads by the average width of the disturbed area (5 additional feet of width for side-cast material) and converted to acres (1 acre/43,560 square feet).

[h] Based on the maximum potential length of intermittent blading proposed to allow overland travel inside the 660-foot study corridor as described by the Applicant (July 10, 1995). Area of impact is calculated by multiplying the length of the proposed access roads by the average width of the disturbed area (10 foot wide vehicle lane plus 5 additional feet of width for side-cast material) and converted to acres (1 acre/43,560 square feet). Actual intermittent blading impacts will be considerably less because it will only be done as necessary.

[i] Based on the summary of all overland travel presented in Table C.3-9.

the new and upgraded access improvements and the base maps at the end of the Volume I illustrate their alignments. New, permanent single-lane access routes would need to be constructed outside of the 660-foot corridor at three locations to a maximum width of 15-feet (see Table B-4). In addition, SPPCo proposes to construct permanent, overland access routes within the 660-foot study corridor at five locations. These permanent, overland routes would be utilized for construction, maintenance, and emergency access. SPPCo expects the frequency of post-construction access to the project ROW to be approximately once or twice a year. Upgrading of existing access routes would include limited grading and widening of existing, four-wheel drive routes to two-track roads (15-foot maximum width). Improvement of new roads along the 230 kV segment would include placement of gravel/rock. As presented in Table B-4, such upgrading would be required at numerous locations along the Proposed Project route. Finally, temporary overland travel routes would be required for construction purposes at several locations.

Permanent and temporary overland travel would occur within the 160-foot ROW and would involve off-road vehicle travel over existing terrain. In some locations intermittent blading of rough areas would be required to allow for a single-lane overland route of 12 to 15 feet wide. Blading will be accomplished using a D-8 bulldozer or equivalent. Surface material, including rocks, would be bladed and side-cast to allow for passage of rubber-tired vehicles. Rocks that cannot be removed with blading equipment would be avoided. Overland travel would occur on specified routes and work areas only and would be prohibited in all other areas (see above discussion). Access ramps and crane landing pads (50 x 100 feet) would need to be bladed and leveled for all transmission structure sites located on hill-sides. The area of disturbance for crane landing pads is included within the average 18,000 square feet of disturbance for structures (see Table B-3). Table B-5 summaries SPPCo's estimated number of hillside crane landing sites by segment. The exact number and location of landings cannot be determined until pre-construction structure spotting occurs and slopes are verified. Crane landings would be permitted only in specified areas and prohibited everywhere else (including exclusion zones). Bridges, culverts, gates and cattle guards would be installed where necessary.

Tree removal and trimming for required line clearance and overland travel would also be conducted. Tree trimming would be conducted to allow for a ten-year growth envelope as illustrated on Figures B.2-15a,b,c. On non-federal lands, tree removal would be done in accordance with the Timber Harvest Plan to be prepared for the Proposed Project under the authority of the California Division of Forestry, Department of Forestry and Fire Protection. The Timber Harvest Plan will be prepared by a California Registered Professional Forester, subject to the review and approval of the Department, after preliminary staking of the route is completed. The plan would specify the areas requiring tree removal versus tree trimming, the number of trees to be lost to removal, and required trimming practices given the varying growth rates of the tree species encountered along the Proposed Project ROW. On federal lands, tree removal would be conducted consistent with BLM and USFS requirements. When the project ROW crosses a fence, SPPCo would install a gate for access. Cattle guards would be installed where livestock access is controlled. A series of interlinking locks would provide access to all authorized users.

Table B-4 Construction Access Route Improvements

Access Route Improvements	Route Segments Requiring Improvements[1]
Construct new access routes outside 660 foot study corridor area.[2]	• Near AØ3, about one mile from the Devils Garden area, south of Mahogany Ridge • One mile north of Angle Point CØ2, about 8 miles north of Alkali Lake and the Infernal Caverns, extends out southwest from Segment C • Between CØ4 and CØ5 segment points, about 1 mile southwest of Delta Lake
Construct permanent, overland access routes within the 660 foot study corridor	• Along 230 kV portion between BPA 230 kV line and Alturas Substation • Railroad crossing between AØ4 and AØ5 • Short sections from CØ1 to CØ2 and CØ4 to CØ6 • One section between C-10 and EØ2 • Short sections between DØ4 and DØ7
Upgrade existing 4WD roadways with limited grading and selective widening.[2]	• Along 230 kV portion between BPA 230 kV line and Alturas Substation • About .4 miles north of Segment A, near Angle Point AØ3, southwest of Rattlesnake Creek • About 3.5 miles southwest of Modoc National Wildlife Refuge, along Segment C, between AØ6 and CØ1 • Extends out westward from segment point CØ3, about 5 miles north of Alkali Lake an Infernal Caverns • Near and along Segment C, from north of C-6 to north of C-7, southeast of Delta Lake at Modoc County/Lassen County border • Generally, follows segment alignment from north of Dø1 to Dø4 • Along Segment J, between J-7 and JNO7, directly north of Snowstorm Mountain, northeast of Horse Lake • Along Segment L between points J-8 and L-1, north of Snowstorm Mountain, west of Secret Creek • Along Segment L around Angle Point LØ1, directly north of Snowstorm Mountain and on the western side of Secret Creek • Between E-1 and E-2, running southeast of centerline to Highway 395 north of Madeline • Between L-7 and L-8 and between L-8 and N-2, east of Shaffer Mountain • Along Segment J, between J-4 and J-6, south of Termo • Along Segment P, between P-1 and P-5, northeast of Doyle • Along Segment X, near X-7 and between X-7 and X-8, near Anderson Siding
Intermittent blading of rough areas within 660-foot corridor for temporary overland travel routes.[2]	• Extensively on the plateau west of the Likely Valley (Angle Points CØ1 to CØ6) • North and west of the Madeline Plains (C-8 to about E-2 or D-7, and D-8 to G-1) • South of the Madeline Plains (J-4 to near L-5, including the southern portion of K-6 to J-8) • South of Secret Valley (just south of L-7 to L-8, and on the N Segment to M-3) • Along Segment LN (east Secret Valley), between L-1 and LN-3, between LN-5 and LN-6, and between LN-7 and N-2 • West of the Fort Sage Mountains (P-2 to P-5) • Portions of the route east of the Fort Sage Mountains (Q-1 to Q-2, Q-4 to P-9) • West of the Petersens (P-9 to T-2, near S-1 and S-2, route options near W-2) • Scattered locations in the Long Valley area (W-3 to X-1) • A small area on the north flank of Peavine Peak • Much of Segments X-7 to X-9 and Segment Y
Tree removal for line per clearing pattern or overland travel.	• Along Segment A, from A-1 to A-3, near Devils Garden, south of Mahogany Ridge and Big Sage Reservoir • On Segment A, south of A-3, near Devils Garden, south of Mahogany Ridge • Along Segment C, from angle ZØ6 to CØ2, and various locations from C-4 to E-2 • Various locations between C-10 and DØ1, DØ2 and DØ7, DØ7 and GØ1, and DØ8 to FØ1 • Along Segment E from C-10 to Ash Valley Road, west of the town of Madeline • Various locations between JØ7 and LØ2 along the J and L Segments • Along Segment L, at various locations between LØ2 and LØ4 • Along the LN Segment (east Secret Valley) at various locations between highway 395 and LNØ2 • Along Segment Q, south of QØ4 to 1.5 miles south of QØ5 • Along Segment Q, between QØ5 and PØ9 directly north of Seven Lakes Mountain, and south of Long Valley • From TØ2 to WNØ1, east of Long Valley

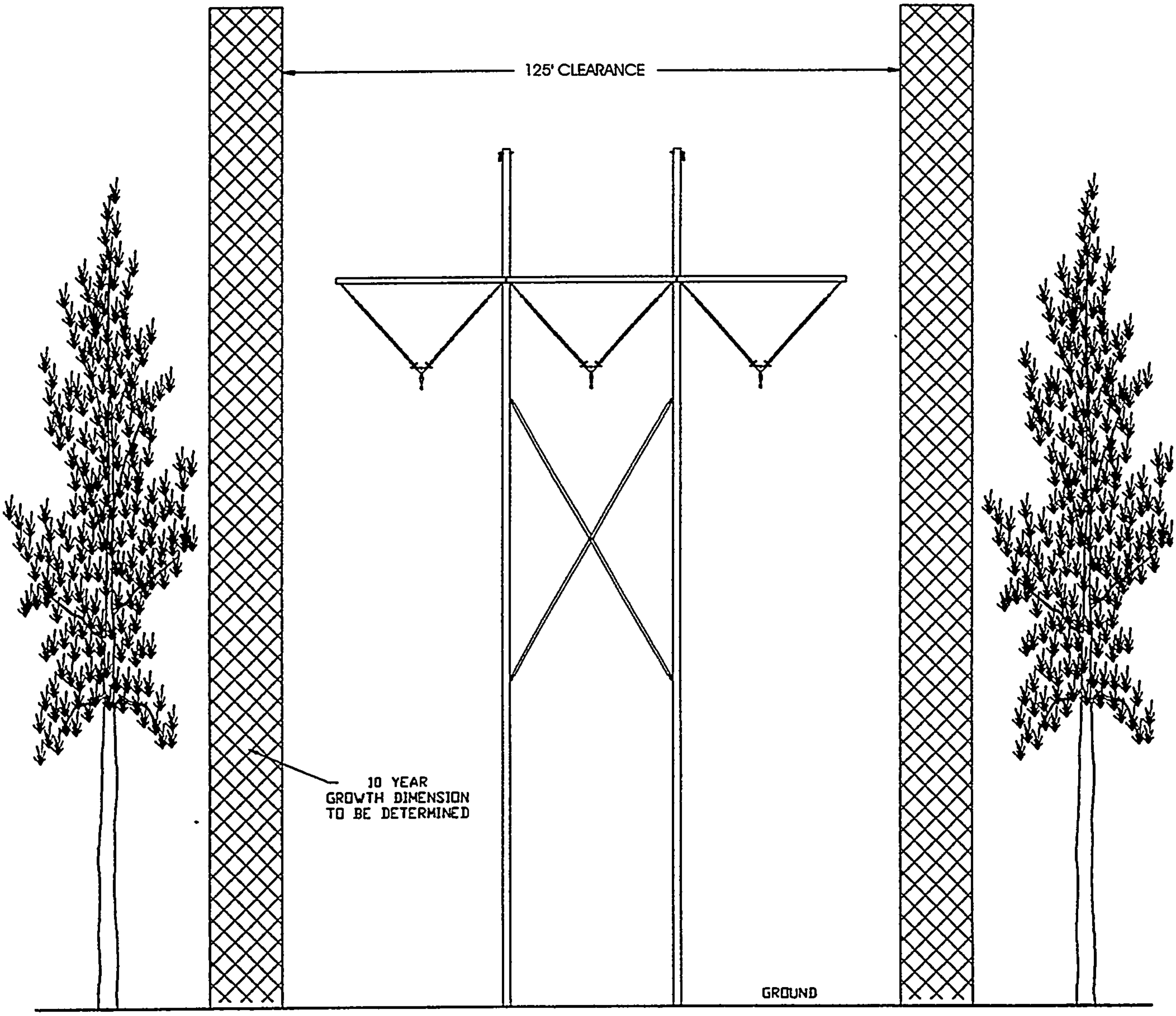
1. Refer to detailed project base maps at the end of Volume I.
2. 15-foot maximum width.

Table B-5 Alturas 345 kV Estimated Number of Hillside Crane Landings[1]

SEGMENT	# PADS
AØ1 - HSØ1	2
HSØ2 - ANPØ2	2
ANPØ2 - AØ3	2
AØ3 - AØ4	3
AØ4 - AØ5	2
AØ5 - AØ6	8
BØ2- BØ3	2
BØØ - BØ4	1
BØ7 - BØ8	7
AØ6 - CØ1	10
CØ1 - CØ2	11
CØ2 - CØ3	4
CØ3 - CØ4	2
CØ4 - CØ5	10
CØ5 - CØ6	9
CØ6 - CØ7	7
CØ7 - CØ8	7
CØ8 - CØ9	5
CØ9 - C10	3
C10 - EØ1	4
EØ1- EØ2	9
EØ2- ENØ1	5
DØ0 - DØ1	15
DØ1 - DØ2	2
DØ2 - DØ3	6
DØ3 - DØ4	12
DØ4 - DØ5	2
DØ5 - DØ7	4
DØ7 - DØ8	3
DØ8 - GØ1	4
EØ6 - EØ7	5
EØ7 - EØ8	1
JØ3 - JØ4	2
JØ4 - JØ5	8
JØ5 - JØ6	14
JØ6 - JØ7	10
JØ7 - JNØ7	4
JNØ7 - JNØ8	7
LØ0 - LØ1	7
LØ1 - LØ2	1
LØ2 - LØ3	7
LØ3 - LØ4	6
LØ4 - LØ5	5
LNØ9 - LØ8	10
LØ1 - LNØ1	8
LNØ1 - LNØ2	14
LNØ2 - LNØ3	12
LNØ3 - LNØ4	1
LNØ5 - LNØ6	5
LNØ7 - LNØ8	8

SEGMENT	#PADS
LNØ8 - NØ2	10
LØ8 - MØ1	2
MØ1 - MØ2	3
MØ2 - MØ3	2
NØ1 - NØ2	3
NØ2 - NØ3	7
OØ5 - PØ1	2
PØ1 - PØ2	6
PØ2 - PØ3	9
PØ3 - PØ4	7
PØ4 - PØ5	8
PØ5 - PØ6	4
PØ8 - PØ9	1
QØ1 - QØ2	12
QØ2 - QØ3	3
QØ3 - QØ4	2
QØ4 - QØ5	15
QØ5 - PØ9	18
PØ9 - RØ1	1
RØ1 - RØ2	3
RØ2 - SØ1	3
SØ1 - SØ2	9
SØ2 - SNØ1	2
SNØ1 - WNØ1	5
RØ2 - TØ1	4
TØ1 - TØ2	12
WNØ1 - WØ1	2
WØ1 - WNØ2	9
WNØ2 - WNØ3	4
WNØ3 - WNØ4	7
WØ1 - WØ2	10
WØ2 - WNØ4	7
WNØ4 - WNØ5	7
WNØ5 - WNØ6	4
WNØ6 - WNØ7	5
WNØ7 - WNØ8	1
XØ1 - XØ2	3
XØ2 - XØ3	5
XØ3 - XØ4	3
XØ4 - XØ5	2
XØ5 - XØ6	2
XØ6 - XØ7	7
XØ7 - XØ8	17
XØ8 - XØ9	3
XØ9 - X10	3
X10 - X11	4
X11 - X12	6
X12 - X13	1
XØ9 - YØ1	9
YØ1 - X12	1

[1] Exact number and location of landings cannot be determined until structure spotting takes place (pre-construction flagging). Crane landing estimates based on an approximate 4:1 slope (horizontal : vertical).

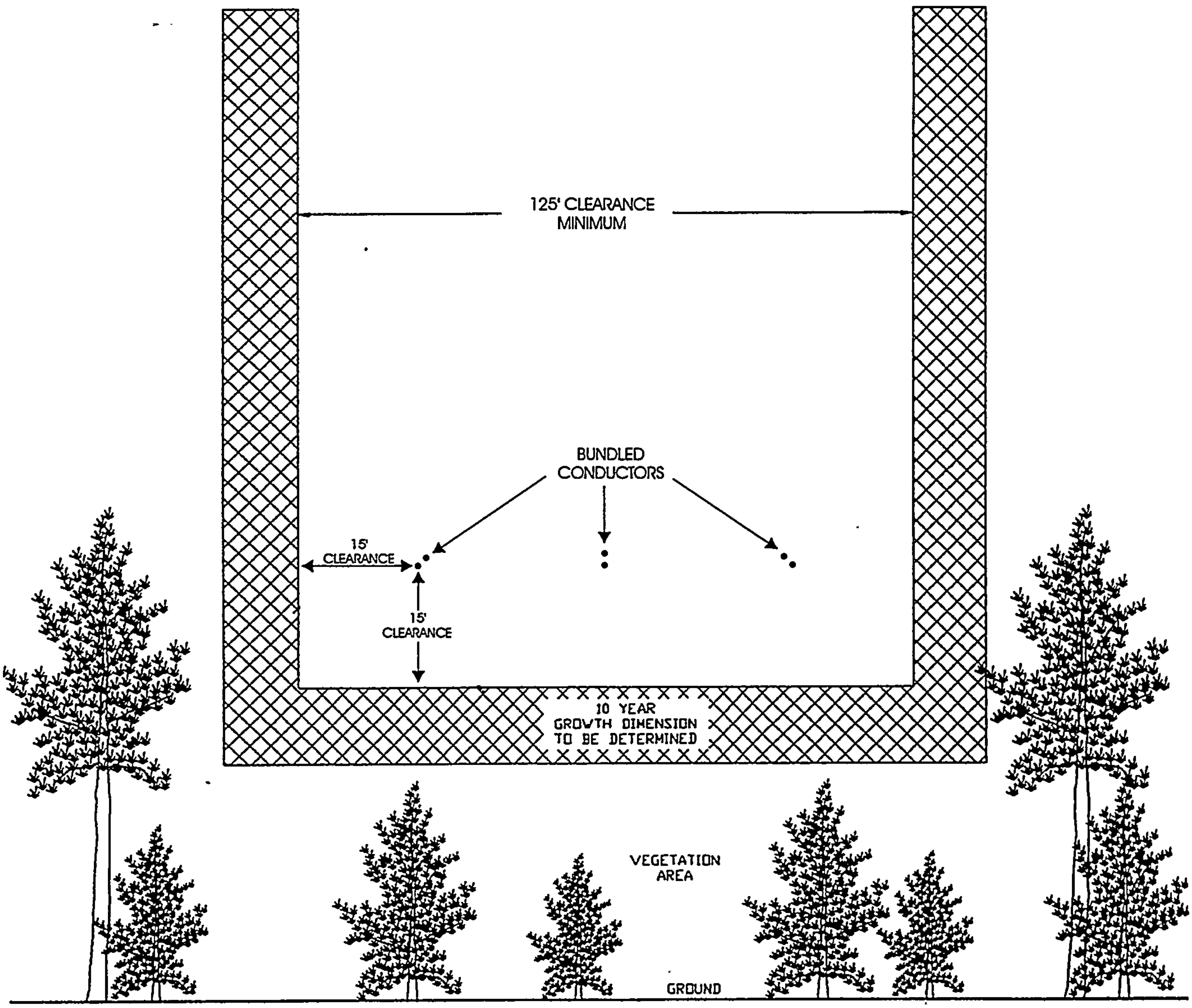


ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-15a

Tree Trimming Clearance at H-Frame Structure

Source: SPPCo

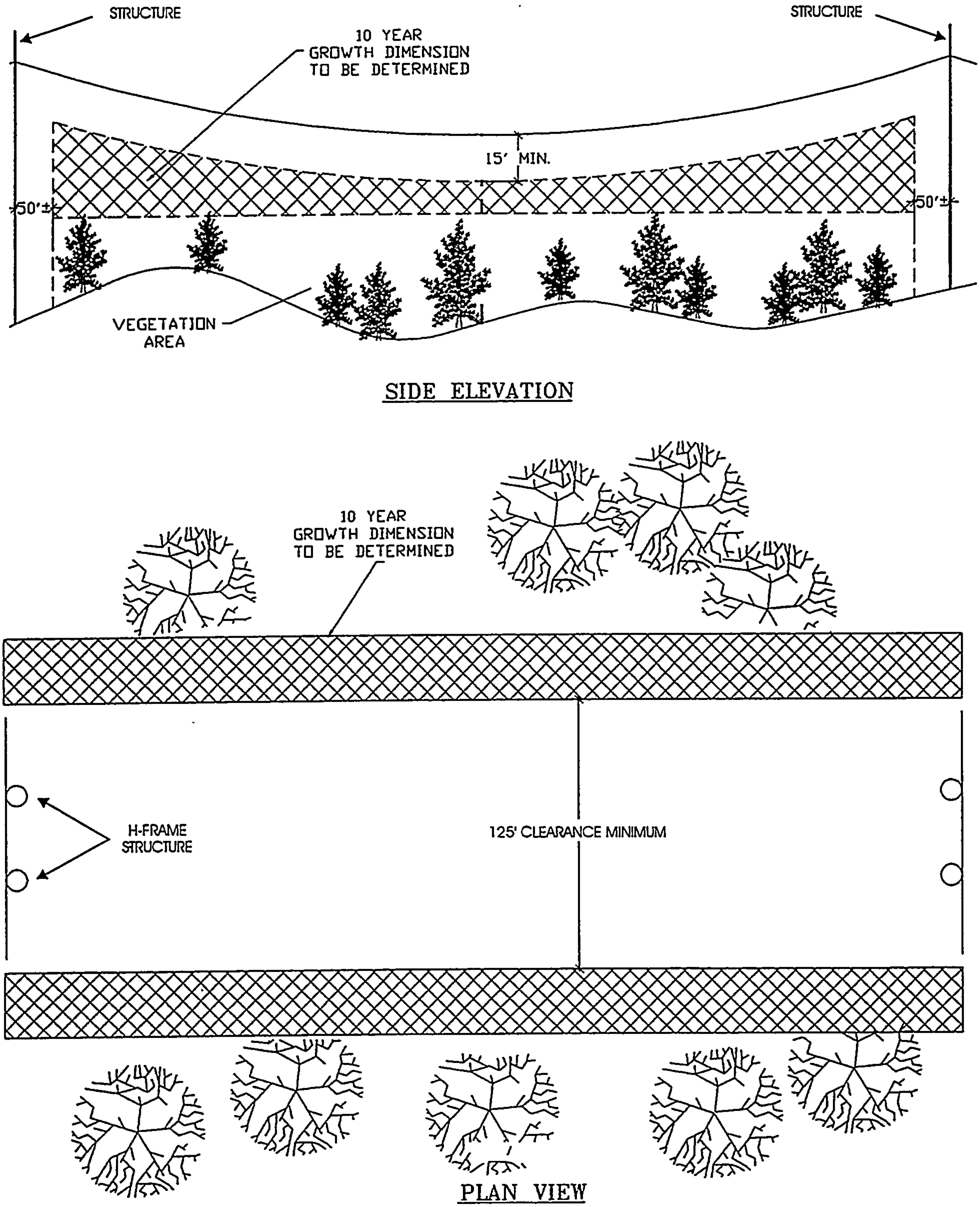


Source: SPPCo

ALTURAS TRANSMISSION LINE EIR/S

Figure B.15-b

Tree Trimming Clearance at Conductor Midspan



Source: SPPCo

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-15c

Tree Trimming Clearance Side Elevation and Plan View

Structure Foundation Excavation. Two excavations approximately 2 to 8 feet in diameter and 10 to 25 feet in depth would be required for each H-frame tangent structure. One excavation ranging from 6 to 12 feet in diameter and 10 to 30 feet in depth would be required for each single-pole structure. Three excavations approximately 2 to 8 feet in diameter and 10 to 25 feet in depth would be required for the angle structures. Smaller diameter excavations would be required for the 6 to 12 anchors for attachment of the guys on the 3-pole angle structures. Excavations for direct-embedment of the tubular steel poles would be augured when possible. If auger excavation becomes difficult due to subsurface conditions or terrain, a track-type backhoe would be used. Blasting would only be used in areas where conventional excavation techniques are not effective. Blasting is anticipated in lava flow areas which are not sufficiently fractured to excavate conventionally. All blasting would be performed by licensed demolition personnel. The area of disturbance for structure excavations and erection, and construction vehicle movement is estimated by SPPCo to be approximately 18,000 square feet, on average, per structure (see Table B-3). As proposed by SPPCo, no structures would be located within river, stream, or creek beds.

Structure Assembly. The preparation of sub-assemblies and the storage of structure components would occur at the staging areas discussed in Section B.2.3.5. After material crews deliver the structure components and sub-assemblies to the structure sites within the ROW, assembly crews would assemble the structures into complete units and ready them for erection. Assembly crews would follow the delivery crews and would use a boom truck or small mobile crane to assemble the structure in preparation for erection.

Structure Erection. Erection crews would follow the assembly crews and would set the completed structures in the excavations using a large mobile crane (with a 50-100 ton rating). As previously discussed, landings of 50 feet by 100 feet would be utilized for cranes on hillside locations. Native material would be used as backfill and compacted with air tamps to completely fill the space between the pole and the sides of the excavations. Guys would be installed on the 3-pole angle structures. Each guy installation would result in a disturbed area of roughly 10 feet by 20 feet.

Conductor and Shield Wire Installation. The installation of conductors and shield wires to the erected structures would involve a three step process: (1) Installation of pull ropes (sockline), (2) pulling of conductors and shield wires; and (3) sagging and connection of conductors and shield wires to the structures. This three step process would be performed approximately every 9,000 feet, connecting 6 to 10 structures at a time; terrain constraints and environmental sensitivities would determine the actual number of structures to be strung at a time.

Sockline installation would require the use of a puller truck carrying reels of wire rope (9,000 feet each) and a D-6 bulldozer or cat. The puller truck would be located on a designated work pad at the beginning of the run of structures to be strung. At this location, the five lines of sockline would be connected to the bulldozer/cat. Pulleys would also be located on each structure. The bulldozer/cat would travel from the puller truck to each structure (either side could be accessed) via defined access roads or overland routes; SPPCo may be required to utilize helicopters or manual stringing in areas where steep terrain or sensitive environmental resources make overland travel impossible (including perennial river and stream beds). As discussed in Section C.7, Hydrology, SPPCo expects that they may need to cross the stream located in Crooks Canyon by utilizing a temporary bridge; however, SPPCo states that no other river or stream beds would be crossed with construction equipment. At each structure, the pull ropes would be threaded through the stringing blocks attached to the insulators on each structure.

Once the socklines have been installed, trucks carrying conductor and shield wire and a tensioner truck would be brought on-site. At the terminus of the structures, a tensioner truck would be brought on-site. The sockline would then be connected to one conductor pair and shield wire at a time. The sockline would then be pulled in with the tensioner keeping the wire under enough tension to keep it above the ground to avoid any damage from dragging.

After the conductors and shield wires have been strung, they are sagged to the proper tension and secured to temporary anchors. The wires are then removed from the stringing blocks and permanently attached to the structure insulators using a clipping crew.

Right-of-Way Cleanup. Cleanup crews would follow the clipping crews removing all surplus material, equipment, packing crates and other construction debris daily. Littering will not tolerated. SPPCo proposes that tree trimmings and removed vegetation would be shredded and spread within the ROW at a depth no greater than three inches. All debris cleaned from the ROW will be disposed of in conformance with permit conditions, regulatory requirements, and the restoration plan. Disposal of removed trees on non-federal and federal lands would be conducted in accordance with the Timber Harvest Plan and BLM/USFS requirements, respectively. Rocks excavated during access and site preparation would also be distributed within the ROW; on BLM lands, the agency has the option of requiring that rocks be buried or removed from the site.

Site Restoration. SPPCo crews would restore all access roads and overland travel paths, not required for future maintenance activities. In addition, other disturbed areas (structure erection sites, including crane landings, pulling sites and staging areas) would also be restored. Native seed mixtures and live plant material would be planted in order to revegetate areas disturbed during construction. Section C.3, Biological Resources and Appendix E.3, Community and Habitat Restoration Plan Objectives and Guidelines, present general guidelines for the revegetation of the major plant communities affected by the Proposed Project. The plant communities addressed include big sagebrush, juniper woodland, woodland, silver sagebrush, and low sagebrush. A Community and Habitat Restoration Plan would also be required to address detailed mitigation planning for affected special status plant species, natural plant communities, and wetlands (see Section C.3 and Appendix E.3). Reclamation and revegetation will be completed according to the requirements of the permit conditions, regulatory requirements, and restoration plan. Site adapted native plant material and locally-collected seeds from native plant materials would be utilized as required by permitting agencies. Mulches and fertilizers would also be applied as specified in the Soil Conservation and Erosion Control Plan. Site restoration efforts are expected to begin as line construction is completed (June through November, 1996), with any necessary follow-up to be conducted during the fourth quarter of 1997.

B.2.3.3 Substation Construction

Construction of all substations would occur from March, 1996 through mid-December, 1996, not including design and acquisition of materials. In the construction sequence, first, the site is cleared and graded, to assure soil compaction and surface drainage. Excess topsoil and organic debris would be removed to an offsite landfill or reserved for use along the ROW and spread similarly to chipped woody debris (maximum three inch depth). Fencing is installed around the perimeter of the substation to provide security for substation equipment, and to keep unauthorized personnel and wildlife at a safe distance from the high voltage equipment when the substation is eventually energized.

Reinforced concrete footings and slabs would be constructed to support structures, equipment, and the control building. Buried conduit would be installed throughout the substation, to be used for electrical control cables. After trenches are dug, conduit would be placed on a bed of sand, covered with sand, and then soil would be back-filled to match the adjacent grade.

A ground mat would then be constructed inside the substation fence, to assure that all equipment and structures are properly grounded. A computer would be used to design the spacing for a grid of conductors to be buried approximately 12" below the substation soil grade. Trenches would be dug in both directions across the station and copper conductors installed in the trenches, creating a mat across the entire substation. The conductors would be thermally welded at intersections, and conductor tails brought up next to the equipment and structure footings for use in grounding equipment and structures. Then soil would be back-filled to match the existing grade.

Gravel would be installed over the substation pad to a depth of approximately 3 inches. The angular, 100% crushed gravel would be screened to be no larger than 1-1/2 inches in size. Gravel is essential for providing electrical isolation for maintenance and operations workers in the station. The gravel would also prevent equipment and vehicles from getting stuck in mud during inclement weather and inhibit weed growth.

The control building would then be erected on a concrete slab. SPPCo normally uses a pre-fabricated steel building, which permits easy erection and provides for later expansion. Equipment installed inside the control building would consist of relay and control panels, AC and DC load centers to provide power to all loads and equipment inside and outside the control building, a battery bank to permit transmission line switching equipment to operate during loss of AC, a heating/cooling system to prevent protective and control equipment temperature failure, communications equipment to allow remote control and monitoring of essential equipment, and other protection and control equipment.

Next, structures would be erected to support switches, electrical conductors, instrument transformers, lightning arresters, and other electrical equipment, as well as to terminate incoming and outgoing transmission lines. Structures would be fabricated from welded tubular steel and painted a color to blend with the surrounding terrain, such as desert tan or sky gray. Structures would be grounded by thermally welding one or more ground grid tails to each structure.

Electricians would then set all equipment on slabs and footings, and either bolt or weld the equipment securely to meet seismic requirements. Equipment to be installed includes a phase angle regulating transformer, voltage transformer, shunt reactors (inductors), 230 or 345 kV circuit breakers, high voltage air switches, high voltage current and voltage instrument transformers used for relaying or metering, electrical conductors, and buswork.

As mentioned above, panels consisting of protective relays and controls would be installed in the control building. Control cables would be pulled from the panel boards in the control building, through underground conduits, to circuit breakers, transformer and shunt reactor auxiliary loads, and other station equipment.

When all substation and protective and control equipment was installed, and all controls adjusted to the specified settings, systems would be extensively tested. Following testing, switches and circuit breakers would be closed, energizing substation equipment and the transmission line.

After completion of construction, SPPCo proposes to landscape the perimeter of the Border Town Substation. Existing vegetation adjacent to the County road near the Alturas Substation would be preserved for visual screening.

B.2.3.4 Construction Employment

Construction employment on the Proposed Project would include skilled or semi-skilled positions, including line workers, welders, heavy equipment operators, surveyors, engineers, utility equipment workers, truck drivers, warehouse workers, clerical workers and laborers. Table B-6 presents anticipated construction employment totals based on a 16-month construction schedule. The figures provided in Table B-6 do not include any employment that would result from support services such as food, lodging and vehicle maintenance. Figure B.2-13 illustrates the distribution of this labor force over the 9-month construction period.

SPPCo expects that specialized labor (lineman, substation equipment technicians, etc.) would not be hired from the local communities. However, local labor would be used for support activities (material hauling, site grading, etc.) and services (food, lodging, etc.), to every extent possible.

Table B-6 Construction Employment Totals

Project Component	Minimum Quantity of People Required During Task	Maximum Quantity of People Required During Task
Transmission Line & Substation Survey	9	18
345 KV Transmission Line Construction	6	67
230 KV Transmission Line Construction	10	15
Substation site work & Grading (at each sub-site)	6 (18 total)	15 (45 total)
Substation Construction (at each sub-site)	5 (15 total)	15 (45 total)
Engineering Support	3	6
Construction Inspection	6	15
Geotechnical Testing	10	20
Pre-construction resource verification	5	10
Construction compliance monitors	4	12
Right of way (liaison with private property owners)	2	4
Mitigation measures	20	30
Material Transportation (wire, structures, equip., etc.)	30	60
Total	138	287

B.2.3.5 Materials, Equipment, and Staging Areas

SPPCo has identified seven staging areas along the proposed transmission line route. Five of these sites were proposed for use by Tuscarora Pipeline Company for their pipeline construction activities and were included in the Tuscarora Pipeline EIR/S analysis. Figures B.2-2a-d illustrates the locations of the seven staging areas, including: (1) An area west of Alturas near the Alturas Lumber Yard (approximately 50 acres); (2) A location in the Madeline Plains north of Angle Point EØ8 and east of U.S. 395 (APN 043-050-43) (approximately 20 acres); (3) A site east of Ravendale (about 4 acres); (4) A site west of Angle Point M-Ø2 on the Wendel Quad (approximately 16 acres); (5) A site just north of Wendel adjacent to the railway (about 8 acres); (6) A location adjacent to the proposed Border Town Substation site (approximately 8 acres); and (7) Property near SPPCo's material storage yard in Reno at 11 Ohm Place (approximately 10 acres). Sites 1 through 5 are the proposed Tuscarora staging grounds.

Staging areas would be between 4 and 50 acres in size for a total of approximately 100 acres; the designated sites are oversized to allow for some flexibility in siting actual staging area boundaries to avoid sensitive environmental resources. Staging areas may be graded and covered with gravel. These yards would also be used as headquarters for crew and company reporting. Structure components and wire reels would be hauled to the structure locations from storage yards by semi-tractor trailers and unloaded by a mobile crane, or hauled and set by helicopter. Structure sub-assemblies would be prepared at the staging areas.

Table B-7 lists the type and purpose of the major equipment that would be used during construction of the transmission line.

Table B-7 Major Equipment Used During Construction

Equipment	Use
3/4 ton pickup trucks	Transport construction personnel
1 ton crew trucks	Transport construction personnel
2 ton flat bed trucks	Haul materials
Flat bed boom truck	Haul and unload materials
Rigging truck	Haul tools and equipment
Mechanic truck	Service and repair equipment
Shop vans	Store tools
Office van	House the office
D-8 bulldozer	Blade access roads, platforms
D-6 bulldozer	Pull hardline & rangeland drill
Truck mounted digger	Excavate foundations
Crawler backhoe	Excavate foundations
Small mobile cranes (≤12 tons)	Load and unload materials
Large mobile cranes (≥75 tons)	Erect structures
Transport	Haul structure components
Drill cat	Drill holes for blasting
Puller	Pull conductor and wire
Tensioner	Pull conductor and wire
Wire reel trailer	Haul wire
Semi tractor trailers	Haul structure components
Air compressors	Operate air tools
Air tampers	Compact soil around poles
Small helicopter	Pull hardline
Large helicopter	Erect and haul structures
Rangeland drill	Sow seed

B.2.4 PROPOSED PROJECT OPERATION AND MAINTENANCE

This Section includes discussion of the normal operation of the proposed transmission line, as well as procedures for line maintenance.

B.2.4.1 Transmission Line Operation

Once the transmission line is operational, SPPCo's Electric System Control Center would be responsible for its operation. This department would monitor voltage and power flow along the transmission line from a central control center in Reno. Substations would not be manned on a continual basis, but their operation would be monitored from Reno. Figure B.2-6 presents a "One-Line Diagram" illustrating the components of proposed transmission line as it would be at completion of construction.

With the proper maintenance, SPPCo expects that the operational life of the Proposed Project would be indefinite with proper design, quality materials, an aggressive maintenance program, and the dry climate.

B.2.4.2 Maintenance of Project Facilities

Maintenance activities for the transmission line would include patrol of the lines, climbing inspections, pole testing, anchor testing, right-of-way maintenance, construction activities, and repair of transmission lines. SPPCo anticipates using one foreman, five linemen, and one heavy equipment operator for maintenance along the entire transmission system. This team could be assisted by another four-person crew on an as-needed basis.

Since 1987, SPPCo has been a member of the Northwest/Southwest Transmission Reliability Committee (NSTRC), whose Charter includes the description below:

> ...formed to maintain and promote practices and procedures to enhance the reliability of the interconnected transmission system of the western utilities. The aim of this organization is to establish appropriate minimum maintenance and operating standards such that reliability is maintained at reasonable cost.

This group has established "Transmission Line Inspection and Repair Practices, Agreement for 230 kV and Above." The transmission line maintenance procedures developed by SPPCo and the NSTRC are described in Table B-8.

Emergency maintenance would involve prompt movement of repair crews to repair or replace any damaged components. Crews would be instructed to protect crops, plants, wildlife, and other resources of significance, as defined by the various mitigation plans to be prepared for project construction, including the Community and Habitat Restoration Plan and the Soil Conservation and Erosion Control Plan. Restoration procedures following completion of repair work would be similar to those prescribed

Table B-8 Line Maintenance

Maintenance Function	Description
Overall line integrity	Two patrols per year: one ground patrol (vehicle[1] and foot) and one air patrol (helicopter). More frequent patrols if required by storms or system disturbances.
Structures	Climbing inspection; approximately 10% of structures per year. Check for corrosion, misalignment, excavations.
Lines	Climbing inspection on selected lines to inspect structure, hardware, insulator keys, etc. Check conductors and fixtures (including spacers, shoes, dampeners, insulators, splices, jumpers). Check for sag.
Poles	As needed, based on age and problems noted. Check structure poles for integrity of anchor rods, down guys, footings.
Anchors	As needed, depending on age and soil conditions.
Right-of-way maintenance	Continuous, while other inspections are done along the route. Tree-trimming and removal as needed.[2] Check for encroachments (buildings, excavations, wells, fences, flora, flammable material).

1. Ground patrol vehicles would travel on roadways that exist upon completion of the project.
2. Tree trimming to be conducted to allow for a 10-year growth envelope (see Section C.3). Dead trees to be removed that may fall into conductors or structures. To determine tree trimming and removal needs, site reconnaissance of the ROW would be conducted every three to five years.

for normal construction. The comfort and safety of local residents would be provided for by limiting noise, dust, and any danger caused by maintenance vehicle traffic. Routine and emergency maintenance procedures would be provided in the Construction, Operation and Maintenance Plan to be prepared and approved for the project prior to issuance of permits for the project by the Lead Agencies.

SPPCo is not proposing any maintenance of access roads and overland travel routes to be utilized for maintenance activities. If roadways become unusable due to deterioration, SPPCo proposes to make them passable after the proper approvals have been obtained.

B.2.5 POTENTIAL PROJECT ACCIDENT SCENARIOS

The Proposed Project includes both manual and automatic systems that would result in de-energizing of the transmission line if an accident were to occur. SPPCo's Electric System Control Center in Reno, Nevada would have the capability to manually open breakers located at the substations along the transmission line in order to immediately de-energize the line if an accident were detected.

The Proposed Project would include fault-sensing equipment at the substations that would detect a problem in transmission of power along the line. Fault sensors would be activated when they detect a break in power transmission for any reason. When fault-sensors are activated, they would automatically cause a circuit breaker to open (breakers react in a fraction of a second), causing electrical transmission to stop. The breakers would then automatically close, and if the fault is detected again they would reopen and be locked out. The System Control Center would then send a field crew out via truck or helicopter, depending on the fault location, to identify and correct the problem.

Under certain circumstances (e.g., a forest/range fire approaching the transmission line), the System Control Center could manually open the breakers at the substations (North Valley Road and Alturas) of terminals and cause the de-energizing of the line. Table B-9 lists potential transmission line accidents, their causes and effects, and SPPCo's proposed response and prevention mechanisms.

Table B-9 Potential Transmission Line Accidents

Accident Scenario	Cause of Accident	Effect	Response	Prevention
Forest/range fire burns through transmission line ROW	Lightning, human error, ash contaminates insulators and causes arcing	Danger to fire-fighters if water is used; Reduced structural integrity	Breakers open and de-energize line if proximity threatens safety of fire-fighters	N/A
Raptors, vegetation (or other objects) come into contact with energized lines	Transmission line high voltage	Forest/range fire; Reduced structural integrity	Breakers open to cut off power flow; repair crew sent out	Vegetation removal Raptor diverters
Aircraft collision with energized lines	Low visibility of lines or pilot not observing markers	Lines broken; structures could be damaged	Breakers open to cut off power flow; repair crew sent out	Follow FAA marking requirements for aircraft warning
Flooding, heavy rains, landslide or earthquake	Natural causes; improper structure location	Lines broken; Structure damage or collapse	Breakers open to cut off power flow; repair crew sent out	Select structure sites for maximum stability
Severe weather (ice or snow)	Weight of ice on lines and/or structures	Lines broken; Structure damage or collapse	Breakers open to cut off power flow; repair crew sent out	N/A

B.3 PROJECT ALTERNATIVES OVERVIEW AND SCREENING

B.3.1 CEQA/NEPA REQUIREMENTS FOR ALTERNATIVES

One of the most important aspects of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed project. In addition to mandating consideration of the No Project alternative, both CEQA Guidelines (Section 15126(d)) and NEPA Regulations (Section 1502.14) emphasize the selection of a reasonable range of technically feasible alternatives and adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision makers. CEQA Guidelines state that the discussion of alternatives shall focus on alternatives capable of eliminating or reducing significant adverse environmental effects of a proposed project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. However, CEQA Guidelines declare that an EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote or speculative. Finally, NEPA Regulations (Section 1502.14(c)) provide for the inclusion of reasonable alternatives not within the jurisdiction of the lead agency.

B.3.2 ALTERNATIVES SCREENING METHODOLOGY

The alternatives screening process serves two overall purposes: (1) to eliminate alternatives that do not conform to CEQA and NEPA requirements; and (2) to distinguish project alternatives from other EIR/S elements (such as suggested mitigation measures). Many alternatives were proposed during the EIR/S scoping process for consideration in establishing a reasonable range of alternatives. The alternatives screening process consisted of three steps:

Step 1: Clarify the descriptions of the alternatives to allow comparative evaluation

Step 2: Evaluate each alternative using the following criteria:
- Potential for provision of clear environmental advantages over the Proposed Project
- Technical and regulatory feasibility
- Consistency with the project applicant's objectives and public policy objectives

Step 3: Determine suitability of the proposed alternative for full analysis in the EIR/S. If the alternative is unsuitable, eliminate it from further consideration.

Infeasible alternatives and alternatives that clearly offered no potential for overall environmental advantage were removed from further analysis. In the final phase of the screening analysis, the advantages and disadvantages of the remaining alternatives were carefully weighed with respect to potential for overall environmental advantage, technical feasibility, and consistency with project and public objectives. These criteria are discussed in the following sub-sections.

B.3.2.1 Potential to Eliminate Significant Environmental Effects

If an alternative clearly does not provide potential overall environmental advantage as compared to the Proposed Project, it is eliminated from further consideration. At the screening stage, it is not possible to evaluate all of the impacts of the alternatives to the Proposed Project with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

B.3.2.2 Feasibility

For the screening analysis, the technical and regulatory feasibility of potential alternatives was assessed at a general level. Infeasibility was defined more by kind than by degree. The assessment was directed toward reverse reason, that is, was anything about the alternative infeasible on technical or regulatory grounds. According to recent case law (*Citizens of Goleta Valley, et al. v. Board of Supervisors of the County of Santa Barbara, et al.,*) 52 Cal.3d 553, 801 P.2d 1161, 276 Cal. Rptr. 410 (1990)), the Court stated that a feasible alternative "...is one which can be accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors."

B.3.2.3 Consistency with Objectives

The objectives of the Proposed Project are listed and discussed in Section A.6 (Purpose and Need) and summarized as follows:

1. Increase SPPCo system import capacity from 360 to 660 MW:
   - Fulfill existing inadequate transmission service requirements
   - Allow purchases from neighboring utilities
   - Respond to long-term emergencies

2. Improve service reliability to the Reno/Lake Tahoe area
   - Improve reliability from the east
   - Improve voltage control (support during peak periods)

3. Provide direct access to the Pacific Northwest power market

4. Secondary Objectives/Benefits: transmission service, exports benefits, PG&E upgrade deferrals, communication benefits, and future LMUD intertie, provide transmission facilities for North Valley growth.

This screening analysis does not focus on relative economic factors of the alternatives (as long as they are economically feasible) since CEQA Guidelines require considerations of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives or would be more costly."

B.3.3 SUMMARY OF SCREENING RESULTS

Proposed alternatives identified by the Applicant, agencies, and the public are listed below according to the determination made for analysis. Alternatives considered included alternative route alignments and substation sites, alternatives that could replace the Proposed Project as a whole, and the No Project Alternative.

B.3.3.1 Alternative Route Alignments and Substation Sites Analyzed in the EIR/S

An Alternative Route Alignment is defined as a re-alignment of a portion of the proposed Alturas Transmission Line Project route. Such alignments are not complete alternatives to the project as a whole, but rather could replace specific segments of the Proposed Project. Alternative route alignments and substation sites would not affect the ability of the Proposed Project to achieve the desired project objectives. Therefore, these alternatives were considered in context of their ability to reduce the significant environmental impacts of the Proposed Project and their technical and regulatory feasibility.

The following alternative route alignments and substation sites have been chosen for detailed analysis in this EIR/S through the alternative screening process. These alternatives are described in Section B.4 and are illustrated on Figures B.4-1 through B.4-5 in Section B.4. Each alternative route alignment is evaluated within each environmental issue area of Part C of this EIR/S. The alternative route alignments and substation sites eliminated from further consideration are listed in Section B.3.3.3 and described in Section B.3.4.

Alternative Route Alignments (Section B.4.1)

- Alturas Area Alternative Alignment (Segment B)
- Madeline Plains Alternatives (Segments D, F, G, H, I)
- Ravendale Alternative Alignment (Segment J, I)
- East Secret Valley Alignment (Segment ESVA)
- Wendel Alternative Alignment (Segment M)
- West Side of Fort Sage Mountains Alignment (Segment P)
- Long Valley Alignments (Segments S, U, Z, and WCFG)
- Peavine Peak Alternative Alignment (Segment X-East).

Substation Alternatives (Section B.4.2)

- Alturas Substation Alternative (Mill Site)
- Border Town Substation Alternative (SPPCo Site).

B.3.3.2 Project Alternatives Analyzed in the EIR/S

Numerous project alternatives were evaluated in the screening process that could replace the Proposed Project as a whole. Project alternatives considered included Transmission Alternatives, Generation Alternatives, System Enhancement Alternatives, and Alternative Transmission Technologies. In addition, as required by CEQA, the No Project Alternative was evaluated. The alternatives that could replace the Proposed Project as a whole were assessed for their ability to reasonably achieve the project objectives, both individually and collectively. Since CEQA Guidelines require the consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives," for an alternative to reasonably achieve a project objective, 100 percent satisfaction was not required. Several of these project alternatives would involve partial use of existing facilities.

As discussed in Sections B.3.4.3 through B.3.4.6, Transmission Alternatives were the only type of project alternatives that could reasonably satisfy at least one project objective. Those Transmission Alternatives that could reasonably satisfy at least one of the three primary project objectives were evaluated individually and collectively for their potential to provide clear environmental advantages over the Proposed Project (see Section B.3.4.6.2). The No Project Alternative is described in Section B.4.3 and is evaluated within each environmental issue area of Part C of this EIR/S. Project alternatives eliminated from further consideration are listed in Section B.3.3.3 and described in Section B.3.4.

B.3.3.3 Alternatives Eliminated from Full Consideration in the EIR/S

The alternatives listed below were eliminated from full consideration in the EIR/S; they are described and the reasons for their elimination are presented in Section B.3.4.

Alternative Route Alignments (Section B.3.4.1)

- USFS Alturas Alignment
- Alturas Ridge Routes
- Knoch Re-Alignment and Barager Variation
- Eastern Madeline Plains Alternative Alignment
- Western Madeline Plains Alternative Alignment
- Leonard Re-Alignment
- McCourt West Secret Valley Re-Alignment
- Re-Alignment East of Ravendale
- Re-Alignment North of Honey Lake
- Sierra Army Depot Alternative Alignment
- Herman Re-Alignment
- East Side of Petersen Mountain Range Routes
- Route Segment V
- Tuscarora Gas Pipeline Alignment.

Substation Alternatives (Section B.3.4.2)

- Alternative Border Town Substation Sites
- Expansion of North Valley Road Substation
- Termination of Project on East Side of System.

Generation Alternatives (Section B.3.4.3)

- Piñon Pine Power Plant
- Fort Churchill Combustion Turbine
- Wind Technology
- Solar Technology
- Geothermal Energy.

System Enhancement Alternatives (Section B.3.4.4)

- Demand Side Measures
- Static Var Compensator
- Capacitor Banks.

Alternative Transmission Technologies (Section B.3.4.5)

- Lower/Higher Voltages
- Direct Current Transmission
- Underground Construction
- Other Transmission Technologies.

Transmission Alternatives (Section B.3.4.6)

Transmission Alternatives That Do Not Satisfy Project Objectives

- Enhancement of 230 kV Utah Intertie Alternatives
- Intertie Alternatives to Nevada Power Company.

Transmission Alternatives That Satisfy Project Objectives

- Los Angeles Department of Water and Power (LADWP) Corridor Alternatives
  - Nevada Route Alternative
  - Summer Lake-Valley Road Alternative
- Midpoint-Valmy Alternatives
- Burns-Oreana Alternative
- Pacific DC Intertie Tap Alternative
- Frenchman Tap Alternative
- Tracy-Silver Lake Alternatives.

B.3.4 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

As discussed in Section B.3, alternatives were assessed for their ability to reasonably achieve the project objectives and reduce the significant environmental impacts of the Proposed Project. Also, their technical and regulatory feasibility was evaluated. Based on these screening criteria, the following alternatives were eliminated from further consideration.

B.3.4.1 Alternative Route Alignments

This section discusses the alternative route alignments eliminated from further consideration. Alternative route alignments are presented from north to south.

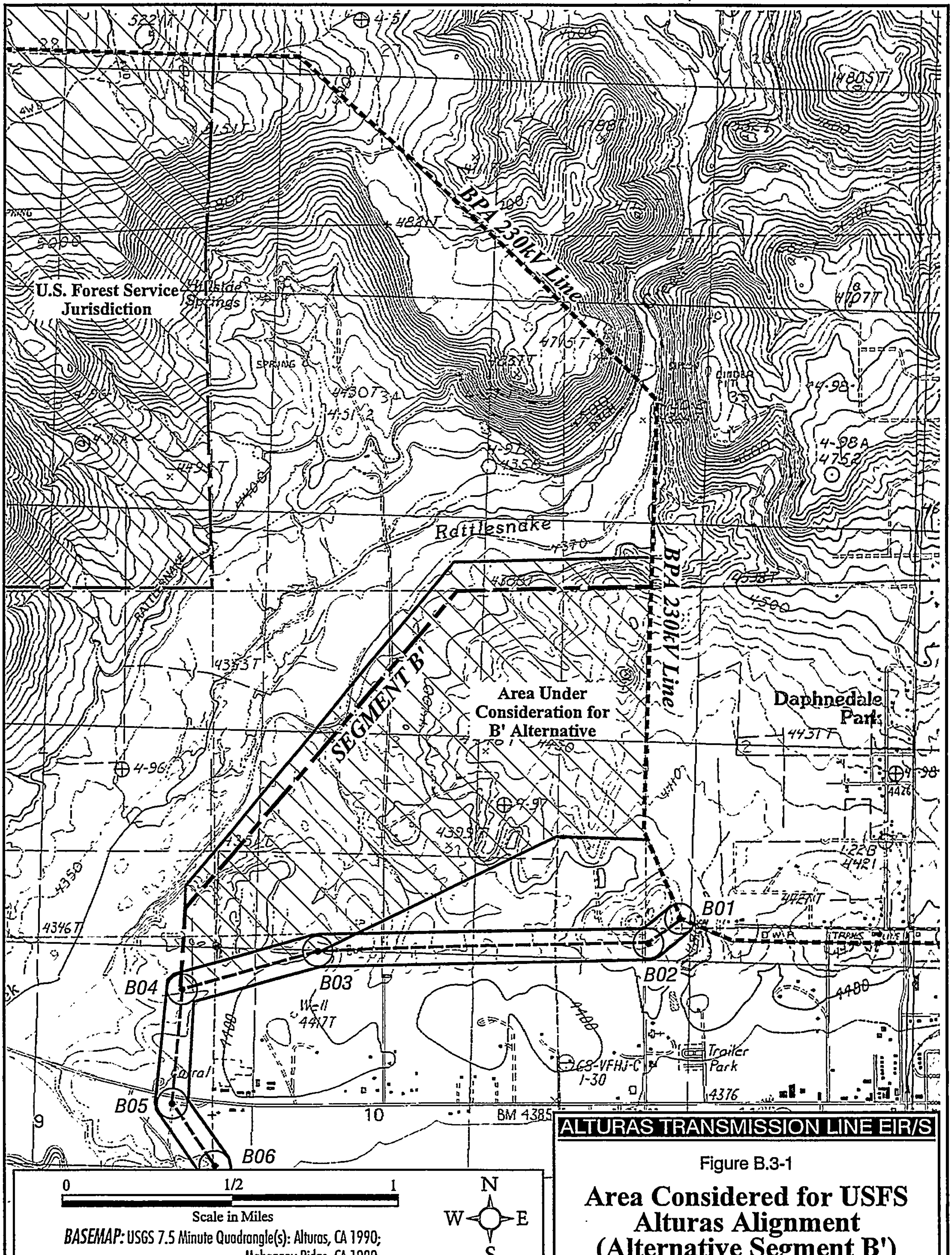
USFS Alturas Alignment

Description. The USFS (USFS, Modoc National Forest, February 10, 1995) recommended evaluation of a route that would replace Segment A of the Proposed Project. The USFS Alturas Alignment (represented as Segment B') would originate on private lands at a BPA line tap point east of the USFS and between the Alturas City golf course on the south and the riparian zone of Rattlesnake Creek on the north. This route would proceed to the southwest to join up with the already-defined route of Alternative Segment B (described in Section B.4.1.1), near angle points B03 and B04, as shown schematically on Figure B.3-1. Since the USFS Alturas Alignment would connect to Alternative Segment B, the Alternative Alturas Substation (Mill Site, between angle points B06 and B07 - see Section B.4.2.1) would be utilized under this alternative. A study area for the USFS Alturas Alignment was originally suggested and an environmentally preferable route within the study area was identified.

This alternative route was suggested to avoid placing the line on USFS land, since proposed Segment A does not follow an existing utility corridor. The USFS indicates that the Forest Land Management Plan directs the placement of new utility facilities within or contiguous to existing corridors and encourages the use of private lands for new corridors. The Forest Land Management Plan also states that construction of new corridors will be considered only if technology, safety, national and state practices, engineering, or environmental quality preclude co-existing uses.

The examination of this alternative is based on the following:

- Analyses of Proposed Segment A, Alternative Segment B, the Proposed Alternative Substation (Devils Garden Site), and the alternative Mill Site location for the substation in the Draft EIR/S
- Alternatives comparison analyses between Segments A and B and the alternative substation sites
- The detailed issue-by-issue responses to comment GP.41-7 from our Team's disciplinary specialists
- Examination of aerial photography for the area in question (flown 10-8-94)
- Site reconnaissance and photography on June 29, 1995
- Subsequent informational letters received from Modoc NF (Henderson, 7/10/95, regarding Forest Service policy pertaining to consideration of private lands use and Forest Plan amendment policy) and from Sierra Pacific (Owens, 7/18/95, regarding SPPCo's original selection of Segment A and the Devils Garden substation site as alternative to Segment B and other substation site alternatives)
- Specific comments received from Modoc NF (dated August 16, 1995).



ALTURAS TRANSMISSION LINE EIR/S

Figure B.3-1

Area Considered for USFS Alturas Alignment (Alternative Segment B')

Based on this analysis, this alternative is compared with proposed and alternative routes in the matrix presented as Table B-10.

Rationale for Elimination. This alternative route is similar to Alternative Segment B which is fully analyzed in Part C of this EIR/S. Alternative Segment B avoids USFS land and appears to comply with the objectives of the USFS regarding use of private land; it would achieve the same purpose as the USFS recommended alternative. The environmental impacts of the USFS Alturas Alignment (study area and identified alignment) are presented in Table B-10 and compared to Proposed Segment A and Alternative Segment B. As presented in Table B-10, in comparison with Proposed Segment A, the USFS Alturas Alignment (Segment B') has no environmental issue areas of clear environmental advantage. Other comparison issue area impacts are summarized as follows:

- Segment B', in comparison to Proposed Segment A, has minor advantages in the issue areas of air quality (less construction emissions), biological resources (possible with increasing distance from the Rattlesnake Creek bottomlands), cultural resources (probably fewer sites to avoid/mitigate), and geology/soils/paleontology (fewer structure sites and postulated blasting requirements).

- Segment B', in comparison to Proposed Segment A, has clear disadvantages in the issue areas of land use (substantially greater conflicts with residential and agricultural uses), transportation (adverse impacts on Alturas Municipal Airport), and visual resources (double-circuit 230 kV line with structures every 700-800 feet would conflict with the open Rattlesnake Creek drainage area and the City golf course, would cross Route 299 one mile closer to central Alturas, and the Mill Site substation would be visually prominent from Route 299).

- Segment B', in comparison to Proposed Segment A, has minor disadvantages in the issue areas of energy and utilities (greater number of crossed utility lines), hydrology (due to the greater impacts associated with the Mill Site), noise (more receptors affected), and public health and safety concerns (more nearby residential development).

In comparison with Alternative Segment B, the USFS Alturas Alignment (Segment B') has no environmental issue areas of absolutely clear environmental advantage. Other comparison issue area impacts are summarized as follows:

- Segment B', in comparison to Alternative Segment B, has a probable minor advantages in the issue areas of land use (where there would be substantially reduced immediate effects on nearby residents, which are counterbalanced to some extent by adverse effects on irrigated cropland and pasture and more generalized effects over the wide-open Rattlesnake Creek drainage area on residents and users of the area - see Table B-10); and visual resources (with the immediate foreground effects on more residents north of Route 299 substantially reduced, which would be counterbalanced somewhat by the more generalized effects on the entire Rattlesnake Creek drainage area where the line would be prominent in the middle ground for many residents and users of the area due to the gently sloping topography of the area - less than 100 feet of relief over the major portion of the area considered).

- Segment B', in comparison to Alternative Segment B, has minor advantages in the issue areas of energy and utilities (slightly fewer utilities line crossed), noise (fewer receptors affected), and public health and safety (less nearby residential development, at least over the near term).

- Segment B', in comparison to Alternative Segment B, has similar levels of impact in the issue areas of cultural resources (possibly a minor disadvantage, depending on exact routing) and transportation (no appreciable difference in effects).

Table B-10 Comparison Matrix for USFS Alturas Alignment

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
GENERAL SEGMENT INFORMATION				
General Descriptive Parameters	Connection to BPA on Modoc NF Crosses about 2.5 miles of Modoc NF Substation on BLM land 7.1 miles total segment length	BPA connection SE of golf course Crosses no Modoc NF Mill site (west of Alturas and just south of Route 299) for substation 4.6 miles total segment length	BPA connection somewhere north of golf course (see map) Crosses no Modoc NF Mill site for substation would be preferred; no suitable location north of Hwy 299 4.9 up to approx. 5.5 miles total segment length, depending on BPA connection point and routing	BPA connection approx. 4000 feet north of golf course (see map) Crosses no Modoc NF Mill site for substation would be preferred; no suitable location north of Hwy 299 5.1 miles total segment length
IMPACT ANALYSIS ++: Clear Environmental Advantage - - : Clear Environmental Disadvantage +: Minor Environmental Advantage - : Minor Environmental Disadvantage N: No Discernible Environmental Difference				
Air Quality	Construction emissions greatest due to longest length	(+) Construction emissions would be about 35% lower than for Segment A due to shorter length	[+ vs. A, - vs. B] Construction emissions would be about 20-30% lower than for Segment A due to shorter length, but slightly greater than for Segment B due to slightly greater length	[+ vs. A, - vs. B] Construction emissions would be about 28% lower than for Segment A due to shorter length, but slightly greater than for Segment B (by approx. 12%) due to slightly greater length

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
Biological Resources	Disturbance to 21 acres of juniper woodland, 7 acres of big sagebrush scrub, 0.8 acre of montane meadow, 0.7 acre of volcanic gravels, and 1.6 acres of low sagebrush.	(++) Reduced impacts on juniper woodland (impacts eliminated), big sagebrush scrub (5 acres), montane meadow (.4 acre), volcanic gravels (.2 acre), and low sagebrush (impacts eliminated); reduced raptor predation enhancement potential.	[+ or N vs A, - or - - vs.B] Similar impacts on plant communities as for Segment B; slightly greater raptor predation enhancement potential than for Segment B due to location closer to Rattlesnake Creek drainage bottomlands.	[N or + vs A, - - vs.B] Slightly greater impacts on plant communities than for Segment B due to crossing of undeveloped land at the northeastern and southwestern portions of the segment (1.5 miles); substantially greater raptor predation enhancement potential than for Segment B due to location closer to Rattlesnake Creek drainage bottomlands.
	Potential disturbance to 9 occurrences of 3 special status plant species.	Potential disturbance to one occurrence of a special status plant species.	Probably similar impacts to Segment B because little or no additional natural habitat would be directly disturbed; however, impacts could be greater than for Segment B if the undeveloped central or northeast portions of the area being considered were crossed (see aerial photo).	Slightly greater potential for impacts on special status species than for Segment B due to crossing of natural habitat at the northeastern and southwestern portions of the segment (1.5 miles; see aerial photo).
	Greater potential for impacts on wildlife associated with construction disturbance or indirect impacts of increased access (e.g., Swainson's hawk, prairie falcon, bald eagle, golden eagle, sandhill crane) due to greater length, less developed character, and proximity to prime habitat areas of Pit River and Warm Springs Valley.	Slightly reduced potential for impacts due to shorter line length and avoidance of Devils Garden plateau and rimfaces.	As with Segment B, impacts would probably be lower relative to Segment A, but this alternative, depending on routing relative to Segment B, could place the transmission line closer to open water habitat in the Rattlesnake Creek bottomland area, thereby increasing impacts on waterfowl and on the sandhill cranes (highest collision potentials among these 3 alternatives, with double-circuit 230kV line, 6 double-wire transmission line, passing from the BPA line to the substation) and antelope which use this area.	This alternative, relative to Segment B, would place the transmission line much closer to open water habitat in the Rattlesnake Creek bottomland area (parallel and directly adjacent for about 1.5 miles), thereby increasing impacts on waterfowl and on the sandhill cranes (highest collision potentials among these alternatives, with double-circuit 230kV line, 6 double-wire transmission line, passing from the BPA line to the substation) and antelope which use this area.
Cultural Resources	Potentially significant impacts on 17 + sites.	(+) Potentially significant impacts on 5 sites.	[+ vs. A, - or N vs. B] Not surveyed. Probably similar to Segment B, however, impacts could be greater than for Segment B if the undeveloped central, northeast, or southwest portions of the area being considered were crossed (see aerial photo).	[+ vs. A, - vs. B] Not surveyed. Impacts could be greater than for Segment B due to crossing of the undeveloped northeast and southwest portions of the segment (1.5 miles; see aerial photo).

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
Energy and Utilities	(+) Least potential for impacts; see Segment B.	Potential for disruption of utility service during construction would be higher than for Segment A because of a greater number of crossed overhead electrical lines.	[- vs. A, + or N vs. B] Impacts similar or slightly less than for Segment B, but greater than for Segment A.	[- vs. A, + vs. B] Impacts slightly less than for Segment B, but greater than for Segment A.
Geology/Soils/ Paleontology	Crosses potentially active fault	(+) No active or potentially active faults crossed	[+ vs. A, - vs. B] Crosses potentially active fault	[+ vs. A, - vs. B] Crosses potentially active fault
	May require greater amount of blasting due to portion on basaltic Devils Garden	Less blasting potentially required	Probable similar blasting requirements as for Segment B	Probable similar blasting requirements as for Segment B, but potentially greater depending on characteristics of undeveloped northeast and southwest portions of the segment.
	Potentially greater grading and erosion due to greater length and access requirements	Less grading and potential for erosion	Potentially greater grading and erosion than for Segment B, but less than for Segment A, depending on greater length and access requirements per specific route that could be chosen.	Potentially greater grading and erosion than for Segment B due to greater length and access requirements (but less than for Segment A).
Hydrology	(N) Crosses 2400 feet of Pit River floodplain (one or 2 structures within)	(N) Crosses 1600 feet of Pit River floodplain (one structure within)	[- vs. A and B] Same or similar Pit River crossing conditions as for Segment B	[- vs. A and B] Same or similar Pit River crossing conditions as for Segment B
	Potentially greater grading and potential for erosion and sedimentation impacts due to greater length and access requirements	Less grading and potential for erosion and sedimentation impacts along shorter transmission line route	Potentially greater grading and erosion and sedimentation impacts than for Segment B, but less than for Segment A, depending on greater length and access requirements per specific route that could be chosen - also depends on proximity of route to bottomlands of Rattlesnake Creek	Substantially greater grading and erosion and sedimentation impacts than for Segment B (but only slightly less than for Segment A) due to greater length and access requirements and proximity of route to bottomlands of Rattlesnake Creek
	Substation would result in less impacts due to location on a relatively flat highland plateau (Devils Garden)	Substation would result in greater impacts due to location in lowlands where construction has a greater chance of affecting the important Pit River hydrologic regime.	Same substation impacts as for Segment B	Same substation impacts as for Segment B

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
Land Use	(++) Only 2 residences within 2000 feet (both at approx. 2000 feet from centerline) that would be affected. Minor adverse effects on recreational uses of Modoc NF (bike trail, woodcutting, hunting, wildlife viewing, recreational users of roads above head of Daggert Canyon and in vicinity of Indian Springs Reservoir) Crossing of Modoc NF is expected to require a Forest Plan amendment for permit	Greater impacts associated with degradation of quality of residential uses - more residences at shorter distances - 33 residences (30 between B01 and B04) and a trailer park within 2000 feet. Of the 30 between B01 and B04, 3 are less than 1000 feet away, and about 17 are in the 1000-1500 range. Minor adverse effects on City golf course No Modoc NF requirements (e.g., plan amendment) required for permitting in Alturas area	[- - vs. A, N or + vs. B] Impacts would be less than for Segment B since the line would be farther for most of the residences that would be affected by B (and only 3 or 4 residences before B04, and 6-7 total, would be within 2000 feet); however, the line would be in an open area visible to most of them (mostly in the 2500-5000 foot range) and the line would result in greater impacts to 3 (and possibly 4) residences along or east of Spicer Lane north of Segment B. Minor adverse effects on City golf course - less substantial than for Segment B due to greater average distance (unless northern border is used), but still prominent visually due to the openness of the terrain in the area north and to the west of the golf course. No Modoc NF requirements (e.g., plan amendment) required for permitting in Alturas area	[- - vs. A, N or + vs. B] Impacts would be less than for Segment B since the line would be farther for most of the residences that would be affected by B (and only 2 residences before B04 - at distances of approx. 1700 and 1,800 feet - and 5 total, would be within 2000 feet); an additional previously unaffected residence complex at the end of Spicer Lane would also now be at a distance of approx. 2,400 feet; however, the line would be in an open area visible to many of the residences along Segment B (mostly in the 3000-6000 foot range). The line would result in greater impacts to 3 residences along or east of Spicer Lane north of Segment B. Very minor adverse effects on City golf course - less substantial than for Segment B due to greater average distance (approx. 4,300 feet), but still somewhat prominent visually due to the openness and minimal relief of the terrain in the area north and to the west of the golf course. No Modoc NF requirements (e.g., plan amendment) required for permitting in Alturas area

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
Land Use (continued)	Temporary adverse effects on grazing during project construction. Substation would introduce industrial use to an area of minimal development and minor recreational usage	Reduced effects on grazing as compared with Segment A due to crossing of less grazing land. Substation would be in an industrial area but would intrude on some nearby residential (2 residences within 2000 feet) and commercial (along Route 299 (1200-2000 feet away) uses. Also, see visual resources.	Greater impacts on grazing, as well as impacts on irrigated cropland and pasture (including wheeled irrigation systems) which is the primary land use north of Segment B; parcels are large and use of parcel boundaries is not practical in the area north of Route 299. Substation effects same as for Segment B.	Greater impacts on grazing, as well as impacts on irrigated cropland and pasture (including wheeled irrigation systems) which is the primary land use north of Segment B (1.6 miles of the 3.1 miles crossed north of Angle Point B04); parcels are large and use of parcel boundaries is not practical in the area north of Route 299, except for approx. .6 mile at the northernmost portion of Segment B'. Substation effects same as for Segment B.
Noise	(+) No receptors subject to severe short-term construction noise impacts	10 receptors near Segment B subject to severe short-term construction noise impacts	[- vs. A, + vs. B] 4 receptors probably subject to severe short-term construction noise impacts	[- vs. A, + vs. B] 4 receptors probably subject to severe short-term construction noise impacts
Public Health and Safety	(+) Little potential for significant EMF exposure concerns General safety concerns similar for all alternatives	Segment B has most nearby residences and most likely to attract future nearby residential development General safety concerns similar for all alternatives	[- vs. A, +/N vs. B] Similar long-term impact concerns as for Segment B, but currently less nearby residential development General safety concerns similar for all alternatives	[- vs. A, + vs. B] Similar long-term impact concerns as for Segment B, but currently less nearby residential development General safety concerns similar for all alternatives
Socioeconomics / Public Services	Impacts similar for all alternatives	Impacts similar for all alternatives	Impacts similar for all alternatives	Impacts similar for all alternatives
Transportation/ Traffic	(++) Impacts on Route 299 similar for all alternatives Construction potentially impacts 3 roadways Lesser degree of interference with navigable airspace and associated safety reduction at Alturas Municipal Airport (line 7000 feet from runway).	Impacts on Route 299 similar for all alternatives Construction potentially impacts 5 roadways Greater degree of interference with navigable airspace and associated safety reduction at Alturas Municipal Airport (line 3700 feet from runway).	[- - vs A, N vs B] Impacts on Route 299 similar for all alternatives Construction potentially impacts 4 roadways Impacts with respect to airport same as for Segment B (line 3700 feet from runway).	[- - vs A, N vs B] Impacts on Route 299 similar for all alternatives Construction potentially impacts 4 roadways Impacts with respect to airport same as for Segment B (line 3700 feet from runway).

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
Visual Resources	(++) Line (345kV, 3-pair transmission line, with 1200-foot structure spacing, structures 70-130 feet in height, after substation) would be a prominent foreground feature in the area west of Alturas, particularly between the south edge of Devils Garden and just north of Centerville Road (including a prominent crossing of Route 299), creating moderate to strong visual contrast and moderate landscape change; structure skylining, diminished scenic quality - unavoidable impacts. Portion on Modoc NF would be consistent with USFS VQOs of Partial Retention and Modification. Minor visual impacts of substation (Devils Garden site), provided that construction road clearance does not provide visual access to substation.	Line (230kV, double-circuit, 6 double transmission lines, with 700-800 foot structure spacing, structures approximately 110-130 feet in height, before substation) would be a prominent foreground feature in the area at the northwest edges of Alturas, immediately adjacent to residential areas, and including a crossing of Route 299 about 1 mile closer to the City. After substation 345kV south to just north of Centerville Road, with impacts similar to Segment A, except closer to the urban area. No ridge skylining to the north of Route 299. As viewed from Route 299, Fourth Street, and the various nearby residences, the line's visual prominence, moderate to strong visual contrast, and impairment of scenic views creates unavoidable impacts. The Mill Site substation alternative would result in unavoidable impacts due to visual prominence, moderate visual contrast, and impairment of scenic views for motorists on Route 299 and nearby residents (2 within 2000 feet).	[- - vs. A, N or + vs. B] Impacts would be similar in general to those of Segment B, except that the direct visual prominence of the line to immediately adjacent Alturas residences north of Route 299 would be replaced to some extent by more generalized disruption of views across the wide-open drainage of Rattlesnake Creek, which consists of flat to gently rolling terrain of mostly pasture and irrigated cropland set within the surrounding highlands dominated by juniper woodland; the route, depending on its specific location, would be prominent from the City golf course (to the north and west), Spicer Lane, and the residences along Spicer Lane. The crossing of Route 299 and impacts south from there (including the visually prominent and significant substation) would be the same as or similar to those of Segment B. Mill Site substation impacts same as for Segment B.	[- - vs. A, N or + vs. B] The direct visual prominence of the 230kV, double-circuit line to immediately adjacent Alturas residences north of Route 299 would be reduced substantially for most residences affected by Segment B (the line would still be very prominent to 4 residences north of Route 299). This would be replaced to some extent by more generalized disruption of views across the wide-open drainage of Rattlesnake Creek, which consists of flat to gently rolling terrain of mostly pasture and irrigated cropland set within the surrounding highlands dominated by juniper woodland; the route would be prominent from Spicer Lane and the residences along Spicer Lane. The crossing of Route 299 and impacts south from there (including the visually prominent and significant substation) would be the same as or similar to those of Segment B. Mill Site substation impacts same as for Segment B.

++: Clear environmental advantage. +: Minor environmental advantage. N: No discernible advantage.
- - : Clear environmental disadvantage. - : Minor environmental disadvantage.

- Segment B', in comparison to Alternative Segment B, has clear disadvantages relative to Segment B in the area of biological resources (additional disturbance and increased bird collision potential due to double-circuit lines in the Rattlesnake Creek drainage area, depending on specific location - worse with increasing proximity to the Rattlesnake Creek riparian area).

- Segment B', in comparison to Alternative Segment B, has a minor disadvantage in the issue areas of air quality (greater length) and minor-to-clear disadvantages in geology/soils and hydrology (more ground disturbance, erosion, and sedimentation potential - worse with increasing proximity to Rattlesnake Creek).

In conclusion, based on the analysis summarized above and presented in Table B-10, the USFS Alturas Alignment (represented by Segment B') does not offer the potential for environmental advantage, but rather is inferior to Proposed Segment A from an environmental perspective; it also appears to be (at best) even with or even inferior to Alternative Segment B (which is also judged to be inferior to Segment A). Therefore, the USFS Alturas Alignment as been eliminated from further consideration as an alternative route segment for the Proposed Project.

Alturas Ridge Routes

Description. Several alternative route alignments were suggested by the CDFG to replace proposed route Segment C which is located southwest of Alturas. These alternative alignments would move the route further west into the hills and along the Rocky Prairie area, then south on the west side of Likely Mountain to join the alternative alignment D at the northwest corner of the Madeline Plains (see Figures B.4-2 and B.4-3 in Section B.4). These routes were identified by CDFG to reduce impacts to wildlife and wildlife habitat and to reduce interference with aircraft use related to antelope and deer census activities.

Rationale for Elimination. The primary environmental advantage of these route alignments would be avoidance of lower-lying areas used by waterfowl, other birds, deer and antelope. However, portions of these alternative route segments pass very close to Graven Reservoir, Bayley Reservoir, and Delta Lake and would have the potential to impact birds (e.g., line collisions) using these water bodies. Other biological disadvantages include potentially greater impacts on sensitive plant species because sensitive plants in this area tend to be concentrated in the foothill areas. Also, greater line lengths would result from these alignments that in turn would cause more habitat disturbance from ground clearing and greater energy use. Land use impacts would be greater than for the proposed route due to conflicts with recreational uses at the reservoirs, and visual impacts on greater numbers of people using these areas would probably be more adverse than for the proposed route.

These alternative alignments would result in minor disadvantages in the geology and hydrology issue areas due to steeper terrain and number of stream crossings associated with these routes. Conflicts with USFS plans and policies is another disadvantage because the southern portion of this alternative alignment crosses or is adjacent to USFS lands that are designated as "Partial Retention" by the USFS Visual Quality Objectives (VQO). This designation does not prohibit transmission lines, but the USFS would require a detailed analysis to determine whether or not the project would be compatible with this partial retention area. On balance, these alternative alignments do not offer the potential to reduce overall significant impacts of the Proposed Project. This is due to the fact that they may reduce impacts in a few areas, but increase or create new impacts in other resource or geographic areas.

Knoch Re-Alignment and Barager Variation

Description. A citizen request (by Wauneta Jo Knoch, April 20, 1994) was made to re-route a portion of the proposed route in Modoc County (Segment C, on the ridge southwest of Alturas, between Angle Points CØ1 and CØ3) to the west on the basis of potential impacts to a BLM viewshed and associated impacts to a private residence. Subsequently, Ronald and Nanette Barager suggested consideration of a similar alternative starting at Angle Point AØ6 proceeding slightly to the west of the proposed route (by about 1000 feet) to an angle point about 4000 feet south-southwest of Angle Point CØ1, and from there down to an angle point about 2000 feet south-southwest of Angle Point CØ3, with this latter portion being about 3000 feet west of the proposed route (comment on DEIR/S, dated April 10, 1995, see Comment/ Response to Comment TA.1-1). This Barager variation was proposed to replace physical encroachment and visual impacts on various residences and residential parcels.

Rationale for Elimination. Review of the portion of the proposed route that would be replaced by these alternatives indicates that, for the most part, the transmission line would not be visible or would not create a significant visual impact on the residential properties of concern due to distance generally greater than 2000 ft (and generally well in excess of 3000 feet for the Wildlife Estates properties) and topography. Further, movement of the line to the west would have greater effects on the California Pines area, and would get into areas of more sensitive topography and associated habitat conditions, including being closer to Graves Reservoir. Therefore, there appears to be no environmental advantages for these alignments.

Eastern Madeline Plains Alternative Alignment

Description. This alignment represents relocation of a portion of Proposed Segment E (Angle Points EØ2 to EØ5) to the eastern edge of the Madeline Plains rather than paralleling the Tuscarora Pipeline corridor on the west side of U.S. 395. This route was suggested by CDFG to reduce greater sandhill crane, migratory birds, and sage grouse impacts from line collisions and habitat loss and to avoid conflicts with low-flying antelope census aircraft activities. A specific alignment was not identified by CDFG.

Rationale for Elimination. This alternative alignment would have the potential to reduce bird collisions due to the fact that it would be moved from the central waterfowl habitat area to the edge of the hills and edge of sensitive bird habitat. However, it would have the potential to interfere with bird flights between a small seasonal lake northeast of Madeline and the main valley area or Moon Lake. There would be no environmental benefit to sensitive plant species because the foothills in the region crossed by this alternative route generally maintain more sensitive plant communities. By removing the line from the Tuscarora Pipeline corridor, this alignment may result in greater construction disturbance to habitats, although habitat value at the edge of the plains may be of less value. Finally, this route may pass through or adjacent to the Tule Mountain Wilderness Study area north of Madeline and would conflict with BLM land use policies for Wilderness Study Areas. A more southern route would have the potential to impact the community of Madeline. Therefore, on balance, this route does not appear to offer the potential for overall environmental advantage.

Western Madeline Plains Alternative Alignment

Description. This alignment would generally re-locate the Madeline Plains portion of the proposed route (Segments E and K, between Angle Points DØ8 and FØ3) westward to the western edge of the Madeline Plains. This route was suggested by CDFG to possibly reduce impacts to birds from line collisions and habitat loss and improve antelope census aircraft flight safety conditions.

Rationale for Elimination. This route was considered by SPPCo and dismissed during the project planning process due to potential land use conflicts with farmlands and ranches, including the bisection of cultivated lands. The alignment would provide potential benefits to wildlife but no advantages to botanical resources because sensitive plant species are more concentrated in the foothills in this region. The proposed alternative segment would also add more distance to the transmission line thus creating potentially more habitat disturbance and more area subject to bird collision impacts, although it would be in a potentially less sensitive area for bird habitat. Therefore, on balance, this alternative does not appear to offer the potential for environmental advantages.

Leonard Re-Alignment

Description. A member of the public requested consideration of an alternative alignment in the vicinity of Madeline (near Angle Point EØ2) to move the transmission line to an access road 3/4 mile west of the proposed route (scoping comment letter of May 1, 1994 by Robert Leonard).

Rationale for Elimination. An alternative that moves this portion of the proposed route to the far west is already included in the EIR/S analysis (Alternative Segment D). The route recommended by Leonard would cross steep topography at its southern end that would render project implementation difficult, if not infeasible, and would increase the chance of erosion and associated vegetation loss. Therefore this alternative does not appear to offer the potential for overall environmental advantage.

McCourt West Secret Valley Re-Alignment

Description. This route would traverse lands west of Snowstorm Mountain. It was recommended by a member of the public (Michael McCourt) during the scoping process.

Rationale for Elimination. Compared to the proposed route, this alternative would result in potentially greater environmental impacts. It would cross several miles of the Biscar State Wildlife Area and would be in close proximity to Biscar Reservoir, resulting in a higher potential for bird collision impacts. Cultural resources may also be impacted, as the vicinity of Snowstorm Mountain is a sensitive area. For these reasons, this alternative is not further considered in this EIR/S.

Re-Alignment East of Ravendale

Description. For a portion of the Proposed Project route in the Ravendale - Spanish Springs area (Segments K and L, between angle points KØ3 and LØ2), CDFG (Scoping Comment letter dated May 27, 1994) has requested study of a route to the east side of U.S. 395, in order to reduce possible sandhill crane impacts from line collisions and habitat loss, migratory bird collisions, and sage grouse impacts primarily from line collisions and habitat loss, and to improve antelope census aircraft flight safety conditions.

Rationale for Elimination. This suggested alignment has been eliminated from further consideration based on the following key constraint factors that preclude the development of a feasible route on the east side of U.S. 395 that offers a reasonable likelihood of potential environmental advantage:

- Location relative to the BLM Ravendale Fire Station - The BLM Ravendale Fire Station is located along U.S. 395 (west side) in the Spanish Springs area, about 5 miles southeast of the town of Ravendale. As documented in a letter from BLM to SPPCo (Peter Humm to Carl Barnett, dated February 25, 1994), this fire station serves as a fire fighting helicopter base during the fire season, with a contract helicopter stationed there full time and other helicopters flying in and out whenever a major wildland fire occurs in the area. Based on concerns regarding helicopter flight safety, as expressed by BLM's Eagle Lake Resource Area Manager and referencing the concerns of the Helitack Foreman at the station (letter dated December 15, 1993) and by Pete Gillies, Chief Pilot of Western Helicopters (letter dated September 15, 1993), it was recommended that "the least desirable location for the powerline, from a helicopter flight safety standpoint, would be east of and uphill from the fire station, between Highway 395 and the Spanish Springs dude ranch . . . With respect to safety for helicopter operations, the western alignment would be the preferred route. Ideally, the line should be at least three miles west of the fire station." As stated by Mr. Gillies, "because of normal prevailing winds, most approaches made to the heliport(s) begin east of the fire station, and the rising terrain of the mountain to the east creates enough of a problem in itself, let alone running a large power line across it from north to south." Furthermore, the rugged slopes of Spanish Springs Peak and Shinn Mountain to the east of the highway would have more limited access for construction and maintenance and they feature numerous springs and ephemeral watercourses that give rise to significant additional impact concerns.

- Impacts on Ravendale Airport - Immediately to the northeast of the town of Ravendale (and northeast of U.S. 395) is the Ravendale Airport, which features a north-south runway extending approximately 3,000 feet north from the highway. Concerns have been expressed by Lassen County regarding impacts on the airport (SPPCo Proponent's Environmental Assessment, Volume 2, Appendix H - meeting memorandum recorded by S. Younkin, August 13, 1993), also noting that most of the land east of Ravendale is in a FEMA 100-year flood zone. As discussed in Section C.12 (Transportation and Traffic), significant height restrictions would be applicable to the project within approximately 4,000 feet of the airport (80 feet at 4,000 feet, based on a 50 to 1 slope). This would effectively necessitate a possible route distance of at least 7,000 north from Ravendale and place the line out in the middle of the open plain area about 6,000 to 7,000 feet or more from the highway. This would involve many more parcels of private land and significantly greater visual disruption than the Proposed Project route west and southwest of the highway (Segment K) and the other alternative route in the area (Segment J, still further west and southwest).

Note that the above-referenced fire station and airport are discussed in Section C.12 and mapped in Figure C.12-1b.

Re-Alignment North of Honey Lake

Description. The CDFG has requested that the portion of the proposed route in the vicinity of Honey Lake (Segment L, near angle point LØ8) be re-routed to more closely follow U.S. 395. Therefore the route in this area would be re-located about one mile to the west and generally adjacent to the proposed Tuscarora Pipeline. The basis for this recommendation is potential reduction of sage grouse impacts from line collisions and habitat loss and improvement of aircraft flight safety conditions for antelope census and deer herd composition counts.

Rationale for Elimination. There are sensitive biological resources throughout this area, along both the proposed route and along U.S. 395, and moving the line closer to U.S. 395 would increase visual impacts. Therefore this re-alignment does not appear to offer overall environmental advantage. However, this slight re-alignment would be considered as potential mitigation if the biological and transportation impacts of the proposed route are determined to be significant.

Sierra Army Depot Alternative Alignment

Description. The portion of the proposed route to the east of Sierra Army Depot (Segment O, near angle point OØ4) would be moved southeast four miles to the California/Nevada border on the east side of Duck Lake and Calneva Lake. This alternative alignment was proposed by SPPCo.

Rationale for Elimination. This alternative alignment appears to offer no overall environmental advantage over the Proposed Project route because the portion of the proposed route that would be replaced by this alignment passes along an existing dirt road on the eastern border of the highly disturbed Sierra Army Depot property. Construction along this road would result in less biological and cultural resources impacts than constructing the project on an undeveloped stretch of land in eastern California at the Nevada border.

Herman Re-Alignment

Description. A scoping comment (by Paul Herman) requested inclusion of previously eliminated PEA route segments in the vicinity of Doyle. No further definition of this alternative was provided.

Rationale for Elimination. Alternative routes in and around Doyle (PEA Segments 48 and 49) were eliminated by the applicant during the project planning process due to land use conflicts with small ranches in the Doyle community and biological/agency conflicts in the Doyle Wildlife Area. Because of these conflicts, these routes do not provide environmental advantages over the portion of the proposed route that they would replace.

East Side of Petersen Mountain Range Routes

Description. CDFG (1994) and Toiyabe National Forest (1994) requested review of alternative routes that would avoid the Hallelujah Junction Wildlife area and the Forest. Potential alternative routes could replace proposed route Segments R, T, W, X, Y, and portions of Segment Q as shown in Figure B.3-2. The Applicant initially identified several routes on the east side of Petersen Mountain, but dismissed these routes early in the planning process due to land use, line length, and biological resource considerations (SPPCo, 1994a, Response to Item I.4). There are basically two potential routes considered here:

- **Eastside Route 1** - A route that departs from proposed route Segment Q just north of Seven Lakes Mountain, circumvents Seven Lakes Mountain to the east, progresses either on the east side of Red Rock Valley or to the east of the Sand Hills through the Bedell Flat area and then progresses south through the canyon to the east side of Petersen Mountain, passes through the west side of Cold Springs Valley, crosses U.S. 395, and ties into the proposed Border Town substation site on the west side of U.S. 395. This route was suggested by CDFG. This route does not satisfy concerns of Toiyabe National Forest, because it would not replace segments of the proposed route (Segments X and Y) that traverse Toiyabe National Forest lands.

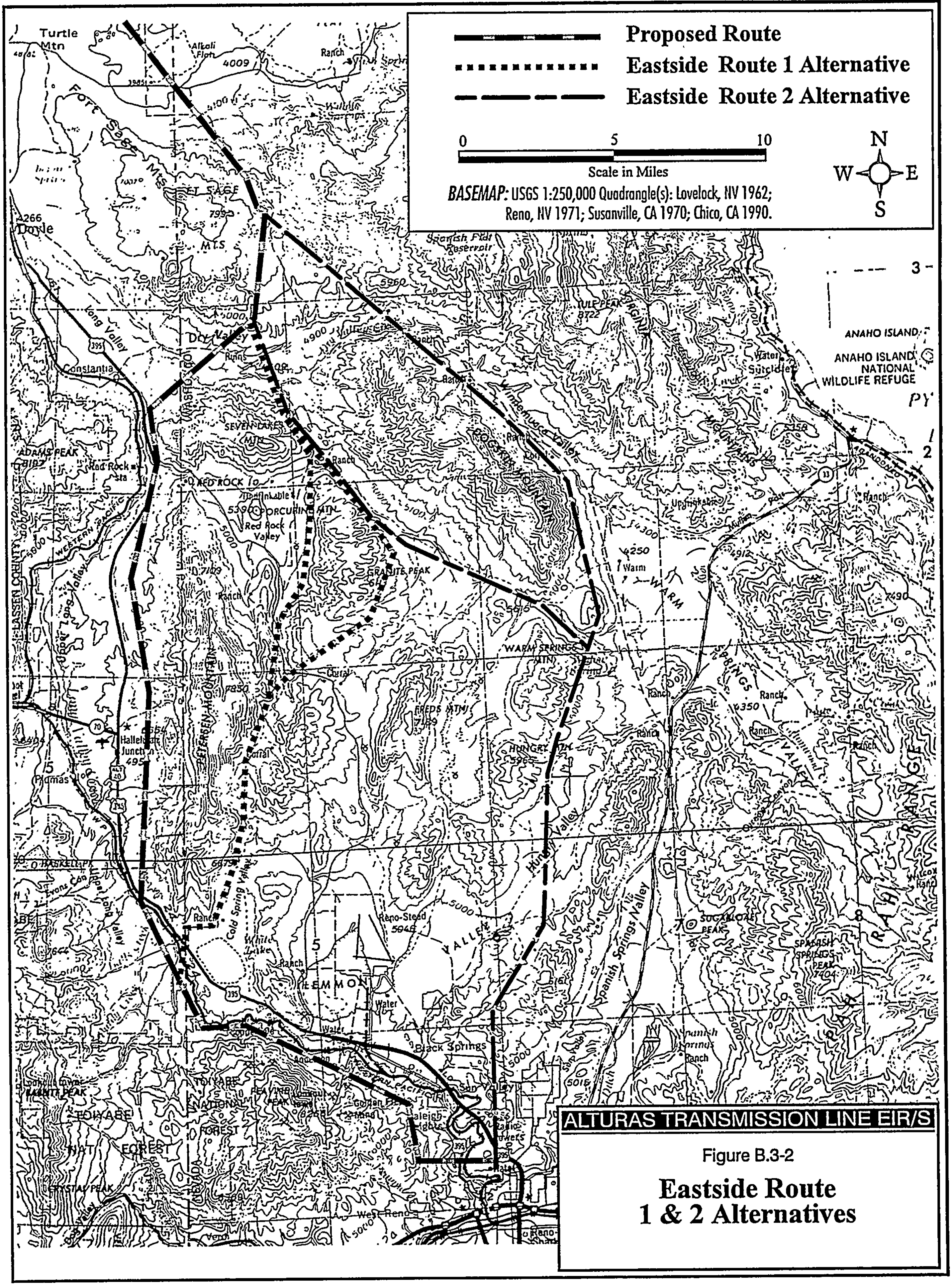
- **Eastside Route 2** - A route that proceeds from proposed route Segment Q southeast of the Fort Sage Mountains through Winnemucca Valley or the Bedell Flat area, east of Warm Springs Mountain and Hungry Mountain, and then south through Hungry Valley to the North Valley Road substation. This second route was suggested by Toiyabe National Forest because it would avoid crossing any USFS land. This route would necessitate development of a substation in place of the proposed Border Town substation, since the route would no longer pass near Border Town. This means that either the existing North Valley Road substation would be substantially expanded (see Section B.3.4.2 on this alternative) or a new site along Eastside Route 2 would need to be selected for substation development.

The examination of these alternatives is based on the following:

- Consideration of SPPCo's analysis and rejection of similar routing options (SPPCo, 1993c, 1994a)
- Analysis of similar routes through Bedell Flat and the Winnemucca Valley for the Tuscarora Natural Gas Pipeline Project (FERC, 1995)
- Consideration of BLM planning and land status mapping for the area, including a May 31, 1994 memorandum from the BLM's Lahontan Resource Area regarding alternative routing in the area of concern
- Review of spring 1994 aerial photography of the southern portions of these alternatives
- Field reconnaissance and photography on July 18 and 19, 1994 and July 27 and 28, 1995.

Based on this analysis, these alternatives are compared with proposed and alternative routes west of Petersen Mountain in the matrix presented as Table B-11.

Rationale for Elimination. The main advantage of a route to the east of Petersen Mountain would be the avoidance of a State of California-designated wildlife area and/or Toiyabe National Forest (and the foothills of Peavine Peak), but this advantage is offset by impacts on residential land uses, and impacts on biological, cultural, and earth resources the east side of Petersen Mountain and by other environmental disadvantages. Even from a wildlife perspective, an Eastside alternative would not provide a distinct environmental advantage over the proposed route. While issues of the CDFG and USFS would be resolved by Eastside routes, both BLM and the Nevada Department of Wildlife have expressed concerns



ALTURAS TRANSMISSION LINE EIR/S

Figure B.3-2

Eastside Route 1 & 2 Alternatives

regarding impacts on wildlife around Petersen Mountain and the Sand Hills east of Petersen Mountain. Much of the area on the east side of Petersen Mountain is relatively undisturbed and undeveloped except primarily for pockets of low-density residential use.

- **Eastside Route 1** - Eastside Route 1 would encounter substantial land use conflicts in the Red Rock Valley/Rancho Haven area and in the Cold Spring Valley where extensive development of residential uses has occurred, is continuing, and where small parcels slated for future residential development would need to be crossed. The BLM indicates that the northern portion of Route 1 would be inconsistent with BLM land use plans. Approval of the project in this area would require a plan amendment to allow overhead transmission lines. Overhead lines are not authorized on public land in the Dry Valley or Bedell Flat areas due to the BLM's limitation on developments that alter the undeveloped character of the landscape.

  Deer and antelope crucial habitat has been identified for Route 1, along with prairie falcon and red-tailed hawk nest sites. Also, this route would have the potential to cross sage grouse strutting grounds and wintering areas. Access limitations and rougher terrain associated with this route would result in potentially greater earth resources, cultural resources, and wildlife habitat impacts due to more extensive construction activities. Route 1 would result in more severe botanical impacts due to the amount of undisturbed land to be crossed. Proposed route Segment W (that would be replaced by this alignment) was subjected to a fire in the past and was replanted with an invasive grass that has displaced sensitive native plant species. Therefore proposed route Segment W would result in very low level botanical impacts relative to this alternative alignment. On balance, Route 1 does not appear to offer the potential for overall environmental advantage.

- **Eastside Route 2** - The primary environmental disadvantages of Eastside Route 2 are related to land use, geology, and cultural resources. Eastside Route 2 would result in significant land use conflicts in areas immediately north of the North Valley Road Substation site where residential development is prevalent in the Panther Valley and Golden Valley/Sun Valley areas). Potential conflicts with BLM land use planning, ranching and agricultural, and future residential development in the Golden Valley/Sun Valley and Lemmon Valley/Hungry Valley areas are additional land use disadvantages, relative to the proposed route, particularly where a substation may need to be developed. A route through Hungry Valley could also be of concern to the residents of the Reno-Sparks Indian Colony, recently established by Congress in the southeastern part of Hungry Valley.

  Portions of this route cross rugged terrain with limited access, necessitating development of access roads and substantial construction disturbance on steep slopes. Construction-related impacts due to land disturbance would be considerably greater than for the proposed route. Cultural resources impacts may be more severe because of increased construction activities and because this area is less disturbed relative to the U.S. 395 corridor.

  Minor environmental advantages to biological resources resulting from Eastside Route 2 would be primarily related to avoidance of habitats outside of USFS boundaries. Wildlife habitat value may be higher along portions of the proposed route (Long Valley area) replaced by Route 2. There are several communities of sensitive plants along proposed route Segment X that could be avoided by Route 2, but it is expected that other sensitive plant species would be found along this mainly undeveloped eastern route. Numerous threatened and endangered plant species have been identified from Warm Springs Mountain to Hungry Valley.

  In summary, Route 2 would offer a benefit in that it would avoid the CDFG Wildlife Area, Toiyabe National Forest, and the lower slopes of Peavine Peak, but would encounter other significant land use and agency conflicts, as well as other environmental disadvantages, which on balance, do not appear to offer the potential for overall environmental advantage, particularly if a substation were to be developed somewhere along the route north from North Valley Road (see also Section B.3.4.2 regarding potential expansion of North Valley Road Substation as an alternative to development of the proposed Border Town Substation).

Table B-11 Comparison Matrix for Routes to the East Side of Petersen Mountain

Issue Area	Eastside Route 1 (in comparison with Proposed and Alternative Routes West of Petersen Mountain)	Eastside Route 2 (in comparison with Proposed and Alternative Routes West of Petersen Mountain)
IMPACT ANALYSIS ++: Clear environmental advantage. +: Minor environmental advantage N: No discernible advantage. - - : Clear environmental disadvantage. - : Minor environmental disadvantage.		
Air Quality	(N) Similar air quality impacts would be expected.	(N) Similar air quality impacts would be expected.
Biological Resources	(+ or N) Potential minor advantages by virtue of avoidance of Long Valley riparian corridor and Hallelujah Junction Wildlife Area, counterbalanced to some extent by greater overall disturbance to undeveloped land and impacts on the Dry Valley Creek watershed and impacts on deer, antelope, and sage grouse habitat in the Dry Valley Creek watershed, the canyon east of Petersen Mountain, and in the Sand Hills and Bedell Flats areas.	(+ or N) Potential minor advantages by virtue of avoidance of Long Valley riparian corridor and Hallelujah Junction Wildlife Area, counterbalanced to some extent by greater overall disturbance to undeveloped land and impacts on the Dry Valley Creek watershed and impacts on deer, antelope, and sage grouse habitat in the Dry Valley Creek watershed, the upper Winnemucca Valley (which includes numerous springs and several small reservoirs, with an introduced herd of bighorn sheep in the Virginia Mountains to the northeast), and the Bedell Flats area.
Cultural Resources	(-) Higher potential for disturbance to sites due to the more undeveloped nature of the potential route; higher densities of sites found in the Bedell Flat area on Tuscarora project surveys (30 sites found along a 22 mile, 200 foot wide survey corridor).	(-) Higher potential for disturbance to sites due to the more undeveloped nature of the potential route; higher densities and complexities of sites found in the Winnemucca Valley area on Tuscarora project surveys (16 sites found along a 21 mile, 200 foot wide survey corridor); historic Winnemucca Ranch along route through upper Winnemucca Valley. Also, higher densities of sites found in the Bedell Flat area on Tuscarora project surveys (30 sites found along a 22 mile, 200 foot wide survey corridor).
Energy and Utilities	(N) Similar impacts would be expected.	(N) Similar impacts would be expected.
Geology/Soils/ Paleontology	(-) Impacts would probably be greater due to more rough topography to be encountered and greater difficulty of access, particularly in the upper Dry Valley Creek drainage and in the canyon to the east of Petersen Mountain.	(-) Impacts would probably be greater due to more rough topography to be encountered and greater difficulty of access, particularly in the upper Dry Valley Creek drainage, upper Winnemucca Valley/northeast flanks of Dogskin Mountain, east of Warm Springs and Hungry Mountains, and in the hills directly to the north from North Valley Road Substation.
Hydrology	(N) Similar levels of impact would be expected with the drier conditions and limited resources counterbalanced by greater potential for erosion and sedimentation due to topographic and access considerations.	(N) Similar levels of impact would be expected with the drier conditions and limited resources counterbalanced by greater potential for erosion and sedimentation due to topographic and access considerations.
Land Use	(--) Substantially greater impacts on residential uses would be expected, due to the introduction of the line adjacent to residential areas without such intrusive industrial facilities (the Red Rock Valley/Rancho Haven area, which consists of 13.6 square miles of contiguous private land, approximately 3 miles wide by 4 miles long, all of which is designated in the Washoe County Land Use Plan as low-density residential and much of which is already developed as residential; and the Cold Spring Valley area, which features substantial pockets of residential development northwest, north, and northeast of White Lake that are designated Washoe County as low, medium, and high density suburban). The residential areas northwest of White Lake approach within 1,000 feet of rugged topography of the southmost extension of Petersen Mountain. BLM has indicated that a route through Dry Valley or Bedell Flat (that would avoid the Red Rock Valley/Rancho Haven area) would seriously conflict with planning for that area.	(N) Reductions of impacts on residential uses in the Border Town to North Valley Road area and impacts on recreational use of the foothills of Peavine Peak would be counterbalanced by impacts on residential uses in the Panther Valley (where the line would need to pass within 1,000-2,000 feet of 30-50 residences; 15 residences here would have only open, undeveloped land between them and the line) and north from Panther Valley where the line would pass between the Washoe County-designated low density suburban areas of eastern Golden Valley and western Sun Valley in the area of O'Brien Pass (Golden Valley Road /West 7th Avenue) - here approximately 15 residences in western Sun Valley and 5-8 residences in eastern Golden Valley would be expected to be within 2,000 feet of the line. The line would also degrade the recreational use of Hungry Valley and intrude on the Winnemucca Ranch complex. BLM has indicated that a route through Dry Valley and Bedell Flat would seriously conflict with planning for that area.

Issue Area	Eastside Route 1 (in comparison with Proposed and Alternative Routes West of Petersen Mountain)	Eastside Route 2 (in comparison with Proposed and Alternative Routes West of Petersen Mountain)
Noise	(-) Somewhat greater impacts due to more nearby residences.	(N) Similar levels of impact would be expected.
Public Health and Safety	(-) Somewhat greater levels of public concern would be expected due to residential uses.	(N) Similar levels of impact would be expected.
Socioeconomics/Public Services	(-) Somewhat greater impacts due to more nearby residential uses.	(N) Similar levels of impact would be expected.
Transportation/ Traffic	(+) Slightly reduced impacts on important transportation corrdors.	(+) Slightly reduced impacts on important transportation corrdors.
Visual Resources	(N or +) Reduced impacts on heavily travelled U.S. 395 corridor, counterbalanced somewhat by introduction of a major, intrusive industrial feature into undeveloped and residential areas.	(N or +) Reduced impacts on heavily travelled U.S. 395 corridor and on Peavine Mountain foothills, counterbalanced somewhat by introduction of a major, intrusive industrial feature into undeveloped, agricultural, and residential areas.

Alternative Segment V

Description. This alternative segment would replace proposed Segment W in the vicinity of Hallelujah Junction and Long Valley. Alternative Segment V would be located on the west side of U.S. 395, whereas proposed Segment W would be sited on the east side of the highway. Alternative Segment V could also include the construction of a substation on assessor parcel number 021-020-02 (BLM owned), instead of the proposed Border Town Substation site.

Rationale for Elimination. Sensitive wildlife and plant species are located in substantially greater numbers along this alternative segment than along the proposed route. In addition, Lassen County has expressed concerns over this alternative segment due to potential general plan and land use conflicts with residential and agricultural development. Therefore, it appears that, on balance, the impacts of this alternative would be at least equal to and probably greater than those of the proposed route segment.

Tuscarora Natural Gas Pipeline Alignment

Description. This alternative would involve relocating the majority of the Proposed Project alignment within or adjacent to the proposed Tuscarora Natural Gas Pipeline Project ROW. As currently proposed, the Tuscarora Natural Gas Pipeline Project would run adjacent to the proposed Alturas Transmission Line Project for approximately 37 miles at four separate locations (see Section B.5, Scenario for Analysis of Cumulative Impacts, for a complete description). In addition, the two projects would cross at four locations. The Base Maps in Appendix C illustrate the areas of common alignment for the two projects as currently proposed. This alternative assumes that both project alignments would follow the Tuscarora corridor from Alturas to northern Reno area.

The Tuscarora Natural Gas Pipeline Project involves the construction of approximately 250 miles of new natural gas pipeline, both mainline and laterals, between Malin, Oregon and Tracy, Nevada, as well as ancillary facilities. From Alturas, the pipeline parallels U.S. 395 in a north-south direction for approximately 75 miles, where, northeast of Wendel, the direction of the pipeline alignment would change to a southeast orientation. About ten miles southeast of Honey Lake, the gas pipeline would enter Nevada as it continues south to its termination point near Tracy, Nevada.

The proponent of the pipeline, Tuscarora Gas Transmission Line Company, consists of a partnership between Tuscarora Gas Pipeline Company (a wholly owned affiliate of Sierra Pacific Resources [a parent company to Sierra Pacific Power Company]) and TCPL Tuscarora, Ltd. (a wholly owned affiliate of TransCanada Pipelines Ltd.).

Rationale for Elimination. The main advantage of relocating the majority of the Proposed Project alignment within or adjacent to the Tuscarora Natural Gas Pipeline Project ROW would be the minimization of impacts related to construction activities. Construction of the gas pipeline involves the excavation of a trench varying in width from three to five feet, depending on soil/rock conditions. The trench depth would be sufficient to allow for 36 inches of cover over the top of the installed pipeline (24 inches minimum in areas of solid rock). Since the transmission line structures would require excavations 10 to 30 feet in depth, the structures could not be placed directly over the pipeline alignment. Therefore, impacts associated with soil removal (biology and cultural resources) could not be avoided by relocating the Alturas Transmission Line Project within the Tuscarora Pipeline alignment. However, soil disturbance impacts related to construction vehicle movement could be minimized by utilizing a joint construction ROW.

If the Proposed Project were to be located within or adjacent to the Tuscarora Natural Gas Pipeline ROW, the transmission line would parallel U.S. 395 for approximately 75 continuous miles (within 100 to 1,000 feet of the highway); as proposed, the Alturas Transmission Line Project parallels U.S. 395 for 27 miles at two separate locations (14 miles starting three miles south of Madeline and 13 miles through Secret Valley starting one mile northeast of Tule Patch Spring). By increasing the length of the transmission line along U.S. 395 to 75 continuous miles, visual impacts would be significantly intensified. The gas pipeline project does not impose the same visual impacts since it is located below ground and areas of surface disturbance could be mitigated with proper revegetation and recontouring. In addition, traffic interference impacts resulting from construction activities along U.S. 395, a major regional roadway, would be exacerbated if the two projects were constructed consecutively. Further, impacts related to restricted emergency vehicle and property owner access would increase.

By placing the Alturas Transmission Line Project and Tuscarora Natural Gas Pipeline within the same ROW, system safety issues such as induced and fault currents must be considered. Induced current could cause hazardous electric shock and becomes a compatibility concern when electric transmission lines are to be located near metal pipelines. Metal components may act as conductors and can acquire an electrical potential from an electric transmission line, causing an electric current along the pipeline. Such currents can cause corrosion of the pipeline and could deliver a shock to a person upon contact. Fault current is produced when the current being transported by a high voltage transmission line flows into the ground because lightning comes into contact with a transmission line structure, broken energized conductors come into contact with the ground, or flashover occurs from conductors to towers due to dust or ash accumulation on the insulators. Depending on its magnitude, a fault current can cause damage to metal structures, puncture the coating of an underground pipeline (or even the pipeline itself if sufficient heat is generated) and can travel along the pipeline. To minimize the effect of induced and fault currents, several measures may be necessary to protect the pipeline. These measures include using thicker coatings for the sections of pipe near transmission line structure foundations, installing shielding and corrosion protection systems, or placing ground shields underneath structures. The effectiveness and the required frequency of replacement of such measures depends on the area's ground resistance (earth resistivity) and frequency of ground faulting occurrences. To replace these subsurface devices, soil excavation would be required.

For the reasons stated above, no net environmental advantage is expected from relocating the majority of the Proposed Project alignment within or adjacent to the Tuscarora Natural Gas Pipeline Project ROW. Therefore, this alternative has been eliminated from further consideration.

B.3.4.2 Substation Alternatives

Alternative Border Town Substation Sites

Description. During the scoping process, numerous sites were identified in the Border Town area as potential alternative sites for the proposed Border Town substation. Table B-12 presents general information for each of these alternative sites, including assessor parcel numbers, ownership, and locality (one of the alternative sites is located in Lassen County, California; four are in Sierra County, California; and one is in Stead [City of Reno], Nevada). The specific locations of these alternative sites are illustrated on Base Maps 29, 30, 31, and WCFG, which are included at the end of Volume I.

Rationale for Elimination. The environmental impacts of the alternative substation sites and a comparison of their impacts to the proposed Border Town Substation impacts are presented in Table B-12 for the following issue areas: Biological Resources, Visual Resources, Cultural Resources, Land Use/Recreation, Earth Resources, and Transportation/Traffic. Since no significant difference is expected for the subject alternative sites (in comparison with the proposed Border Town Substation site) for the issue areas of Air Quality, Energy and Utilities, Noise, Public Health and Safety, and Socioeconomics and Public Services, no parcel specific analysis was conducted for the noted issue areas.

As presented in Table B-12, no environmental advantage was identified (regardless of issue area), in comparison to the proposed Border Town Substation site, for each alternative parcel. The main environmental disadvantages associated with the alternative substation parcels are summarized as follows:

Table B-12 Alternative Border Town Substation Site Screening

	Proposed Border Town Substation	Alternative Substation Sites					
		APN 147-090-10	APN 021-020-26	APN 021-080-01	APN 021-080-12	APN 082-083-09	Stead Ind. Park[1]
GENERAL SITE INFORMATION							
Owner	BLM	CDFG	CDFG	BLM	CDFG	USFS	Private
General Location (See Base Maps at the end of Volume I)	Western Border Town	Approximately three miles northwest of Border Town, adjacent to the east side of U.S. 395; Lassen County, California. (See Base Maps 29 & WCFG.)	Approximately two miles northwest of Border Town, adjacent to the east side of U.S. 395; Sierra County, California. (See Base Maps 29 & WCFG.)	Approximately one-half mile northwest of Border Town, with frontage on the east side of U.S. 395; Sierra County, California. (See Base Maps 30 & WCFG.)	Approximately one-half mile northwest of Border Town, adjacent to the east side of U.S. 395; Sierra County, California. (See Base Maps 30 & WCFG.)	Approximately six miles southeast of Border Town, and one mile south of U.S. 395; Sierra County, California. (See Base Map 31.)	Approximately six miles southeast of Border Town, and one mile north of U.S. 395; vicinity of Lear and Moya Boulevards, Stead (City of Reno), Nevada.
Project & Alternative Segments Traversing Alternative Substation Sites		Proposed Segment W; approx 1 mile Alternative Segment WCFG; approx 2000 ft	Proposed Segment W; approx 1 mile Alternative Segment WCFG; approx 1 mile	Alternative Segment WCFG (near WN06); approx 1500 ft Alternative Segment WCFG (near WN07); approx 1500 ft	Alternative Segment WCFG; approx 3000 ft	None; Rerouting of Proposed Project would be required	None; Rerouting of Proposed Project would be required
IMPACT ANALYSIS[2] ++: Clear Environmental Advantage - - : Clear Environmental Disadvantage +: Minor Environmental Advantage - : Minor Environmental Disadvantage N: No Discernible Environmental Difference							
BIOLOGICAL RESOURCES	Low Sagebrush Scrub; no sensitive species or habitat Access to biological communities already exists because of improved access to area	[- -] Sagebrush/Bitterbrush Scrub; no sensitive species or habitat (within W and WCFG alignments) Permanent substation access would increase access to natural communities resulting in habitat degradation and wildlife disturbance impacts Located within Hallelujah Junction Wildlife Area	[- -] Sagebrush/Bitterbrush Scrub & Rabbitbrush/ Montane Meadow; no sensitive species or habitat (within W and WCFG alignments) Permanent substation access would increase access to natural communities resulting in habitat degradation and wildlife disturbance impacts Located within Hallelujah Junction Wildlife Area	[-] Sagebrush/Bitterbrush Scrub; no sensitive species or habitat (within WCFG alignment) Permanent substation access would increase access to natural communities resulting in habitat degradation and wildlife disturbance impacts	[- -] Sagebrush/Bitterbrush Scrub; no sensitive species or habitat (within WCFG alignment) Permanent substation access would increase access to natural communities resulting in habitat degradation and wildlife disturbance impacts Located within Hallelujah Junction Wildlife Area	[N to - -][3] Area comprised of Big Sagebrush Scrub; presence of sensitive species or habitat unknown Existing 4WD access to site	[N to - -][4] No biological resources expected in area of proposed alternative substation site (Lear & Moya Blvds); however, rerouting of transmission line through Stead could require traversing the Peavine Mtn drainage area and its associated potential wetlands and water bodies

	Proposed Border Town Substation	Alternative Substation Sites					
		APN 147-090-10	APN 021-020-26	APN 021-080-01	APN 021-080-12	APN 082-083-09	Stead Ind. Park[1]
VISUAL RESOURCES	Distant middle-ground to back-ground feature to southbound motorists on US 395	[N] Prominent middle-ground feature to US 395 motorists	[N] Prominent foreground to middleground feature to motorist on US 395 motorists (depending on location of substation)	[-] Prominent fore-ground feature to motorists on US 395	[-] Prominent fore-ground feature to motorists on US 395	[N] Distant middle-ground to back-ground feature to motorists on US 395	[N to - -][4] Alternative substation site would not likely be visible from US 395 because of buildout of area
	Distant middleground to background feature to one dozen western Border Town residences	Limited, if any, residential visibility	Limited, if any, residential visibility	Distant middleground to background feature to residences in eastern Border Town	Distant middleground to background feature to residences in eastern Border Town	Distant middle-ground to back-ground feature to Anderson Acres residences	Rerouting of transmission line through Stead could require traversing residential areas with densities up to 7 dwelling units per acre
CULTURAL RESOURCES	One cultural resource site recorded; does not appear to be significant under NRHP eligibility criteria	[N] No cultural resource sites recorded at this location (within W and WCFG alignments)	[-] One cultural resource site recorded on W alignment. No sites recorded on WCFG alignment. Site on W alignment appears to be significant under NRHP eligibility criteria. Impacts to site mitigable through data recovery.	[N] Two cultural resource sites recorded on WCFG alignment. Neither site appears to be significant under NRHP eligibility criteria	[N] No cultural resource sites recorded at this location (within WCFG alignment)	[N] No cultural resource sites recorded within subject lands. Two recorded sites (one historic, one prehistoric) located within 1/4 mile	[N] No cultural resources retaining integrity expected in area of alternative substation site (Lear & Moya) since area is developed and industrial in nature
LAND USE/ RECREATION	No residences within 2000 feet	[-] No residences within 2000 feet	[-] No residences within 2000 feet	[N] No residences within 2000 feet	[- -] Up to 15 residences within 2000 feet, depending on substation location	[-] No residences within 2000 feet	[N to - -][4] Substation would likely be consistent with industrial nature of alternative area (Lear & Moya), depending on Land Use designations and planning policies; however, routing of transmission line through Stead could result in residential and commercial land use conflicts and planning policy inconsistencies
	Degradation of existing access to recreational uses	Degradation of limited recreational use (recreation is limited because of no available vehicular access)	Degradation of limited recreational use (recreation is limited because of no available vehicular access)	Degradation of limited recreational use (recreation is limited because of no available vehicular access)	Degradation of limited recreational use (recreation is limited because of no available vehicular access)	Degradation of recreational use (existing 4WD access)	
	Consistent with Lahontan RMP	Inconsistent with Wildlife Area Management Plans	Inconsistent with Wildlife Area Management Plans	Consistant with Lahontan RMP	Inconsistent with Wildlife Area Management Plans	Inconsistant with Toiyabe NF land and RMP	
	Inconsistent with Sierra County General Plan	Inconsistent with Lassen County General Plan	Inconsistent with Sierra County General Plan	Inconsistent with Sierra County General Plan	Inconsistent with Sierra County General Plan	Inconsistent with Sierra County General Plan	

	Proposed Border Town Substation	Alternative Substation Sites					
		APN 147-090-10	APN 021-020-26	APN 021-080-01	APN 021-080-12	APN 082-083-09	Stead Ind. Park[1]
EARTH RESOURCES	Site relatively flat with no unique geologic features No unique hydrological features	[-] Additional grading and higher potential for erosion because of topography No unique hydrological features	[-] Additional grading and higher potential for erosion because of topography No unique hydrological features	[-] Additional grading and higher potential for erosion because of topography No unique hydrological features	[-] Additional grading and higher potential for erosion because of topography No unique hydrological features	[- -] Additional grading and higher potential for erosion because of topography No unique hydrological features Site traversed by a fault	[N to - -][4] Substation would not likely result in significant impacts to earth resources; however, routing of transmission line through Stead could require the crossing of potential flood hazard and wetland areas, and water bodies
TRANS./ TRAFFIC	Access via US 395 interchange and improved surface streets	[-] Greater potential for traffic disruptions because direct access off of US 395 would be required	[-] Greater potential for traffic disruptions because direct access off of US 395 would be required	[-] Greater potential for traffic disruptions because direct access off of US 395 would be required	[-] Greater potential for traffic disruptions because direct access off of US 395 would be required	[N] Access available via improved surface streets and existing 4WD road	[-] Access available via improved surface streets. Rerouting of transmission line could not occur to the north because of the Reno-Stead Airport
SUMMARY		[- -] 1 [-] 3 [N] 2 [+] 0 [++] 0	[- -] 1 [-] 4 [N] 1 [+] 0 [++] 0	[- -] 0 [-] 4 [N] 2 [+] 0 [++] 0	[- -] 2 [-] 3 [N] 1 [+] 0 [++] 0	[- -] 1 [-] 1 [N] 3 [N to - -][3] 1 [+] 0 [++] 0	[- -] 0 [-] 1 [N] 1 [N to - -][4] 4 [+] 0 [++] 0

1. No specific parcel identified during scoping.
2. Environmental issue areas for which no significant differences could be expected for the subject alternative sites (in comparison with the proposed Border Town Substation site) including air quality, energy and utilities, noise, public health and safety, and socioeconomics and public services.
3. Depending on presence of sensitive species or habitat.
4. Depending on transmission line rerouting alignment.

- Because of the need to construct permanent access to the future substation, four of the alternative parcels identified would increase access to biological communities, resulting in habitat degradation and wildlife disturbance impacts. Further, three of these parcels are located within the Hallelujah Junction Wildlife Area. Access to biological communities surrounding the proposed Border Town Substation site already exists because of existing, improved access to the area.

- Given the proximity of four of the alternative parcels to U.S. 395, a substation on any of these parcels would be a "prominent" foreground to middleground feature (depending on parcel) to motorists, whereas the proposed Border Town Substation would be a "distant" middleground to background feature to southbound motorists only.

- Existing, limited recreational uses would be degraded on four of the alternative sites. The Border Town Substation would be passed by persons destined to recreational areas to the west.

- Five of the alternative parcels would require additional grading and have a higher potential for erosion because of topography. One alternative site is traversed by a fault. The Border Town site is relatively flat with no unique geologic features.

- Greater potential for traffic disruptions for four of the alternative parcels because direct access off of U.S. 395 would be required. The Border Town site can be accessed via a U.S. 395 interchange and improved surface streets.

- The Stead Industrial Park alternative would require a rerouting of the transmission line. While a substation within an existing industrialized area is not expected to result in any significant impacts, the rerouting of the transmission line could likely require that existing and/or planned residential (density up to 7 dwelling units per acre) and commercial areas be traversed, resulting in significant land use and visual impacts. Further, the Peavine Mountain drainage area, with its associated potential flood plains and wetlands, and water bodies might need to be crossed, resulting in biological and hydrological impacts. Access to the Stead area from the north is not likely because of the Reno-Stead Airport.

Because of the reasons summarized above and presented in Table B-12, the subject alternatives are not considered to offer environmental advantage to that of the proposed Border Town Substation site and have been eliminated from further consideration.

Expansion of North Valley Road Substation

Description. During the scoping process, several requests were made to investigate the possibility of expanding the existing North Valley Road Substation on the north side of Reno to accommodate equipment planned for the proposed Border Town Substation. The North Valley Road Substation is the proposed terminus for the proposed transmission line. This alternative would replace the Border Town Substation.

To accommodate the equipment planned for the proposed Border Town substation, the North Valley Substation pad would need to be expanded to accommodate the phase shifter bus, reactors, and circuit breakers. The size of the pad expansion consider by SPPCo was approximately 500' by 340' (the Border Town Substation pad is 790' by 430') and would be in addition to the 128 foot expansion required to terminate the project at the North Valley Substation (see Figure B.2-12) For purposes of this analysis, expansion of the North Valley Substation pad to accommodate the Border Town Substation equipment is assumed to occur to the north, lengthwise, for the following reasons:

- Expansion to the west would require rerouting the transmission line through and expanding the substation onto property zoned for Single Family Residential, in which the portion of the property which would be directly affected by substation expansion has been designated as Public Open Space in the Draft City of Reno Master Plan.

- Expansion to the due-east is not feasible because of existing gas distribution facilities.

- Expansion to the northeast would require that the Alturas Transmission Line cross existing 345 kV and 120 kV transmission lines that enter the North Valley Substation or traverse the area to the east of the substation, respectively, imposing reliability concerns and requiring taller structures to provide appropriate clearances. Expansion to the northeast would also impose similar topographic constraints as expanding to the north.

- Expansion to the south would require that the Alturas Transmission Line pass the existing North Valley Road Substation, terminate at the southern site, and then return to the North Valley Road Substation in order to tie into the North Valley Road bus. Insufficient area exists to the south to accommodate this line configuration, especially given existing warehouse/manufacturing facilities on the southern parcel.

- The parcel to the north is zoned industrial and is owned by SPPCo.

For optimum performance of the Proposed Project, the reactors should be distributed along the transmission line from one end to another; therefore, by expanding the North Valley Substation, line performance would be degraded because one reactor distribution point (Border Town) would be lost. As discussed in Section A.6.3.3, from a utility planning standpoint, placing the phase shifter toward the edge of the service area would be desirable, since any future customers served by SPPCo (e.g., 120 kV expansion into North Valleys area) should be on the same side as existing customers (Section E.3 discusses the growth-inducement impacts of the project). From an operation and maintenance viewpoint, the closer the phase shifter is to crews to the south, the better.

Expansion of the North Valley Substation site to accommodate the proposed Border Town Substation equipment could require relocation of the existing 345 kV transmission line that enters the North Valley Substation from the north.

Rationale for Elimination. The parcel to the north of the existing North Valley Road Substation contains steeply sloping terrain throughout the site, with an average slope of over 20 percent in the area of expansion. For this reason a two-tiered substation design scenario would minimize cut and fill to approximately 200,000 cubic yards (cy) of cut and 200,000 cy of fill (the lower tier being the 128 foot expansion of the North Valley Substation, and the upper tier being a 500' by 340' pad located further up the slope to the north). If a two-tiered approach were not used (the 128' expansion and new 500' by 340' pad were constructed directly adjacent and due north), the construction of a 500 by 340 foot pad in such terrain would require about 635,000 cy of cut and 16,000 cy of fill (the area of the 128' expansion is relatively level). These volumes of substantial cut and fill, regardless if the two-tiered approach is used or not, could result in the following impacts:

- Significant erosion impacts could be expected with the exposure of soils around the expansion pad (which would be paved), because of the recontouring of the area that would be required. Recontouring of the expansion area could also affect the adjacent parcel to the west (zoned Single Family Residential), since the actual expansion pad would likely run directly adjacent or very close to the western property boundary because of existing transmission facilities to the east, as described above.

- Cut and fill activities would require substantial construction vehicle operation to excavate, move, and recompact substantial amounts of soil. Spoils (rocks, debris, etc.) would also have to be removed from the site for disposal. This intensification of construction vehicle usage would significantly impact local transportation and air quality; a non-attainment classified air basin for both State and Federal ambient air quality standards.

- Construction into areas of over 20 percent is discouraged by the City of Reno zoning regulations which require a density reduction factor for development on slopes of over 10 percent.

- Cut and fill scars would be visible from the Reno/Sparks metropolitan area and U.S. 395.

The placement of facilities planned for the Border Town site at North Valley Road Substation would result in a net additional cost of 4 to 10 million dollars because of required site work; approximately 1 million dollars in equipment savings would occur due to the elimination of one circuit breaker and associated equipment.

For the reasons cited above, the expansion of the North Valley Substation has been eliminated from further consideration.

Termination of Project on East Side of System

Description. Comments on the Draft EIR/S requested that the possibility of terminating the Proposed Project on the east side of SPPCo's system be investigated. The Tracy and Fort Churchill Substations were suggested as possible termination points. The North Valley Road Substation, located in the northwestern portion of SPPCo's system, is the proposed terminus for the proposed transmission line.

Rationale for Elimination. As discussed in Section A.6.5, if the Proposed Project were to be terminated at the Tracy Substation, the project objective of improved service reliability and system security for the portion of SPPCo's service area west of Tracy, would not be realized. In addition, a Tracy Substation termination would not prevent the projected failure of the 120 kV line extending from Tracy Substation to Spanish Springs Substation. Termination of the Proposed Project at the Fort Churchill Substation would require extensive modification of substation facilities and upgrade of existing transmission facilities servicing the Reno/Sparks metropolitan area or construction of new lines. The upgrade or construction of new transmission facilities through an urban environment would impose significant property owner and land use constraints, and associated visual and air quality impacts. For these reasons, termination of the Proposed Project on the east side of the system has been eliminated from further consideration.

B.3.4.3 Generation Alternatives

Increasing generation is one technology available for serving the increasing needs of utility customers. While generation additions at the proper locations could provide improved service reliability to the Reno area, they would not directly improve import capacity or provide direct access to the Pacific Northwest power market (project objectives).

SPPCo states that the addition of new generation sources does not displace their need for additional transmission capacity. SPPCo's 1993 Electric Resource Plan (ERP) included discussion of two potential new generation resources: plans for construction of the Piñon Pine Power Plant and siting studies for the Fort Churchill Combustion Turbine.

Piñon Pine Power Plant

Description. The Piñon Pine Power Plant would use an Integrated Gasification/Combined Cycle technology that converts coal into a clean gas, virtually free of sulfur and particulates, and then burns the gas in a combustion turbine and captures the exhaust heat to drive a steam turbine. This project would be a part of the U.S. Department of Energy's Clean Coal Technology Program, paid for with 50% federal matching funds for construction and the first four years of operation. The plant would generate approximately 89 MW of summer-rated capacity, and would be located approximately 20 miles east of Reno, Nevada at the existing Tracy generating station. The Final EIS for the power plant was released in September, 1994, and a Record of Decision was issued in November, 1994. Construction ground breaking occurred early-1995. Estimated operation start-up is 1997-98.

Rationale for Elimination. As noted above and discussed in Section A.6, Purpose and Need, generation alternatives cannot provide direct access to the Pacific Northwest or improve import capability, except for providing improved response to long-term emergencies. SPPCo must improve its transmission system import capability to meet the needs of other utilities within the Control Area (see Section A.6). Further, since the Piñon Pine Power Plant would be located at the existing SPPCo Tracy facilities, it would place more supply on the Valmy-Tracy-North Valley corridor. As a result, this generation project would not improve service reliability to the Reno/Lake Tahoe area. In addition, ground breaking for construction of the Piñon Pine Power Plant has commenced; since SPPCo has received all necessary permits for the project, this project would exist whether or not the Alturas Transmission Line Project is approved. For these reasons, the Piñon Pine Power Plant has been eliminated from further consideration as an alternative to the Proposed Project.

Fort Churchill Combustion Turbine

Description. SPPCo has recently installed two combustion turbines (70 MW each) at its Tracy facilities. As part of this system generation upgrade, SPPCo is also studying the feasibility of adding a third combustion turbine near its Fort Churchill Power Plant. Generation siting studies are being prepared to evaluate possible sites near the Fort Churchill plant for the collection of air quality and meteorological information so that SPPCo can proceed with the permitting of at least one gas combustion turbine at Fort Churchill in the future.

Rationale for Elimination. The Fort Churchill Combustion Turbine would provide no improvement in import capability, except for improved response to long-term emergencies. In addition, the combustion turbine alternative would not provide additional access to the Pacific Northwest power market. Since the Fort Churchill Combustion Turbine would be located to the south of Reno, avoiding the Valmy-Tracy-North Valley corridor, it is expected to provide limited improvement in Reno/Lake Tahoe service reliability. For these reasons, this generation alternative has been eliminated from further consideration.

Wind Technology

Description. The perception of wind as an emerging energy source reached a peak in the early 1980s, when wind turbine generators to convert wind power into electricity were being installed in California at a rate of nearly 2,000 per year. Progress slowed a few years later, however, as start-up tax subsidies disappeared and experience demonstrated some deficiencies in design. At the present time, technological progress again has caught up, contributing lower cost, greater reliability, and reason for genuine optimism for the future (Lamarre, 1992). A major factor has been the inclusion of environmental externalities by electric utilities in their resource planning programs. The more penetrating analysis, which has included these potential costs, has shown wind power to be substantially more economically attractive than was previously thought.

There are now more than 16,000 wind turbines installed in the U.S., with almost all located in California. Their aggregate power rating is about 1,500 MW, and they generated some 2.7 billion kilowatt-hours (kWh) of electricity in 1991. It has been estimated that with fully commercial development, 20 percent of the nation's electricity needs could be supplied by wind power. And while California has seen much more than its share of this resource, there still are opportunities for substantial growth.

Rationale for Elimination. Wind energy is a method of generating, not transmitting, electric power. Therefore this form of power generation has the same limitations in satisfying the project objectives as the other generation alternatives considered. In particular, if wind generation facilities were sited appropriately, avoiding the Valmy-Tracy-North Valley corridor, they could provide partial improvement in service reliability for the Reno/Lake Tahoe area, assuming naturally windy sites were available for development (e.g., mountain passes or high ridges). Wind energy generation would provide no improvement in import capacity, but could serve as a back-up to long-term emergencies. Wind energy would also not provide any additional access to the Pacific Northwest power market. Therefore, this alternative was eliminated from further consideration.

Solar Technology

Description. Solar energy always has held promise as an environmentally preferred resource. However, it suffers from serious limitations in that the quantity of energy striking a unit area of the earth's surface, and so available for capture, is quite small, even in the characteristically sunny southwest. Its availability only during daytime hours also limits its usefulness as an alternative source. If electricity is the type of energy most needed, then solar energy needs to be converted to electricity before it can be used. Recent advances make almost certain dramatic, near-future improvements in conversion efficiency, now expected to reach the goal of 26 percent in routine use with commercial devices (Moore, 1992).

A key to this improvement lies in the use of high-concentration photovoltaic technology; solar cells capable of functioning at a high conversion efficiency and extended lifetimes, even when subjected to sunlight concentrated more than 100 times. Research sponsored by the Electrical Power Research Institute has overcome some early technical problems. Current product development is proceeding, with planned initial commercialization expected by 1995. Photovoltaic panels would incorporate numerous cells in an array. A goal now believed to be fully achievable would be systems with overall efficiencies near 20 percent, at capital costs of less than $2 per watt of peak-rated power; this is a high capital cost, but with no fuel cost to pay, it is at the acceptable range.

Rationale for Elimination. Solar energy, like wind energy, has the same limitations with respect to satisfying the project objectives as the other generation alternatives considered. Therefore, this alternative was eliminated from further consideration.

Geothermal Energy

Description. In California and the western states, geothermal energy is relatively well developed and contributes to the electricity supply.

Rationale for Elimination. Geothermal energy, like wind and solar energy, has the same limitations with respect to satisfying the project objectives as the other generation alternatives considered. Further, since geothermal energy is a subsurface resource, the capture, conversion, and transmission of this resource could impose significant adverse impacts. In addition, since it is the marginal resources that have remained untapped, the costs for utilizing this resource would be relatively high. Therefore, this alternative was eliminated from further consideration.

B.3.4.4 System Enhancement Alternatives

Demand Side Measure Alternative

Description. Demand side management programs are designed to reduce customer energy consumption. Regulatory requirements dictate that supply-side and demand side resource options should be considered on an equal basis in a utility's plan to acquire lowest cost resources. SPPCo has developed numerous existing and proposed demand side programs to improve customer energy efficiency through its Electric Resource Planning process; these programs were considered by SPPCo as being in place in their demand projections. Existing programs include residential and commercial "Good Cents" certification, residential and commercial lighting rebates, electric water heater wrapping, large commercial and industrial Peak Performance/Shared Savings conservation programs, peak shaving through the interruption of customer loads, etc. Programs proposed for the future include solar water heating, refrigerator recycling, and customer power factor correction. The five-year goals for the SPPCo demand side programs is a savings of approximately 11 MW during peak winter and summer demand.

Rationale for Elimination. While reductions in demand are considered an essential part of SPPCo's future operation, the savings from these programs (11 MW) are insufficient to improve the service reliability to the Reno/Lake Tahoe area to the level desired (a strong second source); the 11 MW savings offered by the conservation programs represents an approximate 1% reduction in winter and summer peak demands (1099 MW and 1130 MW, respectively, in 1994 - see Table A-3). Further, the noted conservation programs would do little to increase the simultaneous import capacity rating of the SPPCo system, nor would they provide additional access to the Pacific Northwest power market. For these reasons, this alternative has been eliminated from further consideration.

Static Var Compensator

Description. The Static Var Compensator (SVC) is an active device which injects or absorbs reactive power into the transmission network to control system voltages and to dampen electrical oscillations caused by major transmission disturbances. This device utilizes system components (thyristors, shunt reactors and capacitors, harmonic filters, and microprocessor controls) that have been in use by the utility industry for two decades. This SVC mechanism would extend SPPCo's export capabilities and increase the operational flexibility of the system.

Rationale for Elimination. While the SVC would increase export capabilities and the operational flexibility of the SPPCo system, it would not improve SPPCo's capability to import additional power appreciably, improve service reliability to the Reno/Lake Tahoe area by providing a strong second source, nor provide additional access to the Pacific Northwest power market. Therefore, this alternative has been eliminated from further consideration.

Capacitor Banks

Description. The installation of capacitors helps maintain system voltages at prescribed levels by allowing reactive power to be altered as demand fluctuates. Reactive power is a component of power production that is not sold, but is critical to the operation of an electrical system. By increasing the reactive power supply to an area, voltage levels can be bolstered or supported. Conversely, by decreasing the reactive supply, voltage levels can be reduced. Capacitors can be installed closer to the loads and supply needed support in areas where reactive power is deficient.

Rational for Elimination. As with the other system enhancement alternatives discussed, the installation of capacitor banks would not increase import capacity beyond an insignificant increment, improve service reliability to the Reno/Lake Tahoe area (except for improving voltage control during peak periods), or provide additional access to the Pacific Northwest power market. Therefore, this alternative has been eliminated from further consideration.

B.3.4.5 Alternative Transmission Technologies

Lower/Higher Voltages

Description. SPPCo sized the Alturas Transmission Line at 345 kV to meet existing and projected native, transmission and wheeling customer needs (see Section A.6.2.2). Other standard transmission line voltages include 115 kV, 230 kV and 500 kV.

Rationale for Elimination. The use of a lower voltage, such as 115 kV or 230 kV, would not provide SPPCo with the system performance desired given the length of the Proposed Project (performance is a function of voltage and length), while imposing essentially the same environmental impacts; structure erection and conductor stringing would be similar to the Proposed Project. Building the Alturas Transmission Line at 500 kV instead of 345 kV was rejected because SPPCo's needs are met by the capacity of the 345 kV line and the higher costs of a 500 kV project cannot be justified unless significant participation by other utilities occurs. Although interest in using the Proposed Project for wheeling through SPPCo's system has been shown by at least two utilities, no firm commitments have been established. Furthermore, construction of a 500 kV project would delay the in-service date past the early-1997 time frame that is critical for SPPCo. For these reasons, these alternatives have been eliminated from further consideration.

Direct Current Transmission

Description. SPPCo considered the construction and operation of a direct current (DC) as opposed to an alternating current (AC) transmission line. Given the need to connect to existing AC transmission lines in Alturas and Reno, a DC transmission line would require DC/AC conversion terminals at both ends of the line. A 345 kV DC transmission line would offer much greater power transfer capacity.

Rationale for Elimination. SPPCo rejected a DC transmission line on the basis of costs: 1) DC/AC conversion terminals are approximately $50 million each, thereby nearly doubling the costs of the project and 2) tapping the DC line at a future date to provide transmission service to other utilities between Alturas and Border Town, would be more complicated and considerably more expensive. In addition, while a 345 kV DC project would offer greater power transfer capacity, SPPCO has not identified a need for that much additional capacity. Finally, the construction of a DC transmission line would impose essentially the same environmental impacts as constructing an AC line (structure erection and conductor stringing). Therefore, this alternative has been eliminated from further consideration.

Underground Construction

Description. There has been underground construction of transmission systems in the United States since the late 1920s. Underground construction of transmission lines is commonly used for lower voltage distribution lines in urban areas. Most high voltage (115 kV or above) underground installations have been constructed under constraining circumstances for short distances where overhead lines were impractical or unsafe (e.g., in the vicinity of airports, urban centers, long water crossings, etc.). Underground transmission lines offer the principal environmental advantage of reduction of adverse visual impacts and reduction in electric and magnetic field exposure.

Rationale for Elimination. There are two types of undergrounding technologies available for 345 kV transmission lines:

- **High-Pressure Fluid Filled (HPFF).** The majority of underground 345 kV transmission lines utilize the HPFF system technology. This system is comprised of a steel pipe (typically 10-3/4 inch diameter for a 345 kV line), into which three dielectric fluid (oil) impregnated paper-insulated cables are drawn. For cooling purposes, the pipe is filled with dielectric fluid (oil) and is pressurized to about 200 pounds per square inch (psi). In order to maintain oil pressure and accommodate oil contraction and expansion in the system, storage tanks (500 to 1000 gallon capacity) and oil-pressure control units, with pumps and relief valves, would need to be installed about every five miles.

- **Self-Contained Fluid Filled (SCFF).** The SCFF system is rarely used for 345 kV systems. This system is comprised of copper conductors (one for each phase) with hollow cores that contain dielectric fluid (oil), pressurized to 15 to 40 psig or higher, for cooling purposes. The conductors are insulated and wrapped in a lead or aluminum sheath to prevent moisture ingress and to withstand the internal fluid pressure. Conductors are spaced approximately 15 inches apart below ground. Oil reservoirs (10 to 40 gallon capacity, no pumping facilities) are installed every two to four thousand feet to accommodate fluid expansion and contraction.

To underground shorter, individual segments of an above ground transmission line, converting from an overhead to underground system would be required. Such conversions would be needed at each end of the underground segment and would require installation of conversion facilities. These facilities would require an approximate 120 square feet, fenced, and graveled site. Within the fenced area would be located a three-pole structure of same or larger magnitude as used on the overhead line to convert the line conductors. On these structures surge arrestors, insulators, and overhead to underground transformation terminators would be installed. The terminators sit atop the riser pipes that house the underground cable and lead to the underground system. Similar facilities would be required to convert the underground conductors to an overhead system. Also located on site would be fluid handling equipment such as storage tanks and pressurizing equipment.

Both the HPFF and SCFF system installation costs are approximately 12 times higher than that of an overhead system. In addition, maintenance costs are estimated to be up to 200 times higher than for an overhead line because of the routine (weekly, monthly, semiannual, and annual) monitoring required for a pressurized oil system. The identification and repair of cable failures is also more difficult and time consuming for both systems.

A third underground technology, Extruded Dielectric Cables, has proven reliable at 69 kV and 138 kV, has limited applications at 230 kV, and has not been installed in the U.S. at 345 kV (the Electric Power Research Institute is currently conducting research at 345 kV). For this reason, Extruded Dielectric Cables have been eliminated from further consideration because of technological constraints.

During construction, the environmental impacts of an underground transmission line would be similar to those for major pipeline construction. Construction of an underground transmission line would require a continuous trench, whereas overhead transmission line construction would result in disturbances to individual structure sites, located approximately every 1,200 feet, and the impacts associated with conductor stringing (overland travel).

Operation of a HPFF or SCFF system presents the possibility of an oil spill. With the HPFF system, if the pipe enclosure, storage tank, or pressurization system were to fail or be damaged a spill could occur. Likewise, failure or damage to the SCFF conductors or reservoirs could result in a spill. Damage to these facilities could occur due to rupture during an earthquake (both systems would be rigid, subject to breakage during seismic activity). Failure of system facilities could also occur because of corrosion, faulty seals, poor maintenance; human error; or vandalism. An oil spill and cleanup activities could result in the following significant impacts: plant and wildlife mortality, contamination of water bodies, disturbance of cultural resources, degradation of land use and recreational activities, and visual blight. Dielectric fluid filled systems also impose an added system safety risk of fire or explosion since the fluid is volatile. Line losses would also greater for underground systems than overhead transmission lines. If repair activities necessitate the replacement of underground conductors, excavation would be required, resulting in impacts similar to constructing an underground transmission line.

Although visual impacts would be mitigated and electric and magnetic field impacts would be partially mitigated with an underground system, potentially greater adverse environmental impacts could be expected because the majority of the right-of-way would be disturbed during construction and the environmental consequences of system failure during operation. Because of the technical complications and costs, and the potential adverse effects of undergrounding, an underground project was not considered a viable alternative and was eliminated from further consideration.

Other Transmission Technologies

Description. Other technologies that might be considered as an alternative for economical bulk-power transmission of electric energy from a generating source to load centers are microwave, laser, and superconductors.

Rationale for Elimination. Current research and development shows some promising indications that the above noted technologies may eventually be available for overhead transmission systems. However, none of these technologies are currently available for commercial use. Therefore, new technologies were eliminated from further consideration.

B.3.4.6 Transmission Alternatives

In accordance with the alternative screening criteria discussed in Section B.3.2, Transmission Alternatives were evaluated for their ability to satisfy the project objectives. Those Transmission Alternatives that could not satisfy the project objectives have been eliminated from further consideration and are described in Section B.3.4.6.1. For those transmission alternatives that could satisfy the project objectives, an assessment of the potential of these alternatives to provide clear environmental advantage in comparison to the Proposed Project was conducted (see Section B.3.4.6.2).

B.3.4.6.1 *Transmission Alternatives That Do Not Satisfy Project Objectives*

Enhancement of 230 kV Utah Intertie Alternatives

Description. SPPCo has an existing 230 kilovolt (kV) intertie east of the Fort Churchill Generating Plant near Yerington, Nevada, which connects to PacifiCorp's Pavant Substation in Utah and the LADWP's

Intermountain Generating Plant in Utah. SPPCo has studied several enhancements to this transmission line, including installing series capacitors in one or more locations, paralleling the existing line with another 230 kV transmission line, and building new interconnections between the 230 kV line and existing 120 kV or 345 kV facilities in the Winnemucca/Battle Mountain area. As illustrated on Table A.6-5 in Section A.6, Purpose and Need, these alternatives would offer 20-50 megawatts (MW) of additional import capacity (depending upon the alternative implemented), partial improvement to the service reliability in the Reno/Lake Tahoe area and limited additional, but indirect access to the Pacific Northwest power market.

Rationale for Elimination. SPPCo does not believe that the Utah Intertie Enhancement Alternatives offer enough import capability and access to the Pacific Northwest power market to meet its near-term needs. In addition, these alternatives would not provide a sufficient improvement in reliability needed for the Reno/Lake Tahoe area to remedy existing system limitations. Finally, SPPCo's assessment of the costs versus additional import capacity to be gained by the alternatives concluded that the Utah Intertie Enhancement Alternatives were less cost effective than other comparable alternatives considered (e.g. Frenchman Tap Project - see Section B.4.4.5). Therefore, these alternatives were eliminated from further consideration.

Intertie Alternatives to Nevada Power Company

Description. Several possible tielines with Nevada Power Company in Las Vegas, Nevada, have been considered by SPPCo, including various 230 kV and 345 kV lines from the Yerington, Tonopah, or Ely areas, south to Las Vegas. The Nevada Power Company interties would offer 66-153 MW of additional import capacity, depending on the alternative implemented, and a comparable increase in indirect access to the Pacific Northwest power market (see Section A.6).

Rationale for Elimination. The Nevada Power Company interties would provide only partial relief to existing transmission system import limitations. The interties would not provide cost-effective, direct access to the Pacific Northwest power market. Further, SPPCo asserts that most of these alternatives would not improve service reliability to the Reno/Lake Tahoe area. Therefore, these alternatives were eliminated from further consideration.

B.3.4.6.2 ***Transmission Alternatives That Reasonably Satisfy Project Objectives***

The following alternatives, either individually or collectively, could satisfy the Proposed Project objectives. These alternatives are described below and are assessed for their ability to provide environmental advantage over the Proposed Project. Since these projects have only been preliminarily studied by SPPCo for their technical feasibility and estimated cost, no site specific routing information is available. Therefore, the environmental analysis of these alternatives is limited to a qualitative assessment. The approximate routes for these transmission alternatives are shown on Figure B.3-3. Table B-13 summarizes the ability of the transmission alternatives to satisfy the project objectives, individually and collectively (see Section A.6 and Table A-8 for a complete description of project objectives and the ability of the transmission alternatives to satisfy them, respectively).

As presented in Table B-13, the Nevada Route, Summer Lake-Valley Road, and the Pacific DC Intertie Tap alternatives are each capable of reasonably achieving all of the primary project objectives, but would not achieve the secondary project objectives of a future intertie to Lassen Municipal Utility District (LMUD) and the provision of transmission facilities to future North Valley customers. These alternatives are analyzed below for their potential to eliminate or reduce the environmental impacts of the Proposed Project. Further, a feasible alternative is one that can be "accomplished within a reasonable period of time, taking into account economic, legal, social and technological factors" (*Citizens of Goleta Valley, et al.).* These factors are also taken into consideration in the assessment of all the Transmission Alternatives discussed in this section.

The Midpoint-Toano-Carlin-Valmy, Midpoint-Carlin-Valmy, and Burns-Oreana Alternatives are each capable of reasonably satisfying the project objective of increased import capacity. In addition, these alternatives would provide SPPCo with indirect access to the Pacific Northwest power market via Idaho Power Company (IPC). .However, to fully realize the potential economic benefits of this project objective, "direct" versus "indirect" access is preferred by SPPCo because direct access would save IPC wheeling charges, although other wheeling charges may be incurred depending upon whether purchases are from BPA or other utilities wheeling through BPA's system. Since CEQA Guidelines require the consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives," this objective is considered to be reasonably satisfied by the subject alternatives. None of these alternatives would improve the service reliability to the Reno/Lake Tahoe area or provide for future interconnection to LMUD. Since the Tracy-Silver Lake Alternatives would improve service reliability to the Reno/Lake Tahoe area (see Table B-13), these alternatives are considered collectively with the Midpoint-Toano-Carlin-Valmy, Midpoint-Carlin-Valmy, and Burns-Oreana Alternatives in this Section. These alternatives, when considered collectively, could reasonably satisfy all of the project objectives with the exception of future interconnection to LMUD.

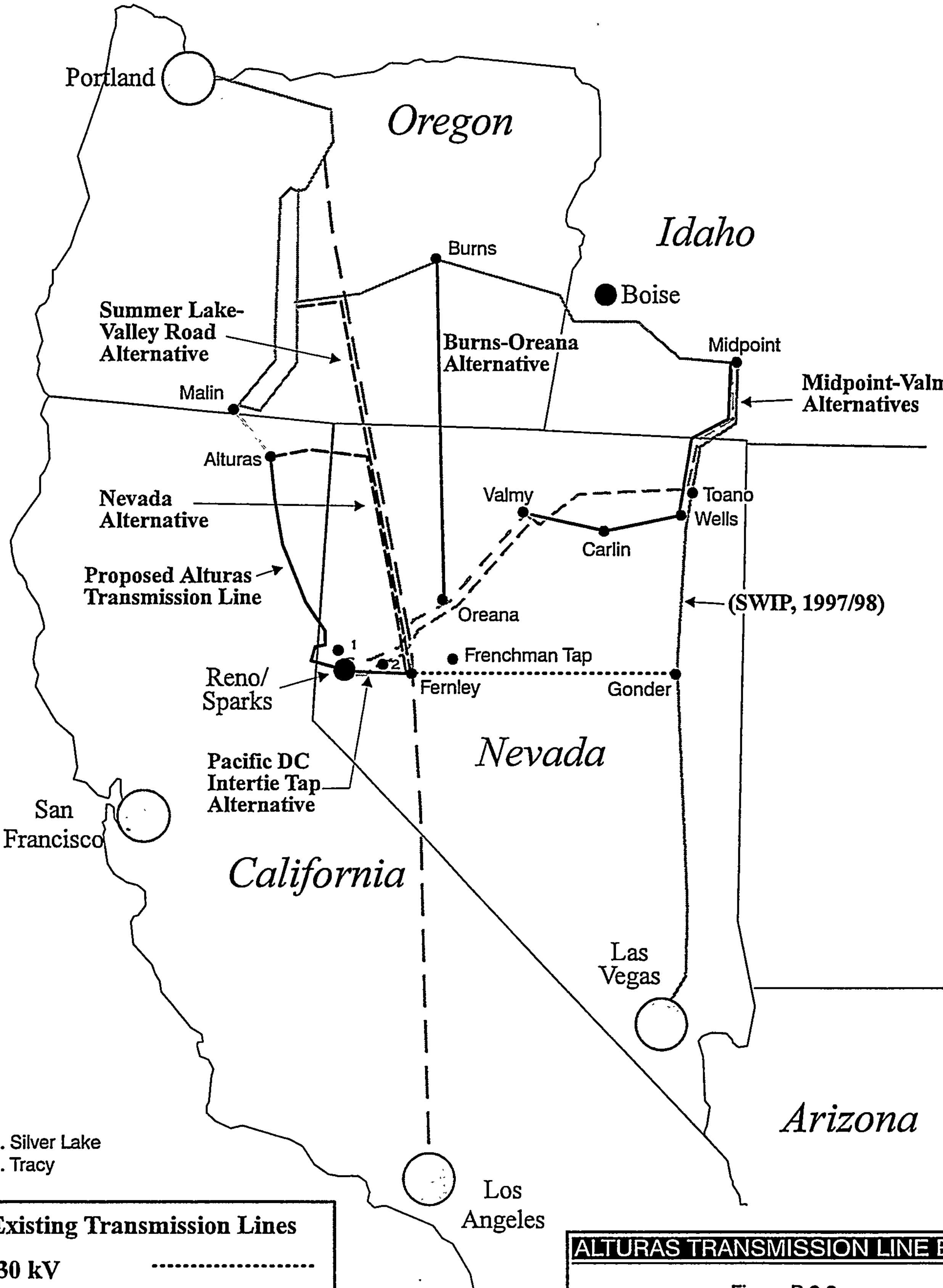
The Frenchman Tap Alternative is considered to be capable of reasonably satisfying the project objective of increased import capacity, even though the alternative would not be able to completely remedy existing system limitations. This alterative would not be able to satisfy, even partially, any of the other project objectives. When assessing this alternative in conjunction with the other Transmission Alternatives presented in Table B-13, the Frenchman Tap Alternative does not provide any complementary benefits.

Table B-13 Transmission Alternatives vs. Project Objectives Summary

Transmission Alternatives	Primary Project Objectives[1]			Secondary Objectives and Benefits[2] (LMUD, Exports, Pg&e Deferral, Comm. Benefits)
	Increase Import Capacity from 360 MW to 600 MW	Improve System Security and Reliability West of Tracy	Access to Pacific Northwest Power Market	
LADWP CORRIDOR ALTERNATIVES				
Nevada Route Alternative	Y	Y, except for providing transmission service to North Valley	Y	Y, except LMUD intertie
Summer Lake-Valley Road Alternative	Y	Y, except for providing transmission service to North Valley	Y	Y, except LMUD intertie
MIDPOINT-VALMY ALTERNATIVES				
Midpoint-Toano-Carlin-Valmy Alternative	Y	N, except for partial improvement in voltage control	Y, indirect access only	Y. except LMUD intertie
Midpoint-Carlin-Valmy Alternative	Y	N, except for partial improvement in voltage control	Y, indirect access only	Y, except LMUD intertie
TRACY-SILVER LAKE ALTERNATIVES				
120 kV from East Tracy to Silver Lake Substation	N	Y	N	N
345 kV from East Tracy to Silver Lake Substation	N	Y	N	N
OTHER				
Burns-Oreana Alternative	Y	N	Y, indirect access only	Y, except LMUD intertie
Pacific DC Intertie Tap Alternative	Y	Y, except for providing transmission service to North Valley	Y	Y, except LMUD intertie
Frenchman Tap Alternative	Y, but ability to fulfill existing inadequate system requirements is only partially fulfilled.	N	N	N

Y = Yes, expected to reasonably satisfy objective or provided stated benefit.
N = Not expected to satisfy objective or provide stated benefit beyond an insignificant increment.

1 The primary objectives of the Proposed Project are those considered critically necessary for SPPCo to operate within prudent utility practices.
2 The secondary objectives and benefits are considered indirect benefits of the Proposed Project and are not considered principal to the Proposed Project justification by satisfying critical needs.



Existing Transmission Lines

230 kV	....
345 kV	— — — — — —
500 kV AC	————————
1000 kV DC	—— —— ——

Note: Not to scale

ALTURAS TRANSMISSION LINE EIR/S

Figure B.3-3

Vicinity Map of Proposed Project and Alternatives

LADWP Corridor Alternatives

Two alternatives were considered that would travel within the LADWP 1000 kV DC transmission line corridor. These alternatives included the Nevada Route Alternative and the Summer Lake-Valley Road Alternative. The main advantage of the LADWP Corridor Alternatives would be the avoidance of adverse impacts along the Proposed Project route while still achieving the project objectives. However, this advantage would be offset by comparable impacts imposed by the alternative routes, including impacts to biology, land use, soils, hydrology, visual, and historic resources. The alternative routes would also present technological and economic constraints.

Nevada Route Alternative

Description. The Nevada Route Alternative offers a route alternative that travels mostly adjacent to existing powerline routes, particularly the LADWP 1000 kV DC transmission line, which runs in a north-south direction through the northwest part of Nevada. The basis for this recommendation was the potential environmental advantages of paralleling an existing utility corridor and passing through areas that may be less sensitive than the Proposed Project. This alternative would originate in the eastern portion of Alturas, California, and proceed east into Nevada and then south to the Fernley (Nevada) area, where it would proceed west to the Reno area as shown on Figure B.3-3 and described below. It would be approximately 230 miles in total length and travel as follows:

- **Alturas to LADWP Corridor (47 miles).** The Nevada Route Alternative would probably originate on the east side of Alturas near the BPA Warner Substation. The route would proceed eastward across the Warner Mountains, through the Cedarville area, and across Surprise Valley and the California-Nevada border. It would cross the Hays Canyon Range, joining the LADWP corridor on the east side of Long Valley, near Fortynine Lake.

- **LADWP Corridor (150 miles).** The route of the LADWP DC transmission line would be picked up on the east side of Long Valley at a point about four miles northeast of Fortynine Lake. This route segment would parallel the LADWP line all the way south to the vicinity of Fernley, Nevada, which is located along Interstate 80, about 30 miles east of Reno.

  The LADWP line proceeds south through Long Valley, west of Fox Mountain and the Granite Range, through Squaw Valley and the very northeastern edge of the Smoke Creek Desert, to just west of the town of Gerlach. From there the line skirts the southwest edge of the Black Rock Desert, proceeding south through the northeastern portion of the San Emidio Desert, crossing the low northern end of the Lake Range and Poito Valley (between the northern end of Winnemucca Lake and the Selenite Range, which includes Kumiva Peak). The line passes in a southeasterly direction through the saddle between the Selenite Range and the Nightingale Mountains and then proceeds south along the eastern foothills of the Nightingale Mountains. It continues south through the Truckee Range and eventually crosses Interstate 80 about three miles east of Fernley. However, the Nevada Route Alternative, as suggested herein, would turn west toward Reno in the area where the LADWP line crosses the east-west transmission line corridor located less than one mile north of Interstate 80.

- **Fernley-Reno Corridor (30-34 miles).** This portion of the route would parallel existing power lines along the north side of Interstate 80 from the LADWP line intersection point (about four miles northeast of Fernley) to the Reno area.

The Nevada Route Alternative would probably involve a new Alturas Substation site (on the east side of Alturas) and a different substation site in the Reno area to replace the proposed Border Town Substation. System tie-in would need to occur at the North Valley Road Substation site. This alternative would achieve the project objectives of increasing import capacity, improving service reliability to the Reno/Lake Tahoe area and providing direct access to the Pacific Northwest power market. However, as discussed below, the feasibility of this alternative is subject to existing land use constraints within the City of Sparks and northern Reno area, as well as eastern Alturas and the Cedarville area.

Rationale for Elimination. The analysis of the Nevada Route Alternative involved the solicitation of comments from various resource management and planning agencies, including the U.S. Bureau of Land Management (BLM), California Department of Fish and Game (CDFG), U.S. Forest Service (USFS), U.S. Fish and Wildlife Service, Modoc County, Lassen County, LMUD, Nevada Division of Wildlife, Nevada Air National Guard, Public Service Commission of Nevada, LADWP, Pyramid Lake Paiute Tribe, Truckee Meadows Regional Planning Agency, and the City of Sparks. The merits of the Nevada Route as an alternative to the Proposed Project are summarized below.

Potential environmental impacts of the Nevada Route Alternative include the following:

Land Use and Wildlife Impacts in the Eastern Alturas Area. Development of a substation and the initial portion of the Nevada Route Alternative in the eastern Alturas area would likely traverse many more private properties and place more residences in close proximity to the line as compared with the Proposed Project. In addition, the desire to avoid the XL Ranch Indian Reservation leaves few, if any, options for traversing the highly sensitive wildlife corridor between the north fork of the Pit River and Dorris Reservoir.

Soil and Hydrology Impacts in the Warner Mountains (Cedar Pass). The Nevada Route Alternative would need to cross the Warner Mountains (east of Alturas) in the area of Cedar Pass. Steep topography and highly erodible soils in the Warner Mountains would likely present significant erosion and sedimentation impacts, requiring special structure design and construction techniques.

Land Use Impacts East Warner Mountains. If the Nevada Route Alternative crossed the Warner Mountains in the area of Cedar Pass, it could travel within an existing Modoc National Forest designated utility corridor. Following this corridor east of the Warner Mountains, the alternative would traverse the Town of Cedarville, traversing additional private properties and placing additional residences in close proximity to the line.

Biological and Hydrological Impacts in Surprise Valley. The biological resource value and sensitivity of the Surprise Valley area is significant. Of particular concern in this area are sandhill cranes, wintering bald eagles, wetlands, rare shrimp species, and antelope kidding areas near the Nevada border. In addition, the Nevada Route Alternative would need to cross Middle Alkali Lake located within Surprise Valley. Given the periodic flooding of the lake, special structure foundations would be required (California State Route 299 crosses this area by means of a causeway).

Scenic and Historical Impacts East of Surprise Valley. From the California-Nevada border to the point the Nevada Route Alternative intersects the LADWP corridor near Fortynine Lake, the alternative route would be close to or within the one-mile wide Applegate-Lassen Emigrant Trail corridor. The Nevada portion of the Trail is on the National Register of Historic Places. In association with this historical resource designation, the BLM has also designated the corridor of Nevada State Route 8A (eastward extension of California State Route 299) as a Scenic Byway.

Environmental Impacts in Nevada. As discussed in Section B.4.4.1.1, approximately 150 miles of the Nevada Route Alternative would travel parallel to the existing Los Angeles Department of Water and Power (LADWP) 1000 kV transmission line. The 200-foot wide right-of-way for this transmission line was granted by the BLM in 1967. Since the LADWP right-of-way was granted prior to the adoption of the National Environmental Policy Act (NEPA) (adopted in 1969), no environmental review was conducted prior to the granting of the right-of-way and therefore, limited information is currently available on the environmental resources along the proposed alternative route within Nevada.

When consulted, the Nevada Division of Wildlife expressed specific concerns regarding the extensive sage grouse, antelope, and mule deer resources that could be affected along much of the alternative route. In addition, the southern end of the route could affect wintering bald eagles and waterfowl in the Truckee River corridor. The Division also noted that limited information is available on the effectiveness of revegetation in areas of drier ecology and the significance of limited water resources. In addition, the BLM (Winnemucca District) and Pyramid Lake Paiute Tribe noted that the Winnemucca Lake and San Emidio Desert areas, two areas the LADWP right-of-way traverses, are highly sensitive for cultural resources.

Impacts in the Northern Sparks and Reno Area. As discussed in Section A.6, in order for the Proposed Project, or any transmission or generation alternative, to improve service reliability to the Reno/Lake Tahoe area, connection to SPPCo's North Valley Road Substation would be required. This need is based on existing limitations of the Tracy-to-North Valley connections and projected load increases in the Reno/Lake Tahoe area. For the Nevada Route Alternative to access the North Valley Road Substation, the route would likely need to cross a severely constrained and rapidly growing area of the City of Sparks (to the north) and the northern Reno area. These growing areas are also located within the Truckee Meadows Air Basin, a non-attainment classified air basin for both State and Federal ambient air quality standards, resulting in possible significant air quality impacts. This routing could also result in significant property ownership constraints and potentially significant land use and visual impacts. For example, in the area of northern Sparks, the Nevada Alternative would need to traverse lands designated as Low Density Residential allowing 3 to 7 dwelling units per acre. When traversing northern Reno, the alternative would cross Low Density Residential (3 to 7 dwelling units per acre) and Medium Density Residential (7 to 21 dwelling units per acre) lands. In addition, given that the alternative would be traversing an urban area, electric and magnetic field (EMF) concerns would be significant, because separation distances from sensitive resources would be restricted due to limited available space (see discussion below on utility corridor requirements).

Public comments were received on the Draft EIR/S suggesting that the transmission line be placed underground when traversing the urbanized Sparks and northern Reno areas. As discussed in Section B.3.4.6, in addition to construction impacts (land use, air quality, traffic, etc.), an underground transmission line imposes the risk of oil spill, and fire and explosion during operation. Line losses would also be greater. Although visual and electric and magnetic field impacts would be mitigated with an underground system, potentially greater adverse environmental impacts (especially air quality and transportation) could be expected because the majority of the right-of-way would be disturbed during construction, and because of the potential environmental consequences of system failure during operation.

Public comments were also received on the Draft EIR/S suggesting that a system of smaller, 120 kV and 230 kV transmission lines be used when traversing the urbanized northern Sparks and Reno areas, in lieu of one 345 kV line. While this option provides some relief to visual impacts along a single right-of-way, since shorter structures would be required, a system of multiple transmission lines (whether directly parallel or separated) would result in cumulative visual impacts, because multiple right-of-ways would be required. Multiple right-of-ways would exacerbate property owner and land use concerns. In addition, construction impacts (air quality, transportation, etc.) would be more significant since several projects would need to be constructed.

Additional Considerations. The Nevada Route Alternative would travel primarily within the LADWP transmission line corridor, designated by the BLM as a "utility corridor." Both the BLM and USFS designate corridors to concentrate facilities into a specific area or concentrated linear area. Through the consolidation of corridors, agencies can minimize the number of separate right-of-ways, identify preferred locations for future right-of-ways, and establish joint-use planning corridors, thereby, minimizing the environmental impacts of the utilities (Western Regional Corridor Study, 1992).

The Western System Coordinating Council (WSCC) has established reliability and operating criteria for their member utilities located in the fourteen western states (see Section A.2.1.2). Although the WSCC does not define specific separation distances, without adequate separation of transmission systems, WSCC criteria considers the simultaneous outage of parallel transmission facilities as a credible event, or an event that has a significant likelihood of occurring.

In order to mitigate reliability concerns with respect to an accident affecting both the Nevada Route Alternative and the LADWP line, a separation distance between the two lines of at least the distance of the spans between the structures (1200 feet or more, depending on LADWP span lengths) is recommended by LADWP.

The Nevada Route Alternative would require the construction of about 30 miles of 345 kV line from the Fernley area to SPPCo's North Valley Road Substation. From Fernley to Tracy, (approximately 15 miles east of Reno), no existing transmission corridors are available in which the alternative could travel. From Tracy to the North Valley Road Substation however, an existing SPPCo transmission line corridor could be utilized by the Nevada Route Alternative. This corridor contains a 345 kV and 120 kV transmission line, with 140 feet and 105 feet $\pm$ wide right-of-ways, respectively (or a 255 $\pm$ foot wide corridor). The separation distance between these two transmission lines is 200 feet. In many areas, urban development in the northern Sparks and Reno area, usually in the form of residential development, has encroached up to edge of the right-of-ways for these existing 345 kV and 120 kV transmission lines. Adding a third transmission line to this corridor would require expansion of the corridor into existing urbanized areas resulting in significant land use impacts; the City of Sparks estimates that up to 64 homes could be lost.

As previously noted, SPPCo has only conducted preliminary technical feasibility analyses and cost-estimates for the alternatives included in Table B-13 (except the Nevada Route Alternative, since this route was identified during the scoping process). Given the time required to permit, design, and construct projects of this magnitude, SPPCo estimates that these alternative facilities would not be available for operation until the year 2000. As discussed in Section A.6, given SPPCo's existing system limitations, SPPCo is currently unable to operate within prudent, WSCC operating criteria. This existing system shortcoming will only be exacerbated as loads continue to grow. As early as the summer of 1997, a 120 kV line that services the Reno area is projected to exceed its design power carrying capability. This condition could, if uncorrected, cause damage to the line, or to avoid line damage, result in an interruption of service to the Reno/Lake Tahoe area. Because SPPCo is a WSCC member utility, failure of the SPPCo system could also have ramifications on the service provided by other WSCC utilities. Interruptions of service in the Reno/Lake Tahoe area would impose economic impacts on all affected commercial and industrial activities. In addition, such interruptions could affect the responsiveness of emergency services. However, the responsibility in planning for the length of permitting processes is the Applicant's, and as such, has been given only minor consideration in the evaluation of alternatives.

For all of the reasons discussed above, the Nevada Route Alternative is not considered to offer environmental advantage in comparison to the Proposed Project.

Summer Lake-Valley Road Alternative

Description. The Summer Lake-Valley Road Alternative would involve the construction of a transmission line starting at PacifiCorp's existing 500 kV Summer Lake Substation (where BPA's 1000 kV DC line crosses it). The alternative would then follow the corridor of the LADWP line from northwestern Nevada to just east of Reno (see Figure B.3-3). This route would follow existing corridors from Summer Lake east to the LADWP 1000 kV DC line, then south to a point east of Reno where the line would turn west to Reno along existing SPPCo corridors and would terminate at the North Valley Road Substation. This route would be longer than the Nevada Route Alternative and the Proposed Project. This alternative would achieve the project objectives of increasing import capacity, improving service reliability to the Reno/Lake Tahoe area and providing direct access to the Pacific Northwest power market. However, as discussed in this section, the feasibility of this alternative is subject to existing land use constraints within the City of Sparks and northern Reno area.

Rationale for Elimination. As illustrated on Figure B.3-3, the alignment of the Summer Lake-Valley Road Alternative is the same as the Nevada Route Alternative with the exception of the northern segment (the Nevada Route Alternative turns west toward Alturas near Fortynine Lake, while the Summer Lake-Valley Road Alternative continues north to Summer Lake, Oregon). The Summer Lake-Valley Road Alternative is approximately 150 miles longer than the Nevada Route Alternative (approximately 25 additional miles within Nevada and 125 miles in Oregon). Since the Summer Lake-Valley Road Alternative introduces 25 additional miles of transmission line in Nevada, the environmental and economic effects of the Summer Lake-Valley Road Alternative in Nevada are expected to be more severe than the Nevada Route Alternative. In addition, the Summer Lake-Valley Road Alternative could impose biological and visual impacts in Oregon as it travels to Summer Lake. These impacts could be encountered as the alternative skirts the eastern end of the Abert Rim Wilderness Area and the northern boundary of the Summer Lake Wilderness Study Area. In addition, the alternative would cross U.S. 395 and Highway 140. The feasibility of this alternative is subject to the same delay ramifications as the Nevada Route Alternative, given required permitting, design, and construction timelines. For these reasons, the Summer-Lake Valley Road Alternative is not considered to be preferable to the Proposed Project.

Pacific DC Intertie Alternative

Description. The LADWP 1000 kV DC transmission line is also known as the Pacific DC Intertie. Under the Pacific DC Intertie Tap Alternative, SPPCo would connect directly into the LADWP line at its crosspoint with SPPCo's 230 kV lines (about 30 miles east of Reno). This alternative would require construction of only about 30 miles of 345 kV line from a new converter station near Fernley to the existing North Valley Road Substation.

The Pacific DC Intertie Tap Alternative would provide 400 MW in increased import capability and improve the service reliability for the Reno/Lake Tahoe area. While this alternative could provide direct access to the Pacific Northwest power market, this access is severely restricted since there is little, if any, available capacity on the 1000 kV DC transmission line. Further, as stated by SPPCo, the service reliability and import capability provided by a DC transmission interconnection is inferior to an AC interconnection such as the Proposed Project.

Rationale for Elimination. As discussed in relation to the LADWP Corridor Alternatives, in order for the Proposed Project or any transmission or generation alternative to improve the service reliability to the Reno/Lake Tahoe area, connection to the North Valley Road Substation would be required. The Pacific DC Intertie Tap Alternative would travel a path similar to the southern, east-west segment of the LADWP Corridor Alternatives (Fernley area to North Valley Road Substation), likely crossing a severely constrained and rapidly growing area of the City of Sparks. This would result in significant property ownership and EMF constraints in routing the line, as well as potentially significant land use, visual, and air quality impacts. In addition, the alternative would most likely travel within close proximity to the Truckee River and Interstate 80, imposing potential biological and water quality concerns, and adding to potential visual impacts.

The following utility corridor restrictions could occur with the Pacific DC Intertie Alternative:

As with the southern, east-west segment of the Nevada Route Alternative, the Pacific DC Intertie Tap Alternative would also require the construction of about 30 miles of 345 kV line from the Fernley area to SPPCo's North Valley Road Substation. Given that the Pacific DC Intertie Tap Alternative could be sharing an existing SPPCo corridor with a 345 kV and 120 kV line that traverses northern Sparks and Reno, significant land use impacts are expected when expanding the corridor width because of the encroachment of urban development to the edges of the existing corridor.

Other issues that are presented by the Pacific DC Intertie Alternative include:

Capacity of the LADWP Line. The LADWP 1000 kV DC transmission line is a major transmission line connecting the Pacific Northwest and the Pacific Southwest. The line is owned by southern California utilities (primarily LADWP and Southern California Edison). In addition, several Pacific Northwest utilities (Bonneville Power Administration [BPA], IPC and PacifiCorp) have access to the DC line through existing, contractual ownership agreements. While the LADWP 1000 kV DC transmission line has a total capacity of 3100 MW, bi-directional, the line is currently operating at near capacity during the peak transmission periods. As discussed in Section A.6.9.1, the Pacific Northwest has a large amount of hydroelectric generation capacity which peaks in output from water run-off from the snow melt during the spring and summer. One of SPPCo's primary objectives is to gain direct access to the Pacific Northwest power market, in particular the economical, hydroelectric generation in the spring and summer. Since little, if any, surplus capacity is available on the 1000 kV DC line during these periods, the Pacific DC Intertie does not appear to be able to satisfy this objective.

Permitting, Design, and Construction Timing. The feasibility of this alternative is subject to the same delay ramifications as the LADWP Corridor Alternatives, given required permitting, design, and construction timelines.

Alternative Costs. Despite the significantly shorter line construction requirements (30 miles versus 165 miles for the Proposed Project), SPPCo and BPA estimate that total construction costs for this alternative would be comparable to those of the Proposed Project (about $100 million). The major expense would be construction of the DC converter station near Fernley ($50 million).

For the reasons discussed above, the Pacific DC Intertie Tap Alternative is not considered to be preferable to the Proposed Project.

Midpoint-Valmy, Burns-Oreana, and Tracy-North Valley Alternatives

The Midpoint-Valmy (Midpoint-Toano-Carlin-Valmy and Midpoint-Carlin-Valmy), and Burns-Oreana Alternatives are major alternative transmission line projects in which SPPCo has been involved in preliminary feasibility studies. As summarized on Table A-8, these alternatives would increase the import capacity of the SPPCo system and provide indirect access to the Pacific Northwest power market (access would be less cost effective); reasonably satisfying these project objectives. These alternatives would not improve the service reliability to the Reno/Lake Tahoe area since they terminate at Valmy, thus increasing the supply on the Valmy-Tracy-North Valley corridor. Therefore, these alternatives are being considered in conjunction with the Tracy-Silver Lake Alternatives which offer the ability to improve the service reliability to the Reno/Lake Tahoe area. These combined alternatives would satisfy the primary project objectives.

Midpoint-Toano-Carlin-Valmy Alternative + Tracy-North Valley Alternatives

Description. The Midpoint-Toano-Carlin-Valmy Alternative proposes use of the northern 130-mile portion of the SWIP (500 kV transmission line) from the Midpoint Substation to a new substation at Toano. The SWIP is a 500 kV AC transmission line project proposed by Idaho Power Company. The north-to-south portion of SWIP would be approximately 520 miles long and extend from the Midpoint Substation in southern Idaho to a new substation in Ely Nevada area and then connect to a new substation just northeast of Las Vegas, Nevada. The east-to-west SWIP crosstie is a 500 kV transmission line to be constructed from the Intermountain Generating Station near Delta, Utah, to the new substation in the Ely, Nevada area. The project's north-to-south capacity rating is tentatively set at 1200 MW. A Final Environmental Impact Statement/Draft Plan Amendment has been prepared for SWIP and a Record of Decision and ROW grants were issued by the BLM in December, 1994. The anticipated in-service date for the SWIP is 1997/98.

At the Midpoint Substation two 500 kV breakers, a 500/345 kV tie bank and two 115 MVAR lines reactors would be installed. From Toano, a 112-mile 345 kV transmission line to Carlin would be built where a 345 kV to 120 kV tap and two reactors would be installed. From Carlin, the 345 kV transmission line would travel to Valmy, a distance of 63 miles. At Valmy, the alternative would require one 35 MVAR switched reactor, two 345 kV breakers and a new 345 kV cross bus. This alternative would improve the simultaneous import capacity of SPPCo's system by approximately 350 MW.

The Tracy-Silver Lake Alternatives considered by SPPCo include the construction of either a 120 kV or 345 kV transmission line from SPPCo's East Tracy Substation to Silver Lake Substation. The East Tracy Substation is located approximately 15 miles east of Reno and the Silver Lake Substation is located in the North Valley area. The 120 kV alternative would be able to satisfy existing and projected short-term limitations to the Reno/Lake Tahoe area, while the 345 kV alternative would be able to accommodate long-term needs. While these alternatives would improve the service reliability to the Reno/Lake Tahoe area, they would not improve system import capability or provide additional access to the Pacific Northwest power market. For this reason, these alternatives are considered in conjunction with the other transmission alternatives discussed in this Section.

Rationale for Elimination. Because the Midpoint-Toano-Carlin-Valmy Alternative utilizes the northern 130-mile segment of the SWIP line (approved December, 1994) from Midpoint to Toano, this discussion is confined to the potential environmental impacts of the alternative from Toano to Valmy. The 175-mile

Toano to Valmy portion of the alternative would travel west from Toano, crossing U.S. 93 and passing near the northern boundary of the Humbolt National Forest, East Humbolt Range Wilderness Area. The alternative would then continue west following Interstate 80 and the Humbolt River, imposing potential visual, biological and surface water quality impacts. From Carlin, the alternative would cross the Tuscarora Mountains and Sheep Creek Range as it continues west to Valmy. The extent to which resources in proximity to the designated utility corridor could be impacted by the alternative is contingent upon required separation distances and terrain constraints. With the exception of the East Humbolt Range Wilderness Area, the Western Regional Corridor Study does not identify any other designated resource areas (e.g., wilderness areas, Indian lands, wildlife refuges, etc.) within proximity to the alternative utility corridor. However, this does not preclude the avoidance of sensitive resources within the area.

Either Tracy-Silver Lake Alternative would involve the construction of 26 miles of transmission line in existing SPPCo utility corridors. These transmission line corridors travel into the northern Reno area from the east, traversing the northern area of Sparks. As a result, the impacts associated with either of these alternatives would be similar to those discussed above for the southern, east-west segment of the Nevada Route Alternative.

The following utility corridor restrictions could occur with the Midpoint-Toano-Carlin-Valmy Alternative and Tracy-North Valley Alternatives:

The entire 305-mile Midpoint-Toano-Carlin-Valmy Alternative could travel within existing BLM and USFS designated utility corridors. To comply with WSCC Operating Criteria, the northern 130 miles of the alternative (the SWIP line) would be separated from adjacent high capacity lines by 2000 feet in most areas (SWIP DEIS, June 1992). Smaller separations would be required for the remaining 175 miles of the Midpoint-Toano-Carlin-Valmy Alternative, since the utility corridor in which the alternative would travel does not currently contain major transmission facilities (230 kV or greater).

Existing SPPCo transmission line corridors could be utilized by the Tracy-Silver Lake Alternatives. These corridors include a joint 345 kV and 120 kV corridor from SPPCo's East Tracy Substation to the North Valley Road Substation, and a 120 kV corridor from the North Valley Road Substation to the Silver Lake Substation. To comply with WSCC Operating Criteria, adequate separation distances between the transmission lines would be required to avoid a simultaneous failure. The ability of the existing corridor widths to satisfy necessary separation distances is dependent upon the size of the alternative line (120 kV or 345 kV), the terrain, environmental resources, and existing land uses.
The feasibility of this alternative is subject to the same delay ramifications as the LADWP Corridor Alternatives, given required permitting, design, and construction timelines.

For the reasons discussed above, these combined alternatives are not considered preferable to the Proposed Project.

Midpoint-Carlin-Valmy Alternative + Tracy-North Valley Alternatives

Description. The Midpoint-Carlin-Valmy Alternative proposes the construction of a 242-mile 345 kV transmission line from Midpoint Substation to a new substation at Carlin. At the Midpoint Substation two 345 kV 50 MVAR switched reactors and a 345 kV PCB line terminal would be required. From Carlin, the 345 kV transmission line would travel to Valmy, a distance of 63-miles. At Valmy, the alternative would require a 35 MVAR switched reactor and two 345 kV PCB line terminals. This alternative would improve the simultaneous import capacity of SPPCo's system by approximately 300 MW and is considered in conjunction with the Tracy-North Valley Alternatives, as previously described.

Rationale for Elimination. The 305-mile Midpoint-Carlin-Valmy Alternative would follow a path similar to the Midpoint-Toano-Carlin-Valmy Alternative. However, the Midpoint-Carlin-Valmy Alternative is expected to have additional impacts to those of the Midpoint-Toano-Carlin-Valmy Alternative since the northern segment of the alternative would not utilize the approved SWIP line. This would involve the construction of approximately 130 additional miles of transmission line. In addition, the Midpoint-Carlin-Valmy Alternative would most likely not be available for operation until the year 2000, imposing the same feasibility constraints as the LADWP Corridor Alternatives. For these reasons, these combined alternatives are not considered preferable to the Proposed Project.

Burns-Oreana Alternative + Tracy-North Valley Alternatives

Description. The 250-mile Burns-Oreana Alternative would involve the construction of a transmission line to connect the PacifiCorp Burns 500 kV substation in eastern Oregon to SPPCo's Valmy-Tracy double circuit 345 kV transmission system at Oreana (approximately halfway between Tracy and Valmy, northeast of Reno, Nevada). This line would follow all or part of the existing corridor for SPPCo's 120 kV line from Burns, Oregon to Oreana, Nevada. Similar to the SWIP/Midpoint-Valmy Alternatives, the Burns-Oreana Alternative would provide 350 MW in increased import capability and indirect access to the Pacific Northwest power market. No improvement in service reliability for the Reno/Lake Tahoe area would be achieved with this alternative; therefore, it is considered in conjunction with the Tracy-North Valley alternatives, as previously described.

Rationale for Elimination. 250-mile Burns-Oreana Alternative would travel approximately 120 miles from Burns, Oregon in a southerly direction to the Oregon-Nevada border. Once in Nevada, the alternative would proceed south to Oreana. Within Oregon, the alternative would travel between the Harney Lake and Malheur Lake Wildlife Refuge areas, traversing the western and eastern boundaries of each refuge, respectively. As the line continues south, it would travel along the western boundary of the Donner and Blitzen River Wildlife Refuge and Wilderness Study Area. To the south of the Donner and Blitzen River Wilderness Study Area, the alternative could travel in either of two designated utility corridors; both running north-south. The western utility corridor would have the alternative skirting the eastern boundary of the Charles Sheldon Antelope Range Wilderness Study Area as it leaves Oregon and enters Nevada. The western utility corridor option then travels south for 40 miles at which point it crosses the Fort McDermitt Indian Reservation at Quinn River Lakes. If the eastern utility corridor is chosen, the alternative would travel east 20 miles, and then turn south, traversing the eastern boundary of the Trout Creek Wilderness Study Area. At the Oregon-Nevada border, this eastern utility corridor would travel just west of the Fort McDermitt Indian Reservation, northwest of McConnell Peak, and then continue south for approximately 40 miles where it would rejoin the western utility corridor option. From this point, the Burns-Oreana Alternative would continue south passing through the Winnemucca area (an area of sensitive cultural resources) and traversing the eastern boundary of the Rye Patch State Recreation Area before it enters the Oreana area. The extent that resources within proximity to the designated utility corridor could be impacted by the alternative is contingent upon required separation distances and terrain constraints.

The Burns-Oreana Alternative would also parallel State Highway 205 in Oregon for approximately 60 miles. In Nevada, if the western corridor option is selected, the alternative would parallel State Highway 140 for about 40 miles. From Winnemucca to Oreana, the alternative would be adjacent to Interstate 80. The proximity of the alternative to these major roadways could impose significant visual impacts.

As previously discussed, since the Tracy-Silver Lake Alternatives would need to travel into the northern Reno area from the east, they would most likely need to traverse the northern area of Sparks. As a result, the impacts associated with either of these alternatives would be similar to those discussed for the southern, east-west segment of the Nevada Route Alternative and Pacific DC Intertie Tap Alternative.

The following utility corridor restrictions could occur with the Burns-Oreana Alternative and Tracy-North Valley Alternatives:

The entire 250-mile Burns-Oreana Alternative could travel within existing BLM and USFS designated utility corridors. These corridors contain existing SPPCo 120 kV lines. Unlike the other joint utility alternatives discussed, the Burns-Oreana Alternative would require smaller separations between lines because of the capacity of existing lines (120 kV versus 345 kV or greater). However, if terrain or environmental resources prohibit adequate separation, rerouting of the alternative outside of the designated utility corridor could still be required. Other factors such as harmonic interference, impulse voltage, and ground resistivity would also need to be taken into consideration.

As previously discussed, existing SPPCo transmission line corridors could be utilized by the Tracy-Silver Lake Alternatives. The ability of the existing corridor widths to satisfy necessary separation distances is dependent upon the size of the alternative line (120 kV or 345 kV), terrain, environmental resources, and existing land uses.

The feasibility of this alternative is subject to the same delay ramifications as the LADWP Corridor Alternatives, given required permitting, design, and construction timelines.

For the reasons discussed above, these combined alternatives are not considered preferable to the Proposed Project.

Frenchman Tap Project

Description. Oxbow Power, Inc. owns and operates a 230 kV line constructed to deliver geothermal power generated in Dixie Valley (north-central Nevada) to the Southern California Edison (SCE) Company at Bishop, California. This line crosses SPPCo's 230 kV system near Sand Springs Pass, Nevada. This alternative would feature a 230 kV interconnection point between the Oxbow line and SPPCo's system including a 230 kV phase shifter to control power flow. This alternative would provide some import capacity to SPPCo (25-135 MW depending upon extent of modifications), but the major benefits would be added transmission service potential, increased reliability, operating flexibility and voltage regulation. In addition it would provide additional markets for power sales and purchases.

SPPCo's April 1, 1993 Electric Resource Plan, prepared for the Public Service Commission of Nevada, states that

> ... continued development of the Frenchman Tap project is warranted as it would provide future purchase power alternatives ... and a purchase power path if a large industrial customer project is accelerated. The system benefits offered by the Frenchman Tap interconnection and the potential for SPPCo to make short term (up to 10 years) purchases from SCE make it likely that SPPCo would bring this project to the Public Service Commission of Nevada for approval at a later date, possibly in conjunction with a purchase power contract.

While SPPCo may continue its evaluation of this project, it states that this project could not replace the Proposed Project because it would provide less power. In addition, it would not provide the import capability needed for Reno/Tahoe area, or import capability to meet northern Nevada resource requirements. For this reason, this alternative is considered in combination with other alternatives identified in this Section which, when considered together, may meet the Proposed Project objectives.

Rationale for Elimination. As previously discussed, this alternative would only be able to reasonably satisfy the project objective of increased import capacity. However, when considering the benefits of this alternative in conjunction with the objective benefits of the other transmission alternatives, the Frenchman Tap Alternative does not provide any complementary benefits. Therefore, this alternative has been eliminated from further consideration.

B.4 DESCRIPTION OF PROJECT ALTERNATIVES ANALYZED IN THIS EIR/S

As discussed in Section B.3, alternatives were assessed for their ability to reasonably achieve the project objectives and reduce the significant environmental impacts of the Proposed Project. Based on this screening criteria, the following alternatives were selected for further consideration within this EIR/S.

B.4.1 ALTERNATIVE ROUTE ALIGNMENTS

As described in Section B.3.3, alternative route alignments would replace one or more segments of the proposed Alturas Transmission Line route. Figures B.4-1 through B.4-5 show all of the following alternative route segments. In addition, the alternative routes are illustrated on the base maps at the end of Volume I. These alternatives are described below and are evaluated within each environmental issue area of Part C.

B.4.1.1 Alturas Area Alternative Alignment (Segment B)

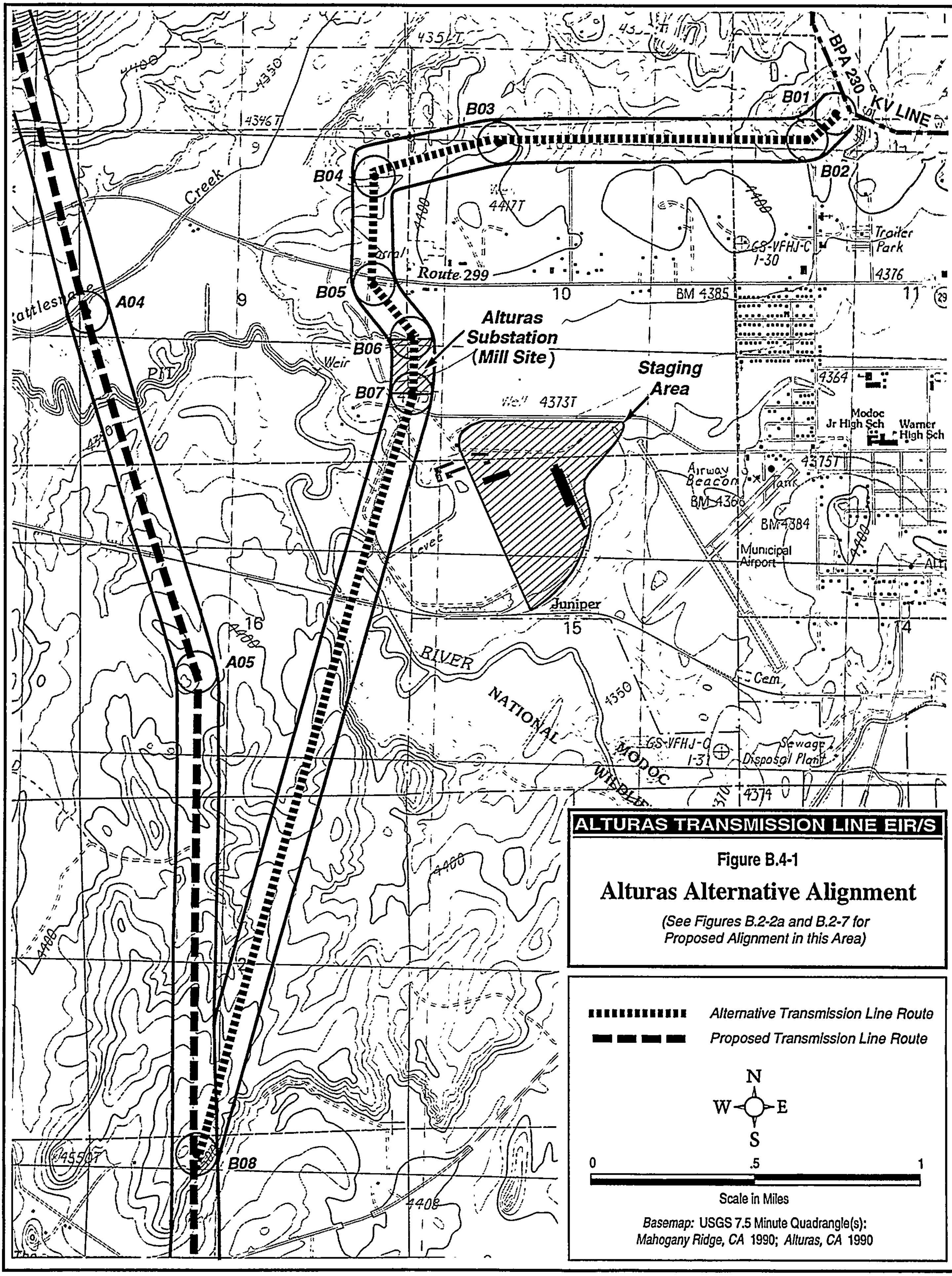
Alternative Segment B would replace the majority of Proposed Segment A and would initiate at a location on the west side of Alturas, north of Highway 299 where it would tie-in to the BPA 230 kV transmission line. From Angle Points BØ1 to BØ2 the alternative extends in a southwesterly direction for about 1.2 miles from the BPA tap point, across agricultural lands, adjacent to the northern terminus of Warner Avenue. From Angle Point BØ2, Alternative Segment B turns west and crosses open, grass fields, to Angle Point BØ4. From Angle Point BØ2 to BØ4, the alternative passes approximately 500 feet south of the Alturas golf course, and north of a few rural residences that form the southern boundary of the grass field. Between Angle Points BØ1 and BØ4, Alternative Segment B crosses several powerlines and a telecommunications line. At Angle Point BØ4, the alternative turns due south, crossing Highway 299 to Angle Point BØ5, and then southeast to Angle Point BØ6 and the Alturas Substation Mill Site Alternative, located in an open field south of Highway 299. From Angle Point BØ6, south to the convergence with Proposed Segment A, Alternative Segment B turns south and then southwest, crossing the Pit River and its associated wetlands, the Modoc National Wildlife Refuge, a telecommunications line, a power line and a railroad. The terrain is relatively flat and primarily contains shrub vegetation, wetland vegetation, and some agricultural and grazing lands. Before reaching the convergence point with Proposed Segment A, Alternative Segment B crosses low plateaus with exposed volcanic rims, as well as County Road 54 (Centerville Road), just east of its intersection with County Road 76.

Alternative Segment B: 4.6 miles Proposed Segment A: 7.1 miles

B.4.1.2 Madeline Plains Alternatives (Segments D, F, G, H, I)

Numerous alternative route alignments have been identified by the applicant for the western area of the Madeline Plains. These alternative segments, in combination, would replace Proposed Segment E. These alternatives were developed to reduce impacts to wetlands areas and to minimize land use conflicts along the proposed route.

Alternative segment D,F,G,H,I: 25 miles (approx.) Proposed Segment E: 18.1 miles



ALTURAS TRANSMISSION LINE EIR/S

Figure B.4-1

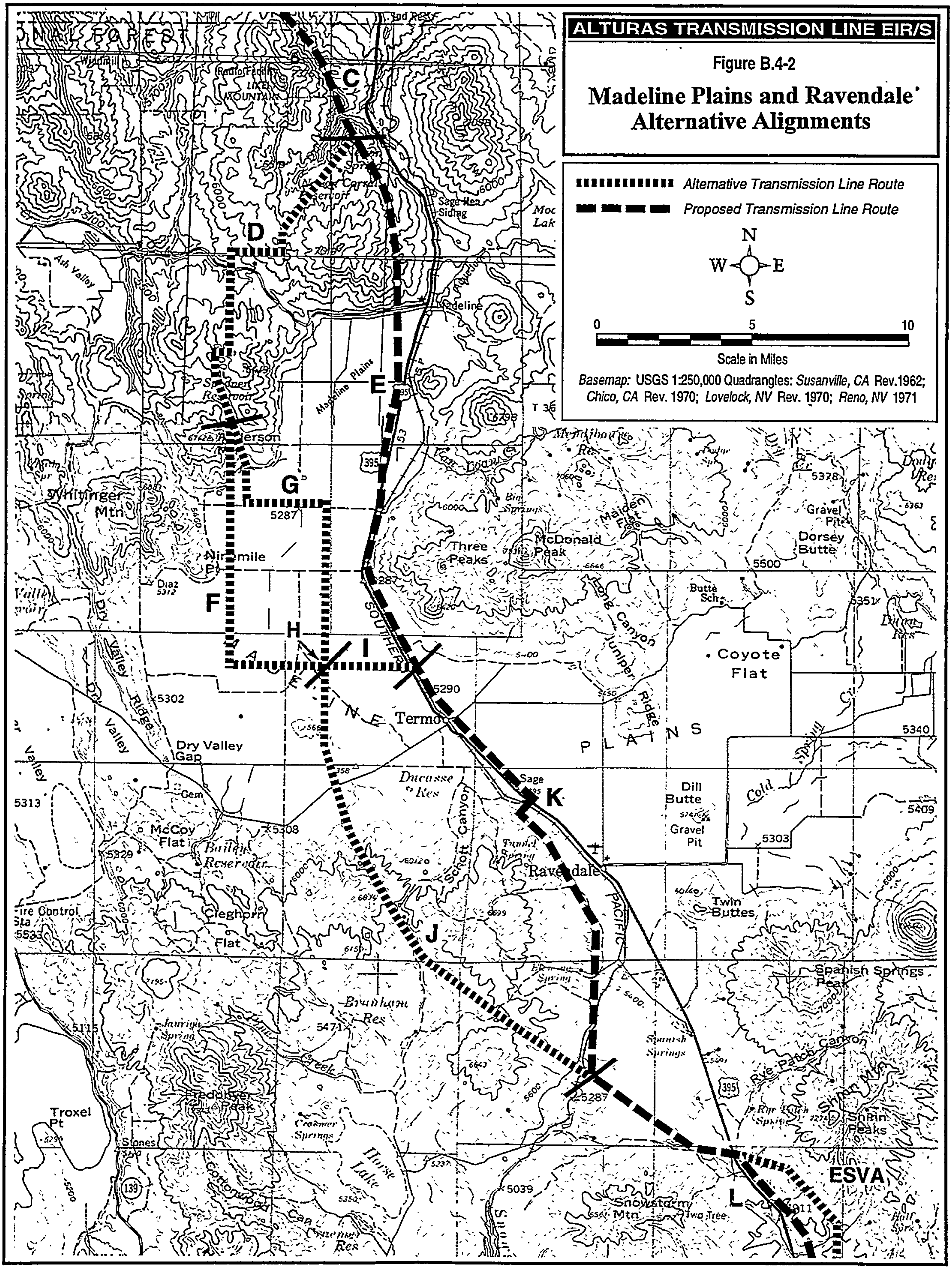
Alturas Alternative Alignment

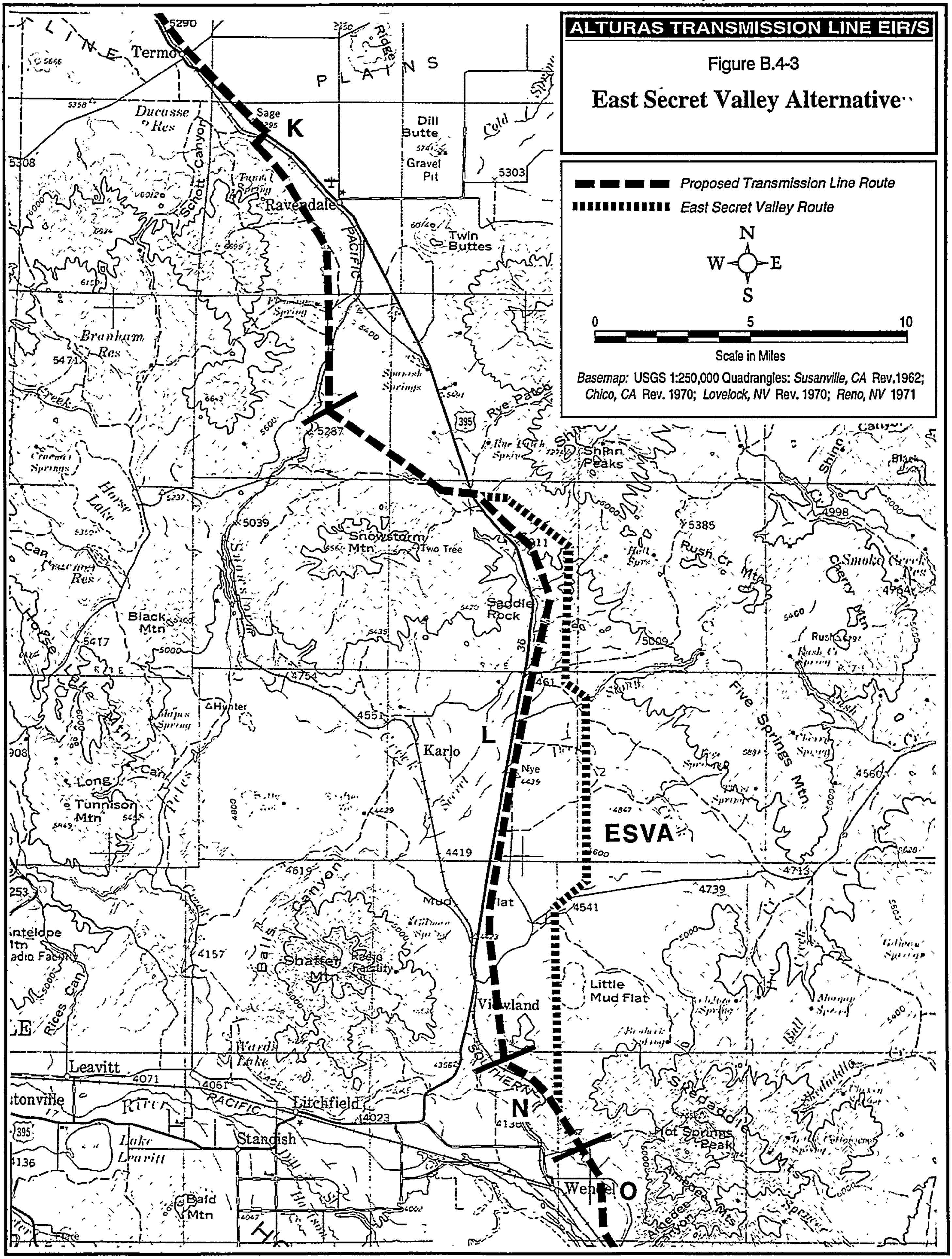
(See Figures B.2-2a and B.2-7 for Proposed Alignment in this Area)

ALTURAS TRANSMISSION LINE EIR/S

Figure B.4-2

Madeline Plains and Ravendale Alternative Alignments

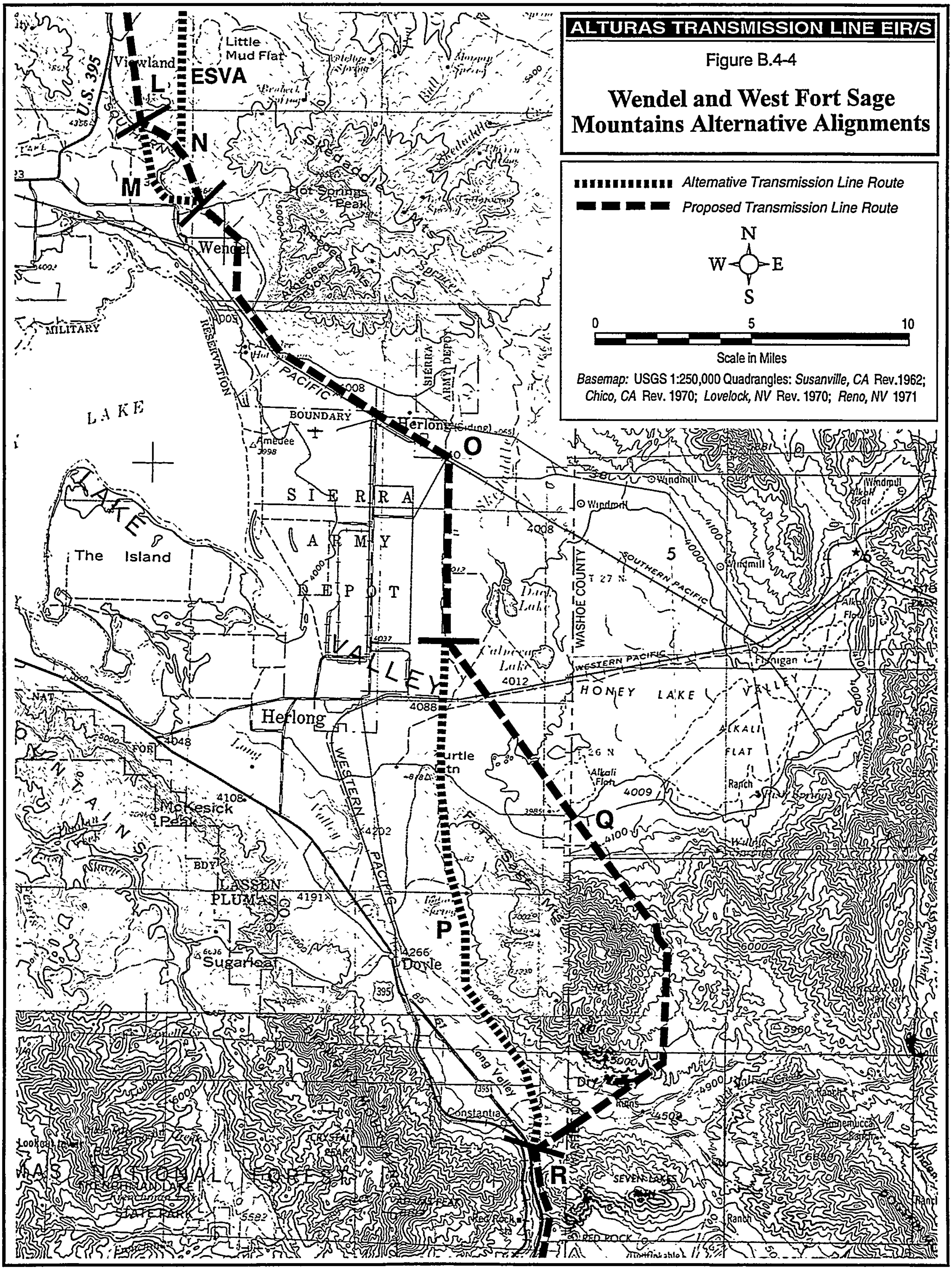


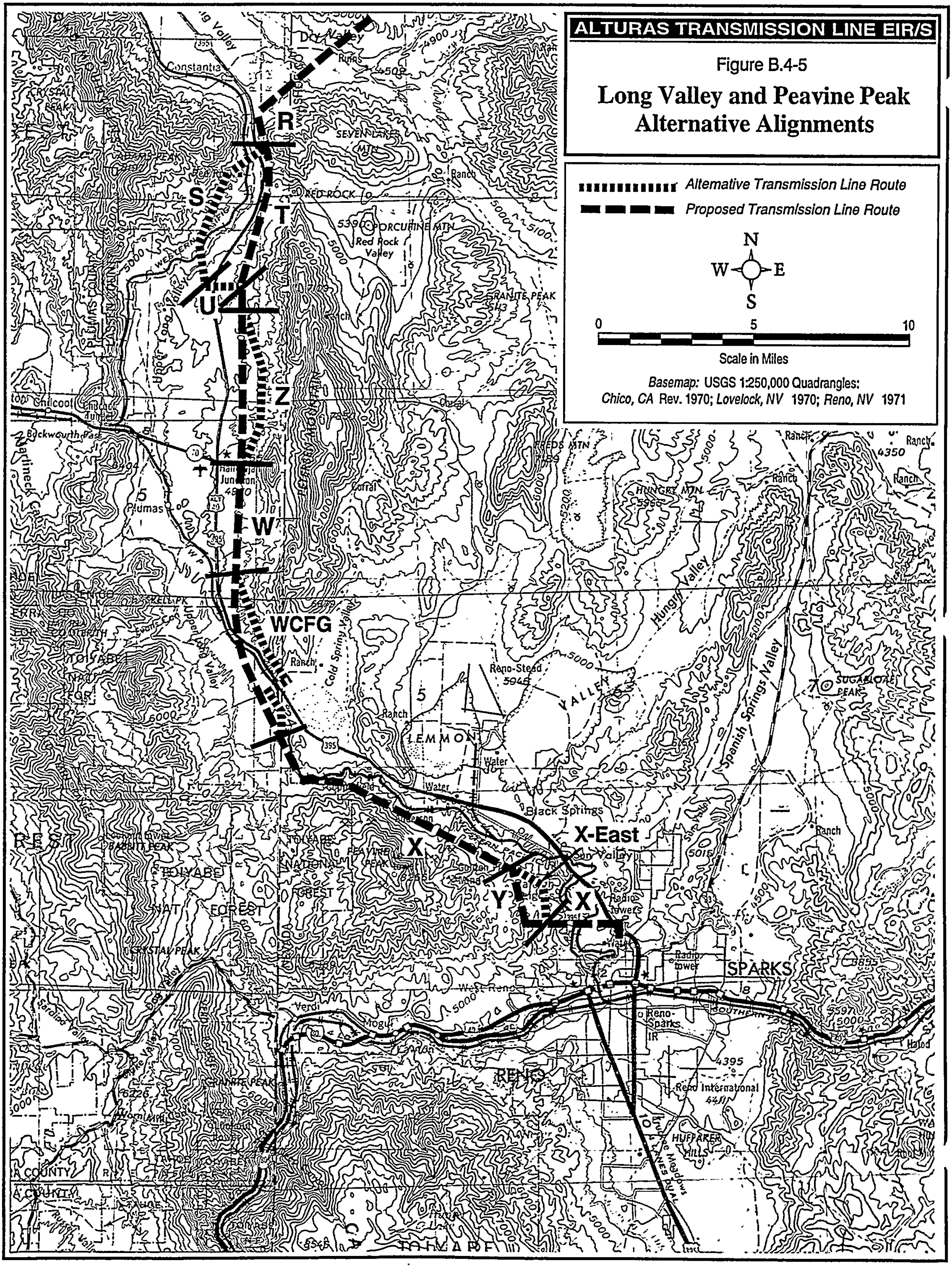

ALTURAS TRANSMISSION LINE EIR/S
Figure B.4-3
East Secret Valley Alternative
Proposed Transmission Line Route
East Secret Valley Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev.1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1971
K
L
N
O
ESVA
Termo
Ravendale
Dill Butte
Gravel Pit
Twin Buttes
Snowstorm Mtn
Saddle Rock
Shinn Peaks
Karlo
Nye
Black Mtn
Long
Tunnison Mtn
Shaffer Mtn
Radio Facility
Mud Flat
Little Mud Flat
Viewland
Leavitt
Litchfield
Standish
Wendel
Hot Springs Peak
Five Springs Mtn
Rush Cr Mtn
Bald Mtn

ALTURAS TRANSMISSION LINE EIR/S

Figure B.4-4

Wendel and West Fort Sage Mountains Alternative Alignments




ALTURAS TRANSMISSION LINE EIR/S
Figure B.4-5
Long Valley and Peavine Peak Alternative Alignments
Alternative Transmission Line Route
Proposed Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles:
Chico, CA Rev. 1970; Lovelock, NV 1970; Reno, NV 1971
R
S
T
U
Z
W
WCFG
X
X-East
Y
X
SPARKS
RENO
Black Springs
LEMMON
Hungry Valley
Spanish Springs Valley
Cold Spring Valley
PEAVINE PEAK
Reno-Stead
Verdi

Alternative Segment D

Alternative Segment D extends from its intersection with Proposed Segments C and E, south, to its intersection with Alternative Segments F and G at Angle Point DØ8, east of Anderson Mountain. The landscape along Alternative Segment D consists primarily of rolling hills and angular ridgelines covered by scrub vegetation and patchy-to-dense stands of juniper. From Angle Point C10 to Angle Point DØ1, Alternative Segment D passes southeast of Harter Flat and Nelson Corral Reservoir. The alternative parallels the Nelson Corral Reservoir unpaved access road and then crosses several four-wheel drive roads. From Angle Point DØ1 to Angle Point DØ7 the alternative crosses juniper- and scrub-covered hills and several four-wheel drive roads, before reaching Sagebrush Flat at Angle Point DØ7. Between Angle Points DØ3 and DØ4, Alternative Segment D crosses Ash Valley Road within Holbrook Canyon. From Angle Point DØ7, the alternative extends southeast along the southeastern edge of Sagebrush Flat before passing through Anderson Canyon to Angle Point DØ8, paralleling the four-wheel drive access road to Spooner Reservoir.

Alternative Segment F

Alternative Segment F extends from Angle Point DØ8, east of Anderson Mountain, south to its intersection with Alternative Segments G, J, and I, approximately two miles west of Angle Point EØ8 on U.S. 395 at Angle Point FØ4/JØ1. Alternative Segment F is more distant from U.S. 395 than Alternative Segment G (both having a north-south orientation). Alternative Segment F crosses the Madeline Plains approximately four to five miles to the west of U.S. 395 and passes approximately one-half mile east of Ninemile Point. The landscape crossed by Alternative Segment F is primarily agricultural fields and flat scrub-covered plains. The alternative would be backdropped by the distant hills to the west of the plains, becoming more visible as it turns east at Angle Point FØ3 toward U.S. 395. This portion of Alternative Segment F crosses public and private lands. In addition, between Angle Points DØ8 and FØ1, the alternative crosses an existing telecommunication line.

Alternative Segment G

Alternative Segment G extends from Angle Point DØ8, south to its intersection with Alternative Segments G, J and I at Angle Point FØ4/JØ1. Alternative Segment G crosses the Madeline Plains approximately three miles closer to U.S. 395 than Alternative Segment F does. Like Alternative Segment F, Alternative Segment G also crosses private and public lands used primarily for agricultural activities.

Alternative Segment H

Alternative Segment H is a very short connection between Alternative Segments F and I. Alternative Segment H crosses one private and one BLM parcel.

Alternative Segment I

Alternative Segment I is a relatively short (two-mile) connecting segment that extends from Angle Point JØ1, due east to Angle Point IØ1, immediately adjacent to U.S. 395, directly across from Angle Point EØ8. Alternative Segment I was added by SPPCo to provide a connection between Proposed Segment E and Alternative Segment J, or Alternative Segments D, F, G, and H with Proposed Segment K. Alternative Segment I crosses agricultural areas and scrub vegetation as it converges on U.S. 395. Between Angle Point IØ1 and U.S. 395, the alternative would cross an existing telecommunication line.

B.4.1.3 Ravendale Alternative Alignment (Segment J,I)

Alternative Segment J would replace Proposed Segment K and would traverse hills near Branham Reservoir, west of Ravendale. Access to Alternative Segment J would be gained via Alternative Segment I (see description above). Alternative Segment J extends from Angle Point, FØ4/JØ1 south and southeast to its intersection with Proposed Segments K and L near Snowstorm Creek. Alternative Segment J would provide a more concealed alternative to the more visible Proposed Segment K that parallels U.S. 395 before diverging from the highway in the vicinity of Ravendale.

Alternative Segment J crosses the southern portion of the Madeline Plains before entering hilly terrain west, and southwest, of Ravendale. The landscape along this alternative transitions from the open agricultural and scrub lands of the Madeline Plains to the scrub- and juniper-covered hills to the south. Between Angle Points JØ3 and JØ4, Alternative Segment J crosses the paved, two-lane Termo-Grasshopper Road which extends from Termo on U.S. 395, west to State Route 139 in Grasshopper Valley. From Angle Points JØ4 to JØ8 the alternative crosses Schott Canyon Road (to Horse Lake), Horse Lake Road, and several four-wheel drive roads in the hills and mountains northeast of Horse Lake. This portion of Alternative Segment J would require upgrading of existing four-wheel drive roads in the vicinity of Angle Points JØ4 and JØ5, as well as intermittent blading to allow overland travel. Alternative Segment J is located predominantly on public lands.

Alternative Segment J,I: 19.2 miles | Proposed Segment K: 15.4 miles

B.4.1.4 East Secret Valley Alignment (Segment ESVA)

Alternative Segment ESVA would be located about 1.5 miles to the east of Proposed Segment L, adjacent to the east side of U.S. 395 (see Figure B.4-5). Alternative Segment ESVA would depart from the proposed route at Angle Point LØ1 north of Snowstorm Mountain and would traverse the east side of Secret Valley, rejoining the proposed route at Angle Point NØ2. The BLM recommended Alternative Segment ESVA to mitigate visual impacts along the highway and at the roadside rest stop near Tule Patch Spring.

Alternative Segment ESVA: 23.0 miles | Proposed Segment L,N: 21.1 miles

B.4.1.5 Wendel Alternative Alignment (Segment M)

Alternative Segment M essentially provides a Honey Lake Valley alternative to Proposed Segment N crossing of the Skedaddle Mountains. At its junction with Proposed Segments L and N at Angle Point LØ8, Alternative Segment M extends south and east around the base of the foothills of the Skedaddle Mountains before rejoining Proposed Segment N (Angle Point MØ3) northeast of Wendel. Alternative Segment M stays at a lower elevation than Proposed Segment N and parallels the Southern Pacific Railroad between Angle Points MØ1 and MØ2. Alternative Segment M generally crosses scrub vegetation in northern Honey Lake Valley. Views in this vicinity are generally dominated by the Skedaddle Mountains to the north and east, and panoramic vistas to the east, south and west across Honey Lake Valley to the Fort Sage and Diamond Mountains in the distance. Alternative Segment M would be visible from Wendel Road. Alternative Segment M crosses private lands, as well as public lands.

Alternative Segment M: 3.6 miles — Proposed Segment N: 3.2 miles

B.4.1.6 West Side of Fort Sage Mountains (Segment P)

Alternative Segment P provides an alternative alignment to Proposed Segment Q located on the east side of the Fort Sage Mountains. From Honey Lake Valley (Angle Point OØ5), Alternative Segment P extends south along the western foothills of the Fort Sage Mountains and on the west side of Long Valley, before intersecting Proposed Segments Q and R at Angle Point PØ9. Alternative Segment P would be visible to motorists on U.S. 395, which is approximately three miles west of the northern portion of the alternative segment, and U.S. 395 converges to within less than one-half mile at the southern end of the alternative segment. The terrain between U.S. 395 and Alternative Segment P consists of expansive, flat, scrub-covered plains. The northern portion of the alternative would appear as a distant background feature with the Fort Sage Mountains beyond. The southern portion of the alternative would be considerably more visible due to its closer proximity to U.S. 395. Between Angle Points QØ5 and PØ1, Alternative Segment P crosses an existing overhead telecommunication line. Alternative Segment P could reduce the potential land use impacts associated with transmission line routing east of the Fort Sage Mountains.

Alternative Segment P: 17.6 miles — Proposed Segment Q: 21.0 miles

B.4.1.7 Long Valley Alignments (Segments S, U, Z, and WCFG Alternative)

The Long Valley Alternative Alignments include Alternative Segments S, U, Z, and an alternative alignment (referred to as the WCFG Segment) identified by the CDFG. The combination of Alternative Segments S and U provide a routing alternative to Proposed Segment T. Alternative Segment Z provides a more easterly route to Proposed Segment W, between Angle Points WØ1 and WNØ4. The Alternative Segment WCFG provides a more easterly routing alternative to Proposed Segment WØ3 through XØ1 near the Border Town Substation site.

Alternative Segments S, U

From its northern junction with Proposed Segment R at Angle Point RØ2 (adjacent to U.S. 395 and just north of the U.S. 395/Red Rock Road intersection), Alternative Segment S extends south to its junction with Alternative Segment U. Alternative Segment S crosses U.S. 395 at Angle Point RØ2 and travels in a southwest direction, crossing to the west side of the Southern Pacific Railroad, west of Long Valley Creek. Generally, Alternative Segment S then parallels the railroad to its southern terminus at Angle Point SNØ1. This alternative would be visible to motorists travelling north and south on U.S. 395, particularly that portion of the alternative that crosses U.S. 395 near Angle Point RØ2. Alternative Segment S then crosses to the west of U.S. 395 to Long Valley.

Alternative Segment U is a relatively short (approximately two miles) crossover segment that connects Alternative Segment S (at Angle Point SNØ1) with Proposed Segment W (at Angle Point WNØ1). Alternative Segment U travels in a northwest-southeast direction, crossing an existing overhead telecommunication line and U.S. 395. Alternative Segment U crosses a relatively flat, scrub- and sage-dominated landscape with scattered juniper. This alternative would be visible to both northbound and southbound motorists on U.S. 395. Alternative Segment U would cross BLM lands.

Alternative Segments S,U: 5.9 miles — Proposed Segment T: 4.9 miles

Alternative Segment Z

Alternative Segment Z is a bypass segment that is located approximately one-half mile to the east (at its most distant point) of Proposed Segment W, between Angle Points WØ1 and WNØ4. Alternative Segment Z was located to bypass private property approximately two miles northeast of Hallelujah Junction. Alternative Segment Z would be located further to the east than Proposed Segment W, at a slightly higher elevation, as it crosses a series of finger ridges and foothills at the base of Petersen Mountain.

Alternative Segment Z: 4.5 miles — Proposed Segment W: 3.8 miles

Alternative Segment WCFG

Alternative Segment WCFG provides an alternative route, north of U.S. 395, to Proposed Segments W and X between Angle Point WNØ4 (just north of Angle Point WØ3) and Border Town Substation near Angle Point XØ1. Between Angle Points WNØ4 and WNØ6, the alternative crosses numerous finger ridges in the southwestern foothills of Petersen Mountain. Between WNØ6 and WNØ7, Alternative Segment WCFG crosses U.S. 395 before turning southeast and then south to the Border Town Substation site. Vegetation along Alternative Segment WCFG is primarily scrub and sagebrush. Alternative Segment WCFG would be visible to both north and southbound viewers on U.S. 395 and Border Town residents oriented toward Long Valley. The alternative segment would cross BLM lands.

Alternative Segment WCFG: 4.2 miles | Proposed Segment W: 4.0 miles

B.4.1.8 Peavine Peak Alternative Alignment (Segment X-East)

Alternative Segment X-East would replace Proposed Segment Y and would bring the route further down the slope from Peavine Peak into an existing transmission line corridor for a portion of the route. From Angle Points XØ9 to X12, Alternative Segment X-East provides a more easterly alternative to Proposed Segment Y, crossing the eastern foothills of Peavine Peak. From Angle Point XØ9 through X12, the alternative crosses similar landscapes as Proposed Segment Y. Alternative Segment X-East would be seen by residences at the western-most end of Hoge Road. Other developed features in the landscape include a radio transmission tower and fence lines.

Alternative Segment X-East: 2.3 miles | Proposed Segment Y: 2.1 miles

B.4.2 SUBSTATION ALTERNATIVES

B.4.2.1 Alturas Substation Alternative (Mill Site)

The Alturas Substation Alternative, known as the Mill Site, is located adjacent to Alternative Segment B, between Angle Points BØ6 and BØ7. The site would be located in an open, grass and scrub vegetated field south of Highway 299 and immediately north of the western end of 4th Street, west of Alturas. From the north, the site would be visible to residents adjacent to, and motorists on, Highway 299. The site would also be visible to residents on Mill Street to the east, motorists on 4th street immediately to the south, two rural residences to the southwest, and a rural residence to the west (see Figure B.4-1). It is approximately eight acres in size.

B.4.2.2 Border Town Substation Alternative (SPPCo Site)

An alternative site for the proposed Border Town substation is located just to the south of the proposed substation site (see Figure B.2-9). It is about 176 acres in size and is owned by SPPCo. Facilities to be located on this site would be the same as described in Section B.2.2.3.

B.4.3 NO PROJECT ALTERNATIVE

The No Project Alternative required for consideration under CEQA and NEPA regulations would mean that the Alturas Transmission Line Project would not be built. Under the No Project Alternative, no adverse environmental impacts from the construction and operation of the Proposed Project would occur. However, SPPCo would need to augment existing facilities and add new transmission and generation capacity to compensate for existing system limitations and anticipated load growth.

Over the short-term (one to three years) some existing system limitations could be mitigated by augmenting existing transmission facilities (e.g., system enhancement alternatives and Frenchman Tap type projects) and constructing new generation capacity (e.g., Piñon Pine Power Plant and Fort Churchill Combustion Turbine). These short-term transmission modifications would provide some improvement in the service reliability to the Reno/Lake Tahoe area, but not to the level required by SPPCo in the event projected load growth is realized. In addition, none of the short-term system modifications would provide additional access to the Pacific Northwest power market or improve import capability, with the exception of improved response for long-term emergencies.

To improve import capability and gain additional access to the Pacific Northwest power market, SPPCo would need to pursue a major transmission facility comparable to the Proposed Project. Given design, permitting and construction timelines, SPPCo does not expect such a transmission facility would be available for operation until the year 2000-2002 timeframe. This delay would severely affect SPPCo's ability to service projected growth, in accordance with Western State Coordinating Council Operating Guidelines (see Section A.6, Purpose and Need).

B.5 SCENARIO FOR ANALYSIS OF CUMULATIVE IMPACTS

The cumulative scenario consists of projects that are reasonably foreseeable (i.e., planned or projected) during the life of the proposed Alturas Transmission Line Project. This section provides a listing of various projects comprising the cumulative scenario. These projects are listed as cumulative projects to the Alturas Transmission Line based on discussions with various planning agencies overseeing the projects. Therefore, the listed projects are those which, when considered together with the Alturas Transmission Line, may compound or increase environmental impacts.

Cumulative projects do not include existing projects that are completed or in operation (with the exception of existing projects that would have increased activities over the baseline assumptions). These existing projects are included in the environmental setting for individual issue areas in Part C. Section E-3, Growth-Inducing Impacts of the Proposed Project, discusses the potential of the Proposed Project to encourage other utility companies to propose additional utility construction within the project right-of-way. Table B-14 presents the cumulative projects considered for this study. Cumulative projects are mapped, by segment, on the Base Maps at the end of Volume I, showing the approximate geographic locations of key future projects in the study area.

Tuscarora Pipeline. The Tuscarora Natural Gas Pipeline Project is a 250 mile pressurized underground natural gas pipeline and ancillary facilities that would transport natural gas from Malin, Oregon to SPPCo's existing Tracy Thermal-Electric Power Generation Plant located East of Reno, Nevada, and is considered a linear project. The Tuscarora Pipeline is designed to transport approximately 110 million cubic feet per day of sweet natural gas at a maximum operating pressure of 1,000 pounds per square inch. The pipeline would be buried with a minimum depth of cover of 36 inches in soil and 24 inches in rock. The proposed width of the permanent right-of-way (easement) is 50 feet. During construction, the required right-of-way would consist of the permanent easement plus additional temporary working space, but would not exceed 100 feet in width.

Table B-14 Cumulative Projects by County

Site No.	Project	Project Type	Project Location	Proximity Proposed Project	Permitting Status
			Linear Projects (Multi-County)		
*	Tuscarora Pipeline	20-inch diameter pressurized, underground, natural gas pipeline	See text description	See text description	Approved; projected completion 12/95
			Modoc County		
1*	Centerville Estates	One Land Subdivision	Near Three Sisters; northwest of Centerville Road	Approximately 2 miles west of Hwy 395	Approval pending
2*	Modoc Farms T00	One Land Subdivision	Near Three Sisters; Northwest of Centerville Road	Approximately 2 miles west of Hwy 395	Approved
3*	Wildlife Estates	One Land Subdivision (residential)	West of U.S. 395; south of Centerville Road	Approximately 2 miles west of Hwy 395	Approved/not recorded; pending road improvements
4*	Land Subdivision	Three subdivisions	Township 41-42, approximately 3.5 miles west of Hwy 395	Near proposed project route Segments A-6 to C-1	Approved
			Lassen County		
5+	Hog Farm	Swine rearing and finishing facility	Assessor Parcel No. 119-200-10; 2 miles east of Hwy 395; north of Honey Lake Valley	Near alternative project route Segment M, south of L-8	Approval pending
6*	LMUD Intertie with the Alturas Transmission Line	Intertie of a municipal transmission line to the Alturas 345 kV line to provide a more economical power and energy source for Lassen County	Would cross through eastern portion of Lassen County and LMUD's service area	LMUD intertie at Wendel site in East Lassen County	Project completion projected at approximately 2004
7+	Gas-fired Power Plant	Development of a 200 MW Gas-fired Power Plant being considered by Raytheon Engineers and Constructors, and LRRW Power Plant	Near Calneva Lake	Approximately 3 miles east of angle point 0-05	Application pending
8+	Fish Springs Ranch Pumping Project	Pump 13,000 acre feet of water per year from Fish Springs Ranch to the Lemmon Valley Area	East side of Fort Sage Mountains	Portion of route is near proposed project route Segment Q	Application pending
9*	Sierra Lady Mineral Project	Establishment and operation of a pozzolan recovery and processing operation	East of Long Valley along route	Four 5-acre sites near route Segments U, V, W, and Z	Approved 12/2/93; 5 year projected completion
10	California Correctional Facility	New correctional facility	Susanville area	13 miles from proposed project	State approved project; 90% constructed; projected completion 12/95

Site No.	Project	Project Type	Project Location	Proximity Proposed Project	Permitting Status
			Sierra County		
11*	Ski Resort/Golf Course	Large ski resort and 18-hole golf course	Long Valley/Balls Canyon area	Less than 1 mile west of Hwy 395	Application withdrawn
			Washoe County		
18	Residential development; up to 335 homes on 440 acre site	Residential subdivision, Washoe County North Valleys Area Plan amendment	Washoe County, California/Nevada border, south of Border Town area	Alturas Project would traverse subject property	Application filed with Washoe County
19	Evans Creek Watershed Project	Flood control dam and drainage pipe (54")	Northwestern Reno	Soil excavation area for dam within Segment X	Permit Application by summer 1996
			BLM Lands		
12	East Lassen Management Area	Ecosystem management project; would involve managing multiple uses within an ecosystem framework	East Lassen Management Area		Currently at early EIS preparation stage
13*	BLM/CDFG Land Exchange	BLM would exchange a portion of Bass Hill for portion of Doyle Wildlife Area	South of Honey Lake Valley and West of Virginia Mountains	Near proposed project Segment Q	Approval pending for 2-3 years
14+	Alturas Reservoir Management Project	Existing artificial irrigation reservoirs would be managed to enhance the recreational fishery by managing timing of irrigation	Hollbrook Canyon Area	Near proposed project Segment D (angle point D-01)	Cooperative Agreement under Negotiations
15*	Infernal Caverns Battlefield Trail Project	Land exchange and development of battlefield area as a historical site with Construction of a 4.5 mile, 3 foot wide recreational trail leading to the Infernal Caverns Battlefield	Infernal Caverns Area	Near proposed project segment (between angle points C-03 and C-04)	Environmental Assessment approved for portion of trail on BLM
16	West Valley Pumped Storage Hydroelectric Plant (WVPSHP)	Proposed WVPSHP would consist of existing Moon Lake Dam/Spillway and a new dam	Between Moon Lake Reservoir and West Valley Reservoir adjacent to and including Cedar Creek on BLM Lands	Approximately 5 miles east of Hwy 395	Preliminary application under FERC review
17+	Ravendale School	Proposed elementary school	Termo-Grasshopper Road	Near route Segments J-3 to J-4	Lease approved; projected completion 6/96

* Project plotted on base maps for Proposed Project (at the end of Volume I)
\+ Project plotted on base maps for alternative route segments (at the end of Volume I)

The route of the Tuscarora Natural Gas Pipeline Project is adjacent to the proposed transmission line along approximately 37 miles of their length. As illustrated on the base maps at the end of Volume I, the pipeline would either cross or traverse along the same corridor as the Alturas Transmission Line in the following locations:

- At approximately 4.6 miles south-west of the City of Alturas the two routes cross
- At approximately 3.0 miles south of Madeline the two routes join and traverse south along the same corridor for approximately 14 miles, splitting at approximately 4 miles southeast of Termo
- One mile northeast of Tule Patch Spring the two routes join and traverse south along the same corridor for approximately 13 miles through Secret Valley and Mud Flat.
- At approximately 2.5 miles southeast of Wendel, the two routes join and traverse the same corridor for approximately 8.0 miles to the northeast corner of the Sierra Army Deport boundary.
- Finally, the two routes cross on the east side of the Fort Sage Mountains, and then join and traverse south along the same corridor for approximately 1.7 miles.

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PART C.1 INTRODUCTION

C.1.1 CONTENTS OF PART C

Part C examines the environmental consequences associated with the Proposed Alturas Transmission Line Project and its alternatives. Two types of alternatives were addressed: alternative route alignments and alternative substation sites. The No Project Alternative was also considered.

Part B offers a complete and detailed description of the Proposed Project, the alternative route alignments and substation sites, and the No Project Alternative. In addition, Section B.3 describes other alternatives considered, but eliminated from further consideration. The rationale for the elimination of these subject alternatives is also provided in Section B.3.

The Proposed Project and each of the alternative route alignments, substation sites, and the No Project Alternative are examined at length and in detail in Part C, as they relate to each of the 13 environmental issue areas listed below:

- C.2 Air Quality
- C.3 Biological Resources
- C.4 Cultural Resources
- C.5 Energy and Utilities
- C.6 Geology, Soils, and Paleontology
- C.7 Hydrology
- C.8 Land Use, Recreation, and Educational, Religious, or Scientific Uses
- C.9 Noise
- C.10 Public Safety and Health
- C.11 Socioeconomics and Public Services
- C.12 Transportation and Traffic
- C.13 Visual Resources
- C.14 Potential for Impacts on Minority and Low-Income Populations

Within each environmental issue area, the Proposed Project is first examined. The alternative route alignments and substation sites, and the No Project Alternative are then discussed in the following order:

- C.x.3 Alternative Alignments and Substation Sites
  - C.x.3.1 Alturas Area Alternative Alignment (Segment B)
  - C.x.3.2 Madeline Plains Alternative Alignments (Segments D, F, G, H, I)
  - C.x.3.3 Ravendale Alternative Alignment (Segment J)
  - C.x.3.4 East Secret Valley Alignment (Segment ESVA)
  - C.x.3.5 Wendel Alternative Alignment (Segment M)
  - C.x.3.6 West Side of Fort Sage Mountains Alternative Alignment (Segment P)
  - C.x.3.7 Long Valley Alternative Alignments (Segments S, U, Z, and WCFG)
  - C.x.3.8 Peavine Peak Alternative Alignment (Segment X-East)
  - C.x.3.9 Substation Alternatives
- C.x.4 The No Project Alternative

By identifying the impacts associated with each environmental issue area and the offsetting mitigation measures, the regulatory agencies and the general public are offered a discussion of the significant environmental impacts of this Proposed Project and its alternatives.

C.1.2 ASSESSMENT METHODOLOGY

In Part C, the analysis within each environmental issue area begins with an examination of the existing physical or baseline setting wherein the Proposed Project would be placed. The regulatory setting, which includes applicable government rules, regulations, plans, and policies, is also presented in the baseline setting. For the purpose of this document, and pursuant to NEPA and CEQA Guidelines, the baseline used for the impact analysis reflects the actual conditions at the time of preparation of the report, including the No Project Alternative.

The environmental consequences and potential impacts that the Proposed Project would bring to each issue area are quantified by using state-of-the-art impact assessment tools. These tools included a Geographic Information System to map environmental and land use resources along the Proposed Project route. Mitigation measures for each impact were identified and assessed for their effectiveness. The Applicant has also incorporated various measures and procedures into the Proposed Project that would avoid or reduce impacts. In assessment of the impacts, these measures have been assumed to be part of the Proposed Project, and are not included explicitly as EIR/S mitigation measures. Generally, the Applicant-proposed measures that could reduce the potential impacts in an issue area (such as biology, cultural resources, etc.) are summarized in that particular issue area.

The impacts identified by applying the assessment methodology were then compared with predetermined, specific significance criteria, and were classified according to significance categories listed in each issue area. The cumulative impacts of the project taken together with the related cumulative projects (listed in Section B.5) were assessed next, and mitigation measures for each impact were identified. The focus in cumulative impact analyses was to identify those project impacts that might not be significant when considered alone, but contribute to a significant impact when viewed in conjunction with future planned projects. Finally, the impacts found to be significant and unavoidable or unmitigable to a non-significant level were identified. The same methodology was applied systematically to each alternative route alignment and substation site. A comparative analysis of the Proposed Project and the alternatives is provided in Part D of this document.

There are impacts that cannot be fully mitigated to non-significant levels. These impacts are referred to as unavoidable significant impacts, and summarized at the end of each issue area analysis.

The Proposed Project and its alternatives are of a linear nature covering hundreds of miles. It was impossible to show the environmental resources and depict the location and magnitude of impacts in a few figures. Thus, a comprehensive set of base maps was prepared that is located at the end of Volume I. Significant site-specific information (e.g., water crossing locations, sensitive habitats, active faults, land uses, etc.) has been shown on these maps along the 165-mile long span of the Project. The reader is urged to review these maps in conjunction with the information presented in the text of Part C.

C.1.3 SIGNIFICANCE CATEGORIES

While the criteria for determining significant impacts are unique to each issue area, the classification of the impacts was uniformly applied in accordance with the following definitions:

Class I:	Significant; cannot be mitigated to a level that is not significant
Class II:	Significant; can be mitigated to a level that is not significant
Class III:	Adverse, but not significant
Class IV:	Beneficial impacts.

C.1.4 MITIGATION MEASURES

Once an impact was identified, diligent effort was taken to also identify mitigation measures that will reduce the impact to a level that is not significant. Since some reviewing agencies require a demonstration of reduction of impacts to the maximum extent possible, mitigation measures were identified for all classes of impacts (except Class IV). The mitigation measures recommended by this study have been identified in the impact assessment sections and presented in a Mitigation Monitoring Program at the end of the analysis for each issue area (Section C.x.5). The complete Proposed Mitigation Monitoring, Compliance, and Reporting Plan is presented in Part F.

PART C.2 AIR QUALITY

C.2.1 ENVIRONMENTAL BASELINE AND REGULATORY SETTING

C.2.1.1 Characteristics of the Study Region and Project Area

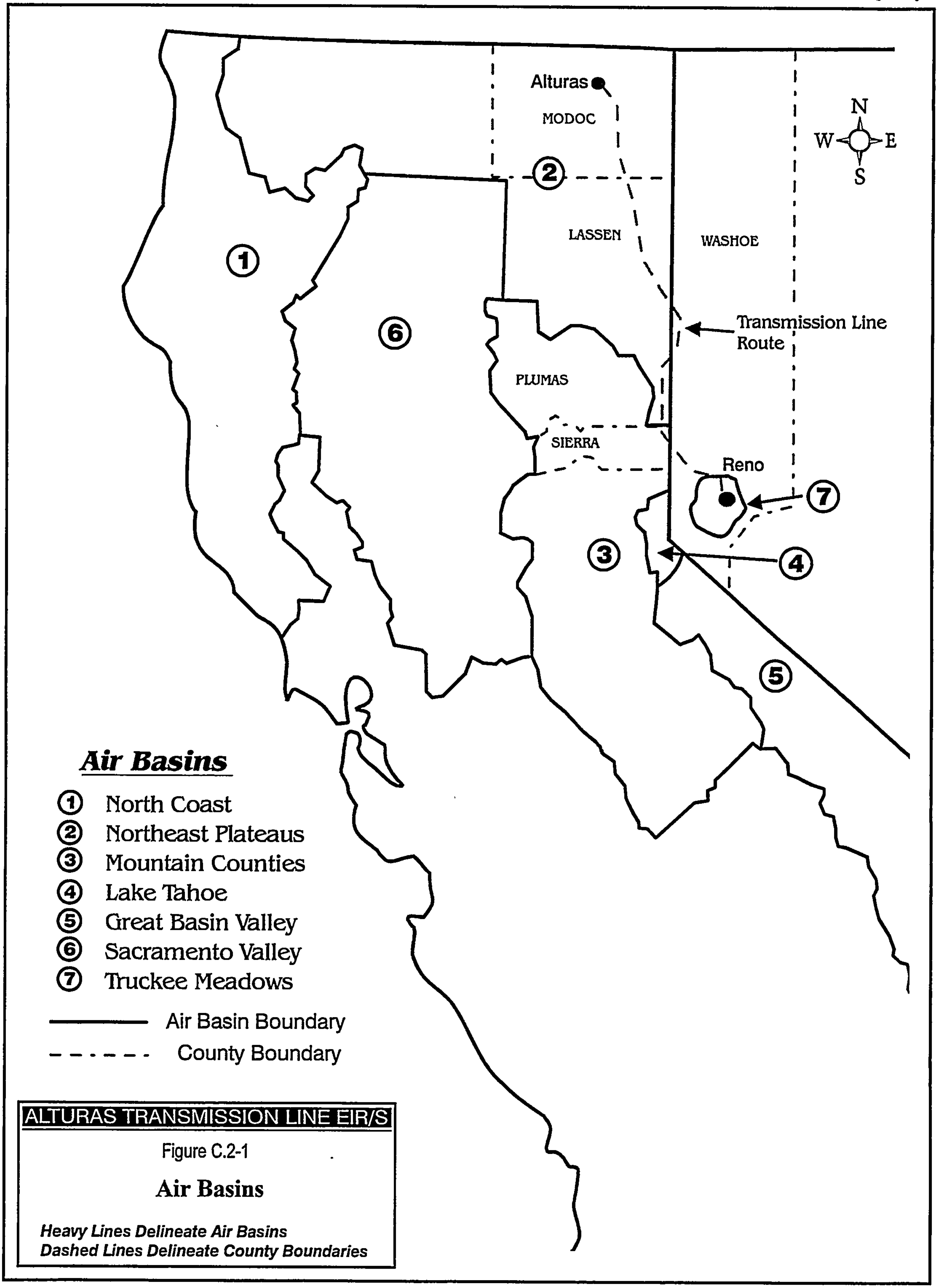
The proposed Alturas Transmission Line Project would be located in northeastern California and Washoe County, Nevada. The Washoe County alignment (approximately 26 miles long) would be situated within the Hydrographic Air Basin #87 (Truckee Meadow), which extends into the adjacent section of California. The longest section of transmission corridor would be located in the two northeastern California counties (Modoc and Lassen; 133 miles long) within the Northeast Plateau Air Basin. The section within Sierra County (about five miles long) would be in the Mountains Counties Air Basin. These air basins are further divided meteorologically by the various valleys and ridges in this mountainous terrain. The Reno area has the most significant air quality problems, based on its non-attainment status (i.e., not in compliance with air quality standards set by State and Federal governments) for ozone (O_3), carbon monoxide (CO), and fine, inhalable particulate matter (size less than 10 microns - PM_{10}). The alternative transmission line alignments would also be present within these three air basins. Figure C.2-1 shows the location of the project alignments and the boundaries of the air basins.

Emissions that would result from construction or operation of the transmission facilities are subject to the rules, regulations and standards promulgated and enforced by the U. S. Environmental Protection Agency (EPA), California Air Resources Board (ARB); Nevada Department of Environmental Protection (NDEP), Bureau of Air Quality (BAQ), Washoe County District Health Department; and the local Air Pollution Control Districts (APCDs), including: Washoe County District Health Department, Air Quality Management Division (AQMD); Northern Sierra County APCD, Modoc County APCD, and Lassen County APCD. Rules and regulations of these agencies are designed to achieve defined air quality standards that are protective of public health and the environment. To achieve these standards, they limit the emissions and the permissible impacts of emissions from projects, and specify emission controls and control technologies for each type of emitting source.

C.2.1.2 Existing Environment

Climate

The climate of the study area is influenced largely by its location, regional weather systems, and topographic orientation. The general climate of the area is characterized by hot, dry summers and cold winters. Although annual precipitation is typically below 200 mm for this semiarid region, the winter is not "dry" but is considered to be a recharge period for soil moisture which is primarily delivered by



ALTURAS TRANSMISSION LINE EIR/S

Figure C.2-1

Air Basins

Heavy Lines Delineate Air Basins
Dashed Lines Delineate County Boundaries

snow and rain storms. (G.M. Hidy and H.E. Klieforth, 1990). Surface winds are often channeled through valleys between the generally north-south trending Sierra Nevada/Cascade Ranges, an orographic barrier that forces clouds arriving from the west to rise and release moisture onto the western slopes before dropping down the east side. The region to the east is called a "rain shadow" because of the limited amount of precipitation that remains. A rain shadow zone is usually characterized as having mild temperatures and a moderately dry to dry climate. This region generally receives between 6 to 16 inches of annual precipitation. An inversion layer often forms in winter when ground surfaces are cold and denser cold air settles into valleys (drainage winds).

Temperatures over a 24 hour period can vary significantly because of the ability of the ground to absorb and re-emit solar radiation. When the sky is cloud free, the temperature can range from below freezing before sunrise to quite hot in the afternoon. Moisture in the atmosphere, when present, is insulating and reduces the diurnal temperature range. The most important climatic and meteorological factors influencing air quality are temperature inversions, topographic barriers to air flow, and sunlight. Refer to Technical Appendix D, Volume II, for a discussion of air pollution meteorology.

The meteorology of the Truckee Meadows Air Basin is of principal concern to air quality in the study region. The Basin is considered a semi-arid region, and receives an annual average of five to ten inches of precipitation. There is less than 0.3 inches of precipitation during June through August. In winter (November through February) stagnant conditions and thermal inversions frequently occur that trap pollutants near the ground. The highest average wind speeds occur during May. From April through October dry, windy conditions can occur that result in significant fugitive dust.

Air Quality

Local Air Quality Standards. The quality of surface air (air quality) is evaluated by measuring ambient concentrations of pollutants that are known to have deleterious effects on human health or the environment. Air quality is evaluated by comparing monitored concentrations of *criteria* air pollutants to ambient air quality standards (AAQS). The current applicable California, Nevada and National Ambient Air Quality Standards (CAAQS, Nevada AAQS and NAAQS) are listed in Table C.2-1. The CAAQS are generally more stringent than the corresponding Nevada AAQS and the NAAQS. A brief description of the air pollutants of concern is given below. A summary of the air quality status of the air basins affected by the Proposed Project and Alternatives is provided in Table C.2-2. California ambient air quality standards are uniformly attained in both the Northeast Plateau and Mountain Counties air basins, with the exception of PM_{10}. The Truckee Meadows air basin, located northeast of Reno, Nevada, is classified as non-attainment for O_3, CO, and PM_{10} for both state and national ambient air quality standards. The two California air basins (Northeast Plateau and Mountain Counties) are characterized as either unclassified or unclassified/attainment with respect to the NAAQS.

Table C.2-1 Applicable Ambient Air Quality Standards

Pollutant	Averaging Time	Nevada Standards	California Standards[1,3]	National Standards[2] Primary[3,4]	National Standards[2] Secondary[3,5]
Ozone (O_3)	1-hour	0.12 ppm	0.09 ppm	0.12 ppm	0.12 ppm
Ozone (Lake Tahoe Basin)		0.10 ppm	NS[6]	NS	NS
Carbon Monoxide (CO)	8-hour	NS	9 ppm	9 ppm	NS
Nevada CO below 5,000ft elev.	8-hour	9 ppm	NS	NS	NS
Nevada CO above 5,000ft elev.	8-hour	6 ppm	NS	NS	NS
CO at any elevation	1-hour	35 ppm	20 ppm	35 ppm	NS
Nitrogen Dioxide (NO_2)	Ann.Arith.Mean	0.05 ppm	NS	0.053 ppm	0.053 ppm NS
	1-hour	NS	0.25 ppm	NS	
Sulfur Dioxide (SO_2)	Ann.Arith.Mean	0.03 ppm	NS	0.03 ppm	NS
	24-hour	0.14 ppm	0.05 ppm[7]	0.14 ppm	NS
	3-hour	0.5 ppm	NS	NS	0.5 ppm
	1-hour	NS	0.25 ppm	NS	NS
Suspended Particulate Matter	Ann.Geo.Mean	NS	30 $\mu g/m^3$	NS	NS
Less than ten micron in diameter (PM_{10})[8]	Ann.Arith.Mean	50 $\mu g/m^3$	NS	50 $\mu g/m^3$	50 $\mu g/m^3$
	24-hour	150 $\mu g/m^3$	50 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$

1. California standards for O_3, CO, SO_2 (1-hour), NO_2, and PM_{10} are values that are not to be exceeded.
2. National Standards, other than ozone and those based on annual averages or annual arithmetic means. They are not to be exceeded more than once a year. The O_3 Standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
3. Concentration are based upon reference temperature of 25°C and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to these reference values; ppm in this table refers to parts per million by volume or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the EPA.
5. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the implementation plan is approved by the EPA.
6. NS = No Standard.
7. At locations where the state standards for ozone and/or PM_{10} are violated. National standards apply elsewhere.
8. Particulate standards are always expressed in units of $\mu g/m^3$ (micrograms per cubic meter). The equivalent value in ppm is obtained at standard pressure and temperature (STP) through the following equation: 1 mg/m^3 = (24.5/molecular weight in grams of one mole of gaseous pollutants) ppm.

Ambient air quality monitoring is conducted by the California Air Resources Board, the U.S. Park Service, local air pollution control districts, and private firms. There are seven monitoring stations in the vicinity of the Proposed Project. Tables C.2-3 and C.2-4 show the second highest concentrations at each station and number of days in 1992 the air basin exceeded the AAQS. The second highest concentrations have been presented because they reflect a reasonable worst case. The highest concentrations usually are associated with anomalies and are not a good indicator of the air quality status. The annual second highest concentrations for PM_{10}, O_3, CO (1 hour), and CO (8 hours) are also rendered as a series of bar charts in Figures C.2-2 through C.2-5. The bar charts illustrate the air quality standards so that a comparison can be made between the existing conditions and the State and National Standards. There are no data for some pollutants at some monitoring stations, because the amount of collected monitoring data are limited under the general principal that air pollutants that consistently meet air quality standards are not monitored. The criteria air pollutants of principal concern are briefly described in the following paragraphs.

Table C.2-2 Attainment Status of Affected Air Basins

Air Basin	O_3		CO		NO_2		SO_2		PM_{10}	
	State	Natl.	State	Natl.	State	Natl.	State	Natl.	State	Natl
Hydrographic Basin #87 (Truckee Meadows)	N	N	N	N	A	A	A	A	N	N
Mountain Counties - Sierra County	U	UA	U	UA	A	UA	A	UA	N	U
Mountain Counties - Plumas County	U	UA	A	UA	A	UA	A	UA	N	U
Northeast Plateau - Lassen County	A	UA	U	UA	A	UA	A	UA	U	U
Northeast Plateau - Modoc County	A	UA	U	UA	A	UA	A	UA	N	U

Note: A = In Attainment of Standards; P = Partial Attainment; N = Non-Attainment; U = Unclassified; UA = Unclassified/Attainment

Sources: ARB, *Summary of 1992 Air Quality Data, Gaseous and Particulate Pollutants*
ARB, *Air Quality Designation for State and National Ambient Air Quality Standards, 1993*

Table C.2-3 Nevada Air Quality Summary[a]

	Truckee Meadows				
Standards	South Reno	Reno	Galletti	Sparks	Lemon Valley
Ozone (1-Hour)					
2nd High (ppm)	0.09	0.08	–	0.08	0.09
Days > Nevada AAQS (0.12)	0	0	–	0	0
Days > Nevada AAQS Lake Tahoe Basin (0.10)	–	–	–	–	–
Days > National AAQS (0.12)	0	0	–	0	0
PM_{10} (24-Hour)					
2nd High (ug/m^3)	55	83	137	82	–
Days > Nevada AAQS (150)[b]	0/59	0/53	0/88	0/60	–
Days > National AAQS (150)	0/59	0/53	0/88	0/60	–
CO (8-Hour)					
2nd High (ppm)	4.0	6.7	8.0	7.6	2.7
Days > Nevada AAQS below 5,000 feet (9.0)	0	0	0	0	0
Days > Nevada AAQS above 5,000 feet (6.0)	–	–	–	–	–
Days > National AAQS (9.5)	–	–	–	–	–

a Nevada Bureau of Air Quality measurements for 1992.
b "Days" for PM_{10} are given as exceedances/number of annual measurements. Data source State of Nevada Division of Environmental Protection 1988-1992 air quality trend report.

Table C.2-4 California Air Quality Summary[b]

	Mountain Counties	Northeast Plateau
Standards	Loyalton[b]	Alturas[b]
Ozone (1-Hour)		
2nd High (ppm)	–	–
Days > California AAQS (0.09)	–	–
Days > National AAQS (0.12)	–	–
NO_2 (1-Hour)		
2nd High (ppm)	–	–
Days > California AAQS (0.25)	–	–
PM_{10} (24-Hour)		
2nd High (ug/m^3)	70	46
Days > California AAQS (50)[c]	7/60	1/7
Days > National AAQS (150)	0/60	0/7
CO (8-Hour)		
2nd High (ppm)	–	–
Days > California AAQS (9.0)	–	–
Days > National AAQS (9.5)	–	–

a Air quality measurements for 1992
b Air monitoring stations only identify PM_{10} concentrations.
c "Days" for PM_{10} are given as exceedances/number of annual measurements.
Data Source: ARB, 1994.

Photochemical Pollutants. Ozone is formed in the atmosphere through a series of complex photochemical reactions involving oxides of nitrogen (NO_X), reactive organic compounds (ROC), and sunlight occurring over a period of several hours. Since ozone is not emitted directly into the atmosphere, but is formed as a result of photochemical reactions, it is classified as a *secondary* or regional pollutant. Because this ozone-forming reaction takes time, peak ozone levels are often found downwind of major emission source areas. There are no major emissions source areas upwind of Proposed Project facilities. Figure C.2-3 displays the one-hour ozone monitoring data in 1992 from four stations in Nevada, the only relevant data available for the project area.

Inert Pollutants. Inert pollutants do not react chemically, but retain the same chemical composition from point of emission to point of impact. Inert pollutants considered include CO and PM_{10}. CO is formed primarily by the incomplete combustion of organic fuels. The highest concentrations of CO are found where vehicles are present in great numbers, operating at low speeds, during conditions of cold temperatures and a surface inversion layer. There are no large concentrations of commuting vehicles near the Proposed Project. Figure C.2-4 displays second highest one-hour CO concentration data in 1992 for five stations in Nevada, the only available data relevant to the study area. Figure C.2-5 displays the corresponding eight-hour CO data. The annual second highest data at Galletti and Sparks approach, but do not reach, the NAAQS.

NO is a colorless gas that is formed during high temperature combustion processes, for example in motor vehicle engines or industrial boilers. It rapidly oxidizes to form nitrogen dioxide (NO_2), a brownish gas that has known health effects. High concentrations can damage the respiratory system. There are also nitrogen oxide gases (NO_X) that combine with other pollutants to affect air quality.

PM_{10} is a class of particulate matter with an aerodynamic diameter of ten microns (millionth of a meter) or less. These finer particulates are inhalable and can have adverse health effects. The largest source of PM_{10} emissions in rural areas is natural wind blown sand and dust. A significant portion, however, of fine particulates can arise from anthropogenic (man-made) sources, such as unpaved roads, soil disturbed by construction, agricultural tilling, etc. Particulate matter is also released during combustion processes, such as those using gasoline and diesel fuels, and wood burning. PM_{10} represents approximately 50-60% of the total suspended particulates (TSP) generated from fugitive sources and 90% of TSP from combustion sources.

Fine particulate emissions are of concern in the project area. Figure C.2-2 displays 24-hour concentration data in 1992 from four monitoring stations in Nevada and from Loyalton and Alturas in California. The second highest annual concentration at Galletti in Nevada approached the NAAQS, and Alturas approached the CAAQS. During 1992, the Alturas second high concentration was lower than those for all four stations in Nevada. The second high concentration at Loyalton exceeded the CAAQS.

Figure C.2-2 Second Highest PM10 Concentrations

24-Hour Averaging Time

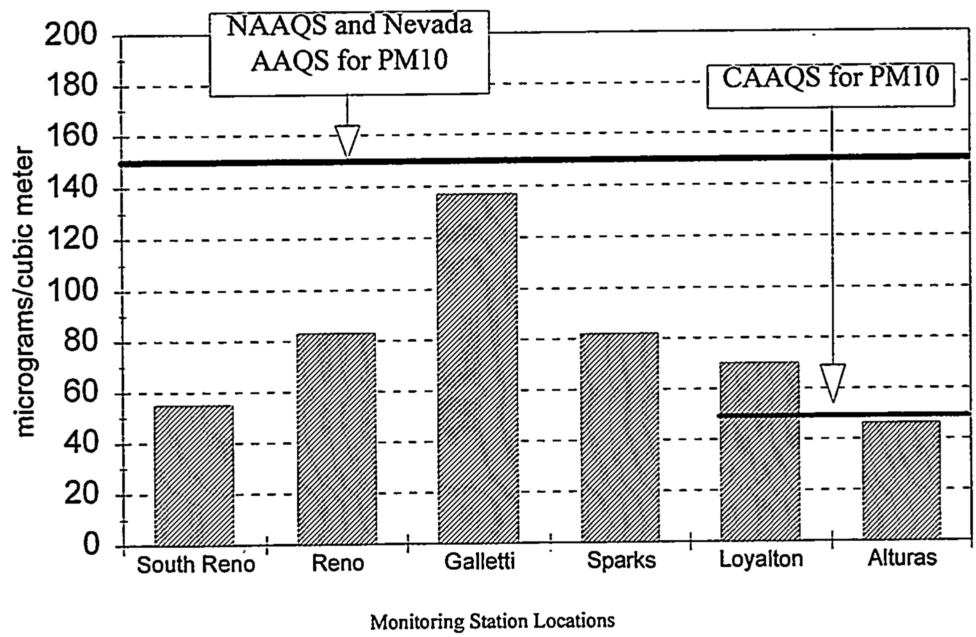
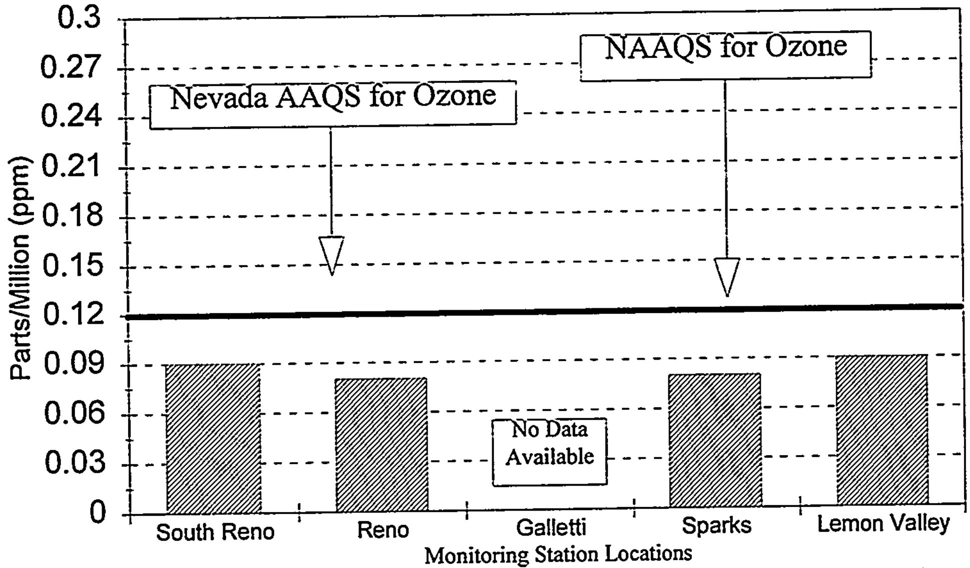


Figure C.2-3 Second Highest Ozone Concentrations

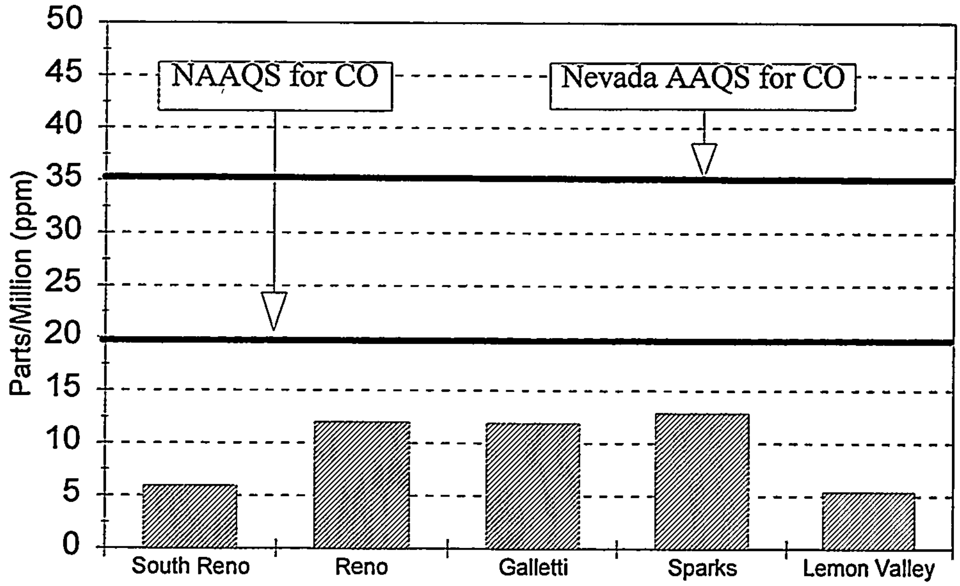
1-Hour Averaging Time



The monitoring stations are not located within the Lake Tahoe Basin (no data is available for California)

Figure C.2-4 Second Highest CO Concentrations

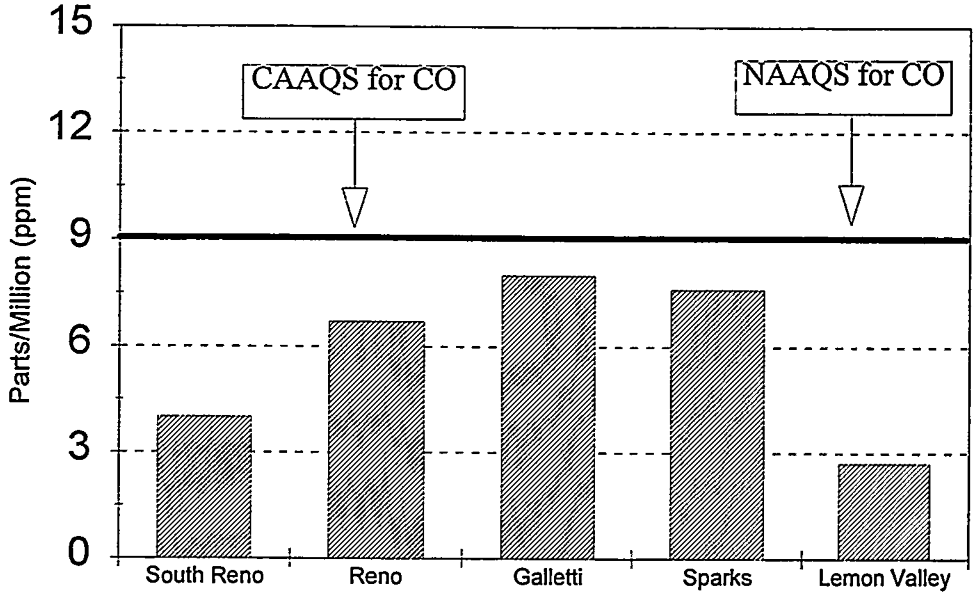
1-Hour Averaging Time



Monitoring Station Locations (no data available for California)

Figure C.2-5 Second Highest CO Concentrations

8-Hour Averaging Time



Monitoring Station Locations

The following monitoring stations are all below 5000 ft in elevation (no data available for California).

Toxic Air Contaminants (TACs) are air pollutants that are known or suspected to cause cancer, genetic mutations, birth defects, or other serious illnesses in people exposed to them. TACs come from three basic source types: industrial facilities, internal combustion engines (stationary and mobile), and small "area sources" (such as solvent use). Generally, TACs behave in the atmosphere in the same way as inert pollutants. The concentrations of both inert and toxic pollutants are therefore determined by the level of emissions at the source and the meteorological conditions encountered as these pollutants are transported away from the source toward potential sensitive receptors. For stationary sources the risk associated with these pollutants are generally localized (thus, the impact zones are usually referred to as "hot spots"). There is no available countywide date from the four Agencies on TACS.

C.2.1.3 Applicable Regulations, Plans, and Standards

Federal and State Regulations

Federal, state, and regional agencies have established standards and regulations that affect Proposed Projects. The following federal and state regulatory considerations apply to the project and to all alternatives.

- The Federal Clean Air Act of 1970 directs the attainment and maintenance of National Ambient Air Quality Standards (NAAQS). The 1990 Amendments to this Act determine attainment and maintenance of NAAQS (Title I), motor vehicles and fuel reformulation Title II, permits and enforcement (Titles V and VII), hazardous air pollutants (Title III), acid deposition (Title IV), and stratospheric ozone protection (Title VI),

- Federal New Source Review and Prevention of Significant Deterioration.

- The EPA implements the NAAQS and determines attainment of federal air quality standards on a short- and long-term basis.

- The California ARB has established the CAAQS and determines attainment status for criteria air pollutants.

- The California Clean Air Act (CCAA) went into effect on January 1, 1991. The CCAA mandates achieving the health-based CAAQS at the earliest practicable date.

- The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) requires an inventory of air toxics emissions from individual existing facilities in California, an assessment of health risk, and public notification of potential significant health risk when found to be present.

- The NDEP, BAQ is responsible for setting the Nevada AAQS. These standards are essentially the same as the Federal standards with three exceptions; the three hour level established for SO_2, the ozone standard set for the Lake Tahoe basin, and the CO concentration above 5,000 ft elevation (refer to Table C.2-1).

The Bureau of Land Management, under Section 176(c) of the 1990 Clean Air Act Amendments, must make a determination of whether the proposed transmission line "conforms" to the State Implementation Plan (SIP). This determination applies to projects (direct and indirect) located within a non-attainment or maintenance area that can be practicably controlled by the Federal Agency through its continuing responsibility (Federal Register, 1993). Federal actions that apply to the General Conformity Rule includes: Federal activities that are not covered by the Transportation Conformity Rule, projects that require Federal approval, or projects that use Federal funding (i.e., expansion of existing airports, port enlargements, relocations of military troops, etc.) (Federal Register, 1993).

Direct project emissions are emissions of a criteria pollutant or its precursors that are created by a Federal action and occur at the same time and place as the project. Indirect emissions are those that are reasonably foreseeable and which can be practicably controlled through Federal responsibility. If the total direct and indirect emissions are projected to exceed the "de minimis" thresholds, and the project is not an exempt activity, then the agency must conduct an air quality conformity analysis (EPA, *Overview and Outline of the Federal General Conformity Rule*, 1993). However, an activity that generates emissions at a level that is below the "de minimis" thresholds, would be presumed to conform. Furthermore, those projects that fall within an air basin that has been designated unclassified/attainment, are not subject to the Federal General Conformity Rule.

Regional and Local Regulations

Regional agencies have been set up to oversee the attainment of State and Federal air quality standards within defined air basins. Although polluted air migrates between air basins, there is a basis for providing in Nevada and California law, area-specific agencies to attain air quality standards and then to maintain them. Attainment of an air quality standard will be reached through Agency planning and enforcement of tighter controls on releases of emissions.

With respect to the state standards, the air basins as described in Table C.2-2 are all characterized as non-attainment for PM_{10}, except for Lassen County, which is characterized as unclassified. The construction of the Alturas Transmission Line Project will contribute to the short-term concentrations of PM_{10} in localized areas. The agencies have adopted several rules and regulations that would substantially reduce the amount of emissions discharged from the disturbed sites. The Truckee Meadows Air Basin is not in attainment of the Federal standard for PM_{10}.

Modoc County APCD. The Modoc County Air Pollution Control District (MCAPCD) has jurisdiction for air quality attainment in the Modoc County portion of the Northeast Plateau Air Basin. MCAPCD has promulgated a nuisance rule to control the release of PM_{10} from construction site sources on a case by case basis. Rule 4:2 of the MCAPCD states that a person shall not emit quantities of air contaminants which cause injury, detrimental, nuisance, or annoyance to any considerable number of persons, or to the public; or which endanger the comfort, repose, health or safety of any such persons, or the public, or which cause to have a natural tendency to cause injury or damage to business or property (Modoc County Air Pollution Control District, 1989).

Sierra County APCD. The Sierra County Air Pollution Control District (SCAPCD) has jurisdiction for air quality attainment in the Sierra County portion of the Mountain Counties Air Basin. SCAPCD Rule 226 requires any person that may disturb the topsoil or remove the ground cover to take all reasonable precaution to prevent emissions of fugitive dust (Northern Sierra Air Quality Management District, 1993). The rule also requires an individual to submit to the Air Pollution Control Officer a dust plan that describes mitigation measures that will be implemented at the site.

The District also has provisions for the public to prevent or interrupt the construction process through a nuisance filed by individuals who have justification. The SCAPCD nuisance rule is described in the same context as MCAPCD's Rule 4:2, as described above.

Lassen County APCD. Lassen County Air Pollution Control District (LCAPCD) has jurisdiction for maintaining the air quality standards in the Lassen County portion of the Northeast Plateau Air Basin. PM_{10} emissions are controlled through two rules by the District, Rule 4:2 (Nuisance) and Rule 4:18 (Fugitive Dust Emissions). The nuisance rule is described in the same context as MCAPCD's Rule 4:2, as described above. The fugitive dust emissions rule places responsibility on individuals to take reasonable precautions to prevent particulate matter from becoming airborne during processes that could potentially emit PM_{10}.

Washoe County District Health Department, AQMD. The Air Quality Management Division is responsible for maintaining the air quality standards for the Truckee Meadows Air Basin, as well as the rest of the county. Rule 040.030 of the Washoe County Air Quality Rules & Regulations was adopted to address the fugitive dust emission throughout the county. The rule states that a person should take reasonable precautions to prevent the generation of dust. The dust could be controlled through cessation of operation, clean-up, sweeping, sprinkling, compacting, utilization of enclosures, chemical or asphalt sealing, and use of windscreens or snow fences (*NDEP, BAQ, 1992*).

A dust plan must be submitted to and approved by the Control Officer before any topsoil can be disturbed. The dust plan is required for those projects where more than one acre of surface area is to be altered or where the natural field is removed. The Control Officer will determine the mitigation methods for implementation at the time of dust plan approval.

The Truckee Meadows Air Basin has exceeded the 24-hour average and the annual average for the Federal PM_{10} air quality standards and subsequently has been classified non-attainment. This classification requires States to develop an attainment plan for those non-attainment regions. Nevada developed the State Implementation Plan (SIP) and submitted it to the EPA in September of 1991. The Truckee Meadows Air Basin had until December 31, 1994 to meet the air quality standard or the area would be reclassified from "moderate" to a "serious" PM_{10} non-attainment area (*NDEP, BAQ, 1991*). The Truckee Meadows Air Basin did not meet the deadline and therefore will be classified as "serious" non-attainment. The classification will require the area to adopt EPA's more stringent Best Available Control Measure (BACM) requirements. The SIP requirements, will be implemented in the mitigation measures.

C.2.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

C.2.2.1 Introduction

In this section, the potential incremental air quality impacts associated with the construction and operation of the Proposed Project are analyzed. Short-term construction emissions and long-term operational emissions would result from the proposed Alturas Transmission Line Project.

Significance criteria for both construction and operation phases are identified below. Maximum daily emissions associated with construction and operation activities are calculated. Based on the identified emissions and the significance criteria, the potential air quality impacts of the Proposed Project are identified and classified.

C.2.2.2 Definition and Use of Significance Criteria

Section 15002 of the California Environmental Quality Act (CEQA) has established guidelines for determining the significance of environmental impacts (*CEQA Guidelines, 1992*). Appendix G of the CEQA Guidelines specifically addresses the air quality issue area, stating that a project will normally have a significant effect on the air quality if emissions associated with this project "violate any ambient air quality standard, contribute substantially to an existing or projected violation, or expose sensitive receptors to substantial pollutant concentrations."

In California, each APCD can determine its own set of significance criteria. Air basins with generally good air quality conditions do not have significance criteria established by the affected APCDs for construction emissions due to the temporary nature of these emissions. Modoc, Lassen, and Sierra Counties for example, do not have a significant criteria for these emissions.

Washoe County District Health Department, AQMD has the responsibility of determining significance criteria for construction emissions within its jurisdiction. There are no significance criteria established at this time.

The following criteria were used to evaluate the air quality impacts:

- The primary significance criterion for emissions associated with the operation phase of the Proposed Project is the potential for exceedance of the state or national air quality standards. In areas where these standards are currently exceeded (i.e., non-attainment areas), any substantial addition of emissions would exacerbate the existing exceedance, and thus could be considered a significant impact. Some APCDs have specifically defined the level of emissions that would constitute a "substantial" increase; however, this level is not identified by the Districts in the study area.

- Based on the nonattainment status of the study area with respect to PM_{10}, there are a number of rules that regulate any activity that generates dust and particulate matters. For the purpose of this analysis, any activity that produces substantial levels of particulate matters would be considered to cause a significant impact.

C.2.2.3 Environmental Impacts and Mitigation Measures

C.2.2.3.1 *Construction*

There are two distinct construction activities for the Proposed Project: construction of the transmission line and construction of three substations. As discussed in Part B, the proposed 164-mile transmission line would tap into the Bonneville Power Administration transmission line northwest of the City of Alturas in Modoc County, California, and terminate near Reno, Nevada. This EIR/S discusses in detail the emissions from construction of the entire transmission line and the three substations that would be constructed in the areas of Alturas, Border Town, and Reno.

Section B.2.3.2 describes the specific construction activities for the erection of the structures and installation of the wires. These activities require providing access to the structure sites and preparation of the right-of-way (ROW). Based on the description of the construction process, a construction scenario was developed for each individual activity. The maximum daily emissions associated with each construction activity is identified. The development of scenarios for the maximum daily emissions associated with each construction activity involved making reasonable assumptions regarding number and type of construction equipment, the power ratings or fuel requirements for this equipment, load and usage factors, and the number of construction workers required for each activity.

Three sources of emissions were identified: (1) pollutants associated with the usage of the construction equipment, (2) fugitive dust emissions associated with disturbance of land, and (3) vehicular emissions associated with construction workers' commute. Emission factors for each source and/or activity were collected.

Emissions associated with each activity are shown in Appendix D, Volume III, of the Final EIR/S. All assumptions made and the emission factors used are shown in the tables presented in this Appendix. Table C.2-5 summarizes the total maximum daily emissions calculated for each construction activity. As shown in this table, the material delivery activity has the highest level of daily emissions for all pollutants except TSP and PM_{10}. For TSP and PM_{10}, the ROW construction/road preparation is the activity with highest level of emissions. Though the material delivery activity would produce the highest overall levels of emissions, its potential adverse impacts would be less than those resulting from ROW construction and road preparation. This is because the material delivery involves sources of emissions that would travel over longer distances, thus dispersing the pollutant through the atmosphere over a larger area (i.e., less concentration at any particular area). ROW construction/road preparation and wire installation would be

Table C.2-5 Maximum Daily Emissions Associated With Construction Phase

Emissions from Transmission Line Construction (lbs/day)							
Source/Activity	THC	ROC	NO_x	SO_2	CO	TSP	PM_{10}
ROW Construction/Road Preparation	6.91	6.52	50.12	5.45	43.48	974.05	624.83
Wire Setup Sites	2.63	2.45	16.84	1.80	39.73	14.83	9.89
Structure Excavation	5.15	4.84	30.25	2.09	47.04	16.31	11.31
Material Delivery	14.07	12.96	63.38	6.56	303.82	4.20	4.06
Structure Assembly	4.03	3.78	31.94	3.14	48.24	15.89	10.91
Structure Erection	4.28	3.97	18.18	1.51	75.24	15.14	10.19
Wire Installation	11.82	10.83	32.14	3.16	285.4	586.36	376.04
Clean Up	5.45	5.04	26.21	2.73	112.30	15.36	10.40
Restoration	5.35	4.93	20.48	1.90	116.63	15.06	10.11

Emissions from New Substation Construction (lbs/day)							
Source/Activity	THC	ROC	NO_x	SO_2	CO	TSP	PM_{10}
Grading	7.35	6.89	50.25	5.45	62.05	644.40	413.85
Footing Construction	5.81	5.45	33.69	3.16	56.54	643.11	412.59
Equipment Installation	7.29	6.80	41.31	3.21	104.88	3.24	3.13
Emissions from Substation Expansion (lbs/day)							
Grading	4.79	4.49	31.86	3.44	46.18	82.74	53.83
Footing Construction	3.44	3.21	17.23	1.60	44.11	81.58	52.72
Equipment Installation	6.91	6.44	40.56	3.13	99.62	3.09	2.96

Emissions from Staging Area Construction (lbs/day)							
Source/Activity	THC	ROC	NO_x	SO_2	CO	TSP	PM_{10}
Grading	4.48	4.20	30.73	3.32	42.09	802.59	514.49

Abbreviations:
THC - Total hydrocarbons CO - Carbon monoxide
NO_x - Nitrogen oxides
TSP - Total suspended particulates
ROC - Reactive organic compounds
PM_{10} - Particulates less than 10 microns in size
SO_2 - Sulfur dioxide

the two activities with highest levels of potential adverse impact. The activities associated with substation construction (for example, grading, as shown in Table C.2-5) produce emission levels comparable with ROW preparation.

Based on the significance criteria identified for construction activities, the impacts associated with most construction emissions are considered adverse, but not significant because of their temporary nature (**Class III**). Impacts resulting from PM_{10} would be significant, but mitigable to a level of non-significant (**Class II**) through implementation of Mitigation Measures A-1 through A-4, below, and the required dust plans.

SCAPCD, LCAPCD, and Washoe County District Health Department, AQMD require that any Proposed Project with the potential to produce significant levels of PM_{10} take into consideration all reasonable precautions to prevent or minimize emissions of fugitive dust during construction. SCAPCD and Washoe County District Health Department, AQMD require Applicants to submit a dust plan that describes the mitigation measures that would be implemented at the site for a Proposed Project.

A-1 The Applicant shall submit a Construction, Operation, and Maintenance Plan to the Lead Agency for review and approval prior to Project Approval. The Plan must include the measures (A-2 through A-4) that will be utilized to mitigate potential impacts from fugitive dust. The Plan must describe the construction boundaries (staging areas, ROW, and substation); schedule for watering; and water transportation and storage; and a description of any other dust control methodologies (i.e., soil coating, fences, etc.) that will be utilized during construction activities.

A-2 The Applicant/contractor shall apply water spray to all disturbed active construction areas a minimum of two times per day, except when soil water content exceeds the level recommended by the soils engineer for compaction or when weather conditions warrant a reduction in water applied. Watering shall continue until the soil coatings or other approved dust control measures are applied. Additionally, adequate dust control shall be used to keep fugitive dust from being transmitted outside of the ROW or property boundaries. Soil stockpiled for more than two days shall be covered, kept moist, or treated with soil binders to prevent dust generation. Truck soil loads shall be covered while in transit.

A-3 The Applicant/contractor shall increase dust control watering when wind speeds exceed 15 miles per hour. The amount of watering shall depend upon the soil moisture content.

A-4 The Applicant/construction contractor shall confine construction activities to the ROW, substation sites, and authorized staging areas and ROW access. Soil disturbance shall be limited to the areas defined by the Construction, Operation, and Maintenance Plan to be reviewed and approved by the U.S. Bureau of Land Management (BLM), California Public Utilities Commission (CPUC), and affected air districts.

C.2.2.3.2 *Operations*

Vehicular emissions associated with maintenance and repair of the transmission line would be the only sources of emissions during the operational phase of the Proposed Project. The maximum level of anticipated emissions in this phase are shown in Table C.2-6.

Table C.2-6 Maximum Daily Vehicular Emissions Associated With Operation Phase

	Operational Emissions (lbs/day)						
Source/Activity	**THC**	**ROC**	**NO_x**	**SO_2**	**CO**	**TSP**	**PM_{10}**
Mobile Sources	1.90	1.73	7.25	0.5	18.21	0.88	0.87

This level of emissions would not result in any violation of standards. Therefore, the impact associated with this phase in attainment areas is adverse, but not significant **(Class III)**. In non-attainment areas (such as Truckee Meadows Air Basin in Nevada), the addition of any source of emissions, particularly NO_x, ROC, and PM_{10} could be significant, because it exacerbates the existing conditions. However, based on the nature of these emissions sources (i.e., mobile sources which disperse the pollutants over a large area [90% of which would be outside of this air basin]) and the level of estimated worst-case maximum daily emissions, the impacts are assumed adverse, but not significant **(Class III)**.

General Conformity Under the Clean Air Act

The Bureau of Land Management, as the lead Federal agency for the Proposed Project, under Section 176(c) of the 1990 Clean Air Act Amendments, must make a determination whether the proposed transmission line "conforms" with the State Implementation Plan (SIP). The project would be exempt from the requirements of performing an air quality conformity analysis, if its total emissions are below the Federal General Conformity Rule "de minimis" emission thresholds.

Based on the general conformity requirements (40 CFR Parts 6, 51 and 93), the analysis focused on the segment of the project located within Federal land that has been designated as nonattainment/maintenance of the NAAQS. This is the portion of the transmission line that can be practicably controlled by the Federal agency through its continuing program responsibility.

The Proposed Alturas Transmission Line would be constructed through three air basins, the Northeast Plateaus, Mountain Counties, and Truckee Meadows Air Basin. Both the Northeast Plateau and Mountain Counties Air Basin are unclassified/attainment of the NAAQS. However, the Truckee Meadows Air Basin exceeds the NAAQS for ozone, CO and PM_{10}. The Environmental Protection Agency (EPA) has designated the Truckee Meadows Air Basin as marginally non-attainment of the NAAQS for ozone, non-attainment for CO, and moderately nonattainment for PM_{10}.

On a regional basis, the EPA has identified Washoe County as being non-attainment of the NAAQS for ozone. However, Washoe County has not exceeded the NAAQS for ozone in the last three years. As a result, Washoe County has asked EPA to redesignate it as in attainment of the NAAQS for ozone.

Based on the general conformity requirements (40 CFR Parts 6, 51 and 93), the determination of conformity would apply only to Federal land located within the Truckee Meadows air basin for CO and PM_{10}, and the Truckee Meadows air basin and a small portion of Washoe County for ozone.

For determining General Conformity, total construction emission for PM_{10} and CO were quantified for a 2.5 mile segment of the Proposed Alturas Transmission Line that would be constructed on Federal land and fall within the Truckee Meadow air basin. An eight mile segment was used to determine conformity for ozone, a segment that includes Federal land located within the Truckee Meadows air basin as well as a small portion of Washoe County. Table C.2-7 below lists total emissions for each segment and compares them to the "de minimus" thresholds.

Table C.2-7 Comparison Between Applicable Construction Emissions And the General Conformity De Minimus Thresholds

	VOC[c]	NO_x[d]	CO[e]	PM_{10}[f]
De Minimus Thresholds (Tons/Year)	100	100	100	100
Construction Emission Within Truckee Meadows Air Basin (Tons) (2.5 mile segment)[a]			9.24	4.31
Construction Emissions Within Truckee Meadows Air Basin & Small Portion of Washoe County (Tons) (8 mile segment)[b]	0.63	3.90		

a Total construction emissions for PM_{10} and CO were quantified for a 2.5 mile segment of the Proposed Alturas Transmission Line that would be constructed on Federal land and fall within the Truckee Meadow air basin.

b Total construction emissions for ozone were quantified for an 8 mile segment of the proposed Alturas Transmission Line that would be constructed within Truckee Meadows air basin and a small portion of Washoe County.

c De Minimus Threshold for VOCs within a marginally non-attainment area for ozone.

d De Minimus Threshold for NO_x within a marginally non-attainment area for ozone.

e De Minimus Threshold for all non-attainment areas.

f De Minimus Threshold for moderate non-attainment areas.

Table C.2-7 indicates that total construction emissions that would be generated along these two segments of the Proposed Alturas Transmission Line would fall substantially below the "de minimus" emission thresholds. Therefore, the project is in conformity with the SIP and will not require an air quality conformity analysis.

C.2.2.4 Cumulative Impacts and Mitigation Measures

As discussed in Section B.5 (Table B.5-1), a number of projects are planned to be constructed in the same general area as the proposed Alturas Transmission Line Project. The potential for these projects, combined with the Proposed Project, to affect the air quality of the region are discussed below.

C.2.2.4.1 *Construction*

As discussed above, the only major sources of emissions for the Proposed Project would be those associated with the construction activities. One of the cumulative projects that would travel parallel to the Proposed Project for about 37 miles is the proposed Tuscarora Gas Pipeline Project. Based on the existing anticipated schedules, the concurrent construction of both projects could occur. If such an overlap of construction activities occurred, there would be an increased level of emissions reaching receptors from south of Alturas to the Doyle State Wildlife Area boundary. This potential cumulative impact, would be adverse, but temporary, not affecting any particular receptors more than a maximum of a few months (**Class III**).

The proposed Evans Creek Watershed flood control dam and channel modification would be constructed some time in the spring of 1997. Based on the construction schedule for the Proposed Alturas Transmission Line, a potential overlap of the construction schedules could occur. This construction overlap could create a short-term cumulative impact. However, the short-term cumulative impact could be reduced to a less than significant level through the implementation of Mitigation Measures A-1 through A-4 (**Class II**).

A number of subdivision projects have been proposed in Modoc County that would be in the vicinity of the Proposed Project and could result in short-term cumulative impacts. Cumulative PM_{10} emissions associated with cumulative project construction could be reduced to a less than significant level with the implementation of Mitigation Measures A-1 to A-4 (**Class II**).

The combination of the construction emissions from other projects listed in Table B.5-1 with the Proposed Project could potentially affect receptors at the same time. However, since the construction emissions are short-term, the cumulative impact is expected be insignificant.

C.2.2.4.2 *Operations*

The Proposed Project would have no stationary source of emissions and minimal amounts of vehicular emissions associated with the maintenance activities that will occur over the entire length of the Project. Due to the small amount and the mobile nature of these emissions, no cumulative impacts for operation of the proposed transmission line are anticipated.

C.2.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

The alternative alignments and substation sites would be constructed in the same counties and air basins as the Proposed Project. Therefore, the settings for the alternative alignments are the same as presented in Section C.2.1, Environmental Baseline and Regulatory Setting.

The air quality impacts for the alternative alignments and substation sites will not be significantly different from the Proposed Project. The daily emissions shown in Table C.2-5 would be the same for each alternative. Localized short-term releases of emissions would occur in the same manner as the Proposed Project. Implementation of the Mitigation Measures, A-1 through A-4, would help to reduce the amount of emissions generated during the construction phase.

The distance traveled commuting to and from the staging areas could increase the amount of emissions released for alternative alignments that are longer than the Proposed Project. However, the amount of emissions that are released from traveling a few miles further will not cause a significant impact to a particular region. This is also true for any increases in the miles traveled for the operational phase of this project.

A deviation in total emissions between the alternatives and the Proposed Project could occur for construction emissions. The deviation would occur if the alternative is longer or shorter than the Proposed Project, or if the alternative passes through rough terrain where cut and fill operations must occur.

The long-term emissions from maintenance operations would be similar to those of the Proposed Project. No significant air quality impact would occur from the operational activities.

C.2.3.1 Alturas Area Alternative Alignment (Segment B)

The length of Alternative Segment B is approximately 30% shorter than Proposed Segment A. The short-term, day-to-day emissions from constructing the alternative portion of the transmission line would be similar to the construction emissions from constructing Proposed Segment A. However, the total emissions for this alternative would be approximately 30% lower than that for Proposed Segment A, due to the fact that the alternative is shorter.

C.2.3.2 Madeline Plains Alternatives (Segments D, F, G, H, I)

This alternative is broken up into several segments. Alternative Segments D, G, and I, would be approximately 6.5 miles longer than the Proposed Segment E, which they would replace. The added length would create about 35% more construction emissions from the alternative than from Proposed Segment E. Alternative Segments D, F, H, and I would be about 7.5 miles longer and would create approximately 40% more construction emissions than Proposed Segment E.

C.2.3.3 Ravendale Alternative Alignment (Segment J, I)

Alternative Segments J, I Alternative would be approximately 25% longer in distance than Proposed Segment K, which they would replace. The longer distance would create an equivalent increase in the total construction emissions for this area.

C.2.3.4 East Secret Valley Alignment (Segment ESVA)

Alternative Segment ESVA would be approximately 2 miles longer than Proposed Segment L, a portion of which it replaces. The greater length would increase total construction emissions in this area by 10%.

C.2.3.5 Wendel Alternative Alignment (Segment M)

Alternative Segment M would be approximately a half mile longer than Proposed Segment N, which it would replace. The 15% increase in distance would produce an equivalent amount of increased emissions in the area.

C.2.3.6 West Side of Fort Sage Mountains (Segment P)

Alternative Segment P would reduce the overall construction emissions because it is approximately 3.5 miles shorter than Proposed Segment Q, which it would replace. This alternative also passes through an area that will need less ROW preparation, tree removal, and possible cut and fill activities. The overall reduction in construction emissions for this segment could exceed 20%.

C.2.3.7 Long Valley Alignments (Segments S, U, Z, and WCFG)

Alternative Segments S, U, Z, and WCFG, which would replace Proposed Segments T and (portions of) W, would extend the transmission line by .2 to two miles in length depending on the number of alternatives implemented. The extra mileage would increase the construction emissions for Proposed Segments T and W up to approximately 15%.

C.2.3.8 Peavine Peak Alternative Alignment (Segment X-East)

Alternative Segment X-East is approximately .2 miles longer than Proposed Segment Y. Therefore, the air quality impacts associated with alternative would be approximately 10% greater.

C.2.3.9 Substation Alternatives

There would be very few differences between the proposed substation sites and the alternatives, since construction activities would be similar. Additional, but negligible emissions from vehicle trips accessing the proposed Alturas Substation site versus the alternative Mill site would be experienced since the proposed site is farther from the City of Alturas. The proposed and alternative Border Town Substation sites are in close proximity to each other, therefore, no substantial difference in emissions is anticipated from vehicles accessing the sites.

C.2.4 THE NO PROJECT ALTERNATIVE

Under the No Project Alternative, the proposed Alturas Transmission Line Project would not be constructed, eliminating the air quality impacts discussed in Section C.2.2. However, SPPCo would have to upgrade their existing facilities and add new transmission and generation capacity to compensate for existing system limitations and anticipated loads. Construction of at least portions of the SPPCo facility expansions and transmission line additions could occur in the Truckee Meadows Air Basin. These localized short-term construction scenarios could create a significant air quality impact since construction activities could create a nuisance or not conform with the requirements of the SIP for the Truckee Meadows Air Basin, a non-attainment air basin.

C.2.5 MITIGATION MONITORING PROGRAM

The mitigation measures recommended for the Proposed Project or one of the alternatives would be implemented and enforced through the local Air Pollution Control Districts, upon approval by the Lead Agencies and any other permitting agency. The following Mitigation Monitoring Plan specifies the implementation of the mitigation measures defined in Section C.2, along with the name of the responsible agencies or parties, the period when mitigation monitoring is to take place, and effectiveness criteria.

Table C.2-8 Mitigation Monitoring Program

Impact	Mitigation Measure	Location	Responsible Agency	Monitoring/Reporting Action	Effectiveness Criteria	Timing
Particulate emissions from construction activity (Class II)	A-1 Submit a Construction, Operation, and Maintenance Plan, detailing measures (A-2 through A-4) to mitigate potential impacts. Describe the construction boundaries (staging areas, ROW, substation), schedule for watering and water transportation and storage. A-2 Reduce particulate emissions (dust) by applying water to disturbed construction areas until the soil coatings or other approved dust control measures are applied. Cover stockpiled soil; cover soil loads while in transit. A-3 Increase dust control watering when wind speeds exceed 15 miles per hour, depending upon the soil moisture content. A-4 Confine construction activities to the ROW and substation sites with the exception of staging areas and ROW access.	All Proposed and Alternative Segments	BLM CPUC APCDs	Review and approve Construction, Operation and Maintenance Plan; monitor construction activity for compliance with Plan.	Compliance with Plan	Plan approved prior to construction; monitor activities during construction

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PART C.3 BIOLOGICAL RESOURCES

C.3.1 ENVIRONMENTAL BASELINE AND REGULATORY SETTING

This section describes the existing biological resources in the region around the Proposed Project, specific biological resources within the project study area, and the regulations applicable to biological resources. The project study area for biological resources consists of the Applicant's proposed transmission line route and several alternative route segments which together total about 270 miles in length. The description of the biological resources baseline is divided here into two sections: a regional overview divided by geographic subregions and the setting of the proposed transmission line route. The environmental settings for each of the alternative alignments and substation sites are described in Section C.3.3.

The diversity and distribution of biological resources within the study corridor are a function of the regional climate, soils, and topography (Young et al., 1977). Although a small portion of the project area near the northern terminus lies outside of the Great Basin as defined by hydrology, the vegetation, geology, and climate of the entire route is characteristic of the Great Basin. The regional overview divides the study area into two physiographic units that are readily distinguished by differences in soils, topography and geological origins: these are the Modoc Plateau Region and the Basin and Range Region. Both the Modoc Plateau and the Basin and Range regions lie within a rain shadow created by the southern Cascades and the northern Sierra Nevada. The result is a dry to moderately dry continental climate that receives between 5 and 12 inches of annual precipitation and experiences cold winters and dry summers. Most of the precipitation falls in the winter, whereas the greatest demand for soil moisture occurs in the summer. For most of the region, the availability of water or soil moisture is the critical factor that determines the broad distribution of vegetation types and associated wildlife species.

C.3.1.1 Regional Overview

North of the Honey Lake Valley, the project study area traverses an undulating terrain of valleys, plateaus and mountain ridges that lie within the Modoc Plateau Region. From the northern margin of the Honey Lake valley south to Reno the project parallels the western margins of the Basin and Range Region. The two geographic regions are distinguished from each other by differences in their soils, geologic origins, topography, and vegetation types.

C.3.1.1.1 *Vegetation*

Plant communities of the Modoc Plateau and the Basin and Range regions were classified based on existing descriptions developed by Holland (1986) and BioSystems (1994a). In some cases it was necessary to identify subdivisions of larger community types or discrete plant communities associated with special soils or substrates that were not described elsewhere. Table C.3-1 compares the classifications used for this study to those used for the Tuscarora Pipeline Project and others developed by Holland (1986).

Table C.3-1 Comparison of Plant Community Classifications

Alturas Transmission Line	Tuscarora Pipeline (BioSystems, 1994a)	Holland (1986)
big sagebrush scrub[1]	big sagebrush scrub	big sagebrush scrub (Element Code: 35210)
sagebrush/bitterbrush scrub	included in big sagebrush scrub	included in big sagebrush scrub
low sagebrush scrub	low sagebrush scrub	low elevation analog of subalpine sagebrush scrub (Element Code: 35220)
silver sagebrush scrub	silver sagebrush scrub	not treated
northern juniper woodland	northern juniper woodland and Great Basin juniper woodland	northern juniper woodland and Great Basin juniper woodland and scrub (Element Codes: 72110 and 72123)
yellow pine forest	yellow pine forest	Jeffrey pine forest (Element Code: 85100)
Alturas volcanic gravel	Alturas volcanic gravel	not treated
chenopod mixed scrub	chenopod mixed scrub	intermediate to desert saltbush scrub (Element Code 36110) and desert greasewood scrub (Element Code: 36130)
mud flat	mud flat	not treated
montane meadow	meadow/seep	montane meadow (Element Code: 45100)
riparian scrub	Modoc riparian scrub and Great Basin Riparian Scrub	Modoc-Great Basin riparian scrub (Element Code: 63600)
greasewood scrub	greasewood scrub	desert greasewood scrub (Element Code: 36130)
greasewood playa	not treated	partially resembles desert sink scrub (Element Code: 36120)
altered andesite	not treated	not treated
volcanic vertisols	subset of northern juniper woodland	not treated
stabilized or partially-stabilized dunes	stabilized or partially-stabilized dunes	stabilized and partially-stabilized desert dunes (Element Code: 22200)
cultivated or disturbed	cultivated or disturbed	not treated
silver sagebrush basins	silver sagebrush scrub (wetland)	not treated
alkali meadow	not treated	alkali meadow (Element Code: 45310)
stream channel (unvegetated)	not treated	not treated
irrigated pasture	subset of cultivated or disturbed	not treated
rabbitbrush scrub	rabbitbrush scrub	rabbibrush scrub (Element Code: 35400)
white ash deposits	not treated	not treated

[1] Scrub is a widely used technical term to describe shrub-dominated plant communities.

Individual plant communities are often separated by environmental gradients (Whittaker, 1967). Gradients of soil moisture, soil fertility, temperature, slope, and other physical parameters affect the distribution of individual species in the project area and in turn affect the type of plant community that develops at a given location. Often the dominant species of one plant community is a co-dominant or sub-dominant species of an adjacent plant community. These attributes of all plant communities complicate any effort to divide these associations of species into discrete units and account for the different classifications used by different observers.

Modoc Plateau Region

This region occupies most of Modoc and Lassen Counties in the extreme northeastern corner of California. The Modoc Plateau Region is bounded on the west by the volcanic mountains of the southern Cascades and on the north, east, and south by the Basin and Range regions of Nevada and Oregon. Geologically, the Modoc Plateau Region resembles the large lava plateaus of the Columbia Plateau in Oregon and Washington and the Snake River Plain in southern Idaho. The topography of the Modoc Plateau Region consists of extensive, undulating lava plains and shield volcanoes formed when large volumes of fluid basalt erupted onto the surface more than 1 million years ago (Young et al., 1977). Other features of the Modoc Plateau include former lakebeds, include such as the Madeline Plains and Likely Valley where runoff accumulated in closed topographic depressions during the glacial periods of the past 2 million years (Young et al., 1977). The soils that have developed on the lakebeds, lava flows, and other volcanic debris have in turn influenced the development of the regional vegetation.

The vegetation of the region is characterized by several plant communities dominated by species of sagebrush (*Artemisia* spp.), other mixed Great Basin shrubs, rabbitbrush (*Chrysothamnus* spp.), western juniper (*Juniperus occidentalis*), and yellow pine (*Pinus jeffreyi*). The distribution of plant communities in the region appears to be strongly related to variations in soils and elevation (Young et al., 1977).

The dominant plant communities associated with the Modoc Plateau Region include:

- Big sagebrush scrub
- Low sagebrush scrub
- Silver sagebrush scrub (non-wetland)
- Northern juniper woodland
- Yellow pine forest.

Other plant communities that are less common include:

- Alturas volcanic gravel
- Mud flat
- Montane meadow (wetland)
- Riparian scrub
- Riparian woodland
- Volcanic vertisols
- Greasewood scrub
- Rabbitbrush scrub
- Silver sagebrush basins (wetland)
- Irrigated pasture (wetland)
- Stream channels
- Disturbed/cultivated areas
- White ash deposits.

The plant community classification used here is an amalgamation of the classification system developed by Robert Holland for the California Natural Heritage Division (Holland, 1986), preliminary series descriptions edited by J.O. Sawyer (1994), and other classifications from Barbour and Major (1977), and BioSystems (1994). Descriptions of the dominant plant communities are provided below.

Sagebrush Communities. Three distinct sagebrush-dominated communities occur on the Modoc Plateau. Big sagebrush scrub is dominated by big sagebrush (*Artemisia tridentata*). Silver sagebrush (*Artemisia cana*) forms the principal component of the silver sagebrush community and two species, low sagebrush (*Artemisia arbuscula*) and black sagebrush (*Artemisia nova*), co-occur in the low sagebrush community. The big sagebrush community is one of most ubiquitous plant communities in the Great Basin and is perhaps the most widespread plant community on the Modoc Plateau occupying perhaps 30-40% of the Modoc Plateau Region. The low sagebrush community is common on the Modoc Plateau where suitable habitat occurs and may occupy as much as 10-15% of the region's total area. Silver sagebrush is the least common sagebrush community which occurs only on deep, poorly drained soils developed on lakebed sediments or other fine grained materials. The silver sagebrush community probably occupies less than 5% of the Modoc Plateau region.

The big sagebrush scrub plant community is dominated, as the name implies, by big sagebrush. Other associated species include rabbitbrush (*Chrysothamnus* sp.), basin wildrye (*Leymus cinereus*), squirreltail (*Elymus elymoides*), and cheatgrass (*Bromus tectorum*). Individual shrubs range from 1.5 to 6 feet tall and the space between shrubs is characterized by grasses and forbs. The big sagebrush scrub community is widespread in the Modoc Plateau Region and occurs on sites similar to those favored by the sagebrush/bitterbrush community. Typical habitat includes soils that are moderately deep, coarser-textured, and well-drained.

Sites with shallow, rocky soils that are poorly drained are frequently characterized by the low sagebrush scrub plant community. Dominant species are low sagebrush (*Artemisia arbuscula*) or black sagebrush (*Artemisia nova*). Associates usually include Sandberg bluegrass (*Poa secunda*), bluebunch wheatgrass (*Pseudoroegneria spicata*) and a number of other perennial herbs. A major factor in the ecology of the low sagebrush community may be poor aeration in the rooting zone caused by perched water tables during the spring (Young, et al., 1977).

The silver sagebrush scrub plant community is characteristic of the margins of vernally moist areas such as the Madeline Plains where the surface soil horizons are saturated by spring accumulations of runoff that form a perched water table because of low soil permeability. Unlike the low sagebrush community, silver sagebrush is found on soils that are deep and generally fine textured. The dominant species is silver sagebrush, but associates include big sagebrush, rabbitbrush, and basin wildrye (*Leymus cinereus*). The distribution of the silver sagebrush community on the Modoc Plateau is very localized. The community occurs as isolated blocks where suitable habitat is concentrated such as the vernally moist habitats on the Madeline Plains and in Likely Valley. It is likely that the silver sagebrush community occupies less than 5% of the total regional area.

Silver sagebrush also occurs on low-lying terraces and basins where surface runoff accumulates and saturates the soil for extended periods during the late winter and early spring. These areas are classified separately as silver sagebrush basin wetlands. Characteristic plant species of the silver sagebrush basin wetlands are silver sagebrush (*Artemisia cana* ssp. *bolanderi*), fine branch popcorn flower (*Plagiobothrys* *leptocladus*), least navarretia (*Navarretia minima*), Great Basin navarretia (*Navarretia propinqua*), dense flowered knotweed (*Polygonum confertiflorum*), and willow dock (*Rumex salicifolius* var. *lacustris*).

Forest and Woodland Communities. The northern juniper woodland community consists of widely-spaced to nearly closed-canopy stands of western juniper (*Juniperus occidentalis*). Northern juniper woodland is found on slopes and ridges at elevations generally above 4,500 feet. Typical soils range from coarse-textured colluvium on slopes to fine-textured clays on plateaus and ridges. Common understory species include shrubs such as big sagebrush, low sagebrush, and antelope bitterbrush. Northern juniper woodland is most extensive in the regions north of Secret Valley and Snowstorm Mountain, however juniper appears to be excluded from the fine-textured soils on the floors of the valleys. Some of the mature junipers observed on plateaus north of Likely Mountain had trunk diameters of more than three feet and may reach ages of more than 500 years. The suppression of natural fires and the introduction of cattle grazing may favor the expansion of juniper woodlands into areas where they were formerly less common. Northern juniper woodland probably occupies 25-35% of the regional area and, like the big sagebrush community, is one of the most common plant communities in the northern Great Basin.

Juniper woodlands give way to yellow pine forest above about 5,500 feet and the pines are firmly established at elevations greater than 6,000 feet. Yellow pine forest on the Modoc Plateau varies from rather open pine-shrub associations at lower elevations to closed canopy forest on north-facing slopes and higher elevations where soil moisture is more plentiful. Although ponderosa pine (*Pinus ponderosa*) occurs along creeks and in the higher mountains of the Modoc Plateau, the dominant species is Jeffrey pine (*Pinus jeffreyi*). Associated species include white fir (*Abies concolor* var. *lowiana*) at upper elevations, western juniper at lower elevations, antelope bitterbrush, big sagebrush, and greenleaf manzanita (*Arctostaphylos patula*). Yellow pine forest occupies a relatively modest proportion of the total region, perhaps totaling less than 5-8%, and much less in the project study area.

Wetland Plant Communities. Wetland plant communities occur throughout the Modoc Plateau wherever the surface horizons of the soil are saturated long enough to favor the growth of hydrophytic (wetland-adapted) species. The area of wetlands in the region are limited by low annual precipitation totals and the inter-annual variability of rainfall totals. None of the wetland plant communities discussed here occur in extensive blocks; most are seasonal and occur within the context of narrow riparian corridors or isolated seeps.

Regionally, most of the wetland plant communities are associated with the closed basins that were once filled by pluvial lakes, the margins of streams and rivers, and isolated meadows associated with springs or seeps. Because most of the annual precipitation falls during the winter, most wetland areas are seasonal, although some areas near the Pit River and its tributaries remain perennially wet. Wetland plant communities on the Modoc Plateau include:

- Silver sagebrush basins
- Montane meadows
- Mud flat
- Stream channels
- Irrigated pasture.

Stream channels were delineated where there were well-defined beds and banks. Stream channels conveyed both perennial and seasonal streams in the project study area. All of the stream channels that were delineated contain water during the wet season. The beds of the stream channels usually consist of unconsolidated sands, gravels, and cobbles over bedrock. Stream channels ranged in width from 1.5 to 40 feet.

Stream channels are generally unvegetated or sparsely vegetated. Most qualify as waters of the United States (see Section C.3.1.3 for definition) because of their defined bed and bank. Those sites with hydrophytic vegetation and that flood frequently and for long durations during the growing season are jurisdictional wetlands. A typical plant species found in the channels of many seasonal streams within the project study area was small flowered sumpweed (*Iva axilaris*).

Montane meadow wetlands are the most widely distributed wetland type in the project study area but probably occupy less than 1% of the regional area. Montane meadows occur on volcanic tablelands alluvial fans, basin rims, and along river floodplains and channels. Dominant plant species of montane meadows on the Modoc Plateau include meadow foxtail (*Alopecurus pratensis*), Nevada bluegrass (*Poa nevadensis*), California oatgrass (*Danthonia californica*), beaked sedge (*Carex rostrata*), Nebraska sedge (*Carex nebrascensis*), baltic rush (*Juncus balticus*), Nevada rush (*Juncus nevadensis*), western buttercup (*Ranunculus occidentalis*), water cress (*Rorippa nasturtium-aquaticum*), American speedwell (*Veronica americana*), northwest cinquefoil (*Potentilla gracilis*), common camassia (*Camassia quamash*), toad lily (*Montia chamissoi*), and fountain miner's lettuce (*Montia fontana*).

Montane meadow soils are saturated or flooded during winter and spring and remain saturated or moist during summer. Soils are typically deep (>18 inches) loams or clay loams. Montane meadows in the region are associated with saturation or inundation caused by overbank creek flooding and seasonally high water tables on floodplains such as the Pit River Valley. On the volcanic tablelands of the Modoc Plateau, montane meadows also occur where groundwater surfaces at seeps or springs.

A single, large mud flat is at the southern end of Secret Valley near the southern margin of the Modoc Plateau. The mud flat differs from the playas of the Honey Lake Valley because it is entirely vegetated when it is not flooded. Mud flat supports an uncommon mix of species not observed in association elsewhere in the region (Jones and Stokes Associates, Inc., 1994). Dominant species include common sunflower (*Helianthus annuus*), tansy leaf suncup (*Camissonia tanacetifolia*), and willow dock (*Rumex salicifolius*). During wet years, such as 1995, willow dock was common, but after drier years, such as 1994, species such as tansy leaf suncup and common sunflower dominated the mud flat. Records indicate that the mud flat floods only once every 5-10 years (U.S. Soil Conservation Service, in prep). The very fine textured soils of the basin seal at the surface when moistened and cause the basin to retain surface runoff under normal conditions.

Irrigated pastures on the Modoc Plateau are dominated by hydrophytic grass species such as meadow foxtail (*Alopecurus pratensis*), Nevada bluegrass (*Poa nevadensis*), and California oatgrass (*Danthonia californica*). These areas are routinely flood-irrigated as part of the operation of local ranches. In some areas, such as the Madeline Plains, natural hydrologic conditions also contribute to the maintenance of the plant community (Jones and Stokes Associates, Inc., 1994). Soils of the irrigated pastures are generally saturated or flooded during the winter and spring and remain saturated or moist during summer.

Chenopod Shrub Plant Communities. Chenopod shrub plant communities are uncommon in the Modoc Plateau Region. The only representative of this category of plant communities on the Modoc Plateau is greasewood scrub, which is dominated by greasewood (*Sarcobatus vermiculatus*). Greasewood scrub typically occurs in low-lying portions of closed basins where some groundwater is seasonally available (Young, et al., 1977). A more detailed description of the greasewood scrub plant community is presented in the discussion of Basin and Range Region plant communities.

Rabbitbrush Plant Communities. Rubber rabbitbrush (*Chrysothamnus viscidiflorus*) is the dominant species on sites that are subjected to disturbances such as grazing, fire, or human activities. It is a frequent species on the margins of roads. Holland (1986) theorized that "self-churning" vertisol clay soils may have been the only pristine habitats dominated by rabbitbrush. Although rabbitbrush is a common component of many plant communities on the Modoc Plateau and the Basin and Range regions, it infrequently dominates the plant community.

Disturbed or Cultivated Plant Communities. Fire, grazing, agriculture, and introduction of aggressive non-native species have altered some of the plant communities of the Modoc plateau. Areas where the natural plant community has been completely or substantially replaced by non-native plant species were classified as disturbed or cultivated. These included cultivated fields, pastures (except irrigated pasture), heavily grazed or non-native grasslands, irrigation ditches and ponds, highways, gravel pits, and structures.

Plant Communities Associated with Unusual Soils or Substrates. Several plant communities on the Modoc Plateau are restricted to specialized edaphic (soil) conditions:

- Alturas volcanic gravels
- Volcanic vertisols
- White ash deposits.

These plant communities are highly specialized and localized habitat types that are not treated in Holland (1986) or recognized by the CNDDB that support unusual associations of species not found elsewhere in the project area (for additional details on these plant communities please refer to Section C.3.1.2.4 of the EIR/S and the Plant Community Survey Report in Appendix E.7).

The Alturas volcanic gravels plant community occurs only on the Modoc Plateau in the vicinity of Alturas, California. It consists of localized barren areas of gravelly soil derived from volcanic tuffs. Associated plant communities include low sagebrush scrub and northern juniper woodland. Plant cover is typically less than 20% and consists of widely scattered annuals and low-growing perennial species. Several special status plant species that are entirely or largely restricted to this habitat type include doublet (*Dimeresia howellii*), lilliput lupine (*Lupinus uncialis*), prostrate buckwheat (*Eriogonum prociduum*), and Suksdorf's milkvetch (*Astragalus pulsiferae* var. *suksdorfii*).

The volcanic vertisol plant community occupies nearly level terrain on lava plateaus where the associated soils are best developed. Vertisol soils are composed of clays that shrink and swell as they become dry or wet. During the dry season these soils contract until they are almost granular in texture. As they become wet, the soil matrix swells more rapidly in the upper horizons than farther down. Differential rates of expansion and contraction in the soil causes churning. The volcanic vertisol plant community is found near the low sagebrush scrub-northern juniper woodland ecotone, but differs from these two plant communities in the low percentage of low sagebrush or black sagebrush, the presence of deep vertisols, and the nearly uniform presence of Cusick's sunflower (*Helianthus cusickii*). Other characteristic species include woolly daisy (*Eriophyllum lanatum*), cryptantha (*Cryptantha intermedia*), rough-stem fireweed (*Epilobium brachycarpum*), and rubber rabbitbrush (*Chrysothamnus nauseosus*). Holmgren's skullcap (*Scutellaria holmgreniorum*), a CNPS List 3 species now proposed for List 4, is typically associated with this plant community. Plant cover occupies approximately half of the available surface area in this plant community with the remaining area occupied by bare ground and rock.

The plant community associated with white ash deposits occurs on small, isolated islands of a white, chalky soil that apparently excludes most of the zonal vegetation. Associated plant communities include big sagebrush scrub and low sagebrush scrub. Adjacent plant communities generally have closely spaced shrubs with a significant herbaceous understory in the intervals between shrubs. In contrast, the total plant cover of white ash areas is less than 15 percent. Green prince's plume (*Stanleya viridiflora*), a CNPS List 2 candidate species, is closely associated with white ash deposits. Other species include a non-native mustard (*Sisymbrium loeslii*), smooth horsebush (*Tetradymia glabrata*), and cheat grass (*Bromus tectorum*).

Basin and Range Region

The dominant feature of the Basin and Range Region is row upon row of parallel north-south trending mountains separated by low valleys. The mountain ranges are the product of faulting which has gradually lifted the mountains upward while the valleys become lower. Most of the valleys are deeply filled with the accumulated alluvial material eroded from the mountains. The alluvial material is deposited in broad coalesced alluvial fans called "bajadas", while the basins sometimes contain seasonal lakes known as "playas." Geographically, the Basin and Range Region dominates most of the state of Nevada and occupies the margins of Oregon, Idaho, Utah, Arizona and California. The Sierra Nevada Mountain Range forms the western margin of the Basin and Range Region.

As recently as 10,000 years ago, a vast lake occupied the Honey Lake Valley and most of the lowlands of western Nevada. Walker Lake and Pyramid Lake represent the remains of that lake. The salts, carbonates and other minerals that were concentrated in the waters of the ancient lake are the key factors that control the species composition and distribution of the vegetation found in the lowlands of the Basin and Range Region.

One family of plants that is especially successful on poorly-drained alkaline soils is the goosefoot family (Chenopodiaceae). Members of this family that are important in the region's alkaline soil areas are greasewood (*Sarcobatus vermiculatus*), spiny hop-sage (*Grayia spinosa*), and shadscale (*Atriplex confertifolia*).

On the bajadas the soils become less alkaline and the vegetation is largely dominated by associations of big sagebrush, rabbitbrush, and desert peach. Widely scattered stands of juniper occupy the higher slopes.

The dominant plant communities associated with the Basin and Range Region include:

- Sagebrush/bitterbrush scrub
- Big sagebrush scrub
- Low sagebrush scrub
- Greasewood scrub
- Chenopod mixed scrub
- Greasewood playa
- Northern juniper woodland
- Disturbed/cultivated areas.

Other plant communities that occur much less frequently are:

- Altered andesite
- Montane meadow
- Riparian scrub
- Stabilized or partially-stabilized sand dunes
- Alkali meadow
- Yellow pine forest
- Stream channels.

Although the Basin and Range Region shares some of the same plant communities already described for the Modoc Plateau Region, three communities are described in this section that are more dominant in the Basin and Range Region. The three plant communities described here are greasewood scrub, chenopod mixed scrub, and greasewood playa, which dominate most of the lowland areas in the Honey Lake Valley and other playa lakebeds and alkali sinks throughout the region. Although these communities represent perhaps only 10% of the region's total area, they are a unique component of the regional vegetation due to the dominance of a single family of plants.

Chenopod Shrub Dominated Plant Communities. Greasewood playa, greasewood scrub, and shadscale scrub are dominated by species of the goosefoot family (Chenopodiaceae). Many members of this family are uniquely adapted to survival in saline or alkaline soils that are periodically saturated or even inundated. High levels of salts, carbonates, and other minerals have accumulated over thousands of years in the closed basins of the Basin and Range Region. These lowlands are often characterized by salt-encrusted soils inhospitable to most vascular plant species. For these reasons, chenopod shrubs dominate the vegetation of the Honey Lake Valley.

Greasewood scrub habitats in the Basin and Range region are generally similar to the habitats associated with this plant community in the Modoc Plateau region. For a detailed description of those habitats please refer to preceding discussions of Modoc Plateau plant communities.

In some areas, greasewood scrub borders on shallow, interconnected basins where water collects during the wet season. Although the basins are unvegetated, they occur within a matrix of low mounds that support greasewood (*Sarcobatus vermiculatus*) and shadscale (*Atriplex confertifolia*). Therefore, these features have been categorized here as the greasewood playa plant community. A playa is generally defined as "... a dry barren area in the lowest part of an undrained desert basin, underlain by clay, silt, or sand..." (Bates and Jackson, 1984). The playa soils are not highly saline or alkaline. Water has been observed to pond in the playa areas as late as May 1. However, ponding is probably sporadic and unpredictable from one year to the next. The playa basins do not qualify as jurisdictional wetlands because of the lack of hydrophytic vegetation and lack of wetland hydrology and hydric soil. Although wetland drainage patterns are evident, wetland hydrology is unlikely because of the low average annual precipitation and low frequency of rainfall during the growing season, and their ability to dry rapidly following a rainfall event. Playas were delineated as potentially jurisdictional non-wetland waters of the United States based on the presence of visible ordinary high-water marks around the margins in the form of drift lines, and dramatic changes in vegetation.

Sagebrush Communities. Three sagebrush plant communities occur in the Basin and Range region. Big sagebrush scrub and low sagebrush scrub are described in the preceding discussion of Modoc Plateau plant communities; sagebrush-bitterbrush scrub is discussed below.

Sagebrush-bitterbrush scrub is co-dominated by big sagebrush (*Artemisia tridentata*) and antelope bitterbrush (*Purshia tridentata*). A less common associate is desert peach (*Prunus andersonii*). This plant community is associated with moderately deep, well-developed soils that have been strongly influenced by the deposition of pumice and volcanic ash (Young, et al., 1977). The sagebrush-bitterbrush community frequently intergrades with the big sagebrush community.

Forest and Woodland Communities. Both juniper woodland and yellow pine forest plant communities occur in the Basin and Range region, however they are much less common than in the Modoc Plateau region. Yellow pine forest is restricted to specialized habitats near the southern end of Long Valley where soils or north-facing slopes provide competitive advantages to the trees. Detailed descriptions of these plant communities are presented in the discussion of Modoc Plateau plant communities.

Plant Communities Associated with Wetlands and Waters. Five plant communities associated with wetlands or potentially jurisdictional waters occur in the Basin and Range region. These include:

- Montane meadows
- Alkali meadows
- Greasewood-playa
- Riparian scrub
- Stream channels.

The greasewood-playa plant community has been described as part of the descriptions of chenopod shrub dominated plant communities. Montane meadow plant communities and stream channels are described under the discussion of Modoc Plateau plant communities. The remaining plant communities are described here.

Alkali meadows generally occur at the margins of pluvial lakebeds in locations where shallow groundwater evaporates at the surface causing salts to accumulate. Only one alkali meadow area was identified in the project area located in the Honey Lake Valley at the base of the Amedee Mountains on Segment O of the Proposed Project route. Plant species associated with alkali meadows include salt grass (*Distichlis spicata*), bush seepweed (*Suaeda moquinii*), and Nevada bulrush (*Scirpus nevadensis*). Most of these species are halophytes which are capable of tapping shallow groundwater that does not intercept the soil surface. Roots of some of these species can extend more than 10 feet below the soil surface. The alkali meadow plant community in the project area is dominated by hydrophytic plant species but does not meet the qualifications of a jurisdictional wetland based on the lack of wetland hydrology indicators or positive hydric soil indicators.

Riparian scrub occurs on terraces adjacent to stream channels. Riparian scrub is dominated by Pacific willow (*Salix lucida* ssp. *lasiandra*), arroyo willow (*Salix lasiolepis*), and wood's rose (*Rosa woodsii* var. *ultramontana*). Riparian scrub occurs on soils that are composed of coarse-textured, recently deposited alluvium. The stream terraces where riparian scrub occurs flood frequently for long durations during the early portion of the growing season, and soils remain saturated or moist during the dry season. The riparian scrub is a jurisdictional wetland type because it is dominated by hydrophytic plant species and positive indicators of wetland hydrology and hydric soils are associated with these sites.

Plant Communities Associated with Unusual Soils or Substrates. Two plant communities associated with specialized edaphic (soil) conditions occur in the Basin and Range region of the Proposed Project. These are stabilized or partially-stabilized sand dunes and altered andesite plant communities.

The stabilized or partially-stabilized sand dune plant community corresponds to the stabilized and partially-stabilized desert dunes types of Holland (1986), which is recognized as a "high priority" habitat type by CNDDB. It is localized and uncommon in the project vicinity. This plant community occurs in areas where wind-blown sand has formed dunes that have become stabilized or partially-stabilized by vegetation. It is characterized by a sparse cover of widely scattered shrubs and a diverse assemblage of annual and perennial herbs, some of which are largely or entirely restricted to sandy soils. Characteristic shrubs include fourwing saltbush (*Atriplex polycarpa*), rubber rabbitbrush (*Chrysothamnus nauseosus*), smooth horsebush (*Tetradymia glabrata*), and buckwheat (*Eriogonum nummulare*). Herbaceous species include cryptantha (*Cryptantha circumscissa*), mustard (*Descurainia paradissa*), bicolor phacelia (*Phacelia bicolor* var. *bicolor*), and evening primrose (*Oenothera deltoides* ssp. *piperi*). Lance-leaved scurf-pea (*Psoralidium lanceolatum*), a CNPS List 2 candidate species, is closely associated with this habitat.

The altered andesite plant community has been previously studied by Billings (1950), and De Lucia, Schlesinger, and Billings (1989, 1988). These studies have identified several soil characteristics of the chemically altered soils that offer conifers such as ponderosa pine a competitive advantage over the Great Basin plant species found on unaltered soils nearby. The most significant factors are acidity and a deficiency of phosphorus which act as barriers to the establishment of big sagebrush and other Great Basin species (Billings, 1950). Bare ground accounts for more than half of the total surface cover in this plant community. Ponderosa pine (*Pinus ponderosa*) contributes approximately one-fifth of the total cover. Other important species include cheat grass (*Bromus tectorum*), a non-native grass species, Wright's buckwheat (*Eriogonum wrightii*), and miner's lettuce (*Claytonia perfoliata*). The endemic rare plant, altered andesite buckwheat (*Eriogonum robustum*), is entirely restricted to this plant community. Other species identified by Billings (1950) that are generally restricted to soils derived from altered andesite include: Nuttall's sandwort (*Minuartia nuttallii*), pussy paws (*Calyptridium umbellatum*), bitterroot (*Lewisia rediviva*), woolly daisy (*Eriophyllum lanatum* var. *integrifolium*), onion (*Allium parvum*), fescue (*Festuca arida*), and monkeyflower (*Mimulus nanus*).

Chenopod mixed scrub is dominated by shadscale (*Atriplex confertifolia*), and is defined as having less than 30% of its composition as greasewood. Other associates include budsage (*Artemisia spinescens*) and spiny hop-sage (*Grayia spinosa*).

C.3.1.1.2 *Wildlife*

The Proposed Project would occur in extreme northeastern California and a small portion of Nevada northwest from Reno. The regional area addressed for wildlife resources includes parts of Modoc, Lassen, and Sierra Counties in the Basin and Range Region and the Modoc Plateau Region. A diversity of wildlife habitats in these regions support a large number of wildlife species.

Wildlife habitat can be broadly defined as any area which supports wildlife species. It is often difficult to determine what elements in the landscape actually increase the habitat value of a given habitat. The type of vegetation and the structure of the vegetative community are important characteristics of habitat since wildlife species rely upon vegetation for food and cover. Slope, elevation, exposure, and accessibility by predators or humans can also have an impact on habitat suitability.

Habitat requirements vary according to species, season, and climatic conditions. Wildlife species require different habitat types during various seasons or life stages. Amphibian species require water for breeding and early development but are generally less dependent on water upon reaching maturity and during the non-breeding season. Other animals have the ability to migrate in search of suitable habitat or preferable climatic conditions during specific times of the year. In dry climates rainfall is an important variable in habitat suitability. During years of heavy rainfall foraging habitat may be available over a broader area, or aquatic habitat may be more abundant, offering wildlife increased opportunities.

The varied wildlife habitat types present in both the Basin and Range Region and the Modoc Plateau provide opportunities for wildlife to occur during all or portions of their life history. In addition, the relative lack of development and human disturbance in the area enhance the opportunity for wildlife species to live and reproduce without disturbance. Wildlife habitat types described in the following section are based on wildlife use and will allow evaluation of project impacts on important wildlife habitat features as well as direct impacts on individuals or populations.

The following wildlife habitat types will be discussed as they relate to wildlife:

- Yellow pine forest habitats
- Juniper habitats
- Sagebrush habitats
- Riparian habitats
- Wetland habitats
- Aquatic habitats
- Agriculture/Pasture.

Habitat descriptions are based on vegetation type, physical characteristics, and wildlife use. The vegetation types discussed in this section are described in terms of their value to wildlife species. For a more detailed description of the regional vegetation types see Section C.3.1.1.1. Table C.3-2 correlates the vegetation types described in Section C.3.1.1.1 with the wildlife habitat types discussed below.

In the Modoc Plateau Region predominant wildlife habitat types include open sagebrush and northern juniper woodland. Open sagebrush is predominant in the lower-elevation valleys and level plains. The rolling topography has been colonized by juniper trees, with pine forests in the higher elevation areas such as Likely Mountain. Agriculture and cattle grazing are common on the Modoc Plateau. The level, low elevation valleys have been developed and irrigated for agricultural crops such as alfalfa and for pasture.

Common wildlife habitat types within the Basin and Range Region in the vicinity of the California-Nevada border include desert scrub and sagebrush. This area encompasses lands to the south of the north perimeter of the Honey Lake Valley. Basin and Range habitats are more dry than the Modoc Plateau and only support scattered junipers on higher elevation portions.

Yellow Pine Forest Habitats

Yellow pine forest occurs in a small portion of the project area in the vicinity of Likely Mountain (Segment C). This habitat type includes conifer trees such as white fir and ponderosa pine. The canopy may be nearly closed in some places. In the project area the understory in this habitat type may include forbs and grasses, and grades into sagebrush cover in more open areas. Avian species such as the northern goshawk prefer this habitat type, although this species was not observed during field surveys. Nuthatches, chickadees, lazuli buntings, and great horned owls were observed in this habitat type. Mule deer, American badgers, and woodrat middens were also observed in this habitat type during project field surveys.

Table C.3-2 Regional Wildlife Habitats and Associated Vegetation

Wildlife Habitat Type	Vegetation Types (See Section C.3.1.1.1)	Typical Representative Wildlife Species	Typical Habitat Use	Important Features
Yellow pine forest	Yellow pine forest	Passerine birds *lazuli bunting* *western tananger* *yellow-rumped warbler* *Steller's jay* Small mammals *pallid bat* *marmot* Raptors *northern goshawk*	Nesting Burrowing Perch-hunting Foraging	Tall pines Snags, crevices in trees Grassy understory
Northern juniper woodland	Northern juniper woodland	Passerine birds *Townsend's solitaire* *gray flycatcher* *chipping sparrow* Mammals *Great Basin pocket mouse* *mule deer* Raptors *red-tailed hawk* *great horned owl* *ferruginous hawk*	Nesting Burrowing Cover Foraging	Irregular distribution of trees Grassy understory Shrub understory
Sagebrush	Sagebrush/bitterbrush Big sagebrush Low sagebrush Greasewood scrub Silver sagebrush	Passerine birds *horned lark* *sage thrasher* Game birds *sage grouse* *chukar* Mammals *Long-tailed pocket mouse* *pronghorn* *mule deer* *American badger* *Pygmy rabbit* Raptors *Swainson's hawk* *burrowing owl* *long-eared owl* *red-tailed hawk* *golden eagle*	Nesting Foraging Lek sites Brood rearing Winter and early spring forage Pronghorn kidding Greater sandhill crane foraging	Uniform cover Open, clear views
Riparian	Riparian scrub Riparian woodland Riparian willow scrub	Passerine birds *willow flycatcher* *Wilson's warbler* *western flycatcher* *bank swallow* Mammals *pronghorn* *mule deer* *muskrat* Raptors Cooper's hawk	Nesting Foraging Migration Dispersal Perch-hunting	Corridor structure Ecotone(edge habitat) Water source Dense overstory Dense understory
Wetland	Mud flat Montane meadow/ seep	Waterfowl/Shorebirds long-billed curlew *greater sandhill crane* *white-faced ibis* Raptors *short-eared owl* *red-tailed hawk* *northern harrier* Amphibians *Great Basin spadefoot toad*	Resting Foraging Nesting Breeding	Emergent vegetation Moisture/water Open water

Wildlife Habitat Type	Vegetation Types (See Section C.3.1.1.1)	Typical Representative Wildlife Species	Typical Habitat Use	Important Features
Aquatic	Alkali playa	Waterfowl *double-crested cormorant* *American white pelican* *black tern* *mallard* *gadwall* *American wigeon* Raptors *northern harrier* *bald eagle* Amphibians *Great Basin spadefoot toad* Fish *Pit roach* *hardhead*	Resting Foraging Breeding	Open water
Agriculture/ pasture	Various (disturbed)	Waterfowl *northern pintail* *cinnamon teal* *ruddy duck* Raptors *northern harrier* *American kestrel* *prairie falcon* Mammals *pronghorn* *mule deer*	Nesting Foraging Burrowing Winter forage Perch-hunting Greater sandhill crane foraging	Grasses Grain and stubble Open water/flooded fields Soft, turned soils Irrigation structures Fence posts

Juniper Habitats

Juniper habitats are common on gently rolling topography and some level areas within the project area. These habitats form a transition between habitats at higher elevations (pine forests) and habitats at lower elevation (sagebrush). Juniper habitats can be relatively open to dense aggregations in the form of shrubs and small trees. In open areas a sagebrush understory is common, whereas in more dense stands a grassy understory develops. Mature junipers range in height from 4.5 to 9 meters in height.

Birds and small mammals rely on juniper berries as a food source. In addition, Swainson's hawk, golden eagle, peregrine falcon, ferruginous hawk, and other raptor species use this habitat for foraging and/or nesting. Some mammals, such as pronghorn, may consume juniper foliage, especially during harsh winters. The understory vegetation and the configuration of dense juniper trees provide cover and nesting habitat for songbirds and raptors. Small mammals, deer, and antelope use juniper habitats for foraging. Small mammals build nests at the bases of juniper trees or in stumps or snags. Larger mammals such as the American badger dig burrows in juniper habitat. A variety of reptile species, including western fence lizards (*Sceloperus occidentalis*) and racers (*Coluber constrictor*), also live in juniper habitat. Juniper and associated shrubs provide an important source of forage for wintering mule deer, especially during periods when other types of forage are buried beneath snow. During the winter months mule deer will form groups and take cover beneath juniper trees where temperatures may be a few degrees warmer than in open habitats (Kahre, 1995).

Juniper habitat is very common in the Modoc Plateau region and supports a diversity of wildlife species. Juniper habitat has expanded and densities have increased in the last century due to heavy grazing and fire suppression (Martin, 1980).

Sagebrush Habitats

Parts of the Modoc Plateau and Basin and Range Regions are dominated by sagebrush habitats. These habitats support an abundance of wildlife and provide habitat for several species during critical seasons such as the breeding season. Several species of wildlife, including sage grouse, Brewer's sparrow, vesper sparrow, loggerhead shrike, and the pygmy rabbit, depend on sagebrush habitats throughout their life history.

Sagebrush habitats can be roughly broken into two main groups: low sagebrush and big sagebrush. Low sagebrush provides an important source of early spring forage for pronghorn and mule deer. Pronghorn use this habitat for kidding. The young can take cover in the vegetation and the open habitat allows pronghorn to locate potential predators from a great distance. Several species of raptors (see Table C.3-2) find low sagebrush habitats to be ideal hunting grounds as these stands tend to lose their snow cover earlier in the spring than surrounding habitats. Sage grouse, burrowing owl, and pronghorn breed in low sagebrush habitat.

Low sagebrush habitats provide an important source of forage for deer, antelope, sage grouse, and greater sandhill crane during winter. Sage grouse rely on sagebrush for food, cover, and nesting habitat. Adult grouse feed almost exclusively on sagebrush leaves during the winter months and insects and forbs found within sagebrush habitats are important components of spring and summer diets. Small mammals rely upon the sagebrush communities for cover and for food. Big sagebrush may form closed canopy stands which provide excellent cover for small mammals such as rabbits and kangaroo rats.

The sandy soils associated with sagebrush habitats make it easier for small mammals and reptile species to dig burrows. Small mammals and reptile species also rely upon the sagebrush vegetation as a source of water. Morning dew collects on the leaves and flowers making it available for small animals. In addition, the sagebrush habitat provides cover in the form of much-needed shade during the hot, dry summers.

Riparian Habitats

Riparian habitats include the vegetation communities which grow along the banks or edges of rivers or creeks. Riparian habitats typically include a dense understory of shrubs and vines sheltered by overstory vegetation provided by tree species such as willow, aspen, and cottonwood. Typical riparian habitat in the Basin and Range is dominated by willow species, particularly the shrub-like sandbar willow (*Salix exigua*). Riparian areas on the Modoc Plateau are generally characterized by larger willow species, alders, aspens, and cottonwoods, which may form a dense overstory which extends beyond the cut banks of the river. In the northern portion of the Modoc Plateau, the Pit River supports lush riparian vegetation including tall cottonwoods and willows with a dense understory composed of grasses, forbs, and shrubs.

However, many riparian systems on the Modoc Plateau are subject to grazing and human disturbances. Natural riparian vegetation associated with typical riparian habitats is only present in a few isolated locations. Within the protected State wildlife areas (e.g., Doyle Wildlife Area, Hallelujah Junction Wildlife Area) and the riparian habitat acquired as part of the Modoc National Wildlife Refuge, willow riparian habitat has become established and some understory vegetation has begun to emerge. Through continued management for wildlife species, it is likely that these riparian habitats will become an increasingly important resource for local fauna and migratory songbirds.

Riparian areas are critical to many species of wildlife. The structure of the vegetation communities associated with riparian habitats provide cover and nesting habitat for songbirds and smaller birds of prey. These areas are critical for wildlife migration and dispersal. The linear configuration of riparian areas creates corridors for local animal movement including travel to and from different habitat types. While riparian habitat occurs as linear strips through various vegetation types, the adjacent upland habitat is often different. The edges where riparian habitat meets with upland habitat are known as ecotones, or edge habitats. Numerous studies have shown that edge habitats are critical for many animal species. The variety in vegetative structure and species composition associated with riparian areas is critical for breeding birds, small mammals, reptiles, and amphibian species which have a terrestrial stage in their life history.

Within the vicinity of the Proposed Project, important wintering habitat for the bald eagle occurs along the South Fork of the Pit River, west of Alturas, and in the Madeline Plains. The eagles migrate south from the Klamath Basin during the winter and feed on fish populations in the river and in local aquatic habitat. In addition, wintering mule deer rely upon riparian habitat for thermal cover during cold weather (Hall, 1994).

Wetland Habitats

Wetland habitat occurs in river valleys and adjacent to seeps and springs in the Modoc and Basin and Range regions. This habitat stays green and lush year-round, making it stand out from the more dry habitats in the region. Wetland vegetation provides cover for migrating birds, nesting habitat for songbirds and waterfowl, and brood areas for sage grouse. At the Modoc National Wildlife Refuge, wetland habitat has been created and enhanced together with open water habitat to create habitat for cranes and migrating waterfowl. This habitat type is an important resource for the greater sandhill crane and several other sensitive species (see Table C.3-2).

Aquatic Habitats

The Pit River and its tributaries, the Susan River and associated irrigation canals, and Long Valley Creek are the main open water aquatic habitats in the areas of the Proposed Project route. Several reservoirs including Delta Lake and local stock ponds also provide aquatic habitat in the vicinity of the ROW.

These areas support aquatic habitat year-round. This habitat is important for a variety of fish, reptiles, and birds, including waterfowl. Fish and amphibian species rely upon such aquatic habitat for breeding and spend all or portions of their lives in the water. Waterfowl rely upon these habitats for resting and feeding during fall and spring migration. During such migrations large numbers of waterfowl descend on these areas. Several waterfowl species use these areas for breeding as well.

Honey Lake and surrounding low-lying areas are known to fill up during years of heavy rainfall and provide additional aquatic habitat which is used by migrating waterfowl and shorebirds and wintering bald eagles. The Susan River and associated irrigation canals, located on the north shore of Honey Lake, provide year-round aquatic habitat and winter habitat for bald eagles (BioSystems, 1994). Also located on the north shore of Honey Lake is the California Department of Fish and Game (CDFG) Honey Lake Wildlife Area. This area is managed for waterfowl and is used extensively by waterfowl and shorebirds, including the greater sandhill crane, particularly during the migration periods.

Terrestrial wildlife species rely upon these areas for year-round water supply, particularly during the hot and dry summer season. Cattle are frequently seen in these habitats in both the Basin and Range Region and the Modoc Plateau.

Aquatic habitats in the Modoc Plateau and Basin and Range Regions also include ephemeral pools such as the playa lakes that occur in the Secret Valley region (e.g., in the vicinity of Mud Flat). Such ephemeral pools provide critical breeding habitat for amphibians such as salamanders, frogs, and toads. These ephemeral sources of water generally remain only a few months and only occur during years when sufficient precipitation occurs. However ephemeral lakes and ponds provide an important source of water to terrestrial animals and birds during the early spring after the snow melts, when breeding occurs for many species. Such water sources allow wildlife to disperse during the breeding season without making it necessary to travel long distances to water.

Agriculture and Pasture Habitats

In the Basin and Range portion of the Proposed Project area, agricultural uses are generally limited to cattle grazing in the sagebrush habitats in and adjacent to Long Valley. Intensive grazing lands and areas which have been plowed and irrigated for crops are fairly common in the valleys and open, level portions of the Modoc Plateau.

Most of the public lands and much of the private lands in the region are grazed by cattle. Where grazing has reduced native plant cover, there is generally a corresponding reduction in habitat value for some wildlife species. However, other animals, such as Swainson's hawks, may seek these areas because the altered conditions have improved their foraging opportunities.

Agricultural use of the land also has a direct effect upon which wildlife species are likely to use an area. Croplands are generally found on fertile soils which historically supported prime habitat for native species. Although agricultural fields can provide a year-round source of food for many wildlife species, some agricultural practices such as harvest practices, fencing, trapping, and applying pesticides, can reduce the value of these lands to wildlife.

Agriculture in the Modoc Plateau Region is dominated by alfalfa, irrigated pasture, and rice. Alfalfa and irrigated pasture occur throughout the region, and rice cultivation is found primarily in Likely Valley. These areas provide foraging habitat for migrating waterfowl and resident birds as well. Alfalfa is grown in the Modoc Plateau Region such as in the Madeline Plains. The Modoc National Wildlife Refuge includes irrigated pastures of native hay meadows. Deer and pronghorn forage in fields cultivated for alfalfa. Suitable habitat for denning and nesting occurs on the weedy edges of fields and irrigation canals as well as poorly maintained fields in agricultural areas.

C.3.1.1.3 *Rare, Threatened, or Endangered Species*

Special Status Plants

Special status plants are defined as species that are listed under the State or Federal endangered species laws, candidates for such listing, or species that would meet the criteria for listing but have not yet been formally listed, such as plants included in Lists 1A, 1B, and 2 of the California Native Plant Society's (CNPS) Inventory (Skinner and Pavlik, 1994). Other plant taxa not currently included in the CNPS Inventory have been addressed in this document as special status species if available information indicates that they are highly restricted in their range or abundance. Plant species on CNPS Lists 3 and 4 generally do not qualify for protection under the California Environmental Quality Act (CEQA) but have been considered in this document as recommended by the CNPS (Skinner and Pavlik, 1994). The EIR/S incorporates recently proposed changes to the CNPS List status of several species (Tibor, 1995).

A large number of special status plant species are known to occur within the Modoc Plateau and Basin and Range Regions. Ninety-three species have been identified based on previous surveys, database records, preliminary reports, and professional botanists familiar with the area (see Table C.3-3). A large proportion of the species (about half) are uncommon in California but more abundant elsewhere, while one-fourth are rare, threatened, or endangered in California and elsewhere. Only 13 of the species listed in Table C.3-3 are endemic to California. Twenty-five species listed in Table C.3-3 are not considered rare, threatened, or endangered but possess limited distributions and have been placed on the CNPS List 4 "watch list."

The principal reason for the large number of special status species is the geography of the two regions. A second factor in the diversity of special status species is the presence of special topographic, edaphic (soil), and climatic factors that are uncommon or unique to these areas. The Modoc Plateau and Basin and Range Regions are located within broad transition zones where the floras of the Cascades, Great Basin, Sierra Nevada, and Columbia Plateau intersect. Many species of plants reach the limits of their geographic distributions within these two areas and are considered to be locally rare or uncommon but occur with greater frequency outside of the region or the political boundaries that divide the states of California, Oregon, and Nevada.

Table C.3-3 Special Status Plant Species Known to Occur in the Region of the Proposed Project Right-of Way,

Scientific Name Common Name[a]	USFWS Listing[b]	State Status[c]	CNPS Status[d]	Habitat Type	Distribution By County & State[e]	Flowering Phenology
Alisma gramineum[f] water plantain	—	—	3-2-1 List 2[g]	pond, still waters	LAS, MOD, OR, WA ++	June-July
Allium atrorubens var. *atrorubens* Great Basin onion	—	—	2-1-2 List 2	Great Basin scrub, pinyon-juniper woodland	LAS, MNO, AZ, NV OR+	May-June
Antennaria flagellaris stoloniferous pussy-toes	—	—	1-2-1 List 2	Great Basin scrub	LAS, MOD, NV+	June-July
Arabis cobrensis Masonic rock cress	—	—	3-1-1 List 2	Great Basin scrub, pinyon-juniper woodland	MOD, MNO, NV	June-July
Arnica fulgens hillside arnica	—	—	3-2-1 List 2[g]	Great Basin scrub, lower montane forest, moist meadow	LAS, MOD, PLU, NV OR, WA, ++	May-Aug
Arnica sororia twin arnica	—	—	1-2-1 List 4[g]	Great Basin scrub, pinyon-juniper woodland, yellow pine forest	LAS, MNO, MOD, NV, OR, VA, ++	May-Aug
Astragalus agrestis[f] purple loco	—	—	3-2-1 List 2[g]	vernally moist sagebrush	LAS, NV, OR, ++	April-July
Astragalus anxius troubled milkvetch	C2	—	3-1-3 List 1B	volcanic scabland	LAS	May-June
Astragalus argophyllus var. *argophyllus* silverleaf milkvetch	—	—	3-2-1 List 2	alkaline meadows	INY, LAS, MNO, AZ, ID, NV, UT+	May-July
Astragalus geyeri var. *geyeri* Geyer's milkvetch	—	—	3-2-1 List 2	Great Basin scrub, stabilized sand	INY, LAS, MNO, NV, OR, WA+	May-July
Astragalus inversus Susanville milkvetch	—	—	1-2-3 List 4[g]	Great Basin scrub, yellow pine forest	LAS, MOD, SHA, SIS	May-Aug
Astragalus lentiginousus var. *chartaceus* hard-podded freckled milkvetch	C3c	—	1-2-1 List 4[g]	Great basin scrub, northern juniper woodland	LAS, MOD, ID, OR NV, UT, WY	April-June
Astragalus pulsiferae var. *pulsiferae* Pulsifier's milkvetch	—	—	3-1-2 List 1B[g]	Great Basin scrub (sandy)	LAS, PLU, SIE, NV	May-Aug
Astragalus pulsiferae var. *suksdorfii* Suksdorf's milkvetch	C2	—	1-2-2 List 4[g]	montane conifer forest, northern juniper woodland	LAS, MOD, PLU, SHA NV, WA	April-Aug

Scientific Name Common Name[a]	USFWS Listing[b]	State Status[c]	CNPS Status[d]	Habitat Type	Distribution By County & State[e]	Flowering Phenology
Atriplex gardneri[f] var. *falcata* falcate saltbush	—	—	3-2-1 List 2[g]	low chenopod scrub (subalkaline soils)	LAS, MOD, NV, OR+	June-Aug
Calochortus longebarbatus var. *longebarbatus* long-haired star tulip	C2	—	2-2-2 List 1B[g]	meadow, seeps	MOD, SHA, SIS	June-Aug
Camissonia boothii ssp. *alyssoides* Pine Creek evening-primrose	—	—	1-2-1 List 4[g]	Great Basin scrub	LAS,NV	May-Aug
Camissonia minor Nelson's evening-primrose	—	—	1-2-1 List 4[g]	Great Basin scrub	MOD, NV	April July
Camissonia tanacetifolia ssp. *quadriperforata* Sierra Valley evening-primrose	C3c	—	1-1-3 List 4	Great Basin scrub (clay, sandy)	LAS, PLU, SIE	May-July
Carex atherodes awned sedge	—	—	3-2-1 List 2[g]	wet meadows and shallow water	MOD, NY to MO, OR, WA, CO, UT	Jun-Aug
Carex petasata Liddon's sedge	—	—	2-1-1 List 2	lower coniferous forest, dry meadows	ALP, LAS, MNO, MOD OR, ++	June-July
Carex sheldonii Sheldon's sedge	—	—	2-1-1 List 2	wet meadows, marshes, streams	MOD, PLA, PLU, ID OR, UT+	Aug
Chenopodium simplex large-seeded goosefoot	—	—	1-1-1 List 4	open disturbed places, Great Basin scrub	INY, MOD, PLU, ++	June-Oct
Claytonia umbellata Great Basin claytonia	—	—	3-1-2 List 1B	talus	ALP, LAS, MNO, MOD, SIS, NV, OR	June-Aug
Cleomella hillmanii[f] Hillman's cleomella	—	—	3-2-1 List 2[g]	Great Basin scrub (clay)	LAS, NV	April-June
Collomia tracyi Tracy's collomia	—	—	1-1-3 List 4	rocky, sandy areas, lower coniferous forest	HUM, LAS, SIS, TRI	June-July
Cordylanthus capitatus Yakima bird's-beak	—	—	2-2-1 List 2[g]	open coniferous forest, northern juniper woodland	LAS, MOD, ID, NV OR, WA	July-Sept
Corydalis caseana ssp. *caseana* Sierra corydalis	C3c	—	1-1-3 List 4	meadows, springs, seeps, upper coniferous forest	BUT, LAS, PLA, PLU, SHA, SIE, TEH, TUL	June-Aug
Cryptantha scoparia desert crypthantha	—	—	1-1-1 List 4	chenopod scrub, Great Basin scrub	INY, LAS, NV, OR+	May-June
Dalea ornata ornate dalea	—	—	3-3-1 List 2	rocky or sandy places, Great Basin scrub	LAS, ID, NV, OR WA	May-June
Delphinium stachydeum spiked larkspur	—	—	1-1-1 List 4	coniferous forest (Warner Mtns)	LAS, MOD, ID, OR+	July-Aug

Scientific Name Common Name[a]	USFWS Listing[b]	State Status[c]	CNPS Status[d]	Habitat Type	Distribution By County & State[e]	Flowering Phenology
Dimeresia howellii doublet	—	—	2-1-1 List 2[g]	pinyon-juniper woodland (volcanic)	LAS, MOD, SIS, NV	June-July
Downingia laeta[f] Great Basin downingia	—	—	3-2-1 List 2[g]	vernal swales, pools	LAS, MOD, NV, OR	June-July
Drosera anglica English sundew	—	—	2-1-1 List 2	meadows, bogs, fens	LAS, NEV, PLU, SIE, SIS, ID, OR, WA	July-Aug
Erigeron elegantulus volcanic daisy	—	—	1-1-1 List 4	rocky places (volcanic), Great Basin scrub	LAS, MOD, SIS, OR	June-July
Eriogonum collinum[f] clay-loving buckwheat	—	—	1-2-1 List 4[g]	Great Basin scrub, northern juniper woodland (volcanic vertisol clay)	LAS, NV	July-Sept
Eriogonum nutans nodding buckwheat	—	—	2-2-1 List 2[g]	Great Basin scrub	LAS, MNO, NV, OR, UT	July-Aug
Eriogonum robustum altered andesite buckwheat	C2	—	—	gravelly slopes, altered andesite	NV	May-July
Eriogonum prociduum prostrate buckwheat	C2	—	2-2-2 List 1B	Great Basin scrub, pinyon-juniper woodland	LAS, MOD, NV	May-July
Eriogonum umbellatum var. *glaberrimum* green buckwheat	—	—	3-1-1 List 2	Great Basin scrub, montane forest (gravel)	MOD, OR	June-Sept
Galium glabrescens ssp. *modocense* Modoc bedstraw	C3c	—	2-2-3 List 1B	Great Basin scrub	MOD	July
Galium serpenticum ssp. *warnerense* Warner Mountains bedstraw	C3c	—	3-2-2 List 1B	meadows, seeps in rocks	MOD, OR	July
Gentiana affinis var. *parvidentata* small-toothed prairie gentian	—	—	?-?-1 List 3	Great Basin scrub	MOD, ID, OR+	July-Sept
Geum aleppicum Aleppo avens	—	—	3-2-1 List 2	Great Basin Scrub (meadows)	LAS, MOD, SIS, OR ++	June-Aug
Gratiola heterosepala Boggs Lake hedge-hyssop	C3c	E	1-2-2 List 4[g]	vernal pools	FRE, LAK, LAS, MAD, MOD, PLA, SAC, SHA, SJQ, SOL, STA, TEH, OR	April-June
Hackelia cusickii Cusick's stickseed	—	—	1-2-1 List 4[g]	open juniper woodland	SIS, LAS, MOD, NV	May-July
Iliamna bakeri Baker's globe mallow	—	—	2-1-1 List 2[g]	chaparral (volcanic), juniper woodland	LAS, MOD, SHA, SIS	July-Aug

Scientific Name Common Name[a]	USFWS Listing[b]	State Status[c]	CNPS Status[d]	Habitat Type	Distribution By County & State[e]	Flowering Phenology
Ivesia aperta var. *aperta* Sierra Valley ivesia	—	—	2-2-3 List 1B	dry, rocky meadows, Great Basin scrub	PLU, SIE	June-July
Ivesia aperta var. *canina* Dog Valley ivesia	C1	—	3-2-3 List 1B	dry meadows, forest clearings	SIE	June-Aug
Ivesia baileyi var. *baileyi* Bailey's ivesia	—	—	3-2-1 List 2	rock outcrops	LAS, PLU, NV	June-July
Ivesia baileyi var. *beneolens* Owyhee ivesia	—	—	3-1-1 List 2	volcanic cliffs, juniper woodland	MOD, ID, NV, OR	June-July
Ivesia paniculata Ash Creek ivesia	C2	—	2-1-3 List 1B	Great Basin scrub (volcanic)	LAS	June-July
Ivesia sericoleuca Plumas ivesia	—	—	1-2-3 List 1B	Great Basin scrub vernally mesic areas	NEV, PLA, PLU, SIE	June-Aug
Ivesia webberi Webber's ivesia	C2	—	3-2-2 List 1B	Great Basin scrub	PLU, SIE, NV	May-July
Juncus hemiendytus var. *abjectus* Center Basin rush	—	—	deleted: too common[g]	subalpine coniferous forest	ALP, LAS, MNO, NEV, PLU, SIE, TUL, TUO, ID, NV, OR	June-July
Lomatium foeniculaceum[f] var. *macdougalii* MacDougal's lomatium	—	—	2-2-1 List 2[g]	Great Basin scrub, yellow pine forest, northern juniper woodland	LAS, MOD, PLU, OR	April-June
Lomatium hendersonii Henderson's lomatium	—	—	2-2-1 List 2[g]	Great Basin scrub, northern juniper woodland	LAS, MOD, PLU, OR	April-June
Lomatium ravenii Raven's lomatium	C3c	—	1-1-1 List 4	Great Basin scrub (often alkaline soils)	LAS, NV, OR, UT	April-May
Lupinus uncialis[f] Lilliput lupine	—	—	2-2-1 List 2[g]	Great Basin scrub	MOD, NV, OR	May-July
Mimulus pygmaeus Egg Lake monkeyflower	C2	—	1-2-2 List 4[g]	lower coniferous forest, meadows	LAS, MOD, PLU, OR	May-July
Opuntia pulchella sand cholla	C3c	CY	2-2-2 List 2	dry lake borders, sandy flats	INY, MNO, AZ, NV	May-June
Oryctes nevadensis Nevada oryctes	C2	—	3-3-2 List 1B	chenopod scrub	INYO, NV	July
Pedicularis centranthera dwarf lousewort	—	—	3-1-1 List 2	Great Basin scrub	LAS, OR, NV, UT+	April-May

Scientific Name Common Name[a]	USFWS Listing[b]	State Status[c]	CNPS Status[d]	Habitat Type	Distribution By County & State[e]	Flowering Phenology
Penstemon cinereus gray beardtongue	—	—	2-1-1 List 2[g]	volcanic gravels, Great Basin scrub	MOD, SIS, NV	May-July
Penstemon cinicola ash beardtongue	—	—	1-2-1 List 4	volcanic sands, lower coniferous forest	LAS, MOD, SIS	May-July
Penstemon neotericus Plumas County beardtongue	—	—	1-1-3 List 4	lower coniferous forest	LAS, PLU, SHA, SIE	May-Aug
Penstemon heterodoxus var. *shastensis* Shasta penstemon	—	—	1-1-3 List 4	dry meadows, yellow pine forest	MOD, SHA, SIS	June-Aug
Phacelia inundata playa phacelia	—	—	1-1-1 List 2	alkaline soils, Great Basin scrub	LAS, MOD, NV	May-July
Pogogyne floribunda profuse-flowered pogogyne	--	--	2-2-3 List 1B	vernal pools, Devils Garden	LAS, MOD, SHA	Jun-Aug
Polyctenium williamsiae William's combleaf	C1	CE (NV)	—	vernally moist swales	NV	
Polygala subspinosa spiny milkwort	—	—	2-2-1 List 2	gravelly soils, Great Basin scrub	LAS, NV+	June-July
Polygonum polygaloides ssp. *esotericum* Modoc County knotweed	—	—	3-3-3 List 1B	vernal pools, juniper woodland	MOD, PLU	May-Aug
Polygonum polygaloides[f] ssp. *polygaloides* white-margined knotweed	—	—	—	vernal pools, swales	LAS, MOD, WA, OR	May-Aug
Potamogeton epihydrus ssp. *nuttallii* Nuttall's pondweed	—	—	2-2-1 List 2	shallow freshwater	ELD, MEN, MOD, MPA PLU, OR, WA, ++	July-Aug
Potamogeton filiformis slender-leaved pondweed	—	—	3-2-1 List 2	shallow freshwater	LAS, MER, MNO, SCL** AZ, NV, OR, ++	May-July
Potamogeton zosteriformis eel-grass pondweed	—	—	2-2-1 List 2	freshwater	CCA, LAK, LAS, MOD PLU, SHA, OR, WA, ++	June-July
Potentilla basaltica Soldier Meadows cinquefoil	C1	—	3-1-2 List 1B	alkaline meadows, (volcanic)	LAS, NV	May-July
Psilocarphus elatior tall woolly marbles	—	—	1-2-1 List 4[g]	vernally moist areas, meadows, valley and foothill grassland	LAS, MOD, OR, ++	May-Aug
Psoralidium lanceolatum[f] lance-leaved scurf-pea	—	—	3-2-1 List 2[g]	Great Basin scrub (sandy)	LAS, NV, ++	April-Aug

Scientific Name Common Name[a]	USFWS Listing[b]	State Status[c]	CNPS Status[d]	Habitat Type	Distribution By County & State[e]	Flowering Phenology
Ribes hudsonianum var. *petiolare* western black currant	—	—	3-1-1 List 2	streamsides	MOD, SIS	May-July
Rorippa columbiae Columbia yellow cress	C2	—	3-2-2 List 1B	juniper woodland (meadows, playas)	HUM, MOD, SIS	June-July
Rumex venosus[f] winged dock	—	—	3-1-1 List 2[g]	Great Basin scrub (sandy)	LAS, NM, NV, OR, ++	May-June
Scutellaria holmgreniorum Holmgren's skullcap	C3c	—	1-2-2 List 4[g]	volcanic clays (rocky), Great Basin scrub	LAS, NV	June-July
Senecio hydrophiloides sweet marsh butterweed	—	—	?-?-1 List 3	lower coniferous forest	BUT, MOD, PLU, SIS, NV	May-July
Spartina gracilis alkali cord grass	—	—	1-1-1 List 4	alkaline meadows Great Basin scrub	INY, LAS, MOD, MNO, SIS, NV	June-Aug
Sphaeralcea grossulariifolia[f] current-leaved desert mellow	—	—	2-2-1 List 2[g]	Great Basin scrub	LAS, NV, OR, WA UT	May-June
Stanleya viridiflora[f] green prince's plume	—	—	3-2-1 List 2[g]	white ash deposits	LAS, NV, UT	June-Aug
Stenotus lanuginosus woolly stenotus	—	—	3-2-1 List 2	montane sagebrush scrub	LAS, OR, WA	May-July
Tetradymia spinosa catclaw horsebrush	—	—	2-1-1 List 2[g]	chenopod scrub, sandy or clay	LAS, MOD, MNO, WY, MT, OR, CO, UT, NM, NV	April-June
Thelypodium milleflorum thousand-flowered thelypodium	--	--	2-2-1 List 2[g]	sandy sites in Great Basin scrub	LAS, PLU, NV, OR, ID, WA	Apr-Jun
Trifolium lemmonii Lemmon's clover	C3c	—	1-1-2 List 4	Great Basin scrub, yellow pine forest	NEV, PLU, SIE, NV	June-July
Tripterocalyx crux-maltae[f] Kellogg's sand verbena	—	—	3-2-2 List 1B[g]	stabilized sand dunes, Great Basin scrub	LAS, NV	May-July
Triteleia grandiflora ssp. howellii Howell's triteleia	--	--	3-2-1 List 2	northern juniper woodland, sagebrush scrub, grassland	MOD, SIS, OR, WA	Apr-May

Notes:

[a] Botanical nomenclature corresponds to Hickman (1993).

[b] U.S. Fish and Wildlife Service (1993).
Cat. 1 = Under review, sufficient information to justify listing.
Cat. 2 = Under review, insufficient information.
Cat 3c = Not presently threatened.

[c] Section 1904, California Fish and Game Code (September listing; CDFG 1992): E = Endangered.
NRS 527.060-527.120, Nevada Division of Forestry: CY ≐ Protected cactus; CE(NV) = Critically Endangered

[d] CNPS *Inventory of Rare and Endangered Vascular Plants of California*, Fifth Edition (Skinner and Pavlik, 1994).
List 1B = Plants rare, threatened, or endangered in California and elsewhere.
List 2 = Plants rare, threatened, or endangered in California, but more common elsewhere.
List 3 = Plants about which we need more information -- a review list.
List 4 = Plants of limited distribution -- a watch list.
The R-E-D numbers are encoded as follows:

Rarity: 1 - Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time; 2 - occurrence confined to several populations or to one extended population; 3 - occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.
Endangerment: 1 - not endangered; 2 - endangered in a portion of its range; 3 - endangered throughout its range.
Distribution: 1 - widespread outside California; 2 - rare outside California; 3 - endemic to California.
Habitat type from Munz and Keck (1973), Skinner and Pavlik (1988), Hickman (1993), Clifton (Per. Comm.)

[e] Skinner and Pavlik (1994), Morefield and Knight (1992); some county records from unpublished information or from data presented in this report.

County Key:

ALP - Alpine
AMA - Amador
BUT - Butte
DNT - Del Norte
FRE - Fresno
HUM - Humboldt
INY - Inyo
LAK - Lake
LAS - Lassen
MAD - Madera
MOD - Modoc
MNO - Mono
NAP - Napa
PLA - Placer
PLU - Plumas
SAC - Sacramento
SHA - Shasta
SIE - Sierra
SIS - Siskiyou
SJQ - San Joaquin
SOL - Solano
SON - Sonoma
STA - Stanislaus
TEH - Tehama
TRI - Trinity
TUL - Tulare
TUO - Tuolumne
YUB - Yuba

State Key:

AZ - Arizona
ID - Idaho
NV - Nevada
OR - Oregon
UT - Utah
WA - Washington
WY - Wyoming

[f] Plants presently not listed by USFWS, Nevada, California or CNPS, but meeting at least one of the following criteria:

1. Plants previously not known from California which may be listed by CNPS, or meet criteria for listing under CEQA;
2. Plants of limited distribution in California which may be listed by CNPS, or meet criteria for listing under CEQA.

[g] Proposed CNPS List status and RED code designation (Tibor, 1995).

A larger percentage of the special status plants identified in Table C.3-3 are associated with the Modoc Plateau region than with the Basin and Range Region. This is related to the physical and chemical characteristics of some of the soils found on the Modoc Plateau. Soils are a major factor contributing to the high rates of endemism (species restricted to a particular region or habitat) in California and elsewhere (Skinner and Pavlik, 1994).

Shallow soils on volcanic tuffs found in Modoc and Lassen counties and referred to as "Alturas volcanic gravel barrens" support at least four special status plant species, including prostrate buckwheat (*Eriogonum prociduum*), lilliput lupine (*Lupinus uncialis*), doublet (*Dimeresia howellii*), and Suksdorf's milkvetch (*Astragalus pulsiferae* var. *suksdorfii*). White ash deposits in Secret Valley are characterized by green prince's plume (*Stanleya viridiflora*). Holmgren's skullcap (*Scutellaria holmgreniorum*) is associated with unique volcanic vertisol clay soils developed on basalt near Snowstorm Mountain. Stabilized and partially-stabilized dunes east of Honey Lake support populations of lance-leaved scurf-pea (*Psoralidium lanceolatum*) and winged dock (*Rumex venosus*).

Most, if not all, of the special status plants that occur in the Modoc Plateau and Basin and Range Region are presently rare or uncommon due to natural limiting factors such as the availability of suitable habitat. Although changes in the vegetation caused by human actions have probably degraded or eliminated some of the available habitats, it is unlikely that any of the special status species were historically much more common than they are today. In some instances the species may be more common than was originally believed due to a lack of detailed surveys from the area.

Special Status Wildlife

Several of the wildlife species that occur in the project area are considered to be special status species (see Section C.3.1.2.3). The term "special status species" is used to refer collectively to those species which have been listed or proposed for listing, or are candidates for listing by the U.S. Fish and Wildlife Service (USFWS), California Fish and Game Commission, California Fish and Game Code, or Nevada Division of Wildlife (NDOW). A total of 43 special status species have the potential to occur in the region (see Table C.3-4). These species are discussed in Section C.3.1.2.3 below in terms of legal status and habitat use within the region and the proposed route. These species are addressed in more detail in Appendix E.1.

C.3.1.1.4 Special Habitat Management Areas

In the vicinity of the Proposed Project a number of areas have been designated as special habitat management areas. These areas include:

- Ash Valley Research Natural Area (1,120 acres)
- Doyle Wildlife Area (13,975 acres)
- Honey Lake Wildlife Area (7,366 acres)
- Biscar National Cooperative Land and Wildlife Management Area (2,500 acres)
- Modoc National Wildlife Refuge (6,200 acres)
- Hallelujah Junction Wildlife Area (6,200 acres)
- Pine Dunes Research Natural Area (160 acres).

Table C.3-4 Special Status Wildlife Species That May Occur within the Proposed Project Right-of-Way

Common Name	Species Name	Federal and State Legal Status*
	BIRDS	
American White Pelican (nesting)	*Pelicanus erythrorhynchos*	CSC
Double-Crested Cormorant(rookery)	*Phalacrocorax auritus*	CSC
Western Least Bittern (nesting)	*Ixobrychus exilis hesperis*	C2/CSC
White-Faced Ibis (rookery)	*Plegadis chihi*	C2/CSC
Bald Eagle (nesting & wintering)	*Haliaeetus leucocephalus*	FT/SE
Northern Goshawk (nesting)	*Accipiter gentilis*	C2/CSC
Northern Harrier (nesting)	*Circus cyaneus*	CSC
Swainson's Hawk(nesting)	*Buteo swainsoni*	ST
Ferruginous Hawk (wintering)	*Buteo regalis*	C2/CSC
Golden Eagle (nesting & wintering)	*Aquila chrysaetos*	CSC
Prairie Falcon (nesting)	*Falco mexicanus*	CSC
American Peregrine Falcon	*Falco peregrinus anatum*	FE/SE
Sage Grouse (brood habitat)	*Centrocercus urophasianus*	C2/CSC
Mountain Quail	*Oreortyx pictus*	C2
Greater Sandhill Crane (Breeding/wintering)	*Grus canadensis tabida*	ST
Western Snowy Plover (breeding)	*Charadrius alexandrinus nivosus*	FPT/CSC
Long-Billed Curlew (breeding)	*Numenius americanus*	CSC
Black Tern (nesting colony)	*Chlidonias niger*	C2/CSC
Western Yellow-Billed Cuckoo (nesting)	*Coccyzus americanus occidentalis*	SE
Burrowing Owl (burrow sites)	*Speotyto cunicularia*	C2
Great Gray Owl (nesting)	*Strix nebulosa*	SE
Long-Eared Owl (nesting)	*Asio otus*	CSC
Short-Eared Owl (nesting)	*Asio flammeus*	CSC
Willow Flycatcher (nesting)	*Empidonax traillii*	C2
Bank Swallow (nesting colony)	*Riparia riparia*	ST
Loggerhead Shrike	*Lanius ludovicianus*	C2/CSC
Yellow Warbler (nesting)	*Dendroica petechia brewsteri*	CSC
Tricolored Blackbird	*Agelaius tricolor*	C2/CSC
	FISH	
Short-Nosed Sucker	*Chasmistes brevirostris*	FE/SE
Lost River Sucker	*Dolitistes luxatus*	FE/SE
Modoc Sucker	*Catostomus microps*	FE/SE
Pit Roach	*Lavinia symmetricus mitrulus*	C2/CSC
Hardhead	*Mylopharodon conocephalus*	CSC
	AMPHIBIANS	
Spotted Frog	*Rana pretiosa*	C1/CSC
	REPTILES	
Northwestern Pond Turtle	*Clemmys marmorata marmorata*	C2/CSC
	MAMMALS	
Townsend's Western Big-Eared Bat	*Plecotus townsendii townsendii*	C2/CSC
Spotted Bat	*Euderma maculatum*	C2/CSC
California Mastiff Bat	*Eumops perotis californicus*	C2/CSC
Pallid Bat	*Antrozous pallidus*	CSC
Pygmy Rabbit	*Brachylagus idahoensis*	C2/CSC
California Bighorn Sheep	*Ovis canadensis californiana*	C2/ST

Source: California Natural Diversity Database; Federal Register.

*SE = State Endangered
ST = State Threatened
CSC = California Species of Special Concern
FPT = Federally proposed for listing as threatened
FE = Federally Listed as Endangered
FT = Federally Listed as Threatened
C2 = Category 2; more information needed prior to proposing species for Listing.

The Ash Valley Research Natural Area (RNA), located 15 miles west of the Madeline Plains, was established in 1985 by the U.S. Bureau of Land Management (BLM) to protect the habitats of several special status plant species. Troubled milkvetch (*Astragalus anxius*), a Federal Category 2 candidate and CNPS List 1B species, Ash Creek ivesia (*Ivesia paniculata*), a Federal Category C2 and CNPS List 1B species, and prostrate buckwheat (*Eriogonum prociduum*), a Federal Category C2 candidate and CNPS List 1B species, all occur on volcanic gravels in the Ash Valley area. Portions of this habitat have been included within the Ash Valley RNA.

The Pine Dunes Research Natural Area (RNA), located approximately 16 miles east of Ravendale, was established in 1987 by the U.S. Bureau of Land Management (BLM) to protect a unique stand of ponderosa pine trees. This is a relict stand of 90 trees growing in a dune habitat isolated from surrounding pines.

As a protective measure State of California and Federal agencies have purchased some of the other areas listed above to be managed as wildlife habitat. The Hallelujah Junction Wildlife Area and the Doyle Wildlife Area located in Long Valley were acquired by the CDFG as protected mule deer wintering habitat. The Honey Lake Wildlife Area has been established to provide habitat for waterfowl in the region. The Biscar Wildlife Area located on the west side of Secret Valley has been established by BLM and CDFG and is managed for waterfowl.

The Modoc National Wildlife Refuge provides protection for migrating and breeding waterfowl, shorebirds, and songbirds including the State-listed greater sandhill crane and several other sensitive species, such as the American white pelican, bald eagle, Canada goose, swans, and yellow warbler.

In addition, there are several areas in the Basin and Range region and the Modoc Plateau which are considered to be Significant Natural Areas by CDFG (CDFG Code Sections 1930-1933). The Significant Natural Areas Program (SNAP) was established in association with Assembly Bill 1039 which requires the CDFG to assess and protect biodiversity in the State of California. Significant Natural Areas identified by CDFG must meet at least one of the following criteria:

1. Areas supporting extremely rare species or natural communities
2. Associations or concentrations of rare species
3. Representative examples of common or rare communities
4. High species richness or habitat richness.

The Significant Natural Areas Program includes a database which lists boundaries of areas on both private and public lands which meet the criteria described above. These areas are designated and targeted for acquisition or protection by the CDFG. The Proposed Project would not cross any lands identified or designated by the SNAP.

C.3.1.2 Proposed Transmission Line Route Setting

C.3.1.2.1 *Vegetation*

The proposed transmission line route would vary in elevation from a low of about 4,000 feet in the Honey Lake Valley to a high of nearly 6,000 feet east of Likely Mountain in Lassen County. Three general vegetation types dominate the route:

- Sagebrush communities
- Forests and woodlands
- Chenopod scrubs.

Forests and open woodlands composed largely of western juniper dominate the northern one-quarter of the alignment. Yellow pine forest occurs in two areas of Segment C near Likely Mountain. Segments that have significant areas of northern juniper woodland are Segments A, C, and the northern portion of Segment E. From the Madeline Plains south to the northern margin of Secret Valley, on Segments E, K, and L, the vegetation is dominated by two distinct sagebrush communities, low sagebrush scrub and silver sagebrush scrub, and short sections of northern juniper woodland.

The Secret Valley section of Segment L as well as Segment O, which crosses the eastern portion of the Honey Lake Valley, are dominated by chenopod scrub communities as described in the regional setting section. Small portions of this section of the proposed route are dominated by sagebrush communities which are composed of low sagebrush scrub north of Wendel and big sagebrush scrub near the intersection of Segment O with Segment Q. Smaller sections of this route section near Wendel and east of the Sierra Army Depot cross partially stabilized dune communities dominated by evening primrose (*Oenothera deltoides* ssp. *piperi*), rubber rabbitbrush (*Chrysothamnus nauseosus*), and many-flowered mottled milkvetch (*Astragalus lentiginosus* var. *floribundus*).

East of the Fort Sage Mountains the route passes through sagebrush/bitterbrush scrub and northern juniper woodland before descending into Long Valley. Both community types are common throughout the Basin and Range Region. The proposed route angles straight south following the eastern margin of Long Valley for Segments R, T, and W. Most of this section is located on the coalesced alluvial fans at the base of the Petersen Mountain range. Large sections of this area burned during the 1970's and were subsequently planted with crested wheatgrass (*Agropyron desertorum*) which has persisted as the dominant species. Burned sections that were not reseeded are dominated by other ruderal (weedy) species such as matchweed (*Gutierrezia sarothrae*), tumble mustard (*Sisymbrium altissimum*), and rubber rabbitbrush. These species appear to have substantially slowed the natural post-fire successional process and may out-compete and exclude special status species known from unburned habitats nearby, such as Pulsifer's milkvetch (*Astragalus pulsiferae* var. *pulsiferae*).

The southern section of the alignment northwest of Reno, Nevada is dominated by sagebrush/bitterbrush communities that eventually give way to more ruderal (disturbed) habitats dominated by non-native ruderal species as the proximity to Reno increases. Near the northern terminus of Segment Y, the route crosses small sections of altered andesite soils formed by physical and chemical changes that were catalyzed by ancient hot springs. Altered andesite soils are acidic with low levels of critical nutrients required by most plants. The species that persist on these soils, such as ponderosa pine (*Pinus* *ponderosa*), are excluded from nearby habitats by their inability to compete effectively with Great Basin shrubs for the limited soil moisture. One rare species was also observed on these sites: altered andesite buckwheat (*Eriogonum robustum*), a Federal Category 2 candidate species.

Potential jurisdictional wetlands in the project study area were delineated using the routine wetland delineation methods described in the USACE 1987 Wetland Delineation Manual. The wetland delineation of the Tuscarora Pipeline Project study area was used for the portions of the transmission line project that overlap the pipeline project. The remaining portion of the transmission line project study area (in width or length) was delineated independently. Table C.3-5 lists the potential jurisdictional wetland areas and non-wetland waters of the U.S. that were identified in the study area for the Proposed Project route, and the dominant plant species associated with each wetland.

C.3.1.2.2 *Wildlife*

Wildlife species are distributed throughout the Proposed Project route where suitable habitat occurs. Their distribution along the route is also strongly determined by climate and season as it correlates with life cycles of wildlife species. Wildlife species observed along the Proposed Project route alignment are discussed below in terms of the habitats in which they are observed. Sensitive habitats are listed in Table C.3-6. Raptor nest locations, big game habitats, and other wildlife resources identified in this document are contained in GIS format and stored with BLM.

Big Game Habitats

Habitat for big game and harvest species, including mule deer and pronghorn antelope, occurs throughout the proposed route. Locations of these habitats are shown in the base maps of the ROW at the end of this volume. These animals disperse and use juniper woodlands for cover and forage mainly in the open sagebrush habitat along the route. These species are able to migrate along an elevational gradient to maximize use of climatic conditions and forage availability during different seasons. Big game migrations usually occur in the fall and spring and roughly the same routes are used by the same herds year after year. These migration corridors are crucial to big game herds as they make their way to feeding areas, breeding areas, and seasonal use areas. Segments C, E, K, L, and N cross pronghorn kidding or summer use areas. Segments C, E, and L cross mule deer migration corridors and Segments A, C, L, O, T, and W cross mule deer winter range. Please see Table C.3-6a for a complete list, by milepost, of big game habitat.

Major mule deer herds in the northern portion of the Proposed Project area include the Devil's Garden Interstate herd, Adin deer herd, East Lassen deer herd, and the Doyle deer herd (CDFG, USFS, and BLM, 1984). These herds use the plateaus in the vicinity of the Proposed Project north of Likely on both sides of U.S. 395, the Devil's Garden plateaus and the lowlands in the vicinity including the agricultural areas south of Alturas.

In the central portion of the Proposed Project area, the East Lassen deer herd is believed to include 5,000 - 6,000 deer which occupy an area of approximately 2,085 square miles (1,334,000 acres), including about 448,000 acres of winter range and 640,000 acres of summer range (CDFG and BLM, 1982).

Table C.3-5 Summary of Potential Jurisdictional Wetlands and Non-Wetland Waters of the U.S. in the Study Area of the Proposed Project

Site #	Seg.	Feature ID	Wet.[1]	WUS[2]	Begin MP[3]	End MP[3]	Length[4]	Hydrol. (P/S)[5]	Soils (H/NH)[6]	Veg. (DH/ND)[7]	Veg. Type[8]	Tuscarora Adjacent[9]	OT Dist.[10]	No. Struct.[11]
1	A	Pit River	X	X	4.69	4.96	1440	P	H-1	DH	MM,SC	N	1440	1
2	C	Cattle Trough	X		8.57	8.58	80	S	H-1	DH	MM	N	0	0
3	C	Crooks Creek		X	20.70	20.71	18	P	NH	ND	SC	N	18	0
4	C	Stones Canyon Ck		X	25.68	25.68	10	P	NH	ND	SC	N	0	0
5	C	Bald Mtn Mdw	X		27.33	27.42	500	S	H-1	DH	MM	N	0	0
6	C	Seas. Pond	X		27.54	27.69	800	S	H-1/H-2	DH	MM	N	0	0
7	C	Dry Creek	X	X	30.88	30.94	60	P	H-1	DH	MM	N	0	0
8	C	Trib. of Dry Ck	X		31.50	31.51	17	S	H-1	DH	MM	N	17	0
9	C	Harter Flat Mdw	X		31.68	31.79	480	S	H-1/H-2	DH	MM	N	480	0
10	E	Arnica Mdw	X		36.04	36.05	200	S	H-2	DH	MM	N	200	0
11	E	Silver Sage Basin 1	X		40.53	40.96	2273	S	H-2	DH	SS	Y	100	2
12	E	Mendibourne Ranch	X		40.96	41.57	3219	S	H-1	DH	IP	Y	150	3
13	E	Silver Sage Basin 2	X		41.57	43.40	9680	S	H-2	DH	SS	Y	400	8
14	E	Silver Sage Basin 3	X		53.14	53.97	4000	S	H-2	DH	SS	Y	150	3
15	L	Stock Pond Mdw	X		69.30	69.38	160	S	H-2	DH	MM	N	0	0
16	L	Secret Creek		X	70.33	70.33	10	S	NH	ND	SC	N	0	0
17	L	Shinn Mtn Mdw #1	X		71.68	71.70	80	S	H-1	DH	MM	Y	0	0
18	L	Shinn Mtn Mdw #2	X		72.02	72.05	133	S	H-1	DH	MM	Y	0	0
19	L	Cherry Creek	X		72.29	72.31	107	S	H-1	DH	MM	Y	0	0
20	L	Shinn Mtn Mdw #3	X		72.53	72.54	30	S	H-1	DH	MM	Y	0	0
21	L	Shinn Mtn Mdw #4	X		72.96	72.98	93	S	H-1	DH	MM	Y	0	0
22	L	Shinn Mtn Mdw #5	X		73.86	73.86	10	S	H-1	DH	MM	Y	0	0
23	L	Mud Flat		X	83.40	85.16	9300	S	NH	DH?	MF	Y	400	8
24	O	Amedee Alk. Mdw.			96.34	96.34	32	S	NH	DH	AM	Y	0	0
25	O	Honey Lk Playa #1		X	102.07	103.55	7800	S	NH	ND	PY	Y	350	7
26	O	Honey Lk Playa #2		X	106.43	106.65	1200	S	NH	ND	PY	Y	50	1
27	Q	Honey Lk Playa #3		X	116.38	117.14	4000	S	NH	ND	PY	Y	4000	3
28	Q	Dry Valley Ck		X	128.97	128.98	73	S	NH	ND	SC	N	73	0
29	T	Red Rock Ck	X	X	133.29	133.31	82	S	H-2	DH	MM/SC	N	0	0
30	W	Long Valley Ck		X	148.75	148.77	93	P	NH	ND	SC	N	0	0
31	W	Balls Canyon Ck	X		149.14	149.34	1067	P	H-1	DH	MM	N	1067	0
32	W	Long Valley Ck Mdw	X		150.49	150.64	800	P	H-1	DH	MM	N	800	1
33	X	X3-Mdw	X		153.20	153.21	40	P	H-1	DH	MM	N	40	0
34	X	X7-Stream		X	156.13	156.13	10	P	NH	DH	SC	N	10	0
35	X	Willow Riparian	X		159.93	159.94	50	S	NH	ND	RS	N	50	0

Key to Table C.3-5

(1) **Wet.:** Potentially jurisdictional wetlands as defined by the 1987 Wetland Delineation Manual (U.S. Army Corps of Engineers, 1987).

(2) **WUS:** Potentially jurisdictional non-wetland waters of the US as defined by the Federal Clean Water Act.

(3) **MP:** Mileposts are based on the base maps provided at the end of Volume I. Beginning and ending mileposts are determined based on the points where the project centerline intercepts the margins of a feature.

(4) **Length** is the difference, measured in feet, between the beginning and ending mileposts measured parallel to the project centerline.

(5) **Hydrology:**

P=perennial; water is present at or near the soil surface during the entire year

S=seasonal; water is present at or near the soil surface only during a portion of the year.

(6) **Soils:**

H=hydric soils

H-1 soils were determined to be hydric based on low chroma matrix (1 or less) or low chroma matrix (2 or less) with high chroma mottles

H-2 soils that were determined to be hydric based observations that the flooding occurs frequently and for long duration during the growing season

NH=non-hydric soils

(7) **Vegetation:**

DH=dominance by hydrophytic plant species (>50% composition by species listed as FAC, FACW, or OBL wetland species (Reed, 1988))

ND=no dominance by hydrophytic plant species (<50% composition by species listed as FAC, FACW, or OBL wetland species (Reed, 1988))

(8) **Vegetation Type:**

AM=alkali meadow

IP=irrigated pasture

MF=mud flat

MM=montane meadow

PY=playa

RS=riparian scrub

SC=stream channel

SS=silver sagebrush

(9) **Tuscarora adjacent:**

N=proposed alignment of the Tuscarora Pipeline is not located adjacent to the proposed transmission line corridor

Y=proposed alignment of the Tuscarora Pipeline is located adjacent to the proposed transmission line corridor and would be used for overland travel between structures. Overland travel impacts in these segments would be limited to the distance required for spur access to a structure location.

(10) **OT (overland travel) distance** is equal to the length of the wetland or water crossing. The OT distance is "0" if there is an alternative to overland travel in the wetland such as adjacent access roads or the Tuscarora Pipeline corridor.

(11) **Number of structures** is calculated by dividing the length of a site by the average estimated length between structures (1,200 feet) and rounding to the nearest integer.

Table C.3-6 Sensitive Wildlife Habitats Within the Proposed Transmission Line Right-of-Way

Proposed Segment	Greater Sandhill Crane Nests	Sage Grouse Habitat (Brood and Winter)	Sage Grouse Lek Locations	Pygmy Rabbit Habitat	Raptor Nests	Mule Deer Winter Range	Mule Deer Migration Corridors	Pronghorn Migration Corridors	Pronghorn Kidding or Summer Areas	Pronghorn Winter Range	Loggerhead Shrike Nests
Segment A	1 territory (approximately 80 acres)				Potential prairie falcon golden eagle Swainson's hawk nesting habitat	196 acres		204 acres		520 acres	
Segment C		27 acres	Rocky Prairie Sage Grouse Lek, adjacent w/in 1 mile		prairie falcon, Swainson's hawk nesting; ferruginous hawk (active 1994)	75 acres	83 acres	241 acres	439 acres (summer use)		1 MP 14
Segment E	1 territory (approximately 80 acres)	9.5 acres	1 lek adjacent w/in 0.5 mile				263 acres		219 acres (kidding)		
Segment K		198 acres	1 lek (0.25 acre, w/in ROW)						351 acres (summer use)		
Segment L	1 (potential) territory adjacent	192 acres	lek w/in 0.5 mile	24 acres	Swainson's hawk nest	90 acres	198 acres	198 acres	1070 acres (summer use)		
Segment N		20 acres	Historic lek w/in 0.8 miles		Burrowing owl nest				97 acres		
Segment O				75 acres	Peregrine falcon (active 1994)	623 acres					3 MP 99
Segment Q				82 acres			73 acres				1 MP 106.5
Segment R and T						13 acres	5.8 acres				1 MP 117
Segment W						1,650 acres					1 MP 138

Note: Sensitive habitats were not identified in Segments R, X, and Y. The western edge of the East Lassen deer herd use area is adjacent (east) to the ROW from Wendel north to Madeline.

Table C.3-6a Big Game Habitats Crossed by the Proposed Project Line Right-of-Way

Segment	Start Milepost	End Milepost	Segment Total	Restriction Periods
Mule Deer Winter Range				
Segment A	0.4	4.3	3.9 miles	No construction from 11/15 to 4/15.
Segment A	9.5	11.0	1.5 miles	No construction from 11/15 to 4/15.
Segment C	9.2	24.5	18.3 miles	No construction from 11/15 to 4/15.
Segment C	29.7	33.2	7.7	No construction from 11/15 to 4/15.
Segment E	33.2	37.4	4.2	No construction from 11/15 to 4/15.
Segment L	71	90.3	19.3 miles	No construction from 11/15 to 4/15.
Segment Q	130.5	132	1.5 miles	No construction from 11/15 to 4/15.
Segment R, T	132	138	6.0 miles	No construction from 11/15 to 4/15.
Segment W	138	151.7	13.7 miles	No construction from 11/15 to 4/15.
Pronghorn Antelope Winter Range				
Segment A	0	1.5	1.5	No construction from 11/1 to 3/31.
Segment A	7.5	9.2	1.7	No construction from 11/1 to 3/31.
Segment C	14.1	22.6	8.5	No construction from 11/1 to 3/31.
Segment L	74.1	94.4	20.3	No construction from 11/1 to 3/31.
Pronghorn Antelope Kidding Areas				
Segment A	0.2	0.8	0.6	No construction from 4/15 to 6/30.
Segment C	15.7	19.5	3.8	No construction from 4/15 to 6/30.
Segment E	37.7	40.8	3.1	No construction from 4/15 to 6/30.
Segment K	63.3	65.7	2.4	No construction from 4/15 to 6/30.
Segment L	74.3	74.6	0.3	No construction from 4/14 to 6/30.
Segment L	87.6	89	1.4	No construction from 4/14 to 6/30.
Segment A	0	3.1	3.1	No blasting from 4/15 to 6/30.
Segment A	5.2	8.9	3.7	No blasting from 4/15 to 6/30.
Segment C	12.8	20.9	8.1	No blasting from 4/15 to 6/30.
Segment E	36.7	42.6	5.9	No blasting from 4/15 to 6/30.
Segment E	46.3	48	1.7	No blasting from 4/15 to 6/30.
Segment K	62	66.8	4.8	No blasting from 4/15 to 6/30.
Segment L	73	75.7	2.7	No blasting from 4/15 to 6/30.

The Proposed Project route would traverse portions of the Doyle and Loyalton-Truckee herd use areas. Although there are resident deer in Long Valley, the Hallelujah Junction Wildlife Area and the Doyle Wildlife Area have been established in this area primarily to provide winter habitat for the two herds listed above. Range conditions in Long Valley are considered fair to good, with continued improvement anticipated (Kahre, 1994). Prolonged drought conditions and an extremely cold winter in 1992 resulted in a 30-50% population reduction in both herds, leaving approximately 4000 animals among the Loyalton herd and 6000 animals in the Doyle herd (Hall, 1994; Kahre, 1995).

Several wild horse Herd Management Areas (HMA) occur in the vicinity of the Proposed Project. From north to south, these include the Ravendale HMA (west of U.S. 395 near Ravendale); the Twin Peaks HMA (east of U.S. 395 from the Madeline Plains south to Wendel, and east into Nevada); and the Fort Sage HMA (in the Ft. Sage Mountains east of Doyle). These HMAs include a total of about 1,000 wild horses. A small number of these animals would be temporarily displaced during construction of the

Proposed Project, however direct impacts on the animals themselves are unlikely. These animals are protected under the Wild Horse and Burro Act of 1971, which was established to protect and preserve free-roaming horses, burros, and their young.

Northern Juniper Woodland

Songbirds, small mammals, pronghorn, mule deer, and raptors, such as the ferruginous hawk (*Buteo regalis*) and red-tailed hawks (*Buteo jamaicensis*), were observed in northern juniper woodland habitats in the vicinity of the Proposed Project Segment C. Great horned owls (*Bubo virginianus)* were observed using this habitat for nesting in Segment A. Prairie falcons (*Falco mexicanus*) were observed nesting within northern juniper habitat near Segment A. A prairie falcon eyrie is also located in juniper woodland habitat in the vicinity of Segment C. The open grasslands and isolated juniper trees along Segment C north of Likely Mountain and in Northern Secret Valley provide nesting and foraging habitat for Swainson's hawk.

Sagebrush Habitats

Sagebrush habitat types provide forage and important breeding areas for a number of wildlife species. Sage grouse (*Centrocercus urophasianus*), in particular, rely on the sagebrush habitat for their complete life cycle. For courtship and mating, sage grouse assemble in groups on strutting grounds. Generation after generation of sage grouse will use the same parcel of land for strutting grounds, also known as leks, unless the physical aspects of the grounds are altered or destroyed, or the local male population disintegrates (i.e., localized extinction). Typically the strutting grounds are small open areas up to 10 acres in size which support low, sparse vegetation. Grassy swales, burned areas, wet meadows, dry lake beds or even cultivated fields adjacent to sage brush habitats may be used. Sage grouse nesting habitat usually includes sagebrush and rabbitbrush.

Sage grouse leks (currently in use or historically used) in the vicinity of the proposed transmission line ROW have been documented and mapped. It is assumed that brood rearing habitat exists within the ROW (Segments A, C, E, K, L, and N) where the ROW is within 2 miles or less of a lek location. Habitat known to be used for brood rearing has been indicated by the CDFG district biologists, including Segments E, K, and L.

Segments O and Q included large expanses of moderate to dense sagebrush. Portions of these segments have been identified as potential pygmy rabbit habitat. The sagebrush habitat in these segments also supports two owl species, burrowing owl (*Athene cunicularis*), and great horned owl (*Bubo virginianus*).

Riparian and Open Water Habitats

Specific sections which include or are near to riparian or open water habitat include Segments A and R, which would cross the Pit River and run adjacent to Long Valley Creek, respectively. The northern portion of Segment A also crosses Rattlesnake Creek and the Rock Creek drainage. Shorebirds, cranes, and waterfowl were observed in the Pit River Valley, crossed by Segment A. Riparian habitat in the Pit River Crossing area may be suitable for the willow flycatcher; however, this species was not observed. Riparian habitat in Long Valley appears to be improving in certain locations and this habitat may also be suitable for the willow flycatcher or migrant song bird species.

Agricultural Lands and Irrigated Pasture

Agriculture and irrigated habitats used for grazing occur in or near Segments A, E, R, and Q. In the pastures adjacent to the Pit River greater sandhill cranes were observed nesting and foraging in the vicinity of the ROW during 1994 field surveys. Segments located in the southern portion of the route, including Segments R and Q, crossed cattle grazing areas. Cattle grazed in sagebrush and in the grassy understory of open sagebrush. These areas were fairly disturbed and few wildlife species were observed. However, in the irrigated pastures located in the vicinity of Alturas a number of wildlife species were observed including shorebirds, wading birds, and waterfowl. Pronghorn and mule deer are known to use the irrigated pastures for foraging in the summer months.

The proximity to stock ponds and irrigation ditches and dense grasses associated with agriculture and grazing makes this habitat type attractive to bird species such as black-crowned night herons, waterfowl, and small mammals. Raptors use pasture habitat for foraging since small mammals can be easily seen in the open areas and fence posts provide plentiful perches. Red-tailed hawks *(Buteo jamaicensis)* and northern harriers *(Circus cyaneus)* were observed foraging in the pasture habitat in Segment A. Also within Segment A, a greater sandhill crane nesting territory was identified in wet pasture habitat.

C.3.1.2.3 *Special Status Species*

Special Status Plant Species

Twenty special status plant species were observed in the proposed route alignment study area and are listed in Tables C.3-7 and C.3-8. One additional species, hard-podded freckled milkvetch, was observed only on the East Secret Valley Alternative Alignment. Nine of the observed species are designated or proposed for List 2 status by the CNPS and are more common outside of California but occur only rarely within the state. Two species were observed that are classified by CNPS as rare, threatened, or endangered in California and elsewhere (List 1B). However, one of these two species, Suksdorf's milkvetch (*Astragalus pulsiferae* var. *suksdorfii*), is proposed for down-listing by the CNPS to List 4 based on data from this project and the Tuscarora Pipeline Project. The remaining species that were mapped included seven species that are presently on the CNPS List 4 "watch" list and one species on the CNPS List 3, a list of species requiring further review. Doublet, currently a List 4 species, is proposed for List 2 status and Holmgren's skullcap, a List 3 species, is proposed for List 4 status (Tibor, 1995). One species, altered andesite buckwheat (*Eriogonum robustum*), does not occur in California and has no CNPS rating, but is rare in Nevada. The twenty species included three with Federal status as Category 2 candidate species. No Federal- or State-listed threatened or endangered species were observed.

Table C.3-7 Special Status Plant Species Observed in the Study Area of the Proposed Project Route, Listed by Segment[a]

Segment	Species	Common Name	Number of Occurrences	Habitat
A	*Dimeresia howellii*	doublet	3	Volcanic gravels
	Eriogonum prociduum	prostrate buckwheat	3	Volcanic gravels
	Lupinus uncialis	Lilliput lupine	3	Volcanic gravels
	Hackelia cusickii	Cusick's stickseed	3	Juniper woodland
C	*Arnica sororia*	twin arnica	11	Juniper woodland
	Astragalus pulsiferae var. suksdorfii	Suksdorf's milkvetch	12	Volcanic gravels
	Dimeresia howellii	doublet	5	Volcanic gravels
	Hackelia cusickii	Cusicks's stickseed	9	Juniper woodland
	Lomatium hendersonii	Henderson's lomatium	14	Juniper savanna
	Lupinus uncialis	Lilliput lupine	2	Volcanic gravels
	Eriogonum prociduum	prostrate buckwheat	2	Volcanic gravels
E	*Arnica sororia*	twin arnica	5	Juniper woodland
	Astragalus agrestis	purple loco	1	Vernally moist sage brush
	Hackelia cusickii	Cusicks's stickseed	4	Juniper woodland
	Psilocarphus elatior	Tall woolly marbles	1	Vernally moist meadows
	Lomatium ravenii	Raven's lomatium	4	Juniper savanna
	Erigeron elegantulus	Volcanic daisy	4	Rocky slopes
K	*Camissonia boothii ssp. alyssoides*	Pine Creek evening primrose	1	Vernal clay flat and rocky slopes
	Erigeron elegantulus	volcanic daisy	2	Rocky slopes
	Eriogonum collinum	clay-loving buckwheat	1	Vernal clay flat
	Lomatium ravenii	Raven's lomatium	4	Vernal clay flat
	Scutellaria holmgreniorum	Holmgren's skullcap	2	Volcanic vertisols
L	*Astragalus pulsiferae var. suksdorfii*	Suksdorf's milkvetch	11	Juniper woodland
	Atriplex gardneri var. falcata	falcate saltbush	2	Sub-alkaline soils
	Camissonia boothii ssp. alyssoides	Pine Creek evening primrose	11	Vernal clay flats and rocky slopes
	Pedicularis centranthera	dwarf lousewort	1	Sagebrush scrub on alluvial clay soils (from white ash deposoits)
	Polygala subspinosa	spiny milkwort	10	Rocky slopes/gravelly soils
	Scutellaria holmgreniorum	Holmgren's skullcap	11	Volcanic vertisols
	Stanleya viridiflora	green prince's plume	3	White ash deposits
N	*Polygala subspinosa*	spiny milkwort	1	Rocky slopes
O	*Camissonia minor*	Nelson's evening primrose	2	Great Basin scrub
Q	*Psoralidium lanceolatum*	lance-leaved scurf-pea	4	Sand dunes, sandy soils
	Camissonia minor	Nelson's evening primrose	1	Great Basin scrub
Y	*Eriogonum robustum*	altered andesite buckwheat	1	Altered andesite

[a] Segments of the Proposed Project route not listed here had no known special status plant occurrences within the study corridor. Special status plant species observed in the study area of the alternative alignments are listed in Table C.3-19.

Table C.3-8 Special Status Plant Species Observed in the Study Area of the Proposed Project and Alternative Routes

Species Common Name	Status[a] Federal	State	CNPS	Habitat
Arnica sororia twin arnica	–	–	List 2 (proposed for List 4)[b]	Juniper woodland
Astragalus agrestis purple loco	–	–	List 2 (candidate)[b]	Vernally moist sagebrush
Astragalus lentiginosus var. *chartaceus* Hard-podded freckled milkvetch	–	–	List 4 (candidate)[b]	Rocky colluvium on steep slopes
Astragalus pulsiferae var. suksdorfii Suksdorf's milkvetch	C2	–	List 1B (proposed for List 4)[b]	Volcanic gravels, juniper woodlands
Atriplex gardneri var. falcata falcate saltbush	–	–	List 2 (candidate)[b]	Sub-alkaline soils
Camissonia boothii var. alyssoides Pine Creek evening primrose	–	–	List 4	Vernal clay flats and rocky slopes
Camissonia minor Nelson's evening primrose	–	–	List 4	Great Basin scrub
Dimeresia howellii doublet	–	–	List 4 (proposed for List 2)[b]	Volcanic gravels
Erigeron elegantulus volcanic daisy	–	–	List 4	Rocky slopes
Eriogonum collinum clay-loving buckwheat	–	–	List 4 (candidate)[b]	Vernal clay flat
Eriogonum prociduum prostrate buckwheat	C2	–	List 1B	Volcanic gravels
Eriogonum robustum altered andesite buckwheat	C2	–	–	Altered andesite
Hackelia cusickii Cusicks's stickseed	–	–	List 4	Juniper woodland
Lomatium hendersonii Henderson's lomatium	–	–	List 2	Juniper savanna
Lomatium ravenii Raven's lomatium	C3c	–	List 4	Vernal clay flat
Lupinus uncialis Lilliput lupine	–	–	List 2 (candidate)[b]	Volcanic gravels
Pedicularis centranthera dwarf lousewort	–	–	List 2	Alluvial deposits of white ash
Polygala subspinosa spiny milkwort	–	–	List 2	Rocky slopes, gravelly soils
Psoralidium lanceolatum lance-leaved scurf-pea	–	–	List 2 (candidate)[b]	Sand dunes, sandy soils
Scutellaria holmgreniorum Holmgren's skullcap	C3c	–	List 3 (proposed for List 4)[b]	Volcanic vertisols ("fluffy" clays)
Stanleya viridiflora green prince's plume	–	–	List 2 (candidate)[b]	White ash deposits

[a] See Table C.3-3 for definition of status designations; CNPS—California Native Plant Society

[b] Proposed CNPS List status designations based on list provided by the CNPS Assistant Botanist, Dave Tibor (1995).

Far more special status plant species were observed in the northern half of the proposed route, from Segment A through Segment L, than on the southern half from Segment N to the terminus of Segment X. More than 150 separate occurrences of special status plants were mapped in the northern half, while only nine occurrences were observed in the southern half (Table C.3-7). Each of the special status species occurrences have been mapped using a GIS relational database and portrayed on 7.5-minute USGS quadrangle-based base maps. These maps are included at the end of this volume (Volume I).

All of the special status plant species encountered have fairly narrow north-south distribution limits and only a few persist for more than the length of two segments within the project route. For instance, species found in Segments A and C are rarely found in Segments E or K.

Populations of rare plants vary in size and density. Although some species such as Cusick's stickseed (*Hackelia cusickii*) occur only in small clumps beneath western juniper trees, agglomerations of these clumps are sometimes quite extensive. Unusual habitats, such as the Alturas volcanic gravels, sometimes have extensive and overlapping populations of two or more special status plant species that are relatively dense but extremely localized.

Detailed descriptions of the individual special status plants are contained within Appendix E.1.

Special Status Wildlife Species

During biological surveys of the Proposed Project route, 43 observations of special status species were recorded. Legal status, habitat use, and locations of special status wildlife species are discussed below. Those species observed along the proposed route are noted and referenced to the segment of the route where observed. All data collected during wildlife surveys has been transmitted to CDFG. General wildlife surveys were conducted in May, June, and July of 1994 using protocols developed with CDFG biologists. Additional species-specific surveys were conducted as follows:

- August and October 1994, March 1995 - greater sandhill crane surveys
- September 1994 - bat surveys, including flight over study area, mist nets, and sonograph
- December 1994, January 1995 - raptor surveys, using CDFG raptor routes and methods
- October-December 1994, March-May 1995 - waterfowl surveys by plane with ground truthing.

Special Status Birds

American White Pelican (Pelecanus erythrorhynchos). The American white pelican, a State Species of Special Concern, nests in California only within the Klamath Basin. The last breeding record within the vicinity of the Proposed Project was in 1976 at Honey Lake (Tait, et al., 1978). However, sporadic use of the aquatic habitat in the vicinity of the Proposed Project occurs from April through September. White pelicans feed from the surface using their bills to scoop up food fish and crustaceans. These birds never roost in trees, preferring to rest on beaches and sandbars or old driftwood. They are known to use fresh or saltwater habitats. In the vicinity of the Proposed Project American white pelicans were observed foraging in the Pit River in the Warm Springs Valley and at Bayley Reservoir, near Segment C.

Double-Crested Cormorant (Phalacrocorax auritus). The proposed transmission line route crosses the summer range of the double-crested cormorant, a State Species of Special Concern. Double-crested cormorants are present in the Proposed Project area from March through November, when they migrate west to the coastal regions of California. Cormorants feed on fish and crustaceans which they pursue underwater. Cormorants prefer water less than 9 meters (30 feet) deep with rocky or gravel bottoms. The cormorant population is extremely susceptible to pesticide contamination in water and is thought to be declining as a result of human disturbance to habitat and increased gull predation on eggs and young. These birds are commonly observed at the Modoc National Wildlife Refuge, two miles east of the proposed route, near Alturas. They are also known to use the Pit River in the Warm Springs Valley area within the vicinity of the proposed route. Cormorants were also observed using the wetlands at the Biscar Wildlife Area in Secret Valley.

Western Least Bittern (Ixobrychus exilis hesperis). The western least bittern is a small (pigeon-sized), secretive, marsh-dwelling heron which often climbs in reeds. This Federal Category 2 species prefers fresh water marshes but is known to use salt marsh habitat occasionally where they feed on crustaceans, insects and amphibians or their larvae. Loss of wetland habitat in California has contributed to this species' population decline. However, there were no observations of this species during field surveys.

White-Faced Ibis (Plegadis chihi). White-faced ibis are goose-sized wading birds with long, downcurved bills. The term "wading bird" refers to the fact that these birds forage by wading into wetlands. The white-faced ibis, a Federal Category 2 Species, and State Species of Special Concern, breeds in the wetlands in the Modoc Plateau Region and feeds in the rice fields and wetlands located there. Ibises breed in the Modoc National Wildlife Refuge and in the adjacent wetlands. Ibises are also regular visitors to the Honey Lake Wildlife Area. Their nests are platform nests constructed of reeds anchored to emergent vegetation. Ibises were observed in large numbers (> 100) in the Madeline Plains and at the Modoc National Wildlife Refuge. These large flocks were observed congregating on the edges of and within the alfalfa crops. However, even in such large flocks the birds are very mobile. The ibis flocks observed in the Modoc Plateau Region seemed to relocate on a daily basis.

Northern Goshawk (Accipiter gentilis). This accipiter is a forest species and prefers dense fir and pine forests for nesting and foraging. Prey includes birds and mammals. Goshawks are Species of Special Concern and Federal Category 2 species. The population is believed to be declining in the northern portions of its range and increasing in the southeast. Potential habitat for this species occurs in the vicinity of Likely Mountain; however, there were no observations of goshawks during surveys and there are no records to indicate that the species has used this habitat for nesting in recent years.

Swainson's Hawk (Buteo swainsoni). Swainson's hawk is a Threatened Species in the State of California. Swainson's hawks nest mainly in the Central Valley and the northeastern portions of California. They migrate to South America during the winter months. In the northern region of California, Swainson's hawks nest in juniper trees in sparsely vegetated flatlands (Bloom, 1980). These birds forage for small mammals and may be preyed upon by the larger golden eagle. Swainson's hawks were observed in the vicinity of the proposed route from Susanville to Alturas. They were observed hunting in sagebrush habitat and herbaceous wetlands. One nest was located in the right-of-way (ROW).

Ferruginous Hawk (Buteo regalis). This State Species of Special Concern is a resident and winter migrant at lower elevations and open grasslands and buttes in the Modoc Plateau. Ferruginous hawks frequent open grasslands, sagebrush, and fringes of juniper habitats where small mammals are present. The Proposed Project route occurs in the western edge of nesting range for this species. One nest was observed in the ROW north of the Infernal Caverns.

Golden Eagle (Aquila chrysaetos). The golden eagle is a California Species of Special Concern. These birds of prey feed mainly on small mammals which they hunt in open habitats. Secluded cliffs with overhangs and large trees are used for cover and nesting. Old nests are revisited and alternative nest sites are maintained. In the vicinity of the Proposed Project, golden eagles were observed in the Madeline Plains region, near Likely Mountain, and in Secret Valley. Golden eagles were observed large groups (12 individuals) in the vicinity of Ravendale, and Segment K.

Bald Eagle (Haliaeetus leucocephalus). This Federal Endangered, California Endangered Species breeds in Modoc County in large live trees such as ponderosa pine. These birds often choose the largest tree in a stand and build their nests up to 60 meters above the ground. Bald eagles require a permanent water source nearby, such as a lake or river, with abundant perches. The eagles hunt fish, waterfowl, and other prey from such perches. During the winter months bald eagles roost communally in dense, sheltered, remote conifer stands. The nearby Klamath Basin, approximately 60 miles northwest of Alturas, supports about half of the continental U.S.A.'s west coast wintering population. Bald eagles are also known to winter in the Goose Lake region, north of the proposed transmission line route (about 20 miles north of Alturas). Wintering eagles are also known to forage in the Warm Springs Valley which is crossed in the northern portion of the proposed route, and in the vicinity of the south fork of the Pit River, the Madeline Plains, and the Honey Lake Valley.

Northern Harrier (Circus cyaneus). This ground-nesting raptor, formerly known as the marsh hawk, is a State Species of Special Concern. Harriers feed on small mammals, reptiles, and crustaceans and use tall grasses in wetland habitats or the edges of agricultural fields for cover. Nests are usually near wetlands, but also sometimes in open fields or grain fields. This species is known to occur throughout the California portion of the proposed route. No nests were observed during field surveys, however northern harriers were observed hunting in grasslands within the ROW adjacent to the Pit River.

Prairie Falcon (Falco mexicanus). The prairie falcon, a State Species of Special Concern, is a year-round resident in the Proposed Project area. They are commonly observed in the agricultural portions and sagebrush habitats in the project area. The status of the population in the Great Basin is poorly known (Remsen, 1978). Prairie falcons have been observed along Segments A, C, K, L, and in the agricultural areas south of Alturas and in the Madeline Plains.

American Peregrine Falcon (Falco peregrinus anatum). Peregrine falcons are a State Endangered species and a Federal Endangered species. These birds usually breed and feed near water in association with cliffs and canyons used for cover and nesting. Peregrines occur worldwide, especially in woodland, forest, and coastal habitats. Their previous decline, documented since the 1940s, has been attributed to eggshell thinning as a result of pesticide and PCB contamination. They are fast, agile flyers and feed on other birds caught on the wing. In the vicinity of the Proposed Project a peregrine nest was observed in the region northeast of the Honey Lake Valley.

Sage Grouse (Centrocercus urophasianus). This game bird has been listed as a Federal Category 2 species and a State Species of Special Concern. Lassen and Modoc counties have the most stable populations of sage grouse in California (CDFG, 1990). Threats to populations include overgrazing by cattle, which reduces the cover available to these ground-nesting birds. Grouse are known for gathering at strutting areas during early spring. Males come from several miles away to traditional strutting areas known as leks, where they display their breeding plumage and breeding occurs. Leks are located on patches of bare ground surrounded by moderately dense stands of sage. Adult grouse feed on sage leaves, grass, and forbs supplemented by insects, particularly grasshoppers. Brood-rearing habitat includes wet meadows, such as those in the vicinity of Segment A, which provide important sources of food, water, and cover, particularly for young.

Predators include raptors, ravens, and mammals such as coyotes. Two sage grouse lek locations occur adjacent to Segment K. Several known historic leks occur in the vicinity of Segment C and alternative Segments H, amd ESVA.

Mountain Quail (Oreortyx pictus). This harvest species is listed as a Federal Category 3 species. Mountain quail are found seasonally in open brushy montane regions and in conifer forests. The critical habitat element for this species is available water. It is thought that decline of the species is a result of increased predation at water sources. Heavy grazing by cattle also reduces habitat and cover for quail and leaves them susceptible to predators. Quail nest on the ground, often at the base of a stump or tree. Broods are raised in the vicinity of a water source. Dew and vegetation provide water for quail; however, in dry habitat these birds require a permanent water source. Likely Mountain in the Modoc region provides suitable habitat for this species at higher elevations. The proposed route crosses marginal habitat for Mountain Quail on Segment C (and the D and J alternative segments).

Greater Sandhill Crane (Grus canadensis tabida). The Central Valley population of this State Endangered species nests in six counties of northeast California including Modoc, Lassen, and Siskiyou counties in the Proposed Project area (Schlorff, 1994). These large birds nest in wetlands at the Modoc National Wildlife Refuge, Warm Springs Valley, and the wetlands near the town of Madeline (Littlefield, 1988). The Central Valley population has been monitored by CDFG since the 1970s. Studies have shown that the population is declining in California due to poor nesting success. At the current time nesting success is below the level necessary to sustain the population. Young birds are awkward and susceptible to predators and to drowning. Disturbance to nestlings is extremely dangerous to the young birds. Adult birds are protective of young and stay within the vicinity of the nest until young are able to fly (Littlefield, 1988). Adults may forage several miles from roosting site. Greater sandhill cranes forage in the agricultural lands south of Alturas, in the Madeline Plains agricultural areas, and in local irrigated pastures. Greater sandhill cranes were observed in the vicinity of Segment A (Pit River Valley), in pastures within the Alternative Route Segment B, and in several locations in the Madeline Plains.

Greater sandhill crane nest territories were identified on Segments A and E during 1994 surveys. The nesting pair near Segment A successfully reared one fledgling in 1994.

Western Snowy Plover (Charadrius alexandrinus nivosus). This Federal Category 2 shorebird species is also a California Species of Special Concern. It nests along the edges of alkali lakes in the vicinity of the Proposed Project area. The snowy plover is a ground nesting species and prefers rocky substrates with driftwood or other sources of cover. Predators include coyotes, skunks, and ravens. There were no observations of this species during field surveys and there are no recent noted occurrences of this species within the vicinity of the Proposed Project. However, Honey Lake and White Lake in the Proposed Project area may support snowy plovers during years of high rainfall.

Long-Billed Curlew (Numenius americanus). The long-billed curlew, a California Species of Special Concern, commonly breeds in the wetland areas in the Modoc Plateau Region on grazed, mixed grass and short grass prairies, or in wet meadows. Open crop lands are used for foraging during the winter months. However, curlews migrate to lower elevations and coastal areas during this period. Eastern U.S. populations have declined significantly as a result of agricultural practices and these populations have been proposed for Federal listing as Endangered. Western populations, though reduced, seem to be stable. Long-billed curlews were observed in the Madeline Plains agricultural areas and in the Pit River area in Warm Springs Valley. These birds are regular visitors to the Honey Lake Wildlife Area several miles west of Segment M. In addition, curlews were observed in the Modoc National Wildlife Refuge where they are known to nest. In general, the wetlands and pastures in the vicinity of the Proposed Project provide excellent breeding habitat for this species.

Black Tern (Chlidonias niger). The black tern, a Federal Category 2 species, breeds in the wetlands in the Modoc Plateau region. Terns nest in wetlands either on floating nests or on the ground with plant matter used for lining. They feed on insects, crayfish, tadpoles, and small mollusks found in emergent wetlands. Black tern populations have decreased in California due to loss of habitat. This has been mitigated to some degree through increased rice farming. Black terns were observed in the vicinity of the Modoc National Wildlife Refuge (BioSystems, 1994b).

Western Yellow-Billed Cuckoo (Coccyzus americanus occidentalis). This riparian-nesting species is endangered in the State of California. Formerly common in the Sacramento River area and other locations which included a dense riparian overstory, this bird population has been seriously impacted by habitat loss. There is no habitat for this species in the project area.

Western Burrowing Owl (Athene cunicularia hypugea). The burrowing owl is a Federal Category 2 Candidate species and a California Species of Special Concern. These owls are year long residents of open, dry habitats, including open shrub stages of juniper habitat. Burrowing owls use rodent burrows for nesting cover. Adults will perch near the nest burrow during the morning and evening hours and take cover in the nest during the hottest part of the day. These owls prey on insects, small mammals, reptiles, and carrion. Burrowing owls are known to successfully nest in and adjacent to developed areas including college campuses and airports. However, burrowing owls rely upon rodent burrows and suitable foraging habitats and many human activities including poisoning and trapping rodents, discing and paving land have reduced habitat for this species and contributed to its population decline. Burrowing owls were observed nesting along the proposed transmission line route Segment O, east of the Sierra Army Depot. An adult bird was seen perched near burrows, however there were no young birds observed.

Great Gray Owl (Strix nebulosa). The great gray owl, the largest North American owl, is listed by CDFG as Endangered. In the vicinity of the Proposed Project, these owls are found in the Warner Mountains. During the summer months great gray owls nest in conifer forests and feed on small mammals in wet meadow habitat. Studies indicate that there may be fewer than 50 pairs of great gray owls remaining in California, making this the rarest owl in California. There were no observations of this species recorded during field surveys.

Long-Eared Owl (Asio otus). This species is a year-round resident of northeast California and is a State Species of Special Concern. The long-eared owl prefers to use riparian habitats, including oak thickets and other dense stands of trees. Like most owl species, the long-eared owl does not build its own nest; it uses nests built by raptors, magpies, or squirrels. One long-eared owl nest was observed near Segment O during 1994 field surveys. The nest was occupied and one young bird was observed.

Short-Eared Owl (Asio flammeus). This species is a California Species of Special Concern that winters in California, but also breeds in the northeastern part of the state, generally hunting in meadow-areas and marshes. Short-eared owls build their own nests on the ground, usually in open grassland areas. They are known to nest in the same vicinity as Northern Harriers nest with no hostility. Short-eared owls are crepuscular, active at dawn and dusk, however, there were no observations of this species in the project area.

Willow Flycatcher (Empidonax traillii). This flycatcher species is a State Endangered Species which nests in dense willow riparian habitats in California. The decline in California of willow flycatcher populations has been attributed to habitat loss. This flycatcher is a member of the tyrant flycatcher family (Tyrannidae) and is extremely difficult to identify in the field. The song of this species is usually used as the identifying characteristic since the species in this family resemble one another very closely. As riparian habitat is lost to development, agriculture, and cattle grazing, breeding habitat for these birds is reduced to isolated regions. Within the Modoc National Wildlife Refuge and the Long Valley Creek portion of the Doyle Wildlife Area the riparian habitat has begun to regenerate. Although there were no observations of willow flycatchers in the vicinity of the proposed route, suitable habitat is present and is increasing.

Bank Swallow (Riparia riparia). This State Endangered bird species has very specific habitat requirements and nests in the cut banks of rivers; however, bank swallows are also known to nest in sand and gravel pits. Bank swallows nest in colonies and were formerly common on major rivers in the state. Habitat loss due to development, flood control projects that include channelized concrete banks, and other disturbances have led to population declines for the bank swallow (CDFG, 1992a). The Pit River and Long Valley Creek provide excellent habitat for this species in the vicinity of the Proposed Project. Bank swallows were not observed during 1994 field surveys; however, the excellent habitat present in the area represents potential critical habitat for this species.

Loggerhead Shrike (Lanius ludovicianus). This Federal Category 2 species has the characteristic behavior of impaling its captured prey upon barbed wire or thorns. Shrikes occur throughout California in dry grassland habitats and open sage and scrub habitats. They nest in shrubs or isolated trees in stick nests constructed by both male and female breeding birds. Shrikes were observed in the Basin and Range habitats and in the open sagebrush habitats in the Modoc Plateau Region. Single nests were located in the proposed route ROW on Segments C, O, Q, and W (as well as alternative Segments P and V).

Yellow Warbler (Dendroica petechia brewsteri). This small yellow songbird is a California Species of Special Concern. Warblers as a group are known for the melodious songs the males sing during the breeding season. Breeding occurs in riparian woodland habitat in coastal California to the Sierras and the northeast portion of the State. Brood parasitism by brown-headed cowbirds and increased predation are believed to have caused the yellow warbler population to decline. Riparian habitat in the Basin and Range as well as the Modoc Plateau Region includes potential breeding habitat for this species, particularly in the riparian habitat within the Modoc National Wildlife Refuge and the Doyle Wildlife Area in Long Valley. Ash Creek, west of the proposed route supports good quality habitat for this species, however, there were no observations of this species during field surveys.

Tricolored Blackbird (Agelaius tricolor). Tricolored blackbirds are a State Species of Special Concern and are Federally-listed as Category 2. These birds nest in large colonies in wetland vegetation, grain crops, or brambles. Loss of wetland and open grassland habitats to development have led to this species' decline. Tricolored blackbirds are known to nest in the Modoc Plateau Region, however there were no observations of this species during the 1994 surveys.

Special Status Fish

In the project area, the Pit River, Stones Canyon, Cherry Creek, Dry Creek, Secret Creek, Crooks Canyon, Long Valley Creek, Dry Valley, and Red Rock Canyon support channels, bed and bank, and permanent water supply. The Proposed Project design includes spanning all creek crossings. During field surveys conducted for the Tuscarora Pipeline Project fisheries surveys were conducted in the Pit River, Dry Creek, Cherry Creek, and Secret Creek. Special status species with potential to occur in the region include:

- Short-nosed Sucker (*Chasmistes brevirostris*)
- Lost River Sucker (*Deltistes luxatus*)
- Modoc Sucker (*Catostomus microps*)
- Pit Roach (*Lavinia symmetricus mitrulus*)
- Hardhead (*Mylopharodon conocephalus*).

Surveys of the Pit River revealed green sunfish, tui chub, bluegill, Sacramento squawfish, and brown bullhead. There were no fish present during surveys of Cherry Creek. Special status fish species found in the project area include the Pit roach, a Category 2 species and California Species of Special Concern, and the hardhead, a California Species of Special Concern. These special status fish were observed in ditches near the South Fork Pit River near Likely and near Rattlesnake Butte in the Pit River (BioSystems, 1994b).

Special Status Amphibians

Foothill Yellow-Legged Frog (Rana boylei). The foothill yellow-legged frog is a Federal Category 2 species. In northern California its range occurs mainly west of the Cascades but includes some portions of Plumas and Sierra Counties (Stebbins, 1985). The frogs are found near rocky streams in a variety of habitats including ponderosa pine, mixed conifer and wet meadows. Foothill yellow-legged frogs are not known to occur in the vicinity of the Proposed Project.

Spotted Frog (Rana pretiosa). This Category 2 species has been recorded in a small isolated population which occurs from Klamath Lake south to the northeast corner of Modoc County. In 1910 there was a recorded observation of a spotted frog along the South Fork of the Pit River near Alturas. The only present occurrence of this amphibian has been recorded in Modoc County near the Cederville Ranger Station east of the Proposed Project area (BioSystems, 1994b). Habitat destruction and competition from introduced species has been given as the reason for this species' decline.

Great Basin Spadefoot Toad (Scaphiopus intermontanus). The range of this California Species of Special Concern includes most of the Proposed Project area in Modoc and Lassen California. Spadefoot toads are associated with temporary or permanent water sources in wet meadows, alkali scrub, bittterbrush scrub, and riverine habitats. During dry periods the toads dig their own burrows or use small mammal burrows in the vicinity. There were no observations of this species in the project vicinity during field surveys (BioSystems, 1994b).

Special Status Reptiles

Northwestern Pond Turtle (Clemmys marmorata). The northwestern pond turtle is a Federal Category 2 species and a State Species of Special Concern. This reptile was once common in California. Habitat loss and hunting have caused drastic declines in turtle numbers. This species is not known to have occupied aquatic habitat in the Modoc Plateau or Basin and Range Regions. Western pond turtles were not observed during 1994 surveys. However, several sightings of this species have been recorded in recent years in the vicinity of the Modoc National Wildlife Refuge and in the Madeline Plains (Ryno, 1994).

Special Status Mammals

Mammal surveys included aerial surveys, surveys on foot, and night mistnetting. In addition, Dr. Constantine used special electronic equipment to identify bat species by sound. (The Pettersson 980 bat detector was used to convert the ultrasonic calls of bats into the audible range. It is the only bat detector which readily detects the low frequency calls of *E. maulatum* and *E. perotis*.) Survey efforts were primarily focused on the area north of the Madeline Plains to Alturas with the exception of the mine shafts identified in the vicinity of Reno, Nevada. Surveys were concentrated on potential habitat within the ROW and as far away as 1 mile from either side of the center line.

Townsend's Western Big-Eared Bat (Plecotus townsendii townsendii). Townsend's western big-eared bat is a Federal Category 2 species and a State Species of Special Concern. Big-eared bats are known to occur throughout California in grasslands and deserts as well as high-elevation forests where they use man-made structures, lava tubes, and limestone caves for roosting. Availability of potential roosting areas seems to be the limiting habitat requirement. However, little is known about this species' distribution in the Modoc Plateau or Basin and Range Regions. These bats are known to nest in colonies with females collected in caves or abandoned buildings with young. Males are thought to roost alone in crevices in rocks or under bridges or in other manmade structures. Big-eared bats feed on insects caught on the wing. Like most bat species, the big-eared bat uses sonar to navigate during feeding which occurs at dusk and early evening. A colony of Townsend's big-eared bats was identified in the vicinity of the Infernal Canyons, approximately one mile east of Segment C. Fifty bats were observed roosting in a lava cave (Constantine, 1994).

Spotted Bat (Euderma maculatum). This Federal Category 2 bat species is not currently believed to occur in the northeast portion of California. Spotted bats are considered to be one of North America's rarest mammals (CDFG, 1990). They are known to occupy caves, cliffs, and rock crevices in arid landscapes to coniferous forests in southern California. These bats are believed to be solitary and thought to prey primarily upon moths. Due to the solitary nature of this species and its preferred habitat, this species is extremely difficult to find. There were no observations of this species during field surveys.

Mastiff Bat (Eumops perotis californicus). This species is the largest native bat in the United States. Mastiff bats are a Federal Category 2 Candidate species and a State Species of Special Concern, and are thought to reside at low elevations in coastal basins in southern California. Roosts are usually in large cracks in granite or sandstone, or in hollow trees within open habitats. Their numbers are believed to be reduced as a result of development and loss of habitat. Distribution maps for this species do not indicate that the mastiff bat occurs in Modoc Plateau or Basin and Range Regions (CDFG, 1990). However, this species may be present in suitable habitat in the Modoc Plateau or Basin and Range Regions (Pierson, 1994). There were no observations of this species during field surveys.

Pallid Bat (Antrozous pallidus). The pallid bat, a California Species of Special Concern, occurs throughout California at lower elevations except for the high Sierra Nevada and the northwestern part of the state. Pallid bats roost in groups of 20 or more in caves or mine shafts which provide cover and protection from high temperatures. Maternity colonies can include more than 100 individuals. Pallid bats have a stout skull and dentition such that they can take hard-shelled insects like beetles, Jerusalem crickets and scorpions for prey. Pallid bats are large, and slow-flying and most often forage on the ground (CDFG, 1990). There were no observations of this species during field surveys.

Pygmy Rabbit (Brachylagus idahoensis). This Federal Category 2 species and State Species of Special Concern is also considered a harvest species (CDFG, 1990). The pygmy rabbit is uncommon and found only in the sagebrush and pinyon juniper habitat in the Basin and Range and Modoc Plateau Regions in California, and in Oregon, Nevada, Idaho, and Utah. This species is believed to avoid heavily grazed areas and is usually associated with big sagebrush habitat. Populations are thought to be distributed in patches (CDFG, 1990). Potential pygmy rabbit habitat occurs along Segments L, O, P, and Q. One sighting of pygmy rabbit was recorded during the 1994 surveys in the area south of the Fort Sage Mountains (Segment Q). The Tuscarora Final EIR documents a pygmy rabbit sighting near Wendel on July 18, 1994. The sighting occurred in the vicinity of Segment N, MP 91.8, approximately 1 mile west of the transmission line ROW in big sage habitat.

California Bighorn Sheep (Ovis canadensis californiana). In northeastern California bighorn sheep were introduced into the Warner Mountains Wilderness after 1979. This species prefers open areas with low-growing vegetation for feeding, with close proximity to steep, rugged terrain for escape and lambing. This species is extremely sensitive to disease, and the Warner Mountains population experienced a total die-off in winter 1987-88. Bighorn sheep are not expected to occur in the Modoc Plateau or Basin and Range Regions. Bighorn sheep are believed to be extirpated from their former range in Lassen and Modoc Counties.

C.3.1.2.4 *Sensitive Habitats*

Vegetation

Five plant communities within the project study area were identified as sensitive habitats for special status plants. These are:

- Alturas volcanic gravels
- Volcanic vertisols
- White volcanic ash deposits
- Partially-stabilized dunes
- Altered andesite.

Each of these sensitive habitats and the associated species, as well as potential jurisdictional wetlands, are described below. All five habitats are related to unusual substrates that represent the "limiting factor" separating these plant associations from the zonal vegetation and providing a suitable niche for the associated special status species.

With the exception of the altered andesite plant community that was described by Billings (1950) and others (De Lucia and Schlesinger, 1990), none of these plant communities have yet been formally described. However, many other plant communities in California and elsewhere have been previously defined on the basis of soils or substrates (e.g., serpentine, hardpans, and sand dunes) (Holland, 1986). The uniqueness of the five edaphic plant communities discussed here are related in some instances to the soil morphology, as in the case of volcanic vertisols and stabilized dunes, or to factors such as chemistry (altered andesite and perhaps white volcanic ash deposits). These soil and substrate conditions offer competitive advantages to species that do not survive well in the zonal environment and lead to the development of the plant communities described in this section (De Lucia and Schlesinger, 1990).

Alturas Volcanic Gravels. Pyroclastic rocks (gravel-sized fragments ejected from a volcano) were deposited in the Modoc Plateau region between 10 and 2 million years ago (Pliocene and Miocene periods) over the surface of other pyroclastic materials that became "glued" together by semi-melted silica fragments. Erosion has exposed these gravel areas and a layer of very thin soil has developed in some areas. For unknown reasons these areas possess very little vegetative cover, perhaps less than 20%. The species that persist on the soils are sometimes rare, such as doublet (*Dimeresia howellii*), prostrate buckwheat (*Eriogonum prociduum*), lilliput lupine (*Lupinus uncialis*), and Suksdorf's milkvetch (*Astragalus pulsiferae* var. *suksdorfii*). This habitat is often found near the crest of eroded ridges near Alturas where erosion is at a minimum. The plant community is often localized in small patches (less than 2-3 acres) separated by northern juniper woodland or other communities.

Volcanic Vertisol Low Sagebrush Scrub. The volcanic vertisol low sagebrush scrub plant community is found almost exclusively on vertisol soils mapped as the Tunnison Series. This plant community may be a subset of the low sagebrush scrub plant community but is described separately here because a distinct shift in species composition and soil environment can be detected clearly in the field. The association of species that characterizes this plant community is apparently due largely to differences in the soil. The Tunnison soils are formed on plateaus from weathered andesite and basalt lava (Soil Conservation Service, 1994). These "volcanic" vertisols are very high in clay (>35%), but when dry the soil becomes quite loose and almost granular in appearance. It is only when wet that the high clay content becomes evident. The soils associated with this plant community are sometimes called "fluffy clays" due to the spongy feel of the soil when it is desiccated. Like other vertisols, this soil shrinks when dry, forming deep cracks, and expands during the wet season.

The process of shrinking and swelling appears to limit the accumulation of organic material at the surface because the accumulated litter and organics fall or wash into cracks (Buol et al., 1980). The "churning" action and the reduction of accumulated organic matter may be the factors that control the species composition of the associated plant community. Cusick's sunflower *(Helianthus cusickii)* occurs almost exclusively on the Tunnison vertisol soils in the project area. Holmgren's skullcap, a CNPS List 3 species that is being proposed for List 4, occurs only in association with Cusick's sunflower and the volcanic vertisols. Other species commonly associated with the volcanic plant community include low sagebrush *(Artemisia arbuscula)*, and rubber rabbitbrush *(Chrysothammus nauseosus)*.

White Volcanic Ash Deposits. Aeolian (wind-generated) deposits of white volcanic ash occur sporadically in the area north of Shaffer Mountain in Lassen County (Segment L). The volcanic ash occurs in low mounds that have been dissected by intermittent drainages. Individual shrubs and other plants are more widely spaced on these soils. Bare ground accounts for approximately 40 percent of the total cover. The soils associated with the white ash deposits are well-drained, coarse textured, and largely composed of pumice and fine particles of silica ash. Green prince's plume (*Stanleya viridiflora*) is found only on these soils.

Partially Stabilized Dunes. Between the northern edge of Honey Lake Valley near Wendel and the northern margin of the Fort Sage Mountains (Segments O and Q) the proposed route traverses several areas of semi-active and inactive sand dunes (also along alternative Segments M and P). The dune plant community is composed primarily of devil's lantern (*Oenothera deltoides* ssp. *piperi*), Nuttall's coldenia (*Tiquilia nuttallii*), fourwing saltbush (*Atriplex canescens*), sand verbena (*Abronia turbinata*), and many-flowered mottled milkvetch (*Astragalus lentiginosus* var. *floribundus*). Special status species associated with this plant community include the lance-leaved scurf-pea (*Psoralidium lanceolatum*), Pine Creek evening primrose (*Camissonia boothii* ssp. *alyssoides*), and Geyer's milkvetch (*Astragalus geyeri* var. *geyeri*). The last of these, Geyer's milkvetch, was observed during the surveys of the area in 1993, but was not observed in those locations or elsewhere during the botanical surveys in 1994.

Altered Andesite. Soils formed on altered andesite are unusually acidic and have been leached of most essential nutrients. Nutrient deficiencies appear to exclude the zonal sagebrush plant communities from these areas and permit small assemblages of species that are not widespread in the region (Billings, 1950). The dominant species associated with these sites is ponderosa pine (*Pinus ponderosa*), but bare ground accounts for 60-80% of the total cover on most sites. Altered andesite buckwheat (*Eriogonum robustum*), a Federal Category 2 candidate, is found on some of the altered andesite communities within the Proposed Project route (Segments X and Y).

Potential Jurisdictional Wetlands. In addition, several wetland types are sensitive habitats by virtue of their protection under Section 404 of the Clean Water Act. Principal wetland types are:

- Montane meadow
- Irrigated pasture
- Riparian scrub
- Silver sagebrush basin.

Additional habitats possessing "wetland" hydrology but lacking the vegetation component may be eligible for protection under the wetland guidelines adopted by the California Fish and Game Commission. These areas may include greasewood playas, mudflats, stream channels, or other areas that are inundated during a portion of the wet season but lack the wetland soil and vegetation criteria defined by the U.S. Army Corps of Engineers (USACE). Detailed descriptions of each of the potential wetland types are also presented in Secton C.3.1.1.1.

Wildlife

Agency-designated sensitive habitats are discussed above in Section C.3.1.1.4 in the regional overview.

C.3.1.3 Applicable Regulations, Plans, and Standards

Applicable regulations include Federal and State regulations that address the protection of sensitive species, wetlands, streams, and riparian plant communities. Although the National Environmental Policy Act (NEPA) and CEQA both indirectly regulate biological resources they are not specific to these resources and are addressed elsewhere in this document.

Federal Endangered Species Act - The Federal Endangered Species Act of 1973, and Title 16 (implementing regulations) of the United States Code of Federal Regulations (CFR) 17.1 et seq., designate and provide for protection of threatened and endangered plants and animals and their critical habitat. Procedures for addressing Federally-listed species follow two principal pathways, both of which involve consultation with the USFWS, which administers the act for all terrestrial species. The first pathway is set up for situations where a non-Federal government entity must resolve potential adverse impacts to species protected under the Act. The second pathway is spelled out under Section 7 of the Act and involves projects with a Federal connection or requirement; typically these are projects where a Federal lead agency is sponsoring or permitting the Proposed Project. The Alturas project would fall under the second category. In these instances, the Federal lead agency initiates and coordinates the following steps:

- Informal consultation with USFWS to establish a list of target species
- Preparation of Biological Assessment assessing potential for the project to adversely affect listed species
- Coordination between State and Federal biological resource agencies to assess impacts/propose mitigation
- Development of appropriate mitigation for all significant impacts on Federally-listed species.

USFWS ultimately issues a final opinion on whether the project will affect the Federally-listed species.

Federal Clean Water Act - Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into the "waters of the United States" without a permit from the U.S. Army Corps of Engineers. The definition of waters of the United States includes wetland areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The U.S. Environmental Protection Agency (EPA) also has authority over wetlands and may override a Corps permit. Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may be eligible for one of the Nationwide Permits and would require less review than an individual permit. Examples of Nationwide Permits that may be applicable to this project are Nationwide Permits 26, 18, 25, and 33.

Executive order 11990, Section 1(a) established a federal policy of "no net loss' of wetlands. Compensation for wetland impacts may include restoration and/or offsite replacement or enhancement. However, the characteristics of the restored or enhanced wetlands must be equal to or better than those of the affected wetlands.

California Endangered Species Act of 1984 - Sections 2050 through 2098 of the California Fish and Game Code outline the protection provided to California's rare, endangered, and threatened species. Section 2080 of the California Fish and Game Code prohibits the taking of plants and animals listed under the authority of the California Endangered Species Act of 1984. Individual animal species declared to be Threatened or Endangered by the California Fish and Game Commission are listed in Title 14 of the California Code of Regulations (CCR) under Section 670.5. In addition, the Native Plant Protection Act of 1977, Fish and Game Code Section 1900 et seq., gives the California Department of Fish and Game authority to designate state Endangered, Threatened, and Rare plants and provides specific protection measures for identified populations.

Sensitive species that would qualify for listing but are not currently listed are afforded protection under CEQA. Guidelines for Implementation of the California Environmental Quality Act of 1970 (CEQA Guidelines), Title 14, CCR section 15065 ("Mandatory findings of significance") requires that a reduction in numbers of a rare or endangered species be considered a significant effect. Section 15380 ("Rare or endangered species") provides definitions and provides for assessment of unlisted species as rare or endangered under CEQA if the species can be shown to meet the criteria for listing. Unlisted plant species on the California Native Plant Society's lists 1A, 1B, and 2 would typically be considered under CEQA.

California Streambed Alteration Notification/Agreement - Sections 1601-1606 of the California Fish and Game Code require that a Streambed Alteration Notification be submitted to the CDFG Department for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake". The Department reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by the Department and the applicant is the Streambed Alteration Agreement. Often, projects that require a Streambed Alteration Agreement also require a permit from the USACE under Section 404 of the Clean Water Act. In these instances, the conditions of the Section 404 permit and the Streambed Alteration Agreement may overlap.

Nevada Regulations - Nevada State law established in 1969 (NRS 527.260-.300) provides "a program for the conservation, protection, restoration, and propagation of selected species of flora and for the perpetuation of the habitats of such species." The State Forester Firewarden (SFF) has the authority to list native plant taxa as "threatened with extinction" and to prohibit removal or destruction of such species except by special permit from the SFF. It is also illegal under Nevada State law to "cut, destroy, mutilate, remove, or possess any Christmas (evergreen) tree, cactus (Cactaceae), yucca *(Yucca)* or branches thereof..." from State, county, or private lands without permission from the SFF (NRS 527.060-.120).

Several of the special status wildlife species listed in Table C.3-4 are listed as protected by the State of Nevada. While Nevada does not have its own version of an endangered species act, the Nevada Division of Wildlife has established a list of species which are either declining in all or portions of their range within Nevada, including the following species, which are also listed in the State of California:

- Western least bittern
- White-faced ibis
- Northern goshawk
- Ferruginous hawk
- Bald eagle
- Peregrine falcon
- Western snowy plover
- Long-billed curlew
- Loggerhead shrike.

C.3.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

C.3.2.1 Definition and Use of Significance Criteria

C.3.2.1.1 *Significance Criteria*

Significance criteria for impacts to biological resources were developed based on Section 15065 and Appendices G and I of the CEQA Guidelines, and Section 21083 of the Public Resources Code. According to these guidelines, a project will have a significant effect on biological resources if it would:

- Substantially affect, reduce the number of, or restrict the range of a unique, rare, or endangered species of animal or plant, or the habitat of the species (Section 15065, Appendix G, Appendix I)
- Interfere substantially with the movement of any resident or migratory fish or wildlife species (Appendix G)
- Threaten to eliminate a plant or animal community (Section 15065a)
- Substantially diminish or reduce habitat for fish, wildlife, or plants (Appendix G)
- Change the diversity of species, or number of any species of plants or animals (Appendix I)
- Cause a fish or wildlife population to drop below self-sustaining levels (Section 15065)
- Introduction of new species of plants or animals into an area, or in a barrier to the normal replenishment of existing species (Appendix I)
- Deteriorate existing fish or wildlife habitat (Appendix I).

For the purposes of this EIR/S, three principal components of the guidelines outlined above were considered:

- Magnitude of the impact (e.g., substantial/not substantial)
- Uniqueness of the affected resource (rarity)
- Susceptibility of the affected resource to perturbation (sensitivity).

The evaluation of significance must consider the interrelationship of these three components. For example, a relatively small magnitude impact to altered andesite buckwheat (*Eriogonum robustum*) would be considered significant because the species is very rare and is believed to be very susceptible to disturbance. On the other hand, a plant community such as big sagebrush scrub is not rare or as sensitive to disturbance. Therefore, a much larger magnitude of impact would be required to result in a significant impact.

Vegetation

The following significance criteria were used to assess the significance of potential project impacts on affected vegetation resources. References to CEQA Guidelines are included in parentheses. Significant impacts are those that would result in:

- Substantial disturbance of a special status species[1] or its habitat. (Section 15065, Appendix G, Appendix I)
- A substantial reduction in the numbers of a special status plant species (Section 15065)
- Indirect loss of a special status plant species or its habitat (Section 15065a)
- Filling or degradation of wetlands and waters subject to the jurisdiction of the USACE pursuant to the Federal Clean Water Act (no net loss of wetlands) (Appendix G and Appendix I)
- Loss or degradation of sensitive natural plant communities, including but not limited to plant communities associated with volcanic gravel areas, sand dunes, altered andesite, and volcanic vertisols (Section 15065a, Appendix G)
- Creation of substantial barriers for dispersal of plant species (Appendix G)
- Compaction of soils, clearing of vegetation, or other activities that substantially increase erosion and sedimentation (Appendix G)
- Introduction of non-native plant species or facilitating the dispersal of existing populations of non-native plants (Appendix I).

Wildlife

Evaluation of impacts on wildlife resources considers the magnitude of impact, the rarity of the resource, and susceptibility of the resource to impacts. All impacts that are defined in Section 15065 of the CEQA Guidelines as significant have been designated as significant in this EIRS. Specific examples of significant impacts include:

- Direct mortalities to special status species due to electrocution or collision with transmission lines (Section 15065 and Appendix G)
- Substantial disturbance to a special status species habitat (Section 15065 and Appendix G, I)
- Substantial impediment or interference with wildlife migratory or local movements (Appendix G)
- Substantial reduction or disturbance to special status species habitats which are critical during specific life stages (Section 15065, Appendices G and I)
- Substantial disturbance or displacement of wildlife on critical seasonal ranges (Appendices G and H).

C.3.2.1.2 *Impact Assessment Methodology*

Vegetation

Vegetation resources were surveyed within a 660-foot-wide study corridor extending along the length of the Proposed Project, as well as the proposed alternative alignments. Proposed Project locations and impacting parameters, as defined in the Project Description (Part B of this EIR/S), were compared with the locations of identified biological resources to determine the following:

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1 Special status species are defined here to include all species listed, proposed for listing, or candidates for listing under the Federal Endangered Species Act; the California Endangered Species Act; the CDFG's list of Species of Special Concern; plant species included in the CNPS's List 1A, 1B, and 2; NDOW's list of protected species and species declining in Nevada; as well as species that would qualify for inclusion into any one of these lists (CEQA Guidelines, Section 15380). Plant species included in CNPS List 3 and 4 are included if information regarding rarity was poorly documented prior to the 1993 and 1994 plant surveys. The Final EIR/S incorporates recently proposed changes to the CNPS Inventory. These changes reflect the current state of knowledge on the rarity and endangerment of these species. Although the proposed changes to the CNPS Inventory have not been finalized, the new information has been used in this Final EIR/S to reassess the significance of impacts to the species proposed for changes in their CNPS List status.

- Type of affected resource
- Area, population, and status of the affected resource
- Nature of the potential impact (e.g., construction vs. maintenance, short-term vs. long-term, and direct vs. indirect).

Natural plant community impacts were revised for the Final EIR/S to account for the Applicant's refinements to the estimated size of structure setup areas, spacing of wire setup areas, and substation footprints. Plant community descriptions were also refined and reorganized. Changes include the separation of rabbitbrush scrub from silver sagebrush scrub; separation of chenopod scrub into greasewood scrub, greasewood playa, alkali meadow, and chenopod mixed scrub; separation of one occurrence of irrigated pasture from disturbed/cultivated plant communities; addition of one occurrence of mud flat; separation of silver sage scrub into wetland and non-wetland types; and addition of riparian scrub. Although riparian scrub was not previously addressed in the Draft EIR/S due to its extremely localized distribution (this plant community is restricted to only one occurrence, on Segment X), addition of this plant community does not represent a substantial change to the impact assessment. No new impacts to plant communities have been identified, but some of the impacts have been reassigned, as appropriate, to more specific plant community types.

Special status plant populations were reviewed and designated for avoidance based on the species' rarity, magnitude of the potential impacts, and sensitivity of the species to disturbance. Plant populations to be avoided are so identified in Table E.1-3. If avoidance is not designated, mitigation measures are proposed for potential impacts.

All of the potential impacts on vegetation resources were compared to the significance thresholds listed in Section C.3.2.1.1, above. Mitigation for all significant impacts is also proposed.

Wildlife

The significance criteria were applied to the wildlife species and habitats within the Proposed Project area in order to evaluate the significance of impacts associated with the construction and operation of the Proposed Project. An example of a significant impact is substantial disturbance or habitat removal within a sage grouse lek. Sage grouse leks are used on an annual basis during the breeding season and are established by sage grouse use over many years. Although the general characteristics of sage grouse leks have been described, it is not known why the grouse prefer a given location for a lek. The lek locations cannot be duplicated or replaced and this makes them extremely susceptible to disturbance. In this example a substantial impact may be on the order of 0.01 to 0.1 acre because of the sensitivity and uniqueness of sage grouse leks.

Other examples of sensitive wildlife resources are: mule deer holding areas, and pronghorn kidding areas, migration corridors, and winter ranges. These limited-distribution habitats are most susceptible to project impacts due to their importance to wildlife populations during critical life stages and due to the finite amount of these resources available. Substantial disturbance to or loss of big game winter ranges, for example, would reduce the carrying capacity of the restricted winter forage, putting portions of the herd at risk of starvation or die-off. Project impacts on such sensitive resources would have far-reaching consequences for one or more wildlife populations, and are therefore considered significant.

Impacts on less sensitive wildlife habitat would be considered adverse but not significant. Widespread habitat that does not contain wildlife concentration areas or critical resources is considered less sensitive. For example, surface removal of year-round mule deer range, that is orders of magnitude larger than impacts to sage grouse leks, would not be considered significant.

In Table C.3-9, the significance criteria described above have been applied to the species and habitats that would be affected by the Proposed Project. The determination of significance is based on consideration of the rarity or uniqueness of the species, the susceptibility of the species or habitat to impacts, and the magnitude of impact.

Table C.3-9 Significance Criteria Applied to Wildlife Species and Resources

Species or Habitat	Thresholds of Significance
Big game migration areas, holding areas, winter ranges, kidding areas	Substantial losses of these habitat types would be significant based on CEQA Guidelines Sections 15065 and Appendices G and H. These areas are important to game species during critical lifestages when herds concentrate in specific locations.
Sandhill crane nest territories	For this sensitive bird species, nest territories are critical for reproduction and rearing of young. Substantial disturbance or displacement would be significant (Appendices G and H).
Sage grouse leks and brood or winter habitats	Substantial long-term disturbance to this habitat, or during the breeding period would be significant. (Section 15065).
Aquatic habitat	Critical breeding habitat for fish, amphibians, and reptiles. Substantial disturbance to this habitat would be significant (Section 15065 and Appendix G).
Birds of prey - nesting sites	Substantial disturbance is significant (Appendix H).
Pygmy rabbit habitat	This habitat is unique and potentially sensitive to fragmentation. Substantial loss of this habitat would be significant (Appendix H).
Crane, waterfowl and shorebird collision potential	These species are susceptible to collision. Substantial disturbance of migrational paths or local movements is significant (Appendix G).
Raptor collision and electrocution potential	Substantial reductions birds of prey populations which are susceptible to electrocution would be significant (Appendices G and I).

C.3.2.2 Environmental Impacts and Mitigation Measures

This section presents the potential impacts of the Proposed Project related to biological resources. The first part of the section is an overview of the impact categories used to organize the assessment of impacts. The second and third parts of the section present each of the potential project impacts related to vegetation and wildlife resources, respectively, and outline the steps that would be taken to mitigate significant impacts.

C.3.2.2.1 *Impact Overview*

Vegetation

Assessments of potential impacts on special status plants, natural plant communities, and wetlands are organized into five categories of impacts:

- Temporary and permanent habitat loss
- Overland travel
- Increased access
- Erosion and sedimentation
- Introduction of non-native plant species.

Table C.3-10 summarizes all of the potential impacts on vegetation resources for the Proposed Project. Natural plant communities and special status plant species not listed in Table C.3-10 will be avoided during construction. Plant communities and special status species will be avoided by siting structures and access roads outside of the limits of these resources, as described and tabulated in Appendices E.1 and E.4. If avoidance is not possible during construction, the mitigation measure for the specific impact caused, as described in Section C.3.2.2.2, will be applied. The special status plant species that will be avoided are:

- Falcate saltbush (*Atriplex gardneri var. falcata*)
- Purple loco (*Astragalus agrestis*)
- Volcanic daisy (*Erigeron elegantulus*)
- Clay-loving buckwheat (*Eriogonum collinum*)
- Altered andesite buckwheat (*Eriogonum robustum*)
- Dwarf lousewort (*Pedicularis centranthera*)
- Green prince's plume (*Stanleya viridiflora*).

These species are not addressed further in this section. For descriptions of these species and their distribution in the project area, please refer to the Biological Assessment in Appendix E.1.

Temporary and permanent habitat loss represent direct impacts on vegetation and plant communities. The remaining three impact categories are considered indirect impacts of the Proposed Project. Direct impacts can be quantitatively assessed because they are functionally linked to the actions required to construct, operate, and maintain the Proposed Project. Indirect impacts are assessed with less quantification because they can be affected by a number of independent factors that can vary in magnitude or frequency (e.g., winter rainfall, duration of construction, topography, existing plant community condition, and the origin and fate of non-native plant propagules). All five impact categories contain potential impacts that could result from all phases of the project: construction, operation, and maintenance of the proposed facilities. However, habitat loss and overland travel would be concentrated during the construction phase, while the remaining three categories represent impacts that could persist indefinitely, over the life of the facility and beyond.

Estimation of the potential project impacts were made based on several assumptions and information provide by the Applicant. First, it was assumed that two of the five impact categories, habitat loss and overland travel, represent mutually exclusive fates for a given piece of habitat. Therefore, areas affected

Table C.3-10 Potential Impacts on Vegetation Resources of the Proposed Route, Staging Areas, and Substations

Segment/Resource	Habitat Loss (acres)[1]		Overland Travel (acres)[2]	Increased Access	Erosion and Sedimentation	Non-Native Plant Introduction
	Temporary	Permanent				
Segment A						
Juniper woodland	9.51	3.00	N	Y	Y	Y
Montane meadow	0.41	N	0.50	N	Y	Y
Volcanic gravels	0.41	N	0.34	Y	Y	Y
Low sagebrush scrub	4.03	1.18	1.12	Y	Y	Y
Disturbed/cultivated	2.80	0.25	2.08	N	Y	N
Big sagebrush scrub	2.87	0.34	2.84	N	N	Y
Doublet (*Dimeresia howellii*)	N	N	0.11	Y	Y	Y
Cusick's stickseed (*Hackelia cusickii*)	N	N	N	Y	Y	Y
Segment C						
Volcanic gravels	6.03	2.81	0.78	Y	Y	Y
Big sagebrush scrub	0.58	N	0.41	Y	Y	Y
Disturbed/cultivated	0.99	N	0.53	N	Y	N
Montane meadow	0.62	N	0.03	Y	Y	Y
Juniper woodland	31.32	0.05	2.90	Y	Y	Y
Low sagebrush scrub	33.84	0.32	0.85	Y	Y	Y
Yellow pine forest	9.23	0.02	N	Y	Y	Y
Suksdorf's milkvetch (*Astragalus pulsiferae* var. *suksdorfii*)	2.76	0.21	N	Y	Y	Y
Henderson's lomatium (*Lomatium hendersonii*)	8.52	0.02	N	Y	N	Y
Cusick's stickseed (*Hackelia cusickii*)	2.10	0.01	N	Y	N	Y
Lilliput lupine (*Lupinus uncialis*)	N	0.20	N	Y	Y	Y
Prostrate buckwheat (*Eriogonum prociduum*)	N	N	0.14	Y	Y	Y
Segment E						
Juniper woodland	9.07	7.09	N	Y	Y	Y
Silver sagebrush scrub	5.91	0.02	0.33	N	N	Y
Big sagebrush scrub	6.08	0.02	N	Y	Y	Y
Disturbed/cultivated	7.89	2.05	5.42	Y	Y	N
Irrigated pasture	1.40	N	N	N	N	N
Montane meadow	N	0.01	N	N	Y	Y
Silver sagebrush basin	3.86	0.01	0.26	N	Y	Y
Twin arnica (*Arnica sororia*)	0.12	N	N	N	Y	Y
Cusick's stickseed (*Hackelia cusickii*)	<0.01	N	N	N	Y	Y
Raven's lomatium (*Lomatium ravenii*)	4.19	0.01	N	N	N	Y
Segment K						
Big sagebrush scrub	19.47	0.06	16.50	N	Y	Y
Juniper woodland	1.80	N	N	Y	Y	Y
Silver sagebrush scrub	4.44	0.01	0.14	N	Y	Y
Silver sagebrush basin	1.64	0.01	N	N	Y	Y
Volcanic vertisols	5.71	0.01	N	Y	Y	Y
Raven's lomatium (*Lomatium ravenii*)	0.92	0.01	3.19	N	N	Y
Holmgren's skullcap (*Scutellaria holmgreniorum*)	2.69	0.01	N	Y	Y	Y

Segment/Resource	Habitat Loss (acres)[1]		Overland Travel (acres)[2]	Increased Access	Erosion and Sedimentation	Non-Native Plant Introduction
	Temporary	Permanent				
Segment L						
Low sagebrush scrub	17.72	0.04	4.40	Y	Y	Y
Volcanic vertisols	3.77	0.01	N	Y	Y	Y
Disturbed/cultivated	2.90	0.01	N	N	Y	N
Greasewood scrub	1.81	0.01	N	Y	Y	Y
Mud Flat	3.04	0.01	0.78	N	Y	Y
Montane meadow	0.15	N	N	Y	Y	Y
White Ash deposits	0.41	N	N	N	Y	Y
Juniper woodland	8.01	0.01	N	Y	Y	Y
Big sagebrush scrub	22.80	0.06	0.69	N	N	Y
Holmgren's skullcap (*Scutellaria holmgreniorum*)	0.48	N	N	Y	Y	Y
Pine Creek evening primrose (*Camissonia boothii* var. *alyssoides*)	0.23	N	0.78	N	N	Y
Spiny milkwort (*Polygala subspinosa*)	3.55	0.01	N	N	N	Y
Segment N						
Chenopod scrub	0.82	N	0.74	Y	Y	Y
Big sagebrush scrub	2.22	0.01	1.65	Y	Y	Y
Disturbed/cultivated	2.23	0.01	1.22	N	Y	N
Low sagebrush scrub	1.23	N	N	Y	Y	Y
Segment O						
Sand dune	2.05	0.01	1.87	Y	Y	Y
Alkali meadow	N	N	0.01	Y	Y	Y
Big sagebrush scrub	1.64	0.01	1.61	Y	Y	Y
Disturbed/Cultivated	4.44	0.01	2.13	N	Y	Y
Greasewood scrub	21.69	0.06	10.97	Y	Y	Y
Greasewood scrub/playa	3.45	0.01	0.41	Y	Y	Y
Segment Q						
Sand dune	4.68	0.01	4.38	Y	Y	Y
Big sagebrush scrub	34.25	0.07	7.72	Y	Y	Y
Disturbed/cultivated	0.41	N	0.33	N	Y	N
Greasewood scrub	2.63	0.01	2.86	Y	Y	Y
Greasewood scrub/playa	1.23	N	1.38	Y	Y	Y
Rabbitbrush scrub	0.82	N	0.64	Y	Y	Y
Juniper woodland	13.47	0.12	0.17	Y	Y	Y
Nelson's evening primrose (*Camissonia minor*)	0.23	N	0.42	Y	Y	Y
Lance-leaved scurf-pea (*Psoralidium lanceolatum*)	0.11	N	0.43	Y	Y	Y
Segment R						
Big sagebrush scrub	2.63	N	N	N	Y	Y
Juniper woodland	0.93	N	N	Y	Y	Y
Segment T						
Juniper woodland	1.57	N	1.60	Y	Y	Y
Big sagebrush scrub	3.41	0.01	2.54	Y	Y	Y
Disturbed/cultivated	8.00	0.02	1.43	N	Y	N
Segment W						
Juniper woodland	10.79	0.02	N	Y	Y	Y
Altered andesite	1.82	N	N	Y	Y	Y
Big sagebrush scrub	2.46	0.01	2.35	Y	Y	Y
Disturbed/cultivated	11.34	0.03	10.78	Y	Y	Y
Low sagebrush scrub	3.04	0.01	2.76	Y	Y	Y
Rabbitbrush scrub	0.99	N	0.78	Y	Y	Y
Sagebrush/bitterbrush	0.82	N	0.57	Y	Y	Y
Montane meadow	0.41	N	0.64	N	Y	Y

Segment/Resource	Habitat Loss (acres)[1]		Overland Travel (acres)[2]	Increased Access	Erosion and Sedimentation	Non-Native Plant Introduction
	Temporary	Permanent				
Segment X						
Montane meadow	0.01	N	N	N	Y	Y
Low sagebrush scrub	10.32	0.02	1.79	Y	Y	Y
Disturbed/cultivated	5.59	0.01	3.21	Y	Y	Y
Riparian scrub	0.02	N	N	N	Y	Y
Yellow-pine forest	0.79	N	N	Y	Y	Y
Big sagebrush scrub	13.48	0.03	5.36	N	N	Y
Altered andesite	0.13	N	N	Y	Y	Y
Segment Y						
Big sagebrush scrub	7.89	0.01	0.42	Y	Y	Y
Altered andesite	0.07	N	N	Y	Y	Y
Alturas Substation						
Juniper woodland	7.50	10.50	N	N	Y	Y
Border Town Substation and Staging areas						
Low sagebrush scrub	8.80	11.80	N	N	Y	Y
Border Town Staging Area (Other addressed in Tuscarora EIR/S)	NA[3]	8.00	NA[3]	N	Y	Y
TOTAL AREA	430.30	33.4	113.22	–	–	–

[1] = Habitat loss would be caused by blading, and construction of substations, structure landings, crane landings, wire setup areas and access roads.
[2] = Overland travel during construction.
[3] = Five of the seven proposed staging areas would be constructed and utilized by Tuscarora Gas Pipeline prior to use by Sierra Pacific Power Company (SPPCo). Surface removal and disturbance impacts will be addressed in the assessment of Tuscarora's biological resource impacts. The Proposed Project will increase the duration of the potential impacts beyond the completion of the Tuscarora Gas Pipeline project.
Y= Yes. N = None or negligible.

by temporary or permanent habitat loss cannot also be affected by overland travel. Second, it was assumed that temporary habitat loss would consist of areas that have been cleared or bladed to facilitate construction but possess potential for restoration. Examples of impacts assumed to cause temporary habitat loss include bladed construction access and foot work areas at structure locations[2]. Permanent habitat loss was assumed to consist of areas to be occupied by permanent project facilities such as substations, structure foundations, communication facilities, and permanent access routes inside the corridor. Structure setup areas would occupy approximately 18,000 square feet and structure foundations would occupy approximately 56 square feet per structure. Wire setup areas would be required every 9,000 feet and would occupy approximately 0.17 acre each. Overland travel impacts would consist of off-road travel in areas that do not require blading.

Temporary habitat loss is assumed for all areas where juniper woodlands and yellow pine forest occur because of the associated rocky terrain and the need to remove trees and stumps to facilitate construction access. Impacts on juniper woodland and yellow pine forest are described in more detail in the discussion of temporary habitat loss.

[2] Sidehill structure locations will require habitat removal to construct a 50 x 100 foot landing used by the crane. These sites will be recontoured and revegetated after construction (see Project Description, Section B.2.3).

Surface disturbance is considered a temporary impact and is related to activities such as non-bladed overland travel.

Impacts associated with increased access, erosion and sedimentation, and introduction of non-native plants are summarized in Table C.3-10. The criteria used to assess whether these impacts would affect plant communities, special status species, and wetlands were as follows:

- Existing access to the project area (increased access/non-native plants)
- Topography (erosion and sedimentation)
- Estimated erosion potential of soils (erosion and sedimentation)
- Existing presence/absence of non-native species (non-native plants)
- Estimated susceptibility to competition from non-native plants (non-native plants).

Based on these criteria, plant communities, special status species, and wetlands were determined to be more or less susceptible to access, erosion and sedimentation, or introduction of non-native plants.

Not all of the vegetation resources (e.g., plant communities or special status species) identified in the baseline section are addressed in the impacts section. Those resources that are not addressed in the impacts section will be avoided entirely by selection of the proposed locations of the project centerline, overland travel routes, and ancillary facilities such as substations and temporary staging areas. The Applicant has attempted to reduce potential impacts by selecting centerlines and angle points within the 660-foot study corridor that avoid many sensitive vegetation resources. All resources that would be affected by the Proposed Project, as defined in the Project Description, are addressed in this section.

The following impact assessments sometimes specify whether impacts are temporary, or permanent. For the purposes of this section and the wildlife habitat section that follows, the duration of impacts will be defined as follows:

- Temporary impacts, after mitigation, will meet final success criteria within 1-50 years (period for successful restoration for most plant species)
- Permanent impacts are those which would last longer than 50 years.

Offsite Compensation. In many cases, successful restoration can be achieved within 3-5 years depending on the specific vegetation resource; however, it is anticipated that some lasting or residual impacts will persist for much longer. Temporary impacts may include overland travel impacts to herbaceous plant communities. Temporary loss of resource function and value due to the lag time of restoration and recovery and/or permanent loss of resources will be mitigated by offsite compensation. The area of offsite compensation will be determined by use of a combination of the following factors:

- Acres of impact
- Period of impact
- Habitat yield ratio
- Period of compensation.

Habitat yield ratio represents the approximate amount of increased value that can be gained from the compensation habitat relative to the existing value of the affected habitat. If the habitat used as compensation has a high potential for increased value, the ratio will be close to one. If the existing value of the compensation habitat is already high, the ratio will need to be greater.

Period of compensation is used to assess the number of acres required as compensation for temporary loss of habitat. The period of compensation represents the number of years that offsite compensation will be used to mitigate temporary habitat losses. This number is inversely proportional to the area of compensation; the longer the compensation is provided, the smaller the area of compensation required.

An example of how these factors might be used to calculate the area of compensation is the formula provided by CDFG: Ac = (Ai x Pi x Y)/Tc, where Ac is acres of compensation, Ai is acres of impact, Pi is period of impact, Y is habitat yield ratio, and Tc is the period of compensation. Period of compensation would be determined with the appropriate resource agencies.

Permanent loss of resource function and value due to surface removal at substation sites will be mitigated by offsite compensation. The area of offsite compensation will be determined by use of the following factors:

- Area of impact
- Habitat yield ratio.

An example of how these factors might be used to calculate the area of compensation is the formula Ac = Ai x Y, where Ac is acres of compensation, Ai is acres of impact, and Y is habitat yield ratio.

The areas of offsite compensation required for temporary and permanent loss of plant communities, special status plants, and wildlife habitat are identified in Sections C.3.2.2.2 (Vegetation) and C.3.2.2.3 (Wildlife). In order to implement offsite compensation, several procedures for acquisition and maintenance of acquired lands should be followed.

All lands acquired to mitigate for impacts on California-listed species or other species managed by the State of California (e.g., mule deer/pronghorn antelope or impacts to state managed lands, such as Doyle and Hallelujah Junction Wildlife Areas) shall be subject to approval of the CDFG. These lands shall be deeded to the CDFG or to an organization approved by the CDFG. For lands to go to the CDFG, the Applicant shall cover all costs of acquisition, including transfer costs (title insurance, review by required state authorities, survey costs, etc.). In addition, the Applicant shall complete all initial enhancement measures (e.g., fencing, trash removal, access control structures, etc.) deemed necessary by the CDFG. The Applicant shall also provide an endowment fee (per acre) to the CDFG (or other approved land management organization) which shall be placed in an interest bearing account; the interest from this endowment shall be used for future maintenance and management, and payment of appropriate local taxes.

Mitigation for enhancement of lands managed by federal agencies shall be provided as one cash lump sum to be used for enhancement projects such as planting or rejuvenating winter browse species, water source development and/or protection, cattle control structures, or other projects deemed appropriate by the administering federal agencies, or for acquisition costs, taxes, etc., as described previously.

All impacts discussed in the following section are designated as "significant" or "not significant." However, the sensitivity of the adversely affected resources varies. Impacts on some natural plant communities are considered significant because of the potential for indirect problems such as introduction of non-native species, or subsequent erosion and sedimentation, while other impacts are significant because of the inherent value or sensitivity of the resource. For example, impacts to a CNPS List 1B plant species would be considered significant because the species is rare and endangered. In contrast, impacts on low sagebrush scrub would be considered significant because of the potential for inadequate natural recovery.

Mitigation measures have not been proposed for Class III, adverse, but not significant, impacts for the following reasons: (1) these impacts would be mitigated indirectly by association with plant communities that would be mitigated, (2) impacts are associated with wildlife habitat proposed for mitigation, and (3) avoidance of sensitive species to the extent possible are included as part of the project description.

Wildlife

Impacts on wildlife resources as a result of Proposed Project construction, maintenance, or operations, have been divided into the following seven categories:

- Wildlife habitat removal
- Wildlife habitat disturbance
- Direct mortality and direct disturbance of wildlife
- Indirect impacts from human presence and access
- Bird electrocution
- Bird collision
- Increased predation.

The seven impact categories are described below. Project-related disturbances described in each category are meant to include all activities that might occur during the life of the project, including scheduled maintenance activities. Detailed descriptions of what is meant by overland travel and other activities discussed below are presented in the Project Description (Part B).

Wildlife Habitat Removal. Wildlife habitat removal includes activities such as: (1) grading and blading, (2) tree removal, and (3) tree trimming or scraping road surfaces such that subsurface disturbance occurs. Each of these activities could effectively remove existing habitat, thereby reducing the amount of habitat available to local wildlife populations. Habitat removal would occur primarily during project construction when vehicles require access to structure or substation locations. In some areas, access would require construction of new roads or upgrade of existing roads, including road widening. Blading of previously undisturbed surfaces may also occur to access structure locations. Blading would remove rocks, large shrubs, and other objects from the soil surface, leaving a relatively clear pathway for construction vehicles. Tree trimming would remove branches within the 492-foot ROW to provide clearance for the transmission lines. In some cases entire trees would be removed. Tree trimming would be conducted every 10 years to account for regrowth. In addition, habitat would be removed at many structure locations, at substation locations, and at construction staging areas. Staging areas may not be graded in all cases, however, it is anticipated that these areas could be substantially damaged by vehicle parking and materials storage activities during construction. Specific wildlife habitats which would be impacted are discussed in Section C.3.2.2.3.

Wildlife Habitat Disturbance. This category includes activities during construction or operation that would affect the local wildlife habitat but would not involve subsurface soil disturbance, blading, or clearing of vegetation. The primary form of habitat disturbance would be the use of heavy equipment during stringing of the line, and use of off-road vehicles within the 160-foot ROW (see Project Description). Off-road overland travel would not involve grading or road improvements. Overland travel during construction and maintenance of the Proposed Project would result in some crushed vegetation and potential loss of individual animals such as small mammals or reptiles whose burrows would be compacted.

Direct Mortality and Direct Disturbance to Wildlife. Direct loss of small mammals, reptiles, and other less mobile species would result primarily from the use of construction vehicles. Direct mortality associated with increased human activity is also anticipated, including animal-vehicle collision and illegal take (poaching). In addition, temporary direct disturbance to wildlife would occur during project construction.

Indirect Impacts on Wildlife from Increased Human Presence and Access. Indirect impacts resulting from human disturbance during project construction, maintenance, or the reclamation process (due to heavy vehicle operation, blasting, or helicopter flights, etc.) would cause displacement of some wildlife to other habitats which may or may not be able to support additional animals. Impacts as a result of increased human disturbance may also include reduced reproductive success in local wildlife populations, including songbirds, small mammals, reptiles, and special status species.

For example, greater sandhill cranes are very susceptible to disturbance during the breeding season (approximately early April through late July, with fledging in August). These birds are listed by the State of California as Threatened. If displaced by human disturbance from their breeding territory to an adjacent nest territory, they are known to lose their young in territorial disputes. Such animal mortality is not always significant; however, it is with sandhill cranes because they are a threatened, monogamous, and slow-breeding species with low reproductive success. Another species of concern which may be displaced if the Proposed Project is constructed is the sage grouse. Recent unpublished information obtained by CDFG biologists indicates that grouse will abandon habitat within 0.5 mile of either side of a transmission line center line (Braun, 1995, unpubl.). This information is based upon research conducted in the Gunnison Basin of Colorado and suggests that the presence of potential raptor perches in the form of transmission line structures causes displacement of grouse from suitable habitats.

Burrows could also be disturbed and nests could be abandoned as a result of increased human disturbance. In addition, although road improvements and new roads built during the construction of the Proposed Project would be limited, the provision of some additional access to formerly remote areas would have impacts on wildlife populations for the life of the project, allowing for additional human disturbances created by the public seeking recreation opportunities.

Bird Electrocution. Raptors are most susceptible to electrocution because of their size, distribution, and behavior (Olendorff et al., 1981). They often perch on tall structures which offer them optimal views of prey. Bird electrocutions occur when the wingspan of the bird is greater than the spacing between any two conductors on a power pole or when a bird bridges the gap between a conductor and a ground wire. Bird electrocutions are, therefore, generally a problem associated with low voltage powerlines less than 69 kV (on which conductors are closer together). High voltage transmission lines, such as the Proposed Project, are typically constructed with a greater distance between conductors; thus, there is less risk of bird electrocutions. The spacing of conductors on transmission line structures is almost always greater than the largest North American bird, except perhaps for the California Condor.

The Proposed Alturas 345 kV transmission line will consist primarily of H-frame steel structures with conductors spaced about 20-25 feet apart. In addition, it will feature two overhead static wires located at least 25 feet from the nearest conductor and 20-25 feet from each other. Because of the extensive distance between conductors and the overhead ground wires there is very little potential for bird electrocutions on the structures proposed for this project.

New or expanded substations proposed at Alturas, Border Town, and Reno may, depending on their design, pose electrocution hazards for some birds. Different species of birds are attracted to substations depending on the surrounding habitat. The wires, buswork and support structures provide excellent roosting, perching and nesting sites. Heat generated by transformers provides warmth that may attract birds in winter. Species found at other substations in this project area include ravens, crows, starlings, owls, hawks, gulls, magpies and pigeons. These birds can be electrocuted when making conductor-to-conductor contact or conductor-to-ground contact with uninsulated equipment; the problem can be exacerbated during wet weather. The close proximities of all the alternative substation sites proposed (Alturas, Border Town, and North Valley Road) to open wild areas provide opportunities for bird electrocution problems. The Alturas Substation will consist primarily of 230 kV and 345 kV components which provide sufficient clearance to minimize bird electrocutions.

Problems usually occur on voltage transformer tertiaries where clearances can be spanned by birds. The Applicant is now specifying wider clearances on tertiary bushings and prescribing wildlife boots on transformer bushings to reduce animal electrocution problems. The substations proposed at the southern end of the project route may be particularly attractive to birds such as crows and ravens since there is a general lack of tall trees in these areas. However, the Applicant has indicated that few bird problems have been reported from existing substations in this area (Siegel, 1994).

Bird Collisions. Please note that the discussion below is buttressed by the literature review and analysis presented in Appendices E.1 and E.2.

Most bird collisions with powerlines occur under two common conditions: (1) when a powerline or other aerial structure transects a daily flight path used by a concentration of birds, and (2) when migrants are traveling at reduced altitudes and encounter tall structures in their path (Brown, et al., 1993). Collision rates generally increase in low light conditions, during inclement weather, such as rain or snow, during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger. Collisions are more probable along wetlands, valleys that are bisected by powerlines, and within narrow passes where powerlines run perpendicular to flight paths.

Most documented collisions have occurred with upper shield wires, not with the larger diameter conductors. This wire is apparently unseen as the bird flares up to avoid collision with the large conductor wires located beneath the shield wires. Meyer and Lee (1981) reported over 80 percent of the collisions they observed were with overhead shield wires. Over 82 percent of the collisions that James and Haak (1979) observed were with upper shield wires. Several investigators advocate the removal of the shield wire in areas of high waterfowl use (Beaulaurier, 1981; Hugie et al., 1989; Meyer 1978). It should be noted that the shield wire is essential for protecting the system from electrical damage caused by lightning. It often cannot be removed because of the need for system reliability.

The proximity of transmission lines to waterfowl concentration areas can increase the risk for bird collisions. Faanes (1983) reports 90 percent of all waterfowl/powerline mortalities of waterfowl occurred at wetland sites supporting large concentrations of waterfowl. In studies conducted in the northern Great Plains, powerlines located within 400 meters of water had higher associated mortality than when powerlines were more than 400 meters from water. Malcolm (1982) also reports bird mortalities were greater when powerlines were located next to a water body or passing directly over a wetland.

The following is a brief summary of research conducted to date that describes the likelihood of susceptible bird groups found in the Proposed Project area to be significantly impacted by collisions with powerlines. It is recognized that inference from studies of various projects must be used with caution to predict future impacts from other similar projects. The purpose of the discussion that follows is an attempt to put into perspective the knowledge gained from more than 20 years of research into bird collisions.

Waterfowl and Shorebird Collisions. Waterfowl populations along the proposed Alturas transmission line route, and alternative route segments, vary by habitat and season. The largest concentrations of waterfowl and shorebirds in the project area (which is within the Pacific Flyway) are found at the Modoc National Wildlife Refuge (NWR) near Alturas, around Honey Lake, and the Biscar State Wildlife Area in western Secret Valley. The rice fields and alfalfa grown in areas below Alturas and in the Madeline Plains also attract many waterfowl and shorebirds. Waterfowl and shorebirds are also found at the many lakes, stock ponds, reservoirs, and wetlands in valleys that stretch from Alturas south, through the Madeline Plains, and on to Long Valley below Honey Lake. Large concentrations of waterfowl and shorebirds pass through this area, particularly during migration in the spring and fall. The Tundra swan, American white pelican, the greater sandhill crane, and several species of geese winter and migrate through the area. These large, heavy birds with flocking behavior and poor maneuverability are generally susceptible to powerline collisions.

Special status species of waterfowl and shorebirds that are found in the Proposed Project area include the greater sandhill crane, long-billed curlew, black tern, western snowy plover, western least bittern, white-faced ibis, California gull, double crested cormorant, Barrow's goldeneye, and American white pelican. All of these species have been experiencing population declines as a result of one or more factors relating to habitat disturbance or loss (such as vegetation conversions), pesticide residues, shooting, grazing, and vehicle encroachment. All of the above-mentioned species occur as migrants or summer residents at the Modoc NWR. Many of these species are also found in the Madeline Plains and in the Honey Lake Basin. The white-faced ibis, and the western least bittern may breed at Honey Lake. Tundra swans and white pelicans use White Lake, east of U.S. 395 near Border Town, during years of good rainfall (Herron, 1994). About 500 to 700 pairs of California gulls breed at Honey Lake.

Many of these species were historically more numerous in other parts of California. Therefore, it is important to maintain their presence in the Great Basin to offset the heavy losses that have occurred at wetlands in the Central Valley and along the California coast.

Susceptibility of individual species to collisions with powerlines is not well documented. According to most of the current literature (see Appendix E.2 for a literature review), waterfowl generally fly 10 feet or more above the elevated groundwire on transmission line systems, although some do collide with transmission lines. Literature values for waterfowl/shore bird collision rates with transmission lines range from .003 percent to 0.51 percent (i.e., the ratio of collisions to flyovers). The approach many of these waterfowl studies took was to look at areas where high bird concentrations exist and see if they could determine "worst case" mortality rates. Many of these previous bird mortality studies document powerlines located in or adjacent to wetlands, water bodies, and other high bird concentration areas.

The transmission systems, habitat conditions, weather, investigators, data collection methodologies, and other variables reported from the literature varied considerably, but the data suggest that the frequencies of waterfowl and shorebird collisions with transmission lines are relatively small. Although reported collision fatality rates are small, even these small reductions to local populations of sensitive species are considered significant for the Proposed Project.

Sage Grouse Collisions. There is no data available to suggest that sage grouse may collide with transmission lines. Sage grouse seem to prefer walking to reach suitable habitat (Braun, 1995 unpubl.). However, as an avian species, sage grouse may be susceptible to powerline collisions. Portions of Segments C E, N, and the Proposed and Alternative Segments in the Madeline Plans region support sage grouse. However, as there is no information or documentation regarding the potential for grouse to collide with transmission lines, it is not possible to reasonably estimate the potential for this to occur.

Raptor Collisions. Raptors are generally not prone to collisions with powerlines. Olendorff et al. (1986) states why raptors are not predisposed to powerline collisions:

- Raptors have keen eyesight
- Many raptors soar or use relatively slow flapping flight
- Raptors are generally maneuverable in flight
- Raptors learn to use utility poles and structures as hunting perches and nest sites and thereby become conditioned to the presence of lines
- Raptors, unlike waterfowl, do not fly in "V" formations when in groups, with their position and altitude determined by other birds of the flock.

However, when they are actively pursuing prey, engaged in courtship flights, defending territories, or escaping predators, raptors become vulnerable to collisions. Collision mortality rates are generally highest for subadult raptors.

The project area offers much habitat for a variety of raptors. The area is used for nesting, wintering, and as a migration corridor. Threatened/endangered species that occur in the project area are the bald eagle (winter resident), peregrine falcon (year-round resident, but occasionally nests in project area), and Swainson's hawk (summer resident). Special status species found in the Proposed Project area include the golden eagle (year-round resident), ferruginous hawk (winter resident, but occasionally nests in project area), northern harrier (year-round resident), long-eared owl (year-round resident), short-eared owl (year-round resident), and prairie falcon (year-round resident).

The Proposed Project would have minimal effect on the population levels of special status raptor species. (Appendix E describes specific analyses, species by species, of the potential for raptor collisions.) However, two raptor species that occur within the project area, the bald eagle and peregrine falcon, seem most vulnerable to collisions due to their flight patterns and flight behavior.

Increased Predation. The Proposed Project would introduce structures to areas which are currently open, treeless habitats. As a result, wildlife species such as raptors and ravens in the vicinity of the Proposed Project would be given a competitive advantage. The addition of tall structures that can be used as perches during hunting would benefit some raptor populations by providing a secure vantage point from which to survey large areas of habitat. In addition, habitats which raptors had previously used only occasionally would become routine hunting areas due to the increase in available perches. Ravens, which may prey on eggs of waterfowl, cranes, and other species, might also use the structures as perches or nesting locations.

C.3.2.2.2 *Specific Environmental Impacts and Mitigation Measures—Vegetation*

Additional information pertaining to special status plant species impacts is presented in Appendix E.1, including:

- Species background and ecology
- Known distribution
- Presence and population of species within the impact area of the Proposed Project

- Potential direct and indirect impacts on the species and its habitat by the Proposed Project.

Specific directions for the implementation and monitoring of the proposed mitigation measures for significant impacts to plant communities, special status plants, and jurisdictional wetlands are provided in Section C.3.5 and will be contained in the Community and Habitat Restoration Plan, as described in Part F and specified in Appendix E.3.

Temporary and Permanent Habitat Loss

The Proposed Project will result in permanent and temporary removal of habitat. Temporary habitat removal would be short-term impacts during construction. Permanent habitat removal would consist of long-term impacts associated with permanent project facilities that will remain throughout the life of the project. Examples of these impacts are:

- Construction/upgrade of access roads or blading within the 660-foot study corridor for overland travel routes where required because of topography, rocks, vegetation, etc. (temporary)
- Construction of landings for transmission line structures (temporary)
- Substation construction (permanent)
- Grading for the staging area at Border Town (temporary)
- Construction/upgrade of new access roads outside of the 660-foot-wide study corridor (temporary)
- Structure foundations (permanent)
- Construction of permanent access routes within the 660-foot study corridor (permanent).

Each of these activities would cause the removal of existing vegetation and substantial disturbance of the surface soil layers. Specific impacts and mitigation measures are described below.

Impact 1: Temporary and Permanent Loss of Plant Communities

Juniper Woodland. Approximately 94 acres of western juniper woodland would be temporarily removed on Segments A, C, E, K, L, Q, R, T, W, and the Alturas Substation (Devils Garden site). Permanent loss of western juniper woodland would be approximately 17 acres. Juniper trees will not be uniformly removed in the areas of temporary and permanent habitat loss. Based upon the growth rate of juniper trees, a ten year growth envelope has been estimated and is shown graphically in Figures B.2-15a, B.2-15b, and B.2-15c. Juniper trees that are small enough so that they could not effect the powerline operation (as determined by the growth envelope) will be left in place. A percentage of the existing western juniper (122 per acre existing) (Keeler-Wolf, 1990; Vasek and Thorne, 1977) would therefore remain. Juniper woodland is widespread on the Modoc Plateau relative to the small area of the potential impact. The proposed clearing of juniper woodland is considered a **Class III** impact that is adverse but not significant . No specific mitigation is proposed for impacts to juniper woodland.

Yellow Pine Forest. Temporary loss of yellow pine forest would be approximately 10 acres. Permanent loss would be approximately 0.02 acre. Yellow pine forest is widespread north and west of Segment C on the Modoc Plateau. However, natural regeneration of this plant community is expected to be slow following surface removal and it may be adversely affected by the establishment of non-native weeds.

The proposed clearing of yellow pine forest is considered a **Class II** impact that is significant but mitigable through restoration as described in Mitigation Measure B-1.

Low Sagebrush Scrub. Temporary loss of low sagebrush scrub would be approximately 79 acres. Permanent loss would be approximately 10 acres. Temporary loss would be associated with blading for construction access structure setup, and wire setup on Segments A, C,, L, N, W, and X. Permanent loss would occur due to construction of the Border Town Substation. Low sagebrush scrub is confined to areas with thinner, more rocky soil than is associated with other sagebrush scrub communities. Most areas of low sagebrush scrub are dominated by native shrubs and herbaceous plants whose potential for natural regeneration following surface removal is expected to be low. The proposed clearing of low sagebrush scrub is considered a **Class II** impact that is significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Montane Meadow Wetlands. Temporary loss of montane meadow wetlands would be approximately 2 acres. Permanent loss of montane meadow wetlands would be approximately 0.02 acre for the Proposed Project. Most of the temporary loss (0.41 acre) of this plant community would result from impacts to the montane meadow habitats immediately north of the Pit River on Segment A. The remaining impacts would occur on Segments C, E, and L near the southern terminus of Segment W, and the northern portion of Segment X. Several areas of montane meadow wetlands on Segment L will be avoided by locating the overland travel routes and structure sites outside of these wetland plant communities. Montane meadow wetlands are potentially subject to the jurisdiction of the USACE and protected by Section 404 of the Federal Clean Water Act. Potential project impacts on this plant community may also require a Streambed Alteration Agreement with CDFG. Therefore, the proposed removal of montane meadow wetland vegetation is considered a **Class II** impact that is significant but mitigable by restoration as described in Mitigation Measure B-1.

Volcanic Vertisol. Temporary loss of volcanic vertisol plant communities will be approximately 9 acres. Permanent loss of volcanic vertisol plant communities will be 0.02 acre. Impacts to this plant community are spread almost equally between Segment K and Segment L. Temporary losses of this community type would be due primarily to blading for construction access, wire setup, and structure setup. Volcanic vertisols support a unique association of plants. The distribution of Holmgren's skullcap (*Scutellaria holmgreniorum*), a CNPS List 1B species proposed for List 4, is confined to this soil type. Therefore, the proposed clearing of volcanic vertisol plant communities is considered a **Class II** impact that is significant but mitigable by restoration as described in Mitigation Measures B-1 and B-2, below.

Altered Andesite. Temporary loss of altered andesite plant communities will be approximately 2 acres. One location each on Segments W, X, and Y would be affected. Altered andesite plant communities are found in the area east of Peavine Peak, the Virginia Range and the Pah-Rah Range, in the vicinity of Reno, Nevada. The soils derived from the altered andesites are extremely acidic and poor in some essential nutrients. Due to these physical constraints, these areas support unusual associations of rare and uncommon plants. The distribution of altered andesite buckwheat (*Eriogonum robustum*) is confined only to this soil type. Therefore, the proposed impacts to altered andesite plant communities is considered a **Class II** impact that is significant but mitigable by restoration as described in Mitigation Measures B-1.

Sagebrush/Bitterbrush Scrub. Temporary loss of sagebrush/bitterbrush plant communities will be approximately 1 acre. No permanent losses of this plant community will occur. Impacts would be on Segment W. This plant community is co-dominated by big sagebrush (*Artemisia tridentata*) and bitterbrush (*Purshia tridentata*). The sagebrush/bitterbrush community is most common in the Basin and Range portion of the project area south of the Honey Lake Valley. No special status plants are associated with this plant community, however, bitterbrush is an important forage species for deer and antelope. Clearing of sagebrush/bitterbrush communities is considered a **Class II** impact that is significant, but mitigable by restoration as described in Mitigation Measure B-1.

Big Sagebrush Scrub. Temporary loss of big sagebrush scrub will be approximately 119.78 acres. Permanent losses of this plant community will be approximately 0.63 acre. Impacts to big sagebrush scrub would occur on Segments A, C, E, K, L, N, O, Q, R, T, W X, and Y. This plant community is dominated by big sagebrush (*Artemisia tridentata*). Big sagebrush scrub is widespread throughout the project area and its vicinity. Typically this plant community is found in large stands throughout the intermountain regions of eastern California, Nevada, Idaho, Wyoming, and Utah. Big sagebrush scrub occurs on a wide variety of slopes, aspects, and topographic positions where there are well-drained soils. Other associated plant species include non-native species such as cheat grass (*Bromus tectorum*) and tumble mustard (*Sisymbrium altissimum*), as well other native herbs including blepharipappus (*Blepharipappus scaber*) and bottle-brush squirreltail (*Elymus elymoides*). No special status plants are associated with this plant community and the area that will be impacted is small relative to the distribution of this plant community. Clearing of big sagebrush scrub is considered a **Class III** impact that is adverse but not significant-1. No specific mitigation measures are proposed for impacts to big sagebrush scrub.

Disturbed/Cultivated. Temporary loss of disturbed/cultivated plant communities will be approximately 47 acres. Permanent loss of this plant community will be approximately 2 acres. This plant community will be impacted on Segments A, C, E, L, N, O, Q, T, W, and X. Disturbed/cultivated plant communities are distributed throughout the project vicinity and the region where land has converted to agriculture, cleared, burned, or in some way managed to severely reduce the dominance of native plant species. In some of the areas dominated by this plant community non-native grasses have been introduced following wildfires and these species now dominate. Temporary and permanent impacts to this plant community are considered **Class III** impacts that are adverse but not significant. No specific mitigation measures are proposed for impacts to disturbed/cultivated plant communities.

Greasewood Scrub. Temporary loss of greasewood scrub plant communities will be approximately 26 acres. Permanent loss of this plant community will be approximately 0.07 acre. This plant community will be impacted on Segments L, O, and Q in Secret Valley and the Honey Lake Valley. Greasewood scrub is typically located in poorly drained areas with fine-textured, alkali soils. This community type is not widely distributed in the region or in California. Natural recovery of this plant community would be slow and complete recovery without intervention is uncertain. Therefore, temporary and permanent impacts to this plant community are considered **Class II** impacts that are significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Greasewood Scrub/Playa. Temporary loss of greasewood scrub/playa plant communities will be approximately 5 acres. Permanent loss of this plant community will be 0.01 acre. A playa is generally defined as "... a dry barren area in the lowest part of an undrained desert basin, underlain by clay, silt, or sand..." (Bates and Jackson 1984). Greasewood scrub/playas in the project study area are confined to segments O and Q in the Honey Lake Valley. The playas in the study area are unvegetated but they are embedded in a matrix of small mounds dominated by greasewood scrub. This is not a wetland plant community but the playa portion probably qualifies as a non-wetland jurisdictional water of the US under the Federal Clean Water Act. At least two species of shrimp, a fairy shrimp *(Branchinecta mackini)* and a tadpole shrimp *(Lepidurus lemmoni)*, have been observed in the seasonal playa pools (Belk 1995). Temporary and permanent impacts to this plant community are considered **Class II** impacts that are significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Irrigated Pasture. Temporary loss of irrigated pasture plant communities will be approximately 1 acre. No permanent loss of this plant community is anticipated. Segment E of the proposed transmission line route would traverse irrigated pastures on the Mendibourne Ranch which is located in the northern portion of the Madeline Plains adjacent to Highway 395. The entire area identified as irrigated pasture is routinely flood irrigated as part of the ranch operations (Jones and Stokes Associates, Inc. 1994). Vegetation of the irrigated pasture is dominated by hydrophytic grass species such as meadow foxtail *(Alopecurus pratensis)*, Nevada bluegrass *(Poa nevadensis)*, and California oatgrass *(Danthonia californica)*. Portions of the plant community corresponding to the Pit series soils have been delineated as wetlands since these areas exhibit positive indicators of hydric soils and evidence of natural wetland hydrology. Dry Valley and Ravendale soils were not delineated since these areas would not continue to function as wetlands without human intervention. Due to the level of disturbance and the human modifications to this plant community, temporary and permanent impacts to this plant community are considered **Class III** impacts that are adverse but not significant. No specific mitigation measures are proposed for impacts to irrigated pasture.

Mud Flat. Temporary loss of mud flat plant communities will be approximately 3 acres. Permanent loss of this plant community will be 0.01 acre. A single, large mud flat is traversed by the Proposed Project route at the southern end of Secret Valley on Segment L. This site is identified as "Mud Flat" on maps and differs from the playas of the Honey Lake Valley because it is entirely vegetated by annual plants when it is not flooded. Dominant plant species include common sunflower *(Helianthus annuus)*, tansy leaf suncup *(Camissonia tanacetifolia)*, and willow dock *(Rumex salicifolius)*. Mud Flat does not qualify as a jurisdictional wetland because it lacks hydric soil and is unlikely to meet the criteria for wetland hydrology. It does qualify as a water of the United States because it ponds intermittently and ordinary high-water marks are visible around the margin in the form of wave-cut beach slopes, drift lines, and dramatic changes in vegetation. Due to the uniqueness of the mud flat plant community, the temporary and permanent impacts to this plant community are considered **Class II** impacts that are significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Rabbitbrush Scrub. Temporary loss of rabbitbrush scrub plant communities will be approximately 2 acres. Permanent loss of this plant community will be 0.01 acre. Impacts to this plant community will occur on Segments Q and W. Rabbitbrush scrub occurs on fine-textured soils at the margins of poorly drained areas such as stream floodplains. The plant community is dominated by rabbitbrush species *(Chrysothamnus sp.)*. Temporary and permanent impacts to this plant community are considered **Class II** impacts that are significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Riparian Scrub. Temporary loss of riparian scrub plant communities will be approximately 0.02 acre. No permanent losses of this plant community are anticipated. Impacts to riparian scrub will occur only on Segment X, east of Peavine Mountain. This plant community is dominated by sandbar willow *(Salix exigua)*, shining willow *(Salix lucida ssp. lasiandra)* and nettles *(Urtica dioica)*. Due to the restricted distribution of this plant community in the project vicinity and the region, temporary losses of this plant community are considered **Class II** impacts that are significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Silver Sagebrush Scrub (non-wetland). Temporary loss of silver sagebrush scrub plant communities will be approximately 10 acres. Permanent loss of this plant community will be approximately 0.03 acre. This plant community will be impacted on Segments E and K in the Madeline Plains. Silver sagebrush scrub occurs on fine-textured soils along the margins of closed basins in the Madeline Plains. This plant community is associated with a CNPS List 2 plant species, purple loco *(Astragalus agrestis)*, and a CNPS List 4 species, Raven's lomatium *(Lomatium ravenii)*. Silver sagebrush scrub is an uncommon plant community in the project vicinity but is locally abundant on the Madeline Plains. Due to magnitude of the potential impacts and the limited distribution of this community type in the project vicinity, temporary and permanent impacts to this plant community are considered **Class II** impacts that are significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Silver Sagebrush Basins (wetlands). Temporary loss of silver sagebrush basin wetland plant communities will be approximately 5 acres. Permanent loss of this plant community will be approximately 0.02 acre. This plant community will be impacted on Segments E and K in the Madeline Plains. Silver sagebrush scrub includes jurisdictional and non-jurisdictional areas. Portions of this plant community that readily flood coincide with the low-lying, gently sloped basins. Characteristic plant species of the silver sagebrush basin wetlands are silver sagebrush *(Artemisia cana ssp. bolanderi)*, fine branch popcorn flower *(Plagiobothrys leptocladus)*, least navarretia *(Navarretia minima)*, Great Basin navarretia *(Navarretia propinqua)*, dense flowered knotweed *(Polygonum confertiflorum)*, and willow dock *(Rumex salicifolius)*. Temporary and permanent impacts to this plant community are considered **Class II** impacts that are significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1 because of the wetland status of the silver sagebrush basin plant community and its limited distribution in the project vicinity.

White Ash Deposits. Temporary loss of white ash deposits plant communities will be approximately - 0.41 acre. No permanent loss of this plant community is anticipated. This plant community will be impacted by a single structure location on Segment L. White ash deposits support a unique association of plants that includes the special status green prince's plume *(Stanleya viridiflora)*. White ash deposits occur sporadically at the margins of Secret Valley but nowhere else in the project study area. Due to its uniqueness and limited distribution, temporary and permanent impacts to this plant community are considered **Class II** impacts that are significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Alturas Volcanic Gravels. Temporary loss of Alturas volcanic gravels plant communities will be approximately 6 acres. Permanent loss of this plant community will be approximately 3 acres. . Impacts to this plant community will be caused during structure setup on Segments A C and construction of new access roads on Segment C. This plant community is closely associated with several special status plant species. Temporary impacts on this plant community are considered **Class II** impacts that are significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Stabilized/Partially Stabilized Dunes. Temporary loss of dune plant communities will be approximately 7 acres. Permanent loss of this plant community will be 0.02 acre. Impacts to stabilized/partially stabilized dunes would occur on Segments O and Q. Temporary and permanent losses will be caused by the placement of approximately 16 structures and one wire setup site in this plant community. This plant community is associated with several special status plant species and is an uncommon community type in the region. Temporary impacts to this plant community are considered **Class II** impacts that are significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Chenopod Scrub. Temporary loss of chenopod scrub will be approximately 1 acre. No permanent loss of this plant community is anticipated. Chenopod scrub occurs only on Segment N. Chenopod plant communities dominated by greasewood are addressed separately as greasewood scrub. No special status plants are associated with this plant community. Temporary loss of this plant community is considered a **Class II** impact that is significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-1.

Mitigation Measures

B-1 The objective of this mitigation measure is to reduce the potential impacts to less-than-significant levels by restoring affected areas and enhancing areas offsite. Permanent and temporary loss of significant natural plant communities shall be mitigated by a combination of avoidance, restoration, and offsite compensation. Avoidance will consist of flagging allowable travel routes and construction areas to minimize impacts to natural plant communities. Unavoidable temporary impacts will be restored. Permanent impacts will be mitigated by off-site compensation. Offsite compensation will also be used to off-set temporary loss of plant community functions during the time period required for restoration. The Applicant shall provide the responsible agenceis with detailed maps identifying sensitive resources and the allowable travel routes and construction areas fo that they shall be able to verify that a resource has been avoided by comparing its pre- and post-construction condition. Avoidance will be considered successful if no net loss or degradation of a resource has occurred.

The following mitigation measure shall be implemented for resources that cannot be avoided. Permanent surface removal at substation sites, permanent overland access routes, new spur access roads, and structure footings shall be mitigated by offsite compensation. The area of offsite compensation for permanent impacts shall be determined using the formula:

$$Ac = Ai \times Y,$$

where Ac is acres of compensation, Ai is acres of impact, and Y is the habitat yield ratio. Compensation for all permanent loss of plant communities, except those incurred due to permanent access routes, shall be calculated using a habitat yield ratio of 3. A habitat yield ratio of 5 shall be used to calculate compensation for permanent overland access corridors because of additional unquantified indirect impacts to adjacent resources. Based on these assumptions, the combined total area of compensation for permanent loss of plant community habitat shall be 48 acres. Table C.3-11 summarizes the offsite compensation by plant community. The final area of offsite compensation shall be approved by BLM, CPUC, CDFG, USFS and USFWS, as appropriate and as described previously at the beginning of the Impact Overview (Section C.3.2.2.1).

Temporary loss of plant communities during construction shall be mitigated by restoration. Due to the low potential for restoration of impacted areas to preconstruction conditions and the long recovery time required, offsite compensation will be used to supplement restoration. Offsite compensation will be based on the magnitude of two impact components: loss of the plant community functions and values from time of impact until it has met the final success criteria, and the residual loss at the completion of restoration. The area of offsite compensation for temporary impacts shall be determined using the formula:

$$Ac = (Ai \times Pi \times Y)/Tc,$$

where Ac is acres of compensation, Ai is acres of impact, Pi is period of impact, Y is the habitat yield ratio, and Tc is the period of compensation. For this project, 50 years is used as the period of compensation, and 3 as the habitat yield ratio. The period of impact for temporary impacts is assumed to be 15 years. The total area of compensation for temporary loss of plant community habitat shall be 151.64 acres. Table C.3-11 summarizes the offsite compensation by plant community. The final area and contribution for offsite compensation shall be approved by BLM, CPUC, CDFG, and/or USFWS as described above.

Table C.3-11 Summary of Significant Vegetation Impacts and Offsite Compensation

Affected Communities and Species	Temp. Loss (A1) (acres)	Perm. Loss (A2) (acres)	OT Impacts (A3) (acres)	Perm. Loss from Access (A4) (acres)	(A1 x Pi xY)/Tc (Pi=15; Y=3; Tc=50)	A2 x Y (Y=3)	(A3 x Pi x Y)/Tc (Pi=15; Y=3; Tc=50)	Perm. Access A4 x Y (Y=5)	Total Comp[a]
Plant Communities									
Altered andesite	2.01	0	0	0	1.81	0	0	0	1.81
Alkali meadow	0	0	0.01	0	0	0	0.01	0	0.01
Volcanic gravels	6.44	0.28	1.12	2.53	5.8	0.84	1.01	12.65	20.30
Chenopod scrub	0.82	0	0.74	0	0.74	0	0.67	0	1.41
Greasewood scrub	26.13	0.07	13.83	0	23.52	0.21	12.45	0	36.18
Greasewood scrub/playa	4.68	0.01	1.79	0	4.21	0.03	1.61	0	5.85
Low sagebrush scrub	78.99	8.94	10.92	1.43	71.09	26.82	9.83	7.15	114.89
Mud flat	3.04	0.01	0.78	0	2.74	0.03	0.7	0	3.47
Montane meadow	1.6	0.01	1.17	0.01	1.44	0.03	1.05	0.05	2.57
Rabbitbrush scrub	1.81	0.01	1.42	0	1.63	0.03	1.28	0	2.94
Riparian scrub	0.02	0	0	0	0.02	0	0	0	0.02
Sagebrush/bitterbrush scrub	0.82	0	0.57	0	0.74	0	0.51	0	1.25
Partially stabilized sand dunes	6.73	0.02	6.24	0	6.06	0.06	5.62	0	11.74
Silver sagebrush scrub	10.35	0.03	0.47	0	9.32	0.09	0.42	0	9.83
Silver sagebrush basin	5.5	0.02	0.26	0	4.95	0.06	0.23	0	5.24
Volcanic vertisols	9.47	0.02	0	0	8.52	0.06	0	0	8.58
White ash deposits	0.41	0	0	0	0.37	0	0	0	0.37
Yellow pine forest	9.67	0.02	0	0	8.7	0.06	0	0	8.76
Plant Communities Total	168.49	9.44	39.32	3.97	151.66	28.32	35.39	19.85	235.21
Special Status Plant Species:									
Astragalus pulsiferae var. suksdorfii	2.76	0.21	0	0	2.48	0.63	0	0	3.11
Dimeresia howellii	0	0	0.11	0	0	0	0.10	0	0.09
Eriogonum prociduum	0	0	0.14	0	0	0	0.13	0	0.13
Lomatium hendersonii	8.52	0.02	0	0	7.67	0.06	0	0	7.73
Lupinus uncialis	0	0.2	0	0	0	0.6	0	0	0.6
Polygala subspinosa	3.55	0.01	0	0	3.2	0.03	0	0	3.23
Psoralidium lanceolatum	0.11	0	0.43	0	0.1	0	0.39	0	0.49
Special Status Species Total	14.94	0.44	0.68	0	13.45	1.32	0.62	0	15.38

Additional offsite compensation shall be required if the responsible agencies determine that restoration has failed or would not be feasible. The area of offsite compensation shall be directly proportional to the loss or degradation of the affected resource. If the affected resource cannot be fully restored within 15 years (the average estimated "period of impact" for temporary impacts) additional offsite compensation shall be required and the area shall be determined by the responsible agencies using the methods described for permanent impacts.

A Community and Habitat Restoration Plan (as described further in Part F and Appendix E.3) shall be developed by the Applicant and submitted to BLM, CPUC, USFS, USFWS, and CDFG at least 60 days prior to the start of any construction. The plan shall contain plans for seed collection, soil preparation, planting, and monitoring. Quantitative success criteria shall also be presented in the plan. The restoration objective for affected natural plant communities shall be restoration to preconstruction conditions as measured by species cover, species composition, and species diversity. Success criteria shall be established by comparison with reference sites approved by BLM, CPUC, CDFG, USFS, and/or USFWS.

Restoration will be monitored for five years after construction to assess progress and identify problems. At a point five years after construction, if the responsible agencies determine that restoration has not been successful, then the Applicant shall be required to take specific remedial actions deemed necessary by the responsible agencies and described in the restoration plan as contingency measures. if, at any point within the 5-year monitoring period, the lead agencies or designated monitor determine that the restoration measure have been successful, they may discontinue monitoring. Contingency measures shall be implemented if BLM, CPUC, CDFG, USFS, or other appropriate agencies determine that the restoration has not met the established success criteria at the end of the monitoring period. Contingency measures shall consist of additional offsite compensation as determined by BLM, CPUC, CDFG, USFS, or other appropriate agencies.

B-2 The objective of this mitigation measure is to reduce compaction of volcanic vertisol soils which would be detrimental to the associated natural plant community. Permanent and temporary loss of volcanic vertisol plant communities shall be mitigated as stated in Mitigation Measure B-1; however additional construction standards and methods are required for these areas.

All volcanic vertisol plant communities shall be identified prior to construction, and specific construction standards and methods shall be developed and submitted for review to BLM, CPUC, CDFG, and USFWS at least 60 days prior to construction. These construction standards and methods shall be implemented for all volcanic vertisol soils. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of 6 inches deep and over 100 feet in length, the vertisol soil shall be deemed too wet to adequately support construction equipment.

After construction and prior to restoration, the Applicant shall conduct tests to document the degree of compaction of the vertisols and submit compaction values from a set of at least 20, and not more than 60, randomly determined locations within vertisol soils along the ROW. These values shall be submitted to BLM, CPUC, CDFG, and/or USFWS at least 14 days prior to restoration for a determination by these agencies that remediation of compaction is or is not necessary. Remediation methods may consist of ripping the soil (depth approximately 3 inches). Remediation methods and specifications shall be reviewed and approved by BLM, CPUC, CDFG, and/or USFWS before implementation and may be altered by these agencies to conform to site specific needs.

Impact 2: Temporary and Permanent Loss of Special Status Plant Species and their Habitats

Henderson's lomatium (Lomatium hendersonii). Temporary loss of habitat for Henderson's lomatium would be approximately 9 acres. Permanent loss of this species' habitat will be approximately 0.02 acre. Impacts to this species will be concentrated on the flat lava plateaus of Segment C between Angle Points CØ2 and CØ4. Henderson's lomatium is a CNPS List 2 species that is found in Oregon, Idaho, and Nevada, but has a very limited distribution in California. Therefore, the proposed clearing of habitat for this species is considered a **Class II** that is significant but mitigable by restoration as described in Mitigation Measure B-3, below.

Suksdorf's milkvetch (Astragalus pulsiferae var. suksdorfii). Temporary loss of habitat for Suksdorf's milkvetch will be approximately 3 acres. Permanent loss of this species' habitat will be approximately 0.21 acre. Impacts to this species will be limited to Segment C near Angle Point CØ1. Populations of this species on Segment L will be avoided due to their small size and locations within the project corridor. This species will be impacted by blading for construction access and the construction of H-frame structures. Suksdorf's milkvetch is presently a CNPS List 1B species but is proposed for down-listing to CNPS List 4 (Tibor, 1995). This species is currently known only from northeastern California, a few scattered locations in western Nevada and a disjunct occurrence in Washington. During surveys of the Tuscarora Pipeline route, ten populations were identified that supported approximately 6,500 plants. Sixteen additional populations were identified during surveys for the Alturas Project that may support as many as 6,000 plants. On the basis of the existing information, Suksdorf's milkvetch possesses a greater geographic range than originally believed, however, the magnitude of the potential impacts relative to its distribution in the study area is potentially significant. Therefore, the proposed clearing of habitat for this species is considered a **Class II** impact that is significant but mitigable by restoration as described in Mitigation Measure B-3.

Cusick's Stickseed (Hackelia cusickii). Temporary loss of habitat for Cusick's stickseed will be approximately 2 acres. Permanent loss of this species' habitat will be approximately 0.01 acre. Impacts to this species will be concentrated in the juniper woodland areas of Segment C north and south of Likely Mountain. These impacts will be caused by clearing and blading for construction access in these rocky areas, and construction of H-frame structures. Cusick's stickseed is a CNPS List 4 species that is relatively widespread in the juniper woodland plant communities north of the Madeline Plains. This plant occurs in northeastern California, Nevada, and Oregon. Field surveys identified 16 populations of

Cusick's stickseed in the project study area with an estimated total of nearly 6,000 plants. Based on the size of the populations observed in the project study area and data from other studies of the species in the region (BioSystems, 1994b), it was concluded that Cusick's stickseed does not meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act), or Sections 2062 or 2067 (California Endangered Species Act) of the CDFG Code. Therefore, the proposed clearing of habitat for this species is considered a **Class III** impact, adverse but not significant. No mitigation is proposed for impacts to Cusick's stickseed.

Holmgren's Skullcap (Scutellaria holmgreniorum). Temporary loss of habitat for Holmgren's skullcap will be approximately 3 acres. Permanent loss of this species' habitat will be approximately 0.01 acre. Impacts to this species will occur only on volcanic vertisol areas of Segments K and L. Impacts will be caused by blading for construction access and construction of the transmission line structures. Holmgren's skullcap is a Federal Category 3c species and a CNPS List 3 species that is proposed for CNPS List 4. Volcanic vertisols support a unique association of plants, and potential project impacts to these areas should be mitigated as described in Mitigation Measures B-1 and B-2. Therefore, the proposed clearing of habitat for this species is considered a **Class III** impact that is adverse but not significnat. Although no mitigation isproposed for impacts to this species, mitigation is proposed for impacts to the volcanic vertisols plant community where it occurs.

Spiny Milkwort (Polygala subspinosa). Temporary loss of habitat for spiny milkwort will be approximately 4 acres. Permanent loss of this species' habitat will be approximately 0.01 acre. Impacts to this species will be concentrated at the southern end of Segment L where the rocky terrain will necessitate blading for construction access. This species will also be impacted by structure construction in this area. Plants of this species are widely dispersed in this habitat which may decrease the total number of plants affected. Spiny milkwort is a CNPS List 2 species that is restricted to a relatively small portion of Lassen County in California. The species is also known from Nevada, Utah, southwestern Colorado, northwestern New Mexico, and northern Arizona. The species is locally found in rocky habitats associated with low-growing annual grasses or sparse, low-growing shrubs. Due to the limited distribution of the species in California, the proposed clearing of habitat for this species is considered a **Class II** impact that is significant but mitigable by restoration as described in Mitigation Measure B-3.

Lance-Leaved Scurf-Pea (Psoralidium lanceolatum). Temporary loss of habitat for lance-leaved scurf-pea would be approximately 0.11 acre. No permanent habitat loss would occur. An estimated 1200 linear feet of overland travel will impact approximately 0.43 acre of habitat for lance-leaved scurf-pea All of the impacts would be located on Segment Q of the proposed Project. The distribution of lance-leaved scurf-pea in California is limited to sandy soils on stabilized or partially-stabilized sand dunes in the south eastern portion of the Honey Lake Valley in Lassen County. Based on this limited distribution, the species is considered a candidate for inclusion on the CNPS List 2 (Lis, 1995). Field surveys identified four populations of this species, each composed of approximately 200 to 300 individual plants in the Proposed Project's study area. Other populations were identified on Alternative Segment P. Lance-leaved scurf-pea is rare in California but more abundant elsewhere in the Basin and Range region. Although the magnitude of the potential impact is small, the uniqueness of these populations and their unknown sensitivity to disturbance indicate that the impacts of the Proposed Project are substantial and therefore significant as defined in the CEQA Guidelines. Overland travel and temporary loss of habitat for this species is considered a **Class II** impact that is significant but mitigable by restoration as described in Mitigation Measure B-3.

Twin Arnica (Arnica sororia). Temporary loss of habitat for twin arnica will be approximately 0.12 acre. No permanent loss of this species' habitat is anticipated. Impacts to this species would occur on Segment E of the Proposed Project route. Twin arnica is proposed for down-listing to CNPS List 4 (it is currently on List 2) and possesses no federal or state status. In California, the species is found in Lassen, Mono, and Modoc Counties. Outside of California, twin arnica's range extends from southern British Columbia and Alberta in Canada, to Oregon, northern Nevada, Utah, and Wyoming. Field surveys for the Alturas Transmission Line Project found a total of 25 populations supporting more than 17,000 plants. An additional 44 populations supporting more than 61,000 plants were documented during surveys for the Tuscarora Pipeline Project. Based on the large sizes of the observed populations and their wide distribution in the project vicinity, twin arnica does not meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act), or Secs. 2062 or 2067 (California Endangered Species Act) of the CDFG Code. Therefore, temporary loss of this species' habitat is considered a **Class III** impact which is adverse but not significant. No mitigation is proposed for impacts to twin arnica.

Pine Creek Evening Primrose (Camissonia boothii var. alyssoides). Temporary loss of habitat for Pine Creek evening primrose will be approximately 0.23 acre. No permanent loss of this species' habitat is anticipated. Impacts to this species would occur on Segment L. Pine Creek evening primrose is a CNPS List 4 species with no federal or state status. In California, the species is found in Lassen and Modoc Counties but elsewhere the species' range extends as far as western Utah, southern Idaho, and northern Nevada. Field surveys for the Alturas Transmission Line Project found a total of 10 populations supporting more than 3,000 plants. An additional 18 populations supporting more than 10,000 plants were documented during surveys for the Tuscarora Pipeline Project. Based on the large sizes of the observed populations and their wide distribution in the project vicinity, Pine Creek evening primrose does not meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act), or Secs. 2062 or 2067 (California Endangered Species Act) of the CDFG Code. Therefore, temporary loss of this species' habitat is considered a **Class III** impact which is adverse but not significant. No mitigation is proposed for impacts to Pine Creek evening primrose.

Nelson's Evening Primrose (Camissonia minor). Temporary loss of habitat for Nelson's evening primrose will be approximately 0.23 acre. No permanent loss of this species' habitat is anticipated. Impacts to this species would occur only on Segment Q. Nelson's evening primrose is a CNPS List 4 species with no federal or state status. In California, the species is found in Lassen and Modoc counties. Outside of California, Nelson's evening primrose's range extends as far as eastern Washington, Oregon, Nevada, and Idaho. Field surveys for the Alturas Transmission Line Project found a total of 3 populations supporting more than 640 plants. An additional 28 populations supporting an estimated 3,000 plants were documented during surveys for the Tuscarora Pipeline Project. Based on the large sizes of the observed populations and their wide distribution in the project vicinity, Nelson's evening primrose does not meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act), or Secs. 2062 or 2067 (California Endangered Species Act) of the CDFG Code. Therefore, temporary loss of this species' habitat is considered a **Class III** impact which is adverse but not significant. No mitigation is proposed for impacts to Nelson's evening primrose.

Lilliput Lupine (Lupinus uncialis). Permanent loss of habitat for lilliput lupine will be approximately 0.20 acre. No temporary impacts to this species' habitat are expected. Impacts to lilliput lupine would occur on Segment C. Lilliput lupine is being treated by CDFG as a CNPS List 2 species. The species' lack of formal CNPS List status is due to this species' recent discovery in California. Lilliput lupine has no federal or state list status. In California, the species is known only from Modoc County. Outside of California, lilliput lupine's range extends as far as northern Nevada, and southern Oregon and Idaho. Field surveys for the Alturas Transmission Line Project and the Tuscarora Pipeline Project have collectively found a total of 21 populations supporting more than 4,000 plants. Due to the limited distribution of lilliput lupine in California, the species is considered to be rare plant under CEQA and is eligible for CNPS List 2 status.. Therefore, permanent loss of this species' habitat is considered a **Class II** impact which is significant but mitigable by restoration and offsite compensation as described in Mitigation Measure B-3.

Raven's Lomatium (Lomatium ravenii). Temporary loss of habitat for Raven's lomatium will be approximately 5 acres. Permanent loss of this species' habitat will be approximately 0.02 acre. Impacts to this species will be concentrated on the Madeline Plains portions of Segments E and K. These impacts will be caused by construction of H-frame structures in these areas and blading for construction access. Raven's lomatium is a CNPS List 4 species and was found to be widespread in the Madeline Plains area. This species does not meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act), or Secs. 2062 or 2067 (California Endangered Species Act) of the CDFG Code. Therefore, the proposed clearing of habitat for this species is considered a **Class III** impact, adverse but not significant. No specific mitigation is proposed for impacts to Raven's lomatium.

B-3 The objective of Mitigation Measure B-3 is to reduce permanent and temporary losses of special status plant populations to less-than-significant levels. Permanent and temporary loss of special status plant populations shall be mitigated by a combination of avoidance, restoration, and offsite compensation. Plant populations designated for avoidance are listed in Table E.1-3. Avoidance would be conducted as described in Mitigation Measure B-1. Temporary impacts to populations that cannot be avoided shall be restored. Permanent impacts which cannot be restored shall be mitigated by offsite compensation. Offsite compensation shall also be used to offset temporary losses of plant species habitat during the time period required for restoration. BLM, CPUC, CDFG, USFS, and USFWS shall verify that a resource has been avoided by comparing its pre- and post-construction condition. Avoidance would be considered successful if no net loss or degradation of a resource has occurred.

The following mitigation measure shall be implemented for resources that cannot be avoided. Permanent surface removal at substation sites, permanent overland access routes, new spur access roads, and structure footings shall be mitigated by offsite compensation. The area of offsite compensation for permanent impacts shall be determined using the formula:

$$Ac = Ai \times Y,$$

where Ac is acres of compensation, Ai is acres of impact, and Y is the habitat yield ratio. Compensation for all permanent loss of plant communities, except those incurred due to permanent access routes, shall be calculated using a habitat yield ratio of 3. Permanent overland access corridors shall be routed to avoid special status plant populations. Based on these assumptions, the total area of offsite compensation for permanent loss of special status plant species habitat shall be 1.35 acres. Table C.3-11 summarizes the offsite compensation by plant species.

Temporary loss of special status plant populations during construction will be mitigated by restoration and offsite compensation. Due to the low potential for restoration of impacted populations to preconstruction conditions and the long recovery time required, offsite compensation will be used to supplement restoration. Offsite compensation will be based on the magnitude of two impact components: loss of the plant population from time of impact until it has met the final success criteria, and the residual loss at the completion of restoration. The area of offsite compensation for temporary impacts shall be determined using the formula:

$$Ac = (Ai \times Pi \times Y)/Tc,$$

where Ac is acres of compensation, Ai is acres of impact, Pi is period of impact, Y is the habitat yield ratio, and Tc is the period of compensation. For this project, 50 years is used as the period of compensation, and 3 as the habitat yield ratio. The period of impact for temporary impacts is assumed to be 15 years. The total area of compensation for temporary loss of special status plant species habitat shall be 16 acres. Table C.3-11 summarizes the offsite compensation by plant species.

Populations of falcate saltbush (*Atriplex gardneri* var. *falcata*), dwarf lousewort (*Pedicularis centranthera*), and green prince's plume (*Stanleya viridiflora*) which occur in Segment L shall be avoided by placing all structures outside of the limits of these populations and by placing overland travel exclusion zones around these populations. Habitats for falcate saltbush, dwarf lousewort, and green prince's plume will be clearly flagged prior to construction. In addition, all known populations of altered andesite buckwheat (*Eriogonum robustum*) will be clearly flagged prior to construction. All overland travel routes, structures, and wire setup areas will be located at least 200 feet outside of the habitat for altered andesite buckwheat.

Preconstruction surveys of known populations of special status plants shall be conducted at the discretion of the Lead agencies to verify actual area of impacts. Offsite compensation requirements shall be commensurate with the actual area of impacts. Impacts to special status plant species that the EIR/S assumes will be avoided (including, but not limited to, *Atriplex gardneri* var. *falcata*, *Astragalus agrestis, Erigeron elegantulus, Eriogonum collinum, Eriogonum robustum, Lupinus uncialis, Pedicularis centranthera,* and *Stanleya viridiflora*) shall be mitigated in the same manner as the special status plant species addressed in this mitigation measure. All mitigation shall be subject to the approval of the responsible agencies.

Additional offsite compensation shall be required if the responsible agencies determine that restoration has failed or would not be feasible. Area offsite compensation shall be directly proportional to the loss or degradation of the affected resource. If the affected resource cannot be fully restored within 15 years (the average estimated "period of impact" for temporary impacts) additional offsite compensation shall be required and the area shall be determined by the responsible agencies using the methods described for permanent impacts.

A restoration plan shall be developed by the applicant and submitted to BLM, CPUC, USFS, USFWS, and CDFG at least 60 days prior to the start of construction. The restoration plan shall contain plans for seed collection, soil preparation, planting, and monitoring. Quantitative success criteria shall also be presented in the reclamation plan. The restoration objective for affected plant populations shall be restoration to preconstruction conditions as measured by species cover, species composition, and species diversity. Success criteria shall be established by comparison with reference sites approved by BLM, CPUC, CDFG, USFS, and/or USFWS.

Restoration shall be monitored for five years after construction to assess progress and identify problems. Contingency measures shall be implemented if BLM, CPUC, CDFG, USFS, USFWS, or other appropriate agencies determine that the restoration has not met the established success criteria at the end of the monitoring period, as described in Mitigation Measure B-1. Contingency measures shall consist of offsite compensation determined by BLM, CPUC, CDFG, USFS, USFWS, or other appropriate agencies.

Surface Disturbance by Overland Travel

Overland travel will consist of vehicles with rubber tires or steel tracks that will travel off of the existing roads without a bladed route. Designated overland travel routes will be flagged prior to construction to avoid impacts to sensitive resources and minimize total impact area. If overland travel causes compaction or disruption of the surface soils, mitigation shall be implemented as described for temporary and permanent habitat loss impacts.

Surface disturbance would occur during construction, operation, and maintenance of the Proposed Project and would be related to the following activities:

- Overland travel during line stringing in areas where blading is not required
- Overland travel for annual maintenance of the facility, including tree trimming
- Overland travel by the general public after construction.

Each of these activities would cause temporary damage to existing vegetation but would not involve the same magnitude of surface soil disturbance as described for temporary and permanent habitat removal. The most common type of surface disturbance would be caused by vehicles on rubber tires or steel tracks used to string the line and move people and materials into the project corridor.

Overland travel impacts will vary in magnitude from minor to severe depending on variables such as vegetation type, soil morphology, topography, volume of construction traffic, and types of vehicles. Efforts to restore areas that have not been severely affected by overland travel may cause more disturbance than the original impact. The proposed mitigation for overland travel impacts provides agency discretion to identify areas where restoration would be undesirable. Specific impacts and mitigation measures are described below.

Impact 3: Overland Travel Disturbance of Plant Communities

Natural plant communities that would be impacted (though not necessarily significantly) by surface disturbance include:

- Montane meadow (1.17 acres)
- Volcanic gravels (1.12 acres)
- Low sagebrush scrub (10.92 acres)
- Silver sagebrush scrub (0.47 acre)
- Sand dunes (6.24 acres)
- Big sagebrush scrub (42.09 acres)
- Sagebrush/bitterbrush scrub (0.57 acre)
- Alkali meadow (0.01 acre)
- Chenopod scrub (0.74 acre)
- Disturbed/Cultivated (27.12 acres)
- Greasewood scrub (13.83 acres)
- Greasewood scrub/Playa (1.79 acres)
- Juniper woodland (4.68 acres)
- Mud Flat (0.78 acre)
- Rabbitbrush scrub (1.42 acres)
- Silver sagebrush basin (0.26 acre).

Impacts on these communities would be caused by overland travel by off-road vehicles and assorted heavy equipment within a single-lane, up to 15-foot-wide route roughly parallel to the transmission line centerline. Impacts would include soil compaction, crushing of vegetation, and disruption of microphytic crusts. In arid regions, the microphytic crust is a thin layer of mosses, lichens, and other non-flowering organisms found at the soil surface that is an important link in the soil nutrient cycles. Not all of the plant communities are equally sensitive to surface disturbance, not all of these impacts would occur in every plant community, and overland travel would be limited to areas where other existing surface roads are not available. Overland travel impacts to big sagebrush scrub and juniper woodland would be considered Class III impacts that are adverse but not significant due to the widespread distribution of these plant communities relative to the magnitude of the potential impact. No specific mitigation measures are proposed for overland travel impacts to big sagebrush scrub or juniper woodlands. Surface disturbance to all of the other plant community types would be considered **Class II** significant impacts, mitigable with implementation of Mitigation Measure B-4.

B-4 The object of Mitigation Measure B-4 is to reduce surface disturbance impacts caused by overland travel to less-than-significant levels. Overland travel impacts on significant natural plant communities shall be mitigated by a combination of avoidance, restoration, and offsite compensation. Avoidance would be conducted as described in Mitigation Measure B-1. Unavoidable overland travel impacts shall be restored. Offsite compensation shall also be used to offset temporary loss of plant community functions during the time period required for restoration. BLM, CPUC, CDFG, USFS, and USFWS shall verify that a resource has been avoided by comparing its pre- and post-construction condition. Avoidance would be considered successful if no net loss or degradation of a resource has occurred.

The following mitigation measure shall be implemented for resources that cannot be avoided. Impacted areas shall be evaluated by BLM, CPUC, CDFG, USFS, and/or USFWS after construction is completed to identify areas where success criteria would be met without restoration. All overland travel impacts shall be restored and/or compensated by offsite mitigation unless BLM, CPUC, CDFG, USFS, and/or USFWS determine that it is unnecessary.

Due to the low potential for restoration of impacted areas to preconstruction conditions and the long recovery time required, offsite compensation will be used to supplement restoration. Offsite compensation shall be based on the magnitude of two impact components: loss of the plant community functions and values from time of impact until it has met the final success criteria, and the residual loss at the completion of restoration. The area of offsite compensation for overland travel impacts shall be determined using the formula:

$$Ac = (Ai \times Pi \times Y)/Tc,$$

where Ac is acres of compensation, Ai is acres of impact, Pi is period of impact, Y is the habitat yield ratio, and Tc is the period of compensation. For this project, 50 years is used as the period of compensation, and 3 as the habitat yield ratio. The period of impact for overland travel impacts is assumed to be 15 years. The total area of compensation for overland travel impacts on plant community habitat shall be 35 acres. Table C.3-11 summarizes the offsite compensation by plant community.

Additional offsite compensation shall be required if the responsible agencies determine that restoration has failed or would not be feasible. Area offsite compensation shall be directly proportional to the loss or degradation of the affected resource. If the affected resource cannot be fully restored within 15 years (the average estimated "period of impact" for temporary impacts) additional offsite compensation shall be required and the area shall be determined by the responsible agencies using the methods described for permanent impacts.

The restoration plan shall be developed by the Applicant and submitted to BLM, CPUC, USFS, USFWS, and CDFG at least 60 days prior to the start of any construction. The plan shall contain procedures for seed collection, soil preparation, planting, contingency plans, and monitoring. Quantitative success criteria shall also be presented in the plan. The restoration objective for affected natural plant communities shall be restoration to preconstruction conditions as measured by species cover, species composition, and species diversity. Success criteria shall be established by comparison with reference sites approved by BLM, CPUC, CDFG, USFS, and/or USFWS.

Restoration will be monitored for five years after construction to assess progress and identify problems. Contingency measures shall be implemented if BLM, CPUC, CDFG, USFS, USFWS, or other appropriate agencies determine that the restoration has not met the established success criteria at the end of the monitoring period, as described in Mitigation Measure B-1. Contingency measures shall consist of offsite compensation determined by BLM, CPUC, CDFG, USFS, USFWS, or other appropriate agencies.

Impact 4: Overland Travel Disturbance of Special Status Plant Species and Their Habitats

Doublet (Dimeresia howellii). Surface disturbance by overland travel of doublet habitat will be approximately 0.1 acre. This species is associated with volcanic gravel plant communities on Segments A and C. Doublet is a CNPS List 4 species proposed for List 2 which is known only from the Modoc Plateau in California but also occurs eastward into southwestern Idaho and northwestern Nevada. Existing information for this species indicates that its current CNPS List status should be upgraded to List 2; therefore, it meets the definitions of Section 1901, Chapter 10 of the Native Plant Protection Act, or Sections 2062 or 2067 of the California Endangered Species Act of the CDFG Code. Although the magnitude of the impacts to this species as a result of the Proposed Project is minor, surface disturbance of habitat for doublet is considered a **Class II** impact which is significant but can be mitigated to less-than-significant levels. Mitigation Measure B-5 shall be implemented to address impacts to this species.

Pine Creek Evening Primrose (Camissonia boothii var. alyssoides). Surface disturbance of habitat for Pine Creek evening primrose will be approximately 0.8 acre. This species is widespread on sandy and gravelly soils on Segment L in the Secret Valley area. Although this species is not widely distributed in California, elsewhere it occurs from Nevada to western Utah and southern Idaho. Existing information for this species indicates that its current CNPS List 4 status is warranted; it does not meet the definitions of Section 1901, Chapter 10 of the Native Plant Protection Act, or Sections 2062 or 2067 of the California Endangered Species Act of the CDFG Code. The magnitude of the impacts to this species as a result of the Proposed Project is minor. Therefore, surface disturbance of habitat for Pine Creek evening primrose is considered a **Class III** impact which is adverse but not significant. No mitigation is proposed for impacts to Pine Creek evening primrose.

Raven's Lomatium (Lomatium ravenii). Surface disturbance of habitat for Raven's lomatium will be approximately 2.7 acres. This species occurs throughout the seasonally flooded basins of the Madeline Plains and surface disturbance would occur on Segments E and K. Existing information for this species indicates that its current CNPS List 4 status is warranted; it does not meet the definitions of Section 1901, Chapter 10 of the Native Plant Protection Act, or Sections 2062 or 2067 of the California Endangered Species Act of the CDFG Code. The magnitude of the impacts to this species as a result of the Proposed Project is not substantial relative to its distribution in the project vicinity. Therefore, surface disturbance of habitat for Raven's lomatium is considered a **Class III** impact which is adverse but not significant. No mitigation is proposed for impacts to Raven's lomatium.

Nelson's Evening Primrose (Camissonia minor). Surface disturbance of habitat for Nelson's evening primrose will be approximately 0.2 acre. This species is associated with sandy, somewhat alkaline soils in the Honey Lake Valley. It is known from eastern Lassen and Modoc counties in California but also occurs eastward as far as Wyoming and as far north as Washington. Surface disturbance of habitat for this species would occur on Segment O south of Wendel. Existing information for this species indicates that its current CNPS List 4 status is warranted; it does not meet the definitions of Section 1901, Chapter 10 f the Native Plant Protection Act, or Sections 2062 or 2067 of the California Endangered Species Act of the CDFG Code. The magnitude of the impacts to this species as a result of the Proposed Project is not substantial relative to its distribution in the project vicinity. Therefore, surface disturbance of habitat for Nelson's evening primrose is considered a **Class III** impact which is adverse but not significant. No mitigation is proposed for impacts to Nelson's evening primrose.

Lance-Leaved Scurf-Pea (Psoralidium lanceolatum). Surface disturbance of habitat for lance-leaved scurf-pea will be approximately 0.2 acre. This species is associated with sandy soils on partially stabilized or stabilized sand dunes at the southeastern margins of Honey Lake Valley. It is known only from a few Great Basin habitats in eastern California but also occurs eastward as far as the Great Plains of North America. The Proposed Project would result in surface disturbance of habitat for lance-leaved scurf-pea on Segment Q. This species currently has no formal status as a federal, state, or CNPS listed species. However, existing information for this species indicates that its distribution in California would warrant CNPS List 2 status and consideration under CEQA. The magnitude of the impacts to this species as a result of the Proposed Project is considered substantial relative to its distribution in the project vicinity and California. Therefore, surface disturbance of habitat for lance-leaved scurf-pea is considered a **Class II** impact which is significant but mitigable as described in Mitigation Measure B-5.

Prostrate Buckwheat (Eriogonum prociduum). Surface disturbance caused by overland travel approximately 1,600 feet north of Angle Point CØ1 on Segment C near MP-10.7 would impact at least one population of prostrate buckwheat that contains approximately 250 plants. The area of impact would be approximately 0.14 acre. Prostrate buckwheat is a CNPS List 1B species and a Category 2 candidate for Federal listing. This species has also been placed on the watch list in Nevada and is a candidate for State listing in Oregon. This plant species is known only from Lassen and Modoc counties in California, and elsewhere it is restricted to Washoe County in Nevada and Lake County in Oregon. The localized distribution of the species and its habitats qualifies prostrate buckwheat for protection as a rare plant under CEQA. The magnitude of the impacts to this species as a result of the Proposed Project is considered to be substantial relative to its distribution in the project vicinity and California. Therefore, surface disturbance of habitat for prostrate buckwheat is considered a **Class II** impact which is significant, but mitigable. General mitigation for this impact is described in Mitigation Measure B-5.

B-5 The objective of Mitigation Measure B-5 is to reduce surface disturbance impacts to special status plant habitats caused by overland travel to less-than-significant levels. Overland travel impacts on special status plant populations shall be mitigated by a combination of avoidance, restoration and offsite compensation. All plant populations indicated on Table E.1-3 with an "X" shall be avoided. Overland travel impacts to populations that cannot be avoided shall be restored. Offsite compensation shall also be used to offset temporary losses of plant species habitat during the time period required for restoration. BLM, CPUC, CDFG, USFS, and USFWS shall verify that a resource has been avoided by comparing its pre- and post-construction condition. Avoidance would be considered successful if no net loss or degradation of a resource has occurred.

The following mitigation measure shall be implemented for resources that cannot be avoided. Impacted populations shall be evaluated by the responsible agencies after construction is completed to identify areas where success criteria would be met without restoration. All overland travel impacts shall be subject to restoration and/or compensation by offsite mitigation unless the responsible agencies determine that it is unnecessary.

No overland travel shall occur on Segment C between MP-10.6 and MP-11.0 to prevent impacts to prostrate buckwheat (*Eriogonum prociduum*) and doublet (*Dimeresia howellii*). Exclusion fences strictly marking the allowable travel route shall be installed along the edges the existing access roads between MP-10.6 and MP-11.3 during construction to prevent inadvertent encroachment on special status plant populations adjacent to the roads.

Overland travel impacts on special status plant populations during construction shall be mitigated by restoration. Due to the low potential for restoration of impacted areas to preconstruction conditions and the long recovery time required, offsite compensation will be used to supplement restoration. Offsite compensation will be based on the magnitude of two impact components: loss of the plant community functions and values from time of impact until it has met the final success criteria, and the residual loss at the completion of restoration. The area of offsite compensation for overland travel impacts shall be determined using the formula:

$$Ac = (Ai \times Pi \times Y)/Tc,$$

where Ac is acres of compensation, Ai is acres of impact, Pi is period of impact, Y is the habitat yield ratio, and Tc is the period of compensation. For this project, 50 years is used as the period of compensation, and 3 as the habitat yield ratio. The period of impact for overland travel impacts is assumed to be 15 years. The total area of compensation for temporary loss of special status plant habitat shall be 0.4 acres. Table C.3-11 summarizes the offsite compensation by plant species.

Populations of falcate saltbush (*Atriplex gardneri* var. *falcata*), dwarf lousewort (*Pedicularis centranthera*), and green prince's plume (*Stanleya viridiflora*) which occur in Segment L shall be avoided by placing all structures outside of the limits of these populations and by placing overland travel exclusion zones around these populations. Habitats for falcate saltbush, dwarf lousewort, and green prince's plume will be clearly flagged prior to construction. In addition, all known populations of altered andesite buckwheat (*Eriogonum robustum*) will be clearly flagged prior to construction. All overland travel routes, structures, and wire setup areas will be located at least 200 feet outside of the habitat for altered andesite buckwheat.

The Applicant shall provide for a re-survey of the known populations of special status plants following construction to assess the actual area of impacts. The results of these surveys shall be submitted for review and approval by the responsible agencies and USFWS. Offsite compensation requirements shall be commensurate with the actual area of impacts. Impacts to special status plant species that the EIR/S assumes will be avoided (including, but not limited to, *Atriplex gardneri* var. *falcata, Astragalus agrestis, Erigeron elegantulus, Eriogonum collinum, Eriogonum robustum, Lupinus uncialis, Pedicularis centranthera,* and *Stanleya viridiflora*) shall be mitigated in the same manner as the special status plant species addressed in this mitigation measure. All mitigation shall be subject to the approval of the responsible agencies.

The restoration plan shall be developed by the applicant and submitted to BLM, CPUC, USFS, USFWS, and CDFG at least 60 days prior to the start of construction. The plan shall contain plans for seed collection, soil preparation, planting, and monitoring. Quantitative success criteria shall also be presented in the plan. The restoration objective for affected natural plant communities shall be restoration to preconstruction conditions as measured by species cover, species composition, and species diversity. Success criteria shall be established by comparison with reference sites approved by BLM, CPUC, CDFG, USFS and/or USFWS.

Additional offsite compensation shall be required if the responsible agencies determine that restoration has failed or would not be feasible. Area offsite compensation shall be directly proportional to the loss or degradation of the affected resource. If the affected resource cannot be fully restored within 15 years (the average estimated "period of impact" for temporary impacts) additional offsite compensation shall be required and the area shall be determined by the responsible agencies using the methods described for permanent impacts.

Restoration will be monitored annually for five years to assess progress and identify problems. Contingency measures shall be implemented if BLM, CPUC, CDFG, USFS, USFWS, or other appropriate agencies determine that the restoration has not met the established success criteria at the end of the monitoring period, as described in Mitigation Measure B-1. Contingency measures shall consist of offsite compensation determined by BLM, CPUC, CDFG, USFS, USFWS, or other appropriate agencies.

Increased Access Impacts on Vegetation

Increased access could occur primarily after construction and would be related to the following activities:

- Public use of the Proposed Project corridor area because of enhancement of existing access
- Encroachment on sensitive biological resources during construction by construction personnel.

Each of the above activities would cause temporary damage to existing vegetation and possible permanent damage to sensitive plant communities due to removal or substantial disruption of surface soil layers. Increased access may also lead to increased dispersal of non-native plant species (discussed below). Specific impacts and mitigation measures are described below.

Impact 5: Increased Access to Sensitive Vegetation Resources

The Proposed Project would create new vehicle access and upgrade existing vehicle access (Table C.3-12). Existing access routes would be upgraded and new access routes would be created during construction to facilitate transport of materials and equipment to key sections of the proposed corridor.

Table C.3-12 Lengths and Locations of Proposed New and Upgraded Spur Access Roads Surveyed in 1995 for Biological Resources[1]

Access Road[a]	Length (ft)[b]		7.5' Quadrangle	Location (T, R, Sect.)
	Upgrade	New		
Proposed Route:				
A1	2,000	3,400	Mahogany Ridge	T 43N, R 12E, S. 32
A2	—	500	Alturas	T 42N, R 12E, S. 16
A3	3,600	—	Alturas	T 41N, R 12E, S. 5
C1	—	1,400	Alturas	T 41N, R 12E, S. 17
C2	—	2,600	Alturas	T 41N, R 12E, S. 20
C3	2,800	4,000	Infernal Caverns	T 41N, R 12E, S. 29, 20, and 21
C4	3,000	—	Infernal Caverns	T 40N, R 12E, S. 4 and 3
C5	—	1,400	Likely	T 39N, R 12E, S. 9 and 10
C6	1,600	—	Likely	T 39N, R 12E, S. 23 and 26
C7	3,000	—	Likely	T 39N, R 12E, S. 26 and 36
E1	7,600	—	Madeline	T 38N, R 13E, S. 32, 33, and 34
L1	2,900	—	Snowstorm Mountain	T 32N, R 15E, S. 6, 5, and 4
X1	1,600	—	Verdi	T 20N, R 18E, S. 11
X2	4,300	—	Verdi	T 20N, R 19E, S. 7, 18, 17
Alternatives:				
D1	13,800	—	Holbrook Canyon	T 38N, R 12E, S. 26, 35, and 34 T 37N, R 12E, S. 3 and 4
D2	15,600	—	Holbrook Canyon	T 37N, R 12E, S. 16, 9, and 3
J1	13,000	—	Cleghorn Flat/Termo	T 34N, R 13E, S. 8, 16, 21, 22, 27, and 26
P1	4,000	—	Doyle	T 26N, R 17E, S. 16, 20, and 21
P2	9,200	—	Doyle	T 25N, R 17E, S. 3, 10, and 15
P3	2,400	—	Doyle	T 25N, R 17E, S. 22 and 15

[a] Appendix A.1 of the Final EIR/S Finalizing Addendum contains descriptions of each of the proposed new and upgraded spur access roads in this table.

[b] Length of proposed access roads includes only those portions outside of the 660-foot wide study corridor studied in 1994.

[1] Existing access road desgnated for use by the Applicant will be identified in the construction, operation, and maintenance plan.

Travel by vehicles off established roads (overland travel) and blading for overland travel would remove existing barriers to vehicle access in extensive sections of the project corridor. These actions would impact natural plant communities, special status plant species, and jurisdictional wetlands that are not presently accessible to most vehicles. Increased access was determined to be significant when the Proposed Project would create permanent new access routes that would be used after construction of the project in areas where existing vehicle access routes do not currently exist. Specific impacts considered under separate impact headings but related to vehicle access include:

- Surface disturbance of natural plant communities (including wetlands)
- Surface disturbance of special status plants
- Increased erosion and sedimentation
- Increased potential for introduction on non-native plant species.

Increased access is considered a **Class II** impact that is mitigable as described in the mitigation measures previously specified for surface disturbance, in Mitigation Measure B-6 (below), and in mitigation measures for increased erosion and sedimentation (B-7) and introduction of non-native plant species (B-8).

B-6 The objective of Mitigation Measure B-6 is to reduce to less-than-significant levels potential impacts associated with increased access to remote areas of the Proposed Project area. Existing barriers to overland travel shall be replaced following construction and new barriers shall be placed at access points to non-bladed overland travel routes. Sierra Pacific Power Company shall submit to BLM, CPUC, CDFG, USFS, and USFWS lists and maps for all access that the company will use for long-term operation and maintenance of the facilities at least 60 days prior to the start of construction. This list and associated mitigation shall be reviewed and approved by these agencies. Permanent overland access corridors shall be treated as permanent surface removal and mitigated as specified in Mitigation Measures B-1, B-2, and B-3. Following construction, Sierra Pacific Power Company shall submit "as-built" maps that show the final locations of all access routes to BLM, CPUC, CDFG, USFS, and USFWS which shall be reviewed for consistency with the preconstruction impact assessment. All access routes shall be returned to pre-improvement conditions unless BLM, CPUC, CDFG, USFS, and/or USFWS determine that it is not feasible or desirable. New access roads or overland travel access routes will be blocked during all phases of construction to prevent unauthorized vehicular traffic. Sierra Pacific Power Company shall replace all existing barriers to overland travel on routes specified by BLM, CPUC, CDFG, USFS, and/or USFWS.

During construction, all vehicles shall stay on designated access routes inside and outside of the 160-foot ROW. The Applicant shall not drive across or operate vehicles of any kind off of existing roads within 200 feet of stream channels with adjacent or in-channel wetlands as defined by the criteria of the USACE 1987 Wetland Delineation Manual. No culverts or fill shall be placed in stream channels or adjacent wetlands to facilitate overland travel. Overland travel routes shall be established in consultation with BLM, CPUC, CDFG, USFS, and USFWS as appropriate to avoid known occurrences of sensitive resources. Final staking of these routes shall be completed in the presence of a qualified botanist, wildlife biologist, and cultural resource specialist.

No vehicle travel for construction or maintenance in the project area shall be allowed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of 3 inches deep, and over 100 feet in length, the soil shall be deemed too wet to adequately support construction equipment, on all soils except vertisols. (The standard for vertisol soils is given in Mitigation Measure B-2).

The responsible agencies shall assess whether the objectives of this Mitigation measure have been met. If the objectives have not been met, these agencies will implement contingency measures. These shall include additional offsite compensation and/or modifications to the measures described above.

Erosion and Sedimentation

Erosion and sedimentation would occur during and after construction and would be related to the following activities:

- Overland travel that would compact soils and remove vegetation
- Construction or operation activities could disturb the soil profile.

Erosion and sedimentation would cause temporary damage of existing vegetation and possible permanent damage to plant communities by removing or substantially disrupting surface soil layers. Drainages and wetlands could be substantially degraded by the accumulation of sediments and alteration of natural hydrologic characteristics. Specific impacts and mitigation measures are described below, as well as in Sections C.6 (Geology, Soils, and Paleontology) and C.7 (Hydrology).

Impact 6: Erosion and Sedimentation

The Proposed Project would disturb soils and remove vegetation, which could lead to increased erosion and sedimentation in the project corridor, staging areas, substation sites, and access routes. Erosion and sedimentation would adversely affect drainages and wetlands next to the project area and might delay or prevent suitable recovery of disturbed surfaces. Erosion and sedimentation is considered a **Class II** significant impact requiring Mitigation Measure B-7 (below).

B-7 The objective of this mitigation measure is to reduce to less-than-significant levels the potential for emission and sedimentation during and after construction. Erosion and sedimentation control measures specified in Mitigation Measure G-11 (see Section C.6, Geology, Soils, and Paleontology) shall be implemented according to a Soil Conservation and Erosion Control Plan to be submitted by the Applicant to BLM, CPUC, CDFG, USFWS, and/or the USACE as appropriate at least 60 days prior to the start of construction. These agencies shall review the proposed plan and the applicant shall revise the plan as necessary. The plan shall specify temporary measures to control erosion and sedimentation during construction and permanent measures to minimize erosion and sedimentation following construction. The effectiveness of erosion control measures shall be monitored by erosion control specialists immediately following significant storm events and after construction is completed problem areas shall be repaired or replaced. Contingency measures shall be implemented if the responsible agencies determine that the objective of the mitigation measures are not being met.

Introduction of Non-Native Plant Species

Introduction of non-native plant species would occur primarily during construction, but would also continue to occur during operation and maintenance phases of the Proposed Project. Potential impacts would be related to the following activities:

- Use of vehicles, construction equipment, or earth materials contaminated with non-native plant seed
- Use of straw bales for erosion control that contain seeds of non-native plant species
- Enhanced public access to the project corridor during and after construction.

Inadvertent introduction of non-native plant species is a special concern for plant communities and special status plants in the Modoc Plateau and Great Basin Regions. Non-native plants pose a threat to the natural processes of plant community succession, fire frequency, and biological diversity and species composition. The survival of some populations of special status species could be adversely affected by the success of an introduced plant species. Non-native plant species have radically altered the natural characteristics of plant communities in the Great Basin since the mid-19th century. Species of particular concern are the noxious weed species considered to be capable of the most harm. California and Nevada have laws that prohibit the introduction and willful spread of noxious weeds on private and public lands (Sections 5004, 5006, 6301 through 6303, 6305, and 7201 through 7581 of the Food and Agriculture Code of California, Section 4500, Title 3 of the California Code of Regulations, and Nevada Revised Statutes Chapters 554.100 and 555). Specific impacts and mitigation measures are described below.

Impact 7: Introduction of Non-Native Plant Species

Construction equipment, vehicles, earth materials, straw bales used for erosion control and any other potential vectors for the transport of non-native plant species may cause the inadvertent introduction or spread of non-native species within the Proposed Project corridor. Related impacts include the degradation of significant natural plant communities and special status species habitats within the project corridor and adjacent areas. Resources of special concern are isolated wetland habitats such as the wetland seeps on Segments C and D, and plant communities with naturally high percentages of bare ground such as volcanic vertisols, volcanic gravels, sand dunes, and altered andesites.

Introduction of non-native plant species is considered a **Class II** impact to be mitigated by the use of standard precautionary measures described in Mitigation Measure B-8:

B-8 The objective of Mitigation Measure B-8 is to reduce the potential for introduction or dispersal of non-native plant species to less-than-significant levels. The project corridor shall be surveyed for existing noxious weed populations prior to the start of construction. All noxious weed populations shall be flagged prior to construction. The applicant shall submit a Noxious Weed Control Plan to BLM, CPUC, CDFG, and/or USFWS at least 60 days prior to the start of construction. The weed control plan shall specify the location of existing weed populations; measures to control introduction and spread of noxious weeds in the project corridor; worker training, specifications, and inspection procedures for construction materials and equipment used in the project corridor; post-construction monitoring for noxious weeds; and eradication and control methods.

Known populations of noxious weeds in the project corridor shall be evaluated by BLM, CPUC, CDFG, and USFWS to identify candidates for eradication. Selected weed populations shall then be eradicated prior to construction.

All seeds and straw material shall be certified weed free by the California Department of Food and Agriculture (CDFA) seed laboratory. All gravel and fill material used during project construction and maintenance shall be certified weed free by the local County Agriculture Commissioner's Office. The removal site for all fill materials shall be examined for the presence of noxious weeds by the local County Agriculture Commissioner's and approved by BLM and CPUC. Material transported between counties shall be approved by the local County Agriculture Commissioner in the county receiving the materials.

BLM and CPUC shall monitor the implementation of this mitigation during construction. If these agencies determine that the mitigation measure objectives are not being met, they shall implement contingency measures. Potential contingency measures shall include additional steps to control new occurrences of the target species and changes in equipment and materials used during operation and maintenance.

C.3.2.2.3 *Specific Environmental Impacts and Mitigation Measures—Wildlife*

Proposed Project impacts are presented here according to the impact categories already described. Impacts are identified as significant or not significant and classified according to the resulting level of impact when mitigation measures are applied. Mitigation measures are numbered and cross-referenced when they apply to more than one impact. Not all of the wildlife species identified in the baseline section will be discussed in this section. The impacts and mitigation discussion will address wildlife species and habitats which would be affected by the project as proposed in Part B of this Final EIR/S, based on information obtained through field survey and published and unpublished resource agencies' data.

Wildlife Habitat Removal

Impact 1: Loss of Mule Deer Habitat

The amount of mule deer habitat which would be impacted by the Proposed Project is summarized in Table C.3-13 and Table C.3-13a. Mule deer winter ranges that would be impacted include those of the East Lassen herd, Adin herd, Devils Garden Interstate herd, Doyle herd, and Loyalton-Truckee herd. Crucial winter range for the interstate deer herd that would be affected occurs in the CDFG's Hallelujah Junction Wildlife Area. Mule deer winter range north of Likely provides winter forage for the East Lassen herd and the Warner Mountain herd. Mule deer migration areas are also located in the vicinity

Table C.3-13 Summary of Direct and Indirect Impacts on Wildlife Habitat[a] - Proposed Project Route

Route Segment and Wildlife Resources[b]	Permanent Habitat Loss (acres)[c]	Temporary Habitat Loss (acres)[d]	Overland Travel Disturbance (acres)[e]	Indirect Impacts[f]
Segment A				
Mule deer winter range	10.2	1.24	.6	
Pronghorn winter range	.03	3.8	1.9	
Pronghorn kidding areas	14.9	.56	.7	
Prairie falcon eyrie				w/in 0.5 mile
Swainson's hawk foraging habitat	.08	2.48	.04	
Golden eagle eyrie				w/in 0.5 mile
Segment C				
Mule deer winter range	1.36	34.6	7.5	
Pronghorn winter range	.15	3.4	3.2	
Pronghorn kidding areas	.07	8.1	1.4	
Ferruginous hawk nest				w/in 0.5 mile
Sage grouse brood/winter habitat	.04	1.65	-	27 acres[g]
Segment E				
Mule deer winter range	.04	2.8	.33	
Pronghorn kidding areas	.12	5.12	.93	
Sage grouse brood/winter habitat	.02	1.7	1.15	9.5 acres[g]
Greater sandhill crane nest				w/in 0.5 mile
Segment K				
Pronghorn kidding areas	.04		.08	
Sage grouse brood/winter habitat	.002		.74	198 acres[g]
Segment L				
Mule deer winter range	.34	18.7	.6	
Pronghorn winter range	.36		.4	
Pronghorn kidding areas	.03		.02	
Sage grouse brood/winter habitat	.009		-	192 acres[g]
Segment N				
Burrowing owl nest				w/in 0.5 mile
Sage grouse brood/winter habitat	.02	.8	.19	20 acres[g]
Proghorn kidding areas		3.4		
Segment O				
Mule deer winter range	.03		.62	
Burrowing owl				w/in 0.5 mile
Loggerhead shrike nest				w/in 0.5 mile
Segment Q				
Loggerhead shrike nest				w'/in 0.5 mile
Segment R				
Mule deer winter range	.07	1.7	4.1	
Segment W				
Mule deer winter range	.211	13.6	8.2	
Loggerhead shrike nest				w/in 0.5 mile
Segment X				
Golden eagle nest				w/in 0.5 mile

a This analysis includes impacts associated with access roads and wire setup areas
b Resources were not identified in Segments T and Y, therefore, these segments are not shown in this table.
c Permanent habitat loss due to structure and substation foundation. Calculations based on material presented in Section B.2.3.2 Transmission Line Construction.
d Temporary loss of habitat in areas where blading occurs. Calculations based on material presented in Table B-3 Construction Access Routes.
e Overland travel disturbance in work areas. Calculations based on information presented in Section B.2.3.2.
f Resources are shown in the Indirect Impacts category if they occur within the buffer zones listed in Table C.3-14.
g This impact is indirect due to the fact that although the physical habitat will still be intact, displacement of the population of sage grouse in the area would occur. See impact #13 and corresponding text for more discussion.

Table C.3-13a Summary of Wildlife Habitat Loss and Offsite Compensation*

Affected Communities and Species	Temp. Loss (A_1)(acres)	Perm. Loss (A_2)(acres)	OT Impacts (A_3)(acres)	Perm. Loss from Access (A_4)(acres)	(A_1 mx Pl x Y)/Tc (Pl=15; Y=3; Tc=50)	A_2 x Y (Y=3)	(A_3 x Pl x Y)Tc (Pl=15; Y=3; Tc=50)	Perm. Access A_4 x Y (Y=5)	Total Comp.
Mule Deer	74.00	12.30	21.93	1.60	66.60	32.79	16.80	8.00	124.19
Pronghorn Antelope	24.40	15.70	8.60	5.40	21.96	47.10	7.80	27.00	103.86
Sage Grouse	4.15	0.09	2.10	1.50	3.74	0.27	0.081	7.50	11.59
Pygmy Rabbit	0.01	0.00	1.30	0.00	0.009	0.00	1.17	0.00	1.18
Swainson's Hawk Foraging Habitat	2.48	0.08	0.32	0.00	0.99	0.04	1.10	0.00	2.13
Totals**	105.04	28.17	34.25	8.50	93.30	80.20	26.95	42.50	242.95

* Mitigation Measure B-21 includes additional off site mitigation requirements for improvements to greater sandhill cranes.

** This summary includes impacts associated with wire setup areas and access roads.

of the Skedaddle Mountains and Little Mud Flat, however, these areas are not crossed by the ROW. The mule deer habitats described above are of limited distribution and are important for sustaining herd populations during the critical periods of winter and migration when forage is available in limited quantity.

Permanent loss of mule deer habitat will occur at structure locations and within permanent access routes. As described in the project description, certain sections of construction access roads within the 160-foot ROW will remain as permanent emergency access routes. Intermittent travel on these routes will effectively result in permanent loss of habitat in a corridor of about 15 feet in width. Temporary loss of mule deer habitat would likely occur as a result of blading to allow vehicle access, temporary staging areas, and at structure construction locations. These would be **Class II** impacts, mitigable with Mitigation Measure B-9, below.

B-9 Mitigation for removal of mule deer habitat including mule deer winter habitat shall generally follow the procedures for avoidance, restoration, and offsite described in Mitigation Measure B-1. Mitigation Measure B-9 addresses mule deer habitat specifically, and would reduce impacts to mule deer to a less-than-significant level. This mitigation would be applied as soon as possible after the conclusion of construction of the Proposed Project, or the following spring. Restoration efforts in mule deer habitats shall be modified, however, to emphasize appropriate deer forage and browse species as agreed upon with management agencies. Annual monitoring of restored habitats will be required to mitigation activities. If vegetation has not become established in areas where revegetation has been attempted, the contingency measure of acquisition of offsite habitat would be triggered.

The permanent loss of mule deer habitat at structure locations or failure of revegetation efforts shall be mitigated through acquisition of suitable mule deer habitat in the vicinity of the project area. Habitat acquired for mitigation shall be subject to purchase, transfer, and/or funding for the appropriate resource agency as described previously in Section C.3.2.2.1. Habitat suitability of parcels identified for acquisition must be verified by CDFG or other appropriate resource agencies.

Based on the formula which is shown below and described in detail in Section C.3.2.2.1, approximately 36.9 acres of habitat shall be acquired to mitigate for permanent loss of mule deer habitat (see Table C.3-13a). This total is based on the calculation shown below.

Ai [12.3 acres] x Y [3] = Ac [36.9 acres of compensation]
(Ai = acres of impact -- based on calculation of substation area and structure area)
(Y= habitat yield ratio -- based on CDFG data)
(Ac = acres of compensation).

Permanent loss of mule deer habitat due to emergency access routes which will remain in place after project construction will require offsite compensation based on the formula presented below. To provide for most efficient mitigation of habitat loss, acquisition totals should be combined with acquisition parcels required for other permanent and temporary wildlife habitat losses as well as compensation for vegetation losses described in Mitigation Measure B-1.

Ai [1.6 acres] x Y [5] = Ac [8 acres of compensation required].

In this formula the yield has been increased to a factor of 5 in order to account for additional unquantified indirect impacts to adjacent resources which will be accessible after construction is complete.

Temporary loss of mule deer habitat shall be mitigated through acquisition of suitable mule deer habitat under the same conditions identified above. Approximately 36.45 acres of mule deer habitat shall be acquired to mitigate for temporary loss of this habitat (see Table C.3-13a). This total is based on the formula and calculation shown below.

Pi [15 years] x Y [3] / TC [50 years] = Cr [.9]
(Pi = period of impact)
(Y = habitat yield)
(TC = period of compensation)
(Cr = compensation ratio).

The compensation ratio is applied to the total area of impact (see Table C.3-13a) and the product is the total number of acres required for mitigation.

Ai [74 acres] x Cr [.9] = Ac [66.6 acres of compensation].

Impact 2: Loss of Pronghorn Antelope Habitat

Sensitive pronghorn antelope habitat areas that would be impacted by the Proposed Project include pronghorn kidding areas, pronghorn migration areas, and pronghorn winter ranges (see Table C.3-13). These pronghorn use areas currently support the local pronghorn herds including the Devils Garden, Upper Pit River, and Likely Tables herds. The seasonal habitats described above provide forage for this big game species during periods when the herds are under stress. Winter range and migration areas are important for pronghorn during the periods when the herds leave the summer range to seek lower elevation areas where snowmelt occurs earlier and forage is available. Kidding habitat is critical for birth and early rearing of the young of the herds. The pronghorn habitat areas described above are finite resources with boundaries and limits for these animals. Loss of these habitats could result in a number of animals failing to breed or the mortality of young during winter or migration. Pronghorn winter range in the Secret Valley and Madeline Plains, migration corridors in the vicinity of Spanish Springs, and kidding areas on the tablelands north of Likely Mountain would be affected by permanent habitat loss at structure locations and permanent access routes, and temporary loss of habitat due to blading of vehicle travel routes. Loss of any of the seasonal use areas for this game species would be considered a significant impact. Through application of Mitigation Measure B-10 below, habitat removal activities would result in a **Class II** impact, which must be mitigated.

B-10 Mitigation for loss of sensitive pronghorn habitat areas would generally follow vegetation restoration procedures described in Mitigation Measure B-1. The purpose of Mitigation Measure B-1 is to replace vegetation which would be damaged or destroyed during construction of the Proposed Project. Successful application of Mitigation Measure B-10 would reduce impacts to proghorn antelope habitat to a less-than-significant level. This mitigation would be applied immediately after construction concludes, or the following spring after rainy season concludes. The restoration plan described in B-1 shall incorporate replacement of appropriate plant and browse species of value to pronghorn, thereby replacing the destroyed food source. Winter range shall be restored to include locally important pronghorn browse species. Restoration for kidding areas shall favor the forbs and low herbaceous cover required by pronghorn during lactation.

If vegetation has not recovered to the degree required after 5 years, the contingency plan of additional acquisition of suitable habitat (see Mitigation Measure B-1) would be triggered. Habitat acquisition would follow the same guidelines which are presented below. The permanent loss of pronghorn habitat (at structure locations and permanent access roads) shall be mitigated through acquisition of suitable pronghorn habitat in the vicinity of the project area. Habitat acquired for mitigation shall be subject to an endowment transfer to the appropriate resource agency (e.g., CDFG) and shall remain under agency ownership in perpetuity as described previously. Habitat suitability of parcels identified for acquisition must be verified by CDFG or other appropriate resources agencies.

Permanent loss of pronghorn habitat would require acquisition of 47.1 acres of suitable habitat for this species (see Table C.3-13a). This calculation is based on the formula shown above in Mitigation Measure B-9, and is summarized below.

Ai [15.7 acres] x Y [3] = Ac [47.1 acres of compensation]
(Ai = area of impact -- based on calculation of substation area and structure area)
(Y= habitat yield ratio -- based on CDFG data)
(Ac = acres of compensation).

Permanent loss of 5.4 acres of pronghorn habitat in the form of emergency access routes which will remain in place after project construction is complete will require offsite compensation based on the formula presented below.

Ai [5.4 acres] x Y [5] = Ac [27.0 acres of compensation required]

In this formula the yield has been increased to a factor of 5 in order to account for additional unquantified indirect impacts to adjacent resources which will be accessible after construction is complete.

Temporary loss of pronghorn habitat shall be mitigated through acquisition of suitable habitat under the same conditions identified above (i.e., endowment transfer and suitability assessment.) Approximately 21.96 acres of pronghorn habitat shall be acquired to mitigate for temporary loss of this habitat. This total is based on the formula and calculation shown below.

Pi [15 years] x Y [3] / TC [50 years] = Cr [.9]
(Pi = period of impact)
(Y = habitat yield)
(TC = period of compensation)
(Cr = compensation ratio).

The compensation ratio is applied to the total area of impact (see Table C.3-13) and the product is the total number of acres required for mitigation.

Ai [24.4 acres] x Cr [.9] = Ac [21.96 acres of compensation].

Impact 3: Loss of Sage Grouse Brood Habitat or Winter Habitat

During brood rearing, sage grouse require wet meadow habitat with grasses and forbs. This habitat provides escape cover, high protein forage in the form of insects, and a reliable source of water during the dry season. Since open habitat is required by this species during brood rearing and a limited extent of this habitat type occurs, loss of brood habitats could result in failure to rear young. Sage grouse brood habitat in the vicinity of Termo at Grasshopper Valley Road, and in the southern portion of the Madeline Plains would be affected by habitat loss associated with Proposed Project. Loss of brood rearing habitat of this Federal Category 2/State Species of Special Concern would be considered a significant impact; however, with application of the Mitigation Measure B-11 below, the effects of these activities would be a **Class II** impact.

Winter habitat is composed of low sage scrub which occurs at lower elevations or in areas where snow cover is reduced due to physiographic features. This habitat type is critical for the survival of the species particularly during winters marked by heavy snowfall.

B-11 The purpose of Mitigation Measure B-11 is to replace vegetation sage grouse brood/winter habitat which would be damaged or destroyed during construction of the Proposed Project. This measure would reduce impacts to sage grouse to a less-than-significant level. Restoration plans implemented for sage grouse brood/winter habitat and water habitat shall generally follow Mitigation Measure B-1 and will include species composition and cover requirements specific to this habitat. For example, sagebrush cover will be limited to 40 percent, and succulent forb species required during brood rearing will be specified. Specific locations and methods for this type of restoration will be identified in the Community and Habitat Restoration Plan and will include portions of the following segments:

- Segment C (adjacent to Rocky Prairie lek)

- Segment E (south of Sage Hen Flat)
- Segment K (in the vicinity of Termo and Grasshopper Valley Road)
- Segment L (in the extreme southern portion of the Madeline Plains)
- Segment N (West of Shuffer Mountain).

Successful application of this mitigation measure would be establishment of suitable vegetation species which were originally present and which provide cover and forage during brood-rearing or winter. Sage grouse lek locations will be located prior to construction and avoided during construction as discussed in Mitigation Measure B-14, specifically, allowable travel areas will be identified and flagged. No travel would be allowed to occur outside these areas. The purpose of this mitigation is to identify the lek so it may be avoided. Successful implementation of this measure would be avoidance of any surface disturbance in any identified sage grouse lek. However, approximately 0.09 acre of sage grouse brood habitat will be permanently lost at structure locations. This loss of habitat will require acquisition of 0.27 acre of suitable habitat for this species. This calculation is based on the formula given for permanent loss of habitat in Mitigation Measure B-9. Habitat acquired for mitigation shall be subject to an endowment transfer to the appropriate resource agency (i.e., CDFG) and shall remain under agency ownership in perpetuity. Habitat suitability of parcels identified for acquisition must be verified by CDFG or other appropriate resources agencies.

Permanent loss of 1.5 acres of sage grouse brood/winter habitat due to emergency access routes which will remain in place after project construction is complete will require offsite compensation at a 5 to 1 ratio based on the formula presented below (see Table C.3-13a).

Ai [1.5 acres] x Y [5] = Ac [7.5 acres of compensation required].

In this formula the yield has been increased to a factor of 5 in order to account for additional unquantified indirect impacts to adjacent resources which will be accessible after construction is complete.

Temporary loss of approximately 4.15 acres of sage grouse brood habitat or winter habitat would occur during construction at structure locations along Segments C, E, K, L, and N. (See Table C.3-13). Based on the formula used in the mitigation measures above (Mitigation Measures B-9 and B-10) the total amount of habitat which must be acquired to mitigate for temporary loss of sage grouse habitat is 3.74 acres. This calculation is based on the following formula.

Ai [4.15 acres] x Pi [15 years] x Y [3] / TC [50 years] = Ac [3.74 acres of compensation].

Mitigation of impacts on this habitat type due to overland travel during project construction will follow the same procedure outlined in Mitigation Measure B-13. The habitat will be monitored for recovery over a five year period with monitoring reports filed with the appropriate agencies. Agency approval is required to establish determination of achievement of success criteria. Any habitat which does not achieve success criteria within a five year period will be mitigated through offsite compensation at the .9 compensation ratio defined in Mitigation Measure B-13. As with all habitat acquired for mitigation, the suitability of habitat to be acquired will require verification by the appropriate agencies, and an endowment transfer will be pursued with the appropriate resources agency.

Overland travel in sage grouse brood or winter habitat would result in loss of 6.5 acres of habitat. These habitat loss areas shall be monitored for a period of 3 to 5 years. Successful achievements of restoration goals must be verified with appropriate resource agencies. If agencies determine that the success criteria has not been met, offsite compensation will be required (See Table C.3-13a.)

Impact 4: Loss of Pygmy Rabbit Habitat

This habitat type occurs within Proposed Segment Q, just south of the Fort Sage Mountains in areas of tall sagebrush with sandy, friable soils. Potential habitat also exists within Segment L, Segment O, and other portions of Segment Q. This special status species habitat could be impacted by habitat removal activities during structure construction and line pulling. Substantial habitat loss related to construction of the Proposed Project would be considered a significant impact on this Federal Category 2 species and State Species of Special Concern. However, with application of the Mitigation Measure B-12, habitat removal activities would result in a **Class II** impact.

B-12 Pygmy rabbit habitat will be spanned by the transmission line; impacts associated with structure construction shall be avoided using avoidance procedure described in Mitigation Measure B-1. Existing roads will be used whenever possible to reduce impacts to this habitat. If overland travel is necessary in pygmy rabbit habitat, those areas will be surveyed for the presence of burrows 24 hours prior to overland travel. One-way trap doors will be placed over burrows to allow rabbits to escape but not re-enter. Biological monitors shall be present to verify that these conditions are met. Monitors shall have the authority to terminate construction activities.

Overland Travel Disturbance

Habitat disturbance as described previously would occur primarily as a result of overland travel during construction and operation activities. Table C.3-13a summarizes the offsite compensation acreages that would be required to mitigate for the overland travel impacts.

Impact 5: Overland Travel in Big Game Habitats

Mule deer and pronghorn seasonal use ranges which would be affected by overland travel during construction and maintenance of the Proposed Project are identified by segment in Table C.3- 13 and include:

- Mule deer winter range in the vicinity of Holbrook Canyon
- Pronghorn migration areas in the Madeline Plains and Secret Valley
- Pronghorn kidding areas on the tablelands north of Likely Mountain

- Pronghorn winter range in the northern Secret Valley area.

Overland travel by 4-wheel-drive vehicles and other vehicles during construction, including line pulling, would result in crushed vegetation in the big game use areas. Crushed vegetation would be a significant impact due to the temporary loss of available forage for the species during critical life stages (CEQA Guidelines 15065). The recovery periods for these habitats depend upon the vegetation species present. The annual grassland habitats in the southern portion of the route, for example, would recover quickly from overland travel impacts. However, some of the sagebrush communities may require more than 15 years to recover. Overland travel disturbance to the big game habitats listed above would be considered a **Class II** impact, which shall be mitigated by Mitigation Measure B-13.

B-13 Big game habitats impacted by overland travel will be monitored on an annual basis for 3 to 5 years. The purpose of this measure is to identify areas where natural regeneration has or is taking place. Successful recovery has occurred when vegetation of the same type which was disturbed has become established. All monitoring reports shall be submitted to the appropriate agency (e.g., CDFG, BLM). Successful achievement of regeneration goals must be verified with the appropriate agencies. If regeneration has not occurred in 5 years, the contingency plan of offsite habitat acquisition would be triggered. Acquisition (see Mitigation Measure B-1) of offsite habitat would follow the same procedure as described in Mitigation Measures B-9 and B-10. The agencies shall make the determination regarding the necessity of offsite compensation and determine the appropriate habitat type which must be acquired using the compensation ratio of .9 shown in the formula below.

Pi [15 years] x Y [3] / TC [50 years] = Cr [.9]
(Pi = period of impact)
(Y = habitat yield)
(TC = period of compensation)
(Cr = compensation ratio).

Impact 6: Disturbance to Special Status Wildlife Species and Habitats

Some special status species habitats would be affected by general disturbance associated with construction and maintenance of the Proposed Project. Overland travel and construction activities such as blasting would be concentrated at the staging areas and around structure locations. Some of the species affected include: ferruginous hawk, Swainson's hawk, northern harrier, greater sandhill crane, sage grouse, loggerhead shrike, long-eared owl, burrowing owl, pygmy rabbit, and spring snails *(Pyrgulopsis),* and the springs, wetlands, or wells upon which these species rely. With Mitigation Measures B-14 and B-15, this would be a **Class II** impact.

B-14 Preconstruction surveys which follow CDFG protocol established during baseline studies shall be conducted to identify sensitive wildlife resources. The purpose of this mitigation measure is to locate and identify current-year sensitive resources so they can be avoided. Burrows, nest sites, sage grouse leks, or other special status wildlife habitat shall be located by biologists and subject to avoidance periods and distances listed in Table C.3-14. Avoidance periods are subject to change upon approval by CEFG, based on weather conditions and species use as determined by CDFG. Allowable travel areas shall be flagged rather than flagging the resources themselves since this might draw attention to sensitive resources. Construction activity shall be restricted to the designated travel areas. Raptor surveys in Daggert Canyon and elsewhere in the vicinity of the Proposed Project will be conducted prior to construction. Nest locations will be documented and avoided. Avoidance of special status species such as greater sandhill cranes and Swainson's hawks shall follow CDFG established protocol in addition to the buffer zones shown in Table C.3-14. Overland travel, vehicle parking, and foot travel shall not be permitted in these areas. Biologists will map and flag these areas before the construction process begins, and monitor construction crews to see that mitigation measures are followed. Qualifications of biological monitors shall be specified in a detailed Mitigation Monitoring, Compliance, and Reporting Plan to be submitted to the responsible agencies 60 days prior to construction. Construction and construction related activities shall not take place within the buffer distance of a sensitive wildlife resource during the avoidance period. Biological monitors shall have the authority to terminate construction activities if any significant adverse reaction to project activities is observed (e.g., incubating birds leave nest or abandon young). Successful application of this mitigation measure would result in no disturbance to sensitive wildlife resources during construction.

Permanent loss of 0.08 acre of Swainson's hawk habitat in the vicinity of Segment A would occur at structure locations (see Table C.3-13). The period of impact and habitat yield are slightly different for this species' habitat than what is shown above for big game and sage grouse habitats. The formula used to determine the amount of habitat which must be acquired for mitigation of the proposed impacts is as follows:

- Ai [0.08 acre] x Y [4] = Ac [0.32 acre of compensation].

To provide for most efficient mitigation of habitat loss, acquisition totals should be combined with acquisition parcels required for temporary wildlife habitat losses as well as compensation for vegetation losses described in Mitigation Measure B-1.

Mitigation for temporary loss of this Swainson's hawk foraging habitat would require offsite compensation. The period of impact and habitat yield for this species' habitat (provided by CDFG) is slightly different than for the species identified above, therefore it is necessary to re-calculate the compensation ratio for temporary loss of habitat:

Pi [5 years] x Y[4] / TC[50] = Cr [.4].

Table C.3-14 Avoidance and Buffer Requirements for Reducing Impacts to Special Status Species

Special Status Species	Habitat[1]	Activity to Avoid	Avoidance[2] Period	Buffer Distance	Buffer for over-flights
Golden Eagle	cliff nests	construction	3/15 - 5/15	0.5 mile	500 feet
Peregrine Falcon	cliff nests	construction	3/15 - 5/15	1.5 mile	500 feet
Prairie Falcon	cliff nests	construction	3/1 - 6/30	1 mile	500 feet
Swainson's Hawk	nests	construction foot traffic	4/15 - 8/1 4/15 - 8/1	0.5 mile 200 yards	500 feet
Sandhill Crane	nest territory crane use areas	construction maintenance	4/1 - 8/15 3/1 - 10/1	0.5 mile 0.25 mile	500 feet 500 feet
Sage Grouse	historic or extant lek locations	construction vehicle monitoring	3/1 - 6/1 3/1 - 6/1	2 miles 2 miles	2000 feet
Pygmy Rabbit	specific sagebrush habitat locations	vehicle monitoring	3/1 - 6/30		none
Ferruginous Hawk	nest site	construction	3/1 - 6/30	0.5 mile	500 feet
Northern Harrier	nest site	construction	3/1 - 6/30	0.5 mile	500 feet
Short-eared Owl	nest site	construction	3/1 - 6/30	0.5 mile	500 feet
Long-eared Owl	nest site	construction	3/1 - 6/30	0.5 mile	500 feet
Burrowing Owl	nest site	construction	3/1 - 6/30	0.5 mile	500 feet
Loggerhead Shrike	next site	construction blasting	3/15 - 6/15 3/15 - 6/15	0.5 mile 0.5 mile	500 feet 500 feet
Deer	winter range	construction	11/15 - 4/15		1500 feet
Deer	fall holding areas	construction maintenance	10/15 - 12/31 10/15 - 12/31		1500 feet
Pronghorn	winter range	construction maintenance	11/1 - 3/31 11/1 - 3/31		1500 feet
Pronghorn	kidding areas	construction blasting maintenance	4/15 - 6/30 4/15 - 6/30 4/15 - 6/30	0.5 mile 1 mile	1500 feet
Pronghorn	migration corridors	construction blasting	11/1 - 12/15 11/1 - 12/15	0.5 mile 1 mile	1500 feet

[1] Avoidance areas will be identified by coordinate or milepost and will be provided to construction management before project construction begins. Based on CDFG recommended requirements.
[2] Subject to modification upon approval by CDFG.

The compensation ratio is multiplied by the total number of acres of temporarily lost (Ai) of habitat and the product (Ac) is the amount of habitat required to mitigate for temporary impacts. This calculation is based on the following formula:

Ai [2.48 acres] x Cr [.4] = Ac [0.99 acres of compensation].

Habitat acquired for mitigation shall be subject to an endowment transfer to the appropriate resource agency (e.g., CDFG) and shall remain under agency ownership in perpetuity. Habitat suitability of parcels identified for acquisition must be verified by CDFG or other appropriate resources agencies.

B-15 During operation and maintenance of the transmission line, any overland travel shall be limited to areas identified within the Mitigation Monitoring, Compliance, and Reporting Plan, which limits travel to upland habitats only in order to reduce impacts to riparian habitats. Successful application of this measure would result in no disturbance to riparian areas and other sensitive areas. The mitigation monitoring program would facilitate application of this mitigation by documenting and providing detailed procedures to which construction crews can be held responsible. The Plan would function to consolidate environmental mitigation measures and their directions/methods for use in the field while monitoring construction. With the exception of Cherry Creek, located at the north end of Secret Valley, where construction crews will use creek crossings created for the Tuscarora Pipeline construction, all riparian habitat shall be avoided by project design, including specific buffer and procedural requirements to be defined in the Stream Crossings and Wetlands Protection Plan (see Part F). Overland travel shall be restricted to designated access routes and specified areas within the 160-foot ROW. Biologists will monitor all overland travel within the proposed ROW and in any area where crews are required to leave existing roads. Biological monitors shall have the authority to terminate construction activities if any significant adverse reaction by special status species is observed (e.g., nest abandonment).

Blasting for some construction footings will be required in the area between Secret Valley and the Pit River. Disturbance to springs which support special status snails (genus *Pyrgulopsis*) would be a significant impacts. To mitigate for this potential disturbance, geologic and soils tests performed prior to construction will identify specific areas where blasting will be required. This location information shall be summarized and provided to CDFG 60 days prior to construction. Directed blasting will be employed at these locations to reduce impacts on wells or springs. Any springs or wells located within 100 feet of the ROW shall be monitored before and after blasting to evaluate changes in flow or yield (see Section C.7 Hydrology). Application of this mitigation would reduce impacts to sensitive habitats in the ROW to a less-than-significant level.

Impact 7: Direct Mortality to Wildlife

The most likely cause of direct mortality to wildlife as a result of the Proposed Project would be due to bird collision (see Impact 11). However, direct mortality could occur throughout the Proposed Project area where vehicle access or other human disturbance occurs during construction or maintenance activities. Direct mortality could occur as a result of animal-automobile collisions, crushing of burrows or nests by heavy equipment, hunting, or illegal take. Direct mortality of reptiles and small mammals which are not as mobile as larger wildlife species would likely occur, resulting in an unavoidable **Class III** impact. Direct mortality of larger, mobile wildlife species would be mitigated according to Mitigation Measure B-16 below, resulting in a **Class II** impact. In addition, mortality of ground-nesting birds (or their young) such as northern harrier, greater sandhill crane, or sage grouse, would be considered a **Class II** impact.

B-16 The purpose of this measure is to provide specific directions and descriptions of actions which would reduce human-contact related mortality among wildlife in the vicinity of the project during construction. In order to reduce direct mortality impacts during construction, construction specifications shall include the following conditions:

- No overland travel in the vicinity of sage grouse lek between 3/1 and 6/1
- Vehicles will not exceed 10 mph on designated access roads or in the ROW
- No guns will be permitted in the vicinity of the Proposed Project, including access roads
- Litter or other debris which may attract animals will be removed from the project area; organic waste will be stored in enclosed receptacles, removed from the project site daily, and disposed of at a suitable waste facility
- No pets will be allowed in the construction area, including access routes and staging areas
- Construction crews will be monitored by a qualified biologist approved by CPUC and BLM
- Biological monitors shall be present when construction occurs in sage grouse nesting or brood habitat, or in the vicinity of sandhill crane or northern harrier nesting areas.

Application of this mitigation measure would reduce impacts to wildlife to a less-than-significant level. Successful application of this measure would result in few to no mortalities among wildlife in the vicinity of the Proposed Project during construction.

Impact 8: Indirect Impacts on Wildlife as a Result of Increased Human Presence

Indirect impacts would occur as a result of increased human presence throughout the project area, with heaviest concentrations occurring during construction at structure and substation locations, during stringing of the line, and at construction staging areas.

Wildlife in the vicinity of the Proposed Project would be displaced by increased human activity and associated disturbance to wildlife. Since this effect could potentially harm wildlife populations including big game species during critical life stages and would increase pressures upon adjacent populations and habitats, the impact would be significant. Mitigation of indirect impacts through avoidance during critical seasons (Mitigation Measure B-17, below) would result in a **Class II** impact.

B-17 The purpose of this measure is to reduce impacts to wildlife as a result of increased human presence during construction of the Proposed Project. Construction and operation activities shall be scheduled to avoid critical seasons. Big game ranges, raptor nests, sage grouse leks, sage grouse brood areas, pygmy rabbit habitats, and other sensitive habitats shall be avoided during specific seasons throughout the construction, operation, and maintenance of the Proposed Project (as specified in Table C.3-14). Table C.3-6a lists by milepost and avoidance period the big game habitats to be avoided. Surveys conducted prior to any construction activities will be performed by qualified biologists to locate raptor nests and other resources in/or adjacent to the ROW and access road areas (specified in Mitigation Measure B-14). Northern harrier, sage grouse, burrowing owl, and greater sandhill crane are ground nesting birds known to occur in the project area. In order to avoid disturbance to ground nests, preconstruction surveys will be conducted to identify current locations of these resources and to flag allowable travel routes. No travel would be allowed to occur outside these areas. Designated existing roads will be used except in limited cases, as described in Appendix E.5, Access Roads Survey Summary. If nests are observed, the avoidance period and buffer distances shown in Table C.3-14 shall be observed.

Surveys will be based on the CDFG survey protocol established for baseline surveys on the Proposed Project. Specific distances from resources (see Table C.3-14) shall be maintained during construction, maintenance, and overflights. Travel areas shall be flagged prior to construction (see Mitigation Measure B-14) and biological monitors as specified by CPUC and BLM shall be present during construction to verify that no vehicular travel occurs outside flagged areas. Biological monitors shall have the authority to terminate construction activates if any significant adverse reaction to project activities by special status species is observed. Successful application of this measure would result in little or no disturbance to wildlife during specific seasons such as breeding season. This would reduce impacts to wildlife to a less-than-significant level.

Impact 9: Indirect Impacts on Wildlife Due to Increased Access to Remote Habitats

During (and, potentially, after) project construction, access to remote areas and wildlife habitats would be improved and members of the public might use these routes for recreation activities. This increased activity would have a significant impact on wildlife populations if humans accessed these areas for hunting, poaching, or during breeding periods or other sensitive periods, making this a significant impact due to disturbance or take. Mitigation Measure B-18 would reduce this effect to a **Class II** impact. The purpose of this mitigation measure is to reduce opportunities for humans to use construction access roads to gain entrance to areas currently inaccessible.

B-18 Except for emergency access roads within the 160-foot ROW, and new access roads created during construction and used during maintenance, roads that are improved during project construction shall be returned to their original condition after construction is complete. Roads created for spur access shall be revegetated (see Mitigation Measures B-1 and B-2); these restoration activities shall also include stacking or scattering boulders in the roadway where appropriate (also see Mitigation Measure B-6).

The intent of this approach is to maintain existing "safe islands" for wildlife: locations where humans, including hunters, rarely occur. Successful application of this measure would reduce impacts to wildlife after construction concludes.

Impact 10: Bird Electrocution at Substation and Structure Locations

The Proposed Project would result in very little potential for bird electrocution from the transmission line and at structure locations along the proposed route. However, as discussed in the impact overview, wires, buswork, and support structures at substations make good perches and electrocution potential may result from the presence of uninsulated equipment. Vulnerable species include ravens, crows, starlings, owls, hawks, gulls, and pigeons. Loss of raptors or special status birds would be considered a significant impact due to the potential for substantial reduction in locally sensitive raptor populations (CEQA Guidelines Section 15065). Mitigation Measure B-19, below, if applied during construction, would reduce this impact to the **Class II** level.

The intent of this measure is to incorporate wildlife/avian protection into the design of substations. Application of this measure would result in few or no bird electrocutions at substation sites.

B-19 Substations will be designed to eliminate the attractions of perching and roosting and to minimize bird electrocutions. Design features shall include:

- Replacement of mercury bulbs with sodium bulbs which do not attract insects (insects, in turn, act as a food source to attract raptors and other birds)
- Use of perch deterrents.

In order to evaluate success of this measure, biannual monitoring (twice per year) of substations would be conducted for five years after construction. The timing of surveys would be established by the responsible agencies. Monitoring would be accomplished by qualified biologists who would survey substations and interview substation maintenance persons to document avian mortality. Reports would be filed with CDFG and BLM.

Impact 11: Potential Bird Collisions with Transmission Lines

Bird collisions with transmission lines would potentially occur in areas where the line would bisect waterfowl, shorebird, wading birds, or raptor habitats. Additional potential for collision would occur during migration periods when migrant flocks reduce altitude in order to land and feed. Potential collisions by waterfowl and shorebirds are likely to occur in the area of the Pit River crossing west of Alturas because the proposed transmission line would bisect wetland habitats there that are used by a variety of waterfowl and shorebirds. During foggy conditions wintering raptor populations would also be affected by the Proposed Project as it crosses the Pit River area. The Madeline Plains region, the Honey Lake region, and Long Valley Creek also support waterfowl and shorebirds, particularly during migration. Potential for sage grouse collisions would occur north of the town of Likely, in the Madeline Plains, and in Secret Valley. Raptors use habitats throughout the entire ROW from Reno to Alturas. The potential for bird collisions throughout the ROW would be increased as a result of the Proposed Project.

Loss of bird species protected by the Migratory Bird Treaty Act or the Federal/State Endangered Species Acts and the Bald Eagle Protection Act would be considered a significant impact. Proposed route segments have been analyzed for potential risk of bird collisions. The analysis, presented in Table C.3-15, identified species that would be affected, habitat use, flocking behavior, and transmission line oversitation factors. Mitigation Measure B-20 applies to specific areas where there is a moderate-to-high probability of bird collisions. Mitigation measure B-21 provides for a modification of the proposed route for Segment A in order to decrease bird collision impacts. These measures would reduce impacts to a less than significant level (**Class II**); note that potential impacts on sandhill cranes are discussed below under Impact 12.

The intent of this measure is to reduce the potential for avian collision with the transmission line. Bird flight diverters would be installed during project construction.

B-20 Powerlines shall be marked with "bird flight diverters." Aviation marker balls have been installed at the Modoc National Wildlife Refuge (near Alturas) to significantly reduce collision mortalities among cranes. However, aviation marker balls increase wind-loading, trap bird talons, and become targets for indiscriminate shooters. Therefore, bird flight diverters are recommended. The flight diverters are similar to spiral vibration dampers and have proven to be effective to increase visibility of the lines. Vibration dampers are approximately 15 inches in length and spiral around the ground wire from which they are suspended (illustration provided in Appendix E.2). Spacing will be at approximately every 15 feet.

The segment portions which would be fitted with bird flight diverters are shown in Table C.3-16. The segments indicated would be included in monitoring three times per year (once in Fall, near November 1st; once in Spring, April 15; and once during the peak breeding season, near June 15th) for the lifetime of the project. A detailed collision monitoring plan would be included in the Mitigation Monitoring, Compliance, and Reporting Plan. Monitoring would allow for identification of areas where additional bird flight diverters need to be applied. This Measure would be sucessful if few to no avian collisions occur on an annual basis.

A monitoring effort would be conducted three times per year (once in Fall, November 1st; once in Spring, April 15; and once during the peak breeding season, June 15th) for the duration of the Proposed Project. Monitoring would allow for identification of areas where additional bird flight diverters need to be applied. This measure would be successful if few to no avian collisions occur on an annual basis.

The lifetime monitoring requirement is a stipulation for the USFWS to issuance of an "incidental take" permit [50 CFR section 420(i)(e) *Reporting Requirements*]. If the monitoring efforts show that "takes" associated with collisions with the proposed transmission line are in fact only "incidental", Section 7 consultation under the Federal Endangered Species Act (see Section C.3.1.3) may be reinitiated by the responsible agencies and the terms of the monitoring may be reduced or discontinued entirely. Monitoring would occur on a three times as directed by the agencies.

Additional monitoring would be conducted within segments which have not been fitted with bird flight diverters. These segments would also be monitored three times per year in order to identify instances when, or if, additional bird flight diverters may be required. Monitoring requirements for the segments listed in Table C.3-17 would be concluded after 5 years provided that there is not a significant number of additional collisions or "takes" reported in these segment locations.

Table C.3-15 Species, Environmental, and Line Characteristics that Increase the Potential of Bird Collisions along the Proposed Transmission Line Route

Segment	Collision Susceptible[1] Species and Habitat Use	Weather	Line Placement	Line Orientation	Potential Collision Risk
Segment A	Bald eagle: perching, feeding Peregrine falcon: perching, feeding Ferruginous hawk: perching, feeding Greater sandhill crane: nesting, feeding White-faced ibis: feeding Golden eagle: nesting Other waterfowl/shorebirds: nesting, feeding	• Seasonal valley fog in fall, winter, and spring will increase potential collision rate for migrants as well as resident birds • Seasonal strong winds	• River valley • Low vegetation • Existing power lines • Crosses South Fork Pit River • Near nesting and feeding cranes, waterfowl and shorebirds	• Perpendicular to some known flight paths, especially eagles and cranes	High
Segment C	Ferruginous hawk Golden eagle Sage grouse	• Seasonal strong winds	• High plateau • Existing powerlines		
Segment E	Bald eagle: perching, feeding Golden eagle: perching, feeding Greater sandhill crane: nesting, feeding Waterfowl: nesting, feeding	• Seasonal valley fog • Seasonal strong winds	• Route follows mostly eastern edge of northern Madeline Plains	• Perpendicular to some flight paths • Adjacent to feeding area	Low to Medium
Segment K	Swainson's hawk: perching, feeding Ferruginous hawk: nesting, feeding	• Seasonal strong winds	• Route follows mostly western edge of southern Madeline Plains	• Parallels railroad and two telephone pole lines and Highway 395 • Bisects large open east/west valley	Low
Segment O	Peregrine falcon: nesting, feeding Waterfowl: nesting, feeding	• Seasonal strong winds • Seasonal fog	• Route is 1.5 miles from active eyrie • Route follows east shore of Honey Lake	• Perpendicular to some flight paths	Medium
Segment Q	Swainson's hawk: perching, feeding	• Seasonal valley fog • Strong seasonal winds	• Wetlands • Waterfowl nesting and feeding area	• Bisects small riparian areas found in Dry Valley	Low to Medium
Segments T and W	Waterfowl/shorebirds: nesting, feeding	• Seasonal valley fog • Seasonal strong winds	• Wetlands • Waterfowl nesting and feeding area	• Parallel Highway 395 and railroad above Long Valley	Low to Medium

Table C.3-16 Proposed Project and Alternative Segments Requiring Bird Flight Diverters

Milepost	Habitat Type	Additional Observations
Segment A		
MP-3.5 to MP-6.5	Pit River Crossing	Documented bald eagle wintering area, and greater sandhill crane and waterfowl use areas
Segment C		
MP-15 to MP-20	Open grasslands	Documented raptor and sage grouse use areas
(Alternative) Segment B		
MP-2.2 to MP-5.8	Pit River Crossing	Documented bald eagle wintering area, and greater sandhill crane and waterfowl use areas
Segment E		
MP-46 to MP-52	Madeline Plains Region	Documented bald eagle wintering area, and greater sandhill crane, sage grouse, and waterfowl use areas
(Alternative) Segment ESVA		
ESVA-8 to ESVA-23	Secret Valley	Documented raptor use area
Segment K		
M.P-77 to MP-82	Secret Valley	Documented raptor and sage grouse use areas
(Alternative) Segments F, G,and I		
F-1 to F-4; G-1 to G-10; I-1 to I-2	Madeline Plains Region	Documented bald eagle wintering area, and waterfowl, raptor, and greater sandhill crane use area
Segment O		
MP-96.5 to MP-104.5	Honey Lake Valley	Documented bald eagle wintering area, and shroebird and wading bird stopover
MP-104.5 to MP-114	Honey Lake Valley	Documented raptor use area and shorebird stopover
(Alternative) Segments S, U		
MP-132.5 to S-1; MP-3 to U-2	Long Valley Creek	Migratory corridor for bird species
Segment Q		
MP-133 to MP-136	Long Valley	Raptor use area
Segment W		
MP-149 to MP-153	Long Valley Creek	Raptor use area
Alternative Segment X-East		
XE-1 to MP-163	West of 395 near Reno	Raptor use area
Segment X		
MP-153 to MP-153.3; MP-154.4 to MP-154.7;	Isolated wetland habitat in vicinity of White Lake	In vicinity of waterfowl and shorebird use area adjacent to White Lake. Wetlands in this segment may be used by migrating birds initially drawn to lake.

Table C.3-17 Segments Without Bird Flight Diverters that Require Monitoring

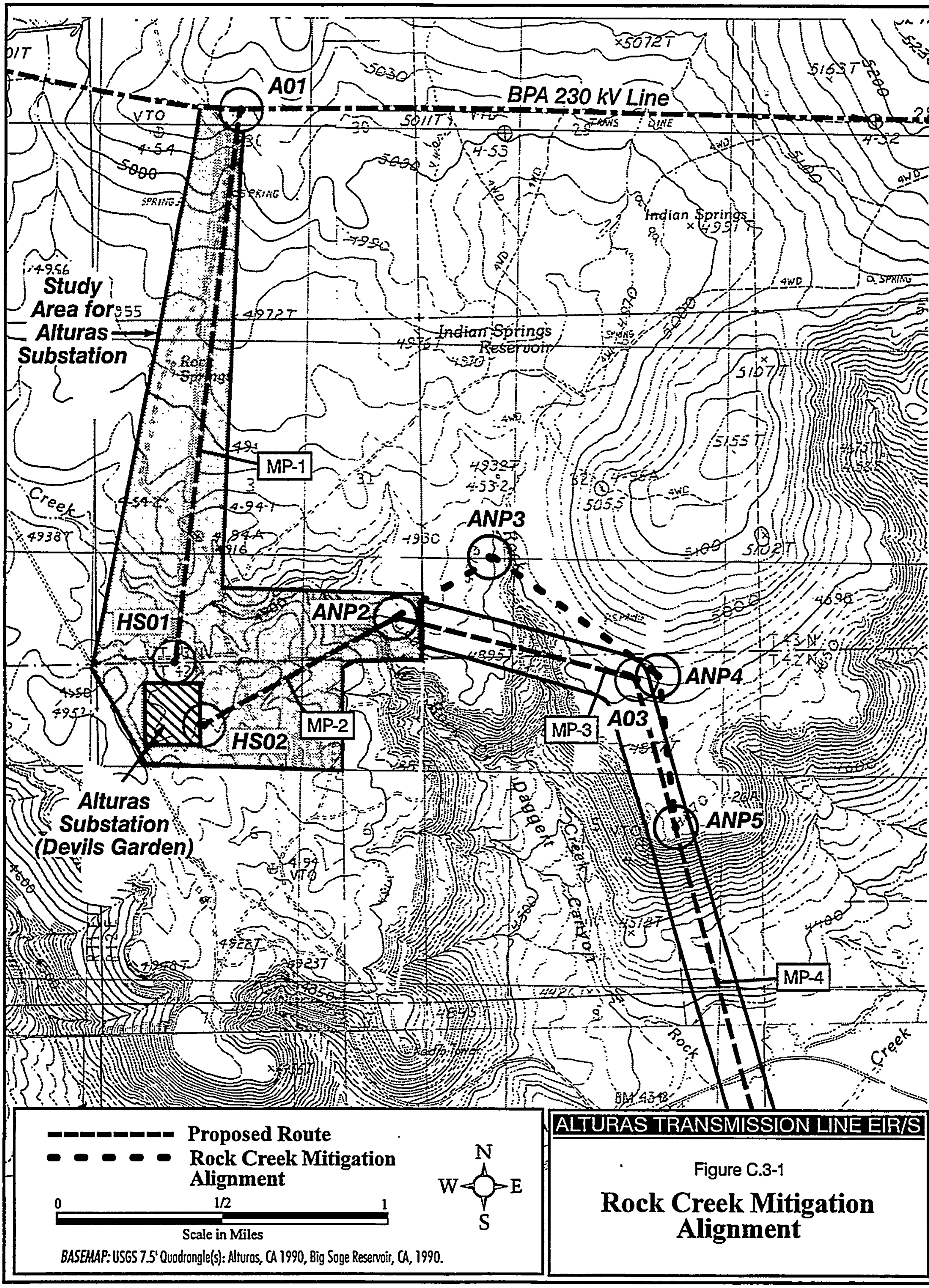
Milepost	Habitat Type	Additional Observations
Segments C and E		
MP-34 to MP-37	North of Madeline Plains	Adjacent to documented bald eagle wintering area.
Segment E		
MP-40 to MP-44	Southern Madeline Plains	South of documented bald eagle wintering area
Segment L		
MP-82 to MP-86.5	Vicinity of Little Mud Flat	No observations of eagles using area to date.
Segments Q and R		
MP-130.5 to MP-133	Extreme northern end of Long Valley	Just south of southern-most observation of bald eagles in project area.

The locations listed in Table C.3-17 have been determined based on observations of bald eagle and raptor behavior in the vicinity of the ROW. The purpose of monitoring these additional segments is to identify any need for additional bird flight diverters. In addition, these segments may be used as "control" segments if statistical methods are applied to monitoring efforts.

Guidelines for survey methodology are described below. Surveys would be conducted beneath all segments marked with bird flight diverters (see Table C.3-16) and the unmarked segments (See Table C.3-17).

Two observers would conduct searches for avian fatalities by searching up to 600 feet on either side of the outside edge of the ROW. Particular attention should be paid to shrubs and areas which might offer cover to an injured bird. Any fatalities observed would be identified by species, if possible, and recorded on data sheets. Any evidence or indication of avian fatalities would also be recorded. If possible, cause of death would be determined (e.g., broken neck, damaged wing, etc.). Scavenger rates would be estimated based on data available in the literature. Additional study design and evaluation criteria would be based on the Brown, et al. publication, *Mitigating Bird Collisions with Powerlines*. This document was prepared by biologists and powerline engineers and includes currently accepted methods for monitoring success of mitigation measures.

B-21 A more northerly route across the head of Rock Creek along Segment A, per the recommendation of Modoc National Forest (letter dated February 28, 1995) and presented in Figure C.3-1, shall be employed to provide decreased collision impacts on birds, including nesting prairie falcons and golden eagles that use the rocky cliff structures in the area that would be spanned by the proposed route at Rock Creek (span distance of approximately 700-900 feet), and on waterfowl using the corridor between Indian Springs Reservoir, Big Sage Reservoir, Lower Cummings Reservoir, Upper Cummings Reservoir, and the Pit River. Slightly greater loss of mule deer habitat and vegetation due to structure construction may result; spring biological surveys shall be conducted in conjunction with the detailed mitigation plan implementation effort, if the project is approved with this measure adopted.



ALTURAS TRANSMISSION LINE EIR/S

Figure C.3-1

Rock Creek Mitigation Alignment

This measure would also result in the potential reduction or elimination of visual skylining at the head of Rock Creek and reduced impacts on recreational visitors to Upper Daggert Canyon by avoiding the bike route at the head of Daggert Canyon. This measure would also probably be advantageous from a geological and soils erosion standpoint due to gentler terrain/topography, unless more blasting is needed (a distinct possibility given the need for one more structure, but a highly site-specific potential requirement). More of the route would be in Modoc NF (approximately 1,900-2,100 feet more). There are no additional springs, creeks, or wetlands that would be encountered by this measure.

Based on provisional NRHP eligibility recommendations, this measure has the potential for significant impacts at the following five sites (sites that appear to be significant or unevaluated):

- KEC-2017: this site is a scatter of obsidian debitage and also contains a prehistoric house ring
- KEC-2019: this site is a scatter of ground stone and also contains what appears to be a prehistoric rock ring
- KEC-2022: this site is an obsidian scatter of debitage and tools
- KEC-2023: this site is an obsidian scatter of debitage and a single Elko series projectile point
- KEC-2024: this site is an obsidian scatter of debitage and tools.

In addition, the measure contains two sites that do not appear to retain those qualities necessary for inclusion on the NRHP. KEC-2018 is an improved spring with a wooden trough. KEC-2021 is an apparent prehistoric stacked stone feature. The impacts to the five provisionally significant sites would be mitigable through avoidance or data recovery/archival research thereby resulting in Class II impacts to the cultural resource base. In contrast, the portion of Proposed Segment A replaced by the Rock Creek Alternate would have the potential to result in Class II impacts to three sites, one of which extends over an extensive area.

Environmental issue areas for which no significant difference could be expected for the subject measure (in comparison with the corresponding section of Proposed Segment A) include air quality, energy and utilities, noise, public health and safety, socioeconomics and public services, and transportation and traffic.

Impact 12: Potential for Special Status Bird Species to Collide with Transmission Lines

Several special status bird species with the potential for collision with power lines occur in the Proposed Project area. These species include: bald eagle, Swainson's hawk, peregrine falcon, golden eagle, sandhill crane, and sage grouse. Compared to the sandhill crane, the bird special status species listed above are not as likely to collide with the transmission line due to either flight behavior or duration of occurrence in the project area (for species-specific analysis of collision potential please see Appendix E.2). Mitigation Measure B-20 would reduce the potential impact to a less than significant level (Class II) for the special status bird species listed above, with the exception of the greater sandhill crane. The greater sandhill crane breeds in the vicinity of the Proposed Project area and is highly susceptible to collision with transmission lines. Therefore, a quantitative estimate of the impact potential for this California-designated Threatened species has been prepared and is summarized below.

In order to establish a quantitative estimate of potential sandhill crane collisions associated with the proposed transmission line, a literature survey, several field surveys and consultations with experts have been conducted (see Appendix E.1, pages E.1-48 through E.1-52). The potential impact has been estimated based on the following equation:

(Number of flights per year over transmission lines) x (Collision rate) = (Total mortalities per year)

Through application of a collision rate determined from both literature data and local observations at Modoc National Wildife Refuge, the estimated project-caused loss of sandhill cranes is approximately 1.8 individuals per year. After application of Mitigation Measure B-20, the residual impact of .8 individuals lost per year would still be a significant impact, requiring offsite compensation as described below under Mitigation Measure B-22 **(Class II** impact).

B-22 This mitigation measure has been created to provide additional breeding opportunities to mitigate for potential loss of greater sandhill crane due to collisions with transmission line. Successful application of this measure would result in increased breeding territory and therefore increased production of greater sandhill cranes. Success will be monitored for the lifetime of the Proposed Project on an annual basis. Mitigation for the residual impact of .8 individuals per year requires offsite compensation: suitable nesting habitat for the greater sandhill crane shall be acquired and managed for sandhill cranes. The following equation was used to determine the total number of acres required to compensate for loss of greater sandhill cranes.

Yearly crane loss [.8] / Nesting territory production rate [.4] x Average nest territory size [100 acres] x Yield [1.74] = Ac [348 acres of compensation].

Based on this formula, approximately 348 acres of suitable crane habitat must be acquired to compensate for the yearly loss of .8 cranes. Land acquired to satisfy this mitigation measure will be suitable nesting habitat for greater sandhill cranes. The CDFG must verify that the land is suitable nesting habitat prior to the acquisition. This verification shall include a site visit and habitat evaluation. Water rights or access to water supply for the parcel chosen must also be acquired to provide for management of the habitat during the crane breeding period. Ownership and management of the land and any necessary associated funding shall be given to the appropriate resource agency (e.g., CDFG) as discussed previously for other offsite compensation requirements.

In addition, a five-year monitoring program shall be established for the Proposed Project to evaluate the effectiveness of the line marking mitigation, and to monitor crane during production on the compensation habitat land. Monitoring would be conducted during the month of April to determine if a nest territory has been established and to evaluate nesting success of the pair. Monitoring would consist of approximately 5 monitoring days, during which time biologists would observe from a safe distance using spotting scopes and binoculars. Observations would be scheduled to occur for 2 hours at dawn and 2 hours at dusk, with additional observations for signs of crane use to be conducted throughout the day. Documentation would include observations of crane behavior on or near the parcel, physical descriptions of the condition of the habitat, photographs of the existing conditions of the parcel, and documentation of contacts with local USFWS or CDFG biologists to summarize any knowledge of general nesting success for the local population of cranes during the current nesting season. The results of the surveys would be filed with the CDFG Region I and the Modoc National Wildlife Refuge. If nesting success has not occurred on the parcel, and there has been one or more crane collisions with the proposed transmission line, the contingency of additional habitat acquisition (see Mitigation Measure B-1) shall be triggered.

Impact 13: Increased Predation on Ground-Nesting Birds, Small Mammals, and Waterfowl

The tall structures associated with the Proposed Project would allow raptors and ravens to perch and gain broad views of surrounding habitats while hunting. This benefit to raptors and ravens would put many prey species at a disadvantage and could cause dramatic decreases in their populations, including upland bird species such as sage grouse, nesting waterfowl, and greater sandhill cranes, and small mammals such as pygmy rabbit. Sage grouse would be displaced from habitat within 0.5 mile of the transmission line. This may result in reduction of a population. Loss or reduction of this upland bird population would be a significant impact. This impact is most likely to occur in Segments C, E, K, L, and N. Potential increase in predation upon the small mammal species and waterfowl or crane eggs would be a significant impact (CEQA Guidelines Section 15065 and Appendix H). With implementation of Mitigation Measures B-23 and B-24, this would result in a **Class II** impact.

B-23 The purpose of this mitigation is to prevent raptors from preying upon the sage grouse populations by using the proposed transmission line as a perch. Perch deterrents shall be installed on structures located within a two-mile radius of an established lek location and in areas which have been identified as potential sage grouse brood habitat. In addition, perch deterrents that have been shown to be effective on other transmission lines would be placed in locations adjacent to waterfowl and crane nesting habitat and in pygmy rabbit habitat. Perch deterrents offer additional protection from other species, such as owls. Specific design/type of perch deterrents would be determined and illustrated in the Mitigation Monitoring Plan. Design would be based on existing designs which have been shown to be effective for other projects. If a new design is used, success rate must be subject to increased monitoring and documentation of success. Perch deterrents shall be installed on portions of the following segments:

- Segment A — waterfowl and crane nesting habitat within 1 mile of proposed line
- Segment C — sage grouse lek within 1 mile of proposed line; brood habitat
- Segment E — sage grouse brood habitat present in some locations; crane nesting habitat
- Segment K — sage grouse leks and brood habitat and potential crane nesting habitat
- Segment L — sage grouse leks and brood habitat present in some locations
- Segment N — sage grouse and pygmy rabbit present in some locations
- Segment O — waterfowl nesting habitat at Amedee Marsh.

Successful application of this mitigation would result in few or no birds of prey perching on the proposed transmission line. Monitoring of success of this measure would involve conducting windshield surveys of the segments which have perch deterrents applied. Monitoring should occur during a season or seasons to be determined by the Lead Agencies in consultation with CDFG. Monitoring should continue for 2 years. If perch deterrents are applied and greater than 5 raptors annually are identified using the Proposed Project as a perch, the contingency plan would be triggered. The contingency plan would involve design or re-design of new perch deterrents, and limitation and implementation of a two-year study of effectiveness to be conducted in a known raptor use area.

B-24 The purpose of this measure is to mitigate for potential impacts to sage grouse as a result of displacement from suitable habitat along the ROW. Approximately 465 acres of sage grouse habitat has been identified in the transmission line ROW, which is equivalent to 5.33 miles of the ROW. Sage grouse may be displaced from approximately 5 square miles of habitat as a result of the Proposed Project. Habitat enhancement in areas outside would be required to mitigate for this loss.

Monitoring of the 0.5 mile area on either side of the transmission line would be accomplished during preconstruction surveys and post construction surveys (primarily in the form of searches for pellets). If monitoring efforts reveal that grouse are no longer using the 0.5 mile area, or that significant reduction occurs, habitat enhancement of adjacent habitats would be implemented.

Examples of habitat enhancement would include clearing of dense sagebrush habitats, establishment of permanent water sources, and managing lands to encourage increased production of grasses and forbs. Habitat enhancement for sage grouse in areas outside of a 0.5 mile area on either side of the transmission line center line where sage grouse habitat would be affected by the proposed transmission line would occur in the Hallelujah Junction Wildlife Area, the Secret Valley area (Biscar Wildlife Area), the southern Madeline Plains, and the Sage Hen Summit area north of the town of Madeline. The specifications of sage grouse habitat enhancement would be described in a habitat enhancement plan which would be presented to the appropriate agencies for approval 60 days prior to construction. Implementation of the plan would be completed prior to conclusion of construction. Monitoring requirements would include a 5-year monitoring study tht would document sage grouse use of enhanced areas.

C.3.2.3 Cumulative Impacts and Mitigation Measures

Vegetation

Cumulative impacts on vegetation resources include all impacts by projects that are planned or projected to be built during the life of the proposed Alturas Transmission Line Project. Projects were considered in the cumulative analyses if their potential impacts considered together with the impacts of the Alturas Transmission Line would be additive and compound or increase the vegetation impacts assessed above. Projects considered and their locations include:

- Tuscarora Gas Pipeline, Malin, Oregon, to Tracy, Nevada
- Centerville Estates, southwest of Alturas near Three Sisters
- Modoc Farms T100, southwest of Alturas near Three Sisters
- Wildlife Estates, southwest of Alturas and south of Centerville Road approximately 2 miles west of U.S. 395
- Land Subdivision (no name), adjacent to project route Segments A-6 to C-1
- Potential future Lassen County tie-in with Alturas Transmission Line, northern margin of Honey Lake Valley between Wendel and Susanville
- Hog Farm, near alternative project Segment M south of Angle Point LØ8
- Sierra Lady Mineral Project, four 5-acre sites near Segments U, V, W, and Z
- Fish Springs Ranch Pumping Project, east side of Fort Sage Mountains
- California Correctional Facility, Susanville, 13 miles west of Proposed Project

- Ski Resort/Golf Course, less than 1 mile west of U.S. 395 in Long Valley/Balls Canyon area
- Infernal Caverns Battlefield Trail Project
- West Valley Pumped Storage Hydroelectric Plant, approximately 10 miles east of Likely Mountain between Madeline and Likely
- Ravendale School, Termo-Grasshopper Road near Alternative Segment J (J-3 to J-4)
- Evans Creek Flood Control Project, near Proposed Segment X (X-12 to X-13)
- Expansion of Boder Town Substation site to serve the North Valleys area.

Proposed or pending projects most likely to contribute additional proposed impacts on vegetation resources include the Tuscarora Pipeline Project, the proposed future Lassen County tie-in with the Proposed Project, the land subdivisions proposed southwest of Alturas, and the West Valley Pumped Storage Hydroelectric facility. The remaining projects are not likely to contribute significantly to cumulative impacts with the Proposed Project.

With the exception of the Tuscarora Pipeline Project and the Evans Creek project, quantitative assessments of potential impacts to vegetation communities are not available for any of the other proposed cumulative projects listed above. Therefore, the cumulative impacts of these projects are not quantitatively assessed in this section. However, each of the projects are likely to result in additional incremental impacts on natural plant communities, jurisdictional wetlands, and special status plant species already affected by the Alturas Transmission Line Project.

The Tuscarora Pipeline Project, Evans Creek Project, and the Alturas Transmission Line Project would affect the following natural plant communities:

- Montane meadows
- Juniper woodland
- Low sagebrush scrub
- Volcanic gravels
- Stabilized or partially stabilized dunes
- Big sagebrush scrub
- Silver sagebrush scrub
- Chenopod scrub
- Mud flat
- Volcanic vertisols
- Yellow pine forest.

The Tuscarora Gas Pipeline Project would result in surface removal and/or disturbance of approximately 3,000 acres of natural plant communities (FERC, 1994). The Evans Creek flood control project would potentially result in permanent loss of an estimated 3 acres and temporary loss or disturbance of an estimated 10 to 20 acres of big sagebrush scrub. The preferred route for the Alturas Transmission Line Project would result in permanent loss of approximately 40 acres and temporary loss or disturbance of approximately 170 acres of natural plant communities. Impacts on these plant communities will be mitigated by a combination of avoidance, restoration, and offsite compensation. Restoration of these plant communities will involve a period of recovery during which some of the pre-construction habitat values may be lost. Offsite compensation may be necessary to offset temporary loss of habitat until the restored plant communities have met their final success criteria. The factors that would be used to evaluate the recommended area for offsite compensation of temporary loss of plant community functions and values are discussed in Section C.3.2.2.1.

The Evans Creek project has no potential impacts on special status plant species. Special status plant species affected by both the Tuscarora Pipeline and Alturas Transmission Line projects would include:

- Suksdorf's milkvetch (*Astragalus pulsiferae* var. *suksdorfii*)
- Henderson's lomatium (*Lomatium hendersonii*)
- Spiny milkwort (*Polygala subspinosa*).
- Cusick's stickseed *(Hackelia cusickii)*
- Raven's lomatium *(Lomatium ravenii)*
- Pink Creek evening primrose *(Camissonia boothii spp. alysoides)*
- Twin arnica (*Arnica sororia*)
- Falcate saltbush (*Atriplex gardneri* var. *falcata*)
- Nelson's evening primrose (*Camissonia minor*)
- Doublet (*Dimeresia howellii*)
- Volcanic daisy (*Erigeron elegantulus*)
- Clay-loving buckwheat (*Eriogonum collinum*)
- Lilliput lupine (*Lupinus uncialis*)
- Dwarf lousewort (*Pedicularis centranthera*)
- Lance-leaf scurf-pea (*Psoralidium lanceolatum*)
- Holmgren's skullcap (*Scutellaria holmgreniorum*)
- Green prince's plume (*Stanleya viridiflora*).

The cumulative impacts to these species would include impacts on about 15 populations of Suksdorf's milkvetch, of which 6 would be impacted by the Alturas Transmission Line project. A total of 4 populations of Henderson's lomatium would be affected by both projects, of which one would be affected by the Alturas project. The two projects would also affect about 12 populations of spiny milkwort, of which 10 would be affected by the proposed Tuscarora Pipeline. A total of 43 populations of Cusick's stickseed would be affected by both projects, of which 11 populations would be affected by the Alturas project. A total of 6 populations of Raven's lomatium would be affected by both projects, of which 5 would be affected by the Alturas project. A total of 2 populations of the Pine Creek evening primrose would be affected by both projects, of which 1 would be affected by the Alturas project. While the Alturas project would have less effects, the total impact would be substantial. Therefore, the incremental effect of the Alturas project would contribute to a large, regionally significant cumulative impact. All significant impacts to these special status plant species could be mitigated through a combination of avoidance, restoration, and offsite compensation. No significant residual cumulative impacts to special status species are anticipated if the mitigation measures specified for each of the Proposed Projects are implemented.

Wildlife

The projects considered above for vegetation impacts are reasonably foreseeable, but as yet specific amounts of disturbance to wildlife/wildlife habitat have not been identified for most of these projects. The proposed Tuscarora Gas Pipeline Project is the largest single contributor to cumulative impacts. The Evans Creek Flood Control project, which would be located adjacent to the southern terminus of the Alturas Transmission Line, would result in loss of 10-20 acres of sagebrush habitat. This would not create additional impacts to big game or to special status wildlife.

The Tuscarora Pipeline and Alturas Transmission Line projects will both affect wildlife resources in the vicinity of Alturas south to the Reno area. Big game habitats which would be affected by both projects will include:

- Pronghorn migration areas
- Pronghorn wintering areas
- Pronghorn kidding areas
- Mule deer migration areas
- Mule deer holding areas
- Mule deer winter areas
- Pronghorn summer/year-round use areas
- Mule deer summer/year-round use areas.

Loss or disturbance to these habitats would be mitigated through restoration and offsite mitigation to provide additional habitat during vegetation recovery periods.

Construction-related disturbance to local wildlife and special status species would include increased noise from heavy equipment use or blasting, increased human presence, direct mortality, and indirect impacts such as displacement of local animal populations. These effects will require mitigation measures to be applied during the construction process for each project. Construction will be planned for both projects to avoid sensitive habitats including the establishment of CDFG-recommended protective buffer distances and avoidance distances and times of activity which will be applied during the life of both projects.

Bird collision and electrocution potential are associated with the Alturas Transmission Line Project. This impact category would apply only to the Alturas project, and would not be an additive impact.

Relative to the Tuscarora project, the Alturas project would result in significantly less habitat removal; however, the total amount of habitat removed as a result of both projects would be substantial. Therefore, the incremental additional habitat which would be removed as a result of the Alturas project would contribute to a large, regionally significant cumulative impact. The combined effect of project-specific mitigation measures and offsite habitat compensation would reduce and compensate for these impacts.

Road-clearing and surface disturbance as a result of the vehicle access required during construction of both projects would also create the effect of habitat fragmentation during the time required for recovery and/or restoration vegetation to become established. This impact over large areas of regionally important habitat would result in an additional significant cumulative impact, mitigable through rigorous application of project-specific mitigation measures; additional offsite mitigation is required for some terrestrial species including big game and sage grouse on both projects.

The Alturas project would have the effect of incremental widening of the transportation/utility corridors already present in the study area such as Mud Flat, Secret Valley, and the Madeline Plains. In areas such as Mud Flat, (northeast of Susanville) which already include Highway 395, telephone lines, low voltage powerlines, underground fiber optics cable, and the new Tuscarora Pipeline, the proposed Alturas project would effectively expand the transportation/utility corridor to nearly a mile wide. Although much of the disturbance from the Proposed Project would be short-term (with the exception of collision impacts and increased predator perches), this impact would be additive in areas such as the Mud Flat area where substantial disturbance has already taken place.

C.3.2.4 Unavoidable Significant Impacts

Bird collision potential will be significantly reduced through the application of recommended mitigation measures (Koop and de Jong, 1989). Studies have shown that waterfowl collision rates can be reduced by as much as 89 percent using flight diverters. However, due to the dynamic nature of waterfowl and shorebird habitats in the vicinity of the project, it is likely that during the lifetime of the Proposed Project a small number of bird collisions would still occur. Loss of bird species protected by the Migratory Bird Treaty Act would be considered a significant and unavoidable impact.

C.3.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

C.3.3.1 Alturas Area Alternative (Alignment B)

C.3.3.1.1 *Environmental Setting*

Alternative Segment B would cross the Pit River Valley adjacent (west) to the town of Alturas, well east of the Warm Springs Valley area. This segment crosses agricultural, riparian, and montane meadow habitats in the vicinity of Alturas. The plant communities associated with Alternative Segment B differ in some respects from those noted for Segment A on the northern portion of the proposed route. The portion of Segment B north of the Pit River is almost entirely cultivated or disturbed habitats, whereas Segment A of the proposed route is largely undisturbed northern juniper woodland north of the Pit River.

A second difference is the number of special status plant occurrences on Segment A relative to Segment B. Nine populations of special status plants occur on Segment A, whereas Segment B has only a single occurrence located near the intersection of the two alignments (see Table C.3-18). Segment B intersects approximately 400 linear feet of the sensitive Alturas volcanic gravels habitat near its southern terminus; Segment A intersects approximately 1,600 linear feet of the volcanic gravels between the Pit River crossing and the intersection with the B segment. The wetland areas adjacent to the Pit River that are crossed by Segment B do not differ substantially from the area crossed by Segment A. Both areas are generally similar in length, species composition, and wetland functions and values.

Wildlife habitat in the Pit River drainage portion of Segment B is roughly similar to that portion of Segment A. However, there are some disturbed areas in this vicinity as described above. Mule deer winter habitat, Swainson's hawk foraging and nesting habitat, and greater sandhill crane use areas occur in the Segment B ROW.

Table C.3-18 Special Status Plant Species Observed in the Study Area of the Alternative Alignments, Listed by Segment[a]

Segment	Species	Common Name	Number of Occurrences	Habitat
B	*Dimeresia howellii*	doublet	1	volcanic gravels
D	*Hackelia cusickii* *Erigeron elegantulus* *Arnica sororia*	Cusick's stickseed volcanic daisy twin arnica	20 9 12	juniper woodland rocky slopes meadow/seep
F	*Astragalus agrestis* *Arnica sororia*	purple loco twin arnica	2 2	vernally moist sagebrush meadow/seep
G	*Astragalus agrestis*	purple loco	1	vernally moist sagebrush
J	*Scutellaria holmgreniorum* *Astragalus pulsiferae* var. *suksdorfii* *Lomatium ravenii* *Erigeron elegantulus*	Holmgren's skullcap Suksdorf's milkvetch Raven's lomatium volcanic daisy	1 2 3 1	volcanic vertisols rocky clay soils vernal clay flats rocky slopes
ESVA	*Astragalus lentigenosus* var. *cartaceus* *Astragalus pulsiferae* var. *suksdorfii* *Camissonia boothii* var. *alyssoides* *Lomatium ravenii* *Polygala subspinosa* *Scutellaria holmgreniorum* *Stanley viridiflora*	hard-podded freckled milkvetch Suksdorf's milkvetch Pine Creek evening primrose Raven's lomatium spiny milkwort Holmgren's skullcap green prince's plume	5 38 14 1 15 3 1	rocky slopes gravelly soils on flats or ridges Fine-textured soils on slopes and flats Vernally moist flats Rocky slopes Volcanic vertisols white ash deposits
M	*Polygala subspinosa*	spiny milkwort	2	gravelly soils
P	*Psoralidium lanceolatum*	lance-leaved scurf-pea	3	sand dunes, sandy soils
X-East	*Eriogonum robustum*	altered andesite buckwheat	1	altered andesite soils

[a] Segments not listed here had no known special status plant occurrences within the study area

C.3.3.1.2 *Environmental Impacts and Mitigation Measures*

Alternative Segment B would reduce impacts on juniper woodland by more than 8 acres compared to Proposed Segment A. This alternative would also eliminate the permanent and temporary removal of 18 acres of juniper woodland associated with the Devils Garden Substation Site on Segment A. The Alturas Alternative would also reduce surface disturbance and removal impacts on big sagebrush scrub, montane meadow, volcanic gravels, and low sagebrush scrub (see Table C.3-19). Mitigations for impacts on natural plant communities and special status species are summarized in Mitigation Measures B-1, B-4, and B-5 for the Proposed Project. Temporary and permanent losses of plant community habitat and overland travel impacts would be mitigated by restoration and by acquisition of 6 acres of comparable offsite habitat. Similar impacts to doublet (*Dimeresia howellii*) would be mitigated by acquisition of 0.4 acre of comparable habitat for that species. Final implementation of this mitigation would be subject to approval by BLM, CPUC, CDFG, and/or USFWS.

Table C.3-19 Potential Impacts on Vegetation Resources on the Alternative Segments and Substation Sites

Segment	Habitat Loss (acres)[1]		Overland Travel (acres)[2]	Increased Access	Erosion and Sedimentation	Non-Native Plant Introduction
	Temporary	Permanent				
Segment B						
Big sagebrush scrub	1.20	0.01	3.72	N	N	N
Montane meadow	0.41	N	0.24	Y	Y	Y
Volcanic gravels	0.41	N	0.14	Y	Y	Y
Doublet (*Dimeresia howellii*)	0.41	N	0.11	N	N	N
Segment D						
Juniper woodland	10.48	2.72	N	Y	Y	Y
Big sagebrush scrub	1.23	N	1.38	Y	Y	Y
Cusick's stickseed (*Hackelia cusickii*)	1.66	N	N	Y	N	N
Twin arnica (*Arnica sororia*)	0.82	N	0.76	N	Y	N
Volcanic daisy (*Erigeron elegantulus*)	0.47	N	N	Y	Y	Y
Segment F						
Big sagebrush scrub	1.23	N	1.03	N	Y	N
Silver sagebrush scrub	3.41	0.01	1.93	N	N	N
Purple loco (*Astragalus agrestis*)	0.97	0.01	2.80	Y	N	Y
Twin arnica (*Arnica sororia*)	1.23	N	1.20	Y	N	Y
Segment G						
Juniper woodland	1.55	N	N	Y	Y	Y
Silver sagebrush scrub	2.90	0.01	1.93	Y	N	Y
Segment H						
Silver sagebrush scrub	N	N	0.12	N	N	N
Purple loco (*Astragalus agrestis*)	N	N	0.12	N	N	N
Segment I						
Silver sagebrush scrub	3.70	0.01	3.86	Y	N	Y
Purple loco (*Astragalus agrestis*)	3.70	0.01	3.86	N	N	N
Segment J						
Silver sagebrush scrub	0.17	N	2.75	Y	N	Y
Big sagebrush scrub	12.57	0.04	4.43	Y	Y	Y
Juniper woodland	4.68	0.01	N	Y	Y	Y
Volcanic vertisols	0.14	N	N	Y	Y	Y
Raven's lomatium (*Lomatium ravenii*)	0.69	0.01	2.65	Y	N	Y
Suksdorf's milkvetch (*Astragalus pulsiferae* var. *suksdorfii*)	0.53	N	N	Y	Y	Y

Segment	Habitat Loss (acres)[1]		Overland Travel (acres)[2]	Increased Access	Erosion and Sedimentation	Non-Native Plant Introduction
	Temporary	Permanent				
ESVA						
Juniper woodland	3.45	3.86	N	Y	Y	Y
Big sagebrush scrub	20.29	19.00	N	Y	Y	Y
Low sagebrush scrub	13.63	12.93	N	Y	Y	Y
Greasewood scrub	0.99	<0.01	0.83	Y	N	Y
Rabbitbrush scrub	0.58	N	0.39	Y	Y	Y
Montane meadow wetlands	N	0.03	N	Y	Y	Y
Disturbed/cultivated	4.03	3.75	N	N	N	N
Silver sagebrush scrub	0.41	N	0.48	Y	Y	Y
Volcanic vertisols	0.41	0.41	N	Y	Y	Y
Hard-podded freckled milkvetch (*Astragalus lentigenosus* var. *chartaceus*)	1.24	1.34	N	Y	Y	Y
Suksdorf's milkvetch (*Astragalus pulsiferae* var. *suksdorfii*)	0.41	0.18	N	Y	Y	Y
Pine Creek evening primrose (*Camissonia boothii* var. *alyssoides*)	1.65	1.62	N	Y	Y	Y
Spiny milkwort (*Polygala subspinosa*)	3.72	3.71	N	N	N	Y
Raven's lomatium (*Lomatium ravenii*)	0.41	0.01	0.41	Y	N	Y
Segment M						
Big sagebrush scrub	1.72	N	N	Y	Y	N
Sand dune	0.80	0.01	2.75	Y	Y	Y
Spiny milkwort (*Polygala subspinosa*)	N	N	0.07	Y	N	Y
Segment P						
Sand dune	1.16	N	0.90	Y	Y	Y
Big sagebrush scrub	4.86	0.04	13.88	N	Y	N
Lance-leaved scurf-pea (*Psoralidium lanceolatum*)	9.74	N	0.79	Y	Y	Y
Segment S						
Big sagebrush scrub	0.51	N	N	N	Y	Y
Segment U						
Juniper woodland	0.8	0.01	2.75	N	Y	Y
Segment Z						
Juniper woodland	4.13	0.02	2.41	Y	Y	Y
WCFG						
Sagebrush/bitterbrush scrub	2.36	0.01	3.89	Y	Y	Y
X-East						
Altered andesite buckwheat	0.41	N	0.28	Y	Y	Y
Big sagebrush scrub	0.99	N	0.69	N	Y	N
Mill Site Substation						
No affected resources	N	N	N	N	Y	Y
Border Town Substation						
Low sagebrush scrub	0.1	7.9	0	Y	Y	Y

[1] = Habitat Loss would be caused by blading, and construction of substations, structure landings, and access roads.
[2] = Overland travel during construction.
[3] = Five of seven proposed staging areas would be constructed and utilized by Tuscarora Gas Pipeline prior to use by Sierra Pacific Power Company (SPPCo). Surface removal and disturbance impacts will be addressed in the assessment of Tuscarora's biological resource impacts. The Proposed Project will increase the duration of the potential impacts beyond the completion of the Tuscarora Gas Pipeline project.
Y= Yes. N = None or negligible.

A total of 2.0 acres of habitat in Segment B would be removed or disturbed by activities relating to gaining access and travel during construction and maintenance structure setup and wire setup. Species that would be affected on this segment include Swainson's hawk, bald eagle, and greater sandhill crane. Sandhill cranes and bald eagles forage in habitat in the vicinity of this segment, and although potential Swainson's hawk nesting and foraging habitat occurs in the vicinity, there were no nests found during field surveys of the area. Bird collision potential would be roughly the same as or possibly slightly less than for Segment A. Refer to Table C.3-20 for species and collision potential analysis. Wildlife species and habitats which would potentially be impacted by the alternative alignments and substations are listed in Table C.3-21. Segment B would also cross two types of big game habitat: 0.2 mile of mule deer winter range and 2.5 miles of pronghorn antelope kidding areas (Table C.3-21a). The potential effects described above would result in significant impacts; however, with implementation of several of the mitigation measures introduced in previous sections these impacts would be considered **Class II** impacts. Mitigation for loss of habitat, bird electrocution potential, and bird collision potential would be mitigated as described in Mitigation Measures B-19, B-20, B-21, and B-22, above.

C.3.3.1.3 *Cumulative Impacts and Mitigation Measures*

Cumulative impacts on juniper woodlands, low sagebrush scrub, big sagebrush scrub, montane meadow, and volcanic gravels would be slightly less if the Segment B were selected. Impacts on wildlife would be slightly lower than those for Segment A.

C.3.3.1.4 *Unavoidable Significant Impacts*

As with the Proposed Project Route A, the potential for avian collision would result in the unavoidable significant impacts of potential losses of individual birds protected under the Migratory Bird Treaty Act.

C.3.3.2 Madeline Plains Alternative Alignments (Segments D,F,G,H,I)

C.3.3.2.1 *Environmental Setting*

The Madeline Plains Alternatives include segments D, F, G, H, and I. These segments cross juniper woodland habitats, agricultural habitats, and sagebrush scrub habitats. Alternative Segment D of the Madeline Plains Alternative intersects extensive and relatively remote stands of northern juniper woodlands similar to those of Proposed Segment E, but of greater length. Like Segment E, the Madeline Plains Alternatives also traverse the silver sagebrush plant community on the Madeline Plains. The principal differences are the number of special status species encountered. Segment D alone has 41 separate occurrences of three special status plants (see Table C.3-18); Proposed Segment E has a total of 15 separate occurrences of six species of special status plants. On both the proposed route and these alternatives, the special status plant populations are rather evenly distributed along the length of the segments and would be difficult to avoid completely. As with the proposed route, these alternative segments would traverse seasonal and perennial wetland habitats on the Madeline Plains, although for slightly greater length.

Table C.3-20 Environmental and Species Characteristics that Increase Potential for Bird Collisions along Alternative Transmission Line Segments

Segment	Collision Susceptible[1] Species	Habitat Use	Weather	Line Placement	Line Orientation	Potential Collision Risk
Segment B	Other waterfowl/shorebirds Bald eagle Peregrine falcon Ferruginous hawk Greater sandhill crane White-faced ibis Swainson's hawk Golden eagle	Nesting, feeding Perching, feeding Perching, feeding Perching, feeding Nesting, feeding Feeding Nesting Nesting	• Seasonal valley fog in fall, winter, and spring will increase potential collision rate for migrants as well as resident birds • Seasonal strong winds	• River valley • Low vegetation • Existing power lines • Crosses South Fork Pit River • Near nesting and feeding cranes, waterfowl and shorebirds	• Perpendicular to some known flight paths, especially eagles and cranes	High
Segments D, F, G, H, I	Sage grouse (lek) Greater sandhill crane Golden eagle Prairie falcon Other waterfowl/shorebirds White-faced ibis Black tern Swainson's hawk Long-billed curlew Northern harrier	Breeding, feeding Nesting, feeding Perching, feeding Perching, feeding Nesting, feeding Feeding Nesting, feeding Perching, feeding Nesting, feeding Nesting, feeding	• Seasonal valley fog • Seasonal strong winds	• Wetlands • Routes are located in center of large open treeless plain where birds concentrate for nesting and feeding especially cranes, waterfowl, grouse and shorebirds	• Routes are east/west and north/south orientations bisecting many local flight paths	Medium to High
Segment J	Possible sage grouse (lek)	Nesting, feeding	• Seasonal strong winds	• Route crosses many irrigation canals and stock ponds	• Bisects lower end of large east/west valley	Low
ESVA	Sage grouse Golden eagle Swainson's hawk	Breeding, nesting, brood rearing, foraging Foraging Nesting, foraging	• Seasonal strong winds	• Uplands • Sagebrush and bitterbrush	• Parallels Hwy. 395 - East of 395	Low
Segment M	None Recorded					
Segment P	Golden eagle Waterfowl/shorebirds Sage grouse	Perching, feeding Nesting, feeding Breeding, feeding, nesting, brood-rearing	• Seasonal valley fog • Strong seasonal winds	• Wetlands • Waterfowl nesting and feeding area	• Parallels wetlands along Long Valley	Medium to High
Segments S, U	Waterfowl/shorebirds Raptors	Nesting, feeding	• Seasonal valley fog • Seasonal strong winds	• Wetlands • Waterfowl nesting and feeding area • Migration corridor	• Crosses over twice and parallels wetlands and Long Valley Creek	Medium to High
Segments Z, WCFG	None recorded					
Segment X-East	Waterfowl/shorebirds	Feeding	• Seasonal valley fog • Strong seasonal winds	• Seasonal wetlands • Waterfowl nesting and feeding area	• Line generally parallels north/south migrating route • Line passes within 1 mile of White Lake	Medium

[1] Species observed within 1.5 miles of flagged route.

Table C.3-21 Summary of Direct and Indirect Impacts on Wildlife Habitat - Alternative Alignments

Route Segment and Wildlife Resources	Permanent Habitat Loss (acres)[a]	Temporary Habitat Loss (acres)[b]	Overland Travel Disturbance (acres)[c]	Indirect Impacts[d]
Segment B				
Pronghorn winter range	.03	2.1	1.9	
Swainson's hawk foraging habitat	.08	.78	.04	
Segment D				
Pronghorn winter range	.15	1.7	4.6	
Pronghorn kidding areas	.07	1.3	3.2	
Segment F				
Pronghorn kidding areas	.12	.02	.93	
Sage grouse brood/winter habitat	.02	1.7	1.15	
Segment G				
Pronghorn kidding areas	.04		.08	
Sage grouse brood/winter habitat	.002		.74	
Segment H				
Sage grouse brood/winter habitat	.04		.02	
Segment I				
Sage grouse brood/winter habitat	.02	.8	.19	
Segment J				
Pronghorn kidding areas	.3	4.1	.62	
ESVA				
Mule deer winter range	1.4	23.0	1.1	--
Pronghorn winter range	0.3	17.5	4.2	--
Pronghorn kidding areas	0.2	14.2	0.8	--
Swainson's hawk foraging habitat	0.9	0.3	4.2	--
Sage grouse lek	--	--	--	See Table E.6-3
Sage grouse brood/winter habitat	0.4	3.9	0.9	--
Segment M				
Mule deer winter range	.04	2.1	.5	
Segment P				
Mule deer winter range	.17		4.1	
Segments S, U, Z, WCFG				
Mule deer winter range	1.1		6.4	
Sage grouse broad/winter habitat	1.3	.9	1.8	
Loggerhead shrike nest				w/in 0.5 miles
X-East				
No Big Game Habitats or sensitive resources recorded				

a Permanent habitat loss due to structure and substation foundation. Calculations based on material presented in Section B.2.3.2 Transmission Line Construction.

b Temporary loss of habitat in areas where blading occurs. Calculations based on material presented in Table B-3 Construction Access Routes.

c Overland travel disturbance in work areas. Calculations based on information presented in Section B.2.3.2.

d Resources are shown in the Indirect Impacts category if they occur within the buffer zones listed in C.3-13.

Table C.3-21a Big Game Habitats Crossed by the Alternative Alignments

Big Game Species and Habitat Type	Start Milepost	End Milepost	Segment Total	Restrictions
		Mule Deer Winter Range		
Segment B	B-1.4	B-1.6	0.2 mile	No construction 10/15 to 4/15.
Segment ESVA	ESVA-1.3	ESVA-23.1	21.8 miles	No construction 10/15 to 4/15.
Segment M	M-0.0	M-0.3	0.3 mile	No construction 10/15 to 4/15.
Segment P	P-3.3	P-17.4	14.1 miles	No construction 10/15 to 4/15.
Segment S	S-0.0	S-3.8	3.8 miles	No construction 10/15 to 4/15.
WCFG	WCFG-0.0	WCFG-4.1	4.1 miles	No construction 10/15 to 4/15.
Segment Z	Z-0.0	Z-4.5	4.5 miles	No construction 10/15 to 4/15.
		Pronghorn Antelope Winter Range		
Segment ESVA	ESVA-7.3	ESVA-23.1	15.8 miles	No construction 10/1 to 4/15.
Segment M	M-0.0	M-3.6	3.6 miles	No construction 10/1 to 4/15.
		Pronghorn Antelope Kidding Areas		
Segment B	B-2.1	B-4.6	2.5 miles	No blasting 4/15 to 6/30.
Segment D	D-8.0	D-8.5	0.5 mile	No construction 4/15 to 4/30.
Segment D	D-7.1	D-10.1	3 miles	No blasting 4/15 to 4/30.
Segment F	F-1.7	F-3.2	1.5 miles	No construction 4/15 to 6/30.
Segment G	G-1.5	G-4.1	2.6 miles	No construction 4/15 to 6/30.
Segment G	G-1.0	G-4.6	3.6 miles	No blasting 4/15 to 6/30.
Segment J	J-13.9	J-16.1	2.2 miles	No construction 4/15 to 6/30
Segment J	J-15.7	J-16.5	0.08 mile	No construction 4/15 to 6/30.
Segment J	J-4.9	J-6.4	1.5 miles	No blasting 4/15 to 6/30.
Segment J	J-13.4	J-16.5	0.08 mile	No blasting 4/15 to 6/30.
Segment ESVA	ESVA-5.5	ESVA-7.7	2.2 miles	No construction 4/15 to 6/30.
Segment ESVA	ESVA-12.5	ESVA-15.8	3.3 miles	No construction 4/15 to 6/30.
Segment ESVA	ESVA-19.1	ESVA-22.8	3.7 miles	No construction 4/15 to 6/30.
Segment ESVA	ESVA-13.3	ESVA-15.1	1.8 miles	No blasting 4/15 to 6/30.
Segment ESVA	ESVA-19.6	ESVA-22.3	2.7 miles	No blasting 4/15 to 6/30.
Segment M	M-1.9	M-3.4	1.5 miles	No construction 4/15 to 6/30.
Segment M	M-1.3	M-3.6	2.3 miles	No blasting 4/15 to 6/30.
Segment M	M-0.0	M-0.4	0.4 mile	No blasting 4/15 to 6-30.

Alternative Segment D traverses an area of quite rugged topography between Likely Mountain and the area around Spooner Reservoir, passing by Nelson Corral Reservoir as well. This remote juniper woodland habitat includes numerous small drainages, several springs, and known American badger habitat. The Madeline Plains Alternatives also bisect agricultural areas which are heavily used by wildlife species including big game, shorebirds, raptors, and greater sandhill cranes. These areas are also used by waterfowl during the migration period.

C.3.3.2.2 *Environmental Impacts and Mitigation Measures*

The Madeline Plains Alternatives would result in impacts on juniper woodlands, silver sagebrush scrub, big sagebrush scrub, Cusick's stickseed, twin arnica, volcanic daisy, and purple loco. The Madeline Plains Alternatives would not affect Raven's lomatium, which would be affected by the proposed route. Impacts on volcanic daisy, purple loco, twin arnica, Cusick's stickseed would be much greater for the Madeline Plains Alternatives compared with what they would be on the proposed route. Mitigation for impacts on natural plant communities and special status species are summarized in Mitigation Measures B-1, B-3, B-4, and B-5 for the Proposed Project.

Temporary and permanent losses of plant community habitat and overland travel impacts would be mitigated by restoration and by acquisition of 40 acres of comparable offsite habitat. Similar impacts to special status plant species would be mitigated by acquisition of 16 acres of comparable habitat for the affected species. Final implementation of the proposed mitigation would be subject to approval by BLM, CPUC, CDFG, and/or USFWS.

A total of approximately 20 acres of big game habitat within this group of alternative segments occurs within the ROW Special status species and habitats which would be affected in the vicinity of these four alternative segments include:

- Mule deer winter range
- Mule deer migration areas
- Pronghorn summer range
- Pronghorn migration range
- Sage grouse lek/sage grouse brood habitat
- Greater sandhill crane use areas
- American badger burrows
- Swainson's hawk
- Prairie falcon
- Northern harrier
- Golden eagle
- White-faced ibis
- Long-billed curlew.

Portions of the Madeline Plains are used by greater sandhill cranes and waterfowl and shorebird populations during migration. The potential for bird collision in the Madeline Plains area would be increased by at least 3 times the estimated loss for Proposed Segment E. This is due to the fact that these segments would run both east-to-west and north-south, effectively bisecting the habitats in the region. The alternative routes located in the agricultural portions of the western Madeline Plains region would result in increased collision impacts to shorebirds, sandhill cranes, and raptors. Increased indirect impacts would also occur to pronghorn known to use this area. In contrast, Proposed Segment E stays in the juniper habitats east of highway 395, at the base of McDonald Peak. Impacts on wildlife populations and special status species would be increased if the transmission line were routed through the Madeline Plains alternative routes.

Mitigation for increased potential for greater sandhill crane collisions with the proposed transmission line would include application of bird flight diverters Mitigation Measure (B-20). However, offsite compensation would be required to mitigate for residual impacts. A residual collision loss of approximately .8 cranes per year would remain after Mitigation Measure B-20 is applied. However, if the Madeline Plains alternatives are selected this estimate would be increase by a factor of 1.77 due to the fact that the habitat would be bisected at least three times, therefore increasing the potential for collision. Based on the formula provided in Mitigation Measure B-21, a total of 617 acres of suitable crane nesting habitat must be acquired to mitigate for this impact under the same terms and conditions identified in Mitigation Measure B-21 for the Proposed Project.

C.3.3.2.3 *Cumulative Impacts and Mitigation Measures*

The Madeline Plains Alternatives would result in increased cumulative impacts on four special status plant species that are not affected by Proposed Segment E of the proposed route. Impacts on greater sandhill cranes would be increased due to the fact that the transmission line would bisect used areas at least 3 times. This alternative would result in increased cumulative impacts on wildlife overall compared to the proposed route.

C.3.3.2.4 *Unavoidable Significant Impacts*

As is the case for the Proposed Project segments, the Madeline Plains Alternatives would result in the unavoidable significant impact of potential mortality of birds protected under the Migratory Bird Treaty Act, as a result of collisions with the transmission line.

C.3.3.3 Ravendale Alternative (Segment J, I)

C.3.3.3.1 *Environmental Setting*

Alternative Segment J would cross sagebrush and juniper habitats just south of the Madeline Plains region. The northern one-third of the area is level sagebrush habitat, with juniper habitats primarily occurring in the southern two thirds of the route where rolling hills are prominent. Alternative Segment J differs from Proposed Segment K in the presence of two species of special status plants. The dominant plant communities that occur on Segment J are the same ones as observed on Segment K. Twelve special status plant occurrences were mapped on Segment J in 1994, compared to 10 special status plant occurrences mapped on Proposed Segment K. Holmgren's skullcap occurs on both segments where it is associated with clay soils referred to as volcanic vertisols. The volcanic vertisol plant community occurs less commonly on Segment J, as does Holmgren's skullcap. Two species were observed on Segment K that were not observed on Segment J: clay-loving buckwheat (*Eriogonum collinum*) and Pine Creek evening primrose (*Camissonia boothii* ssp. *alyssoides*).

Wildlife species observed in the vicinity of Segment J include sage grouse, Swainson's hawk, golden eagle, and pronghorn antelope. In general, the wildlife habitat on Segment J is not significantly different from that on Proposed Segment K, except that Segment J is much more remote and undisturbed and features somewhat more varied topographic conditions and greater microhabitat variation. In addition, use of Segment J would entail use of Segment I for connection with Segment E and the consequent east-west crossing of southern Madeline Plains habitats.

Environmental Impacts and Mitigation Measures

Alternative Segment J would result in increased disturbance of big sagebrush scrub, juniper woodland, and silver sagebrush, scrub and would include substantially more bladed access into a somewhat undisturbed area. The alternative would also disturb an additional population of Suksdorf's milkvetch, which would not be affected by Segment K of the proposed route. However, the alternative would reduce impacts on volcanic vertisols and the associated special status species, Holmgren's skullcap, by more than two acres. Mitigation for impacts on natural plant communities and special status species are summarized in Mitigation Measures B-1, B-3, B-4, and B-5 for the Proposed Project. Temporary and permanent losses of plant community habitat and overland travel impacts would be mitigated by restoration and by acquisition of 22 acres of comparable offsite habitat. Similar impacts on special status plant species would be mitigated by acquisition of 5 acres of comparable habitat for the affected species. Final implementation of the proposed mitigation would be subject to approval by BLM, CPUC, CDFG, and/or USFWS.

The total amount of wildlife habitat to be affected during project construction would be approximately 21 acres. Specific habitats and species to be impacted are listed in Tables C.3-19 and C.3-21. Impacts on wildlife would be somewhat greater than those associated with the Proposed Segment K, due to the more rugged topography, access development, and the new human disturbance this alternative would bring to a more pristine area. Further, greater indirect impacts due to erosion and sedimentation would be expected with this alternative. This alternative would also introduce the added bird collision hazards of a right angle turn and east-west traverse through the southern Madeline Plains.

Alternative Segment J would result in disturbance of sage grouse brood habitats and local raptor populations including the Swainson's hawk. The addition, perches in this habitat would benefit raptors and could result in impacts on special status (prey) species such as sage grouse. This significant impact would be mitigated to result in a **Class II** impact. To mitigate for loss of sage grouse habitat or pronghorn habitats along Segment J, Mitigation Measures B-9 and B-10 (as described for the Proposed Project) would be applied. Mitigation for permanent and temporary loss of habitats will include offsite compensation according to the formulas presented in Mitigation Measures B-9 through B-13.

Cumulative Impacts and Mitigation Measures

Cumulative impacts on volcanic vertisols would be decreased if the Ravendale Alternative were selected; however, impacts to Suksdorf's milkvetch, a CNPS List 1B plant species, would increase slightly. The total area of vegetation and general wildlife habitat impacted on the Ravendale Alternative would be double the impacted area of the Proposed Route.

Unavoidable Significant Impacts

The Ravendale Alternative would not cause any unavoidable significant impacts.

C.3.3.4 East Secret Valley Alignment (Segment ESVA)

C.3.3.4.1 Environmental Setting

Vegetation Resources. Preliminary surveys for special status plant species, natural plant communities, and jurisdictional wetlands were conducted for this alternative alignment during October 19-25, 1994. The entire alignment was resurveyed for vegetation resources during early May and early June 1995. These surveys were conducted at the appropriate times for identification of all early and late season special status plants in the region.

Alternative Segment ESVA would affect the following natural plant communities:

- Juniper woodland
- Low sagebrush scrub
- Big sagebrush scrub
- Rabbitbrush scrub
- Montane meadow wetland
- Greasewood scrub
- Volcanic vertisols.

Special status plant species that were identified during Fall 1994 and Spring 1995 surveys include:

- Suksdorf's milkvetch (*Astragalus pulsiferae* var. *suksdorfii*)
- Green prince's plume (*Stanleya viridiflora*)
- Spiny milkwort (*Polygala subspinosa*)
- Holmgren's skullcap (*Scutellaria holmgreniorum*)
- Hard-podded freckled milkvetch (*Astragalus lentiginosus* var. *chartaceus*)
- Raven's lomatium (Lomatium ravenii)
- Pine Creek evening primrose (*Camissonia boothii* var. *alyssoides*).

Wildlife Resources. Several big game habitats occur in the vicinity of Alternative Segment ESVA. This segment would cross large amounts of pronghorn antelope kidding areas in the north and south portions. A small amount of pronghorn winter range would also be crossed in the center of the segment. In addition, mule deer winter range would be crossed in the southern portion of the segment.

During spring surveys conducted in the vicinity of the East Secret Valley Alignment, a Swainson's hawk nest site was observed near Angle Point LNØ4. Loggerhead shrikes and golden eagles were observed foraging in the area. Potential nesting habitat for the golden eagle does not occur in the vicinity of this alignment. Spring surveys did not identify any loggerhead shrike nest sites. The ESVA also traverses at least one historically documented sage grouse lek site.

C.3.3.4.2 *Environmental Impacts and Mitigation Measures*

Spiny milkwort, hard-podded freckled milkvetch, Suksdorf's milkvetch, and several of the natural plant communities would be adversely affected by surface removal and disturbance since blading would be required for overland travel in many portions of the route.

Alternative Segment ESVA would affect some of the same special status plant species identified for Proposed Segment L. Potential impacts on natural plant communities and wetlands would be significantly greater than for the proposed route due to the absence of existing access routes, the roughness of the terrain which will necessitate more surface disturbance and removal for overland travel, and the greater length of the route.

The ESVA would result in an estimated permanent habitat loss of 35.18 acres of natural plant communities, of which 14.32 acres would be considered a Class II significant, but mitigable impact. An estimated 35.54 acres of natural plant communities would be temporarily removed during construction, of which 14.88 acres would be considered a Class II significant impact. Significant surface removal impacts would be mitigated as described in Mitigation Measure B-1 for the Proposed Project.

An estimated 1.03 acres of greasewood scrub and rabbitbrush scrub would be significantly impacted by overland travel and would be mitigated as described in Mitigation Measure B-4 for the Proposed Project.

Permanent surface removal would impact an estimated 6.86 acres of special status plant habitats, of which 5.23 acres would be considered a Class II significant impact. Temporary surface removal would impact an estimated 7.43 acres of special status plant habitats, of which 5.37 acres would be considered a Class II significant impact. No special status plant habitats would be impacted by surface disturbance such as non-bladed overland travel.

Temporary losses and overland travel impacts to plant community and special status species habitats would be mitigated by onsite restoration and offsite compensation. Permanent removal of plant community and special status plant habitats would be mitigated by offsite compensation. Offsite compensation for all significant impacts to plant communities on the ESVA would be approximately 57 acres. Total offsite compensation for all significant impacts to special status plants would be approximately 21 acres. Final implementation of the proposed mitigation would be subject to approval by BLM, CPUC, CDFG, and USFWS.

Wildlife Resources. Overall, Alternative Segment ESVA would impact the same types of wildlife resources as those identified for Proposed Segment L. However, Alternative Segment ESVA would result in greater impacts on sage grouse leks and big game habitats due to the greater amount of surface disturbance for overland travel and the increased human disturbance this alternative would bring to a heretofore relatively undisturbed area. Construction of Alternative Segment ESVA would result in the loss of at least one active sage grouse lek and potentially one additional lek which is currently inactive but a part of the active lek complex. The loss of these leks would be due to increased raptor perching and predation opportunities provided by the structures and conductor wires. Loss of the active lek is a significant adverse impact which cannot, under current science, be mitigated. Impacts to pronghorn would be the adverse impact to the undisturbed space component of their habitat in the East Secret Valley area. This impact can be mitigated through application of Mitigation Measures B-6 and B-18. Mitigation measures for these impacts would follow formulas and guidelines presented in Mitigation Measures B-9 through B-13.

C.3.3.4.3 *Cumulative Impacts and Mitigation Measures*

The ESVA would substantially increase the total cumulative impacts to biological resources relative to Segment L of the Proposed Project. Whereas Segment L would generally parallel the Tuscarora Pipeline Project and Highway 395, the ESVA would necessitate new surface removal and disturbance to create temporary and permanent access routes.

C.3.3.4.4 *Unavoidable Significant Impact*

No unavoidable significant impacts have been identified for the ESVA.

C.3.3.5 Wendel Alternative (Segment M)

C.3.3.5.1 *Environmental Setting*

Alternative Segment M would cross open grasslands at the western edge of the Skedaddle Mountains east of U.S. 395. Segment M does not differ significantly from Proposed Segment N in terrain characteristics. Two occurrences of the special status plant species, *spiny milkwort,* were observed on Segment M compared to a single occurrence on Segment N. Spiny milkwort is a CNPS List 2 species which occurs on gravely or rocky soils near the northern convergence of the two alignments. Pronghorn migration areas, mule deer holding areas, and mule deer winter range occurs in the vicinity of this alternative segment. The open grasslands and Skedaddle Mountains separate the Honey Lake Valley and the Secret Valley big game use areas. This area is important to local herds during migration. In other respects, this alternative route does not differ significantly from the proposed route.

C.3.3.5.2 *Environmental Impacts and Mitigation Measures*

The Alternative Segment M would affect more acres of big sagebrush scrub and sand dune plant communities than Segment N of the proposed route. Impacts to chenopod scrub would be less than for Segment N. Two populations of a CNPS List 2 plant species, spiny milkwort, would be disturbed by Segment M and not affected by Segment N of the proposed route. Other potential impacts due to increased access or non-native species introduction would be similar to the proposed route. Mitigation for impacts on natural plant communities and special status species are summarized in Mitigation Measures B-1, B-3, B-4, and B-5 for the Proposed Project.

Temporary and permanent losses of plant community habitat and overland travel impacts would be mitigated by restoration and by acquisition of 5 acres of comparable offsite habitat. Similar impacts to special status plant species would be mitigated by acquisition of 0.4 acres of comparable habitat for the affected species. Final implementation of the proposed mitigation would be subject to approval by BLM, CPUC, CDFG, and/or USFWS.

Tables C.3-19 and C.3-21 include acreage totals and species habitats which would be impacted by Segment M. Approximately 3 acres of habitat would be disturbed or removed. Impacts on wildlife species and habitats associated with Segment M would not be significantly different from the impacts associated with the proposed route Segment N. Disturbance to the big game ranges and to mule deer migration and wintering areas in the vicinity of Segment M would be **Class II** impacts. Mitigation measures for permanent and temporary loss of big game habitats would include acquisition of offsite habitat. Acquisition of habitat will follow formulas and guidelines presented in Mitigation Measures B-9 through B-13.

C.3.3.5.3 *Cumulative Impacts and Mitigation Measures*

Alternative Segment M would not alter substantially the cumulative impacts and mitigation measures of the Proposed Segment N.

C.3.3.5.4 *Unavoidable Significant Impacts*

The Wendel Alternative would not cause any unavoidable significant impacts.

C.3.3.6 West Side of Fort Sage Mountains Alternative Alignment (Segment P)

C.3.3.6.1 *Environmental Setting*

The Alternative Segment P would cross juniper woodland habitats and sagebrush scrub habitats on the west side of the Fort Sage Mountains. The botanical and wetland resources of the alternative alignment on the west side of the Fort Sage Mountains differ from those on the proposed route (Segment Q) in two notable respects. Segment P contains significantly less northern juniper woodland than the proposed route but crosses slightly more rabbitbrush scrub habitat. One species of special status plant, the lance-leaved scurf-pea, was observed on both the proposed and alternative alignments.

Portions of this route have been identified as pygmy rabbit habitat. In addition, mule deer ranges used by the East Lassen mule deer herd are located in the vicinity of this segment. During field surveys of this area several reptiles and small mammals were observed in the sandy substrate, including the long-nosed leopard lizard *(Gambelia wislizenii)* and the Great Basin collared lizard *(Crotaphytus insularis bicinctores)*. It should be noted that Segment P would cross the CDFG's Doyle Wildlife Area for approximately 4.5 miles.

C.3.3.6.2 *Environmental Impacts and Mitigation Measures*

Segment P would eliminate impacts to one population of Nelson's evening primrose. Segment P would also reduce or eliminate potential disturbance of nearly two acres of sand dune, four acres of sagebrush-bitterbrush scrub community, and 11 acres of juniper woodland. The proposed alternative would increase impacts on big sagebrush scrub by approximately four acres. Other potential impacts would not differ significantly from those on the proposed route. Mitigations for impacts on natural plant communities and special status species are summarized in Mitigation Measures B-1, B-3, B-4, and B-5 for the Proposed Project.

Temporary and permanent losses of plant community habitat and overland travel impacts would be mitigated by restoration and by acquisition of 19 acres of comparable offsite habitat. Similar impacts to special status plant species would be mitigated by acquisition of 9 acre of comparable habitat for the affected species. Final implementation of the proposed mitigation would be subject to approval by BLM, CPUC, CDFG, and/or USFWS.

The primary habitat to be affected by this alternative segment would be pygmy rabbit habitat. Impacts to this species' habitat would be **Class II** impacts. Tables C.3-19 and C.3-21 include the approximate total area of habitat which would be impacted in the proposed Segment P. The total amount of pygmy rabbit habitat present in this segment is greater than in the proposed Segment Q. Local reptiles and small mammals which are not as mobile as the larger species would experience some direct mortality (**Class III** impact). Construction and overland travel limitations which apply in pygmy rabbit habitat are described in Mitigation Measure B-4. Mitigation for potential direct mortality is described in Mitigation Measure B-7.

C.3.3.6.3 *Cumulative Impacts and Mitigation Measures*

Cumulative impacts on juniper woodland and sand dune plant communities would be significantly less for the West Side of Fort Sage Mountains Alternative alignment (Alternative Segment P) compared to Segment Q of the proposed route. However, impacts on mule deer winter range (especially the protected Doyle Wildlife Area - primarily for deer winter range) would be substantially greater.

C.3.3.6.4 *Unavoidable Significant Impacts*

The West Side of Fort Sage Mountains Alternative would not cause any unavoidable significant impacts.

C.3.3.7 Long Valley Alternatives Alignments (Segments S, U, Z, and WCFG)

C.3.3.7.1 *Environmental Setting*

The four alternative route segments within the upper Long Valley region would be located in the vicinity of the confluence of Long Valley and Dry Creeks. The area is used for grazing and includes sagebrush scrub habitats and juniper woodland habitats. Substantial riparian vegetation and wetland and open water habitat occurs along Long Valley Creek.

Segments S and U each cross Long Valley Creek once. The riparian vegetation at each of these stream crossings is predominantly herbaceous and dominated by Olney threesquare (*Scirpus americanus*), parched fireweed (*Epilobium brachycarpum*), aster (*Aster spathulatus*), and American brooklime (*Veronica americana*). Sparse clumps of sandbar willow (*Salix exigua*) represent the only woody riparian vegetation at these two sites. The upland plant communities of the these segments do not differ substantially from the proposed route alignment (Segment T).

No special status plant species were observed on the alternative segments, however, a population of approximately 10 Pulsifer's milkvetch (*Astragalus pulsiferae var. pulsiferae*) plants was tentatively identified less than 1000 feet east of Segment S in October 1994. However, no populations have been identified in the study area of the Alternative Alignment.

Patchy riparian habitat and sheer banks along Long Valley Creek provide habitat for bird species such as bank swallows and willow flycatcher. Although there were no observations of the willow flycatcher during field surveys, potential habitat occurs in the vicinity of Segment U. In addition, the riparian habitat of Long Valley Creek in the area of Segments S and U provides important habitat for migrating waterfowl as they are channeled through the narrow linear gap between the Diamond Mountains on the west and Petersen Mountain on the east. Several large, shallow beaver ponds have been established in the creek channel, depending on spring runoff conditions. These provide habitat for waterfowl and shorebirds, and attract raptors hunting the other bird species. In years when the beaver dams are fully established, they create fairly extensive wetland areas in Long Valley Creek. Segments S and U would cross these wetland areas.

C.3.3.7.2 *Environmental Impacts and Mitigation Measures*

Vegetation resources affected by the Long Valley Alternative Alignments would not differ substantially from those on the proposed route. However, stream crossings on Segments S and U would need to be avoided during construction by stringing these sections with helicopters. Both alignments would result in impacts on juniper woodland and sagebrush-bitterbrush plant communities. However, the WCFG alignment would eliminate overland travel impacts on approximately 0.6 acre of montane meadow plant community. Mitigation for impacts on natural plant communities and special status species are summarized in Mitigation Measures B-1, B-3, B-4, and B-5 for the Proposed Project.

Temporary and permanent losses of plant community habitat and overland travel impacts would be mitigated by restoration and by acquisition of 15 acres of comparable offsite habitat. Final implementation of the proposed mitigation would be subject to approval by BLM, CPUC, CDFG, and USFWS.

The alternative route segments in the Upper Long Valley would potentially affect local bird populations including waterfowl, bank swallows, and willow flycatcher. Additional perpendicular stream crossings required by Segments S and U would substantially increase potential collisions by waterfowl migrating through the riparian corridor and could increase collisions of raptors hunting in the riparian and wetland areas. It is anticipated that these species would also be affected indirectly during project construction due to the increased noise and human disturbance. However, the WCFG alternative segment is located a distance from these habitats and would not increase potential impacts on the bird species discussed above; the WCFG alternative would result in fewer impacts on wildlife. With application of Mitigation Measures B-14, B-17, B-20, B-21, and B-22, these would be **Class II** impacts. In addition, some portions of these segments would cross mule deer winter range and disturbance to this habitat would likely occur due to overland travel and construction activities. Mitigation for permanent loss, temporary loss, and overland disturbance to big game habitat is described in Mitigation Measures B-9 through B-13. Permanent and temporary loss of these habitats will require habitat acquisition according to the formulas and guidelines in B-9 through B-13.

C.3.3.7.3 *Cumulative Impacts and Mitigation Measures*

Cumulative impacts of the alternatives would not differ substantially from the proposed route, with the exception of increased bird collision potential associated with Segments S and U. Segment WCFG would result in fewer conflicts with big game species.

C.3.3.7.4 *Unavoidable Significant Impacts*

The Long Valley Alternative Alignments would not cause any unavoidable significant impacts.

C.3.3.8 Peavine Peak Alternative Alignment (Segment X-East)

C.3.3.8.1 *Environmental Setting*

Alternative Segment X-East would cross sagebrush and several ponderosa pine stands on altered andesite soils. Sensitive plant communities and rare plants were observed on both Segment X-East and the corresponding portion of the proposed route (Segment Y). Both alignments would traverse isolated occurrences of altered andesite plant communities, and one occurrence of the special status altered andesite buckwheat (*Eriogonum robustum*) was found on both the proposed route and this alternative. No substantial differences in the botanical or wetland resources were observed for the two alternatives.

This route segment would not cross big game habitats. Stands of ponderosa pine may provide habitat for raptor and owl species, however, none were observed during surveys. There were no special status species observed using these habitats during field surveys.

C.3.3.8.2 *Environmental Impacts and Mitigation Measures*

Alternative Segment X-East would not substantially change potential impacts to special status species or natural plant communities. Both this alternative and the corresponding portion of the proposed route (Segment Y) would impact altered andesite plant communities and big sagebrush scrub. Mitigations for impacts to natural plant communities and special status species are summarized in Mitigation Measures B-1, B-3, B-4, and B-5 for the Proposed Project.

Temporary and permanent losses of plant community habitat and overland travel impacts would be mitigated by restoration and by acquisition of 2 acres of comparable offsite habitat. Potential impacts on altered andesite buckwheat, a Federal Category 2 candidate for listing, would be avoided by siting structures and locating overland travel routes outside of this species' habitat. Known populations would be clearly marked prior to construction and monitored during construction. If avoidance of this species was not possible, impacts would be mitigated as described in Mitigation Measure B-3. Final implementation of the proposed mitigation would be subject to approval by BLM, CPUC, CDFG, and/or USFWS.

There would be few impacts associated with wildlife as a result of construction and operation of the transmission line in this area. A slight potential for avian collision would occur due to proximity (within one mile) to White Lake. There would be no significant difference in impacts on wildlife associated with this segment as compared with Proposed Segment Y.

C.3.3.8.3 *Cumulative Impacts and Mitigation Measures*

Alternative Segment X-East would not substantially change the cumulative impacts and mitigation measures of the Proposed Project.

C.3.3.8.4 *Unavoidable Significant Impacts*

Alternative Segment X-East would not cause any unavoidable significant impacts.

C.3.3.9 Substation Alternatives

C.3.3.9.1 *Alturas Substation Alternative Site (Mill Site)*

The Alturas Substation Alternative Site consists of a former lumber mill site that contains no sensitive natural plant communities or special status plant species. Unlike the Devils Garden substation site on Segment A, the Mill Site is almost entirely without vegetation due to previous disturbances that altered the site. This alternative site would not result in any significant impacts on natural plant communities, wetlands, or special status species. No mitigation for vegetation resources would be required.

The Mill Site location also includes very little wildlife habitat. However, this substation is located within the Pit River Valley west of Alturas, adjacent to habitat used by several sensitive species including:

- American white pelican
- Northern harrier
- Bald eagle
- Greater sandhill crane
- Bank swallow (potentially).

The wetlands, riparian habitat, and open grazing lands in the vicinity of the Mill Site are used as hunting areas by local raptors including the northern harrier mentioned above. In addition, this site is located between the Warm Springs Valley wintering raptor area and the Modoc National Wildlife Refuge. Both areas are used by raptors during winter and it is likely that the Mill Site occurs within daily flight paths for these species.

The electrocution potential for raptor populations would be increased during operation of the proposed alternative substation, resulting in a **Class II** impact with application of Mitigation Measure B-19. Sensitive species using adjacent habitats would likely be affected indirectly during construction. There would be no loss of big game habitats.

C.3.3.9.2 *Border Town Substation Alternative Site*

The alternative site for the Border Town substation would be situated on an upland area next to an extensive montane meadow plant community. The alternative site does not include any jurisdictional wetlands or waters. Vegetation at the site is dominated by low sagebrush scrub intergrading with sagebrush-bitterbrush. The proposed and substation sites are both dominated by scattered low sagebrush (*Artemisia arbuscula*) interspersed with a few herbaceous species such as cheat grass (*Bromus tectorum*) and squirreltail (*Elymus elymoides*). There are no significant differences in the biological resources of the proposed site and the alternative Border Town Substation site.

The alternative site for the Border Town Substation would permanently remove approximately 8 acres of low sagebrush scrub. No other plant communities, jurisdictional wetlands, or special status plants would be affected. The alternative substation site would not result in loss of big game habitats. There were no special status species observed in the vicinity of this site. There would be no difference or increase in impacts on wildlife associated with the alternative site. Mitigation for permanent and temporary loss of low sagebrush scrub is summarized in Mitigation Measures B-1 and B-4. Mitigation Measure B-19 for potential bird electrocution would be applied.

C.3.4 NO PROJECT ALTERNATIVE

C.3.4.1 Environmental Consequences and Mitigation Measures

The No Project Alternative would cause no immediate impacts on vegetation or wildlife resources. However, within the next 3 to 6 years it is likely that Sierra Pacific Power Company (SPPCo) would plan and construct a major transmission line project to accommodate regional growth in energy needs. It is anticipated that such a project would result in significant direct and indirect impacts on vegetation and wildlife resources similar to those associated with the Proposed Project. Because the location of such a project is unknown, a quantitative evaluation of the impacts on wildlife associated with construction and operation cannot be conducted. Significant impacts on vegetation and wildlife resources would be mitigated through the same kinds of mitigating measures described in Section C.3.2.2 for the Proposed Project.

C.3.4.2 Cumulative Impacts and Mitigation Measures

The No Project Alternative would substantially decrease the cumulative impacts of projects proposed for the region on·natural plant communities, special status plant species, and wildlife over the near term.

C.3.4.3 Unavoidable Significant Impacts

The No Project Alternative would not cause any unavoidable significant impacts.

C.3.5 MITIGATION MONITORING PROGRAM

Mitigation for significant impacts on vegetation resources will include avoidance, minimization, restoration, and compensation. Specific mitigation for affected resources will be developed in consultation with the California Public Utilities Commission, Bureau of Land Management, the California Department of Fish and Game, the U.S. Fish and Wildlife Service, the Nevada Division of Wildlife, and associated resource management agencies and individuals, utilizing the general mitigation guidelines adopted by those agencies. Data gathered during surveys for the Tuscarora Pipeline Project and the Alturas Transmission Line Project were used to evaluate significance of impacts and appropriate mitigation measures. Emphasis will be placed on avoidance as the primary means of mitigating potential impacts to natural plant communities, wetlands, and special status species. Factors considered in evaluating priority for avoidance included:

- Regulatory status (state and federal legal protection)
- Known distribution
- Resource concentration/dispersal
- Potential for natural recovery or restoration.

Vegetation resources that have high sensitivities to impacts were identified and given the highest priority for avoidance. In the case of some special status plant populations (e.g., spiny milkwort) the dispersal of individual plants substantially lowers the potential for effective avoidance. Other forms of mitigation were adopted where avoidance was not possible. Offsite compensation will be used to mitigate for loss and for the recovery lag time inherent in restoration and natural recovery of plant communities and habitats. Table C.3-22 summarizes the mitigation monitoring program for the impacts discussed in Sections C.3.2 and C.3.3.

Biological resource monitoring will be conducted by individuals with specific qualifications relevant to the resources that will be monitored. Types of qualifications that will be considered for selecting monitors include:

- Emphasis of undergraduate/graduate degree(s)
- Related experience
- Special skills such as statistical analysis, experimental design, erosion control techniques, vegetation sampling, etc.

Depending on the monitoring objective, individuals will have suitable experience in soil science, botany, ecology, restoration, wildlife observation, and wetland delineation. The objective will be to utilize monitors who can collect and analyze the data required to document mitigation success, problems, and, if necessary, suggest remedial action. Specific qualifications of biological resource monitors will be discussed with the regulatory agencies prior to construction.

The lead agencies (CPUC and BLM) will provide support and ensure that the applicant provides the required funding and personnel to prepare and implement the mitigation measures, including monitoring plans, monitoring, report writing, and documentation.

Table C.3-22 Mitigation Monitoring Program

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
BIOLOGICAL RESOURCES: VEGETATION						
Temporary and permanent loss of plant communities (Class II)	**B-1** Flag allowable travel routes and construction areas to avoid surface removal of significant plant communities; where not avoided, use restoration and offsite compensation per Community and Habitat Restoration Plan (with Contingency Plan) and Offsite Compensation Plan to be prepared by SPPCo under the supervision of responsible agencies. **B-2** Avoid surface removal of volcanic vertisol plant communities; flag allowable travel routes and construction areas to avoid; cease activities if ruts form greater than 6" deep for more than 100 feet in vertisol soils; cease activities if ruts form greater than 3" deep for more than 100 feet on all other soils.	Proposed Segments A,C,E, K,L,N,Q,R,T,W,X,Y,Z; Devils Garden and Border Town Substations Alternative Segments D,G, J,ESVA,M,P,S,U,Z, WCFG,X-East	BLM CPUC CDFG USACE USFS	Monitor identification of allowable travel routes and construction areas based on avoidance of sensitive resources, prior to construction; monitor construction. After construction, verify where restoration is required. Monitor revegetation effectiveness for 5 years; activate Contingency Plan requiring additional offsite compensation in case of failure to meet success criteria.	Compliance with avoidance zone; achievement of annual criteria for revegetation effectiveness in terms of coverage, species composition, and viability in comparison with reference plots; compensation land transfer completed.	Plans in place 60 days before and allowable travel and construction areas flagged before construction; avoidance during construction; evaluate avoidance and conduct restoration after construction; effectiveness monitoring for 5 years after construction.
Temporary and permanent loss of special status plants and habitats (Class II)	**B-3** Avoid special status species if possible; flag allowable travel routes and construction areas prior to construction; if not avoided, use restoration and offsite compensation, per restoration and compensation plans.	Proposed Segments C,E,K, and L Alternative Segments D,J, and ESVA	BLM CPUC CDFG USACE USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above
Overland travel disturbing plant communities (Class II)	**B-4** Reduce surface impacts on plant communities by using avoidance, restoration, and offsite compensation or enhancement, per restoration and compensation plans.	All Proposed and Alternative Segments	BLM CPUC CDFG USACE USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above
Overland travel disturbing special status plants and habitats (Class II)	**B-5** Reduce surface impacts on plant communities by using avoidance, restoration, and offsite compensation or enhancement.	Proposed Segments A,E,K, L, and Q Alternative Segments B,D, F,I,J,M,P	BLM CPUC CDFG USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Increased access to sensitive vegetation resources (Class II)	**B-6** Replace existing barriers to overland travel following blading and place new barriers at access points to non-bladed overland travel routes.	All Segments except Proposed Segment R and Alternative Segments H and U	BLM CPUC CDFG USFS USFWS	Replace or enhance existing barriers to overland travel and restore new or upgraded roads to pre-existing conditions. Monitor mitigation to evaluate success or failure. Contingency plan in case of failure to meet success criteria.	Access not used for one year after construction.	Place barriers after construction; monitor after construction to evaluate success
Erosion and sedimentation (Class II)	**B-7** Implement Soil Conservation and Erosion Control Plan (Mitigation Measure **G-11**).	All Proposed and Alternative Segments except Alternative Segments H and I	BLM CPUC CDFG RWQCB USACE USFS	Review and approve Plan for application to biological resources. Monitor compliance and trigger contingency plan as appropriate.	See Mitigation Measure **G-11**; no adverse effects on vegetation, wetlands, or riparian areas.	See **G-11** below
Introduction of non-native plant species (Class II)	**B-8** Implement Noxious Weed Control Plan, flag existing weed populations, and control equipment and materials transported to the project corridor during and after construction.	All Proposed and Alternative Segments	BLM CPUC CDFG USFS	Plan review/approval; monitor flagging and construction/revegetation; post-construction success evaluation/trigger of remedial action	Seeds and straw to be certified weed-free by CDFA; fill materials to pass County Agriculture Commissioner certification	Plans in place 60 days before construction; monitor effectiveness during and after construction.
BIOLOGICAL RESOURCES: WILDLIFE						
Loss of mule deer winter, holding, and migration habitat (Class II)	**B-9** Restoration/reclamation to include forbs and shrubs appropriate for each habitat type and offsite compensation per Mitigation Measure **B-1**.	Proposed Segments A,C,E, K,L,N,O,Q,R,W Alternative Segments F,G, H,J,M,P	BLM CPUC CDFG USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above
Loss of pronghorn winter, migration, and kidding habitat (Class II)	**B-10** Same as for **B-9**, with restoration to include browse and other species preferred by pronghorn.	Proposed Segments A,C,E, K,L,N Alternative Segments B,D, G,J	BLM CPUC CDFG USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above
Loss of sage grouse brood habitat (Class II)	**B-11** Same as for **B-9**, with restoration of sage and forbs required by young grouse.	Proposed Segments A,C,E, K,L,N Alternative Segments F,G, H,I,J,ESVA	BLM CPUC CDFG USFWS USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above
Loss of pygmy rabbit habitat (Class II)	**B-12** Flag allowable construction areas and use existing roads whenever possible; remove pygmy rabbits where avoidance is not possible.	Proposed Segments L,N, O,Q Alternative Segments ESVA,M,P	BLM CPUC CDFG USFWS USFS	Monitor identification of allowable construction areas and removal of rabbits prior to construction.	No mortalities. No rabbits crushed in burrows.	Flag allowable construction areas before construction and ensure avoidance during construction

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Overland travel disturbing big game habitat (Class II)	**B-13** Monitor natural recovery and locate areas where restoration may be needed. Offsite compensation for failed recovery.	Proposed Segments A,C,E, K,L,O,Q,R,W Alternative Segments B,F, G,J,ESVA,M,P	BLM CPUC CDFG USFS	Prepare plan for mitigation and monitoring during and after construction. Monitor to evaluate recovery. Require offsite compensation where remedial actions are necessary.	Meet success criteria for natural recovery of habitat, or for offsite compensation where needed.	Prepare plan before permit issuance; during and after construction, monitor and identify areas needing remedial action for 5 years
Disturbance to special status species and habitats, including special status bats, pygmy rabbits, raptor nest sites, and sage grouse lek locations (Class II)	**B-14** Flag allowable travel areas to avoid habitat per species-specific buffers and seasonal avoidance periods; utilize biological monitor during construction. **B-15** Overland travel to be limited to areas identified in biological monitoring plan. Riparian and perennial stream habitats to be avoided.	Sensitive sites located on all Proposed and Alternative Segments	BLM CPUC CDFG USFWS USFS	Flag allowable travel areas and monitor construction to ensure no overland travel occurs outside these areas.	No disturbance to sensitive areas.	Flag allowable travel areas before construction and ensure avoidance of outside areas during construction
Direct mortality of individual animals (Class II)	**B-16** Construction specifications to include speed limits, firearms and pet restrictions, and litter removal program. Include construction worker training.	All Proposed and Alternative Segments, substations, access roads, staging areas	BLM CPUC CDFG USFS	Prepare Wildlife Construction Disturbance Prevention Plan. Prepare crew education materials. Conduct pre-field "tailgate" sessions. Prepare monitoring report.	Compliance with construction specifications. No observations of mortality or evidence collected by biological monitor.	Prepare plan and provide education before construction; monitor during construction
Indirect impacts to wildlife due to increased human presence (Class II)	**B-17** Construction to be scheduled to avoid critical seasons and establish buffer distances for sensitive areas. See **B-14** and **B-15** above	All Sensitive sites on all Proposed and Alternative Segments	BLM CPUC CDFG USFS	Construction monitoring to verify that avoidance requirements are met.	Compliance with construction specifications. No observations of distressed wildlife by biological monitor	Prepare location lists before construction; monitor during construction
Indirect impacts to wildlife due to increased access to remote habitat (Class II)	**B-18** Improved roads to be returned to preconstruction condition. Existing barriers to be replaced. See also **B-6** above.	All segments with improved or new access roads	BLM CPUC CDFG USFS	Mitigation monitoring for 5 years to evaluate success of mitigation measure. Contingency plan in case of failure to meet success criteria. Require additional offsite compensation in case of failure to meet success criteria.	Compliance with construction specifications. Achievement of habitat recovery.	Block roads and monitor effectiveness after construction

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Bird electrocution at substation locations (Class II)	**B-19** Substation design to eliminate attraction of perching and roosting and to minimize electrocution hazard.	All Proposed and Alternative substation locations	BLM CPUC CDFG USFWS USFS	Review/approve designs. Conduct monitoring program for 5 years after construction is complete to document and evaluate avoidance. Require additional offsite compensation in case of failure to meet success criteria.	No increase in bird electrocutions.	Monitor after construction - two surveys per year, plus contact with maintenance staff.
Potential bird collisions with transmission lines (Class II)	**B-20** Mark powerlines with bird flight diverters. **B-21** Use Rock Creek modification to Proposed Segment A.	Proposed Segments A,C,E, K,O,Q,T,W,X Alternative Segments B,F, G,I,ESVA,S,U,X-East	BLM CPUC CDFG USFWS USFS	As required by USFWS, conduct lifetime monitoring program during critical periods. Annual report to be provided. Require additional offsite compensation in case of failure to meet success criteria.	No increase in bird collision mortality.	Monitor 3 times per year (approximately on Nov. 1, Apr. 15, and June 15) after construction for lifetime.
	B-22 With application of **B-20**, off-site compensation would be required to reduce residual impacts to level that is not significant for greater sandhill cranes.			Monitoring of offsite habitat acquired to determine nesting success. Evaluate effectiveness after 5 years of monitoring. Require additional offsite compensation in case of failure to meet success criteria.	Confirmation of one nest success in a 5-year period.	Monitor for 5 years after construction - Annual 5-day survey during month of April to assess nest success and photo-document habitat condition.
Increased perching opportunities for raptors and ravens and displacement of sage grouse	**B-23** Install perch deterrents on structures located within 2-mile radius of sage grouse leks and in vicinity of waterfowl nesting habitat.	Proposed Segments A,C,E,K,L,N,O Alternative Segments B,D, F,G,H,I,J,ESVA,P	BLM CPUC CDFG USFWS USFS	Conduct 2-year post-construction surveys to document and evaluate success of measure.	No significant increase in predation of upland game birds. No more than 5 observations of raptors perching on transmission line structures annually.	Monitor after construction - during winter season when raptor population is high.

* The Mitigation Monitoring Program would be the same for any of the alternative alignments or substations should they be selected. The only possible change would be agency responsibility if the action were to take place on BLM or USFS administered lands. Please refer to Table C.4.3 for locations of resources on the alternative project components and the associated potential impacts.

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PART C.4 CULTURAL RESOURCES

C.4.1 ENVIRONMENTAL BASELINE AND REGULATORY SETTING

C.4.1.1 Introduction

C.4.1.1.1 *Definition of the Resource*

In conformance with the requirements of National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), and California Environmental Quality Act (CEQA), the potential for the occurrence of and effects of the project on cultural resources within the project area are considered here. Cultural resources include prehistoric and historic archaeological sites, historic architectural and engineering remains, and sites of traditional value or religious importance to Native Americans. A cultural resource is considered to be a significant historic property when it has been determined that it is eligible for inclusion on the National Register of Historic Places (NRHP). Also a significant cultural resource is a property that is an important resource as defined in Appendix K of the CEQA Guidelines. Cultural resources are significant in local, state, or national history based on their architecture, archaeology, engineering, or culture. To be considered significant, a property must possess integrity of location, design, setting, materials, workmanship, feeling, and association. The property must contribute to an understanding of history or prehistory through the variety, quantity, clarity, and research potential of the information present, and must:

1. Be associated with events that have made a significant contribution to the broad patterns of our history; or

2. Be associated with the lives of persons significant in our past; or

3. Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or that possesses high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or

4. Have yielded, or be likely to yield, information important in prehistory or history.

C.4.1.1.2 *Study Area*

For purposes of this study, the area of potential project effect (APE) encompasses a 201-meter wide (660-foot wide), 440-kilometer long (273.5 miles long) [8,885 hectares (21,880 acres)] survey corridor along the proposed transmission line route corridor and alternative route alignments, as well as block areas for proposed or alternative substation locations encompassing an additional 150.5 hectares (372 acres), for a project total of 9,004 hectares (22,252 acres). The Proposed Project corridor and its alternatives run roughly northwest to southeast from a location near Alturas, California in the north, to the city of Reno, Nevada at its southern terminus. The transmission line corridor, alternative alignments, and substation locations are depicted in Figure ES-2. A comprehensive description of the project and alternatives is provided in Part B of this EIR/S.

The Proposed Project is comprised of the following route segments from north to south: Segments A, C, E, K, L, N, O, Q, R, T, W, X and Y, and the Alturas, Border Town, and North Valley Road substation locations. The alternative alignments from north to south include Segments B, D, G, H, F, I, J, ESVA, M, P, S, U, Z, WCFG, and X-East, and the alternative Alturas and Border Town substation locations.

An intensive (Class III) cultural resources survey was conducted on lands encompassed within the study area. A Class III cultural resources survey is a walking survey with crew members spaced no more than 30 meters (100 feet) apart. A summary discussion of prehistory, ethnography, and history for the study area and surrounding region is provided below.

C.4.1.1.3 *Data Sources*

A number of data sources were utilized in order to understand the nature of anticipated cultural resources within the study area. Included was a cultural resources record search commissioned by Sierra Pacific Power Company and completed by PAR Environmental Services, Inc. of Sacramento, California (Maniery, 1993), which was designed to document all historic and prehistoric locations within one-half mile of the corridor's centerline. Repositories utilized by this study included: California State University, Chico (California Archaeological Inventory, Northeast Information Center); Nevada State Museum, Carson City; the U.S. Bureau of Land Management (BLM) District Offices in Susanville and Carson City; the Nevada State Historic Preservation Office (Division of Historic Preservation and Archeology) in Carson City; the California Department of Transportation (Caltrans District 02) in Redding, California; and the Toiyabe National Forest Supervisor's Office in Sparks, Nevada. Supplemental records searches were conducted at the California and Nevada BLM State Offices to review General Land Office (GLO) Plats to assess the potential for historic sites and features within the study area. Since the corridor had been subsequently altered from the original alignment as studied by Maniery (1993), a supplemental records search was conducted at the California Archaeological Inventory, Northeast Information Center at California State University in Chico, and the Nevada State Museum in Carson City. In addition, a search of the site records on the Modoc National Forest Office in Alturas, California (Modoc NF) was completed immediately prior to initiating the survey on Modoc NF lands.

C.4.1.2 Regional Setting

C.4.1.2.1 *Prehistory*

For the development of the prehistoric setting, the project corridor is divided into three major areas that correspond to the major biological and physiographic zones through which the corridor passes (see also Price et al., 1994:3-8). These three areas from north to south are: the Modoc Plateau and Pit River; the Madeline Plains, Secret Valley and Honey Lake Valley; and western Nevada. Described below is a brief summary of what is known regarding the prehistory of these areas.

Modoc Plateau and Pit River

In large measure, the history of northeastern California archaeology has been the record of Luther Cressman's (1936, 1942, 1956, 1960) early attempts to provide a culture history for the region followed by others' attempts to fill in the gaps left in Cressman's work. Much of this early work was involved in a meticulous description of the material culture of the Native Americans who occupied the area prehistorically. The area was occupied by members of the Modoc tribe at the time of initial contact with non-Native Americans.

Archaeologists have recovered isolated projectile points (spear and dart points) in the area that resemble those dated as early as 8,000 to 11,000 years ago (B.P.—before present) (Raven, 1984:467) suggesting that early populations focused on hunting large mammals may have sporadically used this area during this period (Big Game Hunting Tradition). Archaeological research in the surrounding region, such as Cressman's (1942, 1956) at the Narrows Complex, provisionally dates evidence of occupation from between 7,500 and 4,000 years ago, and Sampson's (1985) and Grayson's (1972, 1976) work at Nightfire Island, which spans a period between 7,000 and 500 years ago, firmly establish dates for the earliest populations in California's northeast sector.

Following the Big Game Hunting Tradition referenced above, the Western Pluvial Lakes Tradition (WPLT) represents subsequent adaptations by human populations that focused on the resources available at the edges of the shrinking Pleistocene (Ice Age) lakes. In theory, WPLT sites should be common within this area because of the nature of the local post-Pleistocene environment and the area's proximity to Bedwell's type-locality in south central Oregon. However, relatively few such sites have been found in the area which may reflect the catastrophic Mt. Mazama (site of Crater Lake today) ash fall 7,000 years ago on regional plant and animal resources.

Archaeological research in the region has produced a chronology, or sequence of prehistoric adaptations based on a suite of artifact types. Some of the earliest established materials are from the phase named The Narrows by Cressman (1942, 1956) which may date to as old as 7,500 years ago. This phase is characterized by the long, narrow, plano-convex, willow-leaf projectile points, fossilized bone foreshafts, beveled-edge knives, and the presence of manos. The apparent association of this phase with extinct mastodon remains suggested the early date to Cressman. This phase is followed stratigraphically by the Lairds Bay "Horizon" that was dated to about 4,000 years ago. Archaeological materials include Northern side-notched and Elko corner-notched projectile point forms, along with the continued presence of grinding stones. The last phase, the Modoc "Horizon" contains Rose Spring and Gunther projectile point forms and probably marks the transition from a thrusting spear and atlatl hunting technology to one utilizing the bow and arrow.

Further work (Squier and Grosscup, 1952, 1954; Johnson, 1969; Swartz, 1961, 1964; Hardesty and Fox, 1974) served to refine this sequence and suggest parallels from both the Great Basin to the south and east, as well as the established sequences of northern California. Important research was conducted during the

1970s in the Surprise Valley area to the east of the project area (O'Connell, 1975). O'Connell established a refined five-phase chronology beginning 6,500 years ago. Using models of human adaptation derived from cultural ecology and functionalism, O'Connell developed inferences concerning group size and composition, seasonal shifts in adaptive strategy, and a hypothesized regional subsistence-settlement system. He also provided an important correlation of ethnographically-described Modoc house types with those found in archaeological contexts.

Richard Hughes (1986) has provided an important analysis of obsidian (volcanic glass) procurement practices by means of his study of obsidian projectile points over time. The earliest forms appear to have been entirely derived from local sources (Northern side-notched phases) with more distant sources being utilized during Elko times. Finally, it appears there was a return to local sources during the later periods marked by the use of bow and arrow technology. Hughes suggests that these changes may reflect changing subsistence systems, shifts in the location of exchange networks, and the changing nature of social relations, including the factor of enmity. Cultural resource management projects have provided additional insight into the density, nature, and location of prehistoric properties.

Madeline Plains, Secret Valley, and Honey Lake Valley

All three of these major landforms lie within the Great Basin physiographic province south of the Modoc Plateau at its connection with the Sierra Nevada and Cascade Ranges. Therefore, within a very short distance a variety of major environmental zones and their resulting ecotones (areas of overlapping environmental zones) provided for a number of economic opportunities for prehistoric hunting and gathering populations. This region was occupied by several closely related bands of Northern Paiute at the time of their first contact with non-Native Americans.

Three early excavations dominate the archaeological record of this region. These excavations were at the Karlo Site (Riddell, 1960), an open-air village site of some antiquity located on the northwest edge of Secret Valley; Tommy Tucker Cave (Fenenga and Riddell, 1949; Riddell, 1956), located on the west side of the Hot Springs Mountains east of Honey Lake; and Amedee Cave, located not far from Tommy Tucker Cave (Riddell and Shutler, 1952).

Raven (1984:451-452) points out five important characteristics manifested by the excavations at Karlo:

1. It was the first important open-air site excavated in a Great Basin assemblage of sites dominated by dry cave excavations.

2. It contained a long stratigraphic sequence with virtually every Great Basin point type represented.

3. It possessed 42 burials with grave goods that allowed a more comprehensive intra-site comparison of burials and artifacts.

4. The shell bead sequence was sufficiently like the California sequence in that it provided a non-projectile point cross-dating tool.

5. The stratigraphy was intact enough to provide evidence of architectural features and a sequence of faunal utilization that would be confirmed by evidence from numerous other Great Basin sites.

The Karlo site is a mixture of California and Great Basin traits. Later, other archaeologists defined seven components at Karlo on the basis of burial orientation, grave lot seriation, stratigraphy, and projectile points (Bennyhoff and Hughes, 1987) extending from mid-Holocene (4200 B.P.) through Historic times.

Tommy Tucker Cave provided evidence of the presence of six separate components (Bennyhoff and Hughes, 1987:167); however, the deposits were so thoroughly disturbed that the evidence from this cave is of limited use. The same can be said of Amedee cave where four separate components were hypothesized, based upon the presence of four projectile point series. The last occupation at Amedee Cave was evidently a historic occupation reported to Riddell by Northern Paiute informants (Riddell, 1978:42).

Riddell (1958) notes that archaeological surveys were limited in this area during the mid-1930s and began to accelerate after the mid-1940s. Summaries of much of this and later work has been presented in two major BLM Class II surveys that were conducted by BLM personnel as a result of livestock grazing management EIS requirements (BLM Susanville District, 1979, 1981). Riddell (1958) has also reported the presence of what he has identified as a Scottsbluff point found in proximity to Rancholabrean megafauna (large Ice Age mammals) as well as isolated Clovis points (typically associated with Mastodon kill sites) from Secret Valley, but unfortunately these and other extremely interesting finds have been the product of pothunting and avocational activity which is extremely active within this region.

Western Nevada

The archaeological sequence for the western Great Basin has been provided by a number of researchers including Hester (1973); Bard, Busby, and Findlay (1981); Pendleton, McLane, and Thomas (1982); and Elston (1982, 1986). The following is a composite of their conclusions regarding the prehistory of the area:

Pre-Archaic (11,200-7,000 Before Present). Pre-Archaic hunters (Big Game Hunting Tradition) may have occupied the Eastern Sierra Front and the western Great Basin as early as 11,000 or 12,000 B.P. However, the evidence for this is based solely on the presence of artifacts that appear to be associated with that period (Tuohy, 1974; Willig, 1988). Distinctive artifacts resembling those used by the early extinct-megafauna hunters (called "Paleo-Indians" by some and found in an unambiguous early context throughout the North American southwest, east, and southeast) are found as isolates or mixed with scatters of other objects in the western Great Basin (Ruhstaller and Pendleton, 1982:20-22). The stone tool (lithic) technology is characterized by large bifacial knives, stemmed and concave-based projectile points with ground edges, crescents, and several types of scraper or scraper planes with rather steep edges. Sites where such finds have been made include:

- Fishbone Cave: 11,200 B.P. (Orr, 1956, 1974)
- Leonard Rockshelter: 8,660 B.P. (Heizer and Hester, 1978)
- Falcon Hill Caves: 8,380 B.P. (Rozaire, 1969)
- Last Supper Cave: 8,960 B.P. (Layton, 1979)

The Western Pluvial Lakes Tradition (WPLT) characterizes a prehistoric lifeway (subsistence and settlement pattern) that Bedwell (1973) has suggested may represent a bridge between the earliest North American lifeway (as hypothesized above) and the tradition that dominated the Great Basin until contact times — the Archaic. The name WPLT is derived from its common occurrence along the edges of extinct pluvial (Ice Age) lakes to the north. Bedwell has suggested that with the hypothesized drying that followed the Pleistocene, human populations may have been restricted to lake or stream margins sometime between 11,000 to 8,000 years ago. Diagnostic artifacts of this tradition include stemmed and non-notched lanceolate projectile points (e.g., Great Basin stemmed), various lanceolate knives (in assemblages with the following technologies: Parman, Mohave, Haskett, etc.), and scrapers, crescents, and possible core-blade and burin technologies. Sites in the Proposed Project's general region that may represent this adaptation include the Hathaway Beach Site, Sadmat, Harvey, and other Carson Sink sites, the Dansie Site, the Coleman Site near Lake Winnemucca, and 26Wa1676 on White Lake Playa near Reno (see Ruhstaller and Pendleton, 1982:22-24). The Karlo Site near Honey Lake (Riddell, 1960) may also contain evidence of this tradition. The assignment of this particular tradition to the western Great Basin, however, is also speculative; its presence is based solely upon typological grounds (artifacts that share similar traits) (Hester, 1973:68).

Archaic (7,000-150 B.P.). The Archaic lifeway is one marked by an increasing dependence upon the exploitation of an extremely diverse resource base. Through time, archaic settlement patterns tend to become more complex, vary more in size, and the sites demonstrate more clearly a wider range of associated functions (thus, simple hunting blinds become associated with other hunting features such as walls, dead falls, etc.). This trend can be seen as the consequence of an increasingly complex need to synchronize human scheduling activities with the natural seasonality that a larger range of useful subsistence items demands. The use of greater and greater varieties of food stuffs begins to pit resource against resource for the attention of the human hunter-gatherer, with timing being the most accurate gauge of whether a particular strategy will be successful or not. Social organization and the informal web of human interaction would have become increasingly important.

Early Archaic (7,000-4,000 B.P.). The Early Archaic begins later in the western Great Basin than elsewhere in North America. It begins between 7000 and 4500 B.P. and ends sometime between 4000 and 3500 B.P. The diagnostic projectile point types for this period include the Pinto and Gypsum Cave forms (called the Gatecliff Series by Thomas, 1981) along with Humboldt (a poor time marker as it is found throughout the record) and Martis points. The Martis archaeological complex may have spread eastward out of the Sierra Nevada at around 4000 B.C. into this project's province (Elston, 1971:10-11; Price, 1962:92; Moratto, 1984). All of these projectile points are smaller than many of the proposed pre-Archaic forms, though they were probably also being used to take big game—although not of an extinct variety—by means of an atlatl (spear thrower) dart. Grinding implements are common evidence of hard seed processing. Other cultural elements commonly encountered where preservation permits include baskets, nets, mats, cordage, bone tools, bone and marine shell ornaments, and fur and bird skin robes. Food and other domestic and ritual supplies were commonly cached in caves, rock shelters, and house pits. Site density for this period is quite low with a distinct locational preference for valley bottoms near potable water.

Middle Archaic (4,000-1,500 B.P.). The Middle Archaic lasted from about 4000 B.P. until about 1500 B.P. This is a period marked by changes in settlement and subsistence patterns, stylistic elaboration, and the presence of many more sites. During this period, it appears seasonal camps and winter sites were reoccupied. House pits contain hearths, storage areas, and occasionally burials. Some evidence that groups may have begun to exploit a definable territory has been suggested. Big game utilization continues with bighorn sheep being common prey, but with a definite increase in the number and variety of smaller game. Seed procurement also increased during this period. Sites were quite commonly strewn with the debitage from quarry-derived waste flakes, helping to make these sites more visible to the archaeological eye. The trade in marine shell and obsidian was well-developed. Elko series projectile points are the diagnostic forms for this period, though the Martis variant is common along the Eastern Sierra Front.

Late Archaic (1,500-150 B.P.). The Late Archaic begins about 1500 B.P. and continues until shortly after contact with Euroamericans. There is evidence that efficient acorn processing technologies developed shortly after 1500 B.P. which may have led to the intensive occupation of the eastern flank of the Sierras by the historic Washoe. The archaeological complex known as Kings Beach emerged in the Lake Tahoe region and along the Sierra Nevada flank and may form the actual evidence of these early Washoe (Elston 1982:198-199). Other investigators see the Kings Beach and the Martis complex as exclusive (Heizer and Elsasser, 1953:4; Elsasser, 1960:72-74), but as they are often found in the same sites, other scholars suggest that the two complexes are separate but overlapping traditions (Elston, 1971:10-11, 1979:46; Elston et al., 1977:167-168). Diagnostic points for this period in the Spanish Springs region include the Rose Spring and Eastgate forms (1500-900 B.P.)—referred to by Thomas (1981) as Rosegate—and Desert Series points, with the occasional addition of a crude brownware ceramic after about 900 B.P.

Perhaps the most important change during this period is that marked by the apparent adoption of the bow and arrow complex which supplanted the atlatl and dart complex. The requirement for smaller and lighter (hence, more fragile) points for arrows led to a finely flaked stone technology emphasizing the elaborate pressure flaking and retouch of thin quarried blanks. Seed processing equipment was also more common, with convincing evidence that plant foods and small game were replacing large game for the attention of these hunter-gatherers. As one might expect, social organization was becoming more elaborate as a mode of exchanging information, personnel, and goods more efficiently. It has also been hotly debated whether this period was marked by the intrusion of the Numic languages as spoken by the Northern Paiute into the Great Basin sometime around 1000 years ago (Lamb, 1958), or conversely, whether these languages developed in place (Goss, 1977). Changes in basketry technology by 400 B.P. are thought to document the expansion of the Numic speakers.

C.4.1.2.2 *Ethnohistory*

The project study area encompasses geographic areas that were utilized by a number of Native American groups. While there are general regions that were typically inhabited by a particular group, these boundaries were extremely fluid resulting in considerable overlap. The following discussion summarizes, from south to north, the ethnographically observed groups that are known to have occupied the study area.

Washoe

The Washoe are different in many respects from other Great Basin Native American peoples, but are most conspicuous for their language, which is distinct from other Great Basin groups, and the clearly pragmatic seasonal cycle of population movement that redistributed the Washoe from Pyramid Lake in the East to the lower end of the American River just east of Sacramento in the west. These seasonal movements were in response to the predictable availability of foods at different elevations and locations throughout the year.

The major habitation centers of the Washoe were on the floors of the large valleys at around 1,400 meters (4500 feet) in elevation and in small valleys at altitudes around 1,700 meters (5500 feet) such as at the upper reaches of the Truckee River near Donner Lake. The Washoe and their neighbors occupied an essentially open range, moving throughout a broad zone in response to available food, social circumstances, and personal preference. Their economy necessitated the exploitation of large areas beyond that which might be considered "their" territory (Price, 1962; Nevers, 1976:90; Stewart, 1961:185-189). For example, living in the Reno Basin and in Long Valley, but seasonally exploiting the fishing resources at Pyramid Lake, regularly brought the Washoe through the southern part of the project study area.

The Washoe people of the Truckee Meadows and northward to Honey Lake recognized themselves as the *welmelti*, though this could often be a general term used by other Washoe to describe native peoples living in the northern ranges of Washoe territory. Subgroups such as the *welmelti* were identified as "subtribes" by the early Euroamericans. Each subtribe had "captains" who were not the chief but the temporary headmen of the major family units that comprised the core of larger families that were concentrated near productive resource centers. Intragroup relations were always peaceful and cooperative. The maintenance of good relations was one of the major functions of the local headmen who usually had close kinship ties with other subgroups and often maintained a wife among the residents. The complexity of coinciding seasonal movement with resource availability was moderated by such close forms of communication as festivals, and gossip during visits. External relations with the Northern

Paiute, the Miwok, and the less well-trusted Maidu and Nisenan were peaceful and often maintained by intermarriage.

Subsistence was conducted by moving to temporary mobile camps which might be maintained anywhere in the general region at different times of the year, and it was not unusual for relatives and friends to come together in winter settlements over several seasons and then break apart for several more. Some populations who were concentrated near year-around food sources might choose to remain in one location throughout the entire year (Freed, 1966:75; Downs, 1966:12-37). Although the tendency was for people to move from lower to higher elevations in the spring and summer to avoid heat and exploit high altitude resources, this movement was not universal nor was it of the same magnitude for all. It depended upon the availability and abundance of resources.

The Washoe hunted large game using the bow and arrow. Deer and mountain sheep were stalked or ambushed by individuals and small groups, but antelope were driven by large groups of cooperating individuals into corrals where they were slaughtered by both men and women. The most plentiful game available to the Washoe were rabbits and hares. These hunts were undertaken by large groups of people and coordinated by a "rabbit boss." Other small animals were also taken, as were all birds except scavengers or predators. The golden eagle was thought to have had magical powers and was never killed or eaten, though its tail feathers were highly valued in trade (Downs, 1961:371).

The gathering of plant products was actively pursued from early spring through late fall. Washoe staples included pine nuts and acorns, both of which were not available in the project area. Rather, the plant foods that would have been attractive in the project area were primarily hard seed resources (sunflowers, wild mustards, wild ryes, other grasses) available during very limited times of the year. Hard seeds required the use of a handstone or mano, as well as a small portable metate for processing prior to cooking.

Fishing was an important and stable resource for the Washoe. It is this abundant and predictable resource that would have consistently drawn the Washoe through the APE (area of potential effect). In particular, the fish associated with the riparian and lacustrine environments provided motivation for hunting forays, gathering activities, semi-permanent camps, winter villages, and the like to occur in the project area during the long-awaited fishing season. The Lahontan sucker (*Pantosteus lahontan*) spawned profusely up Long Valley Creek from Honey Lake in the spring and early summer. The Truckee River flowing from Lake Tahoe to Pyramid Lake was a prime fishery for these people with trout runs from April to June and also from October to December.

House types were variable, but the more permanent winter dwellings were characterized by the occasional excavation of a depression (Hudson, 1902:241), with long poles set into the ground, forming a circle 12-15 feet in diameter. The poles were tied together at the top and covered with a thatch of grass bundles, tule, or deer hides. Summer houses were dome-shaped and were temporary constructions of woven tule or brush, often interwoven with willow for strength.

Social organization and the resulting kinship terminology (the terms used by members of the group to identify each other) were extremely flexible to take advantage of the Washoe practice of "moving about". This practice established interdependencies among many persons and stressed peaceful relations between widely dispersed group. Residence patterns were most commonly bilocal, allowing a newly-married couple the option of residing near either one's parents although they might even choose an alternating, avunculocal, or neolocal pattern. Political organization tended to follow informal lines with local headmen or headwomen representing the respected heads of extended families. The more charismatic of these individuals may have occasionally (depending on circumstance and context) represented a regional community or even several such entities (the so-called "chiefs" or "captains"). Rabbit bosses, "antelope charmers" (Lowie, 1939:303), midwives, shamans, temporary war leaders, or healers may also have had increased status, but usually only during times when their particular skills were needed.

The Washoe buried their dead close to their villages or camp sites by either extended interment with the head to the west, or cremation (Fowler, 1981). Burial practices showed no specific evidence of social stratification, though burial goods were usually gender-specific. Earlier prehistoric burials in Washoe territory are few, but the Martis pattern tended to be tightly flexed burials with accompanying burial goods that resemble Elko burials from elsewhere (Tuohy and Stein, 1969; Riddell, 1960). Modern and historic Washoe have adjusted their burial practices through enculturation to burying individuals in small family 'plots' (Fowler et al., 1981:6).

Northern Paiute

The Northern Paiute are Numic speakers who ranged over a vast area from the Owens Valley, California, north to the John Day River in Oregon, none of whom have ever been politically integrated into what is commonly thought of as the larger political unit known as the "tribe." The subgroup that would have been present in the project area ethnographically is the *Tasiget tuviwarai*, a Northern Paiute name designating people who dwell in the "middle place" (Stewart, 1939). This name is probably a reference to their geographic position between such major resource centers as the Truckee Meadows area, Pyramid Lake, and Honey Lake.

In contrast to the Washoe, the Northern Paiute had no predictable pattern of movement, though they too had a semi-nomadic settlement pattern in the spring, summer, and fall, with most nuclear families or kindreds gathering together to form a larger village with more permanent house structures during the winter months. The resources used by the Northern Paiute were the same as those used by the Washoe.

Family organization was flexible. Social units might occupy more than one household and were economically independent, although they could enter into cooperative communal activities such as hunting, gathering, games, gossip, and competitions.

Subsistence activities were divided between the taking of small and large game; the accumulation of many kinds of seeds, berries, and roots; and the taking of waterfowl, game birds, insects, and fish. As is practically universal among hunting-gathering populations, men most commonly provided the products of the hunt while women most commonly gathered the bulk of the plant foods. Fishing in lakes and rivers was accomplished by the use of weirs, spearing or harpooning from platforms, gill nets, set lines with gorges or angled hooks, and throw lines; winnowing trays were used in lakes. Hunting could be accomplished by stalking game alone or in groups, or by the use of traps, corrals, drives, or deadfalls. Small game could be shot, netted, or caught in snares or deadfalls. With the variety of choices available for each of these activities, it is no wonder that some individuals became known for their own skills, thus obtaining an impermanent form of status related directly to that activity and those skills.

Seed and plant collecting were the most important activities for Northern Paiute caloric intake. South of the Truckee River, pine nuts were the most important plant food resource, with the nuts being parched, winnowed, shelled, and ground into a flour, rich in fats and protein. The acorn groves of Long Valley and the western sides of the Honey Lake Valley and its environs were also famous for their productivity. Within this project area, grass seeds would have had to have taken the place of the missing pine nuts and acorns. In actual practice, pine nuts and acorns are transportable in seed or flour form, and probably constituted an important part of the diet for groups temporarily using this area between the Truckee Meadows, Pyramid Lake, and Honey Lake resource areas.

The Northern Paiute seasonal round (yearly subsistence cycle) can be described as follows: in the spring, ground squirrels were the earliest resource. Migratory birds and new plant shoots became available in March. By late April and May, the spring trout and *cui-ui* at Pyramid Lake began their spawning runs. During the summer, edible berries and seeds were gathered as they became ripe. Desert peach berries, mustard, and mentzelia could be gathered in June. In July, Indian rice grass and cattail pollen were available. Blackberries and currants ripened in August. Sun-dried berries, along with surplus seeds, were stored for winter use during this period. During August, scouts were sent into areas to the south to scout out the best pine groves for the anticipated pine nut crop.

In the fall, pine stands with nut crops in the hills to the south lured most of the population there, but rose hips were available in the valleys and in the northern project area. Men also hunted small game during this period. Extra processed pine nut flour, pine nuts, and cones which had not yet opened were stored for winter or late spring, or provided a supply of nutritious food for forays into the areas to the north where pine trees were absent but hunting remained viable. During the winter, in November, word was sent to the pine nut camps that rabbit drives were being planned in the valleys. This prompted a return to the valley camps. By the time of the first snow, most groups had returned to their winter residences. Winter was a period when tool and shelter maintenance tasks were performed. Small mammals, birds, and fish were hunted when available.

Social and political organization among the Northern Paiute was very flexible. With few exceptions (fishing platforms, specific groves of pine trees, very personal possessions) the concept of private or even public ownership was an alien concept. Other than by means of charismatic control, political organization was rarely used or necessary, and then it tended to stress the roles of ritual and ceremonial leadership.

Fowler and Liljeblad (1986:450) report that upon a death, the "body of the deceased was removed from the house, wrapped in skins with legs flexed in front or behind, and taken to the hills for burial. It might be placed in a rock crevice or cave, or it might be buried on a hillside."

Pit River People

The Pit River band's territories include the drainage of the Pit River, and the region from Montgomery Creek to Goose Lake. The study area crosses what is identified as the Pit River culture area. The territory of the Pit River people centers on the Pit River and surrounding tributaries, lakes, marshes, grasslands, sagebrush steppe, and forests. Fishing resources were abundant, deer were hunted in the foothills of the Warner Mountains, drives netted rabbits, waterfowl were taken in the marshes, and tubers and seeds were gathered in wetlands and grasslands. Bows were a common hunting weapon, spears and nets were used for fishing, and dugout canoes were used for transportation and the hunting of waterfowl. Twined baskets were common.

Winter houses had an excavated floor three to five feet in depth. The roof, which was covered with bark and earth, was held up by center and end posts. Often this large (20 x 30 feet) structure was occupied by a number of families. In the spring, summer, and fall the Pit River people moved from their winter settlements to temporary brush covered shelters for fishing and hunting.

Ritual practices of the Pit River people were described by Kroeber (1925). According to Kroeber, the Pit River people recognized dual and contrasting creators. Shamans, both male and female, practiced healing. Ritual ceremonies were carried out when a girl reached adolescence, a foe was defeated, or boys sought shamanistic power. After marriage the couple lived for a short time with the parents of the bride (Kroeber, 1925:313) and descent was reckoned through the male line. After her husband died, a widow noted her status by cutting her hair, rubbing pitch into it, and wearing pitch lumps on a string around her neck. After two or three years and when her hair grew long again she was free to remarry. The dead were buried in a basket flexed on their side facing east (Kroeber, 1925:313). Olmsted and Stewart (1978:232) state that it was necessary to assist the dead spirit on its journey to the western mountains since it might return for a companion. They also appear to disagree with Kroeber by asserting that the Pit River cremated their dead.

The Modoc

The Modoc peoples occupied the area of Tule and Clear Lakes, including Lost River and Lower Klamath Lake (Kroeber, 1925:318; Merriam and Talbot, 1974:14; Ray, 1963). The study area crosses what has been identified as the Modoc culture area at its extreme northern terminus.

Modoc territory possesses an abundance of lakes, marshes, and streams that provide extensive aquatic resources, while the high plateaus provide abundant seeds and roots. Large game such as elk, mountain sheep, antelope, bear, and deer were hunted during the summer and fall, whereas rabbits and other smaller mammals, along with waterfowl, were taken whenever they were available.

Kroeber (1925:323) reports that Modoc material culture is "distinguished by the almost infinite use of tule and bulrush" which is in keeping with the riparian adaptation and the apparent adaptational similarity of the Modoc with the Klamath, Pomo, and Yokuts who also stressed an adaptation to tule-fringed sloughs. As Modoc territory lacks acorns, the mortar and pestle are very rare. When encountered, it is reported that the mortars and pestles had been used to beat meat and fish. For hard seed grinding, the metate was the preferred tool. The bow and arrow were used for hunting, canoes were used for hunting and transportation, and baskets made from tule provided for a variety of functions.

Modoc settlement patterns were greatly influenced by the seasons. Winter was a time for population clustering when 3 to 15 families might build houses in close proximity. House construction included the excavation of a semi-subterranean living area traditionally covered by tule matting materials to protect the inhabitants from rain and snow. In the spring, the centrifugal village pattern was reversed and individual families or small groups of families individually left their winter villages and set up temporary camps of less substantial structures made of willow poles covered with brush in locations where the hunting and gathering was most abundant.

In reference to the ideological sphere, directions were important to the Modoc. The west, or toward the setting sun according to the Modoc, was where the dead lived and was therefore considered a place of powerful spiritual influences. Some of those influences were considered negative and could be avoided by placing the door of one's house toward some other direction. Ray (1963:20) states that the Modoc thought of the world as "flat," and that it was constructed by their creator from a certain hill east of Tule Lake. The Modoc conceived of a time of animals before men, and many features of the natural world such as hills, lakes, and mountains had sacred elements of significance to the Modoc. The cycle of life from birth to death was marked by religious and secular rituals, although Kroeber posits that religious institutions were "practically unknown" (Kroeber, 1925:320). Kroeber reports that the heads of children were shortened by deformation (1925:326). Dance and song (especially shaman's songs) were closely associated with rituals and tribal actions such as warfare. At death, cremation of the individual, as soon as possible, was the general practice.

The Maidu

The territory of the ethnographic Penutian speaking Maiduan people conformed to the drainages of the Feather, Yuba, Bear and American Rivers. The northern boundary extended from Mount Lassen eastward to the crest of the Sierra Nevada mountains which forms the watershed between the Pit River and the Feather River drainages. The eastern boundary was the crest of the Sierra Nevada Mountains. The southern boundary was somewhere between the American and Consumnes Rivers, but may have extended as far as the middle fork of the Consumnes River. The western boundary was the Sacramento River on the floor of the Sacramento Valley (Kroeber 1925:391-392).

The Maidu were organized into permanent village communities, typically small settlements around a larger central village. The villages served as winter base camps and were self-sufficient and politically autonomous. At other times of the year these settlements served as base camps during the seasonal round of hunting and gathering activities.

Shelters ranged from simple roofless circular brush enclosures to conical structures covered by slabs of bark, skins and/or brush. The Maidu were hunter-gatherers who exploited a broad range of plant and animal resources available within their territory. Major animal species that were hunted included elk, deer, rabbits, squirrels and a variety of fowl and fish. Plant resources included nuts, roots, leaves and seeds. Acorns were a major dietary component.

The annual bear dance was an important community ritual and feast celebrated when the first edible shoots came up in the spring. Social organization was relatively fluid with marriages arranged through mutual consent and choice of the spouses. Post-marital residence was typically in the husband's village. The Maidu buried their dead in the extended position with the face to the east. The house of the deceased was burned. Cemeteries were located around the peripheries of villages (Riddell 1978: 382).

C.4.1.2.3 *History*

The first Euroamericans in close proximity to the project area were early explorers who penetrated the area as early as the 1820s when Hudson Bay Company fur trappers expanded their economic activities in response to failing fur-bearing animal populations to the north and northeast. By the 1840s overland immigrants seeking their fortunes in Oregon began searching for new and quicker routes from the east. They were aided by explorers such as Lindsay and Jesse Applegate who provided a route to the Willamette Valley in Oregon. John C. Fremont, Joseph Chiles, William H. Warner, and Peter Burnett explored the region during the 1840s, providing alternate routes and general information regarding access to these remote regions and anticipating the need for access to the California gold fields. Also notable among these early explorers was James Beckwourth who discovered Beckwourth Pass in 1851. The pass is located just west of the project area in Long Valley. Peter Lassen and William H. Noble established important immigration routes in response to the gold boom in California. The major and most direct routes over the Sierra Nevada range to the California gold fields parallel the Truckee River and are located a mile south of the terminus of this project (Townley, 1983:30-33).

In general, the project area remains less populated than regions to the west and south because of environmental constraints imposed by the distribution of water, the volcanic tableland of the Modoc Plateau, and the rainshadow effect of the mountains to the west. As a result, land entry and settlement tended to follow major transportation routes, especially where those routes intersected a source of potable water. Changes occurring in the second half of the 19th century, particularly in Federal and local laws, regarding private land ownership through sales, preemption, homesteading, timber claims, mineral leasing, and railroad incentives provided the basis for private land entry and general public access.

The key historical events and major historical thematic trends vary in the project area depending on the vagaries of resource availability, transportation development, political forces, and ethnic rivalries between Native American and Euroamerican settlers. Described below are regional characterizations from north to south of major 19th and early 20th century historical trends in the project area.

The northern portion of the project area experienced increased settlement following the resolution of conflicts with Native Americans in the late 1860s. By the time the Modoc Indian War of 1872-1873 ended, settlement was expanding at an ever-increasing pace. Farming in the Pit River drainage attracted large numbers of settlers. Completion of the Nevada-California-Oregon (NCO) railroad in the early 20th century improved access and further accelerated development in the area with a second wave of homesteaders arriving in the early decades of the 20th century.

The central part of the project area was initially settled in the 1860s by ranchers filing claims under the provisions of the Homestead Act. Without abundant perennial surface water, farming was developed to a much lesser extent than along the rich riparian environments of the Pit River to the north. Construction of the NCO railway through this region in the late 19th century resulted in a number of settlements developing in association with its northward progression. Towns such as Termo and Ravendale owed their existence to the advent of the railroad.

Further south in the project area is Honey Lake Valley. The valley was first settled in 1853 by Isaac Roop who built a small cluster of structures along the Nobles Trail. Early settlers were primarily a few ranchers and, to a lesser extent, miners, although the area was never a major mineral producer. Honey Lake Valley was also the site of a political tug-of-war between Nevada and California in the 1860s (Purdy, 1983). Following the cessation of Indian hostilities in the 1870s, the area experienced increased settlement. With construction of the NCO railroad through the area in the 1880s and 1890s, local ranchers were able to more efficiently ship stock. An attempt to make the valley more arable was undertaken in the late 1800s with a scheme to transport water from Eagle Lake to Honey Lake Valley. A system of ditches and pumping facilities was completed by 1916 and operated until the mid-1930s.

Further to the south, the Long Valley and Fort Sage Mountain areas were principally settled by ranchers in the latter half of the 19th century. Fort Sage Mountain is named for Fort Sage, a military garrison used by troops patrolling the Reno-Fort Bidwell road in the early 1870s (Pendleton and Thomas, 1983).

The project area terminates at the north end of Reno. The history of the development of Reno and the Truckee Meadows is inextricably linked to the first waves of westward-bound emigrants who followed the Truckee River route of the Emigrant Trail, westward to the Sierra Nevada. With the establishment of Jamison's Trading Post in 1852 the region began a period of settlement and expansion (Hardesty, 1982). With the discovery of gold and silver in the Comstock to the south, and to a lesser extent in more minor ore bodies such as in Peavine Peak, the area experienced rapid growth in the 1860s. With the completion of the Central Pacific railroad from California in 1868 (and across the continent shortly thereafter), the Virginia and Truckee railroad to Carson City and Virginia City in the 1870s, and the

NCO railroad in the late 1800s, Reno soon became a transportation hub in western Nevada and experienced ever-increasing growth as mining, ranching, tourism, and gambling created a diverse and robust economy.

C.4.1.2.4 *Contemporary Native American Groups*

There are members of each of the groups described previously living in close proximity to the project area. There are also members of other groups such as the Maidu who also live near the study area. The distribution of modern Native American populations in the region is much more variable than at the time of Euroamerican contact. Intermarriage, increased mobility, and economic opportunities have blurred the boundaries even further of what were already fluid "territories". A program to identify and make initial contact with Native Americans potentially affected by the Proposed Project is described in Section C.4.1.3.3.

C.4.1.3 Existing Conditions - Proposed Transmission Line Corridor

C.4.1.3.1 *Archaeological Resources*

The results of the Class III cultural resources inventory for the Proposed Project resulted in the identification of 266 cultural resource sites. One hundred and fifty-four of these sites are prehistoric sites, 53 are historic sites, and 59 are multi-component prehistoric/historic sites. Preliminary evaluations indicate that 27 of the prehistoric sites appear to be eligible for inclusion on the National Register of Historic Places (NRHP) and another 36 are recommended for further evaluation to make preliminary statements regarding their NRHP eligibility. Fouteen of the multi-component sites provisionally appear to be NRHP-eligible and another 17 remain unevaluated, but may possess qualities that would make them eligible for the NRHP. Four of the historic sites appear to be NRHP-eligible and seven may possess qualities that would make them eligible for the NRHP pending further evaluation. In addition to the sites described, 619 isolated finds (both prehistoric and historic) were recorded along the proposed route.

The greatest concentration of prehistoric and multi-component sites are located on the A, C, and E segments in the Modoc Plateau area. Secondary concentrations of prehistoric and multi-component sites are found along the K and L segments. Another secondary concentration of prehistoric sites is found along the Q segment in the Fort Sage Mountain area. Historic sites on the proposed route tend to be concentrated along the O segment in Honey Lake Valley. With the exception of the N, R, and T segments and the Alturas and North Valley substation locations all proposed route components exhibited some occurrences of cultural resource sites. Table C.4-1 provides a numerical breakdown of sites on the proposed route by segment, with information regarding basic site type (prehistoric, historic, or multi-component) and provisional status with regard to significance and/or evaluation recommendations.

Table C.4-1 Cultural Resource Sites Recorded on Proposed Route[1]

		Status				Status				Status		
Segment	**Prehistoric Sites**	**PS**	**U**	**NS**	**Historic Sites**	**PS**	**U**	**NS**	**Prehistoric/Historic Sites**	**PS**	**U**	**NS**
A	13(1)[1]	2	7	4(1)[1]	4(1)[1]		3	1(1)[1]	5	2	3	
C	80	11	22	47	5			5	12		3	9
E	13(1)[b]	1	2	10	9	1	1	7	10(3)[b]		7	3
K	12(1)[b]	5		7	4			4	8(2)[b]	4		4
L	20(6)[b]	6	1	13	1	1			6(6)[b]	4	1	1
N	0				0				0			
O	5(2)[b]			5	20(3)[b]	1	2	17	5(1)[b]	3		2
Q	7(1)[b]	1	3	3	3		1	2	3			3
R	0				0				0			
T	0				0				0			
W	2(1)[c]	1	1		3	1		2	0			
X	1			1	4(1)[d]			4	5			5
Y	2(1)[a]			2	0				5		3	2
Alturas Substation[1]	0				0				1(1)[2]	1		
Border Town Substation	0				1(1)[d]			1	0			
North Valley Road Substation	0				0				0			
Border Town Staging Area	0				0				0			

Numbers in parentheses refer to:

- [a] Also recorded on Segment X
- [b] Also recorded as part of Tuscarora Pipeline Project survey.
- [c] Also recorded on Alternative Segment Z.
- [d] Recorded on Segment X, Alternative Segment WCFG, and at Border Town Substation.
- [1] Common to Segments A and B
- [2] Site also recorded on Segment A

PS = Provisionally Significant
U = Unevaluated (further evaluation recommended)
NS = Not Significant

Prehistoric, historic, and multi-component archaeological sites which appear to be NRHP-eligible or are recommended for further evaluation to provisionally assess their potential to be NRHP-eligible are described below as individually bulleted items (sites recommended for further evaluation are so noted). Unless otherwise noted, provisional assignation of significance or recommendation for further evaluation stems from preliminary field assessments that these sites may have the potential to yield important information in prehistory or history (NRHP eligibility criterion d). Other sites, which were recorded during the Class III survey but whose recordation has exhausted their potential to yield further significant information, are also identified by segment.

Segment A

- KEC-165: this site is an extensive multi-component site. The prehistoric component is a light to moderate density lithic scatter that contains at least nine projectile points, including representatives from the Rosegate and Desert Series. Numerous other lithic tools are present. Obsidian debitage and tools are present. The historic component includes hole-in-cap cans and amethyst glass.

- KEC-171: this site is a multi-component site. The prehistoric component is comprised of a complex lithic scatter of obsidian and basalt with numerous bifaces, projectile point fragments including representatives from the Elko and Rosegate series, ground stone fragments and one rock alignment. The historic component is a trash scatter consisting of amethyst glass fragments, tin cans and earthenware fragments.

- MOD-333: this site is a previously recorded site that is a lithic scatter containing rock rings and rock alignments.

- MOD-617: this previously recorded multi-component site includes an extensive prehistoric lithic scatter as well as a trash scatter and debris from a homestead dating from 1890 to 1910.

- KEC-1974: this site is an extensive prehistoric lithic scatter.

- KEC-1973: this site is the route of the historic Western Pacific Railroad (currently Southern Pacific) with an associated trash scatter of tin cans, blasting powder cans, metal scraps and other related debris. The site is also found on Alternative Segment B.

- KEC-1977: this site is a sparse lithic scatter that contains two obsidian projectile points.

- KEC- 2005: this site is a lithic scatter comprised mainly of obsidian. Four projectile points, including representatives of the Rosegate and Gatecliff series, ground stone artifacts, including a mano, metate, and pestle, a stacked stone feature and three possible hunting blinds are present.

- KEC-2007: this historic site is the remnant of a mining and quarrying complex. A road, trash scatter and structural remnants are present.

- KEC-2009: this multi-component site includes a sparse lithic scatter, and historic trash scatter of tin cans and white improved earthenware fragments.

- KEC-2016: this site is an obsidian lithic scatter that contain a Humboldt series projectile point, another unidentified projectile point and several large bifaces.

- KEC-2029: this site is a sparse lithic scatter.

- KEC-2030: this site is a sparse lithic scatter (obsidian) that contains one projectile point base.

- KEC-2031: this site is a sparse lithic scatter (obsidian).
- KEC-2035: this site is a sparse lithic scatter that also contains a single metate.
- KEC-1644: this site is intersected by one of the proposed access roads for Proposed Segment A. The site is a historic trash scatter intermixed with a prehistoric lithic scatter comprised of obsidian, crypto-crystalline, basalt and ignimbrite flakes.
- KEC-1646: this site is near one of the proposed access roads for Proposed Segment A. The site is a historic road trace with an associated rock alignment that may represent clearing activity from the roadway itself.

Five other sites were recorded on the A segment. Three sites, KEC-1968 (common with Alternative Segment B), 1971, and 2008 are small sparse lithic scatters. KEC-1655 is a sparse lithic scatter on a proposed access road for the segment. One site, KEC-1956 (common with Alternative Segment B), is a small historic trash scatter. None of these five sites appears to retain those qualities necessary for inclusion on the NRHP.

Segment C

- KEC-145: this site is a lithic scatter that includes numerous biface fragments and utilized flakes with three probable house rings.
- KEC-146: this site is an extensive lithic scatter with ground stone fragments.
- KEC-150: this site is a variable density lithic scatter with associated lithic tools and ground stone.
- KEC-156: this site is a sparse lithic scatter with obsidian projectile point fragments.
- KEC-158: this site is a sparse lithic scatter with Elko, Rosegate and possible Gunther series projectile points and a single stacked stone feature.
- KEC-159: this site is a sparse lithic scatter with ground stone, an Elko series projectile point fragment, stacked rock cairn, talus pit and a rock ring feature.
- KEC-1822: this site is a sparse lithic scatter with ground stone, an obsidian core and a single tin can.
- KEC-1830: this site is a sparse lithic scatter containing tools, leaf-shaped, Elko and a possible Martis projectile point and five stacked stone features.
- KEC-1841: this site is a lithic scatter containing numerous tools, Rosegate and Elko series projectile points and a historic component logging camp with tin cans and fence line.
- KEC-1848: this site contains a hunting blind, two stacked stone features and a single obsidian flake.
- KEC-1853: This site consists of three prehistoric rock alignments including one circular alignment (3 meters/10 feet in diameter), a semi-circular alignment (3 meters/10 feet), and a dry-laid wall two courses high between two boulders and upslope from the other alignments.
- KEC-1863: this site is hunting blind, a rock cairn and two stacked stone features.
- KEC-1867: this site is a hunting blind and talus pit separated by 15 meters/50 feet.
- KEC-1876: this site is a cluster of six stacked stone features.

- KEC-1880: this site is a sparse lithic scatter with ground stone fragments.
- KEC-1883: this site is a diffuse lithic scatter that also contains metates.
- KEC-1884: this site is a small lithic scatter with biface fragments.
- KEC-1889: this site is a complex of sparse lithic scatters, groundstone, a stacked stone feature, house ring features and nearby talus pits, a Desert series projectile point and a basalt biface.
- KEC-1894: this site consists of two prehistoric hunting blinds.
- KEC-1895: this site is a sparse lithic scatter with two metates.
- KEC-1900: this site is a sparse lithic scatter with two metates, projectile point fragments and other lithic tools.
- KEC-1901: this site is a sparse lithic scatter containing basalt and obsidian debitage.
- KEC-1902: this site is a large diffuse lithic scatter, with three possible house rings, a hunting blind and one petroglyph panel.
- KEC-1903: this site is a sparse lithic scatter with a mano and a possible midden mound.
- KEC-1907: this site is a possible house ring with obsidian and basalt flakes nearby.
- KEC-1910: this site is a moderately dense lithic scatter with numerous metates.
- KEC-1917: this site is a sparse lithic scatter.
- KEC-1927: this site is a sparse lithic scatter of obsidian and basalt with a single Rosegate series projectile point and a mano fragment.
- KEC-1934: this site is a sparse lithic scatter with an obsidian Cottonwood series projectile point.
- KEC-1942: this site is comprised of a sparse lithic scatter, stacked stone features, talus pits, three projectile points, including a representative from the Elko series and a tin can.
- KEC-1943: this site is a sparse lithic scatter dominated by obsidian.
- KEC-1953: this site is a sparse lithic scatter with a probable Humboldt projectile point.
- KEC-2037: this site consists of five stacked stone features and three talus pits.
- KEC-2038: this site consists of three stacked stone features and three talus pits.

In addition to the sites described above found on Proposed Segment C, two sites were found on a proposed access road for Proposed Segment C. These two sites appear to retain those qualities necessary for inclusion on the NRHP.

- KEC-1647: this site is a prehistoric lithic scatter containing a Humboldt series projectile point base, fire-cracked rock, obsidian flakes and a rock overhang that may have served as a rockshelter.
- KEC-1648: this site is large lithic scatter containing a possible Elko series projectile point fragment, fire-cracked rock and obsidian flakes.

Sixty-one other sites were recorded on the C segment. Twenty-six of these sites, KEC-1814, 1818, 1821, 1826, 1827, 1829, 1837, 1845, 1850, 1852, 1854, 1855, 1856, 1857, 1858, 1864, 1865, 1871, 1873, 1874, 1877, 1881, 1892, 1912, 1913, and 1916, are stacked stone features, talus pits, or hunting blinds. Twenty-one of these sites, KEC-177, 1820, 1847, 1860, 1861, 1869, 1882, 1893, 1906, 1908, 1909, 1914, 1915, 1918, 1919, 1925, 1930, 1941, 1945, 1947, and 1961 are sparse lithic scatters. Five sites are historic. KEC-1846 and 1872 are fence lines with associated post remnants and KEC-1939, 1946 and 1963 are historic trash scatters. Seven sites are multi-component containing both prehistoric and historic elements. KEC-1810 is a stacked stone feature with tin cans in close proximity, KEC-1839 is a sparse lithic scatter, stacked stone feature and a tobacco tin, KEC-160 contains a small lithic scatter, rock check dam and possible tent pads, KEC-1825 is a road cut, and KEC-1887 is a rock cairn and tin can cluster. Two sites, KEC-1944 and 1960 are sparse lithic scatters that also contain limited amounts of historic debris. None of these 61 sites appears to retain those qualities necessary for inclusion on the NRHP.

The location of the Infernal Caverns Battleground Memorial Monument is approximately 1.4 miles east of Segment C (not included in total site count for this segment). The BLM has recently proposed development of an interpretive trail that would cross Segment C twice.

Segment E

- KEC-95: previously recorded as TPP-138/H during the Tuscarora Pipeline Project survey, this site is a complex lithic tool and debris scatter overlain by the remains of a homestead, ditch, and collapsed wooden structure.
- KEC-100: previously recorded as TPP-136/H during the Tuscarora Pipeline Project survey, this site is situated on the eastern edge of the Madeline Plains, contains over 300 groundstone fragments and milling tool slabs, and projectile point types which include Great Basin Stemmed and Elko series. The historic component of the site is a remnant of a large farmstead which contains an 24-meter (80-foot) deep fieldstone lined well, and road and glass fragments. The historic component appears to date from the 1910s.
- KEC-151: previously recorded as TPP-133/H during the Tuscarora Pipeline Project survey, this multi-component site situated on the Madeline Plains contains both a complex prehistoric lithic scatter and a historic wooden road and fence. The lithic scatter exhibits a variety of tool types as well as Rosegate and Elko series projectile points. The historic site appears to be railroad related given its close proximity to the railroad grade.
- KEC-1700: this site is a historic rock alignment, road trace and tin can scatter (1935-45).
- KEC-1701: this multi-component site is a sparse lithic scatter with flakes and groundstone, two possible prehistoric hunting blinds, an Elko series projectile point base and a small tin can and glass scatter.
- KEC-1703: this multi-component site contains two probable prehistoric hunting blinds, an obsidian projectile point fragment and a bottle base.
- KEC-1709: this site appears to be a prehistoric campsite that may contain some midden, there are also two prehistoric hunting blind features and rock cache pits that may have been used for storage.
- KEC-1716: this site is a prehistoric hunting blind associated with a possible cache pit.
- KEC-1731: this multi-component site is a sparse lithic scatter and a historic can and glass scatter. Vent hole milk cans at the site date between 1903 and 1914.

- KEC-1734: this multi-component site is a sparse lithic scatter containing one metate fragment and three tin cans including a vent hole milk can dating between 1915 and 1930.

- KEC-1806: this multi-component site is a sparse lithic scatter containing two metate fragments as well as historic debris.

- KEC-1651: this site was recorded on a proposed access road for Segment E. The site is comprised of a road trace and associated rock wall feature, and a scatter of historic debris including Chinese pottery.

Twenty other sites were recorded on this segment. KEC-96 (previously recorded as TPP-139) is a lithic scatter with no apparent depth. KEC-1721 and 1801 are sparse lithic scatters. KEC-1704, 1705, 1708, 1710, 1711, 1715, 1717, 1718 and 1807 are possible prehistoric hunting blinds some of them also were recorded with bottle flakes and/or glass in close proximity. KEC-1720 is a possible cache pit with one flake and a tin can nearby. KEC-1706, 1714 and 1722 are historic hunters camp with milk cans. KEC-1732 is a tin can scatter dating from 1920 to 1930. Three additional sites were recorded on or near a proposed access road to the segment. KEC-1650 is a 1930s period trash scatter, KEC-1645 is a collapsed shack and scatter of tin cans and KEC-1649 is a scatter of domestic trash. None of these sites appears to retain those qualities necessary for inclusion on the NRHP.

Segment K

- KEC-67: this 3 x 50 meter (3.2 x 54.7 yard) site contains a lithic scatter with possible subsurface deposits and a historic rock wall. The site is recommended for further evaluation.

- KEC-69: this 100 x 50 meter (109.4 x 54.7 yard) lithic scatter appears to have some depth and exhibits a number of tool types as well as typable projectile points including Great Basin Stemmed, Elko and Rosegate series represented.

- KEC-71: this 98 x 132 meter (107 x 144 yard) lithic scatter may contain buried deposits caused by episodes of rapid alluviation. Two projectile point tips were observed on the surface.

- KEC-72: this 110 x 180 meter (120 x 197 yard) site is a complex lithic scatter with some potential for depth. One projectile point was observed that cannot be typed.

- KEC-79: this 80 x 65 meter (87.5 x 71 yard) site is a lithic scatter comprised principally of obsidian that appears to reflect tool maintenance/manufacturing activity. Rosegate and Desert series projectile points were observed.

- KEC-84: this site represents the remains of a ranch complex. Remnants of a well, pumphouse, and well-preserved trough are present. Domestic trash suggests a period of use from 1900 to 1940 based on glass container and can types found at the site. The site appears to have some depth. It has the potential to be eligible to the NRHP under criteria (a) and (d).

- KEC-85: this site is a dense concentration of lithic debris representing biface production. One Rosegate series projectile point was found on the surface of the site.

- KEC-91: previously recorded as TPP-145/H during the Tuscarora Pipeline Project survey and LAS-192/H. This site is the historic townsite of Termo and a prehistoric tool and debris scatter. Dating from 1900, the town of Termo functioned as a terminus for the NCO railroad. The Proposed Project survey corridor does not intersect buildings associated with the townsite, only historic trash scatters and a telephone line as well as some prehistoric debris in a very disturbed context are crossed by the corridor. The historic component of this site appears to be eligible to the NRHP under criterion (a).

- KEC-93: previously recorded as TPP-157/H during the Tuscarora Pipeline Project survey, this multi-component site located in the Madeline Plains is characterized by bottles, cans, and an old dirt road. The prehistoric component includes several pieces of groundstone, biface fragments, one large stemmed and corner-notched projectile point, and more than 500 waste flakes. The historic cans and bottles may date to circa 1910 and are possibly associated with railroad or highway construction.

Fifteen other sites were recorded on the K segment. Seven of these sites, KEC-66, 68, 70, 74, 86, 89, and 92 (previously recorded as TPP-158 and Las-1620) are lithic scatters with no apparent depth or internal complexity. Three sites, KEC-75, 82, and 87, are multi-component, with KEC-75 containing a tin can scatter and a chert scraper, KEC-82 containing a historic trash scatter of mixed debris, and KEC-87 containing tin cans and two waste flakes. Four sites, KEC-77, 81, 83, and 88 are small historic trash scatters. Recordation has exhausted the potential of these fourteen sites to yield further important information. KEC-91 previously recorded as TPP145/H during the Tuscarora Pipeline Project survey contains a variety of features associated with the townsite of Termo. The town dump, a collapsed telephone line, historic debris scatter (including milk cans dating from 1917 to 1929), and standing structures associated with Termo have all been recorded as part of the site record. The site also includes a small prehistoric lithic scatter. A recent testing program undertaken by the Tuscarora cultural resources team at this site has concluded that the site does not appear to be eligible to the NRHP.

Segment L

- KEC-28: previously recorded as Las-381, this site is described as a sparse surface lithic scatter and biface. Further evaluation of this site is needed prior to evaluation of NRHP eligibility.

- KEC-34: previously recorded as TPP-222/H. This site is described as debitage and stone tools and historic trash. Further evaluation of this site is needed prior to evaluation of NRHP eligibility.

- KEC-35: previously recorded as TPP-211/H, is described as a complex lithic scatter with several hundred obsidian, basalt, and cryptocrystalline (CCS) flakes and one Rosegate series projectile point. There is also a rock wall which may be associated with a larger farm/ranching complex.

- KEC-37: previously recorded as TPP-213/H during the Tuscarora Pipeline Project survey, the site, is described as a complex lithic scatter with over 10,000 flakes present. Sixteen projectile points were recorded including representatives from the Elko, Rosegate and Desert series as well as lanceolate and large corner-notched points of unknown type. The site also contains two historic trash scatters representing domestic and farm related debris. Matchstick solder cans date from 1915 to 1930.

- KEC-38: this 60 x 75 meter (65.6 x 82 yard) site is characterized as a high density lithic scatter with a separate ground stone scatter. One Desert series projectile point was recorded. KEC-37/TPP21/H is situated 100 meters (109.4 yards) to the south.

- KEC-63: this 40 x 62-meter (43.7 x 67.8-yard) site contains projectile points including five Desert series projectile points, a lithic scatter, and a possible hunting blind/shelter.

- KEC-64: previously recorded as TPP-217, this site is described as a lithic and tool scatter, including both flaked and groundstone materials. Further evaluation of this site is needed prior to evaluation of NRHP eligibility.

- KEC-65: previously recorded as TPP-217 during the Tuscarora Pipeline Project survey, the site is situated on the north side of Secret Valley. It appears to encompass two previously recorded sites (Las-206 and 215). The site is described as a complex and "vast" lithic scatter containing groundstone, at least 10 projectile points and one basalt adze. Point types included examples of Great Basin Stemmed, Elko, Pinto, Northern Side-Notched, Rosegate and Desert series.

- KEC-105: previously recorded as TPP-206H during the Tuscarora Pipeline Project survey, this site appears to be largely outside the survey corridor. This multi-component site contains rock art (12 panels); a lithic scatter; Northern Side-Notched, Rosegate and Desert series projectile points; milling tools; and a historic volunteer trash scatter.

- KEC-107: previously recorded as TPP-202H, this multi-component site contains a variety of projectile points (Northern Side-notched, Elko series, and Rosegate), three concentrations of lithic debitage, and several lithic tools. The site exhibits some internal assemblage variability. The historic component is comprised of roadside refuse with cans ranging from 1917 to the 1950s. The site is recommended for further evaluation.

- KEC-110: this site contains two rock art panels.

- KEC-111: situated adjacent to a meadow, this site is a compact scatter of lithic debitage and groundstone. It has an assemblage that appears distinct from other sites recorded in the area during the survey.

- KER-1629: previously recorded as TPP-142H during the Tuscarora Pipeline Project survey. This linear site is Old U.S. Highway 395. The site along its entire length varies from extant segments still in use to derelict, abandoned sections. This road feature may be eligible to the NRHP under criterion (a). (This resource is also discussed in Section C.4.1.3.2, Other Historic Resources.)

Fourteen other sites were recorded on the L segment. Thirteen of these sites—KEC-23 (previously recorded as TPP-226), 26 (previously recorded as TPP-228 and Las-380), 28/30 (previously recorded as Las-381), 36 (previously recorded as TP-212), 39, 41, 42, 43, 45, 49, 101, 109 (previously recorded as TPP-208), 180 - and 1637 are all diffuse lithic scatters with no apparent depth or internal assemblage complexity. KEC-106 is a prehistoric hunting blind and small scatter of associated stone tools. Recordation has exhausted the potential of these 14 sites to yield further important information.

Segment N - No cultural resources were recorded in the N segment.

Segment O

- KEC-495: this site is the location of a settler's grave, possibly part of a family plot. It has the potential to be eligible to the NRHP under criteria (a) and (d).

- KEC-496: previously recorded as TPP-238/H during the Tuscarora Pipeline Project survey, this multi-component site has a prehistoric component containing milling tools, two Rosegate series projectile points, and a lithic scatter. The historic component includes a marked grave.

- KEC-512: previously recorded as TPP-277H during the Tuscarora Pipeline Project survey, this is the location of the Eagle Lake Ditch. (This resource is also discussed in Section C.4.1.3.2, Other Historic Resources.)

- KEC-579: situated along the east margin of Honey Lake, this site is described as a cluster of structural remnants associated with a ranchstead/poultry operation. Findings include an apparent chicken coop, pond, fencelines, foundation, wagon parts and auto parts. Little temporally diagnostic material was observed, but it appears the site dates from about 1925 to the 1950s. One lithic flake was also recorded at this location.

- KEC-587: situated along the east margin of Honey Lake, this site contains two collapsed structures, a hand-dug well with rock alignment, and two domestic trash scatters which appear to date from about 1915 to 1930. Additionally, one flake, two metates and one mano were recorded at this location. It is the historic component of this site which appears to be the significant component of this site.

- KEC-589: this site contains two depressions, structural debris, and a trash scatter appearing to date from about 1900 to the 1920s. The site appears to have been damaged by fire and also appears to have been scavenged. The site is recommended for further evaluation.

Twenty-four additional sites were recorded on the O segment along the east margin of the Honey Lake Valley area. Seventeen of these sites, KEC- 1, 467, 486, 511, 517, 522, 535 (previously recorded as TPP-268H), 585, 591, 593, 595, 597, 599, 1004, 1006, 1008, and 1010 are small historic domestic trash scatters, some with associated features such as a well or collapsed structural remnants. Based on tin can and glass chronologies these sites appear to range in age from the turn-of-the-century to the mid-1940s. Five of the sites, KEC-480, 494, 518, 545 (previously recorded as TPP-253), and 1002 are prehistoric surface lithic scatters some of which contain groundstone and/or additional tools. One site, KEC-532 (previously recorded as TPP-269/H) is a multi-component site comprised of a historic trash scatter and lithic scatter. Recordation has exhausted the potential of these 24 sites to yield further important information.

Segment Q

- KEC-1059: situated along the east edge of Honey Lake, this site appears to be the remains of a long-term camp or attempted homestead. Artifacts indicate an initial date of 1899 or earlier. The site is recommended for further evaluation.

- KEC-1077: situated between the Virginia Mountains and State Line Peak, this site was previously recorded as TPP-261 and Wa-5579. The site is characterized as a complex lithic scatter containing more than 1000 flakes. Rosegate and Elko series projectile points were also noted at this location along with milling tools. It appears the site may have subsurface deposits.

- KEC-1126: this 500 x 500 meter (547 x 547 yard) prehistoric lithic scatter located along the south edge of Honey Lake contains Great Basin Stemmed series projectile points suggesting a possible pre-Archaic component. The site appears to have some depth and the site is recommended for further evaluation.

- KEC-1310: this 80 x 150 meter (87.5 x 164 yard) site is described as a flake scatter on the northern edge of Seven Lakes Mountain. The site exhibits some internal variability with the presence of two projectile points (untyped) and three bifacial implements. The site appears to hold some potential for subsurface deposition. The site is recommended for further evaluation.

- KEC-1602: previously recorded as Wa-2111, this site was originally characterized as possibly dating to the late period or time of contact with Euroamericans. The site is comprised of a lithic scatter with fire-cracked rock concentrations that may be hearths. One complete hammerstone was also recorded at this location. The site is recommended for further evaluation.

Eight additional sites were recorded on the Q segment. Two of these sites, KEC-1108 and 1300, are surface lithic scatters comprised of chipping debitage, groundstone, and one projectile point fragment. KEC-1307 is a small surface flake scatter. Three of the sites, KEC-1046, 1054, and 1056, are historic sites, all of which are surface trash scatters along the Honey Lake playa dating from about 1900 to the

1930s. One site, KEC-1207, is multi-component with a large diffuse surface lithic scatter of chipping debitage and some historic debris including condensed milk cans dating from 1917 to 1929. Recordation has exhausted the potential of these eight sites to yield further important information.

Segments R and T - No cultural resources were recorded.

Segment W

- KEC-326: this site is a small lithic scatter containing one Rosegate series projectile point on the edge of the Long Valley floodplain. The site has the potential for subsurface deposition and is recommended for further evaluation.

- KEC-340: situated at the west base of Petersen Mountain, overlooking Long Valley, is a small historic trash scatter apparently associated with shell beads. The beads are both glass trade beads as well as examples of apparent indigenous manufacture (shell and turquoise). The site may be a historic Washoe encampment.

- KEC-366: this site (also located on the alternative Z segment) is a large (2800 x 600 m [3052 x 654 yards]) diffuse lithic scatter situated along the east side of Long Valley. Martis and Elko series projectile points were observed (one of each). The site may have been a lithic reduction area for cryptocrystaline (CCS) material. The site appears to have some depth.

Two additional sites were recorded on this segment. KEC-332 (previously recorded as Sie-720) is a historic trash scatter associated with a ranch still in use. KEC-391 is a surface volunteer trash scatter. Recordation has exhausted the potential of these two sites to yield further important information.

Segment X

Ten sites were recorded on that portion of the X segment that is part of the Proposed Project. KEC-1408, common with the Y segment, is a diffuse surface lithic scatter with associated manos and metates. KEC-312 is an apparent rock alignment/hunting blind with no apparent depth. KEC-323, 325, and 1433 are tin scatters and lithic scatters. KEC-1534 is a large historic trash scatter containing one projectile point. KEC-310 and 1453 are historic trash scatters. KEC-302 appears to be water transport-related features associated with mining activity. KEC-1541 is a mining prospect and associated trash scatter. Recordation of these ten sites has exhausted their potential to yield further important information.

Segment Y

- KEC-1432: this site is a lithic scatter exhibiting some internal variability of tool types. It appears to have depth. The site is recommended for further evaluation.

- KEC-1440: this site is composed of a small lithic flake scatter, a historic rock cairn and associated tin cans. It is recommended for further evaluation.

- KEC-1444: this site is a lithic scatter exhibiting some internal variability of tool types. It appears to have depth. The site is recommended for further evaluation.

Four other sites were recorded on the Y segment. KEC-1436, 1437, and 1547 are small surface flake scatters. A fourth site, KEC-1408, is a diffuse lithic scatter which overlaps both the X and Y segments. Recordation of these four sites has exhausted their potential to yield further significant information.

Alturas Substation - One cultural resource was recorded at this location. KEC-171 is a multi-component site. The prehistoric component is comprised of a complex lithic scatter of obsidian and basalt with numerous bifaces, projectile point fragments including representatives from the Elko and Rosegate series, ground stone fragments and one rock alignment . The historic component is a trash scatter consisting of amethyst glass fragments, tin cans and earthenware fragments. The site extends into Proposed Segment A.

Border Town Substation - One cultural resource site was recorded at this location. KEC-1534 is a large trash scatter with a single projectile point. (It overlaps the WCFG alternative segment.) The site does not appear to be significant under NRHP eligibility criteria.

North Valley Road Substation - No cultural resources were recorded at this location.

Border Town Staging Area - No cultural resources were recorded at this location.

C.4.1.3.2 ***Other Historic Resources***

Segment A - The route crosses the modern Southern Pacific (SP) Railroad grade in this segment (KEC-1973). The route also crosses the reported location of the Lassen Trail. There is no evidence of the Lassen Trail within the survey corridor.

Segment K - The route crosses the Southern Pacific (SP) Railroad grade in this segment. The SP grade was originally developed as a narrow gauge railroad by the Nevada-California-Oregon (NCO) railroad, which was started in 1881 and completed in 1912. The NCO ran from Reno, Nevada to Lakeview, Oregon. The line was acquired by SP in 1926 and was upgraded to standard gauge from Reno to Alturas in 1927. The original grade has been raised and re-ballasted and subjected to repeated modifications as part of normal maintenance and operation. The railroad continues to be used as a modern railroad. The railroad grade was assigned site number TPP-141H during the Tuscarora Pipeline Project survey.

Segment L - The route of Nobles Road, listed as Nobles' Emigrant Trail in the National Register of Historic Places is commemorated along US 395 near Shaffer Mountain. No extant physical remains of the trail are visible in the study corridor. The route also crosses the SP railroad grade (see description above) at two points in this segment.

- KEC-1629: previously recorded as TPP-142H during the Tuscarora Pipeline Project survey. This linear site is Old US Highway 395. The site along its entire length varies from extant segments still in use to derelict abandoned sections. This road feature may be eligible to the NRHP under criteria (a).

Segment O

- KEC-483: previously recorded as TPP-289/H by the Tuscarora Pipeline Project cultural resources survey, this multi-component site contains both a sparse lithic scatter and a historic component composed of a pre-1950 tobacco tin, a sun-affected glass fragment (pre-1920), and a section of the Standish Water Company Ditch. The channel is an earthen irrigation ditch that was in operation between 1910 and 1919.

- KEC-512: previously recorded as TPP-277H, is the Eagle Ditch. The Eagle Ditch is a component of a scheme to transport water from Eagle Lake for Honey Lake Valley agricultural development. The project was begun in 1877 and was subjected to modifications and improvements until its abandonment in 1935. Initially water was transported from Eagle Lake into the Willow Creek drainage by means of an inverted siphon and pumping plant. This was replaced by a tunnel that went into operation in 1924. Most of the ditches in the Honey Lake area were built in 1891 and remained in use until 1935, when declining water levels in Eagle Lake forced abandonment of the project. Segment O crosses the SP railroad grade (see description above) at one point in this segment.

Segment X - This segment crosses the route of the modern Western Pacific Railroad.

C.4.1.3.3 *Native American Concerns*

There are several Federal laws and policy directives that are applicable to the consideration of Native American values. Of particular importance are:

- **American Indian Religious Freedom Act of 1978 (AIRFA).** Requires federal agencies to take into account the effect of their actions on Native American traditional beliefs prior to actions being authorized.

- **Native American Graves Protection and Repatriation Act of 1990 (NAGPRA).** The intent of this legislation is to ensure that disposition of Native American human remains and associated funerary objects is controlled by individuals or groups most closely associated with the materials.

- **Traditional Cultural Properties.** National Register (U.S. Department of the Interior) Bulletin 38 discusses properties that can be determined to be eligible for inclusion on the National Register of Historic Places because of their association with beliefs or cultural practices of a living community that are rooted in that community's history and are important in maintaining the continuing identity of the community.

Based on these legal considerations a program was initiated to contact Native Americans who might be able to contribute information on traditional-use areas and practices in the study area. Lists of Native American groups and individuals to be contacted were obtained from the Nevada BLM State Office, the Susanville BLM District Office, the California Native American Heritage Commission (NAHC), the Tuscarora Pipeline Project ethnographer, and the Native American coordinator for Citizens Alert.

Twenty-seven groups and individuals were identified who might have specific information or concerns related to the Proposed Project. Letters were sent to these groups and individuals, followed by phone calls to further elicit responses. The results of this program are summarized below.

- Several tribes and individuals expressed a desire to be notified of further planning activities associated with the Proposed Project corridor in order to have adequate time to respond with any concerns they might have.

- Several responses cited the need for provisions to be made for tribal participation in the decision-making process for the Proposed Project; the need for face-to-face consultation; submission of findings to tribal councils for review; and financial compensation for time and travel for meetings and/or site visits.

- Some responses requested the presence of Native American monitors during construction at sensitive locations and notification to tribes should cultural materials be discovered during construction.

- Some responses expressed the need for specific detailed route maps that can be reviewed with knowledgeable individuals, so that an understanding of project-related effects can be developed; e.g., how close the transmission line will be to the Hungry Valley Reno-Sparks Tribal Colony homes.

- Concerns were expressed related to powerline impacts on eagle populations.

- Some respondents expressed concerns regarding contacts being made with Indian groups who did not have historical ties to the area.

No specific concerns regarding traditional-use areas or cultural properties were received during this initial contact program. The BLM has assumed formal Native American consultation as its responsibility for this project. Consultation includes, but is not limited to detailed map/route review, meetings with concerned individuals and groups, and site visits to identify areas of specific concern.

C.4.1.4 Applicable Regulations, Plans, and Standards

There is a suite of Federal, California, and Nevada regulatory requirements, as well as government agency policies and guidelines that guide the consideration of cultural resources for projects that come under the purview of Federal and state agencies.

- At the Federal level, the principal regulatory requirement is the National Historic Preservation Act (NHPA) and its implementing regulations found at 36 CFR 800. Known as the "Section 106" compliance process, this act requires that any Federal undertaking ensure the identification of cultural resources and assessment of their significance.

- The Archaeological Resources Protection Act (ARPA) requires acquisition of permits from Federal agencies prior to field studies.

- Additional policy and guidance can be found in agency manuals such as BLM's 8100 series. The implementation of field studies is guided by such formalized policy as Nevada BLM's Cultural Resources Inventory Guidelines.

- The consideration of cultural resources at the state level includes, but is not limited to CEQA and the CEQA Guidelines Appendix K; the California State Historic Preservation Office's (SHPO's) Guidelines for Archaeological Research Designs, and the Nevada SHPO's Guidelines Pertinent to the Conduct of Historical Archaeology in the State of Nevada.

- Additional guidance is provided by the Nevada Division of Historic Preservation and Archaeology's "Issues Regarding the Conduct of Historical Archaeology in Nevada" and "Guidelines Pertinent to the Conduct of Historical Archaeology in the State of Nevada."

- In addition to the consideration of Native American values at the Federal level as described previously, California's Native American Heritage Commission has developed guidelines for the consideration of Native American remains and associated grave goods.

As the lead Federal agency for this project, the BLM is responsible for compliance with Section 106 of the NHPA in coordination with the other cooperating Federal agencies. This coordination involves review by the appropriate SHPO regarding the significance and effects on properties considered to be eligible to the NRHP. This compliance activity will be fulfilled under the aegis of a Programmatic Agreement that has been developed by the California and Nevada BLM, SHPOs, the U.S. Forest Service (USFS), the Advisory Council on Historic Preservation, and the CPUC to ensure appropriate consideration of significant cultural resources in compliance with provisions of the NHPA and its implementing regulations found at 36 CFR 800.

C.4.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

C.4.2.1 Definition and Use of Significance Criteria

C.4.2.1.1 *Significance Criteria*

The following criteria were used to evaluate the significance of potential impacts on archaeological, historic, or ethnographic resources. Impacts may be significant that result in:

- Disturbance to significant cultural resource sites that meet the criteria of eligibility for inclusion on the NRHP, identified at 36 CFR 60.4 or criteria for the California Register of Historic Resources (CRHR).
- Disturbance to an area of traditional or religious importance to Native Americans.

The CRHR's implementing regulations have not yet been finalized; however it is likely that the final CRHR regulations will essentially mirror the criteria for eligibility for the NRHP, but will be somewhat less stringent in the requirement of historic integrity and with respect to resources of local value (Guerra, California State Office of Historic Preservation, 1994).

C.4.2.1.2 *Impact Assessment Methodology*

The evaluations of the significance of the resources recorded during the Class III field surveys as described in Section C.4.1 are provisional at this time. They reflect the professional judgement of the archaeologists conducting the survey; however, final determinations and concurrence of NRHP eligibility await agency and State Historic Preservation Office review of the findings. For purposes of this evaluation, all sites that have been provisionally recommended as NRHP-eligible, or appear to require further evaluation, will be addressed as if they were significant resources (i.e., eligible for the NRHP). Sites that have been found provisionally not to be eligible for the NRHP, and isolates, will be addressed as if they are not eligible for the NRHP. Accordingly, a potentially significant impact would occur when a significant cultural resource as defined in Section C.4.2.1.1 could be disturbed directly by a project-related action or indirectly as a result of project implementation. Unless otherwise noted in Section C.4.1, eligibility of those sites that have been provisionally designated as significant is based on NRHP eligibility criterion (d), potential to yield important information in history or prehistory.

Cultural resources are also defined as including sites or places of importance to Native Americans. The BLM has assumed responsibility for Native American consultation for this project. To date the BLM has not identified any sites or traditional cultural properties of specific concern to Native Americans with respect to this project.

Historic trails whose location is reported to fall within the survey corridor (but do not evince any physical remains) as well as railroads currently in use, will not be affected by activities associated with the Proposed Project.

The cultural resources survey corridor for the Proposed Transmission Line Project route was 660 feet wide. Within this corridor, the Applicant would utilize a right-of-way (ROW) that will be 160 feet wide. However, this impact assessment assumes that there is a potential for impacts over the full 660-foot width, subject to specific ROW corridor selection and possible avoidance measures.

C.4.2.2 Environmental Impacts and Mitigation Measures

There are four categories of potential impacts on cultural resources: (1) activities that would have the potential to disturb and/or destroy both surface and subsurface deposits, (2) disturbances that would primarily be confined to the ground surface, (3) indirect impacts that would be incurred from increased human presence within the project area, and (4) impacts related to effects on the integrity, feeling, or association of a cultural resource site. These impact categories include activities that in some instances would occur only during certain phases of the project (e.g., construction), whereas others have the potential to occur during construction, operation, and/or maintenance (e.g., vegetation management).

Construction activities that have the potential to disturb significant surface and subsurface cultural resource sites as a result of ground disturbance and surface removal include:

- Access road construction or improvement
- Blading where required for overland travel within the corridor
- Construction of structures (tower pads, crane landings, and structure foundations) to support the powerline, and guy wire anchor points installation
- Ground leveling for the staging area at the Border Town site
- Substation construction.

Activities that could result in impacts to the surface components of cultural resource sites as a result of ground disturbance include:

- Stringing operations during construction
- Use of staging areas during construction
- Overland travel with no blading
- Vegetation removal and tree-trimming
- Wire setup areas

The stringing operation and use of staging areas/wire setup areas would occur only during the construction phase of the project. The line stringing operation could potentially disturb the surface distribution of cultural materials at prehistoric and historic sites. The temporary use of a staging area, with its associated vehicular activity, could also result in surface disturbance during construction. Overland travel and vegetation removal/trimming would occur primarily during construction, but could also occur infrequently during operation/maintenance, potentially disturbing the surface integrity of cultural resource sites. The removal or intermittent trimming of vegetation could also result in surface disturbance.

The third general category of impacts are those associated with the potential for the introduction of increased numbers of people into the project area on both a short-term and long-term basis. The presence of increased populations could result in increased vandalism and unauthorized collection of cultural resources. Specific groups expected on or near the site include construction and maintenance crews and the general public. It is anticipated that construction crews would have a short-term presence only during the construction phase. Maintenance and operation traffic would be minimal, but ongoing through the life of the project. The general public could be drawn to the project area as early as the construction phase, but would be more likely to frequent the area after construction if access to the area is improved as the result of construction.

The fourth general category of impacts are those associated with impacts to integrity of setting, feeling, or association. For example a site that is considered significant based on its association with a significant historical event might be considered to be adversely impacted by the visual intrusion of a transmission line structure on the site's setting. Features that could cause long-term disturbance to integrity of setting, feeling or association include:

- Transmission line structures and wires
- Substations
- Permanent roads.

Where feasible, avoidance of significant resources by project design is the preferred mitigation option, because by avoiding resources no significant impact would result. Where avoidance is not feasible, there are a number of mitigation options that can be considered. The proposed mitigation measures described in detail below have not been accepted formally by the reviewing agencies; until the issuance of a Record of Decision, they must be considered as potential measures that may be implemented to either eliminate or reduce significant adverse impacts. Sites that have been recommended as eligible to the NRHP, or are unevaluated, will be treated as significant cultural resources (unless found not eligible to the NRHP by BLM with concurrence by the appropriate SHPO). Such sites that cannot be avoided will be formally addressed under Section 106 procedures as set forth at 36 CFR 800.

There is also the potential for cultural resources to be discovered during construction. Such resources could be potentially affected by any of the impacts listed above. If unanticipated resources are discovered during construction, they will be addressed under the emergency discovery procedures set forth in 36 CFR 800.11 and the Programmatic Agreement for this project (in preparation by BLM). If possible, the resource will be avoided through design modification or through protective measures as described above. If the resource cannot be avoided, the project archaeologist will consult with the Lead Agency and the

SHPO with regard to resource significance. If it is determined the resource is significant, mitigation measures will be devised in consultation with the Lead Agency and SHPO and will be carried out by the Applicant.

Specific resources that could be impacted significantly by the Proposed Project are listed by site component in Table C.4-2. Specific mitigation measures proposed for each impact described below are summarized in Table C.4-5, Mitigation Monitoring Program, in Section C.4.5.

Impact 1 - Surface Removal and Disturbance of Surface or Subsurface Cultural Resource Sites

This impact would result from construction-related activities causing surface disturbance and surface removal (e.g., blading to provide construction equipment access, structure construction, and substation construction). Any disturbance to a cultural resource site considered to be significant under NRHP eligibility criteria is a significant impact, but is mitigable through avoidance (Mitigation Measure C-1, below) or data recovery (Mitigation Measure C-2, below). Such impacts therefore are considered **Class II** impacts. The same impacts described above could also affect cultural resource sites that are not considered significant. Non-significant sites are described in Section C.4.1. Impacts to such sites are considered adverse, but not significant **(Class III)**.

C-1 Construction-related activities shall not occur within 100 feet of all cultural resource sites that are considered NRHP-eligible. All identified sites shall be monitored during construction to ensure avoidance. Flagging shall be implemented on a case-by case basis in a manner that does not draw attention to a specific site location. For example a zone of exclusion might be flagged rather than a site's actual boundaries. Flagging will be done in consultation with the Lead Agency. As required, a BLM-approved archaeologist will accompany the project engineer to the field to identify site boundaries on the ground to ensure that facility placement will not impinge on the site. As required, a BLM-approved cultural resources monitor shall observe all construction through this area and shall be authorized to halt construction activity in the event that it impinges on a site that has been identified for avoidance.

The objective of this mitigation measure is to ensure that those cultural resources that appear to retain qualities sufficient for inclusion on the National Register of Historic Places will not be adversely affected by actions associated with the proposed project. In accordance with the Programmatic Agreement for this project and Section 106 of the National Historic Preservation Act avoidance of such resources would result in "no effect" to the historic property. Specific sites identified for avoidance will be addressed in a Historic Properties Treatment Plan which will be finalized upon agency/SHPO review of the cultural resources technical report. Monitoring protocols set forth in that document and the construction monitoring plan will ensure compliance with the avoidance measures. The construction monitoring plan should include a provision for the monitor to inspect each site subsequent to construction to assess whether the mitigation measure was effective. The construction monitoring plan would provide for emergency discovery and stop work orders should these actions be required. This mitigation measure will considered

Table C.4-2 Potential Impacts—Proposed Project

Project Component	Surface Removal (Affected Sites)	Surface Disturbance (Affected Sites)	Indirectly Impacted (Affected Sites)
Segment A	4 (165[c],1973[b], 2005[c], 1644[b])	14 (165[so,v], 171[v], MOD-333[v], MOD-617[so],1973[so], 1977[so], 2005[so,v], 2007[v], 2009[so,v], 2016[so,v], 2029[so,v], 2030[v], 2031[v], 2035[v])	17 (165, 171, MOD-333, MOD-617, 1973, 1974, 1977, 2005, 2007, 2009, 2016, 2029, 2030, 2031, 2035, 1644, 1646)
Segment C	26 (145[b], 146[b,c], 150[c], 158[b], 1830[b], 1841[b,c], 1848[b,c], 1853[c], 1863[b], 1880[b], 1883[b], 1889[b], 1894[b], 1895[b], 1900[b], 1901[b], 1902[b,c], 1903[b], 1907[b], 1910[b], 1927[c], 1934[b], 1953[c], 2037[b], 1647[b], 1648[b])	22 (145[so], 146[so], 158[so], 159[v], 1830[so,v], 1841[so], 1863[so], 1867[so,w], 1876[v], 1880[so], 1883[so], 1889[so], 1894[so], 1900[so], 1901[so], 1902[so], 1917[so], 1927[so,v], 1924[v] 1942[v], 1943[v], 1953[so,v])	36 (145, 146, 150, 156, 158, 159, 1822, 1830, 1841, 1848, 1853, 1863, 1867, 1876, 1880, 1883, 1884, 1889, 1894, 1895, 1900, 1901, 1902, 1903, 1907, 1910, 1917, 1927, 1934, 1942, 1943, 1953, 2037, 2038, 1647, 1648)
Segment E	3 (95[c], 100[c], 1651[b])	9 (95[so,w], 100[so], 1701[so,v], 1709[v], 1731[v], 1734[v], 1703[v], 1716[v], 1806[v])	12 (95, 100, 151, 1651, 1701, 1709, 1731, 1734, 1700, 1703, 1716, 1806)
Segment K	1 (93[c])	3 (67[SO],72[SO],91[S])	9 (67,69,71,72,79,84,85,91,93)
Segment L	7 (28[c],34[c],37,64[c],65[c],105,107[c])[b]	9 (28[sow],34[sow],35[v],37[vw],38[v],64[so] 65[so,vw],107[sow],105[SO])	13 (28,34,35,37,38,63, 64,65,105,107,110,111,1629)
Segment N	0	0	0
Segment O	1 (496[c])	3(496[so],587[w], 589[w])	7 (483,495,496,512,579, 587,589)
Segment Q	4 (1126[c],1077,1310,1602)[b]	4 (1126[so],1310[so],1509[SO],1602[v])	5 (1059,1077,1126, 1310,1602)
Segment R	0	0	0
Segment T	0	0	0
Segment W	1 (366[c])	1 (366[so])[v,w]	3 (326,340,366)
Segment X	0	0	0
Segment Y	0	0	3 (1432,1440,1444)
Alturas Substa.	1(171[sc])	1(171[sc])	1(171)
Border Town Substa.	0	0	0
N. Valley Rd. Substa.	0	0	0
Border Town Staging Area	0	0	0
Other Staging Areas	*	*	*

For affected sites, the number of affected sites and their designations (in parentheses) are provided; information on these sites is provided in Section C.4.1.3.

* Three of the staging areas are in common with the Tuscarora Pipeline Project (Alturas, Madeline Plains, and Wendel area sites); survey and evaluation of those three areas is being conducted under the aegis of that project. The Ohm Place staging area in Reno is at an existing SPPCo facility site.

b Blading
c Structure Construction
so Stringing Operation/Overland Travel
v Vegetation Management
w Wire setup area
sc Substation Construction

successful if the subject cultural resource is not affected by actions associated with the proposed project either during construction or subsequent maintenance and operation activities. If site avoidance is not achieved through these measures a higher level of mitigation will be triggered through the emergency discovery provisions included in the construction monitoring plan.

C-2 Sites that have been recommended as eligible to the NRHP, or are unevaluated, will be treated as significant cultural resources (unless found not eligible to the NRHP by BLM with concurrence by the appropriate SHPO). In the event 100% avoidance of such a site is not possible, and it appears the project will have adverse effects on the property, the Applicant, through the provisions of the Programmatic Agreement (PA), in preparation by BLM, will implement site-specific steps necessary to reduce or eliminate adverse effects to the historic property. As needed, this typically would entail some form of data recovery, ranging from surface collection, to historic research, to interpretive efforts, to archaeological excavation and analysis.

The objective of this mitigation measure is to ensure that those cultural resources that appear to retain qualities sufficient for inclusion on the National Register of Historic Places and have the potential to be adversely affected by actions associated with the proposed project will have such adverse effects reduced to no adverse effect. In accordance with the Programmatic Agreement for this project and Section 106 of the National Historic Preservation Act data recovery programs and associated actions would result in "no adverse effect" to the historic property. Specific sites identified for data recovery will be addressed in a Historic Properties Treatment Plan which will be finalized upon agency/SHPO review of the cultural resources technical report, and will be legally binding upon the project proponent. Monitoring protocols set forth in that document and the construction monitoring plan will ensure compliance with the data recovery measures. This mitigation measure will be considered successful if an approved data recovery program for the affected cultural resource is in place prior to construction. The data recovery program is typically subject to agency and SHPO review as well as review by potentially affected Native Americans when appropriate. If the data recovery program is approved and carried out, adverse effects would be considered to have been mitigated to acceptable levels.

Impact 2 - Surface Disturbance to Cultural Resource Sites

Activities that would tend to cause surface disturbance could occur during construction, maintenance, or operation of the Proposed Project. Activities that would occur only during project construction include the line stringing operation wire setup areas and use of staging areas for temporary storage of equipment and material. Overland travel could occur during any phase of the project (construction, maintenance, operation), including casual use by the general public following construction. Vegetation management, including removal of trees or trimming of vegetation could take place during construction; occasional trimming operations would continue as part of the line maintenance program.

Any surface disturbance to a cultural resource site considered to be significant under NRHP eligibility criteria would be a significant impact, but mitigable through avoidance (Mitigation Measures C-1, above, and C-3, below), or data recovery (Mitigation Measure C-2, above), therefore resulting in a **Class II** impact. The same impacts described above could also affect cultural resource sites that are not considered significant. Non-significant sites are described in Section C.4.1. Impacts to such sites would be considered adverse, but not significant, (**Class III**).

C-3 In order to minimize inadvertent disturbance of significant cultural resources, the Applicant shall limit vegetation removal/trimming and other maintenance activities to (only) foot traffic in areas which are sensitive for cultural resources (areas in close proximity to significant cultural resources). The maintenance plan will identify these areas on maps, alignment sheets, and/or aerial photographs. Overland travel shall be confined to areas specified in the Biological Monitoring Plan.

The objective of this mitigation measure is to ensure that those cultural resources that appear to retain qualities sufficient for inclusion on the National Register of Historic Places will not be adversely affected by vegetation removal/trimming and maintenance activities associated with the proposed project. In accordance with the Programmatic Agreement for this project and Section 106 of the National Historic Preservation Act avoidance of such resources would result in "no effect" to the historic property. Specific sites identified for avoidance will be addressed in a Historic Properties Treatment Plan which will be finalized upon agency/SHPO review of the cultural resources technical report. Monitoring protocols set forth in that document and the construction monitoring plan will ensure compliance with the avoidance measures. The construction monitoring plan should include a provision for the monitor to inspect each site subsequent to construction to assess whether the mitigation measure was effective. This mitigation measure will be considered successful if the subject cultural resource is not affected by actions associated with the proposed project either during construction or subsequent maintenance and operation activities. The construction monitoring plan would provide for emergency discovery and stop work orders, and would trigger higher levels of mitigation if avoidance measures are not successful. Emergency discovery and stop work orders would be implemented if the construction monitor observes disturbances to identified sites.

Impact 3 - Increased Vandalism or Unauthorized Collection at Cultural Resource Sites

The introduction of increased numbers of people into relatively isolated regions could increase the potential for vandalism or unauthorized collection at cultural resource sites. During construction, construction crews would have the opportunity to visit cultural resource sites during "down-time". Maintenance crews (including vegetation management crews) would also have the opportunity to visit cultural resource locations. Where SPPCo access along the powerline results in road or access improvements, the general public might use the improved ingress, potentially exposing cultural resource locations to vandals and collectors.

Any vandalism or unauthorized collection of artifacts at a cultural resource site considered to be significant under NRHP eligibility criteria would be a significant impact (**Class II**), mitigable through avoidance/prevention (Mitigation Measures C-4 and C-5, below). These impacts could also affect cultural resource sites that are not considered significant; such impacts would be considered adverse but not significant (Class III). Non-significant sites are described in Section C.4.1.

C-4 During preconstruction briefings/meetings and prior to maintenance activities near any sensitive cultural resource, the Applicant shall inform crews (including vegetation management personnel) of the resource values involved and of the regulatory protections afforded the resource. The crews shall also be informed of procedures relating to designated culturally sensitive areas and required not to drive into these areas or to park or operate construction equipment on them. The crews shall also be required not to collect artifacts and, in the event that cultural remains are uncovered, required to inform a construction or maintenance supervisor who must inform appropriate personnel pursuant to the mitigation monitoring plans to be developed for the Proposed Project. In the event of discovery of cultural resources during construction activity, construction activity will be suspended in the immediate vicinity of the Find until a qualified archaeologist investigates the Find and determines appropriate mitigation measures.

The objective of this mitigation measure is to ensure that those cultural resources that appear to retain qualities sufficient for inclusion on the National Register of Historic Places will not be subject to deliberate or inadvertent disturbance or illicit collection by construction and/or maintenance and operation personnel. Crew education protocols set forth in the construction monitoring plan will identify the specifics of the crew education program. This mitigation measure will be considered successful if the subject cultural resource is not affected by actions associated with the proposed project either during construction or subsequent maintenance and operation activities. The penalty provisions of the Archaeological Resources Protection Act will also be identified as part of the crew education program.

C-5 Upon completion of construction, the Applicant shall block or conceal new or improved roads through the use of berms or other features in a fashion that is agreeable to the land managing agency and limits public access. This would reduce or eliminate the potential for impacts from increased public access to the resources.

The objective of this mitigation measure is to ensure that those cultural resources that appear to retain qualities sufficient for inclusion on the National Register of Historic Places will not be adversely affected by increased public access to such resources as a result of road construction associated with the new proposed project. Increased public access could lead to either inadvertent or willful destruction of cultural resources. The construction monitoring plan will identify those roads to be blocked. Monitoring protocols set forth in that document and the construction monitoring plan will ensure compliance with the avoidance measures. The construction monitoring plan should include a provision for the monitor to inspect each site subsequent to construction to assess whether the mitigation measure was effective. This mitigation measure will be considered successful if the blocked access results in no increase in vehicular traffic into the areas blocked and subsequent damage to or removal of cultural resources.

Impact 4 - Impacts to Integrity of Setting, Feeling, or Association

This impact includes those activities which would result in long-term disturbance to the integrity of context, setting, feeling, or association of sites whose significance is tied to NRHP eligibility criteria (a),(b), or (c) or a Traditional Cultural Property. Any disturbance to a cultural resource site would be a significant impact, but would be mitigable through project avoidance (Mitigation Measure C-1), data recovery (Mitigation Measure C-2), project redesign or re-engineering of permanent facilities (Mitigation Measure C-6, below), or a combination of these measures to minimize impacts. In certain instances implementation of such measures might still result in residual significant impacts. Such impacts would be considered **Class I** or **Class II** impacts depending on the effectiveness of the mitigation. A specific mitigation for potential impacts to the context of the Infernal Caverns Battlefield area has been developed by the BLM (Mitigation Measure C-7, below).

C-6 To the maximum extent feasible, permanent facilities including permanent access roads, will be placed as far and as unobtrusively as possible from those cultural resource sites that appear to be significant under NRHP eligibility criteria (a),(b), or (c), or are Traditional Cultural Properties

The objective of this mitigation measure is to protect intact, to the greatest extent possible, the setting of those cultural resources that appear to significant on the basis of their setting or other qualities rather than their information content. In accordance with the Programmatic Agreement for this project and Section 106 of the National Historic Preservation Act, careful consideration of facilities placement and/or use of materials that blend with the surrounding environment would result in "no effect" or "no adverse effect" to such historic properties. The measure would be considered to be successful if review of final design by the lead agencies concludes that integrity of setting has been preserved for these resources.

C-7 The BLM, working with the Applicant, has developed a mitigation measure that would help to offset the impacts on context for the Infernal Caverns Battlefield location. The Applicant would negotiate with the private landowners who currently own the land containing the Infernal Caverns Battlefield. If those owners are willing the Applicant would acquire the land containing the historic features, as well as an access route from the county road to the east of the battlefield. The Applicant would exchange this land with BLM for public land elsewhere, and assist BLM in developing a trailhead and interpretive trail located out of sight of the proposed powerline route (i.e., east of and below the rim). This would mitigate the impacts of the disturbance to the context of the Infernal Caverns historical area, therefore resulting in **Class II** impacts. At this time the plan for the land exchange/interpretive developments is only in the conceptual stage. Actual implementation of the plan would be subject to an Environmental Assessment by BLM.

The objective of this mitigation measure is to offset potential impacts to the setting of the Infernal Battlefield location by providing enhanced interpretive opportunities for the public. Interpretation of significant cultural resources is an important component of the Section 106 compliance process. BLM will be responsible for preparation and implementation of the interpretive plan pending completion of an Environmental Assessment, and will develop mitigation success criteria at that time. Generally the measure would be considered successful if public interpretive value of the resource is increased in the assessment of a BLM interpretive specialist.

C.4.2.3 Cumulative Impacts and Mitigation Measures

There are 18 reasonably foreseeable projects that when considered in conjunction with the Alturas Transmission Line project may compound or increase impacts on cultural resources. With the exceptions of the Tuscarora Gas Pipeline Project and potential LMUD or related Lassen County tie-in/service, these other projects are fairly small (less than 100 acres in size), non-linear developments that would have only modest potential to impact the cultural resource base in this region. The only projects for which quantitative cultural resources data are available for analysis are the Proposed Project, the Tuscarora Project, and a flood control dam and channel modification to the Evens Creek Watershed northwest of Reno, Nevada. The other projects would, however, normally be subjected to State and/or Federal permitting requirements with respect to cultural resources.

Cultural resources survey data for both the Tuscarora and Alturas projects can be assessed in terms of incremental impacts of the Proposed Project on the cultural resource base in the region. The Alturas Project EIR/S cultural resources surveys have identified 266 cultural resource sites within the corridor encompassing the Proposed Project. Of these 266 sites, 104 either appear to be NRHP-eligible or are unevaluated. There are 25 sites common to both the Proposed and the Tuscarora projects. Sixteen of these sites either appear to be significant or are unevaluated.

The Evans Creek watershed improvements appear to have the potential to impact four cultural resource sites.

The Tuscarora Project cultural resources surveys have identified 288 cultural resource sites within that project's study corridor. Seventy-five sites were provisionally evaluated as not NRHP-eligible. Fifty-one sites appear to be NRHP-eligible and another 162 sites have been recommended for further evaluation.

When considered together, these three projects have the potential to impact 533 cultural resource sites. The sites within the study corridor of the Proposed Project represent 50% of the resource base of 533 sites. However, only about fifteen percent (79) of these sites which are significant or unevaluated occur exclusively within the Proposed Project survey corridor. The potential impacts on the 16 sites that co-occur in both project survey corridors are not considered to be exposed to a greater incremental impact than those that occur exclusively in one corridor, since disturbance, or potential for disturbing, to these sites would occur regardless, if one or both projects went forward. However, these impacts would be mitigable resulting in **Class II** impacts only (see below).

Disturbance to a cultural resource site considered to be significant under NRHP eligibility criteria would be a significant impact. These impacts would be mitigable through avoidance or data recovery/archival research (see Mitigation Measures C-1 through C-5, above), thereby resulting in **Class II** impacts on the cultural resource base. In view of the available information it does not appear that the Proposed Project would contribute significantly to cumulative impacts in the project region.

C.4.2.4 Unavoidable Significant Impacts

There are potential Class I impacts to three historic sites, two on Segment K and one on Segment O, which may have historic components that might be eligible to the NRHP under criterion (a) and/or (d).

C.4.3 ALTERNATIVE ALIGNMENTS AND SUBSTATIONS

The same impact categories and mitigation measures proposed to address those impacts described in Section C.4.2.2 for the Proposed Project are employed for cultural resource sites located within the alternative alignment and substation sites. Table C.4-3 provides a numerical breakdown of sites at these alternative locations, with information regarding basic site type (prehistoric, historic, or multi-component) and provisional status with regard to significance and/or evaluation recommendations as was done for the Proposed Project. Resource locations for the alternative alignments and substation sites which have the potential to be impacted are listed by site component and impact category on Table C.4-4. Mitigation measures, by impact category, proposed for each resource located within the alternative alignments are the same as those for the Proposed Project.

C.4.3.1 Alturas Area Alternative Alignment (Segment B)

Alternative Segment B contains 12 sites, five of which appear to be significant, or are unevaluated with respect to eligibility to the NRHP.

- KEC-163: this site is a sparse lithic scatter that also contains an obsidian projectile point fragment.
- KEC-1973: this site is the route of the historic Western Pacific Railroad (currently Southern Pacific) with an associated trash scatter of tin cans, blasting powder cans, metal scraps and other related debris. The site is also found on Proposed Segment A.
- KEC-1985: this site is a complex of sparse lithic scatter loci. Obsidian is the dominant material, a number of tools are also found within these loci.
- KEC-1991: this multi-component site contains a trash dump comprised principally of domestic refuse, and an extensive prehistoric lithic scatter that includes a biface and a scraper. This site is also found within the Alturas Substation location (Mill Site).
- KEC-1994: this multi-component site includes the remains of a structure (basalt blocks, concrete, brick and milled lumber), gravel quarry and a prehistoric sparse lithic scatter.

Seven other sites were found on the B segment. KEC-1968 (common with Proposed Segment A), 1981, 1982, and 1996 are small sparse lithic scatters. KEC-1980 is a remnant of a telegraph line segment (five partial poles, one strand of wire) adjacent to a railroad, KEC-1973. KEC-1978 is a sparse lithic scatter and tin can scatter dating from 1935-1945. KEC-156 (common with Proposed Segment A) is a small historic trash scatter. None of these seven sites appears to retain those qualities necessary for inclusion on the NRHP.

Table C.4-3 Cultural Resource Sites Recorded on Alternative Alignments and Substations

		Status				Status				Status		
Alternative Segment[a]	Prehistoric Sites	PS	U	NS	Historic Sites	PS	U	NS	Prehistoric/Historic Sites	PS	U	NS
B	6(1)[t]		2	4(1)[t]	3(1)[t]		1	2(1)[2]	3		2	1
D	20		7	13	4		1	3	6	1	1	4
G	2	1		1								
J	4	2		2								
ESVA	14(1)	4	1	9(1)[b]	2	1		1	2	1		1
M	3	1		2	2	1(1)[c]		1	3			3
P	6			6	2			2	7		3	4
S	3			3					2	1	1	
U	2			2					1			1
Z	1(1)[d]	1										
WCFG	3		1	2	3		2	1	2			2
X-East	2			2	2			2				
Alturas Substation (Mill Site)	0				0				1(1)[2]	1		
Alternative Border Town Substation Site					3(1)[e]			3	1(1)[f]			1

[a] No sites recorded on Segments F, H, I.
[b] Also recorded on Segment L
[c] Also recorded as part of Tuscarora Pipeline Project survey.
[d] Also recorded on Segment W.
[e] Also recorded on Segments F, H, I.
[f] Also recorded on Segment WCFG and proposed Border Town Substation site.
[t] Common to Segments A and B

PS = Provisionally Significant
U = Unevaluated (further evaluation recommended)
NS = Not Significant

Table C.4-4 Potential Impacts - Alternative Alignments & Substations

Project Component	Surface Removal (Affected Sites)	Surface Disturbance (Affected Sites)	Indirectly Impacted (Affected Sites)
B	0	5 (163[so], 1973[so], 1985[so], 1991[so], 1994[so])	5 (163, 1973, 1985, 1991, 1994)
D	6 (142[b], 1760[b], 1765[b], 1781[b], 1796[b], 1803[b])	7 (142[so, v], 1760[v], 1765[v], 1781[v], 1779[v], 1803[so, v])	10 (142, 1743, 1744, 1747, 1750, 1760, 1765, 1781, 1796, 1803)
G	0	1 (138[v])	1 (138)
H	0	0	0
I	0	0	0
F	0	0	0
J	1(1652[8])	0	1 (113)
ESVA	3 (1613[b],1614[c],1634[c])	4 (1613[SO],1614[SO],1631[SO], 1634[SO])	7 (1613,1614,1631,1634)
M	0	0	2 (9,13)
P	1 (1235[c])	2 (1235[so],1347[SO])	3 (1234,1235,1347)
S	0	0	2 (466)
U	0	0	0
Z	1 (366[c])	1 (366[so])	1 (366)
WCFG	1 (1476[c])	0	3 (1476,1477,1550)
X-East	0	0	0
Alturas Substation (Mill Site)[1]	1 (1991[sc])	1 (1991[sc])	1 (1991)
Border Town Substation (Alternative Site)	0	0	0

B Blading
C Structure Construction
SC Substation Construction
SO Stringing Operation/Overland Travel
V Vegetative Management
1 Site common to Segment B and Alturas Substation

C.4.3.2 Madeline Plains Alternatives (Segments D, G, F, H, I)

C.4.3.2.1 *Environmental Setting*

Among the Madeline Plains alternative segments, cultural resources were found only on Alternative Segments D and G.

Alternative Segment D contains 30 sites, 10 of which appear to be significant.

- KEC-142: this site is a large lithic scatter containing groundstone fragments, bifaces and projectile points from the Rosegate, Elko, Humboldt and Gatecliff series. The site also contains a historic can and glass scatter.

- KEC-1744: this site contains seven talus pits that may be prehistoric hunting blinds.

- KEC-1747: this site is a sparse lithic and groundstone scatter.

- KEC-1750: this site is a sparse lithic and groundstone scatter.

- KEC-1760: this site is a sparse lithic scatter and an associated metate fragment.
- KEC-1765: this small site contains two projectile points including an obsidian Rosegate series projectile point and a large basalt tip fragment.
- KEC-1779: this site is a historic hunting camp with tin cans dating from 1917-45.
- KEC-1781: this site is a lithic scatter with groundstone fragments and a Rosegate series projectile point.
- KEC-1796: this site is a prehistoric hunting blind with a possible hearth found in close proximity, a large projectile point fragment, and a tin can scatter.
- KEC-1803: this site is a rectangular rock cache and approximately five to ten lithic flakes.

Twenty other sites were found on this segment. KEC-1758, 1788, 1790, 1792, 1771, 1772, 1774 and 1775 are simple stacked stone features that do not appear to be natural phenomena. KEC-1738, 1740, 1741, 1743, and 1799 are sparse lithic scatters that in some instances also contain tin cans, or infrequent amounts of other prehistoric artifacts. KEC-1787 and 1753 are possible prehistoric hunting blinds. KEC-1737 and 1745 are tin can scatters. KEC-1746 is a fence line segment and glass fragment. Two additional sites were recorded on or near a proposed access road to the segment. KEC-1653 is a scatter of historic debris, and KEC-1654 is a 1950s era cabin. None of these sites appears to retain those qualities necessary for inclusion on the NRHP.

Two sites have been recorded on Alternative Segment G, one of which appears to be significant: KEC-138 is a 212 x 176 meter (233 x 194 yard) dispersed lithic scatter containing debitage, tools, and typable projectile points. Representative projectile points from both the Elko and Rosegate series were observed. This site appears to be eligible for inclusion on the NRHP. KEC-136 is a lithic scatter composed of both debitage and an array of tools. Approximately 70% of the debitage is obsidian, 25% is basalt and five percent is chert. Recordation has exhausted the potential for this site to yield additional important information.

C.4.3.2.2 *Environmental Impacts and Mitigation Measures*

Use of Alternative Segments D and G would have the potential to result in **Class II** impacts to 11 sites. In contrast, Proposed Segment E would have the potential to result in **Class II** impacts to 12 sites.

C.4.3.2.3 *Cumulative Impacts and Mitigation Measures*

The 32 sites on these alternative segments represent less than one percent of the cumulative total of sites for the Alturas and the Tuscarora projects. Disturbance to a cultural resource site not considered to be significant under NRHP eligibility criteria would not be a significant impact. Disturbance to a cultural resource site considered to be significant under NRHP eligibility criteria could be a significant impact. These impacts would be mitigable through avoidance or data recovery/archival research, therefore reducing the impacts to **Class II**. In view of the available information, it does not appear that the potential impacts on cultural resources for these alternatives would contribute significantly to cumulative cultural resources impacts in this region.

C.4.3.2.4 *Unavoidable Significant Impacts*—None.

C.4.3.3 Ravendale Alternative Alignment (Segments J, I)

C.4.3.3.1 *Environmental Setting*

Alternative Segment I does not contain any cultural resource sites. Alternative Segment J contains four sites, two of which appear to be significant: KEC-113 is a 280 x 140 meter (308 x 154 yard) site that contains hunting blinds, lithic tools, debitage, and milling stones. There were also nine projectile points noted at this location, including examples from the Elko, Rosegate, and Desert series. Although the potential for resources at depth is low, the internal variability and complexity of the assemblage suggests this may be a significant site. KEC-1652 is a large prehistoric lithic scatter containing an Elko series projectile point and other lithic tools. The site straddles both sides of 5-1 road upgrades.

The two other sites recorded on this alternative are KEC-121 and 122, both small, sparse surface lithic scatters whose recordation exhausts their potential to yield important information.

C.4.3.3.2 *Environmental Impacts and Mitigation Measures*

This alternative has the potential to result in **Class II** impacts on two sites. In contrast, Proposed Segment K would have the potential to result in **Class II** impacts on 9 sites.

C.4.3.3.3 *Cumulative Impacts and Mitigation Measures*

The four sites on this alternative represent less than one percent of the cumulative total of sites for the Alturas and the Tuscarora projects. Disturbance to a cultural resource site not considered to be significant under NRHP eligibility criteria would not be a significant impact. Disturbance to a cultural resource site considered to be significant under NRHP eligibility criteria would be a significant impact. These impacts would be mitigable through avoidance or data recovery/archival research, therefore resulting in **Class II** impacts. In view of the available information, it does not appear that the potential impacts on cultural resources for this alternative would contribute significantly to cumulative impacts in this region.

C.4.3.3.4 *Unavoidable Significant Impacts*—None.

C.4.3.4 East Secret Valley Alignment (Segment ESVA)

C.4.3.4.1 *Environmental Setting*

Alternative Segment ESVA contains six sites that provisionally appear to be eligible to the NRHP and one site recommended for further evaluation. For purposes of this analysis, unevaluated sites are treated as significant. The seven sites are:

- KEC-1613: this prehistoric site is a large, 200 x 210 meter (219 x 230 yard), complex lithic scatter composed of flakes tools and milling stone fragments. It appears to be eligible to the NRHP under criterion (d).
- KEC-1614: this prehistoric site is a large, 333 x 242 meter (363 x 264 yard) complex lithic scatter that is estimated to contain over 100,000 flakes. It appears to be eligible to the NRHP under criterion (d).
- KEC-1619: this prehistoric site is a small, concentrated lithic scatter. Nine stone tools and three projectile points were recorded at this location. It appears to be eligible to the NRHP under criterion (d).
- KEC-1627: this prehistoric site is a large, 212 x 91 meter (231 x 99 yard), diffuse to dense lithic scatter. It appears to be eligible to the NRHP under criterion (d).
- KEC-1629: previously recorded as TPP-142H during the Tuscarora Pipeline Project survey, this is Old Highway 395 dating from the 1930s. Much of this roadway is under modern U.S. 395, or is currently used as a secondary road. It appears to be eligible to the NRHP under criterion (a).
- KEC-1631: this site is a large, 455 x 152 meter (495 x 166 yard), multi-component prehistoric lithic scatter and historic ranch complex. It appears the prehistoric component of the sites is eligible to the NRHP under criterion (d), and the historic component is eligible under criteria (a), (c), and (d).
- KEC-1634: this prehistoric site is a large, 212 x 606 meter (231 x 661 yard) diffuse, complex lithic scatter. The site contains lithic waste flakes tools and a projectile point. This site is recommended for further evaluation..

Eleven other cultural resource sites were recorded on Alternative Segment ESVA and have been provisionally assigned a status of non-significant when assessed with respect to NRHP eligibility criteria. One of these, KEC-39 a small prehistoric lithic scatter was originally recorded on Segment L. Six of the remaining sites, KEC-1615, 1616, 1621 (CA-LAS-636), 1622, 1624, and 1633 are lithic scatters whose recordation has exhausted their potential to yield important information.

One site, KEC-1623, is a multi-component lithic scatter and historic campsite. Recordation has exhausted its potential to yield important information. One site, KEC-1628, is the remnant of the Smoke Creek and Secret Valley Road. The site lacks integrity and is recommended as not eligible to the NRHP. Two sites, KEC-1625 and 1630, are individual petroglyph panels. Neither of these sites appears to be eligible to the NRHP.

C.4.3.4.2 *Environmental Impacts and Mitigation Measures*

This alternative has the potential to result in a Class I impact on one site, Class II impacts on six sites, and Class III impacts to twelve sites. In comparison, the portion of the Proposed Segment L which this alignment would replace has 18 identified sites, of which 12 were judged to be provisionally significant. Generally speaking, those sites identified during the Alternative Segment ESVA inventory were less disturbed, more pristine, and appear to contain a higher percentage of significant data. In addition, because many of the sites on Proposed Segment L would also be impacted by the Tuscarora pipeline project, there would be less cumulative or total impact to the area's cultural resources if Proposed Segment L is used instead of Alternative Segment ESVA. Construction activities on Alternative Segment ESVA would also have the potential of opening new access routes into previously undisturbed areas. On balance, it appears that Alternative Segment ESVA would result in more significant impacts to cultural resources.

C.4.3.4.3 *Cumulative Impacts and Mitigation Measures*

The 18 sites on this alternative segment represent about four percent of the cumulative total of sites for the Alturas and Tuscarora projects. Disturbance to a cultural resource site not considered to be significant under NRHP eligibility criteria would not be a significant impact. Disturbance to a cultural resource site considered to be significant under NRHP eligibility criteria would be a significant impact. Significant impacts would be mitigable through avoidance or data recovery/archival research, therefore resulting in Class II impacts. In view of the available information it does not appear that the potential impacts on cultural resources for these alternative segments would contribute significantly to cumulative impacts on cultural resources in this region.

C.4.3.4.4 *Unavailable Significant Impacts*

There are potential Class I impacts to one historic site on Alternative Segment ESVA which may be eligible to the NRHP under criteria (a), (c), and (d).

C.4.3.5 Wendel Alternative Alignment (Segment M)

C.4.3.5.1 *Environmental Setting*

Alternative Segment M contains two sites which appear to be significant.

- KEC-9: previously recorded as TPP-354/H (Las-45) as part of the Tuscarora Pipeline Project survey. This site was described as a historic trash scatter encompassing an area 74 x 54 meters (81 x 59 yards). The site appears to have some depth. This site was regarded as significant by the Tuscarora cultural resources survey team.

- KEC-13: situated on the east side of Honey Lake Valley this site is a concentrated assemblage of lithic debris, groundstone and at least two typable projectile points from the Humboldt and Rosegate series.

The six other sites recorded on this alternative include KEC-6,7,8,11,12 and 15a. KEC-6 is a small surface scatter of glass; KEC-7 and 15a are prehistoric lithic scatters; KEC-8 (previously recorded as Las-507) is a sparse lithic scatter with some historic white earthenware ceramics; KEC-11 is an intermixed prehistoric lithic scatter and historic glass scatter; and KEC-12 is a small scatter of 1900-1930s era sanitary cans and a few fragments of amethyst colored glass. Recordation of these sites exhausts their potential to yield important information. None, therefore, is considered significant.

C.4.3.5.2 *Environmental Impacts and Mitigation Measures*

This alternative has the potential to result in **Class II** impacts on two sites. In contrast, Proposed Project Segment N would result in **Class II** impacts on no sites.

C.4.3.5.3 *Cumulative Impacts and Mitigation Measures*

The eight sites on this alternative represent about one percent of the cumulative total of sites for the Alturas and the Tuscarora projects. Disturbance to a cultural resource site not considered to be significant under NRHP eligibility criteria would not be a significant impact. Disturbance to a cultural resource site considered to be significant under NRHP eligibility criteria could be a significant impact. These impacts would be mitigable through avoidance or data recovery/archival research, therefore resulting in **Class II** impacts. In view of the available information, it does not appear that the potential impacts on cultural resources for this alternative would contribute significantly to cumulative impacts in this region.

C.4.3.5.4 *Unavoidable Significant Impacts*—None.

C.4.3.6 West Side of Fort Sage Mountains (Segment P)

C.4.3.6.1 *Environmental Setting*

Alternative Segment P contains three sites which have been recommended for further evaluation.

- KEC-1234: this 170 x 80 meter (186 x 88 yard) site located on the west of the Fort Sage Mountains is a moderately dense lithic scatter with tools and charcoal present. Because the possibility exists that this site can yield chronological data (radiometric dating on charcoal), it has been recommended for further evaluation.
- KEC-1235: this 240 x 300 meter (263 x 328 yard) site located on the west side of the Fort Sage Mountains is a diffuse lithic scatter that appears to harbor the potential for subsurface deposits. It has been recommended for further evaluation.
- KEC-1347: this multi-component site located along the east side of Long Valley contains a lithic scatter with Great Basin stemmed, Gatecliff (Pinto), and Elko series projectile points. It also has a historic component containing hole-in-cap cans. The site appears to have excellent potential for subsurface deposits and is recommended for further evaluation.

Twelve other sites were recorded on Alternative Segment P. Six of these sites, KEC-1240, 1333, 1341, 1640, 1641 and 1642 are small archaeological sites whose recordation has exhausted their potential to yield important information. Three of the sites, KEC-1208 1272, and 1643 are multi-component sites exhibiting both prehistoric lithic scatters and historic trash scatters; their recordation has exhausted their potential to yield important information. A tenth site, KEC-1353, is described as two collapsed structures with associated trash and a prehistoric component of six lithic flakes and one projectile point. The first of the remaining two sites is KEC-1029, a small trash scatter along the south edge of Honey Lake Valley, with cans and glass suggestive of use between 1908 to 1914 and after 1933. KEC-1034, a 25 x 125 meter (27 x 136 yard) trash scatter also located on the south edge of Honey Lake Valley, which appears to exhibit three episodes of refuse disposal between 1900 and the 1930s. Recordation has exhausted the potential of these sites to yield further important information.

C.4.3.6.2 *Environmental Impacts and Mitigation Measures*

This alternative has the potential to result in **Class II** impacts on three sites. In contrast, Proposed Project Segment Q would result in **Class II** impacts on five sites.

C.4.3.6.3 *Cumulative Impacts and Mitigation Measures*

The 15 sites on this alternative alignment represents about three percent of the cumulative total of sites for the Alturas and Tuscarora projects. Disturbance to a cultural resource site not considered to be significant under NRHP eligibility criteria would not be a significant impact. Disturbance to a cultural resource site considered to be significant under NRHP eligibility criteria would be a significant impact. These impacts would be mitigable through avoidance or data recovery/archival research, therefore resulting in **Class II** impacts. In view of the available information, it does not appear that the potential impacts to cultural resources for this alternative would contribute significantly to cumulative impacts on cultural resources in this region.

C.4.3.6.4 ***Unavoidable Significant Impacts***—None.

C.4.3.7 Long Valley Alignments (Segments S, U, Z, and WCFG)

C.4.3.7.1 *Environmental Setting*

Alternative Segment S contains one site that appears to be NRHP eligible and another requiring further evaluation:

- KEC-452: this multi-component site is a historic trash scatter containing materials suggestive of a blacksmithing operation; a few flakes from stone tool maintenance/manufacturing were also noted at the site. The site appears to have some depth and is recommended as NRHP eligible under criteria (a) and (d).

- KEC-466: this multi-component site may have been the location of a railroad construction camp. Blasting powder containers, coal, and coke were all present. There was also a lithic scatter at this location. The site has been recommended for further evaluation.

Three other sites on Alternative Segment S were also recorded: KEC-403 is a small flake scatter; KEC-404 (previously recorded as Las-1511) is a lithic scatter; and KEC-462 is a lithic scatter with no apparent depth or internal complexity. Their recordation has exhausted their potential to yield further important information; none is therefore significant.

Alternative Segment U contains two prehistoric sites, KEC-418 and 428, both lithic scatters with no depth, were recorded on this segment. A third site, KEC-435, contains both a prehistoric lithic scatter and a historic meat tin. Recordation of these sites exhausts their potential to yield further important information and they are therefore not significant.

Alternative Segment Z contains a single site, KEC-366 (also located on the W segment), which is a large (2800 x 600 meter/3052 x 654 yard) diffuse lithic scatter situated along the east side of Long Valley. One Martis and one Elko series projectile point were observed. The site may have been a lithic reduction area for cryptocrystalline silicates (CCS), a glass-like material. The site appears to have some depth and appears to be eligible to the NRHP.

Alternative Segment WCFG contains three sites recommended for further evaluation.

- KEC-1477 appears to be an early 20th century farm trash scatter and remains of a plow or harrow. Two rock piles consistent with field clearing activity are present. A concentration of ceramics was also noted at this site. Two 12 x 3 foot depressions were recorded. Episodes of alluviation may have created subsurface deposits. The site is recommended for further evaluation.

- KEC-1476 appears to be a volunteer dump of historic trash extending for 1097 meters (1207 yards) with a width of 60 meters (66 yards) along a dirt road and the Western Pacific Railroad.

- KEC-1550 is a small 20 x 22 meter (22 x 24 yard) lithic scatter containing seven flakes and one biface. Because it is located in a setting that could harbor buried deposits the site has been recommended for further evaluation.

Five other cultural resource sites were recorded on Alternative Segment WCFG. KEC-1490 appears to be a volunteer dump of historic trash and one stone flake. KEC-1548 and 1478 are apparent surface lithic scatters. KEC-1534 is a large trash scatter and one prehistoric basalt flake. The fifth site, KEC-1601, is a historic trash scatter near two small check dams. Recordation of these five sites has exhausted their potential to yield further significant information and they are therefore not considered significant.

C.4.3.7.2 *Environmental Impacts and Mitigation Measures*

These alternative segments have the potential to result in a potential **Class I** impact on one site and **Class II** impacts on four sites. In contrast, Proposed Segment T and those portions of Proposed Segment W to which the Long Valley Alignments are an alternative would result in **Class II** impacts to one site (KEC-366) which is common to both Proposed Segment W and Alternative Segment Z.

C.4.3.7.3 *Cumulative Impacts and Mitigation Measures*

The 17 sites on these alternative segments represent about three percent of the cumulative total of sites for the Alturas and Tuscarora projects. Disturbance to a cultural resource site not considered to be significant under NRHP eligibility criteria would not be a significant impact. Disturbance to a cultural resource site considered to be significant under NRHP eligibility criteria would be a significant impact. Significant impacts would be mitigable through avoidance or data recovery/archival research, therefore resulting in **Class II** impacts. In view of the available information, it does not appear that the potential impacts on cultural resources for these alternative segments would contribute significantly to cumulative impacts on cultural resources in this region.

C.4.3.7.4 *Unavoidable Significant Impacts*

There are potential Class I impacts to one historic site on Alternative Segment S which may be eligible to the NRHP under criteria (a) and (d).

C.4.3.8 Peavine Peak Alternative Alignment (Segment X-East)

Four sites were recorded on the Alternative Segment X-East (corresponding with Proposed Project Segment Y). KEC-1409 (previously recorded as Wa-176/161) and KEC-1427 are small lithic scatters. The latter also contained grinding implements (metates). KEC-1420 is a volunteer trash dump and KEC-1428 consists of two mine shafts and an associated trash scatter. Recordation of these four sites has exhausted their potential to yield further significant information; none is considered significant. Therefore, this alternative has no potential to result in **Class II** impacts. In contrast, Proposed Project Segment Y would result in **Class II** impacts to three sites.

C.4.3.9 Substation Alternatives

C.4.3.9.1 *Alternative Alturas Substation Site (Mill Site)*

One cultural resource site was recorded at this location. KEC-1991 is a multi-component site that contains a trash dump comprised principally of domestic refuse, and an extensive prehistoric lithic scatter that includes a biface and a scraper. This site also extends into Alternative Segment B. This alternative has the potential to result in **Class II** impacts to one site. The Alturas Substation (Devils Garden site) also has the potential to result in **Class II** impacts to one site.

C.4.3.9.2 *Border Town Substation Alternative (SPPCo Site)*

Four cultural resource sites occur completely or partially within this alternative location. KEC-1534 is a large trash scatter and one prehistoric basalt flake. KEC-1541 is a low density scatter of tin cans, glass, and other trash along a currently used road. KEC-1542 contains four distinct historic trash dumps and intervening trash dating from the 1920s to the present. KEC-1545 is a small tin can and glass fragment scatter dating from 1938 to the present. Recordation has exhausted the potential for these four sites to yield additional important information and impacts would not be considered significant (**Class III**). Note that the proposed Border Town Substation site would involve **Class III** impacts to only one site.

Neither of the two Border Town sites appears to contain significant cultural resources. The proximity of an historic ranch to the alternative Border Town Station study area indicates the proposed Border Town Substation location would be a superior choice, although this ranch does not represent an historic property as defined by the guidance under the regulations found at 36 CFR 800 for the National Register of Historic Places.

C.4.4 NO PROJECT ALTERNATIVE

C.4.4.1 Environmental Consequences and Mitigation Measures

Over the short-term (one to three years) the No Project Alternative would not likely result in any new surface disturbance. Accordingly, no new **Class II** or **Class III** impacts to cultural resources would be incurred. Over the long-term the No Project Alternative would probably include the construction of a major transmission facility comparable to the Proposed Project with similar types of ground-disturbing impacts. It is assumed that, similar to the Proposed Project, significant impacts on cultural resources associated with any alternative project could be mitigable through the same kinds of mitigating measures described above in Section C.4.2.2.

Potential unavoidable impacts would most likely be mitigable, but the potential for unmitigable impacts remains, in the absence of specific development proposals and thorough examination of their impacts.

C.4.5 MITIGATION MONITORING PROGRAM

The mitigation measures required for the Proposed Project or its alternatives would be implemented through coordination among the Lead Agencies (the CPUC and BLM) and the California or Nevada SHPOs (through the provisions of a Programmatic Agreement prepared by BLM and currently undergoing agency review). The Lead Agencies would provide support and ensure that the Applicant provides the required personnel or funding to implement the required mitigation measures; the Lead Agencies, or its designees, would also prepare detailed mitigation monitoring plans and/or treatment plans, conduct the mitigation monitoring, and provide report compliance. Table C.4-5 presents the Mitigation Monitoring Program.

Table C.4-5 Mitigation Monitoring Program

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Construction activities disturbing or removing surface or subsurface significant/un-evaluated cultural resource sites (Class II)	C-1 Avoid all significant/unevaluated cultural resource sites by flagging/monitoring.	Proposed Segments A,C,E, K,L,O,Q,W Alternative Segments B,D, G,J,ESVA,M,P,S,Z,WCFG	BLM CPUC SHPO USFS	Prepare monitoring and Historic Properties Treatment Plan, flag sensitive areas for avoidance, monitor construction activities, prepare monitoring report. Conduct post-construction survey and documentation to evaluate success of avoidance.	Avoidance of all significant/unevaluated cultural resource sites.	Following agency review/approval of reports: Flag sites before construction; monitor construction; survey after construction
	C-2 Sites recommended as eligible to NRHP, or unevaluated sites, will be treated as significant cultural sites. In the event 100% avoidance is not possible, the Applicant through the provisions of BLM's Programmatic Agreement will implement site-specific steps necessary to reduce or eliminate adverse effects to historic property.			Prepare treatment plan and implement procedures set forth in PA. Conduct evaluations/data recovery/research as required. Report results to Lead Agency(s).	Upon conclusion of evaluations, data recovery/research program exhausts potential of site to yield further important information.	Complete Programmatic Agreement before construction; implementation following agency review/ approval of treatment plans
Construction, operation, maintenance or public use disturbing significant or unevaluated cultural resource sites (Class II)	C-1 and C-2, above C-3 Restrict vegetation management activities in sensitive areas to pedestrian access only. Avoid sensitive cultural resource locations during maintenance activities requiring overland travel.	Proposed Segments A,C,E, K,L,O,Q,W Alternative Segments B,D, G,J,ESVA,M,P,S,Z,WCFG	BLM CPUC SHPO USFS	Prepare monitoring and treatment plan, flag sensitive areas for avoidance, monitor construction activities, prepare monitoring report.	Post-construction and maintenance surveys, document success of avoidance.	Prepare maintenance plan after construction; survey after construction and during maintenance
Unauthorized collection and/or vandalism of significant or unevaluated cultural resource sites (Class II).	C-4 Prior to construction, inform crews of cultural resource values/regulatory protections and required procedures regarding avoidance of sensitive cultural resources.	Proposed Segments A,C,E, K,L,O,Q,W, Alternative Segments B,D, G,J,ESVA,M,P,S,Z,WCFG	BLM CPUC USFS	Prepare monitoring plan. Prepare crew education materials. Conduct pre-field "tailgate" sessions. Prepare monitoring report. Conduct post-construction surveys to evaluate effectiveness of mitigation.	Post-construction surveys of sensitive areas, document success of measures.	Prepare plan and educate crew before construction; survey after construction
	C-5 Post-construction: block public access to all new or improved access roads.			Conduct post-construction inspection of blocked roads.	Post-construction surveys of blocked roads, document success of measure.	Block roads after construction

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Disturbance to context, setting, feeling, or association of cultural resource sites (Class I or II)	C-1 and C-2, above. C-6 Place permanent facilities as far as possible from significant cultural resource sites.	Proposed Segments K,O Alternative Segments ESVA,S	BLM CPUC SHPO	Agency/SHPO may require project modification to further mitigate impacts.	Project modifications result in no adverse effect to context, setting, feeling, or association.	Prior to final project design
	C-7 Acquire land and develop interpretive trail at Infernal Caverns Battlefield area.	Segment C (Infernal Caverns Battlefield area)	BLM CPUC SHPO	BLM develops plan for land exchange/interpretive trail in concert with Applicant. EA prepared by BLM prior to implementation. Conduct post-implementation evaluation of trail.	Minimal intrusion on setting and context.	Complete plans prior to construction of project

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C.5.1 ENVIRONMENTAL BASELINE AND REGULATORY SETTING

The public utilities and energy analysis focuses on the Proposed Project Segments (A, C, E, K, L, N, O, Q, R, T, W, X, and Y) and their alternative alignments. Refer to Land Use (Section C.8) and Transportation and Traffic (Section C.12) for more detailed information on land uses and transportation systems, as well as supporting analysis, and at the end of Volume I for base maps showing the Proposed Project routing, and nearby roadways and railroads that are of concern with respect to existing and proposed utility easements. In addition, refer to Section A.6, Purpose and Need, for a complete description of the existing and forecasted power loads and supply for Sierra Pacific Power Company's (SPPCo's) system and the effects of the Proposed Project on other utility systems. Finally, see Sections B.4.3 and B.3.4.6.2 for a description of other projects that, individually or collectively, could replace the Proposed Project or augment its capabilities.

C.5.1.1 Characteristics of the Study Region and Project Area

Existing Utility Lines

Public utilities comprise two basic classes: local and regional. Regional utilities are those that carry communications or energy over long distances (e.g. electric transmission lines). Local public utility lines are present in many road easements and cross and parallel the Proposed Alturas Transmission Line corridor at many locations. Typical local utilities include sewer lines, storm drains, water mains, gas mains, electric distribution lines, and wire or optical telephone and cable TV lines. Table C.5-1 lists the known existing utility lines to be crossed by the Proposed Project. The list includes overhead and underground electric and telephone/telegraph lines, and gas pipelines. Other local utilities (e.g., sewer lines, water mains, etc.) are not listed. Entries in Table C.5-1 are keyed on the nearest project angle points.

In California and Nevada, databases provide information on the location of underground utilities to those planning to excavate in streets or other utility corridors (the data is not otherwise available). Additional records are maintained by local and county public works departments. Utility feeders on and servicing private property are not systematically recorded in public depositories. Companies that provide regional utility transmission lines post signs along the corridors that they use. Metal stakes are employed for undergrounded gas, oil and communications lines. They identify the line, its owner, and provide a telephone number in case a problem is detected. The exact location of all closely parallel or intersecting local and regional utilities that could be affected by the Proposed Project construction activities would be depicted on final construction plans.

Table C.5-1 Alturas 345kv Transmission Line - Estimated Utility Crossings

Description	Alt[1]	Route Segment	Map[2]
ALTURAS COUNTY			
Overhead Electric Distribution Line		AØ3 - AØ4	1
Overhead Electric Transmission Line		AØ3- AØ4	1
Overhead Electric Transmission Line		AØ4 - AØ5	1
Overhead Electric Transmission Line		AØ5 - AØ6	1-2
Underground Electric Distribution Line		CØ1- CØ2	2-3
Overhead Electric Distribution	*	BØ2 - BØ3	B-1
Overhead Electric Distribution (2)	*	BØ4 - BØ5	B-1
Overhead Electric Distribution	*	BØ5 - BØ6	B-1
Overhead Electric Transmission	*	BØ7 - BØ8	B-1
LASSEN COUNTY			
Overhead Electric Distribution Line		CØ8 - CØ9	6
Overhead Telephone Line		E0Ø2 - ENØ1	7-?
Overhead Electric Distribution Line		ENØ1 - EØ3	?-8
Overhead Telegraph Line		EØ3 - EØ4	8
Overhead Electric Transmission Line		EØ3 - EØ4	8
Overhead Electric Distribution Line		EØ5 - EØ6	9
Overhead Electric Distribution Line (2)	*	DØ8 - FØ1	F-1 - F-2
Overhead Electric Distribution Line	*	GØ5 - GØ6	G-1 - G-2
Overhead Electric Distribution Line	*	GØ6 - FØ4	G-2
Overhead Electric Distribution Line	*	JØ3 - JØ4	J-1 - J-2
Overhead Electric Distribution Line		KØ2 - KØ3	10-11
Overhead Electric Distribution Line		KØ3 - KØ4	10-11
Overhead Telephone Line		KØ3 - KØ4	10-11
Overhead Electric Distribution Line	*	LØ1 - LNØ1	ESVA-1
Overhead Telephone Line		LØ7 - LNØ9	17
Underground Telephone Line		LØ7 - LNØ9	17
Underground Telephone Line	*	NØ7 - LNØ8	ESVA-4 - ESVA-5
Overhead Electric Distribution Line	*	LØ8 - MØ1	M-1
Overhead Electric Distribution Line	*	MØ1 - MØ2	M-1
Overhead Telegraph Line	*	OØ5 - PØ1	P-1
Overhead Electric Distribution Line		OØ5 - PØ1	P-1
Overhead Telegraph Line		OØ5 - QØ1	22-23
Overhead Electric Distribution Line		OØ5 - QØ1	22-23
Overhead Telephone Line	*	RØ2 - SØ1	P-4
Overhead Electric Distribution Line	*	RØ2 - SØ1	P-4
Overhead Electric Transmission Line	*	RØ2 - SØ1	P-4
Overhead Electric Distribution Line		RØ2 - TØ1	26
Overhead Electric Transmission Line	*	SØ1 - SNØ1	S-1
Overhead Telegraph Line (2)	*	SNØ1 - WNØ1	S-1

Description	Alt[1]	Route Segment	Map[2]
Underground Fiber Optic Cable	*	WNØ7 - WNØ8	WCFG
Overhead Telephone Line	*	WNØ7 - WNØ8	WCFG
WASHOE COUNTY			
Overhead Electric Distribution Line		XØ1 - XØ2	30
Overhead Electric Transmission Line		X12 - X13	33
Overhead Telephone Line		X12 - X13	33
Overhead Electric Distribution Line (2)		X12 - X13	33
Underground Telephone Line		X12 - X13	33
Gas Pipeline		X12 - X13	33
Overhead Electric Transmission Line		X12 - X13	33
Overhead Electric Transmission Line		X13 - X14	33

Source: SPPCo.
Note: [1] ROWs marked with a star are utility crossings along alternative route segments that are discussed in Section C.5.3.
[2] This column provides map pages in at the end of Volume I.

The Proposed Project and alternative segments are not entirely contained in established regional utility corridors. However, the Western Regional Corridor Study (1992), prepared by the Western Utility Group (WUG), designates the general Proposed Project alignment as a future utility corridor. The WUG is an ad hoc organization of representatives from primarily investor-owned electric, gas, water and communications utilities in the western United States working cooperatively with affected government agencies (an objective of the WUG is to optimally select and designate utility corridors).

The following paragraphs summarize, by county, the known regional utilities within proximity of the Proposed Project and the expected local utilities that would be encountered:

Modoc County (Segments A and C). The Proposed Project would begin northwest of the City of Alturas where it would tie-in to the Bonneville Power Administration (BPA) 230 kV transmission line. The Alturas Substation would be located on USFS and BLM land north of California Highway 299. The Proposed Project would cross Highway 299 and proceed south and travel generally parallel to U.S. 395, approximately four miles to the west. The undeveloped USFS/BLM land for the Alturas Substation site and interconnection lacks utility easements. South of Highway 299, in the Alturas area, there are only a few roads (including Centerville Road) containing local utilities that cross or parallel the Alturas line corridor. The corridor also crosses a Southern Pacific Transportation Company (SPTC) railroad right-of-way (ROW) that may contain underground regional utilities. Overhead telephone and electrical lines are frequently present in railroad ROW easements. The Proposed Project runs south, generally parallel to U.S. 395, in an area of rural land uses containing few utility lines.

Most of the proposed corridor in Modoc County would be located along roadways and outside established regional utility corridors, although there is a 60 kV Surprise Valley Electrification Corporation (SVE) line that parallels the Proposed Project for a short distance. There are interstate electric and natural gas lines running north-south through the northwestern section of the County. This corridor includes the BPA 230 kV line where it crosses the northern County line and passes between Newell and Clear Lake. A Pacific Power & Light Company (PP&L) 115 kV connects the existing City of Alturas substation with Oregon, in a corridor that passes east of Goose Lake. All other electric transmission lines in the County are 60 kV. There are no gas lines that service the County. In the Alturas area, Proposed Segment A would cross overhead electric transmission lines and an electric distribution line. To the south, Proposed Segment C would cross an underground electric distribution line. These and other utility crossings, below, are listed in Table C.5-1.

Lassen County (Segments C, E, K, L, N, O, Q, R, T and W). The low density of local and regional utilities near the Proposed Project in Modoc County would also be encountered in most segments in Lassen County. The transmission line would enter Lassen County near the town of Likely, parallel to and west of U.S. 395 and continue past Madeline, Termo, and Ravendale to Honey Lake, several miles east of Susanville. The ROW would cross to the east side of U.S. 395 between Angle Points EØ3 and EØ4, and cross back between KØ3 and KØ4. Overhead telephone, telegraph and electric distribution lines would also be crossed between these points. An SPTC ROW runs parallel to U.S. 395 beginning at Angle Point EØ6. Regional utilities are located within and over the SPTC ROW in portions of Segments E, K, and L. South of Angle Point EØ6, the corridor crosses within about one-quarter mile east of an electrical substation with its associated distribution lines paralleling U.S. 395. Near Angle Point NØ9 the corridor is within one-quarter mile of an AT&T communications facility with associated microwave and optical cable transmission lines. The density of local utilities in the vicinity of the proposed corridor increase near each community and developed or partially developed residential subdivisions. Refer to Section C.12 (Transportation and Traffic) and C.8 (Land Use) for descriptions of roads and land use developments, respectively.

The Proposed Project then extends around the east side of Honey Lake, passing through Wendel and running adjacent to the Sierra Army Depot east of Herlong, and rejoins U.S. 395 south of Doyle near Constantia. This is an area very sparse in utility lines with the exception of those in portions of Segments O and Q. The project corridor continues south along U.S. 395 past Hallelujah Junction. Overhead utilities are in proximity to the Proposed Project near U.S. 395 and SPTC ROWs in portions of Segment R, and Union Pacific Railroad System (UPRS) ROW in Segment W. In addition, local utilities would be encountered near each community and residential development. There are no interstate utilities near the Proposed Project in Lassen County.

Sierra County (Segments W and X). The Sierra County portion of Segment W begins about one and one-half mile north of Angle Point WØ3. The transmission line would be located in the vicinity of U.S.

395 in Sierra County, ending near Border Town. This is a short route segment in an area of denser population relative to that encountered, on average, to the north. The frequency of paralleling and crossing underground local utility lines would be proportionately greater in this county. There are local, and possibly regional, utilities in the U.S. 395 roadway easement, streets in Border Town, and the UPRS ROW. There are, however, no underground, overhead, or interstate utility lines in the Project corridor in Sierra County.

Washoe County (Portion of Segments Q and X). Table C.12-1 in Section C.12, Transportation, lists the ten roads in Washoe County near the Proposed Project. These road easements could contain public utility lines. There are no known utility lines in the Nevada portion of Segment Q. The Proposed Project would again enter Nevada at Border Town, near the location where U.S. 395 crosses the state boundary. It would then continue southeast to Reno, running generally parallel to and south of U.S. 395 and a SPTC ROW between Angle Points XØ2 and XØ6. The transmission line would terminate in north Reno near the junction of McCarran Boulevard and U.S. 395 at SPPCo's existing North Valley Road Substation. Local utility lines, including water, sewer, natural gas, electricity, and telecommunications, would be present in or over every road easement, and many would be crossed by the Proposed Project ROW in the Reno area. Table C.5-1 lists nine utility crossings in Washoe County with most occurring between Angle Points XØ12 and XØ13. They include electrical and telephone lines, and a gas pipeline. While there is a transmission line west of U.S. 395 in Reno, there are no interstate transmission lines in the section of Washoe County near the Proposed Project, other than those owned by or servicing SPPCo.

Characteristics of Electrical Energy and Transmission

General information on electric and magnetic fields (EMF) and their characteristics as experienced by the public, both in the home and near transmission lines, is discussed in Section C.10, Public Safety and Health.

Energy Supply and Demand

The principal sources of energy in the study area are hydrocarbon products, electricity, wood, and the renewable resources of geothermal, solar and wind. Petroleum products and natural gas provide more than half of the consumed energy, with electricity and wood providing most of the rest. Firewood and geothermal energy are produced in the area, while most other energy is imported. BPA delivers electrical power to northeastern California. The Proposed Project would make this power available to the Reno area. Various electric utilities service the study area. For example, PP&L and SVE provide power to Modoc County. Imported electrical power is supplemented in some of the counties with power produced by small power plants burning such materials as waste wood.

As proposed, the Project would not tie into local California utilities, with the exception of BPA. SPPCo anticipates making a future intertie to local utilities, Lassen Municipal Utility District (LMUD), approximately the year 2004.

SPPCo generates power and buys wholesale power from other power utilities to meet customer demand. Section A.6, Purpose and Need, provides a complete description of the existing and forecasted power loads and supply for SPPCo's system.

Parts of the study area do not have natural gas service, but instead rely on electricity and firewood for space heating. Propane is also used for space heating and cooking in some areas. Modoc County, for example, is without natural gas service.

Energy consumption is expected to increase in rough proportion to population growth. The Modoc and Lassen County Energy Elements have adopted energy conservation goals in order to reduce this proportionality. Another goal is to increase the amount of energy obtained from renewable sources. Most future transmission lines in the study area will be connected to renewable energy sources (Modoc County Energy Element, pg. 118). Approximately half of all energy consumed is used in transportation. Residential and commercial customers are the next largest user categories. Industrial and agricultural energy use is lower in the California portion of the study area than is the average for the State.

C.5.1.2 Applicable Regulations, Plans, and Standards

Little excavation work would be required in the right-of-way when constructing the Proposed Project, with the exception of that required for installing structure foundations (to be placed approximately every 1,200 feet). Consequently, regulations governing subsurface disturbance within a ROW do not apply. The encroachment permits issued by the California Department of Transportation, the Nevada Department of Transportation and the four affected counties through which the Proposed Project would pass, would provide protection both to the affected public ROW and to any buried public utilities.

Transmission lines can affect the public and public utilities through the creation of accident hazards or through the production of interacting electric and magnetic fields (EMFs), principally with parallel metallic pipelines. There are no Federal standards that limit the strength of EMFs from transmission lines or substation facilities (see Section C.10, Public Safety and Health). Mechanical strength and electrical clearance issues are addressed through the California Public Utilities Commission General Order Number 95 (CPUC GO95, Rules for Overhead Electric Line Construction) and the National Electrical Safety Code (NESC). See Section C.10, Public Safety and Health, for a complete discussion.

California Counties are encouraged by state law to adopt an Energy Element as part of their General Plan. Once adopted, an Energy Element has the same force and effect as other approved elements.

Energy elements have been adopted by Modoc and Sierra Counties. Each element addresses energy supplies, energy use, energy efficiency potentials, renewable resource potentials, county energy strategies, goals and policies, and implementation measures. Electrical supplies and use are considered along with the use of natural gas, petroleum products, wood fuel, and such lesser sources as geothermal, solar and wind. Electrical suppliers and transmission interconnections are described.

It is generally stated in the Energy Elements that proponent applications for energy facility projects shall contain comprehensive information in sufficient detail to enable the county to conduct a thorough analysis of the project. This information is to include descriptions of all project phases, the facility's physical and performance characteristics, the environmental effects, and a project cost/benefit analysis that includes the county fiscal component. Energy facilities must be in compliance with all applicable provisions of the General Plan and Zoning Ordinance, and construction shall start only after all applicable federal, state, and local permits have been obtained and permit conditions satisfied. Siting of energy facilities must be in accord with the Siting Policies in the Energy Element. Also applicable are Construction Policies, General Policies, and policies specific to transmission lines and substation facilities. Also, operation of proposed energy facilities shall not violate, or threaten to violate, applicable environmental standards, including electronic discharges or interference, nor interfere with public utilities and infrastructure. While the CPUC has preempted local county permitting authority over the Proposed Project, with the exception of ministerial permits for the non-electrical components of the project, this EIR/S addresses the consistency of the Proposed Project with local county land use policies (see Section C.8, Land Use).

C.5.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This Section considers energy demand and potential for disruption of utility services. Please refer to Section C.10, Public Safety and Health, for discussion of electric and magnetic frequency impacts and other public safety concerns. See Section A.6, Purpose and Need, for a complete discussion on the Proposed Project impacts on neighboring utility systems. Refer to Section C.12, Transportation and Traffic, for additional discussion on roads, railroads, and potential disruption of their easements during construction and related mitigation measures.

C.5.2.1 Definition and Use of Significance Criteria

Impacts on utilities are considered significant if:

- Construction of the Alturas Transmission Line Project could result in accidental damage to or disruption of service on existing regional and local utility lines
- The operation of the Proposed Project would displace, alter, or disrupt existing regional and local utility lines and services

- The Proposed Project would preclude emergency access to utility lines along the transmission line corridor during or after construction.

Energy impacts are considered significant if:

- The energy requirements of the project during operation would exceed capacity of other energy utility services or would disrupt their plans for providing service
- Project construction or operations would place a substantial burden on existing resources or would entail inefficient and unnecessary consumption of energy and uses of nonrenewable resources.

C.5.2.2 Environmental Impacts and Mitigation Measures

C.5.2.2.1 *Construction Impacts*

Service Disruption/Construction Accident. Construction of the Proposed Project would need to take into account both subsurface and above-ground utilities. Excavation of earth could affect buried utilities, resulting in accidental disruption of service. Excavation as part of the Proposed Project would be limited to construction of three access roads, widening of several existing four-wheel drive (4WD) roads, and excavation of foundations for transmission structures and substations. Over most of the transmission line route there is a low density of utility easements that in most cases could be spanned by structures and avoided. A few angle points, however, have been placed next to roads; and this would require the identification of the exact location of existing utilities. Connections in the Border Town area would require six structures, an area of relatively dense population and easements for local utilities. Structures in the Border Town area may need to be placed in or near utility easements. This would not be the case for structures and connections to substations in the Alturas and Reno areas. Roadways in the small communities along the route could be spanned in most cases and would not require construction of structures within utility easements. In most cases structures along U.S. 395 would be placed outside the roadway easement, and in all cases would be distant enough from existing electrical transmission lines to not cause electrical interference.

In the case of above-ground utilities, SPPCo would locate project structures and string conductors at a safe distance from intersecting transmission line structures, conductors, and telephone wires. Required separation distance between crossing conductors varies with voltage and is governed by the National Electric Safety Code in Nevada and CPUC General Order Number 95 in California. The separation must be greater when crossing a high voltage transmission line (i.e. 345 kV or 120 kV), less when crossing an electric distribution line (i.e. 24 kV or 13.8 kV), and least when telephone or fiber optic cables are involved (specific intersecting utilities are listed in Table C.5-1). During construction, temporary structures are raised on both sides of an existing line to prevent project pull ropes or conductors from sagging too close to operating conductors. Each assembly consists of one or two vertical poles and a crossarm.

The exact locations of all closely parallel or intersecting utilities that could be affected by construction activities would be determined when developing final construction plans; final construction plans are subject to the review and approval of the Lead Agencies and affected responsible, public agencies. When preparing excavations for structure foundations, the construction supervisor would take steps to ensure that excavation would not take place directly over buried utility lines that may be in the transmission line corridor. If service disruptions in subsurface or above-ground utilities were to occur, impacts would be significant; however, these impacts are mitigable with the implementation of Mitigation Measures P-2 (in Public Safety and Health, C.10, below) and U-1 (**Class II**).

U-1 The Applicant shall submit final construction plans to all affected utilities for their review and shall obtain written approval 30-days prior to the commencement of construction. The Applicant shall identify all authorized utilities in the construction plan. In addition, the Applicant/contractor shall provide 72-hour written notice to all utility owners whenever construction activities are scheduled within 100 yards of an existing utility. Prior to the start of construction, the Applicant/contractor shall obtain the necessary information, or have the utility owner mark the specific location of the affected utility. If doubt remains, construction activities shall cease immediately within proximity of the affected utility, until the exact location of the utility is identified by the utility company or Applicant contractor. Compliance during planning and construction is to be monitored by a CPUC/BLM-approved construction monitor.

Interference With Emergency Service Providers. Construction would take place primarily in areas of low population and uncongested traffic; however, there would be some disruption of traffic during construction. As discussed in Section C.12, Transportation and Traffic, the impact of construction activities on utility companies when providing emergency service is a **Class II** impact, mitigable with the implementation of Mitigation Measure T-5.

Energy. During the construction phase, a considerable amount of diesel and gasoline fuel would be required for the construction equipment and worker vehicles. Such fuels are considered nonrenewable resources. Transportation Mitigation Measure T-6 would require a bus shuttle service between work sites and staging areas. This would reduce consumption of fuel by automobiles owned by workers to a less than significant level (**Class III**); no unnecessary consumption of fuel would occur.

C.5.2.2.2 *Operational Impacts*

Utility Service Disruption. Inspection and maintenance of the Alturas Transmission Line and substations would not interfere with other utility lines, as the level of these activities is considerably less than that of construction and are not expected to involve excavation. Nor would these routine operations impede access to other utilities.

Energy and Energy Providers. The Proposed Project would consume little energy. Some energy loss would occur during the electric power transmission process, but the efficiency of energy transmission is second only to that of gas and petroleum pipelines.

The energy requirements of the Proposed Project during construction and operation would not exceed the capacity of other utility services, disrupt plans for providing service, nor place a substantial burden on existing resources. Energy conveyance by transmission lines does not result in inefficient or unnecessary consumption of energy, nor does it require significant amounts of nonrenewable resources.

It is presently infeasible for renewable energy sources, such as solar or geothermal power, to replace the Proposed Project. The Project would convey hydroelectric power, a renewable energy resource, to customers of SPPCo at an acceptable energy efficiency. Energy utilization would result in a minor adverse impact (**Class III**). No mitigation measures beyond those already incorporated in the project design are recommended.

Telecommunications. SPPCo would install, own, maintain, and operate the fiber optic and microwave communications for the System Control and Data Acquisition system described in Part B. The system would not place a significant demand upon public telecommunications services. There would occur no impact on these systems or providers; no mitigation measures beyond those already incorporated in the project design are recommended.

C.5.2.3 Cumulative Impacts and Mitigation Measures

Only cumulative projects in physical proximity to the Proposed Project could result in an impact on utilities or utility services. Cumulative energy impacts are the same as discussed above.

Construction. There are two planned utility projects close to the Proposed Project: Tuscarora Gas Pipeline and LMUD Intertie. The Tuscarora Gas Transmission Pipeline Project would cross or run adjacent to the Proposed Project for approximately 37 miles at various locations along Segments A, C, E, K, L, and O (see end of Volume I base maps). Impacts involving simultaneous construction activities on the Tuscarora Pipeline and the Proposed Project in the same area (see Section B.5) can be adequately mitigated by implementing Mitigation Measure U-1 (**Class II**). Measure U-1 would also apply to impacts on utilities and hookups for other construction projects in a construction zone of the Proposed Project. Mitigation Measure T-13 in Transportation and Traffic would supplement Mitigation Measure U-1 by maintaining coordination with agencies responsible for encroachment permits. The future LMUD Intertie would not occur until approximately the year 2004. As a result, no cumulative construction impacts would occur.

Operation. Impacts on the Alturas Transmission Line Project from construction of the Tuscarora Gas Pipeline or LMUD Intertie after the Proposed Project would be in operation would be mitigated through implementation of the Mitigation Monitoring Program for these projects. Permitting and implementation of Mitigation Monitoring Programs by affected jurisdictions for other cumulative projects in construction should also be sufficient to protect the integrity of the Proposed Project and its operations.

C.5.2.4 Unavoidable Significant Impacts

No unavoidable significant impacts to energy and utilities would occur after mitigation.

C.5.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

C.5.3.1 Alturas Area Alternative Alignment (Segment B)

Alternative Segment B crosses Highway 299, a SPTC ROW, and local roads. Known utility crossings of the Project ROW are listed in Table C.5-1.

Given that Alternative Segment B would be closer to the City of Alturas then Proposed Segment A, the density of local underground utilities would be higher. There would occur seven crossings of overhead electric lines, instead of four along Proposed Segment A. However, there is little probability, as in the case for Proposed Segment A, of an impact on utilities when installing structures and stringing wires. Any impact can be mitigated by Mitigation Measure U-1 to a less than significant level **(Class II)**.

C.5.3.2 Madeline Plains Alternatives (Segments D, F, G, H, I)

Alternative Segments D, F, G, H, and I would pass through the Madeline Plains area. These alternatives would be located near two-lane paved and graveled county roads that provide access principally to agricultural land. Some local utilities services are buried in the easements for these roads. There are four crossings of overhead electric distribution lines along these segments (Table C.5-1).

As shown by data in Table C.5-1, approximately the same number of over head lines would need to be crossed if the Project would be constructed along these segments, instead of Segment E. The potential impact after employing Mitigation Measure U-1 would be similar **(Class II)**.

C.5.3.3 Ravendale Alternative Alignment (Segments J, I)

Alternative Segments J and I begin at the junction of Proposed Segments E and K on the Madeline Plains and rejoin the proposed corridor at the north end of Proposed Segment L near Horse Lake Road. There are three county roads encountered by this alternative whose easements could contain local utilities. Table C.5-1 lists one crossing of an electrical distribution lines along Segment J.

The potential impact would be less for the alternative alignment since Proposed Segment K crosses two overhead electrical distribution lines and one telephone line. Mitigation Measure U-1 would fully mitigate any potential impact on utilities **(Class II)**.

C.5.3.4 East Secret Valley Alignment (Segment ESVA)

Alternative Segment ESVA would be approximately 1.5 miles east of Proposed Segment L. The area is undeveloped.

One overhead electric distribution line would be crossed at the north end of Segment ESVA, and an underground telephone line near the south end. Like Proposed Segment L along U.S. 395. Mitigation Measure U-1 would be employed as necessary **(Class II)**. There would be a very low potential for disrupting service during construction.

C.5.3.5 Wendel Alternative Alignment (Segment M)

Alternative Segment M replaces and is located to the west of Proposed Segment N. This alternative crosses the SPTC ROW twice, but otherwise, like Proposed Segment N, is located near two county roads. An overhead electrical distribution line would be crossed.

The potential impact of Alternative Segment M would be slightly higher than Proposed Segment N, but Mitigation Measure U-1 would be applied as necessary to mitigate impact on utilities **(Class II)**.

C.5.3.6 West Side of Fort Sage Mountains (Segment P)

Alternative Segment P passes on the west side of the Fort Sage Mountains between the Sierra Army Depot and Constantia. It would replace Proposed Segment Q on the east side of the mountains. This alternative crosses an additional road and is adjacent to or near more roads than Proposed Segment P (refer to Table C.12-1 in Traffic). Consequently, the density of local underground utilities would be greater. The alternative also crosses an overhead electrical distribution line, a telegraph line, and an underground fiber optic cable.

The same number of utilities would be crossed by Alternative Segment P as the Proposed Segment Q. The potential impact would be similar, even though there is a greater potential for underground local utilities along Segment P. Any impact can be mitigated by Mitigation Measure U-1 to a less than significant level **(Class II)**.

C.5.3.7 Long Valley Alignments (Segments S, U, Z, and WCFG)

Alternative Segments S and U would replace Proposed Segment T. These alternatives would cross U.S. 395 and UPRS tracks twice. Alternative Segments Z and WCFG would each replace a different part of Proposed Segment W. Both of these alternative segments are on the east side of U.S. 395, although Alternative Segment WCFG would cross U.S. 395 once. Table C.5-1 lists several utility crossings for these alternative segments.

The potential impact of the alternatives would be greater for these alternative segments than for Proposed Segment T and the portions of Proposed Segment W that would be replaced. There would occur only one crossing of an electrical distribution line (between R-2 and T-1) for the Proposed Project. Any impact on utilities of Project or alternative segments would be fully mitigated by Mitigation Measure U-1 **(Class II).**

C.5.3.8 Peavine Peak Alternative Alignment (Segment X-East)

Alternative Segment X-East would replace Proposed Segment Y. The alternative would be further down Peavine Peak, closer to an existing transmission line corridor. The proximity to road easements would be similar for both the Project and alternative segments.

The potential impact of Alternative Segment X-East on utility lines would be similar to that for Proposed Segment Y **(Class II)**. The alternative would be located at a sufficient distance from the existing construction or operation (EMP) interference.

C.5.3.9 Substation Alternatives

The Alturas Mill Substation site is located to the west of Alturas, along Alternative Segment B. The Border Town SPPCo site is located to the south of the proposed Border Town Substation site. Road easements around the Border Town Substation alternative site are similar to those for the proposed site (e.g., U.S. 395 and Long Valley Road).

The potential impacts for the Mill site would be greater than that for the Alturas site, given that the Mill site is closer to Alturas where there is a high density of utilities. The impact for both Border Town substation sites would be similar **(Class II)**.

C.5.4 THE NO PROJECT ALTERNATIVE

C.5.4.1 Environmental Impacts and Mitigation Measures

Under the No Project Alternative, the transmission line would not be constructed; therefore, no adverse impacts on utilities would occur in the study area. The No Project Alternative could result in other construction projects with impacts on utilities. Construction of an alternative transmission line would inevitably result in impacts on utilities that would be similar to those from the Proposed Project or alternative alignments. The total number of potential conflicts with utility easements could be greater or less than those for the Proposed Project, depending on the routing of the alternative line.

C.5.5 MITIGATION MONITORING PROGRAM

Table C.5-2 presents the Mitigation Monitoring Program recommended for mitigating significant impacts on utility systems and outlines the location, responsible party, required monitoring activities, effectiveness criteria, and timing of each monitoring activity.

Table C.5-2 Mitigation Monitoring Program

Impact	Mitigation Measure	Location	Responsible Agency	Monitoring/Reporting Action	Effectiveness Criteria	Timing
Conflict with buried utilities (Class II)	**U-1** The Applicant shall submit final construction plans to all affected utilities for their review and shall obtain written approval 30-days prior to the commencement of construction. In addition, the Applicant/contractor shall provide 72-hour written notice to all utility owners whenever construction activities are scheduled within 100 yards of an existing utility. **P-2** below.	All Proposed and Alternative Segments	BLM CPUC USFS	Inspect documentation of coordination with affected utilities and confirm that all conditions have been met prior to construction.	No disruption of a utility service during or after construction	Prior to construction
Restricted access for utility emergency response units (Class III)	**T-5** (See Table C.12-5 in Section C.12.)					
Cumulative impacts of simultaneous construction projects. (Class II)	**T-13** (See Table C.12-5 in Section C.12.)					

C.5.6 REFERENCES

Lassen County. 1993. *Lassen County Energy Element.* May 25.

Modoc County. 1993. *Energy Element, Modoc County General Plan.* May & June 21.

Sierra Pacific Power Company. 1993. *Proponents Environmental Assessment for Proposed Alturas 345 kV Transmission Line Project.* Volumes I and II. Prepared for California Public Utilities Commission, San Francisco, CA. Reno, NV.

Tuscarora Gas Transmission Company. 1993. *Resource Report 1 - Project Description,* for the proposed Tuscarora Pipeline. Reno, NV.

PART C.6 GEOLOGY, SOILS, AND PALEONTOLOGY

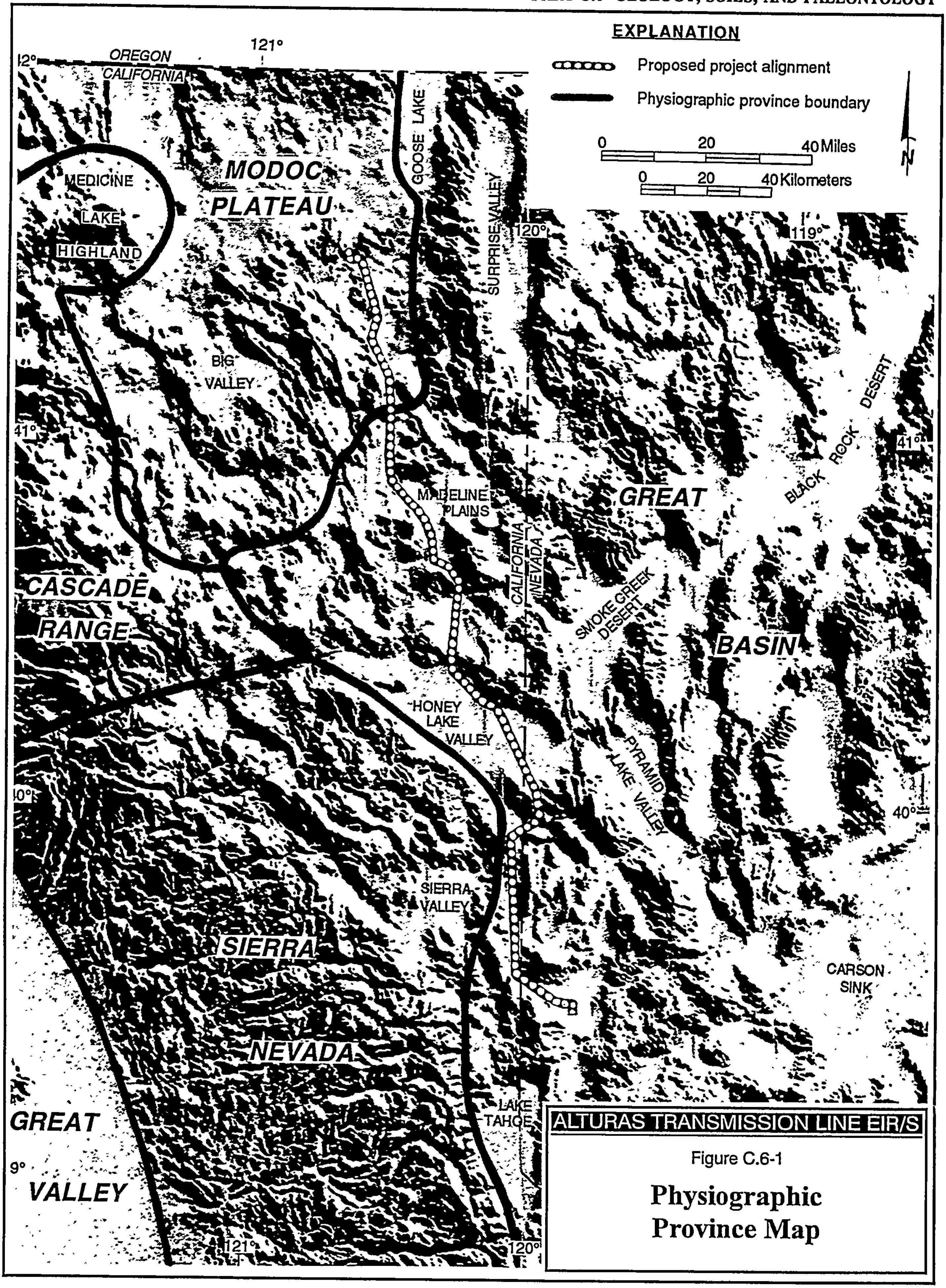
C.6.1 ENVIRONMENTAL SETTING

C.6.1.1 Regional Characteristics/Physiographic Provinces

The Proposed Project extends across two physiographic provinces: the Modoc Plateau on the north and the Great Basin on the south (Figure C.6-1). These provinces are bounded on the west by the Cascade Range and the Sierra Nevada provinces. The boundaries between these provinces are generally gradational, resulting in a variety of province-boundary locations. Geoscientists have noted that the Modoc Plateau area is essentially a transitional terrain between the Cascade Range and the Great Basin. Volcanic flows emanating from the west have filled several basins, smoothing the generally high relief of the Great Basin into a more plateau-like terrain. For this project, the southern-most part of what some geomorphologists would include as Modoc Plateau is included in the Great Basin province, reflecting the basin-and-range structure and more-active tectonics.

The Modoc Plateau is a region of moderate elevation (4000-5500 feet) with localized moderate relief. Elevations of the highest peaks in the province rarely exceed the 7000 to 7500 foot range. The province is comprised primarily of volcanic rocks exhibiting a variety of volcanic landforms such as shield volcanos, cones, vents, tubes, and extensive flat-lying lava flows. Volcanic activity within the province is now generally inactive and the dominant terrain-forming process is faulting. The northern part of the province, including the area known as the Devils Garden, is essentially a large low-relief volcanic plateau which provides the principal basis for the province name. Geomorphology in the southern part of the province is considerably more irregular and is characterized by a basin-and-range type character resulting from on-going fault tectonics. Many of the basins are filled with lake sediments, commonly with a high percentage of volcanic ash. In several of the basins, basin deposits extend well beyond the limits of the present basin indicating a long history of basin-forming tectonics.

The Great Basin is a large area of the western United States where all drainage is internal. That is, the water that flows into the area is trapped in the numerous basins and does not reach the sea. The physiography of the Great Basin is characterized by linear, subparallel ranges and valleys created by differential displacement across normal faults (i.e., faults with vertical displacements as opposed to strike-slip faults which have lateral displacements). The vertical faulting displacements result in a terrain of alternating uplifted blocks forming the mountain ranges and down-dropped blocks forming the valleys (basins). This geomorphology and structure is generally called basin-and-range topography; the area is also called the Basin and Range Province. The terms Great Basin and Basin and Range are commonly used interchangeably but in the strict sense, the province names have somewhat different connotations and implications, and the areas characterized by each are not exactly the same. The name Great Basin is used in this document to provide continuity between geologic and hydrologic aspects of the study region.



ALTURAS TRANSMISSION LINE EIR/S

Figure C.6-1

Physiographic Province Map

The Cascade Range province is comprised of a northwesterly trending, linear chain of potentially active volcanos to the west of the Proposed Project. The major volcanos in proximity to the study region are Mount Shasta and Mount Lassen, both of which are high-standing, perennially snow-capped peaks. However, the Medicine Lake Highlands (Figure C.6-1), a relatively low-relief, dome-shaped, shield volcano, is located east of the main volcano alignment and also has a potential for volcanic eruption. Although only Mount Saint Helens (1980) in Washington state and Mount Lassen (1915) have erupted in historical time, geologic evidence indicates that numerous Cascade Range volcanos have been active within the past couple thousand years, and any of these could erupt in the near future (Section C.6.1.3.5 discusses the volcanic potential in more detail).

The Sierra Nevada province, adjoining the Cascade Range on the south, also trends northwesterly. Unlike the Cascade Range, the Sierra Nevada does not owe its form or elevation to active volcanism. The Sierra Nevada is an asymmetrical mountain range with a gentle western slope and a high steep fault-controlled escarpment on the east. Mount Whitney, in the southeastern part of the range, attains a height of about 14,495 feet and is the highest point in the contiguous United States. Elevations decrease northerly and peaks in proximity to the Proposed Project are generally in the 7000- to 8500-foot elevation range. The Sierras are largely composed of Cretaceous-age granitic rocks bordered on the west by Mesozoic metamorphic rocks. The northern part of the range commonly has remnants of Tertiary-age volcanic rocks overlying the granitic rocks (Figure C.6-2).

C.6.1.2 Geology

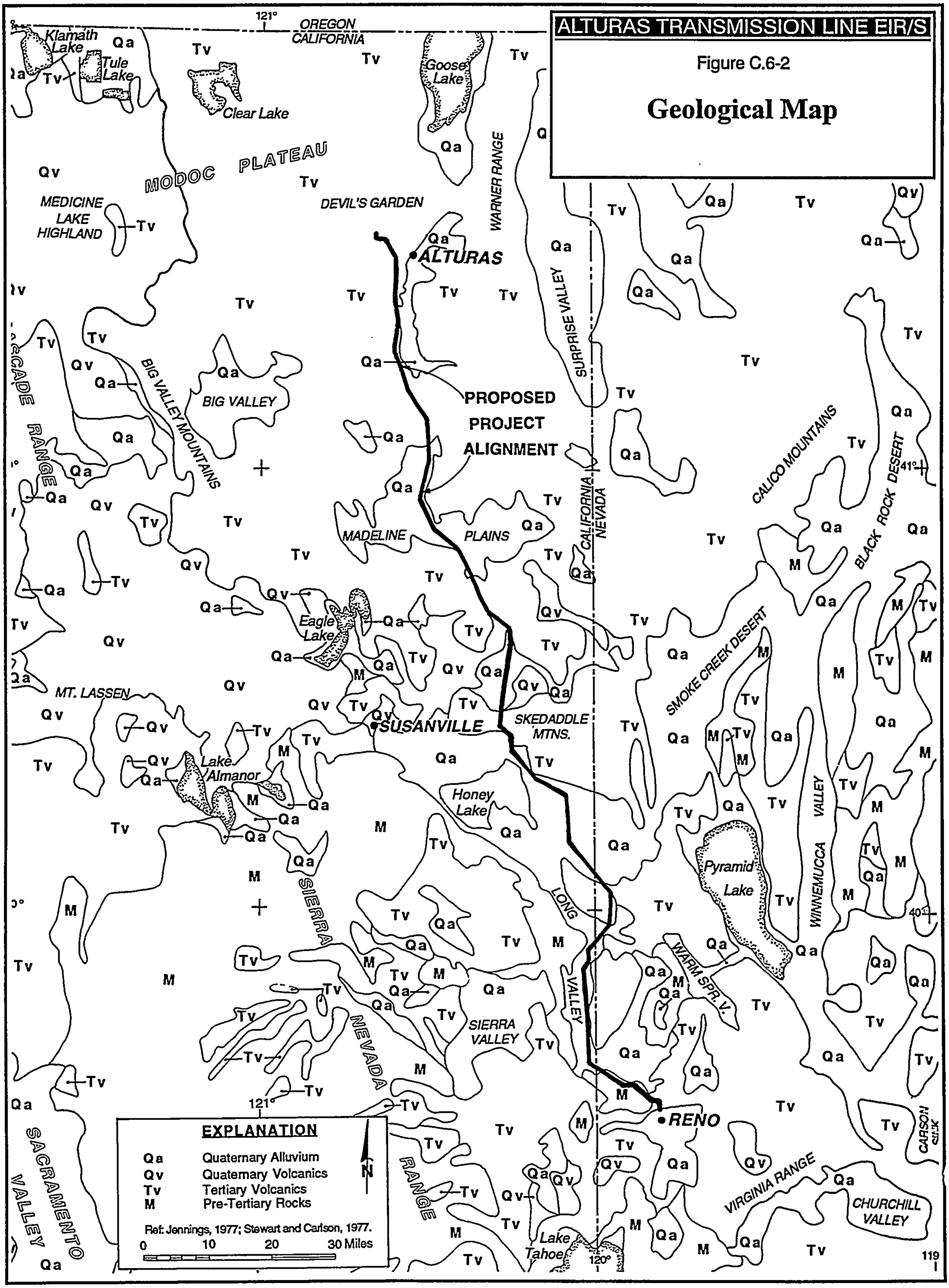
The following sections describe the rock types and geologic features in the study region, with primary emphasis on the project alignment. Descriptions of geologic units are principally from publications of the U.S. Geological Survey (USGS), California Department of Water Resources (DWR), California Division of Mines and Geology (CDMG), and the Nevada Bureau of Mines and Geology (NBMG). These publications vary in scale, date, level of detail, and form of publication (whether final or preliminary). Scale of geologic maps used ranged from 1:24,000 to 1:1,000,000; the most-detailed scale was used where available and appropriate. No attempt was made to reconcile differences in geologic formation names used by different authors or agencies, and they are presented as published and commonly combined into similar groups, such as alluvium (Qa) or lake deposits (Ql).

Figure C.6-2 is a generalized geological map showing the distribution of rock types in the study region. Due to the small scale of the map, the geologic formations are highly generalized and combined into four basic groups, Qa, Qv, Tv, and M. Qa comprises all the Quaternary alluvial units and is typically unconsolidated silt, sand, and gravel eroded from the mountains and washed by streams into the low-lying valleys. The other three units represent rocks of increasing age. Qv represents the youngest volcanic rocks of Quaternary and latest Tertiary age. Tv represents older volcanic rocks, generally of Miocene age and older (greater than about 5 million years) but includes other small outcrops that could not be

ALTURAS TRANSMISSION LINE EIR/S

Figure C.6-2

Geological Map



clearly illustrated at the scale of this map. M represents pre-Tertiary rocks, primarily Mesozoic igneous and metamorphic rocks but also includes older Paleozoic sedimentary and metamorphic rocks. It should be noted that this map is presented to provide a simplified regional overview of geologic rock types and that the generalized formation groupings are not the same as the more-detailed subdivision of formations described in subsequent sections (C.6.1.2.2 and C.6.1.2.2) or those shown on the base maps in Appendix C.

Some discussion of the stratigraphic nomenclature and the ages of the geologic formations in the study region is necessary to place the following discussions in perspective. The study region is in a relatively remote area where the geology has not been studied in much detail. Recent studies such as those of Grose et al. (1992), Grose and Porro (1989), Roberts (1985), and Leudke and Smith (1981) include a substantial amount of radiocarbon dating and have shown that many of the ages assigned by previous geoscientists (such as Gay and Aune, 1958; DWR, 1963; MacDonald, 1966; and Jennings, 1977) were incorrect, especially those assigned to the younger volcanic units. Specifically, younger basalt flows such as those on the Devils Garden Plateau (Qpv^b) assigned a Pleistocene age (i.e. less than 1 to 2 million years [my] old) are now known to be of earliest Pliocene and late Miocene age (5 to 8 my old). This, in turn, indicates that underlying formations such as the Alturas Formation are of Miocene age rather than Pliocene-Pleistocene age. Recent work shows that very few of the youngest basalts are actually of Quaternary age.

Part of the age assignment problem is also due to refinement of the geologic time scale since the 1960s when much of the geology of the area was published. Presently-used geologic time scales (for example, GSA, 1983) place the Pleistocene-Pliocene boundary at 1.6 my and the Pliocene-Miocene boundary at 5.3 my. The geologic time scales used in the 1960s had these period boundaries at 2 or 3 my and 7 to as much as 13 my, respectively. In other words, a formation assigned to the Pliocene period could range anywhere from less than 2 my old to as much as 13 my old. Correction of age assignments in this region will require much more radiometric dating and detailed field geological mapping which are beyond the scope of work normally done for an EIR/S. Fortunately, true age assignments are not critical to impact assessments, as long as the fact that discrepancies exist is understood. This analysis has attempted to reduce some of the ambiguity caused by the discrepancies between older mapping and the more-recent work, but some ambiguity still remains.

The most significant effect of the stratigraphic uncertainty is related to volcanic hazards. A Quaternary age for the youngest basalts could imply a substantial hazard from volcanism along the proposed route, whereas the true ages indicate that volcanic activity is essentially dead in the immediate vicinity, and currently exists primarily in the Cascade Range to the west.

C.6.1.2.1 *Modoc Plateau*

Geologic Formations

As shown on Figure C.6-2, the predominant geologic formations within the study area are Miocene to Pliocene age (approximately 15 to 2 million years before present [bp]) volcanic rocks (Tv), and unconsolidated Quaternary alluvial sediments (Qa). The alluvial sediments consist primarily of Pleistocene (less than about 2 million years old) and Holocene (10,000 years to present).

The oldest formation recognized in the Modoc Plateau is the Cedarville Series, of Oligocene to Miocene age, found in the Warner Range east of the Proposed Project (MacDonald, 1966). The Cedarville Series consists largely of tuffs, agglomerates, and mudflows, with lesser amounts of interbedded andesitic lava flows. During the Miocene, mountain-building forces created fault-block mountains, across much of the western United States, disrupting drainage, forming basins. During times of wet climate, numerous lakes were formed. Sediments accumulated in the lakes, along with lava flows, ashfalls, mudflows, and other volcanically derived material. Lake beds of the Alturas Formation are exposed in the vicinity of Alturas, and consist of diatomite, tuffaceous shale, siltstone, sandstone, and locally, welded ash flows.

Lying on the older formations over a wide area is the Warner Basalt, of late Pliocene to Miocene age. The Warner Basalt varies in thickness, but may average about 100 feet; individual flows range from less than 2 feet to more than 50 feet thick (MacDonald, 1966). Various local names are given to basalt flows that may be associated with the Warner Basalt, such as the Garden Basalt in the Devils Garden area west of Alturas.

Surficial deposits consist largely of stream-laid alluvium, alluvial fans, colluvium, and tuffaceous sandy, silty, and diatomaceous lake beds.

Table C.6-1 describes units encountered in the project corridor, keyed to the project base maps at the end of Volume I by geologic formation notation, e.g., Qa-Quaternary alluvium, Pc-Pliocene continental (nonmarine), Tsma-Tertiary andesite of South Madeline Mountain. Descriptions are based on Gay and Aune, 1958; MacDonald, 1966; Grose and others, 1989 and 1992. The surficial deposits are described first, not necessarily in order of age, followed by bedrock units, in general order of increasing age.

Structure

The dominant structural characteristic of the Modoc Plateau is the flat-lying nature of the volcanic rocks which give the area its plateau aspect. However, the volcanic flows are broken and displaced by a large

Table C.6-1 Geologic Formations, Modoc Plateau

Map Symbol/Formation Name	Age	Description
Surficial Deposits		
Qa - Alluvium	Holocene and Pleistocene	Sand, gravel, and silt; fluvial deposits along modern drainages; grades into colluvium and lacustrine deposits. May include colluvium, talus debris, and terrace deposits.
Qf - Alluvial fan deposits	Holocene and Pleistocene	Gravel and sand; largely consisting of volcanic cobbles. Locally interbedded with lake deposits.
Qle - Eolian, fluvial, and lacustrine deposits	Holocene	Sand, silt, clay
Bedrock Units		
Qpv[b] - Pv[b] Basalt and mafic andesite	Pleistocene - Miocene	Occurring mainly as fractured lava flows; includes the Warner Basalt.
Pc - Undivided nonmarine	Pliocene - Miocene	Includes lakebed deposits of Alturas formation. The Alturas consists of two sedimentary members separated by a basalt member and the Warm Springs tuff. The sedimentary rocks are flat-lying sandstone, gravel, diatomite and tuff.

number of northwest-trending faults. The majority of these faults are normal faults, exhibiting vertical movement with little or no strike-slip component. Strike-slip faults such as the Likely fault, however, are major features crossing the Plateau in a northwesterly trend, and may be related to the major, right-lateral structural feature termed the Walker Lane which extends into the area from the Great Basin (MacDonald, 1966, Bonham, 1969)

Mineral Resources

Mineral resources identified in the vicinity of the project corridor consist mainly of small sand and gravel borrow pits within alluvial deposits and unconsolidated volcanic units.

Several hot springs occur within the Modoc Plateau, some of which may indicate geothermal potential. No geothermal development was identified along the corridor north of Honey Lake. The development and geothermal potential of hot waters is described further under Great Basin geology (Section C.6.1.2.2).

C.6.1.2.2 *Great Basin*

The Great Basin province extends across the entire State of Nevada and includes large parts of western Utah and eastern California. The dominant geological aspect of the province is the alternating, linear, subparallel mountains (ranges) and valleys (basins). In the region surrounding the Proposed Project, the ranges are composed of primarily volcanic rocks and the basins are filled with alluvial and lake deposits (Figure C.6-2). Generally, the margins of the valleys have extensive alluvial fan deposits and the centers of the basins are occupied by flat dry lake beds. These lake beds are the remnants of large deep lakes that filled most of the valleys during the Pleistocene and Pliocene when the climate was cooler and wetter. The largest of the Pleistocene lakes was Lake Lahontan, which occupied the Carson Sink, Pyramid Lake Valley, Smoke Creek Desert as well as Honey Lake Valley and Warm Springs Valley, in the study area. Other large lakes were presented in the Madeline plains basin, Secret Valley, Surprise Valley, Long Valley, Lemmon Valley, and Cold Spring Valley (Bonham, 1969; Soeller and Nielsen, 1980). Shore-line gravel bars and terraces can still be seen around the margins of these valleys.

Descriptions of geologic units found in the Great Basin Province in the project corridor are given in Table C.6-2. Surficial units are presented first, without regard to relative ages, followed by bedrock units, in approximate chronological order, beginning with the youngest.

Structure

Faults throughout the Great Basin trend predominantly north-northeast, but various other trends occur on a smaller scale. The fault domain in northwestern Nevada is characterized by northeasterly trending faults, similar to the prevailing province-wide trend. In the fault domain of southwestern Nevada and southeastern California, south of Reno, the predominant fault trends are more northerly (Figure C.6-3). Between these two fault domains is a narrow belt of northwesterly trending faults called the Walker Lane. The Walker Lane extends from the Las Vegas, Nevada region to between Mount Lassen and Klamath Lake in the Cascade Range. Figure C.6-3 shows Quaternary faults in the project area, including the northwestern part of the Walker Lane. Principal faults in the Walker Lane are the Pyramid Lake, Warm Springs Valley, Honey Lake, Nelson Corral, and Likely fault zones. The Walker Lane is narrow and well defined in the Pyramid Lake area but appears to fan out into a wide zone between the Likely-Nelson Corral fault zone and the Mayfield, MacArthur, Hat Creek faults. There are a large number of strike-slip faults and young volcanic rocks within the Walker Lane area, and historical earthquakes have been markedly more abundant in the area southwest of the Walker Lane than to the northeast. Such characteristics indicate that the Walker Lane is a fundamental element in the geologic development of the region but its exact role is widely debated among earth scientists.

Mineral Resources

Mineral resources identified within the vicinity of the project corridor include small sand and gravel pits at various locations, pozzolan deposits, and geothermal springs and wells. Pozzolan has been mined from open-cut operations in the Long Valley area, north of Hallelujah Junction. Pozzolan is a fine-grained siliceous material used as a strengthening admixture in concrete and concrete products. The local geologic source is primarily diatomaceous earth found within the middle member of the Hallelujah Formation (Th2), which occurs for a distance of at least 8 miles along the project corridor. This geologic unit may have a potential for additional economic deposits of pozzolan.

ALTURAS TRANSMISSION LINE EIR/S

Figure C.6-3

Quaternary Fault Map

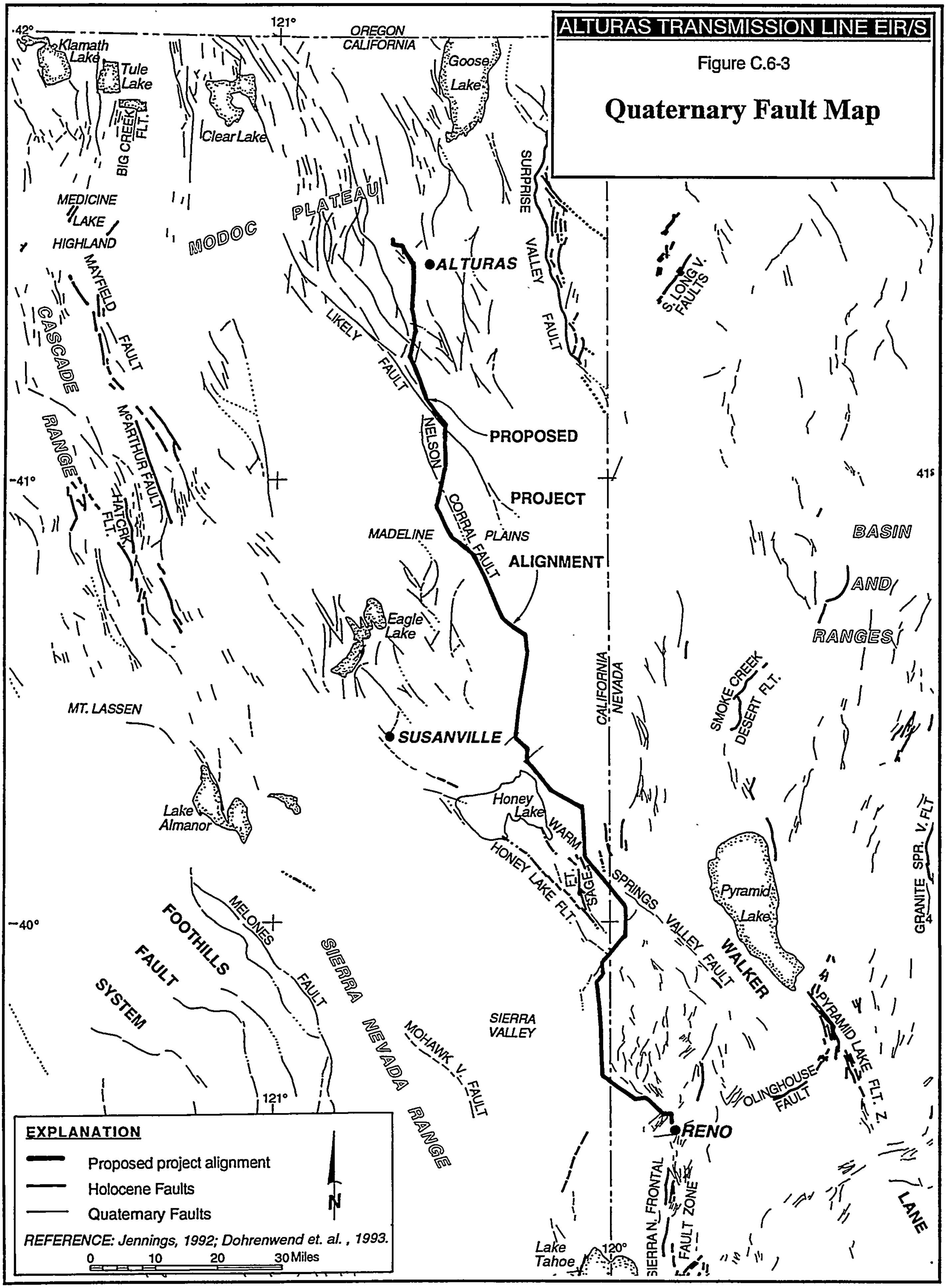


Table C.6-2 Geologic Formations, Great Basin Province

Map Symbol/ Formation Name	Age	Description
Surficial Deposits		
Qa - Alluvium	Holocene and Pleistocene	Described under Modoc Plateau.
Qd - Dune sand	Holocene	Partially stabilized dune field grading into sand sheet and Lake Lahontan deposits.
Qf - Alluvial fan deposits	Holocene and Pleistocene	Described under Modoc Plateau.
Qfy - Young alluvial-fan deposits of Peavine Peak	Pleistocene	Light-brown to light-grayish-brown muddy, sandy cobble to boulder gravel; angular to subangular metamorphic clasts; poorly sorted; poorly consolidated. Little or no soil development. Forms alluvial apron on northeast flank of Peavine Peak.
Qfo - Old alluvial-fan deposits of Peavine Peak	Quaternary	Light-brown to brown, sandy cobble to boulder gravel; angular to subangular metamorphic clasts; poorly sorted; moderately consolidated.
Ql - Lake deposits of Lake Lahontan	Pleistocene	Clay, silt, and sand of small enclosed playa basins.
Qlg - Near-shore and deltaic lake deposits of Lake Lahontan	Pleistocene	Gravel, sand and silt.
Ql - Lake Deposits of Lake Madeline	Holocene and Pleistocene	Silt, clay, and sand; unconsolidated lacustrine deposits of ancient Lake Madeline basins
Qlg - Nearshore and deltaic lake deposits of Lake Madeline	Holocene and Pleistocene	Sand, silt, and gravel
Qhl - Lake deposits of Mud Flat and Little Mud Flat	Holocene	Clay, silt, sand.
Qle - Eolian, fluvial, and lacustrine deposits	Holocene	Sand, silt, clay; mainly derived from reworking of Lake Lahontan sediments
Qt - Tufa and minor sinter	Holocene and Pleistocene	Hot spring and algae deposits from interaction between waters of Wendel Hot Springs and Lake Lahontan.
Qc - Colluvium	Holocene and Pleistocene	Mainly gravel and sand; locally grades into alluvial, fluvial, and lacustrine deposits.
Qld - Fluvial and lacustrine fan-delta deposits of Long Valley Creek	Pleistocene	Arkosic sand, gravel, and silt; thin to thick bedded, cross-bedded; prograde northward into Lake Lahontan deposits.
Qg - Bouldery fan and pediment gravel	Pleistocene	Boulder, gravel, sand, silt, clay.
Qll - Lake deposits	Pleistocene	White, gray, tan; semi-consolidated. Sand, silt, clay, and minor fine gravel of lacustrine origin.
Qs - Sand deposits	Holocene and Pleistocene	Sand and silt; sheet and local dune deposits, mainly eolian and lacustrine. May include relict beach deposits along east margin of the Madeline Plains.

Map Symbol/	Formation Name	Age	Description
			Bedrock Units
Tdrb -	Basalt and mafic andesite of Ducasse Reservoir	Pliocene	Medium gray to black, dense, stony, aphanitic to variously porphyritic with olivine and plagioclase, commonly grading into and interstratified with diktytaxitic intergranular basalt. Estimated nearly equal volumes of basalt and mafic andesite. Cindery vent facies common. Occurs as nearly horizontal infilling of Madeline Plains depression.
Tsbu -	Basalt of Spanish Springs	Pliocene	Dark brown-gray to black, massive to slightly diktytaxitic, ophimottled to intergranular with abundant pyroxene and olivine. Extensive horizontal flows grading downward to Tsbl.
Tsbl -	Basalt, mafic andesite, and tuff of Spanish Springs	Pliocene	Gray to black flows interbedded with silicic tuff. Massive and locally platy andesitic; locally diktytaxitic. Flows occur in Secret Creek canyon.
Thfp -	Mafic andesite	Pliocene	Medium gray, vesicular, aphanitic to moderately microporphyritic with olivine and pyroxene phenocrysts. Massive to moderately platy flows. Interbedded with flow breccia and andesitic pyroclastics. Flowed from plugs and dikes of Horse Mountain volcano.
Tppf -	Mafic andesite	Miocene and (or) Pliocene	Medium gray to black, dense to slightly vesicular flows, aphanitic to moderately finely porphyritic with olivine phenocrysts. Interbedded with andesitic pyroclastics.
Tsma -	Mafic andesite flows and pyroclastics of South Madeline Mountain	Miocene and (or) Pliocene	Light to dark gray, aphanitic to variously porphyritic flows with olivine and plagioclase as common phenocrysts. Abundant interbedded flow breccia and tuff and minor black olivine basalt flows. Originated from summit vent area.
Tvb -	Olivine basalt of Viewland	Pliocene	Black, dense, moderately finely olivine porphyritic. Flows overlie Tlrt on irregular surface.
Tlrt -	Tuff of Lava Rock Reservoir	Pliocene	White to gray, crystal-vitric, locally pumice lapilli with fossiliferous lacustrine tuffaceous clays and crossbedded fluvial layers in middle part of unit. Massive to poorly bedded, horizontal. Underlies basalt in Secret Valley.
Tlrb-	Basalt of Lava Rock Reservoir	Pliocene	Thin horizontal flows of medium gray to black, moderately diktytaxitic, sparsely olivine, microporphyritic.
Tsl -	Andesite and mafic andesite flows	Miocene	Minor pyroclastic interbeds and many small plugs, dikes, and proximal vent facies breccias. Complex unit underlies Snowstorm Mountain and Saddle Rock volcanics.
Ttwf -	Basalt of Three Peaks West volcano	Miocene	Small basaltic volcano peripheral to Three Peaks central volcano. Dark gray to black, dense to variously vesicular, aphanitic to variously porphyritic with olivine phenocrysts, hyalophitic. Interbeds of basaltic pyroclastics and vent facies.
Tama-	Andesite flows and pyroclastics of Anderson Mountain	Miocene	Gray, variously porphyritic with olivine, plagioclase, and pyroxene in intergranular to sub-ophitic matrix. Some flows are stony and aphanitic. Flows interbedded with cogenetic fragmental layers. Derived from summit vent facies, plug, and dikes.
Tvsa -	Mafic andesite of Viewland shield	Miocene	Dark gray, moderately finely pyroxene and olivine (minor) porphyritic. Occurs as flows, 2-4 meters thick, derived from two major plugs on small compound shield.
Twa -	Mafic andesite of Wendel shield	Miocene	Medium to dark gray, moderately finely pyroxene and olivine porphyritic. Occurs as flows, 3-5 meters thick, derived from major plug on small shield.

Map Symbol/ Formation Name		Age	Description
Twra -	Andesite of West Ravendale Mountain	Miocene	Light to dark gray, dense, aphanitic to variously vesicular to locally slightly diktytaxitic, variously sparsely microporphyritic with olivine and plagioclase, locally with tan-red and green-gray 1-3 mm splotches. Mostly dense-platy flows with lesser equivalent interbedded pyroclastics and minor basalt flows.
Tma-	Mafic Andesite flow (Secret Valley)	Miocene	Gray to black, mostly sparsely porphyritic with fine olivine, plagioclase, and pyroxene phenocrysts to aphanitic. Primarily massive flows that are vesicular and platy near their margins. Some interbeds of basalt, flow breccias, and associated pyroclastics.
Tmfs-	Andesite of Five Springs Mountain	Miocene	Member of Tma (see above)
Tfpr -	Andesitic flows and pyroclastics	Miocene	Near horizontal, poorly exposed, overlain irregularly by colluvial and lacustrine clastic deposits on near-shore shelf of ancient Lake Madeline. Unit is probably a downslope extension of Twra.
Tms -	Mafic andesite of Shinn Mountain	Miocene	Dark gray to black, sparsely porphyritic with fine olivine and plagioclase phenocrysts. Primarily massive flows that are vesicular and platy near their margins. Often has distinctive green alteration blotches around vesicles.
Qscb	Basalt of Stoney Creek (Secret Valley)	Early Pleistocene (800,000 yrs)	Light to dark gray, with olivine and plagioclase phenocrysts in a fine-grained groundmass.
Ts -	Lacustrine and alluvial sediments	Pliocene	Thick basin-fill deposits of grayish-orange to pale-brown, coarse to medium sand, granular sand, siltstone, silty to pebbly sandstone, and minor sandy pebble conglomerate, very thin-bedded ash and diatomite. Sediments are generally unconsolidated and bedding is usually indistinct. In part includes much younger alluvium near the surface.
Th3 -	Hallelujah Formation, upper member	Late Pliocene	Arkosic sandstone, maximum thickness of 1200 m. White, light gray and tan; fine to very coarse grained with local beds of pebble and boulder conglomerates and siltstone; clasts of quartz (75%), feldspar (20%), and biotite and hornblende (5-7%) and lithic clasts of granitic and minor volcanic rocks; massive to irregularly bedded and locally cross-bedded; occurs in west-tilted half-graben of Long Valley and sourced from Sierra Nevada uplift to the west.
Th2 -	Hallelujah Formation, middle member	Late Pliocene	Siltstone, thickness ranges from 200 to 1000 m. White; local beds of arkosic sandstone and conglomerate; siltstone rich in vitric tuff shards and diatoms abundant in lake beds (source of economic pozzolan); formed in a relatively quiet lacustrine restricted basin.
Th1 -	Hallelujah Formation, lower member	Late Pliocene	Sandstone and siltstone, light gray and tan, locally greenish; some conglomerate; unconformably rests on Hartford Hill Rhyolite.
Thu -	Hallelujah Formation, undivided	Late Pliocene	Arkosic sandstone, minor pebble conglomerate and siltstone. White, light gray and tan; bedding is finely laminated to very thick, continuous to highly lensic and commonly cross-bedded; occurs in west-tilted graben of Long Valley.
bb -	Granitic Boulder Conglomerate	Late Pliocene	Sub-rounded to angular clasts from granule to large boulder size (up to 15 m) in sandy to fine conglomeratic matrix; entirely granitic locally derived; occurs usually in discontinuous beds conformable to unconformable within all members of Hallelujah Formation; probably indicates debris flow and landslide emplacement.

Map Symbol/ Formation Name		Age	Description
Qpv^b - Pv^b	Basalt and mafic andesite	Pleistocene -Miocene	Occurring mainly as fractured lava flows; includes the Warner Basalt.
Pc -	Undivided nonmarine	Pliocene - Miocene	Includes lakebed deposits of Alturas formation. The Alturas consists of two sedimentary members separated by a basalt member and the Warm Springs tuff. The sedimentary rocks are flat-lying sandstone, gravel, diatomite and tuff.
Tsv -	Pyramid Sequence	Miocene	Basalt, andesite, and dacite flows, flow breccias, mudflow breccias, agglomerates, tuffs and associated intrusives. Lenses of silicic waterlain tuff, diatomite, shale and sandstone intercalated in sequence.
Thhr -	Hartford Hill Rhyolite	Tertiary	White, red, brown, weakly welded ash-flow crystal-vitric tuff with lesser interbedded tuffaceous sandstone; rests nonconformably on granitic basement and local arkosic sandstones; probably Oligocene-Miocene.
Tba -	Porphyritic basalt	Middle Tertiary	Light gray to black with locally tan to red areas; euhedral phenocrysts of sodic labradorite, calcic andesine, and augite in pilotaxitic matrix of feldspar microlites, magnetite, and clinopyroxene; dense to vesicular flows; platy jointed to massive. Although most of the rock in this unit is petrographically basalt, a significant volume is also basaltic andesite and andesite with calcic andesine. Over 600 feet are preserved on top of State Line Peak and thinner sections occur on the west side of the Fort Sage Mountains and within the Warm Springs Valley fault zone. The unit unconformably overlies granodiorite (kg), tuff breccia (Ttb), and rhyolite tuff (Tt).
Ttb -	Tuff breccia	Middle Tertiary	Tan, white, gray, fine to coarse tuff matrix containing gray to black angular vitrophyric blocky fragments, 1 cm-1/2 m of pyroxene andesite and basalt with minor amounts of cinders, scoria, and rhyolite; highly variable of tuff matrix and fragments; unsorted, massive, rarely bedded. This unit occurs on the summit and west side areas of the Fort Sage Mountains where it varies abruptly (within 1/2 mile) in thickness from 0 to 500 feet. It rests on a high-relief surface cut in granodiorite (Kg) and rhyolite tuff (Tt).
Tt -	Rhyolitic tuff	Middle Tertiary	White to light gray, fine grained to lapilli, mostly vitric and crystal-vitric, non-welded to moderately welded, massive to well-bedded; discontinuously preserved everywhere at base of volcanic sequence resting on granitic basement; may correlate with Tvr.
Twt -	Welded tuff	Middle Tertiary	Moderately to strongly welded portions of the crystal vitric rhyolite tuff; rare layers of black or gray vitrophyre. Individual welded zones seldom exceed 100 feet in thickness and 3 miles in known preserved lateral extent. At least two prominent relatively continuous layers occur within the rhyolite tuff (Tt) in the Virginia Hills. Small, seemingly isolated masses also occur in the tuff.
Td -	Microdiorite	Tertiary	Very dark gray, microequigranular to microphaneritic porphyritic; plagioclase and pyroxene with rare biotite and quartz.
Tir -	Rhyolite Plugs	Tertiary	Flow-banded, light gray porphyritic rhyolite. Small quartz and feldspar phenocrysts in a fine-grained matrix.
Tsr -	Silicified Rock	Tertiary	Silicified rock and breccia consisting almost entirely of fine-grained red-brown quartz, colored by iron-oxide. This unit is confined to areas of altered volcanic or granitic rocks.

Map Symbol/ Formation Name		Age	Description
Tg -	Granite Stock	Tertiary	Hypabyssal stock composed of several intrusive phases ranging in composition from pyroxene diorite through granodiorite porphyry to pyroxene syenite. Largely altered to cream-colored iron-stained rock made up of quartz, sericite, and clay. Locally contains chlorite, epidote and potassium feldspar. Pyrite is abundant in unweathered parts of the altered rock.
Ta -	Alta Formation	Miocene	Dark brown pyroxene andesite flows, flow breccia, and laharic breccia. Commonly altered to tan rock composed of quartz, sericite, and clay minerals or propylitized to gray green rock containing chlorite, calcite, albite, epidote, and clay minerals.
Tvr -	Rhyolite tuff of the Fort Sage and Diamond Mountains	Miocene and Oligocene	White to light gray, mostly coarse-grained to lapilli, pumiceous, crystal-vitric; sanidine and biotite crystals nearly ubiquitous; locally with lensic masses of rhyolite, dacite, and andesite tuff breccia; highly variable thickness up to 180 m. Two slightly welded, relatively resistant zones occur locally in middle third of the unit. This unit is the oldest in the Tertiary volcanic sequence.
Kgr -	Hornblende-biotite granodiorite	Cretaceous	White to gray, medium-grained, generally uniform and massive but locally hornblende-rich, with aplitic, or seriate textures. Locally contains minor schistose roof pendants, mafic xenoliths, and thin aplite dikes.
Kga -	Alaskite, aplite, and granite	Cretaceous	White to medium gray and locally greenish, strongly seriate and fine-grained; quartz and K-feldspar irregularly abundant, epidote locally common. This plutonic suite indicates very close proximity to metavolcanic roof pendants.
Kgd -	Granodiorite	Mesozoic	White to light gray, medium crystalline, with nearly ubiquitous biotite and hornblende and varying amounts of dark angular to rounded dioritic inclusions; massive to very weakly foliated; contains local quartz-feldspar pegmatitic masses.
Kgdb -	Grandiorite	Mesozoic	Grandiorite, fault brecciated and granulated.
Mzgd -	Granodiorite	Mesozoic	Greenish-gray, medium-grained, hypidiomorphic-granular to porphyritic. Mafic minerals are altered to chlorite and epidote; plagioclase is partially altered to white mica.
Mzv, Mzvs & Mzt -	Peavine Sequence	Mesozoic	(1) Mzv: Gray to green and grayish-green metavolcanic flows, tuff breccia, and welded tuff of dacitic to andesitic composition. Locally includes metamorphosed epiclastic volcanic sedimentary rocks. Irregular patches of pink to pale-red color are caused by disseminated piedmontite alteration. Where unaltered this unit is resistant to erosion and tends to form bold outcrops. (2) Mzvs: Undifferentiated metavolcanic and metasedimentary rocks. (3) Mzt: Tuff and probable tuff.

Geothermal activity is common in the Great Basin. Geothermal resources have been developed through deep wells in the Wendel-Amedee Known Geothermal Resource Area (KGRA) since the early 1980's (Juncal and Bohm, 1987). This area is located along the northeastern edge of Honey Lake Valley, in a complexly faulted area. Hot springs occur along the Amedee fault, which crosses the project corridor, and the Wendel fault to the northwest. Ground subsidence along the trend of the Amedee fault is suspected of being a result of active withdrawal from geothermal wells at Amedee Hot Springs. (Hart, 1994, personal communication).

C.6.1.3 Geologic Hazards

Potential geologic hazards in the vicinity of the Alturas Transmission Line Project include faults, earthquakes, landslides, liquefaction and volcanic eruptions. These potential hazards are described in the following sections.

C.6.1.3.1 *Faults*

Much of the western United States east of the San Andreas fault in California is an area of crustal extension. Mantle processes throughout Tertiary and Quaternary time have uplifted and faulted this vast area, creating a system of predominantly northerly to north-northeasterly trending normal faults. Figure C.6-3 shows Quaternary faults in the project region. Base maps at the end of Volume I show the spatial relationships of these faults to the Proposed Project in more detail.

The faults on Figure C.6-3 are divided into two groups: Holocene and Quaternary. Such faults are assigned to two activity classes, active and potentially active:

- *Active* faults are defined by the CDMG as faults that have had surface displacement during Holocene time (approximately the past 10,000 or 11,000 years). These faults are specifically mapped by the CDMG as *Earthquake Fault Zones* as mandated by the Alquist-Priolo Earthquake Fault Zoning Act (Hart, 1994). [Note: These are new terms as of January 1, 1994 for features previously called Alquist-Priolo Special Studies Zones]. These zones restrict development of habitable structures and require detailed geological fault studies by California-licensed geologists before building is allowed.

- Other Quaternary faults that were active between about 10,000 years and about 2 million years ago are termed *Potentially Active.*

In spite of the wide acceptance and general use of this classification system defining active and potentially active faults, geological studies in the Great Basin (for example, Schell et al., 1981; Dohrenwend et al., 1993; dePolo and Slemmons, 1993), have shown that faults in this province can lie dormant for much longer than 10,000 years and then cause earthquakes and ground rupture. Review of seismicity maps of the region reveals that many earthquakes have occurred in areas without evidence of previous surface displacements and, therefore, earthquake hazards analyses in this region should include both active and potentially active faults. Table C.6-3 lists the major active and potentially active faults in proximity to the Proposed Project corridor along with information on expected size of the maximum earthquake. The principal sources of data are Jennings (1992) for California and Dohrenwend et al. (1993) for Nevada, although several other sources provided details.

Table C.6-3 Active and Potentially Active Faults

Fault Name; Location	Length (Miles)	Segment/ Mile Post	Magnitude	Comments
Unnamed; Near Dagget Canyon	<2	A/MP 2-3	6.0	
Unnamed; Hills W. of S. Fork Pit R. Valley	6	C/MP 14-15	6.0	
Unnamed; Hills W. of S. Fork Pit R. Valley	2 +	C/MP 17-18	6.0	
Likely (and associated splays); Likely Mountain	60	C/MP 23-29	7.25	
Nelson Corral; Madeline Plains	28	E/MP 41-42	7.0	Also crosses Alternative D between Angle Points DØ1-DØ2 Also crosses Alternative K at Angle Point at KØ6
Unnamed (two); N.E. Honey Lake	3 3	L/MP 83-84 M/MP 87-88	6.0 6.0	Also crosses Alternative M at Angle Point MØ2
*** Warm Springs V.;** S.E. Honey Lake and N.E. side of Ft. Sage Mts.	47	O,Q/MP 107-109	7.5	Also crosses Alternative P between Angle Points OØ5 and PØ1
Unnamed	3	Q/MP 119	6.0	
*** Honey Lake;** Dry Valley-Long Valley	56	Q,P/MP 121-125	7.5	Also crosses Alternative P between Angle Points PØ5 and PØ8
*** Ft Sage Rupture** (2) W. Side Ft. Sage Mts.	5.5	P/PMP 4-9	6.0	Parallels Alternative Route P, does not actually cross the route
Diamond Mountain; W. Side Upper Long V.	13 +	S,U,R,T,Z/ MP 125-135 +	7.0	Parallels Segments S, U, R, T, Z Crosses Alternative S between SMP 1-3
Unnamed; Border Town S.W. side of White Lake	2	X/MP 143-145	6.0	Parallels Segment X and is within 1 mile of Border Town substation
Unnamed; Network of faults between Lemmon Valley and Peavine Peak	10	X/MP 146-157	6.5	Numerous intersecting faults cross ROW several places

1) Active faults are in bold print, marked by asterisk (*); all others are potentially active.
2) The name Fort Sage fault was applied by DWR (1963) to a fault on the northeast flank of the Fort Sage Mountain. This fault is now considered to be a branch of the Warm Spring Valley fault zone. The literature generally refers to the 1950 ground rupture on an unnamed fault on the west side of the Fort Sage Mountains as the Fort Sage fault.

Table C.6-4 Number of Events Per Magnitude Interval

	4.0+	5.0+	6.0+	7.0+	Total
1845-1928	12	5	9	2	27
1928-Present	81	12	4	0	97
TOTALS	93	16	13	2	124

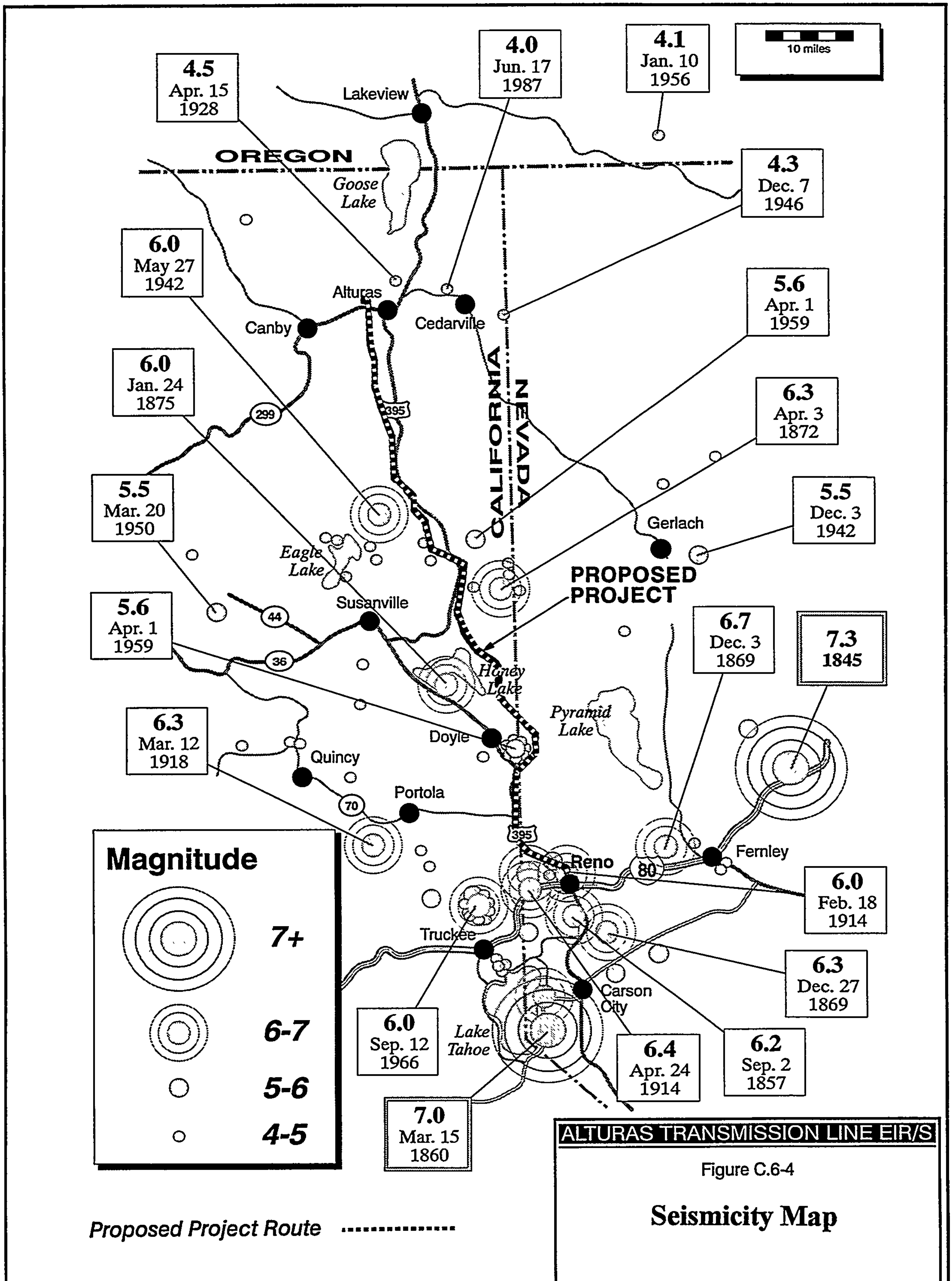


Figure C.6-4

Seismicity Map

Only one of these faults has ruptured the surface in historical time (the Fort Sage fault in 1950) so the maximum earthquake estimates cannot be based on historical seismicity alone. However, geological information can be used for estimating maximum earthquakes by comparing mapped fault lengths to empirical data using the empirical relationships of Wells and Coppersmith (1994). This method of magnitude determination assumes that half of the mapped length or a representative discrete segment will rupture during any one earthquake. This premise is based on the historical observations that faults rarely rupture their entire length (Albee and Smith, 1966; Slemmons, 1982). The magnitudes are estimated by calculating the average maximum earthquake directly from the length/magnitude relationships of Wells and Coppersmith (1994) and then rounding off upward for conservatism.

C.6.1.3.2 *Seismicity*

The Proposed Project is within an area of moderate to low historical seismicity. Figure C.6-4 shows locations of earthquakes larger than magnitude 4 that have occurred in the area since the year 1800 AD. Earthquake data were compiled from the data bases of the USGS, University of California, Berkeley, and University of Nevada, Reno. The figure shows magnitudes for all events since the year 1800, but it should be understood that earthquakes occurring prior to about 1930 are not well located and are of uncertain magnitude. The 1845 event, for example, occurred before the development of seismographs, so its magnitude and location, like all the other pre-1930 events, must be accepted with caution. Table C.6-4 summarizes the magnitude statistics of historic earthquakes in the region. Table C.6-5 presents information on the larger earthquake events.

Considering both the geological data on surface faults and the seismological data, it is apparent that large earthquakes should be expected in the area, though infrequently. Based on the size of potentially active faults, large earthquakes can occur in proximity to several parts of the project route. However, the historical seismicity suggests that the southern part of the Proposed Project will probably experience larger events and earthquake shaking more frequently. Based on published attenuation relationships (for example, Boore et al., 1993 and Campbell and Bozorgnia, 1994) the level of strong ground motion from the large magnitude earthquakes on faults adjacent to the site would be in the 0.6 to 0.7g range.

The Uniform Building Code map shows much of the area to be within Seismic Zone 3; the area near Reno is in Zone 4 which represents the highest potential on the map.

C.6.1.3.3 *Landslides*

Landslides are not common within the Proposed Project area. This is principally because most of the geologic formations in the area are hard and strong volcanic flow rocks, massive granite rocks, and the climate is semi-arid.

Table C.6-5 Large Historic Earthquakes

Magnitude	Date	Location
7.3	1845	North of Carson Sink, NV
7.0	15 Mar 1860	West of Carson City, NV
6.7	27 Dec 1869	Olinghouse, NV
6.4	24 Apr 1914	Truckee, CA-NV border area
6.3	12 Mar 1918	Reno, NV
6.2	3 Sep 1857	Southwest of Reno, NV
6.1	27 Dec 1869	Virginia City, NV
6.0	24 Jan 1875	Honey Lake, CA
5.6	14 Dec 1950	Fort Sage, CA

Three landslide areas have been identified along the Proposed Project routes, but only one of these is within the ROW. The other two are adjacent to the ROW and are identified on the base maps at the end of Volume I. The landslide area within the ROW is in the vicinity of Stones Canyon along Segment C between MP 24 and MP 25 (see base maps 5 and 6 at the end of Volume I). The landslide area is within the Likely fault zone and may be associated with water along the fault zone or a high water table at Cottonwood Springs. Other topographic anomalies occur in the same general area suggesting that other ancient landslides may exist; however, these topographic anomalies could be related to the faulting. The second landslide area is along segment Q where it is crossed by the Warm Springs Valley fault (near MP 113-114), and the third is along Segment X near (MP 148).

C.6.1.3.4 *Liquefaction*

Liquefaction of soils may occur in areas where loose, saturated, sandy soils are strongly shaken by earthquakes. Geologic units most susceptible to liquefaction tend to be very young (generally late Holocene), unconsolidated alluvium where ground water is close to the surface. Areas with ground water less than 10 feet are most susceptible but liquefaction, can occur to about 30 feet. Within the Proposed Project area, such conditions would likely occur in units like Qa or Qld. These deposits are quite limited in the project area and, therefore, liquefaction is not likely along most of the route. The areas of the dry lakes (such as the Madeline Plains and Honey Lake) are probably too clayey to have a high liquefaction potential, even though ground water is commonly very shallow.

C.6.1.3.5 *Volcanic Eruptions*

More than 500 volcanic vents have been identified in the State of California in more than 23 separate areas (Jennings, 1975). Geological studies have revealed that at least 76 of these vents have erupted, some repeatedly, during the past 10,000 years. Past volcanic activity has ranged in scale and type from small cinder cone and basaltic fissure eruptions to large catastrophic eruptions. Figure C.6-5 shows areas where the youngest volcanic rocks occur. These include rocks from volcanos that have been active as recently as historical times (e.g. Mt. Lassen) to those of Miocene age (10-15 million years ago). Generally areas experiencing volcanic activity within the past few thousand years represent the areas most likely to experience volcanism again. The areas with only older volcanic flows (i.e., Pliocene-Miocene) are not likely to experience renewed activity.

More than ten volcanos have erupted during the past 600 years, including Mount Shasta, Lassen Peak, and cinder cone volcanos in the Medicine Lake Highland and the Mono-Inyo volcanic chain. The Lassen Peak eruptions included at least two blasts that devastated areas to the east of the peak and produced mudflows that inundated the valley floors of Hat Creek and Lost Creek. Tephra (ash) from the most violent eruption on May 22, 1915 was carried by winds about 300 miles, as far as Elko, Nevada.

Small cinder-cone eruptions and fissure flows are not likely to damage anything not directly in their paths. Eruptions with the greatest potential for death and destruction are the explosive eruptions, like those from the high peaks of the Cascade Range. These eruptions could eject pumice high into the atmosphere, produce destructive blasts, avalanches, or pyroclastic flows that extend tens of miles from a vent, and produce mudflows and floods that reach to distances of about 100 miles (Miller, 1989). Slopes on or near a volcano and the valleys leading away from it are affected most severely by such eruptions. The risk generally decreases with increasing distance from a vent.

Large explosive eruptions could occur in three or four areas in California. The Cascade Volcanos are the most likely sources of large eruptions. The Mono Basin/Long Valley area (see Figure C.6-5) is another possible source. Although there is no obvious volcanic cone, the Long Valley caldera was the source of a high eruption about 700,000 years ago which spread ash as far east as the state of Kansas. The prevailing winds in California and Nevada are easterly and thus most of the ash from Cascade and Long Valley would fall to the east. Risk to life from these falls decreases rapidly with increasing distance from a vent, but thin deposits of ash could disrupt communication, transportation, and utility systems at great distances, and over wide regions, in eastern California and adjacent states. To evaluate the hazards of volcanism to the Proposed Project, the recency of volcanism in the project area was assessed. Many of the maps in this part of the state are based on old data. Review of recent geologic work with radiometric age determinations of volcanic rocks in the Modoc Plateau and the western Great Basin indicated that there are few Quaternary-age volcanos or volcanic rocks in the area. The Quaternary ages of the rocks shown on the California state geological maps (e.g. Jennings, 1977; Gay and Aune, 1958;

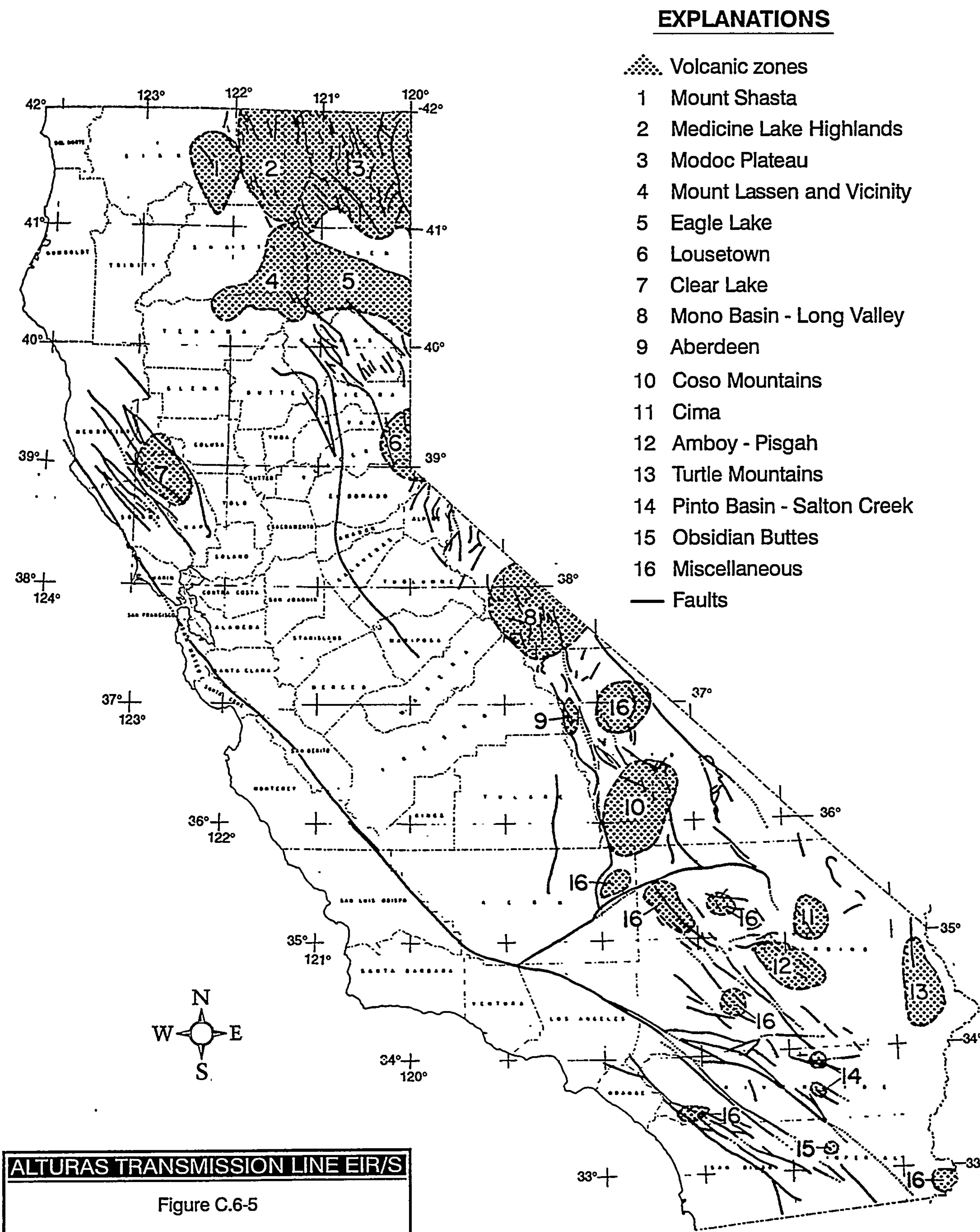


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Figure C.6-5

Map of Volcanic Areas

DWR, 1963) have been found generally to be of early Pliocene-latest Miocene age (5 to 8 million years) old (Leudke and Smith, 1981). Cone-shaped volcanic edifices thought by earlier researchers to be Pleistocene in age (i.e., < 2 million years old) based on geomorphology, have been radiometrically dated as Miocene in age, generally more than 10 million years old.

There are only a few localities where volcanism occurred as recently as the Pleistocene-Pliocene boundary (i.e. about 2 million years or less). One of these is in the area east of the town of Likely (about five miles east of the Proposed Project). Another is along the eastern side of Secret Valley (Stoney Creek basalt) and others are in the Susanville and Eagle Lake areas, more than 20 miles west of the Proposed Project. The youngest volcanic date in the project region is about 170,000 years, in the Eagle Lake area. Another area of bona fide Quaternary volcanism is the area just north of Lake Tahoe where several young cones in the Tahoe volcanotectonic depression have been dated in the 1 to 2 million-year age range.

The implication of these recent dating studies is that violent destructive volcanism is not likely to occur in close proximity to the Proposed Project. The most likely volcanism would occur to the west in the Eagle Lake, Mount Lassen, Mount Shasta, or Medicine Lake Highland areas. Estimates of potential volcanic hazards by Miller (1989) indicate that the areas most likely to be affected are in the immediate vicinity of these volcanos (i.e., on the slopes of the cones). Typical local effects are debris avalanches, pyroclastic flows/surges, and lava flows. More far-reaching effects like flooding and debris flows (mud flows) are not expected to the east because the regional topographic trends are down to the west and most major valleys descend in those directions. The only effect likely in the Proposed Project area would be ash fall from large infrequent eruptions. For example, a blanket of ash about 7-inches thick could be expected in the site area if an eruption similar to the 1980 Mount Saint Helens size eruption were to occur at Mt. Lassen (Miller, 1989). A similar eruption at Medicine Lake Highland would generate slightly more ash (8 inches), and at Mount Shasta about half as much ash (3 to 4 inches).

C.6.1.3.6 *Subsidence/Collapse*

Areas in proximity to active faults can be subject to uplift or subsidence if large earthquakes or fault ruptures occur. This type of subsidence, known as tectonic subsidence, can result from either relative crustal depression on one side of a fault or from compacting of granular, cohesionless sediments. Such uplift or subsidence can change existing slope angles or tilt ground surfaces that are now horizontal. Generally, these changes occur over large regions and are minor with respect to a specific site. Because of the limited amounts of subsidence at local sites, such subsidence is considered not significant.

Subsidence can also occur as a result of collapse into underground cavities. In volcanic terrains long linear cavities known as lava tubes can occur. Lava tubes are common in the Modoc Plateau province such as at the Medicine Lake Highlands and the Lava Beds National Monument where lava flows are very young (Qv on Figure C.6-2). This hazard is minimal along the Proposed Project route because the lavas are generally older and the tubes have collapsed or have become filled by natural processes. However, some caverns are known in proximity to the Proposed Project route (e.g. Infernal Caverns), and thus there may be some potential for such collapse.

Alluvial fan sediments deposited by debris flows in arid environments are commonly susceptible to collapse by a process known as hydrocompaction. Hydrocompaction occurs when water is introduced, such as by irrigation, into loosely compacted sandy and gravelly sediments. This compaction can remove foundation support to structures built upon the overlying ground surface. Most of the Proposed Project is across either hard volcanic rock or fine-grained lake deposits, both of which are not susceptible to hydrocompaction. However, the Proposed Project crosses some small scattered alluvial fan sediments such as along the east side of the Madeline Plains (MP 42-44), the northeast side of Honey Lake (MP 88-94), and the northeast side of Peavine Mountain (MP 148-150), as well as other smaller localized areas, so there is some potential for collapsible soils.

Subsidence due to ground-water extraction has been known to occur within basins of the Great Basin province. Ground water is held in the pore spaces between sediment grains. When the water is extracted, grains compact causing subsidence of the surface. Although this process is quite common in the Great Basin, there have been few reports of significant subsidence due to ground-water extraction in the study region. This is probably because ground-water withdrawals in this region have been small compared to other regions and the precipitation and recharge from areas such as the mountains to the west is greater than the other regions of the Great Basin. Subsidence has occurred in Honey Lake Valley in proximity to the Amedee geothermal area. Although subsidence due to ground water extraction can be important to rigid structures like pipelines or buildings, it is probably not significant to the Proposed Project because the project is a transmission line connected by wires which has much inherent ductility. The subsidence, on the other hand, involves only small decreases in ground level compared to the large spans between wire-supporting structures. The ductility of the transmission line would be enough to overcome the magnitude of changes in ground elevation associated with ground-water subsidence and such changes are slow such that any tilting of structures could be corrected before significant damage occurred.

C.6.1.4 Soils

The term "soils" means different things to different scientists and engineers. To a geologist, soil is the upper part of the rock column where rocks and sediments are broken down and altered by weathering to form horizontal zones. To the geotechnical engineer, soil means nearly all earth materials upon which foundations are placed. This definition commonly includes moderately hard to very hard rocks as well as dirt. To the farmer and soil scientists, soil refers to the material which supports plant growth. For this project all of these definitions were utilized and evaluated; however, within the geological perspective, the agricultural aspects of soils are perhaps the least important and, in fact, there are few soils within the Proposed Project ROW with a high agricultural capability.

C.6.1.4.1 *Soil Descriptions*

Tables F-1, F-2, and F-3 in Appendix F list the soils that have been mapped along the Proposed Project route and the alternatives. These tables list the following characteristics:

- Soil Name
- Map identification number
- Depth of soil horizons
- Soil texture
- Unified soil classification
- Shrink-swell potential
- Corrosion potential
- Erosion potential
- Depth to high-water table
- Depth to bedrock.

The soils along the Proposed Project route and Alternative routes are shown on base maps in Appendix C. Together, the tables in Appendix F and the base maps document the distribution and nature of shrink-swell, corrosion, and erosion potential within the Proposed Project, and Alternatives and to evaluate the suitability of materials for foundation support.

The source of most of the data collected was the Soils Conservation Service (SCS) of the U.S. Department of Agriculture (USDA). The data collected and presented by the SCS are representative of large geographic areas and are not site specific. Soils are generally sampled only to a depth of 5 to 6 feet; therefore, soil and water descriptions are limited to that depth and may not be representative, of geotechnical conditions. These data are nevertheless useful as indications of minimum conditions.

Published surveys with large-scale (1:24,000) maps are available for most of the project corridor. In parts of Lassen County, preliminary large-scale maps are available, as are preliminary, unchecked and incomplete descriptions and engineering data (Appendix F, Table F-4). Explanations of descriptors used on the tables in Appendix F are presented below and should be used as a guide to notations on the base maps at the end of Volume I.

Soil Descriptors

Soil Name and Map Symbol. The soil name and map symbol (number) identifies a soil series, phase, complex or association with sufficient commonality of profile, texture, slope, and other features, so that management and land use practices can be effectively applied. The most representative soil profiles are designated on maps at the end of Volume I used and map units commonly include small areas of other soil types.

Depth. The depths shown are to a major soil horizon or bedrock, if encountered in the upper 60 inches. This 60-inch depth is generally the maximum depth of test pits excavated to analyze soils.

USDA Texture. These are standard terms used by the USDA, and are defined based on the percentages of sand, silt, and clay in a sample of soil (Sheldon, 1980).

Capability Group. The capability grouping shows, in a general way, the suitability of soils for most common crops. The groups are defined according to the limitations of the soils when used for common crops, the risk of damage when used, and the way the soils respond to conservation practices.

Capability Classes, the broadest groups, are designated 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices

Class 3 soils have severe limitations that reduce the choice of plants, require special conservation practices, or both

Class 4 soils have very severe limitations that reduce the choice of plants, require very careful management, or both

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife

Class 6 soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to range, woodland, or wildlife

Class 7 soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to range, woodland, or wildlife

Class 8 soils and landforms have limitations that preclude their use for commercial plants, and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes.

Capability Subclasses are soil groups within one class; their designation is with small letters. The added letter *e* shows that the main limitation is risk of erosion; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, clayey, or stony; and *c* shows that the chief limitation is a climate that is too cold or too dry for common crops.

Capability Units are soil groups within the subclasses. The numbers used to designate capability units in classes 3 and 4 indicate soil limitations as follows:

0. Sand and gravel in the substratum limit the depth of root penetration
1. Erosion is an actual or potential hazard
2. Poor soil drainage or flooding results in excessive soil wetness
3. Permeability is slow or very slow in the subsoil or substratum
4. Soil texture is too coarse, or excessive amounts of gravel are in the profile
5. Texture of the surface layer is fine or very fine
6. Excessive amounts of salts or alkali are in the profile
7. Excessive amounts of cobbles, stones, or rocks are in the profile
8. Nearly impervious bedrock or a hardpan is within the effective rooting depth
9. The soil has low fertility or includes material toxic to plants.

For Classes 5 though 8, only the nonconnotative number 1 is used.

Unified Soil Classification. The Unified Soils Classification System (USCS) classifies soils according to engineering properties that may affect their use as construction materials. Soils are grouped into 15 classes, and soils on classification boundaries are given dual classification. Figure C.6-6 summarizes the key elements of the USCS.

Shrink-Swell Potential. Shrink-swell is the ability of soils to expand and contract when subjected to changes in moisture. The potential depends largely on the nature and amount of clay present. This characteristic may be important to estimate of the effect of the soil on overlying structures. However, the depth and thickness of the designated units is commonly inches and as such would not be significant for the depths of project structures.

Risk of Corrosion. This pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete (Sheldon, 1980). The rate of corrosion is related to several factors: for steel, the factors are soil moisture, particle-size distribution, total acidity, and soil electrical conductivity. For concrete, the rating is based on soil texture, acidity, and sulfate content (Sheldon,1980).

Erosion Factors K and T. Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion when subject to certain kinds of land use. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. The soil-loss tolerance factor (T) is the maximum rate of soil erosion (expressed in terms of tons of soil loss per acre per year) that can occur without reducing crop production or environmental quality (Sheldon, 1980).

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly graded sands and gravelly sands, little or no fines
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS 50% or more passes No. 200 sieve*	SILTS AND CLAYS Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

* Based on the material passing the 3-inch (75-mm) sieve.

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Figure C.6-6

Unified Soil Classification System

High Water Table. High water table is the highest level of a saturated zone (in undrained soils) more than 6 inches thick for a continuous period of more than 2 weeks during most years (Sheldon, 1980). Indicated are the depth to the seasonal high water table and the months of the year that the water table commonly is high. However, the depths of the soil excavation pits generally are not deep enough to provide useful water-table information for the project.

Bedrock. The depths shown are based on soil boring measurements and mapping observations. Hardness of rock is given based on ease of excavation. Soft or rippable bedrock can be excavated with a single-tooth ripping blade on a 200-horsepower tractor, but hard bedrock generally requires blasting (Sheldon, 1980). As above, it should be noted that there is little reliable information in these tables regarding depth to bedrock because soil surveys generally only investigate to a depth of 3 to 5 feet, if bedrock is encountered at these shallow depths, it is reported, but if it is not encountered then there is no information, and the notation of > 60 may be misleading.

C.6.1.4.2 *Agricultural Productivity of Soils*

The capability and suitability of soils for sustaining agricultural crop growth or tree production is dependent on several factors, principally depth, grain size, texture, nature of terrain, availability of water, and climatic setting. The USDA-SCS, considering all of the relevant factors, classifies the soils making up a mapped series or association into Capability Groups as described above. The classification of project soils is presented in Appendix F. Capability Groups indicate the nature and severity of limitations in managing particular soils for agriculture. The classification utilizes eight major classes numbered 1 through 8, with letter and numeric modifiers to indicate the nature of management limitations of subclasses and units. Using this system, soils in capability Classes 1 and 2 have few or no limitations to agricultural management, and can be considered to have high agricultural potential. The higher numbered classes have limitations of varying severity.

Along the Proposed Project and alternative routes, very few soils meet all the criteria to be considered as having high agricultural potential. Most of the soils are thin and stony or have moderate to high erosion potential. Additionally, because of the severe climatic conditions in Modoc County, no soils there are placed in Classes 1 or 2. Without such climatic limitations, several soils (including map units 150, 151, and 152) may be considered as having high agricultural potential. Within Lassen and Sierra Counties, soils placed in the highly productive category are map units 285, 365, 474, 477, 595, and 860. In Washoe County, the USDA-SCS considers map unit 460, as prime agricultural land. These soils occur along the Proposed Project in Honey Lake Valley less than 2 miles between (MP 104-107) and in Long Valley (less than 3000 feet near MP 129).

C.6.1.4.3 *Erosion*

The erosion hazard of soils in the project area by running water or wind has been estimated by the USDA-SCS (Sheldon, 1980; and Susanville Field Office, 1994). Soil map units considered to be moderately or highly subject to erosion are summarized in Table C.6-6 and shown on base maps at the end of Volume I.

Table C.6-6 Erosion Potential of Project Soils

	High Potential	
	Erosion by Water	**Erosion by Wind**
Modoc County	109, 118, 127, 128, 129	
Lassen/Sierra Counties	125, 130, 147, 169, 186, 294, 421, 429, 430, 677, 678, 682, 688	310, 312, 313, 314, 369, 609
Washoe County	282, 863, 871, 880, 892, 895, 901, 982	
	Moderate Potential	
	Erosion by Water	**Erosion by Wind**
Modoc County	128, 133, 146	
Lassen/Sierra Counties	135, 157, 159, 166, 182, 185, 229, 266, 293, 301, 304, 312, 314, 380, 402, 413, 445, 464, 479, 495, 585, 674, 872	116, 285, 290, 325, 329, 330, 336, 341, 345, 358, 360, 361, 365, 370, 372, 375, 384, 474, 477, 530, 588, 595, 860
Washoe County	191, 280, 281, 310, 313, 663, 664, 730, 882, 890, 900, 930, 980	470

The potential for erosion is defined by many variables, including soil texture, depth, slope, vegetative cover, and the presence of water. In many cases, the local conditions are more important than the type of soil. The classification of erodible soils is judgmental, and general, as each described map unit may contain areas of soils more or less susceptible to erosion. The classification can be used as a guide in determining soil-management techniques, especially in areas of soil disturbance.

C.6.1.5 Paleontology

Most of the Proposed Project corridor and alternative alignments traverse terrain underlain by Tertiary volcanic rocks of the Modoc Plateau and the Great Basin geologic provinces. The southern portions of the proposed route are underlain by plutonic igneous rocks and metamorphic rocks. Because of the nature of their formation by deep crystal igneous processes, such rocks are unlikely to contain fossils.

In the valleys of post-Pliocene age (less than approximately 5 million years old), fine-grained lake and coarse alluvial deposits may contain scattered plant and animal remains such as algae (diatoms), snails, and vertebrates (both fish and mammal). Also, some tuffaceous volcanic units that accumulated in lakes or as ash-fall may contain fossils. Within the Alturas Formation (Pc) in the vicinity of Alturas, diatoms, leaves, and rodent teeth have been reported (Gay and Aune, 1958).

Reviews of records on California locations at the University of California, Berkeley; University of California, Davis; and published geological literature (e.g., Jefferson, 1991) did not reveal any known paleontologic sites within the Proposed Project corridor or its alternative corridors. However, these reviews and discussions with University of Nevada, Reno geology personnel and with independent paleontologists indicate that some deposits around Honey Lake and Long Valley contain vertebrate fossils including mammoths, camels, horses, sabre-tooth cats, rhinoceroses and other late-Pleistocene-age fossils. It is possible that these types of fossils could occur in similar deposits along the Proposed Project corridor.

Geologic formations in the project and alternatives vicinity with the potential of containing fossil remains are presented in Table C.6-7. The potential for fossils is based solely on rock and formation type; i.e. no specific localities have been documented as containing important paleontological resources.

C.6.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

C.6.2.1 Definition and Use of Significance Criteria

C.6.2.1.1 *Geology*

The presence of several potentially hazardous geologic conditions within the transmission line corridor was identified in Section C.6.1. These conditions should be considered from two perspectives; first, the impacts that construction of the project could have the geologic features or the geologic environment, and secondly, the impacts that these hazards would have on the safety and viability of the Proposed Project. In addition, the region contains active or proposed mineral extraction or energy development sites that could be affected by the Proposed Project.

Impacts of the Proposed Project on the geologic environment would be considered significant if:

- Unique geologic features or geologic features of unusual scientific value for study or interpretation would be disturbed or otherwise adversely affected by the transmission line and consequent construction activities
- Known mineral and/or energy resources would be rendered inaccessible by project construction
- Geologic processes, such as landslides, could be triggered or accelerated by construction or disturbance of landforms

Table C.6-7 Geologic Formations with Paleontologic Potential

Map Symbol	Geologic Age	Geologic Formation
Qa	Holocene & Pleistocene	Alluvium
Ql	Holocene & Pleistocene	Lake Deposits
Qlg	Holocene & Pleistocene	Near-shore and deltaic lake deposits
Qhl	Holocene	Lake deposits of Mud Flat and Little Mud Flat
Qf	Holocene & Pleistocene	Alluvial fan deposits
Qle	Holocene	Eolian, fluvial and lacustrine deposits
Qfy	Holocene	Young alluvial fan deposits
Qfo	Pleistocene	Old alluvial fan deposits
Qc	Holocene & Pleistocene	Colluvium
Qld	Pleistocene	Fluvial and lacustrine fan-delta deposits
Qll	Pleistocene	Lacustrine sand, silt, and clay
Th2	Late Pliocene	Hallelujah Formation, middle member
Thu	Late Pliocene	Hallelujah Formation, undivided
Pc	Pliocene - Miocene	Continental deposits (includes Alturas Formation)
Tlrt	Pliocene	Tuff of Lava Rock Reservoir
Ts	Pliocene & Miocene	Lacustrine and alluvial sediments
Tsv	Late Miocene	Pyramid Sequence

- Substantial alteration of topography would be required or could occur beyond that which would result from natural erosion and deposition
- Shallow, hard bedrock requires blasting during construction.

Impacts of the following geologic hazards on the Proposed Project would also be considered significant if:

- Ground rupture occurs as a result of active earthquake faulting at project structures or facilities
- Earthquake-induced ground shaking causing liquefaction, settlement, lateral spreading and/or surface cracking damaged project structures or facilities
- Failure of construction excavations resulted from the presence of loose saturated sand or soft clay, and broken, highly fractured rock
- Volcanic activity, including windblown ash, caused damage to project structures or facilities
- Differential subsidence or collapse of rocks or soils were to occur directly under project structures or facilities.

C.6.2.1.2 *Soils*

Impacts of soil conditions would be considered significant if:

- Erodible soils were disturbed to a level that successful revegetation could be impaired
- Erosion rates were increased to a level that siltation could cause significant water-quality impacts
- Damage to project structures or facilities could result from the presence of shrink-swell, collapsible, or corrosive soils
- Damage to or instability of project components could result from presence of high water table in undrained soils
- Reduced agricultural productivity of soils resulted from displacement, erosion, or soil compaction; or if significant amounts of prime agricultural land were removed from productive use.

C.6.2.1.3 *Paleontology*

Impacts on paleontologic resources would be considered significant if they were to result in damage, destruction or alteration of a paleontologic site containing fossils of unusual scientific value.

Exactly what constitutes "unusual scientific value" is the principal issue for evaluation of impacts to paleontological resources. The occurrence of fossils along the route is not, in itself, necessarily significant. Fossils are important for two basic reasons. One basic reason is for correlating geologic units from different areas; this allows reconstruction of ancient environments and age correlations which increase scientific understanding or the potential for mineral discovery. In this regard, the most important fossils are the abundant, common varieties that occur over wide areas. However, because these fossils are so common and widespread, restricting access to a small, local deposit would not be significant. The other basic reason for fossil importance is that a rare or unusual fossil can help explain a local or unusual, biological or geological environment, provide information on evolutionary trends and provide for an age assignment of an important geologic formation. In this case, destruction of the fossil or restriction of access could be significant.

C.6.2.2 Environmental Impacts and Mitigation Measures

C.6.2.2.1 *Geology*

This Section analyzes the potential impacts of the Proposed Project with regard to geologic features and processes along the corridor. Specific sites for support structures have not yet been identified and site-specific geologic and geotechnical investigations have not yet been conducted by the Applicant, so potential impacts can be discussed only generally. A publication of the CDMG, *Note 46, Guidelines for Geologic/Seismic Considerations in Environmental Impact Reports (1982)*, was used as a guide in identifying potential impacts. In addition, criteria established by NEPA, CEQA and CEQA Guidelines were used to evaluate potential geologic impacts. The impacts discussed in detail below are summarized in tabular form in the Impact Summary Tables following the Executive Summary and in Section C.6.5 (Mitigation Monitoring Program).

Geologic Features

Impacts to geologic features are likely to occur largely during construction activities, and are less likely during maintenance and operations. Geologic features considered include topography and unique geologic formations (e.g., rocky outcrops or formations of public interest). Construction of the transmission line and substations would involve both temporary and permanent alterations to topography as a result of site clearing, staging areas, creating pads for structures, and crane landings and grading for access roads. Table B-3 lists routes requiring improvements. Because of the flexibility in siting of structures and the Applicant's proposed use of existing roads, modification of topography is anticipated to be minimal and unique formations will be avoided. Therefore, impacts of project construction on geologic features are considered not significant **(Class III)**.

Although the impacts on geologic features are not anticipated to be significant, some details of construction and operation have not yet been worked out. To ensure that disruptions are minimized, the following mitigation measure is recommended.

G-1 In areas where ground disturbance is *extensive* or where recontouring is required, surface restoration such as smoothing of grading cuts, redistribution of spoils piles, and revegetation shall be performed. The Construction, Operation, and Maintenance Plan shall include details regarding the restoration proposed for areas listed on Table B-3 and any other area where extensive grading or recontouring would be required.

Faulting

It is difficult if not impossible to construct a lengthy transmission line through a seismically active region with surface faulting such as the site area without crossing both active and potentially active faults. Transmission lines are designed to withstand high winds and generally the flexibility inherent in a transmission line system will readily tolerate horizontal and vertical displacements in excess of the magnitudes anticipated from a worst-case fault rupture. However, large abrupt differential fault displacements may comprise a hazard for structures if the rupture occurs within the foundation or between the legs of project structures.

Displacements between structures are less likely to have a significant impact. Structure failure may occur at the active and potentially active fault crossings along the project alignment. The Proposed Project would cross two active fault zones: the Warm Springs Valley Fault Zone (WSVFZ) along Segment O/Q at MP 107 - 109, and the Honey Lake Fault Zone (HLFZ) along Segment Q/P at MP 121 - 125 (see base maps at the end of Volume I). Active faults are believed to be the faults that are most likely to have surface rupture with horizontal and/or vertical movements that could jeopardize the structural integrity of project structures and facilities. Four potentially active (Quaternary) faults would be crossed at a number of additional locations (see Table C.6-3). Potentially active faults are not believed to have experienced surface displacements within the last 10,000 - 11,000 years, and therefore may be less likely to do so in the near future. However, in many cases faults are designated potentially active only because detailed studies have not been conducted in these remote areas; some of these faults could be active and others could be inactive. Surface rupture on either type of fault would be a significant impact (**Class II**), mitigable through recognition and avoidance.

Following are mitigation measures to reduce the potential impacts of fault displacement on the Proposed Project.

G-2 The Applicant shall not locate structures on or astride an active fault trace. Where any structures are to be located within an Earthquake Fault Zone (EFZ), as designated on official CDMG maps, the Applicant shall conduct a detailed geologic investigation to determine as exactly as possible the location of active fault traces. Detailed geologic investigation shall also be completed in the vicinity of certain potentially active faults such as the Amedee fault (between MP 91 and 92) as this fault may have exhibited signs of possible recent displacement. Geologic evaluations required by this mitigation measure shall be conducted by a California-licensed Geologist in accordance with the guidelines published by the CDMG (Note 49) and California State Board of Registration for Geologists and Geophysicists (1993). Trenching may be required to locate the fault and to provide data for determining the age and amount of past displacements such that determinations can be made as to whether the fault is indeed a hazard to the project. The geologic investigation and recommended mitigation measures shall be reviewed and approved by the Lead Agencies, CDMG, and responsible public agencies prior to permit issuance.

G-3 Where possible, the Applicant shall not locate structures on potentially active fault traces. The Applicant shall complete geologic investigations, including literature review field mapping and aerial-photographic interpretation in the vicinity of potentially active faults to determine their potential hazards. Detailed geologic investigations, such as aerial photograph analysis and trenching, shall be conducted for active and potentially active faults where the trace is not sufficiently defined by published maps or surficial geologic features. These investigation shall include determinations of the maximum expected displacement to help assess whether design can accommodate surface fault rupture. The geologic investigations and recommended mitigation measures shall be reviewed and approved by the Lead Agencies, CDMG, and responsible public agencies prior to permit issuance.

G-4 Where transmission lines cross active fault zones, engineering design of structures and wires shall consider the potential for sudden displacements along these faults. The Applicant shall have a geologic study prepared by a qualified registered geologist, including analysis of maximum displacement, sense of movement, and expected recurrence intervals of movement. The study and recommended design criteria shall be reviewed and approved by the Lead Agencies, CDMG, and responsible public agencies prior to permit issuance.

Ground Shaking

Strong ground shaking caused by earthquakes can cause significant damage to structures, particularly as a result of soil liquefaction, settlement, movement on steep slopes, or other types of ground failure. The Proposed Project is in UBC seismic zones 3 and 4 (moderate to high seismicity), and traverses local areas of steep terrain and unconsolidated sandy soils.

Liquefaction often results in loss of ground bearing capacity and/or lateral spreading, both of which can result in damage to engineered structures. During loss of ground bearing capacity, large deformations can occur within the soil mass, allowing buildings to settle and tilt. If structures are buoyant, they may float upward. Lateral spreading is particularly likely in the vicinity of unlined stream and river channels or other sloping locations underlain by shallow ground water. Damage induced by lateral spreading and liquefaction is generally most severe when liquefaction occurs within 15 to 20 feet of the ground surface.

This combination of geologic conditions results in a potentially significant impact (**Class II**), which, through use of appropriate construction and design techniques could be reduced to less than significant. The following mitigation measures could reduce potential impacts from ground shaking, liquefaction, and slope movement resulting from an earthquake.

G-5 The Applicant shall conduct a geotechnical study to determine the seismic criteria to be used for design of structures and facilities for withstanding strong ground shaking at levels anticipated in the region, in accordance with the guidelines of the CDMG Notes 37, 43, and 48. The geotechnical study and recommended design criteria shall be reviewed and approved by the Lead Agencies, CDMG, and responsible public agencies prior to permit issuance.

G-6 To minimize potential damage from ground shaking, liquefaction, and slope movement resulting from an earthquake, the Applicant shall design all transmission line structures using project-specific criteria in accordance with the design provisions of the CPUC General Order Number 95 and the National Electric Safety Code, ANSI-C2, as published by the Institute of Electrical and Electronic Engineers. Design of control buildings at substations shall follow design criteria contained in the most current UBC appropriate for the seismic zone in which the buildings are to be located. Design of project facilities shall be reviewed and approved by the Lead Agencies and responsible public agencies prior to the commencement of construction. Mitigation Measure G-2 through G-6 will be considered successful if the studies result in recommended design measures that ensure against collapse of project structures and facilities.

Landslides/Slope Stability

Slope failures or downslope creep of unstable natural or man-made slopes could lead to transmission line failure. Proposed construction could impact slope stability where the slopes are underlain by existing landslide deposits or weak rock or soils. High or deep cuts may remove support on slopes. These impacts are considered significant (**Class II**), but can be mitigated. The following mitigation measures could reduce potential slope-stability impacts caused by project construction.

G-7 Slope stability of access roads and structure locations shall be assessed by a qualified engineering geologist and geotechnical engineer in the project geotechnical report as required by Mitigation Measure G-5. Suggested guidelines contained in *CDMG Note 44* and in *Guidelines for Engineering Geologic Reports*, published by the California Board of Registration for Geologists (1993) shall be adhered to as appropriate. Structures shall be located so as to reduce the extent of cuts needed for access roads and pads. The siting of access roads and structures shall be reviewed and approved by the Lead Agencies and responsible public agencies prior to permit issuances. Successful mitigation will result in identification of potentially unstable natural slopes and excavations, and in development of design recommendations that will allow construction and operation without slope failures.

Blasting for foundations in layered volcanic rock could trigger rock falls on nearby steep cliffs. Blasting could also adversely affect nearby structures or wells. Blasting during excavation of tower structures and construction of substation pads may impact wildlife, farm animals, local residents, and tourists. A large amount of blasting is not anticipated because much of the route (about 70 percent) is across alluvium, colluvium, lake deposits, and weathered, fractured formations which can be excavated with conventional grading and excavating equipment (i.e., auger drills, backhoes). Where weathered, volcanic rock formations can be excavated by conventional equipment. Unweathered volcanics commonly are highly fractured and will present a range of excavatability, rippability, and grading conditions ranging from easy to difficult. Where rocks are massive, hard, and unfractured, local blasting may be necessary.

The impacts of blasting appear to be significant (**Class II**) but local and short term, and they can be mitigated, by certain blasting techniques designed and implemented by experienced and licensed personnel. These techniques include choice of charge size and type of blasting material. For example, shaped, directional charges tend to concentrate the blast downward while bulk charges tend to distribute the blast in all directions; slow burning explosives create a fluctuating shock wave which is less detrimental to wildlife than the instantaneous shock waves created by fast burning explosives; shots can be blanketed to reduce the noise level; strategic timing of blasting can help to mitigate adverse effects, that is, blasting should be restricted to months when wildlife is not likely to mating or nesting. Residents and tourists in proximity to the blast area can be notified in advance of blasting so that animals and other property can be protected.

G-8 Prior to Project construction, the Applicant shall prepare a Blasting Plan defining the areas that would require, or be likely to require, blasting operations for structure foundation excavations. The Plan shall include consultation with a certified blasting engineer, geologists, and geohydrologists. The Plan shall also define blasting techniques designed to reduce vibration effects on nearby slopes and structures and shall be prepared in coordination with the Fire Suppression and Prevention Plan (Mitigation Measure P-3 to be prepared for the Project. The Blasting Plan must be designed in coordination with, and reviewed and approved by, the Lead Agencies, and public permitting agencies, as well as water resources and fire protection agencies.

Mineral and Energy Resources

Loss or reduced accessibility of mineral resources could occur as a result of construction of the Proposed Project. Structures located within active or proposed economic deposits would limit the extraction of sand, gravel, cinder at various localities, and pozzolan in Long Valley. This is a significant impact (Class II), and could be mitigated through the implementation of Mitigation Measure G-9.

G-9 Structures shall be sited to avoid existing and proposed mineral and aggregate extraction sites. Access roads and structures shall be sited to allow access to existing and potential mineral extraction sites. Structure and access road siting shall be reviewed by the CDMG/NBMG and approved by the Lead Agencies and public permitting agencies prior to permit issuance. This mitigation would be deemed successful if access to minerals sites is unimpeded.

Geothermal fields are an energy resource in the Wendel-Amedee KGRA (northeastern edge of Honey Lake Valley). The Proposed Project would not disrupt existing extraction activities, but could impact future placement of wells or facilities. This is considered an adverse (but not significant), impact (Class III) as the resource is deep underground, and well placement is flexible.

Volcanic Activity

The Proposed Project is near a volcanically active area. Most of the destructive processes associated with volcanic eruptions, such as explosive eruptions, lava flows, pyroclastic surges, floods, and mud flows are not considered significant impacts because they would occur too far away to impact the project area. However, much of the project, especially the northern two-thirds, is downwind from potentially large eruption sources in the Cascade Range, and therefore may be subject to wind-blown ash fall. Miller

(1989) provides data that suggests up to 8 or 9 inches of ash could be expected in the project area from a major eruption on one of the volcanic centers to the west. Volcanic ash consists of small (0.01 mm), sharp, irregular shards of silica glass which can endanger humans by affecting the respiratory system. A major accumulation of wet ash can cause roofs to collapse. If wet, the heavy ash can destabilize telephone and power lines. Lightning often accompanies the ash clouds and may temporarily interrupt radio communication and even start fires. During a major ash fall, visibility is greatly reduced to near night time levels and can halt air, rail, and automobile traffic. The fine ash can disable motor vehicles, airplanes, and other types of machinery such as air-conditioning and water supply systems by clogging filters, and by plugging collection, treatment, and distribution systems used in sewage and waste-water disposal.

Although such events are exceedingly rare (i.e., once every several hundred to a few thousand years), a thick accumulation of volcanic ash in the Proposed Project area could cause significant impacts which would be beyond the control of the Applicant. Although the ash could cause interruption of electrical power, the resulting impact on the Proposed Project itself would not endanger of the public or the environment.

However, if powerlines were to collapse, sparks could generate fires, the downed powerlines could pose an electrocution hazard to people or wildlife, and buildup of ashes could cause short circuits.

The occurrence of a major ash fall is highly improbable and its ability to cause damage is highly dependent on the simultaneous occurrence of events at the source location, project location, and meteorological conditions between the source and the project area. Also, the damage and destruction caused by the ash fall could far exceed any indirect second-hand, impacts caused by the project. The arrival of the ash would take time to reach the project site allowing initiation of protective measures such as shutting down certain facilities, covering sensitive machinery and equipment, and evacuating personnel. Such events are exceedingly rare so it is difficult to prepare a comprehensive contingency plan based on past experience, but some forethought about what to do could help to mitigate any impacts. The following mitigation measure could reduce any impacts resulting from an ash fall to a level of not significant **(Class II)**.

G-10 Prior to permit issuance an Emergency Preparedness Memorandum shall be developed by the Applicant and reviewed and approved by the Lead Agencies and appropriate permitting agencies to minimize the effect of project-related impacts from a volcanic ash fall on people, motorized equipment, and project facilities. The memorandum shall recognize the potential for ash fall, identify potential avoidable adverse affects to project components, and describe the level of action/non-action to be carried out before, during, and after the ash fall.

The plan should describe conditions under which action (or no action) would be taken. The plan shall itemize the steps taken to minimize any environmental impacts above and beyond that of the ash fall itself. The plan should identify areas and facilities that might fail or short-circuit if inundated by ash, such as ventilation systems, transformers, relays, etc., which would require action to prevent additional adverse consequences such as fires and electrocution.

C.6.2.2.2 *Soils*

Soil conditions evaluated in assessing the potential impacts of the Proposed Project include: soil erosion, loss of agricultural lands, corrosivity of soils, and shrink-swell potential of soils.

Erosion

Construction could cause increased soil erosion as a result of surface disturbance and removal of vegetation. Sedimentation into streams and water bodies would likely increase if disturbed soil were left exposed during winter and early spring (periods of high precipitation, runoff and winds). Streambed erosion is discussed in Section C.7.2.2.1. Erosion potential is generally more severe on steep, sparsely vegetated slopes, fine sandy or silty soils, and in loose sandy soils where strong winds occur. Because some construction activities (road and pad grading, mobilization and transporting, and excavation and inspection) could take place during periods of precipitation and high winds, some erosion is likely to occur, despite revegetation and rehabilitation efforts. Nevertheless, comprehensive erosion-control measures described in Mitigation Measure G-11 could reduce the potentially significant impacts of erosion to a less-than-significant **(Class II)** level.

G-11 Prior to permit issuance the Applicant shall prepare a comprehensive Soil Conservation and Erosion Control Plan (SCEC) that describes measures applicable to the entire extent of the Proposed Project. The objectives of the plan are to reduce short-term erosion and sedimentation, as well as to restore topography and vegetation to pre-construction conditions.

The Applicant shall develop the Plan in cooperation with CPUC, BLM, other responsible public agencies such as the CDFG, USFS, and USACE. At a minimum, the SCEC shall include *Right-of-Way Guide Stipulations of BLM Manual Handbook H-2801-1, Chapter II C.6.a. to e.* The SCEC shall be incorporated into construction documents, plans and specifications. The Plan shall be reviewed and approved by the noted public agencies prior to permit issuance, and its implementation shall be monitored by qualified inspectors and/or scientists during construction and during operations, until successful revegetation is achieved. Important elements of the SCEC that will address each phase of permit issuance and operation of the Proposed Project are as follows:

1. **Develop design criteria** for the Plan after consultation and coordination with involved parties.

2. **Implement general environmental protection measures** to minimize the effects of grading, excavation, and backfilling to enhance rehabilitation, and to minimize erosion and sedimentation. These measures shall include the following:

   - Strictly confine all vehicular traffic associated with construction to the right-of-way or to designated access roads
   - Limit disturbance of soils to the minimum area necessary for access and construction
   - Adhere to construction schedules designed to avoid periods of heavy precipitation or high winds
   - Inform construction personnel initially and periodically of environmental concerns, pertinent laws and regulations, and elements of the SCEC
   - Retain environmental inspectors to enforce environmental protection measures in the field during construction
   - Stream crossings and disturbance of drainage should be minimized
   - Stream channels should not be blocked with graded material
   - Grading should be conducted away from watercourses to reduce the risk of material entering the watercourse
   - Graded material should be sloped and bermed, where possible, to reduce surface water flows across the graded area
   - The time between excavation and backfilling should be minimized
   - Any necessary dewatering of excavations should be directed onto stable surfaces to avoid soil erosion
   - Detention basins, straw bales or silt fences should be used where appropriate.

3. **Use specialized equipment or techniques in highly erodible soils.** Construction equipment that minimizes surface disturbance, soil compaction, and loss of topsoil shall be used, such as vehicles with low ground pressure tires, or helicopters. Steep, erodible slopes should not be cleared until immediately before construction is scheduled to commence. Erodible slopes that do not require grading should be hand-cleared.

4. **Limit temporary access roads to the minimum required.** Primary access for construction crews should be via identified public roadways and existing access roads. A small number of temporary access roads may be required in certain areas where natural environmental features, such as stream crossings or steep slopes, make extensive travel along the right-of-way impractical. These access roads should be located and constructed in accordance with the provisions of the SCEC and requirements of the applicable regulatory authorities. When rehabilitating graded areas rocks and boulders may have to be removed to a designated disposal area(s).

5. **Use drainage control features to direct surface runoff.** A variety of drainage-control structures shall be used to direct surface drainage away from disturbed right-of-way, and to control runoff and sediment downslope from all disturbed areas. These structures include

culverts, ditches, water bars (berms and cross ditches), and sediment traps. Develop schedules and specifications on the use of these features.

6. **Revegetate all disturbed areas.** Revegetation seeding mixtures, methods and rates should be developed in coordination with the requirements of Mitigation Measures B-1 to B-5. Redistributed soil properties (texture and restrictive features, such as wind and water erosion hazard, chemical properties, and drainage) shall be considered. Schedule rehabilitation activities based on construction schedules and seasonal climatic variations.

7. **Use special rehabilitation measures where appropriate.** Areas of steep slopes, sandy or clayey soils, and shallow groundwater will require special soil handling techniques and more intensive monitoring.

   Slopes greater than 15 percent are considered steep from a soil management perspective. Special handling techniques for steep slopes include:

   - Replacing topsoil and leaving the seedbed rough
   - Using mulch or erosion-control matting to protect the seed and seedbed from erosion by wind and water.

   In areas of sandy or clayey soils, the following measures would assist in rehabilitation:

   - Reducing compaction in clayey subsoil by ripping and discing
   - Preparing the seedbed to reduce compaction in clayey soils, and seeding with a mixture of local native plant species
   - Protecting the seedbed of sandy soils from wind erosion by using snow fences, straw bales, or increased mulch rates.

   Soils in shallow ground water table areas are sensitive because deep rutting and compaction may occur more readily than in drier areas. Certain types of soils are especially susceptible to compaction and rutting by vehicles during wet weather and this is one of the primary causes of problems during reclamation of a project. When the soils are compressed or churned up by vehicles, it is very difficult to regrow vegetation. Soils of the vertisol order are especially susceptible because they are high in clay content and are prone to swelling when wet and shrinking when drying, forming deep cracks. Such soils are common, for example, on the large dry lake beds such as in Madeline Plains, Mud Flat, and Honey Lake Valley.

   For soils other than vertisols, the following standard shall apply to all construction activities:

   - No construction or routine maintenance activities shall be performed when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of 3 inches deep for more than 100 feet, the soil shall be deemed too wet to adequately support construction equipment.

Vertisol soils shall be identified prior to construction, and specific construction standards and methods shall be developed and submitted to the CDFG and BLM for review 60 days prior to construction.

- No construction or routine maintenance activities shall be performed during periods when the vertisol soils are too wet to adequately support construction equipment. If such equipment creates ruts in excess of 6 inches deep for more than 100 feet, the soil shall be deemed too wet to adequately support construction equipment. After construction, and prior to reclamation, the Applicant shall conduct tests to document the degree of compaction of the soils and submit compaction values from a set of at least 20, and not more than 60, randomly determined locations within vertisol soils along the ROW. These values shall be submitted to the CDFG and the BLM, 14 days prior to reclamation, for a determination as to whether remediation of compaction is necessary. Remediation methods may consist of ripping of soil (depth approximately 3 inches) and/or the addition of organic mulch or sand. Remediation methods and specifications shall be reviewed and approved by the CDFG and BLM before implementation and may be altered by CDFG/BLM to conform to site-specific needs. On all occurrences of vertisols the soils shall be left with 100 percent mulch cover over the ROW. The success of restoration in vertisol soils shall be evaluated by the return of the vegetation to pre-construction conditions.

8. **Stream and wetland crossings.** The number of stream crossings shall be reduced to a minimum because they require special care to protect the variety of resources that could be affected. Resources affected include soils, vegetation, wildlife, fisheries, and water quality.

   The Applicant shall notify the CDFG and consummate a Streambed Alteration Agreement pursuant to the Fish and Game Code (Section 1600 et seq.), as well as Section 404 Permit as required by the USACE and storm-water permits required by Local Water Quality Control Board.

   A protective strip of vegetation should be left on both sides of each stream crossing for as long as possible before construction to minimize sedimentation that may result from erosion of disturbed areas. Where topographic conditions permit, staging areas and additional access roads (such as equipment turnaround areas) shall be kept at least 100 feet back from streambanks and wetlands.

   Damage to streambanks shall be minimized during construction in the ROW. Existing vehicle stream crossings shall be used to the maximum extent possible. Where necessary, temporary crossings should be installed during the clearing phase and should consist of temporary bridges, swamp mats or culverts, and ramps constructed of clean fill. Stream crossings shall be constructed only during low flow periods. No flowing watercourses should be forded unless approval is obtained from the appropriate authorities. Temporary vehicle crossings should be removed at the completion of construction, and the beds and banks of the watercourse should be restored to approximate preconstruction conditions.

Erosion and sediment control practices shall be evaluated during spring to determine their effectiveness. If problems are identified, remedial measures shall be implemented as soon as practicable.

Loss of Agricultural Lands

Highly productive soils, or prime agricultural lands, are rare along the Proposed Project ROW. Where structures are located within high-capability soils, some existing or potential productivity will be impacted. Over the entire length of the Proposed Project, less than 3 miles comprises high-capability soils. These soils are on Federal lands and much of the area could be avoided by strategic placement of structures.

This potential loss of these agricultural lands may be an adverse impact, but is not considered significant (**Class III**). However, some lands not considered highly productive are cultivated. These are discussed in Section C.8. The impact of the Proposed Project on agricultural lands can be reduced by the application of the following mitigation measure.

G-12 Removal of private agricultural land from production will be negotiated between the Applicant and landowner. The Applicant shall compensate the landowner for any loss or reduction of agricultural land. The applicant and landowner may agree as part of the negotiation process to participate in arbitration mediation or to have appraisers determine the value of the loss.

Corrosive Soils

The potential for steel corrosion (uncoated steel) is moderate to high for much of the project alignment (see Tables C.6-3 and C.6-4). Certain soil types within Lassen and Sierra Counties (Calneva and Playas) have a high corrosive potential for concrete. This impact is significant but mitigable (**Class II**).

G-13 Foundation and tower structures should be protected from corrosion in accordance with industry standards, the geotechnical/engineering geologic report, and standard practice for transmission line structures.

High Shrink-Swell Potential

Expansive soils are scattered throughout the project alignment (see Soil Characteristics Tables in Appendix F) and can damage structures whose foundations rest in the upper 4 feet of the soil profile (i.e., the zone of the seasonal wetting and drying). Because structure foundations generally would be below this zone, their integrity should not be significantly impacted by expansive soils. However, substation foundations could be impacted. The presence of expansive soils may be a significant, but mitigable

(Class II) impact. The following mitigation measure would reduce the potential impacts of expansive soil on the Proposed Project.

G-14 The project geotechnical studies shall identify areas of expansive soils. The effect of these soils on the proposed facilities shall be evaluated and where they represent a potential hazard, the expansive soils shall be over excavated and replaced with compacted backfill. The identification of expansive soil sites shall occur prior to permit issuance, subject to the review and approval of the Lead Agencies and responsible permitting agencies. Furthermore, backfill material must be certified to be free of all noxious weed material and propagules.

C.6.2.2.3 *Paleontology*

No specific paleontologic sites are known to exist within the Proposed Project area; however, 17 geologic units crossed by the project route have been identified as having the potential for containing paleontologic remains. Detailed, specific surveys of the project corridor have not been conducted, and existence and precise location of any paleontologic resources have not been determined. Construction of the Proposed Project, particularly the excavation of holes for structures, may result in the loss, destruction, or alteration of paleontologic resources at construction locations. This is considered a significant impact (Class II), but mitigable to a level that is less than significant with application of the following measure.

G-15 Prior to construction, the Applicant shall develop and implement a Paleontologic Data Inventory and Sampling Plan (PDISP). The Plan shall be prepared in coordination with paleontologists familiar with local resource sites, or who are engaged in active research in the project area and shall be approved by appropriate resource management agencies. Procedures for evaluating fossil resource potential, construction monitoring, and for collecting any important fossils shall be similar to the draft guidelines of the Society of Vertebrate Paleontology as contained in the society's News Bulletin No. 163 (January, 1995). The Plan shall identify potential fossil-bearing localities believed to have scientific value, making use of subsurface data collected during project geotechnical investigations, such as drill cuttings or trench spoils, at structure and substation locations. If significant fossils are found or suspected at proposed excavation sites, site-specific mitigation measures shall be developed. Such measures shall include monitoring and, if determined possible by the Lead Agencies and responsible permitting agencies, removal of fossils by professional paleontologists prior to construction.

Excavation activities during construction in potential fossil-bearing localities identified in the PDISP defined above shall be monitored. Monitoring shall be performed by an inspector trained to recognize fossils suspected to occur at the selected construction sites; the monitor shall be authorized to halt construction activity. The PDISP shall establish procedures for temporarily halting construction, and notifying the Lead Agencies, or other authorized agent, and an approved paleontologist in the event fossils are encountered. As defined in the PDISP, the paleontologist will evaluate the significance of the find, and implement removal and archival procedures, as required by Lead Agencies or their authorized agent. Removals shall be conducted under permit authorization from appropriate resource management authorities. Fossils collected shall be cataloged and placed in appropriate museum or university repositories as approved by resource management agencies.

C.6.2.2.4 *Subsidence/Collapsible Soils*

Subsidence could result from earthquake shaking, fault movements, or ground-water withdrawal. Such subsidence generally occurs over large areas and is not important to specific local sites and thus impacts are not considered significant **(Class III)**. Rocky areas underlain by young volcanic rocks can have open cavities which could collapse if loaded, and coarse-grained alluvial-fan-type sediments can collapse due to hydrocompaction. All of these potential hazards should be detected during the course of normal geotechnical design and testing and thus can be avoided or accounted for by normal geotechnical procedures. No mitigation measures are necessary beyond those previously discussed to mitigate impacts of ground shaking (G-5, G-6).

C.6.2.3 Cumulative Impacts and Mitigation Measures

Other projects that may be conducted in the area of the Proposed Project during the same time frame are described in Section B.5. The only impacts from these projects which could generate cumulative geological, soils, or paleontological effects with the Proposed Project are construction-related impacts from projects that would be built at the same time as the Proposed Project. Several of the listed projects that would have construction impacts are small residential, single-building, or farming enterprises which will have no significant cumulative effects. The Proposed Project could affect access to the Sierra Lady Mineral project, but the size of that operation is so small that it would amount to little more than adding two transmission-line support structures and, therefore, the cumulative effects would be minimal and insignificant. Other projects such as the LMUD Intertie would not be built at the same time as the Proposed Project, so would not have cumulative geological impacts. Several of the other listed projects, such as the California Correctional Facility, are too far from the Proposed Project to have cumulative geological impacts. The only project on the cumulative projects list that could result in cumulative geological impacts is the proposed Tuscarora Pipeline.

The Tuscarora Pipeline would cross the Proposed Project ROW about 1 mile south of Angle Point AØ6 and then extend easterly well beyond the project ROW to U.S. 395. The two projects would rejoin in the Madeline Plains area where they would follow the same alignment in several intermittent locations to the Fort Sage Mountain area (see Section B.5). Construction of the Tuscarora project would involve about a 100-foot-wide easement. Construction of both projects could result in increased erosion potential from construction vehicular traffic and excavating activities. The increased erosion potential from construction would be more of a timing issue than a volume issue because both projects would ultimately be required to mitigate their areas of disturbance. In other words, if the two projects are constructed one after the other, the time during which disturbed soils could be subjected to erosion would increase, but the actual erosion may not occur. Another potential cumulative construction impact could result from blasting. In areas of hard rock both projects might require blasting to enable excavation.

These construction impacts are significant but mitigable to a level that is not significant (Class II). Specific mitigation measures to reduce the impacts identified are G-1, and G-8 through G-11. Cooperative mitigation of impacts between the Tuscarora Project and the Alturas Transmission Line Project will be included in the Soil Conservation and Erosion Control Plan required by Mitigation Measure G-11. In the event that reclamation by the Tuscarora Project is already underway or complete when the Alturas Transmission Line Project begins, the Applicant shall be responsible for all mitigation of impacts from construction and overland travel within the Tuscarora ROW. Such mitigation shall comply with the specifications identified in the Tuscarora FEIR/EIS in addition to the mitigations required for the Alturas Project.

A small flood-control dam has been proposed for the Evans Creek watershed. The location of the dam and its reservoir/catch basin are well south of the Proposed Project and thus will have no direct impact on the project (or vice versa). Borrow areas for the clay core of the dam are within the Proposed Project corridor Segment X; the preferred source is near MP 162.5 to 162.6 and an alternate source is near MP 163.7 to 163.9. Both of these areas are small enough that they could be spanned by structures on either side of the borrow areas. Cumulative impacts would comprise potential increase in erosion. These impacts could be mitigated to a level of not significant (Class III) by Mitigation Measures G-1, G-9, and G-11.

C.6.2.4 Unavoidable Significant Impacts

The potential hazard of an ash fall from the volcanos west of the project area would be an unavoidable significant impact. Although the probability of such an occurrence is exceedingly small, there is no way to completely reduce the impacts to a level that is not significant. The impact would be on the project itself, and not an impact caused by the project, and all local facilities, citizens, and the environment would also be affected by the ash fall.

C.6.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

C.6.3.1 Alturas Area Alternative Alignment (Segment B)

Alternative Segment B extends westward from the town of Alturas to near the east bank of Rattlesnake Creek, and then, southwesterly to Proposed Segment A about 3 miles south of town (see Section B.4.1.1 and map B-1 at the end of Volume I). This alternative begins in the flat, low-lying terrain of the Pit River Valley on sedimentary rocks of the Upper Member of the Alturas Formation. Southerly, the alternative extends through a mesa and valley terrain and underlain by the volcanic rocks of the Alturas Formation. The rocks and soils along Alternative Segment B are essentially the same types as those traversed by Proposed Segment A, except that Segment A also traverses basalts of the Devils Garden Plateau. Soils along both of these routes are quite similar and generally consist of thin gravelly and sandy loams overlying hard volcanic bedrock.

Alternative Segment B would not cross any active or potentially active faults but may be subject to strong earthquake shaking from nearby large-magnitude earthquakes, like most other segments of the Proposed Project. Local pockets of the soft modern sediments within the floodplain of the Pit River may be subject to liquefaction from nearby large-magnitude earthquakes when saturated with water. There are no known significant paleontological resources along this alternative route segment. The portion of Alternative Segment B that would cross the volcanic rocks along the southern part of the alternative may require blasting when excavating structure foundations. Mitigation Measure G-8 addresses blasting impacts. Some volcanic eruption impacts may not be completely mitigable and thus represent a significant unavoidable impact (**Class I**). All other geological, soils, and paleontological impacts are considered **Class II**, mitigable by mitigation measures discussed in Section C.6.2.2. Alternative Segment B is north of the Route of the proposed Tuscarora Pipeline so there should not be any significant cumulative geological impacts.

In summary, Alternative Segment B is very similar to Proposed Segment A and there are no clear advantages to either segment.

C.6.3.2 Madeline Plains Alternatives (Segments D, F, G, H, I)

Several alternative segments have been proposed within the Madeline Plains area. Basically these segments traverse the west side of the valley in contrast to Proposed Segments E which extend along the eastern side of the valley (see Figure B.4-3 and base maps at the end of Volume I).

The alternative segments traverse two basic geologic units which are very similar to those along Proposed Segment E. These are Miocene/Pliocene-age, hard, volcanic rocks and Pleistocene-age sediments (Ql) deposited in ice-age lakes that once covered the Madeline Plains. The Ql consists of silt and clay with lesser amounts of sand (DWR, 1963). The volcanic rocks comprise a variety of basaltic and andesitic flow rocks and pyroclastic rocks within the Tdrb, Tsma, Twra, and Tppf formations (Table C.6-2). About 32 percent of the Madeline Plains alternative segments are underlain by lake deposits and about 68 percent by volcanic rock. The Proposed Segment B comprises about 44 percent lake deposits. The surficial soils of all of these lake deposits are clayey and have a high shrink-swell potential and a high corrosion potential for uncoated steel (Tables F-1 to F-3, Appendix F).

The terrain across the Madeline Plains crossed by Alternative Segments G, F, H, and I is nearly featureless and quite flat. The topography north of the Madeline Plains, along Alternative Segment D, is mountainous and quite rugged requiring extensive overland travel (see maps D-1 through D-3 at the end of Volume I). Construction would involve blading within the ROW over about 8 miles of the 11-mile long segment. The remaining portion of Alternative Segment D would be accessed via existing 4WD trails which would need to be upgraded to accommodate construction vehicles. About 8 miles of roads and trails would require upgrading along Alternative Segment D.

Alternative Segment D would cross the Nelson Corral fault, one of the major potentially active faults in the project region (Figure C.6-3 and the end of Volume I, maps D-1 and D-2). This portion of the fault has a prominent scarp up to 300 feet high in proximity to Alternative Segment D. Farther south, in the Madeline Plains, the fault is relatively subtle, indicating that it has moved in late-Quaternary time but probably not within Holocene time.

Except for about 1 mile at the extreme north end, Alternative Segment F would primarily cross the Quaternary sediments of the Madeline Plains (see end of Volume I, maps F1 and F2). The first mile would require blading along the ROW for construction access. The remainder of the alternative is across the flat, open, dry-lake bed of the Madeline Plains with relief of less than about 5 feet.

Alternative Segment G is nearly identical to Alternative Segment F and would require about 1 mile of blading for construction access on the north (at the end of Volume I, maps G-1 and G-2). The remainder of the alternative is across the flat dry-lake bed of the Madeline Plains. Relief along this alternative is also less than about 5 feet.

Alternative Segment I extends easterly from the intersection of Alternative Segments G and H see (Figure B.4-3 and Map I-1 at the end of Volume I). This alternative also crosses the sediments of the Madeline Plains with less than five feet of surface relief.

Construction impacts from these alternative segments would be significant but mitigable (**Class II**). Applicable Mitigation Measures are G-1 through G-5 and G-11, G-13, and G-14.

In summary, Alternative Segments F, G, H, and I are very similar to Proposed Segments E and K and offer no clear geological advantages. However, these alternatives extend from Alternative Segment D which crosses over hard volcanic rock which will require more grading and possibly more blasting than the Proposed Segment E, and thus this alternative would result in greater impacts than the Proposed Segment E.

C.6.3.3 Ravendale Alternative Alignment (Segment J, I)

Alternative Segment J extends southeasterly from the intersection of Alternative Segments G-H-I (see maps J-1 through J-4 at the end of Volume I). The first couple miles of Alternative Segment J would cross the Pleistocene-age dry lake sediments (Ql) and the remaining 14 miles would cross Pliocene and Miocene-age volcanic bedrock (Tdrb, Tsma, Twra, and Tppf). These flows and pyroclastic rocks are nearly horizontal along this segment (Grose et al., 1992). Near the southern margin of the Madeline Plains, the alternative would pass near several cone-like volcanic plugs. These were thought by DWR (1963) to be Pleistocene-age volcanic centers, but Grose et al. (1992) dated similar rocks in this area as Pliocene (Tdrb, Tppf) to middle Miocene (Twra) in age. The surficial soils of the lake beds are the clayey soils (for example, Ravendale soil, 211 on Tables F-1 to F-3, Appendix F) and have a high shrink-swell potential and a high corrosion potential for steel.

The southern 14 miles of the alternative would cross hilly terrain with local relief of a few hundred feet (i.e. 100-300 feet). The irregular topography of this part of the alternative would require blading over about 9 miles for construction access and more than 3 miles of upgrading of existing roads and trails. The foundations of some structures along this alternative would likely be in hard rocks and may require blasting.

The southern part of Alternative Segment J extends along and crosses several Quaternary-age faults (see end of Volume I). The displacement history of these faults is not well documented. They do not appear to have experienced any recent surface displacement (Jennings, 1992), and therefore there is little likelihood of surface rupture, but they should be considered potentially active for the earthquake ground-motion analysis (Mitigation Measure G-5).

The impacts of construction and operation of Alternative Segment J are significant but mitigable (Class II) by Mitigation Measures G-1, G-5, G-6, G-8, and G-10 through G-13.

In summary, Alternative Segment J will require substantially more grading than Proposed Segment K.

C.6.3.4 East Secret Valley Alignment (Segment ESVA)

Alternative Segment ESVA is about 1.5 miles east of U.S. 395, along the eastern margin of Secret Valley. This alternative has an irregular terrain because it traverses eroded volcanic rocks and valley floor sediments. Relief along this alternative is about 300 to 400 feet. The geologic formations are primarily Miocene-age volcanic rocks with short segments across Pliocene lake-bed deposits which are composed of volcanic ash, sand, and gravel interbedded with Pliocene basalt. The Miocene volcanics are hard rocks whereas the lake beds are moderately consolidated. These geological formations are essentially flat and undeformed. There are no known active or potentially active faults crossing this route and the valley appears to be primarily an erosional feature in contrast to most valleys in the region which are fault controlled. There are no known minerals or fossils although lake bed deposits such as these commonly are rich in microscopic plant fossils such as diatoms.

The impacts of Alternative Segment ESVA would be much the same as those described for Proposed Segment L (see Section C.6.2.2) because the geologic units and conditions are very similar. The area would be subject to ash fall from a major volcanic eruption in the Cascade Range to the west, like the rest of the region. Mitigation Measure G-10 would reduce the impacts, but some effects cannot be completely mitigated **(Class I)**. This alternative would cross harder rocks and would probably require blasting. Blasting is a significant impact but could be mitigated **(Class II)** by Mitigation Measure G-8. Although there are no active or potentially active faults, the alternative can expect to be shaken by strong earthquakes from nearby faults. The impacts of these earthquakes are significant but mitigable **(Class II)** by Mitigation Measures G-5 and G-6. Construction could create erosion which could be mitigated by Mitigation Measure G-11. Alternative Segment ESVA is parallel to the Tuscarora Pipeline alignment, so there could be cumulative impacts from ground disturbance and erosion. These impacts could be mitigated by Mitigation Measure G-11.

In summary, the geology, soils, and paleontology are similar to the Proposed Project, but this alternative alignment would probably require more grading and blasting which, although mitigable to levels of not significant **(Class II)**, would cause greater impacts.

C.6.3.5 Wendel Alternative Alignment (Segment M)

Alternative Segment M would be along the northeast margin of Honey Lake Valley (see Map M-1 at the end of Volume I). The alternative descends southerly from about 4400 feet elevation, where it departs from the main line (Proposed Segment N), to about 4100 feet and then approximately parallels elevation contours around a hill to its southerly intersection with the main line. The total length is less than 4 miles.

A small portion of Alternative Segment M, near the northern intersection with Proposed Segment N, is on volcanic rocks (Tvsa) but the bulk of the segment is on alluvial (Qlg) and lake (Ql) sediments. The southern half of the alternative is close to the contact with the volcanic rocks (Twa) along the southwest margin of the Skedaddle Mountains and thus hard bedrock may be at shallow depth below Qlg and Q1 along this part of the alternative.

The Ql deposits are Pleistocene-age clay, silt, and sand whereas the Qlg are gravelly deposits. The volcanic rocks comprise Miocene-age lava flows from ancient shield volcanos to the northeast. Soils are generally gravelly loam and loamy sand with low shrink-swell potential and moderate to high corrosion potential for steel.

Jennings (1992) shows a short northeast-trending late-Quaternary-age fault extending across both Alternative Segment M and Proposed Segment N just northwest of Angle Point MØ2 (MMP 2-3, map M-1, at the end of Volume I). This is a very minor feature only about 2 miles long, and thus does not appear to be capable of large ground displacements or large earthquakes. The feature is associated with tufa deposits indicating that thermal waters have flowed along the fracture. The northerly trending Amedee fault is about 2 miles to the east.

Alternative Segment M would not require much blading or road improvement for construction or operations. The part of the alternative between Angle Points MØ1 and MØ2 would coincide with the Tuscarora Pipeline. Because the two projects would occupy the same corridor in this location there should be no compounding of ground disturbance and hence no significant cumulative geological impacts. A hog farm is planned about half a mile west of Alternative Segment M. This farm would be a small local enterprise and therefore should not conflict with or result in significant cumulative impacts. There are several geothermal utilities and activities in proximity to this alternative but none of these would be crossed by the transmission lines so there should not be any significant adverse impacts on geothermal activities.

There do not appear to be any significant unavoidable impacts other than the volcanic hazard which affects all alternatives equally. All impacts are **Class II** or **III** and Mitigation Measures G-1, G-3, G-5 through G-8, G-11, G-12, and G-15 (Section C.6.2) would reduce impacts to insignificant levels.

In summary, Alternative Segment M is very similar to Proposed Segment N but would result in less impacts because it would require less grading.

C.6.3.6 West Side of Fort Sage Mountains (Segment P)

Alternative Segment P extends due south from the floor of Honey Lake Valley into and across the Fort Sage Mountains to northern Long Valley (Figure B.4-4 and the end of Volume I, Maps P-1 through P-4).

The northern part of the alternative extends for about 4 miles across lake and river deposits of the dry lake bed of Honey Lake Valley. Much of this part of the alternative is overlain by loose wind-blown sand dunes. The central 7 miles is across the Fort Sage Mountains which are composed of Cretaceous-age granitic rocks. The alternative extends along the western slope of the range maintaining a fairly constant gradient between about the 4800 and 5000 foot elevations. It then descends to the floor of Long Valley and extends for about 6 miles to the intersection with Proposed Segment Q just west of Seven Lakes Mountains. The floor of Long Valley is underlain by alluvial and lake sediments. Soils along the alternative are primarily sandy and gravelly loams. These soils generally have a low shrink-swell potential and a moderate to high potential for steel corrosion. Blading would be needed for about 5 to 6 miles within the ROW of Alternative Segment P across the Fort Sage Mountains, and about 5 miles of existing roads and trails would need to be upgraded for construction access. Some blasting may be required within the granitic rocks.

Alternative Segment P would cross several active and potentially active faults and is in close proximity to several other faults. The Warm Springs Valley fault and the Honey Lake fault zones (at the end of Volume I, Map P-1 and P-3, respectively) are major active faults with a potential for large surface displacements. These faults have been designated Alquist-Priolo Earthquake Fault Zones by the California Division of Mines and Geology. The alternative parallels, within about one-half to 1 mile, an escarpment that formed during an earthquake in 1950 (at the end of Volume I, map P-2). Also, the southern end of Alternative Segment P is within half a mile of the Diamond Mountain fault. The part of the alternative through the Fort Sage Mountains (PMP 7-9) is coincident with a northerly trending fault. This fault is not known to have been active in Quaternary time and therefore, is not shown on the maps, but it has the same orientation as the 1950 rupture so it would not be surprising if it also represented a potentially active fault. In addition to the potential for ground rupture and strong earthquake shaking, there may be a potential for liquefaction in the sandy units of Honey Lake and Long Valley if these units are saturated with ground water. The depth to the ground water table is not well documented in this area, but probably is more than 30 feet deep except near active streams, so the liquefaction potential overall is not high.

The principal geological impacts along Alternative Segment P would result from ground disturbance due to construction. The fault crossings and proximity to faults would impact the project by requiring siting studies to ensure that the structures are not placed within active fault zones, and that the structures are designed to withstand ground rupture and earthquake shaking. These impacts are significant **(Class II)** but mitigable with Mitigation Measures G-1 through G-6, G-8, and G-11. If the fault that coincides with the alternative in the Fort Sage Mountains is potentially active, it may not be possible to keep the structures out of the fault zone, and therefore Mitigation Measure G-3 should be applied.

In summary, Alternative Segment P is similar to the proposed Segment Q but it will require more grading and coincides with a fault of unknown character which will require substantial additional studies and which could caste shifts in the expected layout if it turns out to be an active or potentially active fault. This alternative would result in greater impact then Proposed Segment Q.

C.6.3.7 Long Valley Alignments (Segments S, U, Z, and WCFG)

These alternative segments are within Long Valley, a long, narrow, fault-bounded basin in close proximity to the Proposed Segments T and W, thus the geologic characteristics are essentially the same for the proposed and alternative segments. Vertical separations on faults on the west side of the valley have resulted in the east side of the fault (i.e., the valley) being displaced downward resulting in an asymmetrical valley profile. The floor of the valley is largely underlain by Pliocene-age basin fill and lake deposits of the Hallelujah Formation (Th_3, Th_2, Th_1, Th_0) (at the end of Volume I, Maps P-4, S-1, Z-1, and W1). Active streams have eroded channels into the Hallelujah Formation which are filled with modern stream alluvium (Qa). Out of 33 miles of combined Proposed Project and alternative segments, only about 2 miles cross Quaternary alluvium (Qa, Qc); about 94 percent of these segments is underlain by Pliocene sedimentary rocks (Hallelujah Formation). The alluvium is generally unconsolidated silt, sand, and gravel. The Hallelujah Formation comprises primarily deposits of sandstone and siltstone with subordinate amounts of gravel, volcanic ash, and diatomaceous earth. A conglomerate with very large boulders (bb) occurs at scattered localities, especially along Alternative Segment U (at the end of Volume I, Map S-1).

The soils formed in this area are generally sandy and gravelly loams. Most of these soils have low shrink-swell potential, but there are scattered pockets with moderate potential. These soils generally have a moderate corrosion potential for steel with some zones of high corrosivity along Alternative Segment S. Erodibility of these soils is generally low but there are some zones of moderate erodibility within the stream channels along Alternative Segment S.

Ground disturbance in the form of blading within the ROW would be necessary during construction and operation on several of the alternative segments. Table C.6-8 lists the amount and percentage of the total length needing blading:

Table C.6-8 Blading Requirements

Alternative Segment	No. Miles Needing Blading	Percent of Segment
Segment S	1.3 miles	37 percent
Segment Z	0.6 miles	14 percent
Segment WCFG	0.4 miles	8 percent

As discussed above, Long Valley is a fault-bounded valley with the major faults being along the west side of the valley. The northern part of this fault zone is called the Diamond Mountain fault (at the end of Volume I, Maps P-4 and S-1). About 1.3 miles of Alternative Segment S ROW would coincide with this fault. The fault is not zoned as an Alquist-Priolo Earthquake Fault Zone, therefore its potential for surface displacement is very low. However, many similar faults in the Great Basin province with long recurrence intervals have a potential for generating earthquakes. Therefore, it is prudent to consider features such as the Diamond Mountain fault as **Class II** impacts in the earthquake ground-motion analyses (Mitigation Measure G-5). The other alternative as well as the proposed segments in this area do not cross any other known active or potentially active faults. The unconsolidated modern stream alluvium sediment may have a potential for liquefaction if saturated.

The diatomaceous beds within the Hallelujah Formation are mined for pozzolan, and there may be other economic sources of this material in the formation not yet discovered.

Impacts from faults, earthquakes, construction, erosion, corrosion, and minerals may be significant along these alternative segments (**Class II**), but they are mitigable by applying the mitigation measures discussed in Section C.6.2.2. Particular mitigation measures that should be applicable are G-1 through G-6, G-9, G-10, and G-12. There are no significant unavoidable or cumulative impacts along any of these alternative routes although Alternative Segment S seems somewhat less desirable than the Proposed Project considering the geological impacts of faulting.

Construction activities may cause cumulative impacts with the pozzolan recovery operation about 3300 feet west of Alternative Segment Z (ZMP 2-3 area). Both projects would create short-term wind and water erosion potential (**Class II**), mitigable by erosion-protection (Mitigation Measure G-11).

A ski resort/golf club is proposed to be built about 1 mile west of Alternative Segment WCFG. If the Proposed Project and the resort were built at the same time, construction impacts would accumulate (**Class II**). The impacts of these potential cumulative impacts could be reduced to insignificant by Mitigation Measure G-11.

In summary, these alternatives are very similar to the Proposed route and there are no clear differences. Alternative WCFG may result in greater impacts because it crosses more low-lying area which could be subject to more erosion than the proposed route.

C.6.3.8 Peavine Peak Alternative Alignment (Segment X-East)

Alternative Segment X-East is about 2 miles long and would result in a lower elevation route along the east side of Peavine Peak, just northwest of Reno. This alternative descends southeasterly from the principal route at about 5600 feet elevation to about 5400 feet over a distance of 1 mile, then extends southerly for another mile along a side-hill ridge to rejoin the proposed route. The alternative is close enough to the proposed segment that the rock types and geological conditions are identical. The Alternative Segment X-East is underlain by Tertiary-age volcanic flow and breccia rocks of the Alta

Formation (at the end of Volume I, Map X-1), which are commonly hydrothermally altered. These rocks are overlain by primarily gravelly loam soils. These soils have a low to moderate shrink-swell potential and are potentially corrosive due to the hydrothermal alteration. These rocks and soils can be excavated with conventional grading equipment (Mitigation Measure G-13).

There are several local faults in the area (Map X-1) proximity but these are of early-Pleistocene or late Pliocene-age. Such faults generally are not active and do not represent a significant earthquake hazard.

No mineral resources have been identified but there are several inactive prospects in the area. Care must be taken not to place any structures over collapsible mine workings. There is a small area on Alternative Segment X-East (between X-10 and X-11) that is shown as a possible source of crushed aggregate (Bingler et al., 1973), but field reconnaissance could not verify the source.

There are no significant unmitigable, unavoidable, or cumulative impacts associated with Alternative Segment X-East (other than the ash-fall hazard that would affect the Proposed Project and all alternative segments equally). Impacts can be mitigated by instituting the mitigation measures discussed in Section C.6.2.2: Specific mitigation measures applicable to this alternative are the same as for the principal route: G-1, G-5 through G-11, and G-13.

In summary, Alternative Segment X-East is nearly identical to the Proposed Segment Y. There are no significant differences between the two routes.

C.6.3.9 Substation Alternatives

C.6.3.9.1 *Alturas Substation Alternative Site (Mill Site)*

The Mill Site is an eight acre site near Alternative Segment B on the west side of the town of Alturas, south of Highway 299 (Figure B.4.2). Facilities to be constructed at this alternative site would be similar to those proposed for the primary site and consist of a control building, transformers, breakers, and various electrical devices. These facilities would be within a perimeter security fence and founded on either a concrete slab or on a three-inch-thick gravel blanket.

The geologic formation at the site is the Alturas Formation (generalized within the Tv unit on Figure C.6-2), which in this area comprises gently folded beds of sedimentary rocks of the Upper Alturas Formation composed of volcanically derived debris (ash) mixed with sand from local streams and lake-bottom muds. These sedimentary rocks overlie and are interbedded with volcanic flow rocks and tuffs of the Warm Springs member. These formations were deposited in an ancient lake that occupied the area in Pliocene-Miocene time (5-10 million years ago). The deposits are moderately consolidated and thus should provide firm support for foundations but still be excavatable using conventional grading equipment. The soils at this site are thin gravelly and clayey loams with low to high shrink-swell potential, and a moderate to high corrosion potential for steel. The corrosion potential for concrete is low. These soils have low erodability but are thin (about 12 to 18 inches thick) and would probably be removed within the perimeter of the facility during construction.

There are no known active or potentially active faults crossing this site, but the site could be subjected to shaking from infrequent distant earthquakes, like all other facilities in the Alturas area. The terrain is relatively flat with little potential for landsliding. Geologically this appears to be a favorable site for a substation. Any adverse impacts from construction at the site are either not significant (**Class III**) or can be mitigated to levels of not significant (**Class II**) by applying Mitigation Measures G-1, G-5 through G-7, G-10, and G-11.

In summary, the Alternative Substation (Mill Site) would result in slightly greater impacts than the Proposed site because it is in the lowlands where construction activity has a greater chance of causing erosion and siltation than the Proposed Site.

C.6.3.9.2 *Border Town Substation Alternative Site*

The Border Town Substation Alternative site is in Long Valley on the California side of the California-Nevada boundary. Facilities to be constructed at the alternative site would be similar to those for the Proposed Project site, and consist of a control building, transformers, breakers, and various electrical devices. These facilities would be within a perimeter security fence and founded on either a concrete slab or on a 3-inch-thick gravel blanket.

The Border Town Substation Alternative site is within the southern part of Long Valley about 2000 feet south of the Proposed Project site (at the end of Volume I, Map 30). Long Valley is a narrow, fault-bounded valley along the western margin of the Great Basin province. The site is on a relatively flat, elevated terrace along the east side of the valley adjacent to a narrow broad flat-buttoned trough which formed as result of erosion and down-cutting by Long Valley Creek. The elevated terraces are underlain by the Hallelujah Formation (Thu), which is composed of moderately consolidated sediments, sandstone, conglomerate, and siltstone. These materials should provide adequate support for foundations and generally can be graded with conventional equipment. The channel eroded by Long Valley Creek is filled with sandy and gravelly Quaternary Alluvium (Qa).

Strata of the Hallelujah Formation are gently tilted down to the west as a result of down-to-the-east normal fault displacement on a major fault along the west side of the valley. There are no known active or potentially active faults crossing the alternative site location, but the site can expect to be shaken by infrequent distant earthquakes off site. The effects of these earthquakes can be mitigated by proper engineering and design.

The Hallelujah Formation has beds of diatomite that are mined for pozzolan farther to the north in Long Valley. It is possible that similar deposits occur at the site but the existing mines and their surrounding areas to the north are probably adequate for future markets such that restricted access to the small area of the substation site would not be significant. Diatomite is composed of microscopic fossils and as such also may be a paleontological resource. However, the known outcrops and buried beds farther to the north essentially represent a major source of the same microfossils so restricted access to the site would not be significant (**Class III**).

Geologically there is little difference between this Alternative Site and the Proposed Project site. There are no significant adverse geotechnical conditions, such as landslides, and thus the Alternative site is generally suitable for a substation facility. Significant construction impacts (**Class II**) can be mitigated by Mitigation Measure G-11. Earthquake impacts can be mitigated by Mitigation Measures G-5 and G-6. Mitigation Measure G-9 can ensure that mineral resources are not significantly impacted, and paleontological impacts can be mitigated by Mitigation Measure G-15.

C.6.4 NO PROJECT ALTERNATIVE

Under the No Project Alternative, construction of the Proposed Project would not occur. However, as explained in Part B.4, other transmission and power generation options would need to be pursued by SPPCo if their growth projections are realized, resulting in construction and operational impacts. These impacts would be expected to be similar to those described in Section C.6.2, but they could vary depending on the routing locations of alternatives.

C.6.5 MITIGATION MONITORING PROGRAM

The EIR/S prepared for this project indicates that the Proposed Project (and Alternatives) may have significant impacts on the environment. In addition, some hydrological events and conditions could have significant impacts on the project that would inhibit its successful and economic completion and operation. The foregoing sections recommend measures to mitigate these impacts, identify how these measures should be implemented, and who should ensure their effectiveness. Generally, the Applicant is responsible for implementing and financing the mitigation measures and various Federal, State, and local governmental agencies are responsible for approving plans, for monitoring and implementing these plans, and for judging their effectiveness. The following table (Table C.6-9) summarizes the recommended mitigation measures, responsible monitoring agencies, and methods for monitoring implementation of the mitigation measures.

Table C.6-9 Mitigation Monitoring Program

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Disturbed ground or unique geologic formations (Class III)	**G-1** Regrade and recontour disturbed areas. Avoid unique geologic formations.	All Proposed and Alternative Segments	BLM CPUC CDFG CDMG NBMG USACE USFS	Review plans; inspect route during construction	Compliance with approved plans; construction monitored; disturbed ground regraded and/or recontoured to minimize residual affects	During construction
Fault displacement collapsing transmission line structures or substation (Class II)	**G-2** Avoid placement of structures within active fault zone. **G-3** Avoid placement of structures within potentially active fault zones, where possible. **G-4** Conduct geological and/or geotechnical studies to determine amount of fault displacement; design transmission line to withstand expected maximum fault displacement.	Proposed Segments A, C, E, L, N, O, Q, X Alternative Segments D, J, M, P, S, U, Z, WCFG	BLM CPUC CDMG Counties NBMG	Review alignment plans to ensure avoidance; review geologic and geotechnical studies; review as-built maps	Active and potentially active faults are identified on maps of project alignment. No structures located in fault zones. Fault displacement are quantified; design is adequate to resist collapse during expected events. Permits issued; post construction verification.	Review Plans before permit issuance; inspect after construction
Strong ground shaking collapsing transmission line structures or substation facilities (Class II)	**G-5** Conduct geotechnical study to determine seismic criteria for designing structures to withstand strong ground shaking. **G-6** Determine and apply earthquake-resistant design.	All Proposed and Alternative Segments	BLM CPUC CDMG NBMG	1) Review and approve plans 2) Review as-built plans to ensure design was implemented	Compliance with approved plans; facilities built with adequate safety factor to resist damage during large earthquakes.	1) Prior to permit issuance (G-5) or construction (G-6) 2) After construction
Landslides/slope instability damaging structures (Class II)	**G-7** Perform engineering geological and/or geotechnical investigations for structures on slopes within known landslide areas. **G-8** Develop blasting plan to avoid causing landslides or rock falls.	Proposed Segments C, E, L, N, Q, R, T, W, X Alternative Segments B, D, J, M, P, X-East,	BLM CPUC County Building & Safety NBMG	Review investigation report and approve geologist/engineer's recommendations. Review and approve blasting plan. Monitor construction.	Potentially unstable slopes identified and recommendation for corrective action complied with	Perform studies and prepare plans prior to construction.
Loss of or reduced accessibility to mineral resources (Class II)	**G-9** In siting structures and ROW access roads, avoid existing and planned mineral extraction sites and access routes.	Proposed Segments R, T, W, X, and Border Town Substation Alternative Segments M, S, U, WCFG, and Alternative Border Town Substation (SPPCo Site)	BLM CPUC CDMG	Review plans for ROW access roads and placement of structures and substations	No structures or substations located on or preventing access to mine roads or known reserves	Prior to permit issuance

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Ash fall from major volcanic eruption in region (Class II)	**G-10** Develop Emergency Preparedness Plan to identify project components at risk, and develop procedures to minimize impacts.	All Proposed and Alternative Segments	BLM CPUC Counties FEMA NBMG	Review memorandum	Compliance with approved memo that describes measures to be undertaken during an ash fall.	Prior to permit issuance
Construction resulting in grading and ground disturbance and erosion (Class II)	**G-11** Applicant shall prepare Soil Conservation and Erosion Control Plan; minimize new grading and road upgrading; use special equipment; revegetate.	All Proposed and Alternative Segments	BLM CPUC	Review plan, monitor construction	Compliance with approved plan. Graded areas protected from erosion, special equipment used where appropriate, drainage across construction sites controlled, disturbed areas revegetated no construction during wet periods, no deep tire ruts, stream crossings minimized, and banks protected.	Prior to permit issuance
Loss of agricultural lands (Class III)	**G-12** Negotiate with landowners and compensate for loss or reduction of agricultural land	Proposed Segments A, E, K, O, W, X Alternative Segments B, F, G, H, I,	BLM CPUC	Review negotiated agreements	Agreements mutually agreed upon	Complete negotiations prior to construction
Steel or concrete corrosion resulting from corrosive soils (Class II)	**G-13** Test soils for corrosion potential; design to prevent corrosion where potential is high.	Proposed and Alternative Segments A, C, E, K, L, N, O, Q, T, W, Alternative Segments D, F, G, H, I, J, M, P, S, X-East	BLM CPUC Counties	Review plans	Compliance with approved plan; structures designed to resist corrosion	Complete testing and design prior to construction
Damage to project from expansive soils (Class II)	**G-14** Test soils for shrink-swell potential; design facilities to withstand expansivity.	Proposed Segments A, E, K, L, O, Q, R, T, X Alternative Segments D, F, G, H, I, J, M, X-East,	BLM CPUC Counties	Review plans and geotechnical reports	Compliance with recommendations of geotechnical report; facilities designed and built to withstand expansive soils	Complete testing and design prior to permit issuance
Loss, destruction, or alteration of paleontological resources (Class II)	**G-15** Develop paleontologic data inventory and sampling plan; inspect drill cuttings and excavations.	Proposed Segments A, C, L, M, O, Q, R, T, W Alternative Segments J, P, Border Town Alternative Substation (SPPCo Site)	BLM CPUC CDMG NBMG	Review plans; inspect excavations; develop site-specific measures if fossils are found	Compliance with approved plan; fossils catalogued and/or collected and placed in repositories	Develop plan prior to construction; implement during construction

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PART C.7 HYDROLOGY

C.7.1 ENVIRONMENTAL BASELINE AND REGULATORY SETTING

C.7.1.1 Characteristics of the Study Region

The Proposed Alturas Transmission Line Project traverses northeastern California and crosses a small section of northwestern Nevada, comprising a total of 165 linear miles. Approximately 30 miles of the project are within the Modoc Plateau physiographic province, and the remainder are within the Great Basin province.

The climate in the area is dry, and is most influenced by the landward movement of water-bearing air masses which originate over the northern Pacific Ocean and Pacific Coast. However, moisture from the Pacific rarely reaches this inland area. The Klamath and Coast Ranges to the west are the recipients of the majority of precipitation. The average annual precipitation (as a mixture of rain and snow) ranges from 6 to 16 inches near Alturas (DWR, 1963) to 5 to 10 inches per year near Reno (Kahrl, 1979) at the southern terminus of the route. Approximately 70 per cent of the precipitation falls between October and March; the heaviest precipitation usually occurs in December (DWR, 1986).

Seasonal temperatures vary considerably over the study area. In winter months, temperatures can dip to as low as minus 30 degrees Fahrenheit in the snow-covered mountains and on the Modoc Plateau. During summer months, when the Pacific high pressure ridge dominates regional weather patterns, northerly and westerly winds result in warm and dry summer months with temperatures often exceeding 100 degrees (DWR, 1963).

The project would cross two drainage basins, the Central Valley and Lahontan Drainage Basins, which include one major river system, the Pit River. The Pit River originates in Modoc County and lies within the Central Valley Drainage Basin. Pit River runoff is a mixture of rain and snowmelt, with peak flows averaging 8500 acre-feet per month from February through May (Kahrl, 1979).

Four ground water basins, or hydrographic units, lie within the Central Valley and Lahontan Drainage Basins. The various ground water basins (and subbasins, if present and applicable), located within the Proposed Project right-of-way (ROW) are described in detail in Section C.7.1.2.2.

C.7.1.2 Project Route Characteristics

C.7.1.2.1 *Surface Flow*

Hydrology

The following discussion is primarily based on analysis of the Geographic Information System (GIS) hydrologic database. The delineation of surface water courses was estimated from topographic maps and the tabulated GIS data with limited onsite reconnaissance.

The proposed Alturas Transmission Line Project would cross 10 surface water bodies, consisting of streams or irrigation canals; no ponds or lakes lie in the Proposed Project alignment. Most streams crossed by the ROW are dry washes for most of the year, carrying surface water only during wet months and periods of snow melt. The dry washes, or intermittent streams, consist of two general types: broad-bottomed vegetated swales and narrow, bare-bottomed sandy channels. The latter are more likely to carry water during times of precipitation or snow melt, whereas the swales are more likely to absorb any runoff. These intermittent or ephemeral drainages are shown on base maps at the end of Volume I. Perennial stream crossings are presented in Table C.7-1, identified by milepost number, associated drainage basins and watersheds, and flow regimes. Streams generally carry their highest flows in the spring (March) and are lowest in summer and autumn (July-October).

The Pit River is the major river system encountered in the project ROW. This river flows from its headwaters north of Alturas in Modoc County, west to Lake Shasta, and is primarily spring fed. The ROW crosses the Pit River approximately 2 miles west of Alturas where it has an approximate width of 100 feet. Stream gaging station data is not available for seasonal flow rates for this portion of the Pit River; however, Stream Gaging Station 4 is located near Canby, approximately 20 miles downriver from the ROW crossing. At Gaging Station 4, the Pit River is approximately 100 feet wide and has an approximate depth of 3.0 feet; in 1904, a record 13,000 cubic feet per second (cfs) flow was recorded (USGS, 1991). Average monthly flow for the period 1972-1987 was 269.9 cfs, and the average annual rate was 3,238.5 cfs (USGS, 1991). Maximum flows were recorded in March, with the general trend of increased flow rates in winter and spring due to storm runoff and snowmelt.

Water Quality and Uses

Pit River water is characterized as having good to excellent water quality suitable for most beneficial uses. Beneficial uses include municipal and agricultural supply, hydroelectric power generation, contact and non-contact recreation, warm-water spawning and habitat, and wildlife habitat.

Table C.7-1 Perennial Stream Crossings

Route Segment; Location	County	Name	Flow Regime	Project Impacts
A: MP 4.8	Modoc	Pit River	Perennial, gaged	Flooding; erosion, sediment loading
C: MP 19.8	Modoc	Crooks Canyon	Perennial	Erosion, sediment loading
C: MP 24.8	Modoc	Stones Canyon	Perennial	Erosion, sediment loading
C: MP 29.4	Modoc	Dry Creek	Perennial	Flooding; erosion, sediment loading
L: MP 66.65	Lassen	Secret Creek	Wet Meadow	Erosion, sediment loading
L: MP 68.5	Lassen	Cherry Creek	Perennial	Erosion, sediment loading
L: MP 69.15	Lassen	Unnamed	Wet Meadow	Erosion, sediment loading
L: MP 70	Lassen	Unnamed	Wet Meadow w/stream	Erosion, sediment loading
Q: MP 122.4	Lassen	Dry Valley	Perennial	Flooding; erosion, sediment loading
T: MP 126.45	Lassen	Red Rock Canyon	Perennial	Flooding; erosion, sediment loading

Surface water quality in this area is generally affected by reduced flows, elevated temperatures, sedimentation, and enhanced nutrient loading from nonpoint sources. Many of the small and intermittent streams that the Proposed Project would cross may have been affected by agricultural practices and grazing. No surface water intakes for drinking water exist in Modoc or Lassen Counties.

Flooding

Floodplain information was collected and published by the Federal Emergency Management Agency (FEMA). The project alignment crosses seven designated 100-year floodplains. Table C.7-2 presents data on floodplains identified within the proposed alignment. These floodplains are found in the vicinity of the Pit River, widespread in the Madeline Plains, present in the Secret Valley Basin, and intermittent through Honey Lake Valley Basin, particularly along the alignment in Long Valley.

C.7.1.2.2 *Ground Water*

As stated above, the Proposed Project would cross two drainage basins and four ground water basins. Ground water occurrence, quality, and use, as they apply to the scope of this project are presented below for each of the four ground water basins.

Table C.7-2 100-Year Floodplains Crossed by Proposed Project

Route Segment; Location	County	# Feet in Floodplain	Floodplain Area/Name	Project Impacts
A: MP 4.4-4.85	Modoc	2,400	Pit River	1-2 structures within floodplain
K: MP 50.3-52.1	Lassen	18,500	Madeline Plains	12-15 structures within floodplain
L: MP 75.4-75.7	Lassen	1,600	Deep Creek	1 structure within floodplain
L: MP 79.1-80.7	Lassen	9,000	Mud Flat	7-8 structures within floodplain
O: MP 110.5-111.1	Lassen	3,500	Honey Lake Valley	2-3 structures within floodplain
Q: MP 128.9-129.4	Washoe	1,400	Dry Valley	1 structure may be needed in floodplain
T: MP 126.4-126.5	Lassen	400	Red Rock Canyon	Project could span floodplain; no structures affected
	TOTAL:	**36,800**		**23-30 structures located in floodplains**

Alturas Ground Water Basin

The Alturas Ground Water Basin is divided into two subbasins: South Fork Pit River Subbasin and Warm Springs Valley Subbasin. The basis for this division lies with the presence of materials of low permeability in the mesa land that separates the two subbasins. The Proposed Project alignment would be east of the Warm Springs Valley Subbasin, passing through the northwest corner of the South Fork Pit River Subbasin. Therefore, the discussion below focuses on this area.

The Proposed Project alignment would cross the South Fork Pit River Subbasin near the confluence of the two forks of the Pit River: West Rock Creek, and Rattlesnake Creek. Near-surface water in this area moves towards this confluence and rises to the surface, flowing out of the subbasin by way of the Pit River (DWR, 1963). Therefore, it is anticipated that shallow ground water would be encountered during project construction in the immediate vicinity of the river crossing. However, the elevation increases rapidly in the area immediately south of the river within the ROW; this area is west of the subbasin, and depths to ground water increase to greater than 100 feet below grade (fbg) (DWR, 1963). There is a difference of about 5 to 10 feet in ground-water levels between spring and fall. A recent decline in ground-water levels has been noted in some localized areas; northeast of Alturas, levels dropped about 5 feet between 1975 and 1982 (DWR, 1986).

The principal water-bearing formation in the Alturas Basin is the widespread Alturas Formation. According to the California Department of Water Resources (DWR, 1963), the formation consists of moderately consolidated, flat-lying beds of tuff, ashy sandstone, and diatomite. All of the materials were deposited in lakes which occupied this area at various times from the latest part of the Miocene epoch to Pliocene epoch.

Most recharge of ground water occurs in the upland areas of Devils Garden, Portuguese Ridge, and the western slope of the Warner Mountains. Ground water movement in the basin generally follows the topography with water moving from the upland recharge areas that ring the valley down to the valley floor. Ground water in the South Fork Pit River Subbasin moves in a northerly direction towards Alturas. South of County Road 170 there is considerable recharge from irrigation water (DWR, 1986). From Alturas, the ground water moves westerly into Warm Springs Valley Subbasin. In Warm Springs Valley, ground water migrates from the north, east, and south, then westerly along with the Pit River.

Ground water quality in the Alturas subbasin is generally good and suitable for most uses; the Warm Springs Valley subbasin ground water, however, is of poorer quality due to high mineral content. The ground waters of the Warm Springs Valley basin are generally sodium bicarbonate in character. Ground water use in the Alturas Ground Water Basin is primarily for domestic and agriculture purposes. Data from 141 wells indicated that 8 wells produce water with dissolved solids concentrations that exceeded levels recommended for domestic use, and 11 wells produced water which could cause severe problems if used for irrigation (DWR, 1986). Most irrigation supplies in the area come from surface water. Of the 53,000 acres being irrigated in 1979, about 4,400 acre feet came from pumped ground water.

Madeline Plains Ground Water Basin

The Madeline Plains Ground Water Basin is subdivided into the Madeline Plains, Dry Valley, Grasshopper Valley, and Ravendale Subbasins. The Proposed Project ROW would pass along the eastern flank of the Madeline Plains Subbasin, and the western and southern portions of the Ravendale Subbasin. The Madeline Plains is a basin of internal drainage with no surface outlet and hence is within the Great Basin province. Streams in the Madeline Plains area flow only intermittently during or immediately following periods of rainfall (DWR, 1963, p. 183).

The principal water-bearing formations in the Madeline Ground Water Basin are the Pliocene-Miocene lava flows, Pleistocene lake and near-shore deposits, and Holocene valley sediments. It is unlikely that activities relating to construction or operation of the Proposed Project would encounter shallow ground water through this portion of the alignment. However, springs may be encountered in the upland recharge areas of the Madeline Springs and Ravendale Subbasins. These springs flow from joints and fractures in the lavas surrounding the valley floor areas.

Ground water in the basin is of generally good quality. However, as a closed basin with limited recharge, it is susceptible to increased degradation resulting from increased use and reuse of water. Water from most wells already has high electrical conductivity, indicating high salinity. The greatest ground water potential for the Madeline Plains Basin is for wells drilled to depths of several hundred feet. Most ground water in this basin is used for domestic water supply and watering stock (DWR, 1963). Recent developments by Lyneta Farms have substantially increased the acreage of irrigated fields (primarily alfalfa) in the basin. The source of this irrigation water is a combination of deep wells and runoff/snowmelt in the spring.

Secret Valley Ground Water Basin

The Proposed Project would enter Secret Valley east of Secret Creek between Snowstorm and Shinn Mountains, and travel along the valley floor before exiting the valley between Shaffer and the Skedaddle Mountains. The Secret Valley Basin may be hydrologically connected to the Honey Lake Valley Ground Water Basin (Pearson, 1987).

Water-bearing formations in the basin consist of Pleistocene to Miocene lava flows, Pliocene lake deposits, and Holocene valley sediments. Of these, the lavas are the principal aquifers in Secret Valley and may yield large amounts of confined water to wells (DWR, 1963). However, these aquifers are several hundred feet below grade in the area of the Proposed Project. These aquifers are recharged in surrounding uplands by infiltration of precipitation. In Secret Valley, only 6 to 8 inches of mean seasonal precipitation is likely (DWR, 1963). Most ground water in the valley is used for domestic water supply and watering stock, however, there are at least two irrigation wells in the valley (DWR, 1963). The data are insufficient to characterize both the quality of, and potential for ground water in Secret Valley. However, it is likely to be similar to the other enclosed basins in the region.

Honey Lake Valley Ground Water Basin

The Proposed Project ROW would enter the Honey Lake Valley Ground Water Basin north of Wendel, California. Ground water in Honey Lake Valley mainly originates as precipitation and in the drainage areas of the Susan River and Long Valley Creek. Precipitation infiltrates through unconsolidated deposits and faults and fractures in consolidated rocks to become ground water. Ground water flows down gradient from recharge areas in or near the mountains to discharge areas near the central axis of the basin (Handman et al., 1990).

Thermal water is found in several places in the basin, most notably in the Wendel and Amedee areas. According to Juncal and Bohm (1987), the geothermal water is part of a flow system in fractured bedrock and is related to the Honey Lake range-front fault zone, and the Walker Lane fault system. Recharge for the system is from precipitation in the Diamond Mountain range of the Sierra Nevada. Meteoric water infiltrates and circulates deeply in granitic bedrock beneath the valley floor. It is heated by above-average regional heat flow related to volcanism, and rises along the north-northeast-striking faults. Hot-spring locations might be controlled by the intersection of the north-striking and northwest-striking faults. (Handman et al., 1990).

The majority of irrigated land within the Honey Valley Ground Water Basin receives water from the Susan River which flows into Honey Lake from the northwest (DWR, 1963). However, ground water resources have been developed to supplement the surface water supplies as demand has increased for irrigation water.

Analyses of about 500 surface and ground water samples from the Nevada Division of Health, the California Department of Water Resources, the Washoe County Department of Public Works, the Sierra Army Depot, and several published reports (Hilton, 1963; Rush and Glancy, 1967; Clawson, 1968; William F. Guyton Associates, 1987) indicate that the water quality in much of Honey Lake Valley is suitable for irrigation, stock watering, industrial, commercial, and domestic uses (Handman et al., 1990). In the eastern part of the basin, calcium, sodium, and bicarbonate ions predominate in streams fed by mountain springs. Sodium and bicarbonate ions predominate in most ground water samples, and the dissolved solids concentrations are low, generally less than 500 milligrams per liter. In the central part of the basin, sodium and chloride ions predominate and dissolved solids concentrations are higher. Geothermal areas also are characterized by high dissolved solids concentrations, dominated by sodium and sulfate ions. Areas in the basin where ground water contains elevated concentrations of dissolved solids, boron, fluoride, and nitrate have been delineated by the California Department of Water Resources (DWR, 1963). Water from thermal springs at Amedee and Wendel, and from several wells near Standish and elsewhere in Honey Lake Valley, contain elevated concentrations of arsenic (Wormald, 1970). There was no significant change in ground water availability or quality between 1963 and 1987 (Pearson, 1987).

In general, the dissolved solids concentration in ground water increases with depth and with distance from the recharge area because longer flow paths allow more contact with soluble minerals of the aquifer. In the central parts of topographically closed basins, such as Honey Lake Valley, deep water moves upward under artesian pressure into shallower aquifers and continues to dissolve minerals along its flow path. Concentrations of dissolved solids in water in shallow aquifers are increased further by evapotranspiration near the surface. Thus, concentrations of dissolved solids in water in the upper parts of aquifers in some discharge areas (along the central axis of the basin, including Honey Lake and the playa areas) may decrease with depth. Actual flow paths are more complicated than indicated by this simple concept and involve recirculation and mixing of water from different source areas due to density differences caused by differences in temperature or chemical concentrations.

Water quality in the eastern part of the Honey Valley Ground Water Basin is typically poor. In 1963, about 60 percent of the wells east of Bald Mountain yielded poor quality water (DWR, 1963). Much of the ROW alignment, from just south of Wendel to Herlong is within a water-quality hazard area. Ground water in this area shows great variability in character and quality. Reuse and mineralization both contribute to degradation of the ground water.

C.7.1.3 Applicable Regulations, Plans and Standards

Several Federal, State, and county agencies will require permits and would be involved in developing plans and mitigation monitoring because the project will traverse several streams and wetlands. The principal Federal agencies will be the U.S. Bureau of Land Management (BLM), the U.S. Department of Agriculture, Forest Service (USFS), the U.S. Army Corps of Engineers (USACE), and the U.S.

Department of Interior, Fish and Wildlife Service (USFWS). The principal State agencies will be the California Public Utilities Commission (CPUC); the California Department of Conservation, Division of Water Resources (CDWR); the California Department of Fish and Game (CDFG), Northern California-North Coast Region (Region 1); the California Department of Forestry (CDF); the California Regional Water Quality Control Board, Lahontan Region; the Calfornia Regional Water Quality Control Board, Central Valley Region; and the Nevada Department of Conservation and Natural Resources, Divisions of Wildlife, and Water Resources.

The USACE will require a "Section 404 Permit" for construction within the waters of the United States or adjacent wetlands. Most of the floodplains of perennial stream channels crossed would be considered waters of the United States as defined by the ordinary high-water mark of the individual channels. The USACE, in reviewing 404 Permit applications, stresses avoidance of impacts, minimization of unavoidable impacts, and mitigation of unavoidable impacts.

The CDFG has direct jurisdiction, under Fish and Game Code Sections 1601-1603, on any activities that will divert or obstruct natural flow or change the bed, channel, or bank of any stream. The CDFG Code requires that formal notification and subsequent agreement, including mitigation measures, must be completed prior to initiating such changes. The 1603 Agreement is similar to the 404 Permit, but the area of jurisdiction is typically defined on a case-by-case basis for the location, nature and extent of disturbance, and mitigation.

The Water Quality Control Plans (Basin Plans) of the California Water Quality Control Boards require water quality certifications for wetlands and stream crossings under Section 401 of the Clean Water Act. A General Construction Activity Storm Water Permit would be required from the State Water Resources Control Board (SWRCB) under National Pollution Discharge and Elimination System (NPDES) regulations. The Regional Water Quality Control Board (RWQCB) may require an individual NPDES permit depending upon the extent of wetlands disturbance.

To obtain the general permit, a Storm Water Pollution Prevention Plan (SWPPP) must be prepared. The SWPPP will outline Best Management Practices to minimize water contamination during construction. Many of these practices are included in the Project Description (Part B) and mitigation measures of this report (for example, Section C.6.2.2.2). Best Management Practices pertain to, but are not limited to, dry crossings of streams; seeding or revegetation of disturbed areas according to an established revegetation and landscaping plan; using water bars, diversion channels, and terraces to control erosion on steep terrain; maintaining construction sites in sanitary condition; disposal of wastes at appropriate locations; and control of stream sediments with straw bales or fabric filters.

The Nevada Department of Water Resources requires Water Rights for any construction use of water from a well or a stream. Dewatering for construction will need a Waiver Request.

In addition to the State and Federal requirements above, the California counties of Modoc, Lassen, and Sierra have State-mandated General Plans including elements which must be satisfied or modified to accommodate any new facilities that are currently not covered in existing plans (see Section C.8, Land Use).

C.7.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

C.7.2.1 Definition and Use of Significance Criteria

Potential impacts to water resources would result from construction and operation of the Proposed Project. Construction impacts on surface water include erosion of streambeds and banks due to vehicular traffic, increased erosion and siltation from nearby disturbed soils, and accidental spills of hazardous materials. Construction of the Proposed Project in floodplains could result in damage to wetlands or alteration of stream flow; floods could also damage project facilities. In addition, construction could impact the flow of shallow ground water by causing a change in the permeability of aquifers or confining layers. Operational impacts include the effects of increased erosion from vehicular traffic and flooding.

Impacts on surface water or ground water would be considered significant if:

- Flood peaks on the streams crossed by the Proposed Project or alternatives would be increased by an amount sufficient to create a one-tenth foot rise in the 100-year water surface elevation. In the case of cumulative impacts, the significance criterion is 1 foot rise in water surface elevation.
- Permanent structures or fill would be placed above ground and within the 100-year floodway as defined by the Federal Emergency Management Agency (FEMA, 1985).
- Structures or substations constructed in conjunction with the transmission line would be subjected to a substantial risk of damage through flooding or erosion, which is defined as an increase of 1 foot per second in 100-year flow velocity.
- Lateral erosion, stream-bed scour, or long-term channel degradation would result in short- or long-term exposure of the structure or substation foundations to air or flowing water.
- Flooding or scour would result in significant damage to access roads/bridges or to other structures related to the Proposed Project. Significant damage to these structures could place the transmission line at risk of failure, and is defined by lateral erosion which outflanks the structure, vertical scour which extends deeper than the structure piers or abutments, and overtopping of the structure.
- Construction activities would violate State or Federal water quality standards or objectives, or would result in the discharge of contaminants (such as gasoline or diesel fuel) into the surface flow of a stream.
- Construction would divert or reduce subsurface flow to wetland areas, springs, or aquifers.
- The Proposed Project or alternatives would result in a long-term substantial increase in the sediment load of a stream (e.g., post-project construction).

- Construction would result in a short-term, direct discharge of sediment into a flowing stream in excess of the minimum necessary to divert flows around the construction site.

C.7.2.2 Environmental Impacts and Mitigation Measures

C.7.2.2.1 *Impacts on Surface Water*

Potential project impacts on surface water include effects on surface water quality, as well as impacts caused by scour, erosion, or flooding. Table C.7-1 summarizes the locations where the Proposed Project would cross perennial streams. In addition, the Proposed Project would traverse wetlands along segments A, L, W, and X. The Applicant does not propose to locate any structures within the perennial streambeds or the Pit River. For the Proposed Project, the Applicant has stated that the crossing of perennial streams and rivers by construction equipment would be limited to crossing one perennial stream (Crooks Canyon). SPPCo expects that they will need to cross the stream in Crooks Canyon during construction by using a temporary bridge. In addition, the applicant has stated that the crossing of wetlands by construction equipment would be minimized. Streams, rivers, and wetlands could also be affected by construction activity upstream or in the drainage area. Also, to gain or expand access to remote areas, the Applicant would construct or improve access roads, which may require the installation of bridges and culverts.

Scour and Erosion

Scour and erosion impacts can occur in two ways. Project construction may have an effect on the scour and erosive characteristics of a stream or river. In addition, normal scour and erosion in a stream or river can affect project structures or roads. Impacts could also occur as a result of vehicular traffic across streambeds and riverbeds or as a result of increased erosion in disturbed areas upslope. The extent of impact is dependent to a large degree on the width of the stream or river, the amount of flow, the duration of flow, whether intermittent or perennial, and the distance to downstream water bodies or beneficial users.

Note that Mitigation Measure G-11 in Section C.6.2.2.2 (Soils) presents detailed requirements for a Soil Conservation and Erosion Control Plan. Some elements of that Plan are repeated in this Section. As stated in Mitigation Measure G-11, scour and erosion shall be specifically addressed in the Streambed Alteration Agreement with CDFG as part of the Plan.

Scour. According to the Project Description, the structure foundations would be between 10 and 30 feet deep, depending on structure type. The scour potential for most streams is less than 10 feet, while larger rivers have scour potential of over 20 feet. As previously stated, the structures would be placed outside of the streambeds and rivers (except in flood conditions; see following section). Scour impacts to streams, rivers, or other property caused by the project would be unlikely unless the stream topography was altered by project construction. Where construction activities require the crossing of stream and riverbeds, the scour potential of the streambed could increase if the installation, use, and removal of temporary bridges resulted in the alteration of stream or river topography. This impact is considered significant, but mitigable through the implementation of Mitigation Measure H-1 (**Class II**).

H-1 The Applicant shall prepare a Stream Crossings and Wetlands Protection Plan that includes each perennial stream and river that would be traversed during project construction. This plan shall be in accordance with Fish and Game Code Section 1601-1603 and shall describe the location and method of stream and river crossing, including any construction techniques required. The plan shall demonstrate how stream and riverbed topography will not be permanently altered by project construction. In addition, the plan shall include methods for stream and river bank protection including, but not limited to, soil stabilization techniques, temporary retention basins, and drainage diversion structures. The mitigation shall include installation of culverts on small streams with clean washed gravel which may be left in place after the culverts are removed. Gravel berms used for culverts shall be returned to natural stream grade upon completion of construction activities. Preferably these tasks shall be done with hand tools, but if impractical, pneumatic-tired vehicles may be used in the live stream channel. Siltation catchment basins or silt curtains shall be in place prior to any vehicular activity in the stream. The plan shall be developed in conjunction with and subject to the review and approval of the BLM, CPUC, and affected responsible, public agencies such as CDFG, USFS, and USACE prior to permit issuance.

Erosion. Where project construction requires the crossing of stream and riverbeds, the stream and river banks would be subject to lateral erosion. The extent of lateral erosion is more difficult to predict than bed scour, but in general it can be assumed that erosion would be greater at the outside of bends and at stream channels that are too small to carry the 100-year flood. Lateral erosion could expose structure foundations if structures were located adjacent to stream banks. The potential impacts from lateral erosion of the stream channel at stream crossings are considered significant, but these impacts can be mitigated to a level that is not significant (**Class II**). Mitigation Measures H-1 (above) and G-11 would reduce lateral erosion impacts.

Lateral erosion could affect the Proposed Project where the project is parallel and adjacent to the banks of the Pit River and Long Valley Creek. Rivers are capable of moving their banks hundreds of feet in a relatively short time. The river banks are usually subject to lateral erosion during floods which could expose the structure foundations after one or two large floods unless properly mitigated. Impacts could be significant (**Class II**), but Mitigation Measure H-2 would reduce impacts to a level that is not significant.

H-2 Where the Proposed Project parallels waterways such as the Pit River and Long Valley Creek, the Applicant shall maximize the distance of the centerline of the Proposed Project route from these waterways. The Applicant and Lead Agencies shall monitor the integrity of stream and river banks. If channel bank erosion begins to threaten project components, the river and stream banks shall be stabilized to prevent further erosion. Method of compliance with this measure shall be demonstrated in the Construction, Operation, and Maintenance Plan (Plan of Development) and the Streambed Crossings and Wetlands Protection Plan to be developed for the Proposed Project. These plans shall be subject to the review and approval of the BLM, CPUC, and affected public agencies, such as CDFG, USFS and USACE, prior to permit issuance.

Flooding

Table C.7-2 summarizes the seven locations where the Proposed Project would cross or pass through a designated 100-year floodplain. The total length of the project within floodplains is estimated to be 36,500 feet. Based on the size of each floodplain area and the average distance between structures, as many as 30 structures could be placed within designated 100-year flood zones.

Construction. Flooding impacts could occur if the normal flow path of water is obstructed or diverted. Project construction impacts could result if flow is obstructed by materials used for stream or riverbed crossing. Flooding or inundation of the construction area by active low flows could interfere with construction activities and affect the quality of surface flow and ground water. Construction-related flooding impacts are considered significant (**Class II**). However, these impacts would be temporary and could be reduced to a level that is not significant by Mitigation Measures H-1 and H-3.

H-3 Construction activities at river and stream crossings shall be limited to periods of low flow during late summer and autumn (August-October) as approved by the BLM, CPUC, and affected public agencies, prior to the commencement of construction.

Operation. Flooding impacts where structures are located in designated 100-year floodplains are considered significant because floods could erode structure support. Where structures can be spaced far enough apart to span a FEMA-designated floodplain, as would be possible in two of the seven floodplains crossed (see Table C.7-2), no impact would result. However, in the five larger floodplains, structures would have to be placed in the floodplains themselves, and the potential impact would be significant, but mitigable through the implementation of Mitigation Measure H-4 (**Class II**).

H-4 Permanent structures, facilities, and access roads associated with the Proposed Project shall be located outside of streams and riverbeds. In addition, structures shall be located outside of designated 100-year floodplains where possible. Where floodplains cannot be avoided, structures shall be designed according to site-specific analyses by a civil engineer with experience in floodplain engineering. Structure foundation location and designs shall be reviewed and approved by responsible public agencies (e.g., USACE) prior to permit issuance.

Surface Water Quality

Adverse surface water quality impacts could result from construction of the Proposed Project in streams, rivers, creeks, and wetlands adjacent to the construction area or immediately downstream. Construction-related impacts could result from sediment loading of the water or from accidental discharge of oil, fuel, or other construction-related contaminants.

Sediment Loading. Sediment loading in waterways could result from the following construction activities: clearing and grading, excavation, backfilling and excess spoil disposal, and topsoil handling and replacement. In addition, the erosion of upslope areas could result in deposition of sediment within stream and riverbeds. Mitigation measures proposed in other sections of this document would place stringent controls on clearing and grading, protection of property, management of topsoil handling and replacement, excavation, back filling and excess spoil disposal, erosion controls and revegetation during and after construction. These measures include G-11 (requiring an Erosion Control and Rehabilitation Plan) and B-7 (ensuring appropriate habitat rehabilitation). While impacts of sedimentation on surface water quality could be significant (**Class II**), the mitigation measures described above would reduce impacts to levels that are not significant.

Surface Water Contamination. Construction of the Proposed Project would require the use of a variety of motorized heavy equipment, including trucks, cranes, dozers, air compressors, graders, backhoes, and drill rigs. This equipment requires job site replenishment of hazardous chemicals in the form of fuels, oils, and coolants. The potential exists for an accidental spill of any of these chemicals. These contaminants could flow into waterways at the time of spill, or be carried by surface flow during rainy conditions or snow melt. A chemical spill affecting a stream channel or wetland area would be a significant impact (**Class II**); however, it is mitigable (see Mitigation Measures H-5 and H-6 below).

H-5 All refueling and lubrication activities shall be performed at least 100 feet from any stream.

H-6 The Applicant shall develop Best Management Practices (BMPs) as defined in 40CFR 122.2, as part of the requirements for a National Pollutant Discharge Elimination System (NPDES) permit. BMPs shall be approved by the Lead Agencies and affected public agencies prior to permit issuance. They will be modified as necessary during construction to minimize the possibility of pollutant discharge into surface waters.

C.7.2.2.2 *Impacts on Ground Water*

Where ground water is shallow, project components could intrude into subsurface waters that provide drinking and irrigation water for the region. Ground water impacts could occur during construction and excavation for project structure foundations. This type of impact is most likely where excavation for structures (10 to 30 feet in depth, depending on structure type) occurs in areas of shallow ground water. As described in Section C.7.1, the following basins include areas of springs or shallow ground water:

- In the South Fork Pit River Subbasin, near the confluence of the two forks of the Pit River and Rattlesnake Creek, water rises to near the surface
- The Madeline Springs and Ravendale Subbasins of the Madeline Plains Ground Water Basin include springs in the upland recharge areas
- In the Honey Lake Valley Ground Water Basin, ground water may be present at depths of less than 10 feet below grade and less than 30 feet in the northeastern and southern Madeline Plains.

Ground water quality could be affected if contaminants invade excavations that have intruded into shallow ground water bodies. About 9 percent of the Proposed Project route has ground water less than about 10 feet, and areas with ground water less than 30 feet comprise about an additional 7 percent. Excavation that would occur for the Proposed Project would be minor due to its small diameter, occurring only every 1200 feet (average) and extending to depths of only 10 to 30 feet. Such widely scattered, shallow excavations are local and short-term (i.e., during construction) and would not have a significant impact on ground water quality. As such, they represent a **Class III** impact. The excavations would be filled and densely recompacted after installation of the tower legs; this should plug the hole reducing the possibility of any aquifer leakage.

In some cases, flowing water may be encountered in excavations. This could affect the integrity of structure foundations and may require additional measures, such as injection of.concrete slurry or other materials. Structural codes (including CPUC GO95) establish acceptable loads and safety factors for construction of transmission line towers. Compliance with these codes would result in stability of structures in all soil and foundation conditions; therefore, no additional mitigation is required. These procedures would also reduce any possibility of induced subsurface aquifer contamination; thus any impacts would not be significant **(Class III)**.

Major excavation in areas of shallow ground water could interrupt, redirect, or reduce subsurface flow to wetlands and springs. This could occur if structure hole excavations extend through impervious rock layers that exist beneath shallow aquifers or within close proximity to springs. Areas of potential wetlands disturbance include Segments A, W, and X. This hydrologic condition is known to exist in basaltic table land in the Secret Valley area. This impact is significant **(Class II)**, but mitigable through the implementation of Mitigation Measures H-7 below and B-1, Wetland Restoration.

H-7 The Applicant shall avoid the installation of structures in and overland travel through wetlands. Where avoidance is not possible, as determined by the Lead Agencies and responsible public permitting agencies, construction shall occur in late summer, if practicable, when the water table is likely to be lowest. Special equipment shall be used to minimize ground disturbance, such as low pressure tires, wide tracks, swamp mats, and temporary rock and geotextile working platforms. In no event shall any vehicular traffic leave ruts in excess of three inches on non-vertisol soils (see Mitigation Measure G-11). Special care shall be taken in site rehabilitation so that surface drainage is restored.

The Applicant shall develop procedures for construction in wetlands or areas of shallow ground water using applicable (non-pipeline) portions of Federal Energy Regulatory Commission Wetland and Waterbody Consultation and Mitigation Procedures (12/2/94 version). These procedures shall be submitted to appropriate agencies for review and approval prior to permit issuance. An inspector shall be employed to monitor construction procedures in wetlands and shallow ground water areas.

Blasting in hard bedrock may affect local aquifer permeabilities, potentially decreasing or increasing flow to nearby springs or wells. This potential impact is considered significant but mitigable **(Class II)** through the implementation of Mitigation Measures G-8 (regarding blasting) and H-8 (below).

H-8 In areas where springs or shallow aquifers are known to exist, blasting shall not be used unless other excavation techniques are impossible, as determined by the Lead Agencies. If blasting in these areas is found to be essential, the Applicant shall have prepared a Blasting Plan for each subject site (also see G-8). The Blasting Plan shall include consultation with a qualified, registered geologist and/or geohydrologist. The Blasting Plan shall be designed in coordination with the Lead Agencies and water resources agencies to ensure that the character of the aquifers is not affected. The Plan shall be reviewed and approved by the Lead Agencies, responsible public permitting agencies, and water resources agencies prior to commencement of construction within a one-quarter mile of affected locations.

C.7.2.3 Cumulative Impacts and Mitigation Measures

Other projects that may be conducted in the area and during the same timeframe as the Proposed Project are described in Section B.5. The only impacts from these projects which could generate cumulative hydrological impacts are those related to construction. The Proposed Project would have little impact on the ground water regime. Several of the listed projects that will have construction impacts are small residential, single-building, or farming enterprises which will have little significant cumulative hydrological effects. Several of the projects listed in the cumulative scenario, such as the California Correctional Facility, which may have hydrological impacts in their own right, are too far from the Proposed Project to result in cumulative impacts. No substantial cumulative hydrological impacts are expected from the Evans Creek watershed project since the dam and its resevoir/catch basin are well to the south of the Proposed Project and the borrow areas within the Proposed Project ROW are areas small enough that they could be spanned. Basically, the only foreseeable project that could result in cumulative impacts is the proposed Tuscarora Pipeline.

The Tuscarora Pipeline would cross the Proposed Project ROW about a mile south of AØ6 and then extend easterly well beyond the project ROW to U.S. 395. The two projects would rejoin in the Madeline Plains area and would approximately coincide in a southerly direction for about the next 36 miles to the northern Honey Lake area (Section B.5). Construction of the Tuscarora project would involve pipeline burial (a minimum 3 feet in soil and 2 feet in rock). Both projects would cross 100-year floodplains in the Madeline Plains (27,000 linear feet) and Secret Valley (1,500 linear feet) areas, and would cross areas of shallow ground water (< 30 feet deep) on Madeline Plains (49,100 feet) and Honey Lake (44,000 feet). Although these distances are substantial, the two projects would not necessarily impact surface flow or ground water over these entire distances. The Tuscarora Pipeline would not intrude as deeply as the Proposed Project and thus it may impact only about half of the shallow ground-water areas (i.e., only the part where water is less than about 10 feet deep). On the other hand, the Proposed Project may only impact ground water at actual structure locations (which are spaced about 1,200 feet apart). Construction activities in these areas, as well as at the perennial stream crossings at Cherry Creek and an unnamed creek between LØ3 and LØ4, could result in cumulative impacts through discharge of sediment into flowing streams by an increased number of bridges and structures near streams; by increased sediment loading due to activities such as clearing, grading, excavation, backfilling, excess soil disposal, and topsoil handling; by contamination of waters with spilled fuel, oils, and coolants; and by blasting that could affect local aquifers.

All of these impacts are significant (Class II) but can be reduced to a level of not significant by implementation of Mitigation Measures H-1, H-3 through H-8, G-11 (Section C.6.2) and B-1.

C.7.2.4 Unavoidable Significant Impacts

With the implementation of the mitigation measures defined in this section and in other issue areas of this EIR/S (Biology and Geology), no unavoidable significant hydrological impacts are expected.

C.7.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

C.7.3.1 Alturas Area Alternative Alignment (Segment B)

Alternative Segment B is at the northerly part of the Proposed Project, extending westerly from the City of Alturas and then southerly across the Pit River (Section B.4.1.1 and at the end of Volume I, Map B-1). Like Proposed Segment A, this alternative segment is within the Alturas Ground Water Basin. Ground water generally would not be encountered along this route except within the floodplain of the Pit River. The width of the 100-year floodplain of the Pit River is about 1,600 feet wide along this segment and may be too wide to avoid siting a structure within it. With strategic structure placement (Mitigation Measure H-4), the impacts of the floodplain location could be reduced to a level of insignificance (Class II). Construction within the floodplain could result in damage to wetlands or alteration of stream flow. If the spacing between structures could be increased to 1,600 feet, the structures would span the floodplain and the impacts of Alternative Segment B would be essentially the same as for Proposed Segment A. If a structure is located within the floodplain, floods could damage project facilities.

Operational impacts include the effects of erosion from vehicular traffic associated with periodic ground checks. The potential impacts and mitigations would be the same as those discussed in Section C.7.2 for Proposed Segment A. The impacts are considered significant (Class II) but mitigable through the implementation of Mitigation Measures H-1 and H-3 through H-7 (Section C.7.2.2). With the implementation of these mitigation measures, no unavoidable significant hydrologic impacts are expected.

In summary, Alternative Segment B is very similar to Proposed Segment A. Alternative Segment B may require fewer structures within the floodplain which would have the potential for less impacts than Proposed Segment A. However, proposed Segment A is generally on firmer ground than the lowland areas along Alternative Segment B; therefore, Segment A has a lower potential for disturbance during construction and operation than Segment B. This difference offsets the slight advantage of Segment B having one fewer floodplain structure.

C.7.3.2 Madeline Plains Alternatives (D, F, G, H, I)

Alternative Segment D is generally crosses the vegetated mountainous terrain north of the Madeline Plains (Figure B.4-3 and at the end of Volume I, Maps D-1 through D-3). This alternative crosses several unnamed intermittent streams and is in close proximity to several springs (e.g., Harter Spring, Tanner Spring). Considerable grading would be necessary within the ROW and along access roads (see Section C.6.3.2), which could have adverse impacts on drainage and springs. Mitigation Measures H-1 and H-3 through H-7 would reduce the impacts to insignificant (Class II). Blasting may be required for some structure foundations where rock is hard. Blasting impacts are significant and can be reduced by Mitigation Measure H-8 (Class II).

Alternative Segments F, G, H, and I are on the Madeline Plains (see maps at the end of Volume I). The Madeline Plains are a flat featureless dry lake bed that was the site of a lake during the late-Pleistocene ice ages (about 10,000-15,000 years ago). The Madeline Plains Ground Water Basin is described in Section C.7.1.2.2. Ground water throughout most of the basin is greater than 30 feet deep and most producing wells extend to depths of several hundred feet depth (DWR, 1963) so ground water is not likely to be directly affected by construction or operations of the Proposed Project. The lake deposits have moderate permeabilities that, along with their presence of alkali and high concentrations of dissolved salts, frequently make these deposits of little direct value as a source of ground water.

Most of the Madeline Plains is designated as a 100-year floodplain. Approximately 35 to 40 structures would be required within the floodplain for Alternative Segments G and F, and numerous others would be required depending on whether Alternative Segment H or I is selected to complete the alternative alignment across the Plain. Structures along these proposed alternative routes may be subject to inundation during heavy rains and spring snow melt even without the 100-year event.

Construction across the Madeline Plains could have several adverse impacts such as erosion, scour, flooding, and contamination. Operations may be affected by flooding. The impacts could be significant, but they are mitigable (**Class II**). Mitigation Measures H-3, H-4, H-6, and H-7, described in Section C.7.2, could reduce the impacts to insignificant.

In summary, Alternative Segment D encounters several springs and intermittent drainages and will probably require more blasting than the Proposed route; therefore, this alternative would have the potential for greater impacts. Alternative Segments F, G, H, and I are very similar to Proposed Segment E, which they would replace; there are no clear hydrological advantages to either route.

C.7.3.3 Ravendale Alternative Alignment (Segments J, I)

The Ravendale Alternative Segment J extends from the southern margin of the Madeline Plains, southeasterly across a hilly terrain to an intersection with Proposed Segment K, near Snowstorm Creek about 7 miles south of Ravendale (Figure B.4-3 and at the end of Volume I, Maps J-1 through J-4).

This alternative does not appear to cross any significant drainages or springs and ground water is probably deep. The northern 3 to 4 miles of this segment cross the Madeline Plains, a flat dry lake. The Madeline Plains Ground Water Basin is described in Section C.7.1.2.2. Ground water levels and quality in the southern part of the basin are poorly known but projections from regional data suggest that they are too deep to be directly affected by construction or operations of this alternative. The northern 2 or 3 miles are within a 100-year floodplain. Approximately 10 to 12 structures would be within the floodplain. Some of these structures may also be subject to inundation during heavy rains and spring snow melt between the 100-year flood event. Considerable grading would be necessary within the ROW along newly-constructed permanent overland travel routes.

Construction of Alternative Segment J could have several adverse impacts such as erosion, scour, flooding, and contamination. Operations may be affected by flooding. The impacts could be significant but mitigable (**Class II**). Mitigation Measures H-3, H-4, H-6, and H-7, described in Section C.7.2, could reduce the impacts to insignificant.

In summary, Alternative Segment J would require more grading than the Proposed Segment K and could result in more erosion.

C.7.3.4 East Secret Valley Alignment (Segment ESVA)

Alternative Segment ESVA would be in the Secret Valley Ground Water Basin and the Lahontan Drainage Basin. Surface flow along this alternative is generally from the eastern highlands toward the valley floor to the west. The alternative crosses Cherry Creek, which is a perennial stream, and Deep Creek, which is a 100-year floodplain. The Secret Valley ground water is described in Section C.7.1.2.2. The ground water conditions are not well documented, but it can be assumed that the water draining into the basin infiltrates the permeable lake deposits, forming significant ground water quantities. Like most basins in the region, it is probably high in salts, minerals, and dissolved solids. These waters eventually may make their way into Honey Lake Valley.

Alternative Segment ESVA should not have significant impacts on the ground water and small impacts on the surface water, as discussed in Sections C.7.2.2. Construction could cause erosion and sediment loading of the streams, which can be mitigated by Mitigation Measures H-1, H-3, H-5, H-6, and G-11. Excavations could penetrate shallow groundwater aquifers in the volcanic rocks. These impacts would be significant as discussed in Section C.7.2.2.2, but are mitigable (**Class II**) by Mitigation Measure H-7. The blasting likely to be needed for direct embedding of structures in hard volcanic rocks could affect the ground water flow paths. These impacts are significant (**Class II**) but can be reduced by application of Mitigation Measures G-8 and H-8. There does not appear to be any significant cumulative hydrological impacts.

In summary, Alternative Segment ESVA is similar to Proposed Segment L. Alternative Segment ESVA would result in fewer structures placed in a 100-year floodplain than Proposed Segment L. This alternative alignment may require more blasting than Proposed Segment L.

C.7.3.5 Wendel Alternative Alignment (Segment M)

Alternative Segment M is within the Honey Lake Ground Water Basin. Surface water and ground water flow into the basin from the adjacent highlands and infiltrate the valley sedimentary deposits. Honey Lake Valley has been the site of a lake since about late Miocene time. During the latest lake high stand (> 12,000 years ago), the lake was several hundred feet deep. Since then the lake has dried up and water is now extracted from the basin-fill sediments. The best areas for water development are in the northwest and southwest parts of the valley where major streams bring fresh water into the valley. Although the northeast part of the valley, near the project area, has abundant water, it is considered to be hazardous because of high levels of dissolved solids and various chemicals. The depth of ground water varies considerably around the margins of the lake. The ground water contour map of DWR (1963) indicates ground water elevation of 4,020 - 4,030 in proximity to Alternative Segment M (approximately 70 to 80 feet deep) so it is not likely that ground water would be directly affected by construction or operation of this alternative segment.

There are no major streams crossed by Alternative Segment M. Eagle Lake Ditch (now abandoned), which flows laterally around the perimeter of the lake, coincides with the part of Alternative Segment M between M-1 and M-2.

Only about one-half mile of grading would be expected for construction of this alternative segment; so, with strategic placement of structures, there should no significant adverse impacts.

In summary, Alternative Segment M is very similar to Proposed Segment N. Neither route has any significant hydrological impacts.

C.7.3.6 West Side of Fort Sage Mountains (Segment P)

Alternative Segment P is located within the Honey Lake Ground Water Basin and the Lahontan Drainage Basin (see Section C.7.1.2.2). The northern part of the alternative segment (about 4 miles) would be across the dry lake bed of southern Honey Lake Valley. The central part (about 7 miles) is across the mountainous and hilly terrain of the Fort Sage Mountains. This route traverses several local unnamed intermittent streams, and is in proximity (less than 2,000 feet) to Steffens Spring and Indian Spring. The southern part of the alternative segment (about 6 miles) extends southeasterly along the northeast edge of northern Long Valley and then more southerly across the valley floor.

The southern part of Alternative Segment P crosses Dry Valley Creek, which is a perennial stream. A 3-mile-long section of this alternative segment along the margin of the Fort Sage Mountains and northern Long Valley is designated a 100-year-floodplain of Dry Valley Creek. The alternative segment also crosses a small section of 100-year floodplain at the southern intersection with Proposed Segment Q.

Depth to ground water is not well documented along Alternative Segment P. The depth to ground water in the Fort Sage Mountains is probably too deep to be affected by the project because it is a small range with only local recharge. Honey Lake Basin, on the other hand, contains prodigious quantities of water but much of it is of poor quality (Section C.7.1.2.2). The water quality is probably better in the northern Long Valley part of the basin because it is near a recharge area of fresh water entering from the south and west. The depth to ground water at the northern part of this alternative segment (near OØ5) was about 35 feet deep in 1963 (DWR, 1963) so is probably too deep to be directly affected by this project. Ground water depth along the southern part of the segment in northern Long Valley is about 25 feet to 50 feet deep near Doyle but is probably shallower along the Proposed Segment Q because the route is along the perennial Dry Valley Creek.

The impacts of construction of Alternative Segment P are significant (**Class II**) but mitigable by instituting the mitigation measures discussed in Section C.7.2.2; applicable Mitigation Measures include H-1 through H-8. There are no significant cumulative or unavoidable hydrological impacts.

In summary, Alternative Segment P is similar to Proposed Segment Q. Proposed Segment Q is longer, crosses more floodplains, may have a greater exposure to erosion, and is in a more remote area than Alternative Segment P. On the other hand, Alternative Segment P runs along Long Creek, a major fresh water source in the southern part of Honey Lake Valley; thus, the consequences of erosion and pollution are greater. Since the hydrological conditions are not well enough known to offer a clear choice between Proposed Segment Q and Alternative Segment P, the routes seem about equal from a hydrological viewpoint.

C.7.3.7 Long Valley Alignments (Segments S, U, Z, and WCFG)

These alternative segments are within Long Valley, a narrow fault-bounded valley (Section C.6.3.6), with Long Valley Creek, a perennial stream in the northern part of the valley, flowing northward along the west side of the valley. This stream carries runoff to the southwestern end of Honey Lake Valley. The drainage area is small and consists of local hills and peaks such as Peavine Peak, Antelope Mountains, and the easterly facing slopes of the Diamond Mountains. Little information is available on ground water, but the elevation of the routes on an elevated bench suggests that ground water would be below the level of influence of structure foundations, except in the stream channels.

Alternative Segments S and WCFG will have significant but generally mitigable impacts (**Class II**). Alternative Segment S crosses Long Valley Creek between R-2 and S-1. The 100-year floodplain is about 400 feet wide at this crossing and the adjacent lowlands are about 1,000 to 1,400 feet wide. Alternative Segment S crosses Long Valley Creek again just north of SN-1 where the floodplain is about 700 feet wide.

Alternative Segments U and Z cross local intermittent drainages but no perennial streams. The northernmost structure(s) of Alternative Segment U may be underlain by shallow ground water.

Alternative Segment WCFG crosses several local unnamed intermittent drainages from WNØ7 to the southern intersection with the principal route at X-1. The alternative route subparallels the creek bed and is within the adjacent wet meadow for about 1.5 miles. Several structures (5 to 10) may be required in the wetlands to accommodate this route.

These alternative segments may have significant but mitigable hydrological impacts (**Class II**). Mitigation measures are discussed in Section C.7.2.2. The stream crossings for Alternative Segments S and WCFG would require development of plans describing measures to mitigate construction and operational impacts such as flooding, possible contamination, erosion, sediment loading, etc. Proposed Segments T and W would have similar impacts, although perhaps a few less structures in wet meadows. Mitigation Measures H-1 through H-7 would need to be employed for Alternative Segments S and WCFG. There are no significant unavoidable or cumulative hydrological impacts for these alternative segments.

In summary, these alternatives are very similar to the Proposed route. Alternative Segment S crosses the perennial Long Valley Creek twice via its connection with Alternative Segment U and, thus, would cause greater impacts than the Proposed Segments T and W. Alternative Segment WCFG may result in somewhat greater impacts than the Porposed route because it crosses more wet meadow area and could have a greater potential for disturbance of surface flows and ground water.

C.7.3.8 Peavine Peak Alternative Alignment (Segment X-East)

This alternative segment is on the east slopes of Peavine Peak within the Lahontan Drainage Basin. Drainage along this route is toward both the east and the south to the Truckee River, the major trunk stream in the area. There are no major intermittent or perennial streams crossing Alternative Segment X-East. Ground water is deep and should not be directly affected by the project. Existing wells have low yields and a high percentage of total dissolved solids. This water is not recommended for drinking.

There are no adverse unavoidable or cumulative hydrological impacts associated with this alternative route.

In summary, Alternative Segment X-East is nearly identical to Proposed Segment Y. There are no significant hydrological differences between the two routes.

C.7.3.9 Substation Alternatives

C.7.3.9.1 *Alturas Substation Alternative Site (Mill Site)*

The Mill Site is an 8-acre site near Alternative Segment B on the west side of the town of Alturas, south of Highway 299 (Figure B.4.2 and at the end of Volume I). Facilities to be constructed at this alternative site would be similar to those at the Proposed Devils Garden Site and consist of a control building, transformers, breakers, and various electrical devices. These facilities would be within a perimeter security fence and founded on either a concrete slab or on a 3-inch-thick gravel blanket.

The alternative site is within the South Fork Pit River Valley Subbasin of the Alturas Ground Water Basin and within the Central Valley Drainage Basin. This site is underlain by moderately consolidated permeable sedimentary rocks of the Alturas Formation (Section C.6.3.8.1). The sedimentary rocks of the Alturas Formation have a moderate to high permeability and where saturated may yield ground water in quantities sufficient for irrigation. The unit contains both unconfined and confined aquifers and comprise one of the most important ground water sources in the Alturas basin. Ground water at the site is at about elevation 4,340 feet (DWR, 1963). The surface elevation of the site is about 4,370 to 4,375; therefore, construction activities at this site are not likely to directly affect the quality or flow paths of ground water. The Pit River, the major perennial stream in the area, is a few thousand feet west of the site, so construction activities should not have a significant impact on the river. The site is not within the 100-year floodplain.

Although there do not appear to be any significant adverse hydrological impacts from siting a substation at this site, potential construction-related impacts could occur (**Class II**). Mitigation Measures H-5 and H-6 should be applied, and precautions to prevent hazardous materials (fuels) spills should always be employed. Also, erosion of excavations or spoils piles should be prevented, and construction plans for all facilities should be reviewed and approved by responsible public agencies.

In summary, the Alternative Substation (Mill Site) appears to result in greater impacts than the Proposed Site because it is in the lowlands where construction activity has a greater chance of affecting an important hydrological regime than the Proposed Site.

C.7.3.9.2 Border Town Substation Alternative Site

The Border Town Substation Alternative site is in Long Valley, California along the California-Nevada boundary. Facilities at the Border Town alternative substation site are described in Section C.6.3.8.2.

The Border Town substation alternative is within the Honey Lake Ground Water Basin and the Lahontan Drainage area. Drainage flows downslope from the mountains into the valley and then northward along the valley floor via Long Valley Creek. Long Valley Creek is a perennial stream in the northern part of Long Valley, where it receives additional input from tributaries. In the southern part of the valley, where the alternative site is located, the stream is intermittent. Ground water conditions are largely undocumented in Long Valley but comparison to similar valleys in the region suggests that ground water may occur within permeable sediments and sedimentary rocks of the valley. These waters would serve as one of the recharge areas for Honey Lake Valley to the north. However, the preferred siting areas would be on the firmer materials on the elevated terraces, and thus, it is not likely that ground water would be directly affected by construction or operation of a substation in this area. Construction activities could affect surface waters if erosion of excavations and spoils piles is allowed to occur during storms, or if accidental spillage of hazardous materials (e.g., fuels) occurred. Such occurrences can be controlled and mitigated, therefore these impacts are considered significant but mitigable (**Class II**). Mitigation Measures H-1 through H-6 and G-11 would reduce any significant hydrological impacts to a level that would not be significant.

In summary, the Alternative Border Town Site is in a nearly identical hydrological regime as the Proposed Site. There are no clear hydrological differences between the two sites.

C.7.4 NO PROJECT ALTERNATIVE

Under the No Project Alternative, construction of the Proposed Project would not occur. However, as explained in Part B.4, other transmission and power generation options would need to be pursued by SPPCo if their growth projections are realized, resulting in construction and operational impacts. These impacts would be expected to be similar to those described in Section C.7.2, but they could vary depending on the routing locations of alternatives.

C.7.5 MITIGATION MONITORING PROGRAM

The EIR/S prepared for this project indicates that the Proposed Project (and Alternatives) may have significant impacts on the environment. In addition, some hydrological events and conditions could have significant impacts on the Proposed Project that would inhibit its successful and economic completion and operation. The foregoing sections recommend measures to mitigate these impacts, identify how these measures should be implemented, and who should ensure their effectiveness. Generally, the Applicant is responsible for implementing and financing the mitigation measures, and various Federal, State, and local governmental agencies are responsible for approving plans, for monitoring and implementing these plans, and for judging their effectiveness. The following table (Table C.7-3) summarizes the recommended mitigation measures, responsible monitoring agencies, and methods for monitoring implementation of the mitigation measures.

Table C.7-3 Mitigation Monitoring Program

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Scour and erosion of stream beds (Class II)	**G-11** **H-1** Prepare Stream Crossing and Wetlands Protection Plan. **H-2** Maximize distance of ROW from waterways.	Proposed Segments A,C,L,N,Q,R,T,W,X Alternative Segments B,D, M,P,S,U,Z,WCFG, Border Town Alternative Substation (SPPCo Site)	BLM CPUC CDFG CDWR USFS	Review Construction, Operation and Maintenance Plan; monitor construction	Compliance with approved plan. No extensive alteration of stream channels; erosion is minimal; stream banks are protected during construction and catch basins are in place were necessary	Design stream crossings prior to permit issuance; inspect during construction
Flooding of construction activities at stream crossings; flood damage to structures (Class II)	**H-3** Construction to occur only during low flow periods. **H-4** Permanent structures and facilities shall be located outside of stream and river beds. Structures located in floodplains shall be designed based on site-specific analyses.	Proposed Segments A,K,L,O,Q Alternative Segments B,F, G,H,I,P,S,WCFG	BLM CPUC CDFG CDWR USFS	Review Construction, Operation and Maintenance Plan; monitor construction	Compliance with approved plan. No construction during floods. Structures designed and built to resist damage during floods	Design facilities prior to permit issuance; inspect during construction
Accidental contamination of surface waters and ground water (Class II)	**H-5** Perform refueling away from streams.	All Proposed and Alternative Segments	BLM CPUC CDFG CWRCB RWQCB USACE USFS	Review plans; monitor construction	Compliance with Best Management Practices. Permits issued; inspections show no significant impacts. No hazardous spills near stream channels or accidental spills effectively cleaned up	During construction
	H-6 Develop Best Management Practices; clean up spills; obtain 404 and storm water permits.					Prior to permit issuance
Ground water flow affected by construction, drilling, or blasting (Class II)	**G-8 and H-1**, above **H-7** Avoid locating structures in wetlands; avoid travel in wetlands; construct during dry seasons. Develop procedures for construction in wetland areas.	Proposed Segments A,W,X Alternative Segments B,D, F,G,H,I,ESVA,P,U,WCF G	BLM CPUC CDFG CDWR RWQCB USACE USFS	Review construction plans; monitor construction; review blasting plan	Compliance with approved plans and procedures; no change in ground water flow; no permanent disturbance of wetlands; no deep ruts	Determine structure locations and prepare plans & procedures prior to permit issuance; monitor during construction
	H-8 Avoid blasting; if necessary, prepare a Blasting Plan for each site.	Proposed Segments A,C,E,K,L,Q Alternative Segments D,J,P				

C.7.6 REFERENCES

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C.8 LAND USE, RECREATION, AND EDUCATIONAL, RELIGIOUS, OR SCIENTIFIC USES

C.8.1 ENVIRONMENTAL BASELINE AND REGULATORY SETTING

This section presents information on the existing land use patterns and land ownership along and in the area of the proposed transmission line route, and summarizes the land use regulatory environment. It also identifies sensitive land uses (e.g., schools, recreational areas, churches, and houses) adjacent to and near the 160-foot right-of-way (ROW). The inventory of land uses is based on examining land ownership information from the project applicant; evaluating U.S. Geological Survey 7.5-minute quadrangle maps; and conducting a field reconnaissance in June 1994. The study area boundary includes lands both within and beyond the transmission line ROW that could be impacted in terms of construction and operation disturbances. Since the potential area of impact will vary due to topographical and circulation factors, the study area width varies from point to point along the ROW.

C.8.1.1 Land Use Characteristics of the Study Region and Project Area

The land crossed by the proposed and alternative transmission line route is about 44 percent private land and 56 percent public land. The proposed route crosses mainly private land under County jurisdiction and public land of the U.S. Bureau of Land Management (BLM). It also crosses public land of the U.S. Forest Service (USFS), California Department of Fish and Game (CDFG), California State Lands Commission (SLC), and the Sierra Army Depot, a U.S. Military Reservation. Portions of the transmission line route parallel and cross the California Department of Transportation (Caltrans) U.S. 395, Hwy 299, Southern Pacific Transportation Company (SPTC), North Western Pacific Railroad (NWPRR), and Union Pacific Transportation Company (UPTC) ROWs. The proposed route follows U.S. 395 for much of its length. U.S. 395 is the only transportation artery on the east side of the Sierra Nevada and is used by a wide variety of travellers, including vacation travellers and sightseers. This highway is designated a scenic highway by Lassen and Modoc Counties. See Section C.12 (Transportation) for more details on travel corridors. Jurisdictional boundaries for lands traversed by the proposed route are shown on maps at the end of Volume I. Section C.5 (Energy and Utilities) addresses the utility ROWs crossed by the proposed and alternative project routes. Section C.6 (Geology, Soils, and Paleontology) addresses mining activities in the area of the proposed and alternative project routes.

The land crossed by the proposed transmission line route and in the area surrounding the proposed route is predominantly undeveloped. The main uses of the undeveloped public land are grazing, recreation, open space, and wildlife habitat. The main uses of the undeveloped private land are grazing, open space, and wildlife habitat. One section of the undeveloped private land crossed by the proposed route, the Madeline Plains, is used for growing crops (mainly hay). Undeveloped, partially developed, and developed residential subdivisions on private land occur scattered in the area around the proposed route. Pockets of rural residential and commercial development occur around towns and cities crossed by or near the proposed route. More urban residential and commercial development occurs in the area of the proposed route in the City of Reno, Nevada.

C.8.1.2 Land Jurisdiction and Uses Along the ROW

This section describes the land jurisdiction and uses along the proposed transmission line route. Unless indicated otherwise, the land uses on public undeveloped lands crossed by the proposed route include grazing, dispersed recreation, open space, and wildlife habitat; and the land uses on private undeveloped lands crossed by the proposed route include grazing, open space, and wildlife habitat.

Modoc County

Segment A, a portion of Segment C and the proposed Alturas Substation site are located in Modoc County. They cross USFS land in the Modoc National Forest, BLM land, and private land. All of the lands crossed by the proposed route in Modoc County are rural with low population densities. The majority of the proposed transmission line route in Modoc County is located on land designated as Agriculture by the Modoc County General Plan zoned either Agriculture or unclassified. The Alturas Substation site (Devils Garden) is designated zoned Open Space, Forestry, and Grazing (OSF&G). Dispersed recreational uses of the land in the areas of the proposed route in Modoc County consist mainly of big game and upland game hunting, and four-wheel and pleasure driving.

Segment A. Segment A crosses mainly undeveloped BLM and private lands and some undeveloped USFS land. From its beginning to about Angle Point AØ3, it crosses USFS land in the Modoc National Forest. Between AØ4 and AØ5, it crosses the SPTC ROW. From about AØ4 to AØ6, the private land crossed by Segment A contains scattered houses and agricultural structures. About one mile north of AØ6, Segment A is located east of Three Sisters, a partially developed residential subdivision of 15 parcels, and about 1 mile east of a larger undeveloped residential subdivision of about 280 parcels. Segment A crosses Hwy 299 about 0.5 miles north of AØ4, crosses the SPTC ROW about 0.5 miles north of AØ5, and crosses Centerville Road about 1 mile north of AØ6. From about AØ5 to AØ6, it crosses 0.75 to 2.75 miles west of the Modoc National Wildlife Refuge.

Recreational wood-cutting occurs in the area of the Modoc National Forest crossed by Segment A. Daggert Canyon, located in the area between ANPØ2 and AØ4, is a destination for hikers, mountain bicyclists, pedestrians, and motorists in the area of Segment A. It is comprised of two subcanyons. The west subcanyon (West Rock Creek Canyon) is a steep-walled box canyon with a seasonal waterfall at Rock Creek. The eastern subcanyon is a deep lava canyon with a seasonal creek in a roadless area. Both canyons represent a transition from the relatively flat Devil's Garden Plateau to the lowlands below and provide habitat for deer, raptors, and waterfowl. The Devils Garden Mountain Bike Trail begins at Hwy

299, follows Crowder Flat Road to West Rock Creek Canyon, and terminates at a vista point near ANPØ2. Crowder Flat Road also is used as a walking trail. Other recreational uses in this area include deer and upland game hunting and winter wildlife viewing. From about AØ6 to CØ1, Segment A crosses over and parallels an unnamed mountain bike trail for about two-thirds of a mile. Other recreational uses in this area include upland game hunting, cross-country skiing, horseback riding, and trail horse events. The existing road and trail system in this area is the center of these recreational activities.

Segment C. Segment C crosses mainly undeveloped BLM and private lands. From about Angle Points AØ6 to CØ1, Segment C crosses 1 mile west of a partially developed residential subdivision of 19 parcels. The Town of Likely is located about 4.25 miles northeast of CØ5. From about CØ5 to its end in Modoc County, Segment C runs along the eastern boundary of the Modoc National Forest. From its beginning to end in Modoc County, Segment C runs about 3 to 5 miles west of U.S. 395.

Recreational uses from about Angle Points CØ1 to CØ3 include deer and upland game hunting. Waterfowl hunting occurs at the unnamed reservoir about 0.25 miles north of CØ3. Upland game hunting and winter wildlife viewing occur at Sherlock Spring located about one mile northwest of CØ2. Several recreational water bodies in the region of Segment C from about CØ4 to its terminus are used for big game, upland game, and waterfowl hunting: Bayley Reservoir, Delta Lake, Graves Reservoir, Graven Reservoir, Viceroy Pond, Juniper Stock Tank, and Smith Reservoir. Bayley Reservoir and Delta Lake are also used for fishing.

At Angle Point CØ4, Segment C crosses about 1.5 miles southwest of the Infernal Caverns Battleground Memorial Monument and about one mile west of the Infernal Caverns area. The Infernal Caverns Battleground Memorial Monument marks the location of the battle of General George Crook and his soldiers with the Pit River, Paiute, and Modoc Indians on September 25, 1867. It is one of the most intact battleground sites in California, and includes the camp of General Crook and his soldiers, the graves of the soldiers located just east of the battleground, rock rings constructed by the Indians to shield themselves during the battle, petroglyphs, unusual geologic formations, and Indian hunting blinds along Crooks Creek. Other recreational uses in the Infernal Caverns area include hiking and hunting. The BLM plans to develop a trail, vista points, and interpretive center related to the Infernal Caverns and Infernal Caverns Battleground Memorial Monument (see Section C.8.2.4, Cumulative Impacts and Mitigation Measures).

Alturas Substation. The site of the proposed Alturas Substation site (Devils Garden) is located along Segment A of the proposed transmission line route, between Angle Points AØ1 and ANPØ2, on undeveloped BLM land. State Highway 299 runs east-west about 1.25 miles south of the site. Crowder Flat Road, which runs northwest from State Highway 299, runs along the southwestern corner of the site.

The rural and suburban residential and commercial development of the City of Alturas is located a few miles southeast of the site.

Lassen County

The majority of the proposed transmission line route is located in Lassen County (portions of Segments C and Q; Segments E, K, L, N, O, R, and T; and a portion of Segment W). These Segments cross BLM, State of California, and private lands. All of the lands crossed by the proposed route in Lassen County are rural with low population densities. The majority of the proposed transmission line route in Lassen County is located on land designated as Grazing and Sagebrush Environment or Open Space by the Lassen County General Plan. The zoning generally corresponds to these land use designations. North of the Town of Wendel, most of the land crossed by the proposed route is zoned Upland Conservation (UC-2), with some Timber Production Zones (TPZ). South of Wendel, most of the land crossed by the proposed route is zoned Agriculture (A-1). In the Hallelujah Junction area, the proposed route crosses about 0.5 mile east of an area zoned Commercial (C).

Segment C. Segment C crosses from Modoc County into Lassen County about 0.5 miles southwest of CØ6. In Lassen County, it crosses undeveloped BLM land. From the Lassen County line to about CØ9, Segment C runs along the eastern boundary of the Modoc National Forest. A radio facility on Likely Mountain is located about 1.5 miles southwest of Segment C between CØ7 and CØ8.

From about Angle Points CØ7 to CØ8, recreational use is dispersed and consists mainly of hunting. The abandoned Dry Creek Fire Station is located about 1 mile northeast of CØ9. The BLM plans to use the Fire Station facilities as a recreational site that will include a campground; an improved trail upstream along Dry Creek to Nelson Corral Reservoir for hiking, mountain bike riding, and horseback riding; and an interpretive display related to the Infernal Caverns area. Historical houses constructed in the 19th century by Chinese contract labor connected with construction of the now SPTC route through Modoc County, and an associated interpretive area, are located across U.S. 395 from the Dry Creek Fire Station.

Segment E. Segment E crosses mainly undeveloped private land, some undeveloped BLM land, a Caltrans ROW for U.S. 395, and SPTC ROW. From its beginning to about 1.5 miles south of Angle Point EØ2, it crosses undeveloped BLM land. About 1.5 miles south of EØ2, Segment E crosses Ash Valley Road and about 1 mile west of the rural residential and commercial development of the Town of Madeline. From the Town of Madeline to about EØ8, it crosses grazing land and cropland (mainly hay) of the Madeline Plains. Just south of EØ6, it crosses about 0.25 miles east of an electrical substation. In the area about 0.5 mile north and south of EØ7, it crosses immediately west of a gravel mining area that contains two gravel pits. A residence is located about 0.10 mile west of EØ7. For its entire length, Segment E generally parallels U.S. 395 and the SPTC ROW. Recreational uses in the area of Segment E include big game, upland game, and waterfowl hunting. Segment E also passes near Bailey Reservoir.

Segment K. Segment K crosses grazing lands of the Madeline Plains. The lands are mainly under private ownership and include some BLM land and an SPTC ROW. About 0.4 mile southeast of KØ2, it crosses near the Town of Termo, which is located on the opposite side of Highway 395 and consists of a few residences and a general store. At the Town of Termo, Segment K crosses Termo School District property and Ridge Road (Old Mail Route Road) and crosses just east of a Caltrans soils and materials yard located at the intersection of Termo-Grasshopper Road and U.S. 395. U.S. 395 and the SPTC ROW generally parallel Segment K from its beginning to about KØ6. At KØ3, Segment K crosses west over the highway and railroad, then runs about 0.5 miles to 1 mile west of the highway and railroad to about KØ6, where it turns southwest away from these corridors. It crosses the railroad about 3.25 miles south of KØ6. The Town of Ravendale, which consists of a few residences, agricultural structures, and motel, is located about 0.5 miles southeast of KØ5. Recreational uses in the area crossed by Segment K include antelope and small game hunting.

Segment L. Segment L crosses mainly undeveloped BLM land, some undeveloped private land, two undeveloped parcels owned by the SLC, and a SPTC ROW. The private land crossed by Segment L is concentrated in the area from about Angle Point LØ4 to 2.5 miles southeast of LØ7. This area consists of the grazing land of the Secret Valley and Mud Flat, and contains scattered residences and agricultural structures. About 1 mile southeast of LØ2, Segment L crosses about 400 feet west of the Tule Patch Roadside Park along U.S. 395. About 2.5 miles southeast of LØ7, it crosses about 0.25 miles east of an AT&T communications facility.

Recreational use in the area of Segment L is dispersed. A four-wheel drive (4WD) road at the base of Snowstorm Mountain provides access for juniper wood-cutting and hunting. Ramhorn Springs Campground, a BLM designated campground, is located along the road to Rye Patch Canyon between Shinn Mountain and Spanish Springs Peak.

The Tule Patch Spring Rest Area is located southeast of LØ2, off U.S. 395. This rest area is a major stopping point for motorists and other travellers. The main recreational use at the Rest Area is picnicking and enjoying the natural amenities. A trail extends from the Rest Area to a natural spring and to a bluff, from which visitors have a view of the Skedaddle Mountains and the transition from Modoc Plateau to Great Basin vegetation. Caltrans plans to develop an interpretive display that addresses the natural amenities in the vicinity of the Rest Area.

In the Mud Flat area, overall recreational use is low and consists mainly of scattered game bird (e.g., sage grouse), pronghorn antelope, and deer hunting; pleasure driving; and sightseeing (the open country provides views to the Honey Lake Valley). The Viewland Historical Monument Overlook is located northwest of LØ8 off U.S. 395. It contains an historical marker for the Noble Emigrant Trail, and is a common place for motorists to pull off the highway.

Segment N. Segment N crosses mainly undeveloped BLM land, undeveloped private land, and a UPTC ROW. It parallels the UPTC ROW to the east for its entire length. The terminus of Segment N is located about 1 mile southeast of the Wendel Transfer Station, a sanitary disposal facility. The site of the "rearing and finishing facility" of the California Pork Company's proposed commercial swine operation is located about 1.5 miles southwest of NØ2. Recreational use in the area of Segment N is low and consists mainly of scattered game bird and pronghorn antelope hunting.

Segment O. Segment O crosses undeveloped BLM and private lands, two undeveloped State of California parcels, one undeveloped Lassen Municipal Utility District (LMUD) parcel, and two SPTC ROWs. A portion of the northeasterly side of the 660-foot wide Segment O study corridor (between Angle Points MØ3 and OØ1) passes through two corners of the Skedaddle Wilderness Study Area. For its entire length, Segment O runs through the Honey Lake Valley, which contains scattered residences and agricultural structures. From about three miles southwest of O-Ø3 to its terminus, Segment O runs along portions of the boundaries of the Sierra Army Depot, a U.S. Military Reservation used by the U.S. Department of the Army for testing and detonating bombs. Segment O crosses through the Sierra Army Depot between O-Ø3 and O-Ø4. Near O-Ø4, Segment O crosses about one mile south of the northern portion of the Sierra Army Depot. At its beginning, Segment O crosses about one mile southeast of the Wendel Transfer Station, a sanitary disposal facility. From about O-Ø2 to O-Ø4, Segment O parallels the SPTC ROW to the east. Between O-Ø2 and O-Ø3, Segment O crosses two undeveloped residential subdivisions, one on each side of the route. The Amedee Hot Springs, a geothermal production area, lies west of the undeveloped residential subdivision on the west side of Segment O. This area contains the springs and associated facilities of the Amedee Geothermal Project.

Recreational use around the Town of Wendel is low. Wendel Road is the main access route to the Skedaddle Mountains and Honey Lake Valley. The Skedaddle Mountains are a readily accessible and popular area for chukar and deer hunting, hiking, horseback riding, and wildlife viewing. The Skedaddle Mountains, including the Wendel Cliffs, are within a Wilderness Study Area (WSA) mandated by Congress to be protected from activities that would alter the wilderness qualities of the area until Congress decides whether or not to designate all or part of the area as wilderness.

A gravel mining pit west of the smaller, northern portion of the Sierra Army Depot is a popular site used by motorcycle and all-terrain vehicle (ATV) riders as a staging area and campground. This site is also used for large events (past events have included up to 200 people). Pleasure driving and quad motorcycle riding occur in the area around the Sierra Army Depot.

Segment Q. Segment Q transects mainly undeveloped BLM land, some undeveloped private land, four undeveloped State of California parcels, and one WPRR ROW. From its beginning to about QØ1, it runs southeast away from the Sierra Army Depot, crossing the Honey Lake Valley. About three miles southeast of its beginning, it crosses portions of the Doyle State Wildlife Area, managed by CDFG and used for wildlife and recreational uses such as hunting and sightseeing. The northern portion of Segment Q crosses a motorcycle and ATV trail loop and a dirt access road of the Fort Sage Off-Highway Vehicle (OHV) Area.

Segment R. Segment R crosses undeveloped BLM and private lands. For its entire length, it closely parallels the east side of U.S. 395, and generally parallels the SPTC ROW about 0.5 miles to the east.

Segment T. Segment T traverses mainly undeveloped BLM land, some undeveloped private land, and one undeveloped State of California parcel. From its beginning to about 0.5 miles southeast along the route, it closely parallels the east side of U.S. 395. Segment T then runs about 0.5 to 1 mile east of the highway until its terminus at TØ2. The northern portion of Segment T lies within the western portion of the Lassen Red Rocks Scenic Area, a BLM-designated Scenic Area of 804 acres. Major recreational activities in the Lassen Red Rocks Scenic Area include photography, rock climbing, and picnicking. The only access point to this Scenic Area is off Lassen Red Rocks Road.

Segment W. Segment W crosses mainly undeveloped BLM land and some undeveloped private land. Segment W in Lassen County runs a few miles east of Long Valley and generally parallels U.S. 395 about one mile to the east. Around Angle Point WØ2, it crosses a partially developed residential subdivision. Near WNØ4, it crosses about one mile east of the Hallelujah Junction Store. Segment W lies west of the Petersen Mountain Natural Area, a BLM-designated Natural Area of 9,964 acres. Major recreational activities in the Petersen Mountain Natural Area include photography, rockhounding, deer hunting, and observing the natural amenities (riparian and meadow habitats).

Sierra County

Portions of Segments W and X of the proposed transmission line route and the proposed Border Town Substation are located in Sierra County. In this area, the route crosses BLM, State of California, CDFG, and private lands. All of the lands crossed by the proposed route in Sierra County are rural with low population densities. The proposed transmission line route in Sierra County is located on land designated as Agriculture by the Sierra County General Plan.

Segment W. Segment W crosses from Lassen County into Sierra County about 1.5 miles north of WØ3. It crosses undeveloped CDFG land, one Caltrans parcel, and a UPTC ROW. Segment W in Sierra County runs a few miles east of Long Valley. From about 1.5 miles north of WØ3 to its terminus, it crosses the Hallelujah Junction State Wildlife Area. About 0.5 miles southeast of WØ3, Segment W crosses the highway and UPTC, and then generally parallels the highway and railroad about 0.5 miles to the west.

Segment X. Segment X in Sierra County crosses undeveloped BLM and private lands and an undeveloped State of California parcel. In the area of XØ1, Segment X crosses Long Valley Road (Sierra County Road 570). Long Valley Road is the major travel corridor and entrance to Toiyabe National Forest and the Dog Valley Recreation Area, and is heavily used by Long Valley residents for jogging, bicycling, hiking, cross-country skiing, snowmobiling, horseback riding, horse training, nature study, and walking dogs.

Border Town Substation. The Border Town Substation is located on undeveloped BLM land. The SPTC ROW winds to the east and crosses near the middle of the eastern boundary of the proposed substation site. The site generally parallels U.S. 395 between 0.25 to 1 mile to the west. The residential and commercial development of Border Town is located about 0.5 miles northeast of the site. Scattered houses and agricultural structures are located on the private land of Lower Long Valley to the west and between the railroad and White Lake to the east of the site.

Washoe County

Portions of Segments Q and X of the proposed transmission line route are located in Washoe County. They cross USFS, City of Reno, and private lands and SPTC ROWs. The lands crossed by the proposed route in Washoe County are rural residential and low density suburban areas with low to medium population densities. The majority of the transmission line route in Washoe County within the North Valleys Planning Area (i.e., portions of Segment X and Segment Y) is located on land designated as Undeveloped, Agricultural, Low Density Rural, or Medium Urban by the North Valleys Area Plan. The entire transmission line route within the High Desert Planning Area (i.e., Segment Q) is located on land designated as Undeveloped or Agricultural by the High Desert Area Plan. It is noted that the portion of Segment X between Angle Points XØ9 and X12 is not part of the proposed route (see Alternative Segment X-East discussed in Section C.8.3).

Segment Q. Segment Q crosses from Lassen County, California into Washoe County, Nevada at QØ1, and crosses from Washoe County back into Lassen County about 1.5 miles northeast of P-9. Segment Q transects mainly undeveloped BLM land and some private land.

Segment X. Segment X crosses from Sierra County, California into Washoe County, Nevada about 0.25 miles southeast of XØ1. The portion of Segment X from its beginning at the California-Nevada border to XØ9 crosses undeveloped USFS and private lands. From its beginning to about XØ7, it crosses about

0.25 miles east of the foothills of the Toiyabe National Forest. Scattered mines are located on the private land east of the area between XØ7 and XØ8. From its beginning to XØ9, this portion of Segment X generally parallels the SPTC ROW about 0.25 to 0.5 miles to the west, running adjacent to the railroad from about XØ2 to XØ6. From about XØ7 to XØ9, it crosses about 0.5 to 1.5 miles west of the residential subdivisions of Lemmon Valley, Black Springs, Raleigh Heights, and Seneca Drive.

The portion of Segment X from Angle Points X12 to X14 crosses undeveloped USFS land, City of Reno land, and private land. From X12 to X13, it crosses about 0.25 miles north of Talus Drive and several other residential subdivisions, and crosses North Virginia Street (a minor highway that intersects U.S. 395 to the north) and the SPTC ROW about 1.25 miles east of X12. Land uses along North Virginia Street include rural residential, light commercial, and industrial development. At X13, the proposed route crosses less than 0.25 miles southwest of U.S. 395. The existing Sierra Pacific Power Company (SPPCo) Valley Road Substation is located at the terminus of Segment X at Angle Point X14.

The northern portion of Segment X and Segment Y cross the northern and eastern flanks of Peavine Mountain, a regional recreation area used for hiking, horseback riding, mountain bicycle riding, off-road vehicle riding, and hunting. The Peavine Mountain Area includes wetlands, riparian corridors, sensitive plant species habitat, significant wildlife habitat and migration corridors, and scenic ridgelines, hills, and canyons. Segments X and Y cross one heavily used trail along Keystone Canyon, three proposed multi-use recreational trails, and a proposed future trailhead above the Horizon Hills residential development.

Preservation of the natural resources of Peavine Mountain is formally recognized as Open Space in the Regional Open Space Plan (ROSP), adopted in 1994 by Washoe County and the Cities of Reno and Sparks; and in the text and policies of the North Valleys Open Space Plan. The North Valleys Area Plan contains policies that call for ensuring that the scenic qualities of the mountains and hills are maintained; preserving and enhancing the visual qualities as viewed from U.S. 395; and designating Peavine Mountain and its environs as "General Rural" to protect its watershed, scenic, and recreational qualities. The Washoe County Planning Commission has adopted Scenic Roadway Corridor Standards (Article 426) as part of the Washoe County Development Code. Article 426 designates U.S. 395 North, Golden Valley Road to the State Line, as a Scenic Roadway. The primary scenic view from the majority of this highway segment is of Peavine Mountain.

Near X12, Proposed Segment X crosses the northern boundary of Rancho San Rafael Park, a regional park with open vistas located about 1 mile from southern downtown Reno (at end of Volume I). The recreational uses and facilities of the park include hiking, mountain bicycle riding, picnicking, playgrounds, and a museum and arboretum complex. The park is also the site of the annual Reno Balloon Races. About 181 acres were added to the park in December 1994. The grant deed for 120 of these acres, donated to the park by William and Barbara Thornton, restricts construction and maintenance of structures "inconsistent with conservation and maintenance of the property as a natural park, open space, and outdoor recreational area." The U.S. Forest Service and Washoe County Parks Department are currently negotiating to add 158 acres of USFS land that encompasses the clay fill borrow sites and haul road corridor of the Evans Creek Dam Project to Rancho San Rafael Park. After this land is added, Proposed Segment X would cross through the northern portion of the park.

Segment Y. Segment Y covers the portion of the proposed route between XØ9 and X12. It crosses mainly undeveloped USFS land and one private parcel that contains a radio communications facility. It crosses 0.5 miles west of the partially developed residential subdivision along Hoge Road. Scattered mines occur in the general area crossed by Segment Y. Segment Y crosses the eastern flank of Peavine Mountain, described above under "Segment X."

C.8.1.3 Sensitive Land Uses Within and Near the ROW

Sensitive land uses are considered to be those land uses where members of the public are grouped together (e.g., parks) or where uses are particularly sensitive to disturbances that may occur as a result of project construction and operation. Sensitive land use receptors include educational, residential, religious, hospital, recreational, and research uses.

Table C.8-1 lists the sensitive land uses within the study corridor (within 330 feet on either side of the centerline) and near the study corridor (within 2,000 feet of the centerline) of the proposed transmission line route. In Modoc County, the sensitive land uses include residences near Segment A. In Lassen County, the sensitive land uses include residences near Segment E, and a house and trailer near Segment K, in the Madeline Plains; a trailer near Segment L in the Secret Valley; residences near Segment O in the Honey Lake Valley; a house and commercial pottery business near Segment R; and residences near Segment W. In Washoe County, the sensitive land uses include an apartment complex at Talus Drive adjacent to Segment X.

C.8.1.4 Applicable Plans, Regulations, Provisions, and Policies

Federal, state, and local plans, regulations, provisions, and policies govern and regulate the development of the proposed transmission line project. The following sections briefly discuss the land use regulatory authority of federal, state, and local agencies anticipated to have jurisdiction over all or portions of the Proposed Project. A detailed policy consistency analysis is provided in Section C.8.2 (Impacts).

Table C.8-1 Sensitive Land Uses - Proposed and Alternative Project Routes

Receptor	Map I.D. #	Type	Distance (feet) from ROW Center-line	General Location (Quadrangle Name)
Alturas Area				
Proposed Segment A				
Residence (APN 022-010-52)	RES-1	SFD	2000	NE of AØ4, off of SR 299 (Alturas)
Residence (APN-022-010-42)	RES-2	SFD	2000	WSW of AØ4 (Alturas)
Residence (APN-022-010-59)	RES-32	SFD	2000	NW of AØ4 (Alturas)
Residences (The Three Sisters)	RES-3	SFD within partially developed subdivision	1000	NW of AØ6, off County Rd. 54 (Alturas)
Alternative Segment B				
Residence	RES-18	SFD	400	W of BØ1, off North Warner St.(Mahogany Ridge)
Residence	RES-19	SFD	700	S of BØ3 (Alturas)
Arrowhead Golf Course	REC-2	Recreation	200	W of BØ1, off North Warner St.(Mahogany Ridge)
Church of Christ	REL-1	Religious	900	S of BØ3, 1310 N. Warner St. (Alturas)
Residence	RES-20	SFD	800	S of BØ3, 1441 N. Warner St.(Alturas)
Residence	RES-21	SFD	800	S of BØ2, 1375 N. Warner St.(Alturas)
Rattlesnake Creek Ranch	RES-22	SFD	1800	NE of BØ4, Spicer Lane (Alturas)
Residences	RES-23	SFD	1500	E of BØ5, off Spicer Lane (Alturas)
Residence (APN 022-010-36)	RES-24	SFD	400	E of BØ5, N of S.R. 299 where Segment B crosses (Alturas)
Residences (APN 022-010-36)	RES-25	SFD	600	SW of BØ7 (Alturas)
Madeline Plains Area				
Proposed Segment E				
Residences (APN 019-220-23)	RES-4	SFD	1250-1900	NW of EØ3, off Fish and Game Rd. (Madeline)
Residence (APN 031-310-50)	RES-5	SFD	925	W of EØ7, off U.S. 395 (Anderson Mt.)
Alternative Segment F				
Residences (APN 031-150-19 to 031-150-17 and APN 031-150-27)	RES-26 to RES-29	SFD	500 -2000	W of GØ2
Alternative Segment G				
Residence	RES-30	SFD	300	SW of GØ3
Proposed Segment K				
Residence	RES-6	SFD	600	S of KØ2 at U.S. 395 & Termo Grasshopper Rd. (Termo)
Trailer (APN 057-020-54)	RES-7	SFD	450	SE of KØ3, off U.S. 395 (Termo)
Secret Valley Area				
Proposed Segment L				
Tule Patch Spring Rest Area	REC-1	Recreation	300	SE of LØ2, off U.S. 395 (Shinn Mtn.)
Trailers (APN 081-090-19)		SFD	500	N of LØ3 (Shinn Mtn. and Snowstorm Mtn.)
Residence (APN 081-130-13)	RES-8	SFD	1000	NW of LØ4 (Five Springs)
Trailers (APN 081-130-26)	RES-9	SFD	800	NW of LØ5 (Five Springs)
Residence (APN 93-090-18)	RES-10	SFD	700	N of LØ6, off U.S. 395 (Karlo)
Residence (APN 093-090-17	RES 33	SFD	2000	W of LØ6 (Karlo)
Residence (APN 093-090-11)	RES-12	SFD	400	S of LØ6, off US 395

Receptor	Map I.D. #	Type	Distance (feet) from ROW Center-line	General Location (Quadrangle Name)
Residence (APN 093-130-02)	RES-12a	SFD	900	S of LØ6, off U.S. 395 (Karlo)
Residence	RES-11	SFD	150	S of LØ6, off U.S. 395 (Karlo)
Historical Marker "Nobel Emigrant Trail" California Registered Historical Landmark No. 677	HIS-1	Historical	~1 Mile	NW of LØ8, on U.S. 395 (Shaffer Mtn.)
Alternative Segment ESVA				
Residence (APN 093-050-07)	RES-31	SFD	1300	NE of LNØ4 (Five Springs)
Long Valley/Honey Lake Valley Area				
Proposed Segment O				
Residences	RES-13	SFD	500 - 1500	W of OØ1, off Wendel Rd. (Wendel)
Alternative Segment P				
Residences (2 units)	RES-40	SFD	750-1200	N of PØ6 (Constantia)
Residence (APN 111-280-10	Res-41	SFD	1500	SE of PØ6 (Constantia)
Proposed Segment Q				
Doyle Wildlife Area	None	Recreation	0	Between 0Ø5 and QØ1 (CalNeva & Doyle)
Proposed Segment R				
Great Basin Pottery and Residence	RES-14	Commercial/ SFD	~1500	NW of RØ1, at N end of Scott Rd. (Constantia)
Proposed Segment W				
Residence	RES-42	SFD within partially developed subdivision	800	NW of WØ2, N of Hallelujah Junction
Alternative Segment WCFG				
Hallelujah Junction Wildlife Area	None	Recreation	0	Northern half of WCFG segment (Evans Canyon)
Residences (15 units)	RES-43	SFD	1500-2000	E of WNØ7 (Reno NW)
Residences (12 units)	RES-44	SFD	300-1000	SE of WNØ9 (Reno NW)
Border Town to Reno Area				
Proposed Segment X				
Residence (APN 021-100-11)	RES-34	SFD	2000	W of XØ1 (Evans Canyon)
Residences (7 units)	RES-35	SFD	1000-2000	NE of XØ7 (Verdi)
Residences (2 units)	RES-36	SFD	2000	E of XØ7 (Verdi)
Residences ('190 units)	RES-37	SFD	750-2000	S of line between X12 to X13 (Reno)
North Foothill Apts.	RES-15	Multi-family residences	260	Between X12 and X13, off Talus Ave. in Reno (Reno)
Residences ('260 units)	RES-38	SFD	750-2000	W of North Valley Substation
Trailer Park ('280 units)	RES-39	SFD	750-2000	E of North Valley Substation
Alternative Segment X-East				
Residence	RES-17	SFD	400	Between X11 and X12, 1250 Hoge Rd. (Reno)
Residence	RES-16	SFD	200	Between X11 and X12, 1235 Hoge Rd. (Reno)
Residences (10 units)	RES-45	SFD	500-2000	SE of X11 (Reno)

SFD = Single Family Dwelling
N = North
S = South
E = East
W = West

The BLM, as the Federal Lead Agency for the Proposed Project, is responsible for administering federal regulations pertaining to the proposed transmission line and for NEPA certification. The CPUC, as the State Lead Agency for the Proposed Project, is responsible for administering state regulations pertaining to the proposed transmission line and for CEQA certification. Other federal and state agencies have jurisdiction over the land crossed or resources affected by the Proposed Project. In addition, the General Plan and zoning requirements of local jurisdictions are considered by the CPUC in its decision on the Proposed Project.

The primary federal agencies anticipated to have jurisdiction over the Proposed Project include the BLM, USFS, Bonneville Power Administration (BPA), U.S. Department of the Army, U.S. Fish and Wildlife Service (USFWS), and Federal Aviation Administration (FAA). The BLM manages Federal public land crossed by the proposed transmission line, and Federal law requires SPPCo to obtain a ROW grant from the BLM prior to construction. The USFS manages National Forest land crossed by the proposed route and will require a Special Use Permit or ROW grant for the Proposed Project. BPA is an agent of the U.S. Department of Energy that owns and manages electric transmission facilities in the Pacific Northwest; the Proposed Project would interconnect to BPA. The U.S. Department of the Army owns lands crossed by the proposed route, and will require an easement for the project segments that cross its lands. The Army Corps of Engineers regulates development in wetlands, and will require a Section 404 Permit if the Proposed Project will affect wetlands. The USFWS administers the Federal Endangered Species Act. The FAA regulates the potential construction of obstructions to air traffic and requires the filing of a Notice of Obstruction for project facilities over 200 feet above the ground and/or near airports and heliports.

The primary State of California agencies that have jurisdiction over the Proposed Project include the CPUC, SLC, CDFG, California Department of Forestry (CDF), State Historic Preservation Office (SHPO), pertinent Regional Water Quality Control Boards (RWQCB), and Caltrans. The CPUC will require a Certificate of Public Convenience and Necessity for the Proposed Project. The SLC owns and manages lands crossed by the proposed transmission line route and will require a Land Use Lease for crossing SLC property. The CDFG owns and manages lands crossed by the proposed transmission line route, is responsible for managing fish and wildlife resources in the State of California, and administers the California Endangered Species Act. The CDFG will require a Streambed Alteration Agreement if any work will be conducted along the banks or within the bed of any creek or stream. Also, the CDF regulates timber harvesting and will require a Timber Harvest Permit and Timber Alteration Permit if merchantable timber will be removed to construct the Proposed or Alternative Project. SHPO will require compliance of the Proposed Project with Section 106 of the National Historic Preservation Act. The pertinent RWQCB will require a National Pollutant Discharge Elimination System (NPDES) General Construction Activity Storm Water Permit for the Proposed Project. Caltrans develops, maintains, and operates state and federal highways in the State of California and will require an encroachment permit for crossing any of its ROWs.

State of Nevada agencies expected to have jurisdiction over the Proposed Project include the Nevada Public Service Commission (NPSC), Nevada Division of Wildlife (NDOW), Nevada Division of Environmental Protection, SHPO, and Nevada Department of Transportation (NDOT). NPSC will require a permit pursuant to the Utilities Environmental Protection Act (UEPA). NDOW will require a Stream Alteration Permit if any work will be conducted along the banks or within the bed of any creek or stream. The Nevada Division of Environmental Protection will require an NPDES Surface Area Disturbance Permit for the Proposed Project. SHPO will require compliance of the Proposed Project with Section 106 of the National Historic Preservation Act. NDOT develops, maintains, and operates state and federal highways in the State of Nevada and will require an encroachment permit for crossing any of its ROWs.

The primary local agencies that maintain policies applicable to the Proposed Project are the Counties of Modoc, Lassen, and Sierra in California and the County of Washoe in Nevada.

C.8.1.4.1 *Federal Regulations*

The following sections summarize the applicable goals, policies, and standard operating procedures of the BLM; and the applicable goals, objectives, and standards and guidelines of the USFS.

U.S. Bureau of Land Management

Alturas Planning Area Goals, Policies, and Standard Operating Procedures. The Alturas Planning Area of the BLM covers the portion of the proposed transmission line route in Modoc County and in Lassen County to about 2 miles southeast of the Town of Termo. The 1984 Alturas Resource Area Resource Management Plan (RMP) contains goals applicable to the Proposed Project that call for protecting cultural resources of high scientific, interpretive, or sociocultural significance; providing sufficient habitat for native fish and wildlife species and maintaining or improving certain key habitats; managing wetlands and riparian areas to improve or maintain their productivity; providing habitat to maintain and enhance populations of special status species; and maintaining and enhancing water quality. A general policy identified in the RMP applicable to the Proposed Project calls for considering the use of existing utility corridors (power lines of 69 kV or higher) prior to granting rights of way. Standard operating procedures identified in the RMP, applicable to the Proposed Project, call for constructing fences in wildlife use areas according to BLM specifications to permit wildlife movement, implementing projects which could affect water use according to the BLM Best Management Practices Guidelines, reseeding disturbed areas to provide ground cover, and completing a survey for special status species before initiating a project.

Eagle Lake Area Objectives and Standard Operating Procedures. The Eagle Lake Resource Area covers a portion of the proposed transmission line route in Lassen County. The BLM land use planning in the Eagle Lake Resource Area consists of three Management Framework Plans (MFP). These are the Cal-Neva MFP, the Willow Creek MFP, and the Honey Lake-Beckworth MFP. These MFPs contain objectives and standard operating procedures applicable to the Proposed Project that addresses general construction activities and activities by authorized land uses, air quality, cultural resources, ROW corridors, soils, visual resources, water, and wildlife.

Lahontan Resource Area Objectives and Standard Operating Procedures. The Lahontan Resource Area of the BLM covers the portions of the proposed transmission line route in Washoe County, Nevada. The 1985 Lahontan Resource Area RMP and 1994 Lahontan Resource Area Standard Operating Procedures contain objectives and standard operating procedures applicable to the Proposed Project that address general construction activities and activities by authorized public land users, air quality, cultural resources, ROW corridors, soils, visual resources, water, and wildlife. These objectives and standard operating procedures call for maintaining air quality; protecting cultural resources by conducting inventories, avoiding sensitive areas, and mitigating for impacts if avoidance is not effective; prohibiting disposal of hazardous wastes on public lands; preventing soil deterioration; using the contrast rating process to determine visual impacts of development projects and mitigating for visual impacts; maintaining and enhancing water quality; protecting special status species by reviewing development projects; and maintaining and improving wildlife habitat. The standard operating procedures for general construction activities call for minimizing vegetation removal, minimizing erosion and soil damage, removing and disposing of waste in accordance with legal requirements, and revegetating disturbed areas. The standard operating procedures for activities by authorized public land users call for restricting activities during critical wildlife and fish reproductive and migration periods; avoiding impacts to drainages; constructing, maintaining, operating, and/or modifying structures or facilities to protect and minimize impacts to raptors and other wildlife; minimizing impacts to wetlands; protecting water quality; repairing damaged roads; and protecting cultural and visual resources.

U.S. Forest Service

Modoc National Forest Goals, Objectives, and Standards and Guidelines. The 1991 Modoc National Forest Land and RMP contains goals, objectives, and standards and guidelines applicable to the Proposed Project that address air quality, cultural resources, facilities, geology, lands, recreation, riparian areas, sensitive plants, soils, visual resources, watershed, and wildlife and fish. These provisions call for maintaining and protecting environmental resources on USFS lands.

With regard to utility corridors, the goals, standards, and guidelines in the Land and Resource Management Plan call for encouraging the use of private lands for new corridors; limiting allocations of single-purpose transmission lines by placing new utility facilities within or contiguous to existing corridors; minimizing the proliferation of separate utility corridors by confining new utility facilities to existing corridors; considering construction of new corridors if technology, safety, national and state practices, engineering, or environmental quality precludes coexisting uses; avoiding certain sensitive areas when establishing utility corridors; and coordinating with utility managers regarding conflicts of National Forest activities with use and management of the utility corridor. The sensitive areas to be avoided when establishing utility corridors include: critical habitat for special status species, designated Wilderness, Research Natural Areas, semi-primitive recreation areas, Special Interest Areas, and areas used in the practice of Native American religions.

Toiyabe National Forest Goals, Objectives, and Standards and Guidelines. The Toiyabe National Forest Land and RMP goals, objectives, and standards and guidelines, are similar to those in the Modoc National Forest Land and RMP.

C.8.1.4.2 *State Policies*

Californai Public Utilities Commission

The Proposed Project requires a Certificate of Public Convenience and Necessity (CPCN) from the CPUC. By granting a CPCN, the CPUC would find that the project is needed and is in the public interest. The CPCN would authorize SPPCo to take easements and condemn property where necessary. A decision on the CPCN application will be made subsequent to certification of the Final EIR/S. There are no other specific land use policies of the CPUC.

California Department of Fish and Game

A portion of Segment Q of the proposed transmission line route crosses the Doyle State Wildlife Area. Portions of Segments W and X of the proposed route cross the Hallelujah Junction State Wildlife Area. Objectives and policies for management of State Wildlife Areas by the CDFG are contained in the 1994 Fish and Game Code of California, which contains a general policy and land use planning policies applicable to the Proposed Project. The general policy calls for encouraging the preservation, conservation, and maintenance of wildlife resources under the jurisdiction and influence of the state. The land use planning policies call for preserving, protecting, and restoring fish and wildlife resources by implementing a program to ensure close coordination with federal, state, and local planning agencies in forming and implementing any plans which may impact fish or wildlife; reviewing and commenting on Proposed Projects to determine consistency with Fish and Game Commission policies and CDFG management plans, programs, and other responsibilities relative to fish and wildlife resources; and opposing Proposed Projects if they are inconsistent with these plans, programs, and responsibilities and would result in significant loss of fish and wildlife resources. There is also a Management Plan for the Doyle Wildlife Area (1976) and Draft Management Plan for the Hallelujah Junction Wildlife Area (1990). These plans identify limited recreational uses for the two wildlife areas.

C.8.1.4.3 Local Goals, Policies, and Implementation Measures

The State of California requires counties and cities to prepare General Plans that identify goals, policies, and action (implementation) programs to guide land use and development within their respective jurisdictions. Goals and policies regarding the resources along the proposed transmission line route in California are addressed in the Modoc County, Lassen County, and Sierra County General Plans. The State of Nevada requires counties and cities to prepare Comprehensive Plans that identify policies and action programs to guide land use and development within their respective jurisdictions. Policies regarding the resources along the proposed transmission line route in Nevada are addressed in the Washoe County Comprehensive Plan and the City of Reno Master Plan. The following sections present a summary of the applicable land use goals and policies of Modoc, Lassen, Sierra, and Washoe Counties and City of Reno. A detailed analysis of the Proposed Project's consistency with local policies is presented in Section C.8.2.

Modoc County

1988 Modoc County General Plan. Chapter V (Land Use) of the Modoc County General Plan includes goals and policies that call for protecting agricultural land and ensuring compatibility of public and quasi-public land uses (which include transmission lines) with other land uses and development. Chapter VII (Circulation) includes applicable goals and policies that establish specific standards for designing and constructing new roads; and provisions for sizing and locating transmission lines to avoid interfering with adjacent land uses, impacting the environment, or degrading aesthetic values. Chapter VIII (Conservation and Open Space) includes applicable goals and policies that provide for applying specific requirements to projects for mitigating adverse impacts on critical or sensitive wildlife habitats, including habitat for rare, threatened, and endangered species; protecting timber resources; protecting rare, threatened, and endangered plant species; and minimizing impacts on cultural resources. Chapter IX (Noise) includes applicable goals and policies that call for applying specific noise level criteria to land uses other than noise-sensitive land uses, and reviewing building permits for consistency with the Noise Element and other Elements of the General Plan. Chapter X (Safety) includes applicable goals and policies that restrict new development on unsuitable land, minimize topographic alteration on hillsides, and require adequate fire protection and suppression facilities for new development.

1993 Modoc County General Plan Energy Element. The Modoc County Energy Element identifies transmission lines over 69 kV as a conditional use in all County zones. However, the County's jurisdiction over the Proposed Project is preempted by the CPUC. Policies for Energy Facilities included in the Energy Element call for:

- Including specific information in proponent applications for energy facility projects
- Approving energy facilities only if they are in compliance with the General Plan and Zoning Ordinance, and allowing construction only after all permits have been obtained and permit conditions are satisfied
- Avoiding siting energy facilities in sensitive natural resource areas
- Accommodating increased demand for energy transmission with existing transmission facilities, and siting existing transmission or other utility corridors so as to minimize interference with surrounding land uses and minimize visual impacts
- Prohibiting the violation of applicable environmental standards by energy facilities
- Siting and operating energy facilities so as not to exceed the carrying capacity of the affected public infrastructure
- Minimizing generation of wastes, and transporting and disposing of wastes in accordance with applicable laws and regulations
- Periodically updating emergency plans
- Avoiding siting energy facilities in close proximity to sensitive receptors, and protecting energy facilities from incompatible land uses
- Subjecting the construction of energy facilities to Use Permit conditions that minimize disruptions to adjoining properties
- Designing, operating, and maintaining energy facilities to avoid impacts to soils and drainages
- Reclaiming abandoned energy facility sites according to a plan that restores and preserves land values
- Advocating County energy facility policies during energy facility planning.

1991 Modoc County Zoning Ordinance (as amended). Pursuant to the 1993 Modoc County General Plan Energy Element, the 1991 Modoc County Zoning Ordinance identifies transmission lines over 69 kV as a conditional use in all County zones, and requires a Conditional Use Permit for constructing such transmission lines. However, as noted above, the County's jurisdiction over the Proposed Project is preempted by the CPUC. In addition, pursuant to the Energy Element, the Zoning Ordinance requires that all transmission lines over 69 kV comply with specific standards, including placing transmission structures by helicopter or other roadless construction methods in very steep or inaccessible areas; siting transmission lines to avoid impacting critical fish and wildlife habitat; siting transmission lines so as not to interfere with scenic views and to visually integrate with the surrounding setting; avoiding placing transmission structures and diagonal alignments of transmission lines through agricultural fields; and siting transmission lines to follow property lines or routes that would have the least environmental and land use impacts.

Lassen County

1968 Lassen County General Plan and Zoning Ordinance. The Lassen County General Plan contains two general goals applicable to the Proposed Project. These goals establish objectives for protecting the County's wildlife, natural beauty, and wilderness character; and increasing and improving public and private services and facilities for the benefit of County residents and visitors. The General Plan addresses land use, circulation and transportation, recreation and tourism, and natural resource conservation. Although the document does not identify specific policies and implementation measures for these issue areas, it provides recommendations and describes the general County direction and approach for addressing them. Recreation goals identified in the General Plan applicable to the Proposed Project call for maintaining the natural beauty and protecting the physical and scenic natural resources of the County. In addition, one recreation and tourism policy recommendation is applicable to the Proposed Project. It provides for preserving the physical resources and the feeling of wilderness in prime recreational areas by regulating vehicular use and access.

1993 Lassen County General Plan Energy Element. The Lassen County General Plan Energy Element contains general, siting, and construction policies and implementation measures for all energy facilities and specifically for transmission lines and natural gas pipelines. The policies and implementation measures regulate the siting and construction of facilities so as to minimize impacts to environmental resources. The policies and implementation measures for transmission lines and natural gas pipelines include provisions for:

- Submitting plans to the County for review and comment during preliminary route planning and impact assessment
- Siting facilities to minimize impacts on natural resources
- Routing and designing facilities to minimize erosion and sedimentation
- Siting facilities so as not to jeopardize public safety at airports
- Using existing corridors, rights of way, and easements in siting facilities
- Siting facilities so as to minimize impacts to areas with existing or proposed residential development
- Avoiding siting facilities through agricultural fields, and siting facilities along property lines or other routes which would not require splitting parcels
- Siting transmission lines so as to minimize impacts on scenic views and visually integrate the lines with the existing setting, siting transmission lines along highways on the sides of least scenic value, and avoiding siting transmission lines on ridgelines or other visually prominent features

- Developing a fire suppression plan.

1989 Lassen County General Plan Noise Element. The Lassen County General Plan Noise Element identifies noise level performance standards for new projects and developments, and contains a policy that calls for controlling noise generated by new projects and developments so as not to exceed specified noise level standards at any existing residential development or lands designated for residential development.

1987 Lassen County Wendel Area Plan. The boundaries of the Wendel Planning Area are the Town of Wendel to the north, the northern boundary of the Herlong School District to the south, the toe slopes of the Skedaddle-Amedee Mountains to the northeast and east, the State of Nevada line to the east, and the eastern boundary of the Standish-Litchfield Fire Protection District to the west. Portions of Segments N and O of the proposed transmission line route and alternative Segment M occur within the Wendel Planning Area. The Wendel Area Plan includes goals, objectives, policies, and implementation measures applicable to the Proposed Project that call for minimizing and mitigating impacts to soils, geothermal resources, water resources, vegetation, fish and wildlife habitats, agricultural land, cultural resources, scenic resources, traffic patterns and safety, and public roads; minimizing land use conflicts; avoiding exposing development projects to seismic and geotechnical hazards; and minimizing the generation of noise.

1984 Lassen County Hallelujah Junction Area Plan. The Hallelujah Junction Planning Area is located in the Long Valley area of Lassen County. From north to south, the Planning Area covers the area from 1.8 miles north of Hallelujah Junction to the Sierra County line. Portions of Segment W of the proposed transmission line route and alternative Segment Z occur within the Hallelujah Junction Planning Area. The Hallelujah Junction Area Plan includes goals, objectives, policies, and implementation measures applicable to the Proposed Project that call for minimizing and mitigating for impacts to soils, water resources, riparian habitat along Long Valley Creek, deer migration corridors and critical habitat, special status plant and animal species, agricultural land, cultural resources, and scenic resources; avoiding exposing development projects to seismic and geotechnical hazards; and minimizing the generation of noise.

Sierra County

Sierra County General Plan. The Sierra County General Plan establishes goals, policies, and guidelines for resource protection for the unincorporated portions of the County. The policies are similar to those established in the Modoc and Lassen County General Plans.

The Land Use Element of the General Plan contains specific goals and policies for the Long Valley Community. The Element directs the maintenance of open space, agriculture, forest, and recreational uses for this area. Specific policies preserve these uses by precluding residential development through the protection of key wildlife, visual, watershed, and other environmental resources. Furthermore, a key area of Long Valley has been designated as "Recreational". The Land Use Element identifies the following County-wide goals applicable to the portion of the Proposed Project that crosses the Long Valley Community:

- To promote and encourage residential and commercial growth in the Community Core Areas, and confine the extension of public facilities to these areas
- To provide that areas outside the Community Influence Areas are maintained for growth and enhancement of natural resource industry, protection of the County's rural lifestyle, and protection of environmental quality
- To maintain and enhance the identity of each designated Community and allow only land uses which preserve their character
- To provide flexibility in General Plan land use districts to implement a balanced variety of land uses
- To implement development standards which streamline procedures, maximize public involvement, and protect environmentally sensitive areas and areas of natural resource industry.

The Visual Element of the General Plan identifies Long Valley as an area with critical views and important scenic features, and designates this area as a "Unique Area of High Scenic Value" on the map of "Scenic Features". Policy 7 of the Element calls for "a built environment which reflects the County's rural and historic qualities." Implementation Measure 9(b) of the Element directs use of "the Open Space designation or Special Treatment Area Overlay to preserve visual resources which would be significantly impacted by any degree of alteration." The Plants and Wildlife Element of the General Plan designates Long Valley as a "Special Treatment Area " with designations of "Other Sensitive Area" and "Critical Deer Winter Range."

Sierra County General Plan Energy Element. The Sierra County Energy Element contains resource protection policies similar to those in the Energy Elements of Lassen and Modoc Counties. These policies call for protecting environmentally sensitive areas and agricultural uses. The Sierra County Energy Element also contains mitigation measures for fiscal and public services impacts of energy facilities.

Sierra County Zoning Ordinance. The proposed transmission line route crosses areas of Long Valley zoned "General Forest" and "Agriculture". The Sierra County Zoning Ordinance permits public utility distribution facilities but does not permit public utility transmission facilities in these zoning districts.

Washoe County

1993 Washoe County Comprehensive Plan Land Use and Transportation Element. The Washoe County Comprehensive Plan Land Use and Transportation Element contains land use policies and action programs applicable to the Proposed Project that call for establishing visual continuity of roadways in the County; ensuring that development proposals conform with appropriate Comprehensive Plan and relevant Area Plan policies and action programs; ensuring that existing and proposed land uses are compatible; planning development projects so as to prevent soil erosion and preserve natural resources, agricultural land, scenic resources, recreational uses, and cultural resources; and assessing development projects individually and cumulatively for impacts on natural resources. Areas designated "public and semi-public facilities" in the Land Use and Transportation Element are intended for public or semi-public facilities such as schools, churches, fire stations, hospitals, civic and community buildings, and utility buildings and facilities, which includes electrical transmission lines. Development guidelines for areas designated public and semi-public facilities include compatibility with adjacent land uses.

1991 Washoe County Comprehensive Plan Conservation Element. The Washoe County Comprehensive Plan Conservation Element contains policies and action programs addressing cultural, scenic, land, water, and air resources applicable to the Proposed Project that call for preserving cultural resources; protecting environmentally sensitive and/or critical land, water, and wildlife resources; ensuring that information on geotechnical hazards is incorporated into the land use planning and development processes; regulating development to minimize drainage, erosion, siltation, and landslide problems; regulating development to protect riparian vegetation of drainages and wetlands; and protecting, conserving, and enhancing fish and wildlife resources, key wildlife habitats, habitats of special status species, and key wildlife migration routes.

1993 Washoe County Comprehensive Plan High Desert Area Plan. The High Desert Planning Area comprises the northern two thirds of Washoe County. It is bounded on the north by the Oregon-Nevada state line, on the south by the North Valleys Planning Area and the Pyramid Lake Indian Reservation boundary, on the west by the Nevada-California border, and on the east by the Pershing and Humboldt-Washoe County line. A portion of Segment Q of the proposed transmission line route is located within the High Desert Planning Area. The High Desert Area Plan contains conservation policies and action programs applicable to the Proposed Project that provide for maintaining the rural character and protecting the scenic resources, designated wilderness areas, and natural habitats and preserves; and allowing use and development of natural resources under specific conditions. The High Desert Area Plan indicates that utilities such as electrical lines and telephone lines should be placed underground in order to preserve the natural setting of residential communities in the Planning Area; however, this recommendation is not presented as a policy.

1993 Washoe County Comprehensive Plan North Valleys Area Plan. The North Valleys Planning Area is located in the southern portion of Washoe County. It is bounded on the north by the High Desert Planning Area, on the east by the Spanish Springs, Sun Valley and Warm Springs Planning Areas, on the south by the Verdi Planning Area and the City of Reno, and on the west by the Nevada-California border. A portion of Segment X and Segment Y of the proposed transmission line route are within the North Valleys Planning Area. The North Valleys Area Plan contains policies applicable to the Proposed Project with regard to maintaining the scenic qualities of the mountains and hills, preserving and enhancing the visual qualities as viewed from U.S. 395, protecting the natural resources, restricting development projects on land that has geotechnical hazards and high environmental value; and ensuring that development projects proposed within wetland areas comply with federal and local wetland regulations. The North Valleys Area Plan indicates that utilities such as electrical lines and telephone lines should be placed underground in order to preserve the natural setting of the Planning Area; however, this recommendation is not presented as a policy.

City of Reno

The City of Reno land use policy document is The Master Plan/Policy Plan (1986). Applicable policies address land use compatibility issues of new development. The City of Reno will require a Special Use Permit for the Proposed Project; the City maintains jurisdiction over the project since the CPUC has no jurisdiction in Nevada.

C.8.2 ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT

C.8.2.1 Definition and Use of Significance Criteria

Two main components comprise the analysis of land use impacts of the Proposed Project:

- Determination of preclusion of existing land uses, and the potential short-term and long-term conflicts with surrounding land uses
- Identification of the potential inconsistencies with federal, state, and local policies and regulations.

In order to evaluate conflicts created by the Proposed Project with surrounding land uses, the individual impacts of the Proposed Project identified within the respective issue areas are evaluated in terms of their combined effects on land uses. The type and duration of conflicts with residential, recreational, agricultural, and religious land uses that would result from constructing and operating the Proposed Project are determined by aggregating the impacts of the following issue areas: air quality, noise, energy and utilities, public safety and health, socioeconomics, transportation and traffic, and visual resources.

The criteria used to determine the significance of impacts on residential, recreational, agricultural, and religious land uses are based on CEQA guidelines, previous environmental documents analyzing transmission line projects and other projects in the region, and the types of land uses present within and near the transmission line ROW and substation sites. These criteria are based on the long-term compatibility of the Proposed Project with existing and future land uses. For the various types of land uses in the project region, the criteria for determining impact significance are listed below.

General Uses

- Permanent preclusion of a permitted use or a particular land use
- Long-term disturbances that would diminish the quality of a particular land use
- Inclusion of public uses or sensitive land use receptors within the footprint of a hazardous area
- Conflict with federal, state, county, or city land use plans, policies, or regulations.

Residential Uses

- Permanent or long-term change in the character of an area of residential use
- Conflict with the established residential use of an area.

Recreational Uses

- Permanent or long-term preclusion of a recreational use
- Temporary preclusion of a recreational use during the peak use season
- Long-term loss or degradation of the recreational value of a major recreational facility
- Conflict with the established recreational use of an area.

Agricultural Uses

- Conversion of prime cropland or grazing land to non-agricultural use
- Permanent or long-term impairment of the productivity of prime cropland, grazing land, or other agricultural operations
- Conflict with the established agricultural use of an area.

C.8.2.2 Environmental Impacts and Mitigation Measures

C.8.2.2.1 *Construction Impacts*

As described in the Project Description (Section B.2), construction of the transmission line would occur from March 1996 through December 1996. Assuming a reasonable worst case scenario, it can be expected that disturbances from constructing the transmission line would occur for approximately seven days at any given structure site along the ROW. This schedule would mean daily disturbances to land uses adjacent to the ROW during all phases of construction: site preparation, excavating structure foundations, assembling structures, erecting structures, installing conductor and shield wires, site clean-up, and planting and maintaining vegetation for site restoration. The seven days of disturbance would not necessarily be consecutive. The majority of disturbances would occur before site clean-up and restoration. Construction activities would also occur outside of the ROW: overland travel, improving access routes, constructing new access routes, upgrading existing four wheel drive (4WD) roads, intermittent blading of rough areas for overland travel, and constructing and using staging areas.

Based on the construction schedule, it can be expected that disturbances from constructing each substation would occur intermittently over an approximate 14 month period. This schedule would mean daily disturbances to land uses adjacent to the substation sites during all phases of substation construction: site clearing and grading, installing fencing, constructing concrete footings and slabs, digging trenches, installing conduits and conductors, back-filling trenches, placing gravel, constructing a concrete slab, erecting a pre-fabricated control building and auxiliary structures, and installing landscaping. The following discussions describe construction impacts on residential, recreational, agricultural, and religious land uses adjacent to and near the Proposed Project ROW and substation sites.

Construction Impacts on Residential Uses

Table C.8-1 (in Section C.8.1) lists the sensitive land uses, including specific residences, trailers, apartment buildings, and undeveloped or partially developed residential subdivisions within and near the ROWs of the Proposed Project and alternative routes. These and other residential uses near the staging areas, ROW, and proposed access route improvements would experience a variety of disturbances as a result of the transmission line construction activities: increases in noise, dust, odors, and traffic, as well as visual intrusion of construction vehicles, equipment, workers, and stored materials. For residential uses adjacent to or near the ROW, access routes may be temporarily restricted, blocked, or detoured, causing delays in departing from or arriving at homes. Residential uses near the Border Town Substation and North Valley Road Substation sites would also experience increases in noise, dust, odors, and traffic as a result of the substation construction activities described above. Overall, disturbances to residential uses during construction of the transmission line and substations would be adverse, but not significant (**Class III**), due to the temporary nature of the construction activities at any one location along the ROW or at any one substation site.

Mitigation Measures for Impacts on Residential Uses

Mitigation measures to reduce disturbance to residential areas during construction of the Proposed Project are identified in Sections C.2.2 (Air Quality), C.5.2 (Energy and Utilities), C.9.2 (Noise), and C.12.2 (Transportation and Traffic). In addition, visual resources Mitigation Measures V-1 through V-4 call for storing construction materials and excavated materials away from highly visible route segments; confining construction activities and materials storage to within the transmission line ROW, substation sites, and staging areas; prohibiting the construction of roads in highly scenic areas or areas of known public concern; and constructing roads at appropriate angles to minimize views of newly graded terrain. The following mitigation measures would further reduce the adverse, but not significant disturbances to residential uses during construction of the transmission line and substations:

L-1 At least one month prior to constructing the transmission line, a substation, or staging area in a particular area, the Applicant shall give advance notice of such construction and the anticipated disturbances to property owners, residents, and tenants potentially affected by construction activities. The Applicant shall provide this notice by: (1) mailing notices to properties and residential uses within 1000 feet of the transmission line ROW, substation site, or access road; (2) posting bulletins in neighborhoods that would be affected by construction activities; and (3) publishing notices in local newspapers. The Applicant shall incorporate these advance noticing procedures into the Construction, Operation, and Maintenance Plan. The Lead Agency shall review and approve the Construction, Operation, and Maintenance Plan and shall review and approve copies of mailed notices, bulletins, and published notices prepared and distributed by the Applicant.

L-2 The Applicant shall appoint a public affairs officer to be the Applicant's public liaison or point of contact before, during, and after constructing the Proposed Project through residential areas. This officer shall be available to discuss public concerns or questions. Procedures for reaching the public affairs officer via telephone or in person shall be included in notices distributed to the public in accordance with Mitigation Measure L-1. The Lead Agency shall review the memorandum regarding appointment of a specific individual as public affairs officer, and shall review and approve copies of mailed notices, bulletins, and published notices prepared and distributed by the Applicant.

Construction Impacts on Recreational Uses

The public and private lands crossed by the Proposed Project, substation sites, staging areas, and new and improved access routes are currently used for hiking, observing wildlife and scenic resources, hunting, and fishing. The main recreational destinations in the area of the Proposed Project include: Modoc National Forest, Ramhorn Springs Campground, Tule Patch Spring Rest Area, Infernal Caverns Battleground Memorial Monument, Viewland Historical Monument Overlook, Infernal Caverns, Lassen Red Rocks Scenic Area, Petersen Mountain Natural Area, Skedaddle Mountains, Fort Sage OHV Area, the gravel mining pit near the Sierra Army Depot used by motorcycle and ATV riders as a staging area and campground, Devils Garden Mountain Bike Trail near Daggert Canyon and an unnamed mountain bike trail, Sherlock Spring, Bayley Reservoir, Delta Lake, Graves Reservoir, Graven Reservoir, Viceroy Pond, Juniper Stock Tank, Smith Reservoir, and Bailey Reservoir. Recreational users of these areas could experience increases in noise, dust, odors, and traffic; visual intrusion of construction vehicles, equipment, workers, and stored materials; and restricted, blocked, or detoured access to recreational opportunities as a result of constructing the transmission line and substations. These disturbances would detract from the quality of the recreational experience of these users. Disturbances to recreational users would be adverse, but not significant (Class III), due to the temporary nature of the construction activities at any one location along the ROW or at any one substation site.

Northwest of QØ1, Segment Q crosses a motorcycle and All-Terrain Vehicle (ATV) trail loop and a dirt access road of the Fort Sage Off-Highway Vehicle (OHV) Area, a designated BLM recreational area. Several locations in the OHV Area provide views to the Honey Lake Valley. In addition to motorcycle and ATV riding, slower speed family OHV riding and 4WD vehicle riding also occur along the trail and road network of the OHV Area. Other major activities in the OHV Area include sightseeing and wildlife viewing. Activities within the ROW for constructing the transmission line, intermittent blading of rough areas within the ROW for constructing a single lane overland travel route, and upgrading of existing 4WD roads outside the ROW would degrade the recreational experience of the riders of the trail and access road. Human activity, truck traffic, equipment operation, and construction operations would disturb the riders, reduce their safe riding speed, and restrict their use of the trail and access road, resulting in a significant, but mitigable (Class II) impact.

Mitigation Measures for Impacts on Recreational Uses

The following mitigation measures would further reduce the adverse, but not significant impacts on recreational uses during construction of the transmission line and substations:

L-3 At least two weeks prior to constructing the transmission line, a substation, or staging area in a particular area, the Applicant shall give advance notice of future restricting, blocking, or detouring of access routes to known recreational destinations. The Applicant shall provide this notice by posting bulletins along the access routes to known recreational destinations that would be restricted, blocked, or detoured. In accordance with Mitigation Measure T-5, the Applicant shall develop alternative transportation routes for restricted, blocked, or detoured access routes. The Applicant shall incorporate these advance noticing procedures and alternative transportation routes into the Construction, Operation, and Maintenance Plan. The Lead Agency shall designate the party responsible for monitoring the advance noticing. Said monitor shall review and approve the Construction, Operation, and Maintenance Plan and shall review copies of bulletins prepared and distributed by the Applicant.

The following mitigation measure would reduce the significant degradation of the recreational experience of riders at the Fort Sage OHV area to a level of non-significance:

L-4 At least one month prior to constructing the transmission line in the Fort Sage OHV Area, the Applicant shall give notice of construction activities and the restriction or closure of specific motorcycle and ATV trails, dirt access roads, and paved access roads. The Applicant shall provide this notice by posting bulletins at the trailhead and along the specific trails and access roads that would be restricted or closed. The Applicant shall incorporate this advanced noticing procedure into the Construction, Operation, and Maintenance Plan. The Lead Agency-designated monitor shall review and approve the Construction, Operation, and Maintenance Plan and conduct a site visit to the Fort Sage OHV Area to observe whether the bulletins have been posted in the appropriate locations.

Construction Impacts on Grazing

Table C.8-2 lists the name, number of permittees, and seasons of use of grazing allotments crossed by the Proposed Project and alternative routes. Transmission line construction activities would result in a temporary loss of the use of grazing land within the 160-foot ROW as a result of removing vegetation, grading, and blading for site preparation; overland travel; excavating for structure foundations; assembling and erecting structures; installing conductor and shield wires; site clean-up; and planting and maintaining vegetation for site restoration. Construction activities would also result in a temporary loss of the use of grazing land outside the ROW as a result of overland travel; constructing new access routes, upgrading existing 4WD roads, and intermittent blading of rough areas for overland travel; and constructing and using staging areas. In addition, human activity, movement of vehicles and equipment, and noise during construction activities could disturb grazing animals and drive them away from livestock water sources near the construction area. Overall, the loss of use of grazing land would be significant, mitigable (**Class II**) due to conflicts (i.e., disturbances) with the established use of land for grazing and potential to displace livestock from existing water sources.

There are numerous range improvements (e.g., fencing and gates) on BLM and private lands. Constructing the transmission line, substations, and staging areas could require removing sections of fencing along grazing allotments or constructing new gates if the existing gates were too narrow to allow access to construction areas. If these open fence sections were not immediately replaced or covered by temporary barriers, or if new or existing gates were inadvertently left open, grazing animals disturbed by construction activities and trying to move away from the construction area could move to or across U.S. 395 or other roads or to another grazing allotment. Allotment permittees could lose grazing animals or be forced to expend time and money looking for and retrieving lost animals. Furthermore, movement of grazing animals across the roadways or U.S. 395 could result in animal mortality. Movement of grazing animals to another grazing allotment could result in a trespass violation from the BLM or legal

Table C.8-2 BLM and MNF Grazing Allotments Crossed by Proposed and Alternative Project Routes

Allotment Name (# of Permittees)	Season of Use	Segments Crossed
Modoc National Forest - Alturas Area (Segment A)		
Big Sage (4)	5/1 - 9/30	A
BLM Alturas Resource Area (Segments A, C, E and Alternative Segments B, D, F, G, H, I)		
Rye Grass Swale (1)	4/16 - 6/1	C
Rocky Prairie (1)	5/1 -5/31, 9/16 - 10/15	C
Westside (1)	4/13 - 6/25	A, C
South Fork (1)	5/1 - 9/15	C
Flournoy Individual (1)	4/16 - 9/30	C
Nelson Corral (1)	5/16 - 9/20	C, D
No. Ash Valley (2)	4/16 - 9/30	D
Summit (1)	5/1 - 9/30	D
So. Ash Valley (1)	5/15 - 8/1, 5/15 - 9/15	D
BLM Eagle Lake Resource Area (Segments K, L, N, O, Q and Alternative Segments J, ESVA, M, P)		
New Bailey Creek (2)	5/1 - 9/30 4/16 - 10/31	J, K
Rave AMP (1)	4/1 - 10/31	J, K
Crest (1)	5/1 - 9/15	J, K
Snowstorm (2)	4/1 - 8/31 4/1 - 10/31	J, K
Observation (4)	4/15 - 10/31 4/15 - 10/31 4/15 - 10/31 4/15 - 10/31	K, L, ESVA
Deep Cut (2)	4/1 - 6/15 4/1 - 10/31	L, ESVA, M, N
California Winter Range (1)	1/10 - 4/10	O
BLM Lahontan Resource Area (Segments R, T, W, X, Y and Alternative Segments S, U)		
Constantia (2)	5/1 - 10/15 11/1 - 12/30	P, Q, R, S
Hallelujah Junction (2)	4/15 - 11/30	S, T, U, W, Z
Wedekind (1)	4/15 - 6/15	X, Y
Flanigan (1)	12/1 - 10/30	Q

complications between allotment permittees. The loss of grazing animals as a result of removing sections of fencing and leaving gates open would be a significant, mitigable impact (Class II) due to the conflict of temporary fence removal with the established use of land for grazing.

Mitigation Measures for Impacts to Grazing. The following mitigation measures would reduce the significant loss of use of grazing land to a level of non-significance:

L-5 Prior to start of construction for the Proposed Project, the Applicant shall work with the BLM and allotment permittees to identify authorized range improvements crossed by the Proposed Project route, and important livestock waters within 200 yards of the route. The Applicant will work with the BLM and appropriate permittee to insure that range improvements are protected or repaired within one week of any damage, and that alternative water sources for livestock are made available if determined necessary by the BLM. The Applicant shall incorporate procedures for BLM/permittee notification, range improvement protection and repair procedures, and a list of potential water supply methods into the Construction, Operation and Maintenance Plan. The BLM shall designate the party responsible for monitoring implementation of these construction schedule and grazing rotation system adjustments and ensure that the BLM, Applicant, and grazing permittees meet to develop these items, and shall review and approve the Construction, Operation, and Maintenance Plan. For construction within National Forests, the Applicant shall work as specified herein with the USFS and appropriate permittees.

The following mitigation measures would reduce the significant loss of grazing animals as a result of removing sections of fencing and leaving gates open to a level of non-significance.

L-6 Immediately after removing sections of grazing allotment fencing to allow for access to a construction area, the Applicant shall construct a temporary barrier across the section of removed fencing so that grazing animals cannot move through the fencing. The Applicant shall construct the barrier so that it can be easily moved aside to allow for access by construction vehicles and equipment. Immediately after completing construction in an area, the Applicant shall repair the section of removed fencing. The Applicant shall monitor these measures by designating one member of each construction crew who shall be responsible for ensuring that the barriers are constructed immediately after the fencing sections are removed, and that the sections of removed fencing are repaired immediately after construction is completed. The Lead Agency shall designate the party responsible for monitoring these measures. Said monitor shall periodically inspect the construction area to observe whether barriers have been constructed across sections of removed fencing, and shall inspect areas where the transmission line has been constructed to observe whether sections of removed fencing have been repaired.

L-7 The Applicant shall close all gates immediately after they are opened to allow construction vehicles and equipment access to a construction area. The Applicant shall monitor this measure by designating one member of each construction crew who shall be responsible for ensuring that all gates are closed immediately after they are opened. The Lead Agency shall designate the party responsible for monitoring this measure. Said monitor shall periodically inspect the construction area to observe whether all gates are closed.

Construction Impacts on Cropland

During construction of the transmission line, disturbances from construction activities and temporary occupancy of the land within the 160-foot ROW could result in a temporary loss of the use of a relatively small area of cropland for growing hay and other crops in the Madeline Plains (from the Town of Madeline to about E-8). This temporary loss of the use of cropland would result from removing vegetation and grading for site preparation, overland travel, assembling and erecting structures, and site clean-up. Construction activities and temporary occupancy of the land could also result in a temporary loss of the use of cropland outside the ROW as a result of constructing a staging area north of Angle Point EØ8 of the Proposed Project route. Depending on the season and timing of construction, disturbances from construction activities and temporary occupancy of the land within the ROW and staging area could preclude or interfere with planting, maintaining, or harvesting the hay crop, or could damage the hay crop. Overall, the potential loss of use of cropland would be significant, mitigable (Class II) due to potential conflicts, although temporary, with the established use of land for growing hay and other crops.

Mitigation Measures for Impacts on Cropland. The following mitigation measures would reduce the temporary significant loss of use of cropland to a level of non-significance.

L-8a The Applicant shall include a stipulation in its easement agreements with farmers along the ROW, that the farmers shall be reimbursed for the value of the crops lost and the cost of any delay or interruption in necessary farming practices as a result of any interrupted use of cropland during project construction. The State Lead Agency, in consultation with the County Cooperative Extension offices, shall designate the party responsible for monitoring. Said monitor shall ensure that the Applicant incorporates the stated condition in its easement agreements with farmers, and that farmers are adequately and timely reimbursed for crop losses and the cost of delay or interruption of farming practices.

L-8b Prior to constructing the Proposed Project, the Applicant shall work with the appropriate County Cooperative Extension service agent, and farmers to agree to a construction schedule that would avoid the prime crop planting, growing, and harvesting seasons, to the extent possible. If weather or other environmental constraints require that the Applicant construct in actively farmed fields, the Applicant shall reimburse the affected farmers for any crop losses. The State Lead Agency, in consultation with the County Cooperative Extension Offices, shall designate the party responsible for monitoring. Said monitor shall ensure that the Agency, Applicant, and farmers meet to agree to a construction schedule; and that farmers are adequately and timely reimbursed for crop losses.

C.8.2.2.2 *Operations Impacts*

As described in the Project Description (Section B.2), operation of the transmission line would involve patrolling the lines by vehicle, foot, or air to determine overall line integrity; trimming and removing trees and checking for encroachments; and general maintenance and repair activities. These maintenance activities would occur on a periodic basis over the life of the Proposed Project. This schedule would mean periodic disturbances of noise, dust, odors, traffic, and restricted access to land uses adjacent to the ROW. Operation of the Proposed Project would also include the physical presence of the transmission line structures and substations.

Operations Impacts on Residential Uses

Disturbances to Residential Uses. Table C.8-1 lists the sensitive land uses, including specific residences, trailers, apartment buildings, and undeveloped or partially developed residential subdivisions along the proposed and alternative project routes. These and other residential uses would experience increases in noise, dust, odors, and traffic as a result of human activity, truck traffic, and equipment operation as a result of transmission line maintenance. Disturbances to residential uses during maintenance of the transmission line would be adverse, but not significant (**Class III**), due to the intermittent and temporary nature of the maintenance activities at any one location or point along the ROW.

Degradation of Quality of Residential Uses. The presence of the transmission line and substations would degrade the quality of residential uses by changing the character of the environment in which these residential uses are located, and conflicting with the desired uses of the residential property. The character of the environment would change as a result of the presence of the project structures, either on or near the residential property, in the views from the residential uses, and as a result of the presence of electric and magnetic fields (EMFs) from the project facilities.

In rural areas with undisturbed scenic vistas, the presence of the project structures in views would degrade the scenic quality of the land on and near which the residential uses are located. The visual impacts of the Proposed Project are described in Section C.13.2 (Visual Resources). Although the visual analysis does not address impacts to specific residences, based on the information in Table C.13-9, which provides a summary of the significance of visual impacts of the Proposed Project along specific angle point subsegments, the visual impacts of the transmission line would be significant from those residences located near Angle Points EØ3, EØ4, KØ2, KØ3, LØ4 through LØ6, and RØ1. These residences are located within the angle point subsegments that would have significant visual impacts. The visual impacts of the transmission line would also be significant from those residences listed in Table C.8-1, which lists the sensitive land uses within and near the ROW (within 2000 feet of the centerline) along the proposed and alternative project routes. Therefore, the visual impacts of the transmission line would be significant from those residences located along Segments A, B, E, F, G, K, L, O, R, W, and X.

In addition, the presence of the project structures and ROW may conflict physically or visually with the desired uses of the residential property, such as recreating, relaxing, gardening, and entertaining. The 160-foot ROW must remain clear of any structures, prohibiting development of any ROW that crosses private land. Impacts of the Proposed Project on property values are addressed in Section C.11.2 (Socioeconomics and Public Services).

The effects of EMFs are discussed in Section C.10.2 (Public Safety and Health). Currently, there are no Federal or State standards limiting human exposure to EMFs from transmission lines or substation facilities in California and Nevada. While a few states have enacted some type of EMF standards, the purpose of the standards is to ensure that the field levels from new power lines are no greater than the field levels from existing lines. As discussed in Section C.10.2, at the edge of the ROW (80 feet from the centerline) the Alturas Transmission Line Project meets the existing standards for all States with the exception of the residential limit imposed in Montana. The residential electric field standard of 1 kV/m in Montana is met by the Proposed Project for all configurations except the 345 kV H-frame structure. As proposed, the alignment for the Proposed Project is separated from sensitive receptors by a minimum of 300 feet, except for a residence on Segment L (150 feet from centerline) and the North Foothill Apartments on Segment X (approximately 260 feet from centerline).

The proposed Border Town Substation would be incompatible with the surrounding rural residential and agricultural uses. Although the commercial development of Border Town is located about 0.5 mile northeast of the substation site, the large industrial facility would contrast with the rural, open space character of the area; conflict with the uses of residential property described above; and degrade the quality of residential uses in the area.

Given that significant visual impacts would diminish the quality of residential uses and constitute a permanent change in the character of areas of residential use, the impact to residential uses would be a significant, non-mitigable impact (**Class I**).

Mitigation Measures for Impacts on Residential Uses

Applicable mitigation measures for disturbances to residential uses during operation and maintenance of the Proposed Project are identified in Sections C.2.2 (Air Quality), C.5.2 (Energy and Utilities), C.9.2 (Noise), and C.12.2 (Transportation and Traffic). These measures would reduce the adverse, but not significant disturbances to residential uses during maintenance of the transmission line.

The following mitigation measure would reduce the significant degradation of the quality of residential uses as a result of the presence of the project structures:

L-9 As proposed, the Applicant shall design the Proposed Project such that the transmission line structures are not placed within 300 feet of existing residences. Where sensitive receptors would be located less than 300 feet from the centerline, the separation between the receptor and centerline shall be maximized to the extent feasible as determined by the Lead Agencies. Prior to permit issuance, the Applicant shall submit to the Lead Agencies for review and approval final construction plans for the Proposed Project that reflect this requirement. The Lead Agency designated environmental monitor shall ensure that the Proposed Project is sited as approved.

Operations Impacts on Recreational Uses

Disturbance to Recreational Uses. The public and private lands crossed by the Proposed Project route are used for a wide variety of recreational uses, as identified in Section C.8.1.2. These recreational areas are described above under construction impacts to recreational uses. Recreational users of these lands could experience increases in noise, dust, odors, and traffic and restricted access as a result of maintenance activities. These disturbances would detract from the quality of the recreational experience of these users. Disturbances to recreational users would be adverse, but not significant **(Class III)**, due to the intermittent and temporary nature of the maintenance activities in the areas of these recreational opportunities.

Applicable mitigation measures for disturbances to recreational uses during maintenance of the Proposed Project are identified in Sections C.2.2 (Air Quality), C.9.2 (Noise), and C.12.2 (Transportation and Traffic). These measures would reduce the adverse, but not significant disturbances to users of recreational lands during maintenance of the transmission line.

The presence of the transmission line and substations would degrade the quality of the experience of recreational users by changing the character of the environment in which the recreational uses are located, and potentially interfering with existing and future recreational activities. The character of the environment would change as a result of the presence of the transmission line structures in the views of the recreational users (see Section C.13.2, Visual Resources). The presence of the project structures in views to or from recreational areas would change the natural, scenic, or historic environment of the recreational areas and degrade the quality of the recreational experience of the users of those areas. In addition, the presence of the project structures may physically interfere with hiking, observing wildlife, riding mountain bikes, observing scenic and historic resources, and hunting. The change in character of the environment would be significant at the Tule Patch Spring Rest Area, Infernal Caverns Battleground and Memorial Monument, Lassen Red Rocks Scenic Area, Peavine Mountain Area, Rancho San Rafael Park, and Daggert Canyon. The presence of the project structures would degrade the natural setting (natural spring, bluff, and vegetation transition) at the Tule Patch Spring Rest Area; the historical setting (1867 battleground, soldiers' graves, and Indian rock rings and hunting blinds) at and near the Infernal Caverns Battleground and Memorial Monument; the unusual geologic setting at the Lassen Red Rocks Scenic Area; the natural setting and scenic qualities of the Peavine Mountain Area; the open vistas of Rancho San Rafael Park; and the natural setting (unusual, steep canyons and habitat transition) of Daggert Canyon. Degradation of the quality of the experience of recreational users would be significant, non-mitigable (**Class I**) because it would constitute long-term degradation of the overall recreational value of several primary recreation areas.

After the transmission line is constructed, the presence of the structures could restrict use of the trail and access road and pose hazards to rider safety at the Fort Sage OHV Area if the structures are placed within or adjacent to these recreational facilities. Overall, degradation of the recreational experience of the riders of the trails of the Fort Sage OHV Area would be significant, mitigable (**Class II**) due to long-term loss or degradation of the recreational value, and due to conflict with established recreational uses of the OHV Area.

Mitigation Measures for Impacts on Recreational Uses

The following mitigation measure would reduce the significant degradation of the recreational experience of riders at the Fort Sage OHV Area to a level of non-significance:

L-10 The Applicant shall design the Proposed Project such that structures are not placed within or adjacent to the motorcycle and ATV riding trails, dirt access roads, or paved access roads of the Fort Sage OHV Area. The Lead Agency-designated monitor shall review and approve the final plans for siting the transmission line structures.

There are no measures available to mitigate the significant effect of the Proposed Project on the recreational experience of users of the Toiyabe National Forest. The only form of impact offset would be offsite compensation as follows:

L-11 The Applicant shall purchase and grant to the Toiyabe National Forest compensatory land as deemed appropriate by the Toiyabe National Forest. These lands shall be suitable to recreational uses as identified in the Toiyabe National Forest Land and Resource Management Plan.

Land Use Impacts on State Wildlife Areas

Land use impacts on State Wildlife Areas are associated with the introduction of an industrial facility on lands managed by the State for wildlife protection and visitor enjoyment purposes. Although the Biological Resources section (Section C.3.2) addresses physical impacts on wildlife and wildlife habitat in the State Wildlife Areas, this land use section evaluates the impacts on the recreational use of these areas and their resources.

There are two California State Wildlife Areas crossed by the Proposed Project route. The Doyle Wildlife Area is located along proposed Segment Q and alternative Segment P, and the Hallelujah Junction Wildlife Area is located along Segment W and alternative Segment WCFG.

Doyle Wildlife Area. One of the management objectives of the Doyle Wildlife Area Management Plan (CDFG, 1976) is as follows:

- To provide recreational and scientific use opportunity on Doyle Wildlife Area with priority directed towards wildlife-related use to the extent that such use does not adversely affect wildlife and environmental values.

Numerous roads and trails, a railroad ROW and a major state highway pass through the area. A portion of the Wildlife Area is crossed by trails of the Fort Sage OHV area. According to the Management Plan, CDFG and BLM lands together comprise an important recreational area for local residents and visitors for both wildlife and non-wildlife related uses. Major recreational uses include hunting, target shooting, dune buggy riding, motorcycle riding, and sightseeing. Non-wildlife related uses are predominant. Offroad vehicle use is the primary year-round activity on the Doyle Wildlife Area. BLM and CDFG are actively engaged in the "Fort Sage Exchange", in which CDFG will exchange the eastern portion of the Doyle State Wildlife Area, impacted by development and use of the motorcycle and ATV loop trail, for BLM land in the Bald Mountain area southwest of Standish, California.

Hallelujah Junction Wildlife Area. The property has been used historically for livestock grazing. There is currently limited use of this area due to lack of access and visitor facilities such as parking, interpretive signs, etc. Existing uses are confined to academic research and study, bird watching, wildlife photography, and hunting. The CDFG indicates that more visitor-related recreational uses are planned for the future. However, the Draft Management Plan for the area recommends restriction of vehicular public access to preclude adverse impacts through habitat degradation or wildlife disturbance.

Impacts. There are two types of land use impacts associated with the Proposed Project crossing the wildlife areas: degradation of the quality of recreation use and conflicts with Wildlife Area Management Plans.

The CDFG indicates that the Proposed Project would represent an irrevocable encumbrance of public lands (Nelson, 1995). This is based on CDFG's assessment that use of the property would be lost because of the severe degradation caused by the presence of the transmission line. This presence would interfere with and degrade wildlife viewing, hiking enjoyment, and the overall quality of the outdoor experience in the wildlife areas. As described in the Visual Resources analysis (Section C.13.2), the Proposed Project would reduce the visual quality of the surrounding area. In the case of the wildlife areas, there is the potential for placing structures in locations that are in clear view of a large region within the wildlife area. This impact is considered significant **(Class II)**. For the Hallelujah Junction Wildlife Area, this impact would be related to future use of the property.

Although management plans for the wildlife areas are general and do not specifically address placement of transmission lines, the Proposed Project (like any industrial facility) is considered to be in direct conflict with the State's directive regarding wildlife areas. According to the CDFG, the facilities would irreparably limit the agency's ability to carry out its mission, including for example, activities such as construction of wells, visitor facilities, and other facilities that the agency deems necessary for appropriate management of the area.

Mitigation Measures for Impacts to State Wildlife Areas

There are no measures available to mitigate the physical impacts of the transmission line, as it cannot be screened from public views. The only form of impact offset would be offsite compensation as follows:

L-12 The applicant shall purchase and grant to the CDFG compensatory land based on the formula applied in Table C.8-3. These lands shall be suitable for wildlife management and recreational uses as identified in the Wildlife Area Management Plans.

Table C.8-3 was developed to calculate the amount of acreage needed to mitigate or compensate for the degradation of Wildlife Areas. The quality of the existing wildlife areas that would be crossed was considered in developing the acreage amounts. Degradation considerations were factored into the formula in the table. This mitigation table focusses on the segments currently or previously identified as environmentally superior, which include Proposed Segments Q and W, and Alternative Segment WCFG. All CDFG parcels within the two Wildlife Areas that would be crossed by Proposed Segment Q, Proposed Segment W, or Alternative Segment WCFG are included in the calculation. Should other route

Table C.8-3 State Wildlife Area Mitigation Calculations

Parcel #	Length (feet)[1]	Acreage[2] (X)	1 - Degrad. Factor[3] (Y)	Compens. Acreage (X x Y)	Factors Considered for Degradation Value
Doyle Wildlife Area (Proposed Segment Q)					
139-180-19	6785	411.21	.6	246.72	Crossed by main OHV trail; .25 mile width extends beyond wildlife area boundary
139-230-06	2768	167.75	.9	150.97	OHV trail abuts parcel
139-230-03	53	3.21	.9	2.88	OHV area; ROW corridor crosses northeast corner boundary of parcel
Subtotals	**9606**	**582.17**	**N/A**	**400.57**	
Hallelujah Junction Wildlife Area (Proposed Segment W)					
147-090-10	5260	318.79	0.7	223.15	Less than 1 mile from Hwy 395
021-020-26	4630	280.61	0.5	140.30	.25 - 1 mile from Hwy 395; portion of .25 mile width is in Hwy ROW
021-020-27	4120	249.70	.07	174.79	Less than 1 mile from Hwy 395
021-040-24	2570	155.76	0.7	109.03	Less than 1 mile from Hwy 395
021-080-14	640	38.79	0.1	3.88	Adjacent to east edge of parcel
Subtotals	**17229**	**1043.64**	**N/A**	**651**	
Hallelujah Junction Wildlife Area (Alternative Segment WCFG)					
147-090-10	5400	327.27	0.7	229.09	Less than 1 mile from Hwy 395
021-020-26	5624	340.84	0.5	170.42	.25 - 1 mile from Hwy 395; portion of .25 mile width is in Hwy ROW
021-080-12	3206	97.15[4]	0.1	9.72	Adjacent to Hwy 395 and Railroad; west side of corridor is within Hwy ROW
021-080-14	1482	44.91[4]	0.1	4.49	Adjacent to Hwy 395 and railroad; east side of corridor is within Hwy ROW
021-080-13	600	18.18	0.1	1.82	Adjacent to Hwy 395 and railroad; east side of corridor is within Hwy ROW
Subtotals	**16312**	**828.36**	**N/A**	**416**	

1 Length of Proposed Transmission Line route across affected parcel

2 Acreage is calculated based on a width of .25 mile (1320 feet) on both sides of the transmission line centerline (a total of .5 mile or 2640 feet), unless otherwise noted. Within this distance, the transmission line would be considered to be a dominant feature in the viewshed. Acreage Calculation Example: $\frac{1000 \text{ ft. (length)} \times 2640 \text{ ft}}{43{,}560 \text{ ft.}^2\text{/acre}} = 60.6$ acres

3 A value of 1 equals pristine undisturbed environment. The degradation factor is subtracted from the value of 1. The degradation factor represents existing disturbance in the area, e.g., highways or railroad corridor and is assigned a value of 0 - .9. For example, a degradation factor of .3 would result in an overall value of .7 (1 minus .3).

4 Acreage is calculated using width of .25 mile (1320 feet) on only one side of project ROW, since project ROW is adjacent to, and includes highway/railroad ROW.

segments that cross the Wildlife Areas be approved (e.g., Alternative Segment P), appropriate compensatory acreage will need to be calculated pursuant to the procedure in Table C.8-3.

Impacts on Grazing

Human activity, movement of vehicles and equipment, and noise during transmission line maintenance activities could disturb grazing animals and drive them away from the ROW, resulting in a temporary, intermittent loss of the use of grazing land over an area larger than the ROW. This loss of grazing land as a result of disturbance would be adverse, but not significant (**Class III**) due to the intermittent and temporary nature of the maintenance activities at any one location or point along the ROW.

The presence of the transmission line would result in the permanent loss of grazing land. Grazing land would be permanently lost at the sites where the structures have been erected. About 60-150 square feet of land would be lost from placing each project structure. Grazing animals would be able to move around the structures - the structures would not present barriers to the movement of the animals. The loss of grazing land as a result of the presence of the transmission line structures would be adverse, but not significant (**Class III**) because a relatively small area of grazing land would be lost.

Mitigation Measures for Impacts on Grazing. Applicable mitigation measures for disturbances to agricultural uses during maintenance of the Proposed Project identified in Sections C.2.2 (Air Quality), C.9.2 (Noise), and C.12.2 (Transportation and Traffic) would reduce the adverse, but not significant disturbances to grazing animals during maintenance of the transmission line.

Operations Impacts on Cropland

Transmission line maintenance activities could interfere with the use of cropland for growing hay in the Madeline Plains (from the Town of Madeline to about E-8). Depending on the season and timing of the maintenance activities, vehicular and foot traffic, human activity, and movement and use of machinery and equipment could interfere with planting, maintaining, or harvesting the hay crop by interfering with human activity or the movement and use of machinery and equipment (especially wheeled irrigation equipment). Interfering with the use of cropland for growing hay would be adverse, but not significant (**Class III**) due to the intermittent and temporary nature of the maintenance activities at any one location or point along the ROW.

In addition, the presence of the transmission line structures would result in the permanent loss of the use of cropland. A total of about 1,560 square feet of cropland would be permanently lost at sites where structures are erected. The presence of the structures would also constrain the movement and use of machinery and equipment in planting, maintaining, and harvesting the hay crop (especially wheeled irrigation equipment), resulting in the permanent loss of the use of cropland over an area larger than the area occupied by the structures, and decreased productivity of the cropland. Overall, the loss of the use of cropland would be adverse, but not significant (**Class III**) because a relatively small area of cropland would be lost.

Operations Impacts of Increased Access

Constructing new access routes, upgrading existing 4WD roads, blading of rough areas for overland travel, and existence of the 160-foot transmission line ROW will increase opportunities for human intrusion (by vehicle or foot) into and use of relatively undeveloped areas. This increase in human intrusion in these areas could degrade residential, recreational, and agricultural uses as a result of disturbances to residents, recreational activities and users, agricultural activities, and wildlife. Disturbance could result from human activity or noise; damage to soils, vegetation, and scenic resources from human activity; poaching; and human injury and loss of human life, property, wildlife, and wildlife habitat from wildfire due to an increase in fire hazards. In addition, ranchers may be tempted to use the new or improved access routes and transmission line ROW for herding and moving livestock. Use of the access routes or ROW for livestock would have the potential to degrade adjacent wildlife habitat by introducing or concentrating livestock use along the corridor (e.g., trampling and foraging of vegetation) and could disturb residential and recreational uses.

The increase in opportunities for human intrusion into relatively undeveloped areas as a result of improving access routes and constructing new access routes would be significant, but mitigable (**Class II**) because it could result in long-term disturbances that could diminish the qualities of residential, recreational, and agricultural uses.

Mitigation Measures for Impacts of Increased Access. Applicable mitigation measures for increased access to residential, recreational, and agricultural uses are identified in Section C.3.2 (Biological Resources) and C.4.2 (Cultural Resources Measure C-5).

C.8.2.3 Policy Consistency Analysis

The following discussion focuses on potential policy conflicts or inconsistencies. Note that air quality, noise, and visual resource policies are addressed in Sections C.2, C.7, and C.13 respectively. Pursuant to the significance criteria established in Section C.8.2.1, if the Proposed Project conflicts with adopted policies, this would be considered to be a significant impact.

The components of the Proposed Project and the individual issue area impact analyses were reviewed to assess the potential for policy conflicts. Many policies require maximum feasible mitigation of impacts or maximum protection of resources and habitats. In these cases, the project would be consistent with a particular policy only if specific mitigation measures recommended elsewhere in this document were implemented. Therefore, the project can only be determined conditionally consistent with these types of policies. It will be up to decision makers to make final determinations on policy consistency.

C.8.2.3.1 *Federal Policies*

BLM

As described in Section C.8.1, the three BLM Resource Areas have established formal land use plans that cover the area traversed by the Proposed Project. These plans include the Alturas Resource Management Plan (RMP), the Lahontan RMP, and the three Management Framework Plans for the Eagle Lake Resource Area. (The majority of the policy guidelines contained in these plans apply to the BLM's management of resources.) In addition, projects must adhere to provisions of the Federal Land Policy and Management Act (FLPMA) of 1976 which applies to lands administered by the BLM. Provisions of the resource area plans and FLPMA that directly are applicable to the Proposed Project are addressed in the following sections.

FLPMA

The Proposed Project will require approval of a ROW grant on BLM lands. This ROW may be denied if, among other factors, the project is considered inconsistent with the purpose for which the public lands are managed or if it would result in serious environmental consequences that cannot be mitigated. Pursuant to Section 603(c) of the FLPMA, the BLM is prohibited from issuing a ROW for any use within a Wilderness Study Area (WSA). The northeasterly half of the 660-foot study corridor for Segment O of the Proposed Project would cross a portion of the Skedaddle WSA. Approving a ROW for the project within that segment of the study corridor would be in conflict with the provisions of FLPMA. To avoid this regulatory conflict, the centerline of Segment O would need to be moved slightly to the southwest, using the southwestern half of the study corridor. This realignment would locate the route outside of the WSA.

1983 Alturas Resource Area Resource Management Plan & Environmental Impact Statement. This plan contains goals, policy statements, and standard operating procedures (SOPs) pertaining to the protection of natural resources. The mitigation measures outlined in Sections C.3 (Biology), C.4 (Cultural Resources), C.7 (Hydrology), and C.13 (Visual) should result in the Proposed Project being consistent with these provisions.

General Policy Statement #5 states *"Use of existing utility corridors will be considered prior to granting rights-of-way (existing corridors are defined as 60 kV lines or higher)."* The alternatives screening analysis for this EIR/S considered numerous route alternatives, including use of an existing transmission line corridor in Nevada. It will be up to the BLM to determine whether this screening analysis satisfies the intent of this policy statement.

Eagle Lake Resource Area Management Framework Plans. The majority of applicable provisions pertain to visual resource protection. Consistency with BLM visual resource provisions is addressed in Section C.13 (Visual Resources). The Proposed Project should not significantly interfere with range management provisions in the plan if mitigation measures outlined in this land use section are implemented.

1985 Lahontan Resource Management Plan - Record of Decision and Management Decisions Summary; and 1994 Lahontan Resource Management Plan Standard Operating Procedures Update. There are 22 general SOPs regarding construction activities that would be applicable to the Proposed Project. With implementation of mitigation measures proposed in Air Quality (Section C.2), Biology (Section C.3), Cultural Resource (Section C.4), Soils (Section C.6), Land Use, and Visual Resources (Section C.13), the Proposed Project would be consistent with SOPs addressing these issues. To ensure compliance, these general SOPs should be incorporated into permit conditions for the project. With regard to construction of access roads on BLM lands, the BLM will determine which of these roads shall be abandoned and rehabilitated after construction is completed, thus ensuring consistency with the SOP regarding road construction. SOPs regarding hazardous materials as follows should be incorporated as permit conditions to ensure implementation and adequate monitoring:

- *No disposal of hazardous materials on public lands will be authorized.*
- *Initiators of actions which use hazardous materials on public land will be required to have the necessary permits, from the State of Nevada and (if necessary) the Environmental Protection Agency, which are designed to protect the environment. These permits become conditions of approval by the BLM for actions on Federal lands.*
- *Authorized public land users shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated or stored on the authorized area or facilities.*

In consideration of ROW Corridor objectives and SOPs, the BLM is not proposing to amend its Land Management Plan(s) to designate the Proposed Project alignment through BLM lands as a "right-of-way" corridor. However, the Proposed Project would satisfy the federal definition of "transportation and utility corridor" (see Section E.3.3 for a complete discussion of the growth inducement implications of BLM utility corridor regulations).

U.S. Forest Service

The Proposed Project would cross U.S. Forest Service (USFS) lands including the Modoc and Toiyabe National Forests. USFS will require issuance of a special use permit in conformance with Management Area direction for portions of the Proposed Project that cross USFS land.

1991 Modoc National Forest Land and Resource Management Plan. Segment A of the Proposed Project route would cross several USFS properties within the Modoc National Forest. One of the National Forest Program Goals is to *"avoid separate utility rights-of-way."* Also, the plan includes provisions regarding facility placement which state:

Limit allocations of single-purpose transmission and transportation corridors. Place new transportation and utility facilities within or contiguous to existing corridors. Encourage the use of private lands, where appropriate, for new corridors. Appropriateness is determined at the site-specific project level.

Objectives under the Lands category of the plan include the following:

3. Utility Corridor

A. Minimize proliferation of separate utility corridors by confining future needs to existing corridors, if possible. However, consider construction of new corridors outside existing utility rights-of-way if technology, safety, national and state practices, engineering, or environmental quality precludes coexisting uses.

When establishing utility corridors, avoid the following areas: critical habitat for threatened and endangered species, designated Wilderness, Research Natural Areas, semi-primitive recreation areas, Special Interest Areas, and areas used in the practice of Native American religions.

B. Cooperate with utilities representatives to develop strategies which will minimize the potential for a single- or multiple-line power outages which could result from catastrophic events such as wildfire.

C. In managing Forest activities near the utility corridor, coordinate with respective federal or private utility managers to ensure that Forest activities will not conflict with the intended permitted use and management of the utility corridor.

The Proposed Project would represent development of a new utility ROW, although it would parallel portions of the proposed Tuscarora Gas Pipeline. The project would cross a very limited amount of USFS land, but would cross numerous BLM parcels as well as private properties. The proposed ROW would not cross any designated Wilderness, Research Natural Areas, Special Interest Areas, or areas used in the practice of Native American religions. Impacts on critical habitat for threatened and endangered species and recommended mitigation measures are addressed in Section C.3.2 (Biological Resources). Based on this analysis, it does not appear that the Proposed Project would conflict with the Modoc National Forest Land and Resources Management Plan objectives for utility corridors. However, the Forest Service decision makers will determine whether the designation of the Proposed Project ROW, as a utility corridor, is consistent with the Land and Resource Management Plan objectives.

Toiyabe National Forest. A portion of Toiyabe National Forest (from Angle Point XØ8 to east of X12) crossed by the transmission line ROW is former BLM land; management directives for it are contained in the BLM Lahontan Resource Management Plan. Granite Corporation lands recently acquired by the Toiyabe National Forest (from Angle Point XØ4 to XØ8) are managed under the Toiyabe Land and Resource Management Plan. The goals and objectives of the Toiyabe Plan, with respect to utility corridors, are similar to those of the Modoc National Forest Land and Resource Management Plan.

C.8.2.3.2 *State Policies*

California State policies related to land use management issues are administered by the California Department of Fish and Game and California Energy Commission. Since compliance with Department of Fish and Game policies is primarily focused on biological resources, consistency with these State provisions is addressed in Section C.3 (Biology). In addition to the California State code, provisions of the Doyle Wildlife Area Management Plan and Hallelujah Junction Wildlife Area Draft Management Plan would apply to the project. Consistency with these plans is addressed as part of the impact analysis on the two wildlife areas in Section C.8.2.2. There are no known Nevada State policies applicable to land use issues.

California Energy Commission

California State legislation requires the California Energy Commission, in consultation with the CPUC, to implement the Garamendi Bill (California Senate Bill 2431). Senate Bill 2431 contains two general findings concerning the role of transmission in California's future development:

(a) *The Legislature hereby finds and declares that establishing a high-voltage electricity transmission system capable of facilitating bulk power transactions for both firm and nonfirm energy demand, accommodating the development of alternative power supplies with the state, ensuring access to regions outside the state having surplus power available, and reliably and efficiently supplying existing and projected load growth, are vital to the future economic and social well being of California.*

(b) *The Legislature further finds and declares that the construction of new high-voltage transmission lines within new right of way may impose financial hardships and adverse environmental impacts on the state and its residents.....*

These findings recognize the need for long-term transmission line corridor planning within a statewide and even regional framework.

In Senate Bill 2431, the Legislature also identified several policies to guide the use of existing transmission facilities and the development of new facilities. These policies reflect the fact that it is in the state's best interest to minimize the adverse economic and environmental impacts by first pursuing those options with a lower potential for adverse impacts. Accordingly, the Legislature set forth the following priorities for planning and developing new transmission facilities:

(1) *Encourage the use of existing right of way by upgrading existing transmission facilities where technically and economically feasible.*

(2) *Encourage expansion of existing right of way, if technically and economically feasible, whenever construction of new transmission lines is required.*

(3) *Provide for the creation of new right of way if justified by environmental, technical, or economic reasons, as determined by the appropriate licensing agency.*

(4) *Seek agreement among all interested utilities on the efficient use of new transmission capacity whenever there is a need to construct additional capacity.*

Consistency

Finding A. As discussed in Section A.6.4, since the Alturas Transmission Line Project would increase the import capacity of SPPCo's system, bulk power transactions, via additional wheeling capability, for both firm and nonfirm energy demand would be facilitated. This bulk power transfer could be utilized by existing California utilities such as PG&E, Truckee Donner Public Utility District, Plumas-Sierra Rural Electric Cooperative, and Lassen Municipal Utility District. Since the Proposed Project would also facilitate the transfer of power from the Pacific Northwest, the noted California utilities could also benefit from this regional power. The improvement in service reliability that the Alturas Project provides, could also accommodate any future growth in the California portion of SPPCo's service area (currently, approximately 40,000 customers). The Alturas Transmission Line is consistent with this finding of Senate Bill 2431.

Finding B is implemented through policies (1) through (4) identified above.

Policy (1). As discussed in Sections B.3.4.3 and B.4.4.5, several transmission facility upgrades were considered as alternatives to the Proposed Projects, including: enhancement alternatives to the 230 kV Utah Intertie and Frenchman Tap Project. As presented in Table A-6, these transmission upgrade alternatives would not satisfy the project objectives. Further, generation (Pinon Pine Power Plant and Fort Churchill Combustion Turbine) and system enhancement alternatives (demand side measures, static var compensators, capacitor banks) were considered; however, these alternatives also could not satisfy the project objectives. Finally, as discussed in Section A.6.7.4, SPPCo has completed two upgrades to their 120 kV PG&E intertie, is scheduled to complete a third upgrade in 1996, and has plans for four additional upgrades (to be completed by year 2002). While these four additional upgrades are expected to be deferred or delayed with the Alturas Transmission Line Project, the upgrades would not replace the need for the Proposed Project. In summary, the noted upgrades to existing transmission facilities would not satisfy the project objectives and were eliminated from further consideration.

Policy (2). Sections B.4.4 and C.14 discuss several alternatives that would require the construction of new transmission facilities within an expanded, existing right-of-way. The alternatives considered included the Nevada Route Alternative, Summer Lake-Valley Road Alternative, Midpoint-Valmy Alternatives, and Burns-Oreana Alternative. As discussed in Section B.4.4 and C.14, the Nevada Route and Summer Lake-Valley Road Alternatives would need to traverse the northern Sparks and Reno area to access the North Valley Road Substation. The Mid-Point Valmy and Burns-Oreana Alternatives would need to be constructed in conjunction with the Tracy-Silver Lake Alternatives in order to satisfy the project objectives. The Tracy-Silver Lake Alternatives would also traverse the northern Sparks and Reno area. Given the impacts associated with traversing an urbanized area, the noted alternatives were eliminated from further consideration.

Policy (3). Sections A.3, A.4, and A.5 describe the permitting and environmental review processes that the Proposed Project is undergoing, which includes the CPUC's Certificate of Public Necessity and Need review (see Section A.3), the preparation of this EIR/S to satisfy the environmental review requirements of the Lead Agencies (see Sections A.3 and A.4), and issuance of discretionary and administrative permits by the federal, state, and local permitting authorities (see Table A-1). In addition, if the Proposed Project were to be approved, it would be constructed and operated in accordance with the Mitigation Monitoring Program that would be developed for the project based on this EIR/S (see Part F). The intent of this policy is being satisfied by the permitting and environmental review processes that are currently underway.

Policy (4). As discussed under Policies (1) and (2), SPPCo studied many options in developing the Proposed Project. In addition, SPPCo pursued a trans-Sierra intertie with the Sacramento Municipal Utility District (SMUD) (dropped by SMUD in 1989) and consulted with LADWP on the Pacific DC Intertie Alternative (this alternative was considered in Sections B.4.4 and C.14 and was eliminated from further consideration because it did not offer any environmental advantage in comparison to the Proposed Project).

Once SPPCo selected the Alturas Transmission Line Project alignment, SPPCo solicited input from PG&E, Bonneville Power Administration, PacificCorp, Idaho Power Co., Mount Wheeler Power, LMUD, and Truckee Donner Public Utility District in developing the capacity of the line and pursued financial participation (since all of the utilities except LMUD are connected to SPPCo's system, the entities chose not to co-fund the project). The consultation continued and was expanded to all Western Systems Coordinating Council (WSCC) utilities through the development of the WSCC rating and operation studies (see Section A.6.1.2).

SPPCo also investigated the needs of the Transmission Agency of Northern California (TANC) to determine if their goals could be met with the Alturas Transmission Line Project or a modified Alturas Project. The primary objective of TANC is to increase transmission capacity between Central California and Southern Nevada. Since TANC's and SPPCo's needs, including timing, differed significantly, SPPCo concluded that a joint project would not successfully meet both parties needs.

The intent of this policy has been satisfied by SPPCo's efforts.

C.8.2.3.3 *Local Policies*

The General Plan policies of the four counties (Modoc, Lassen, and Sierra Counties in California; Washoe County in Nevada) and the city (Reno) crossed by the proposed ROW are addressed in the following sections. Although California counties and cities do not have discretionary permit jurisdiction over the transmission line, the CPUC will take local policies into consideration during their project review process. Many of the policies of the various counties are the same or very similar. To avoid repetition, project consistency is summarized for those policies that are similar to policies previously presented.

Modoc County

On April 4, 1995, the Modoc County Board of Supervisors approved revisions to the General Plan and Zoning Ordinances to allow for a route review process applicable to the Proposed Project. Moreover, the Modoc County Board of Supervisors and Planning Commission have adopted Resolution No. 95-35 that opposes the Proposed Project because it has little benefit to the County, and the County will bear cumulative environmental impacts along the full length of the corridor for the service and convenience of other regions. The Resolution calls for moving and burying specific sections of Proposed Segment A, reducing the height of the towers, burying specific sections of Alternative Segment B, and including installation of fiber-optics telephone service in the Proposed Project.

1988 Modoc County General Plan. The Proposed Project would not pose conflicts with policies regarding agricultural land use, public uses, noise, or safety. However, Circulation Policy 9 states that transmission lines *"...should be consistent with the land uses and development to minimize adverse social or environmental impacts. Such lines should avoid interference with adjacent land uses and assure that aesthetic values will not be degraded."* Although interference with adjacent land uses would be minimized by the rural location of the proposed route, several residences would be exposed to aesthetic impacts from the transmission line (See Sections C.13.2, Visual Resources and C.8.2, Land Use). Therefore, the Project is inconsistent with this policy. Policies regarding wildlife and protection of rare and endangered plants would be adhered to through implementation of biological resources mitigation measures identified in Section C.3.2. The Proposed Project may be inconsistent with the General Plan's Timber Policy 4 due to the necessary removal of trees within the ROW. See Section C.3.2 regarding tree and vegetation removal.

1993 Modoc County General Plan Energy Element. Policies # 30, 32 - 34, 37 - 42 apply to the Proposed Project and are listed below.

30. *Proponent applications for energy facility projects shall contain comprehensive information in sufficient detail to enable the County to conduct a thorough analysis of the project. At a minimum, information shall include descriptions of all project phases (resource or fuel supply confirmation, construction, operations, maintenance, abandonment); the facility's physical and performance characteristics; environmental effects of all project phases; and a project cost/benefit analysis that includes County fiscal component.*

32. *In the absence of compelling or contravening considerations, energy facilities should not be sited in sensitive natural resource areas, including: unstable geologic or soil areas; flood plains; wetlands; habitat of fish or wildlife species of rare, threatened, or endangered status; known paleontological, archaeological, ethnographic, or historical sites; or designated scenic areas. If siting in such areas is unavoidable, it shall be limited to the smallest possible portion of the energy facility in question, and shall be mitigated in accordance with CEQA.*

33. *Wherever possible, increased demand for energy transmission shall be accommodated with existing transmission facilities. Where new capacity is necessary, priority shall be given to upgrading or reconstructing existing facilities, followed by new construction along existing transmission or other utility corridors. Any new*

transmission facilities shall be sited so as to minimize interference with surrounding land uses, and in ways that minimize their visual impacts.

34. *The operation of energy facilities shall not violate, or threaten to violate, applicable environmental standards, including noise, wastes, pollutant discharges, or electronic discharges or interference.*

37. *Energy facilities shall prepare and periodically update emergency plans for foreseeable accidents and emergency incidents, and such plans shall be coordinated with local public safety agencies.*

38. *Energy facilities should not be sited in close proximity (less than one-quarter mile) to existing residences, recreational areas, or community facilities (e.g., schools, churches). Once sited and operated, energy facilities should be protected from incompatible land uses by discouraging the encroachment of residences, recreational uses, or community facilities.*

39. *The construction of energy facilities shall be subject to County use permit conditions that minimize disruptions to adjoining properties, including but not limited to: construction during daylight hours only; dust control on impacted roads; minimum vegetation removal and soil erosion prevention; and immediate work stoppage and initiation of a response plan in the event of encountering an archaeologic or comparable resource site.*

40. *Energy facilities shall be designed, operated, and maintained over their life so as to avoid massive earth movement, prevent erosion, and minimize disturbance to natural drainages. Fill areas shall be benched and keyed into undisturbed ground where necessary. Deposits of expansive soils should be avoided or removed. Natural drainage crossings shall be provided with properly sized culverts. Top soil material shall be stockpiled and reused after construction wherever practical.*

41. *If and when abandoned, energy facility sites shall be reclaimed according to a plan that restores and preserves land values for subsequent and surrounding uses.*

42. *The County Planning Department shall actively participate as an affected agency in facility siting processes that may occur on federal lands within the County in order to advocate County energy facility policies.*

Given the length of the proposed ROW, it is not possible to avoid all sensitive resource areas and floodplains. However, with mitigation measures outlined in other issue areas primarily in Biology (Section C.3) and Hydrology (Section C.7), impacts would be minimized. Disruptions to surrounding land uses would be minimized by mitigation measures identified in this land use analysis and in the Noise and Traffic sections. With regard to use of existing transmission facilities (policy # 33), the Applicant states that there are no existing transmission facilities in Modoc County suitable for upgrading. Regarding emergency response, the Applicant has agreed to coordinate with local public safety agencies, the BLM, and the CPUC in preparing any required emergency plans.

The Proposed Project would conflict with Policy #38 because residences would be located closer than one-quarter mile to the ROW (see Table C.8-1 for a listing of residences within 2000 feet of the proposed ROW). Significant re-routing of the proposed transmission line would be required to establish a distance of one quarter mile between the route and residences.

In addition to the above policies, the Modoc County Energy Element contains Transmission Line Implementation Measures (Measures K.1 - K.5), described below.

K.1. In very steep or inaccessible areas, helicopter placement of transmission structures or other roadless construction methods may be required to minimize soil disturbance.

SPPCo has generally designed the routing of the Proposed Project to preclude the necessity for helicopter construction. However, helicopter placement may be required by the Lead Agencies as an alternative to terrain construction, if it proves to be necessary. Therefore, the Proposed Project is consistent with this policy.

K.2. Transmission lines shall be sited to avoid impacting critical fish and wildlife habitat. Special attention shall be paid to the location of flyways, nesting and feeding sites of waterfowl and other birds in order to reduce the possibility of collision or electrocution.

Impacts to fish and wildlife habitat are addressed in Section C.3.2 (Biological Resources). With application of the detailed mitigation identified in that section, impacts would be minimized, but not avoided. Therefore, the Proposed Project is inconsistent with this policy.

K.3. The siting of transmission lines shall avoid interfering with scenic views, and shall be visually integrated with the surrounding setting to the greatest extent possible. Applicable visual mitigations include, but are not limited to avoiding ridgelines or other visually prominent features, and using non-glare structures and non-specular lines which more readily blend into the natural landscape.

The line will utilize non-glare structures and non-specular conductors. However, even utilizing mitigation measures to reduce visual impacts, significant impacts will occur along some portions of the route. Therefore, the Proposed Project is inconsistent with this policy. See Section C.13.2 (Visual Resources) for further discussion of visual impacts and policy consistency.

K.4. Space consuming structures and diagonal alignments of transmission lines through agricultural fields should be avoided. Where possible, transmission lines should follow property lines or routes with the least environmental and land use impacts.

The H-frame structures require little surface area. The Applicant indicates that the alignment in existing agricultural areas will follow the edges of the fields where practical. The span length of 1200 feet will allow the line to span the typical field layout pattern of most agricultural operations. With this design and with land use mitigation measures outlined in this section, the Proposed Project should be consistent with this policy.

Lassen County

Lassen County is requiring a General Plan Amendment for the Proposed Project. The amendment will consist of a general addendum to the Lassen County General Plan, similar to the General Plan Amendment for the Tuscarora Pipeline Project, which will recognize the transmission line route and substation locations in the Land Use and Energy Elements. This General Plan Amendment process provides a means for providing review and comments on the Proposed Project.

Policies of the Lassen County Energy Element and General Plan, Wendel Area Plan, and Hallelujah Junction Area Plan were reviewed for consistency. The majority of these policies and implementation measures are very similar to the policies of Modoc County and are summarized below.

- **Policies requiring or encouraging minimization of impacts to resources** (e.g., biology, cultural, soils, water resources, and vegetation removal): The Project would be consistent if mitigation measures identified in individual resource issue areas of this EIR/S are implemented.

- **Policies requiring avoidance of resources** (e.g., biology, cultural, flood plains, seismic, etc.): The Project may be inconsistent. This is due to the fact that the length and magnitude of the Proposed Project makes it infeasible to avoid all sensitive resources. Faults and wetlands will be crossed, and habitat resources will be disturbed during construction.

- **Policies that require biological, cultural, and geological studies:** The Proposed Project would be consistent with Lassen County policies in this area since these types of studies have been conducted as part of this EIR/S. Implementation measures of the Energy Element regarding provision and monitoring of erosion control, revegetation, and drainage plans and fire prevention plans would be adhered to through implementation of mitigation measures found throughout this EIR/S.

- **Policies and measures requiring consultation with other agencies** (such as California Department of Fish and Game and U.S. Fish and Wildlife Service): The project would be consistent, since these consultations are being completed.

- **Energy Element Energy Facility General Policy #2:** Requires projects to minimize and repair consequent damage to public roads. The Applicant states that existing County roads proposed for use during construction will be evaluated prior to construction and then monitored for Project-related damage. The Applicant has committed to repairing the roads to pre-construction conditions. These measures should be incorporated into the Construction, Operation, and Maintenance Plan, and pre-construction evaluation of County roads should be conducted by County personnel.

Sierra County

Sierra County formally opposed the Proposed Project per County Resolution 95-128.

Sierra County General Plan. Policy compliance of the Proposed Project with the Sierra County General Plan would be similar to the policy compliance of the Modoc and Lassen County General Plans described above. Specifically, the Proposed Project would be inconsistent with Policy 7 and Implementation Measure 9(b) of the Visual Element because the presence of the transmission line would degrade Sierra County's rural character and the scenic quality of the Long Valley Community. For the same reason, the Proposed Project would conflict with the designation of Long Valley as a "Unique Area of High Scenic Value."

Furthermore, the Proposed Project would be inconsistent with the recreational designation of the Long Valley Community and the goal for maintaining the area's open space and recreational uses, because the presence of the transmission line would degrade the rural, scenic character of the area and the quality of the experience of recreational users. Also, this degradation caused by the Proposed Project would be inconsistent with the larger, County-wide goals of protecting the rural lifestyle and environmental quality of non-urban areas and preserving the character of designated Communities.

Sierra County Energy Element. The Energy Element contains resource protection policies and implementation measures similar to those of Modoc and Lassen Counties; the policy summary for Lassen County would be applicable to the majority of Sierra County policies. In addition, the Sierra County Energy Element contains implementation measures regarding fiscal and public services impacts. These types of impacts are addressed in Section C.11.2 and are considered to be negligible or not significant. Therefore, the Proposed Project would be consistent with these fiscal and public services policy provisions.

However, the Proposed Project may be inconsistent with Policy 26 of the Energy Element that calls for minimizing new transmission lines and for locating new lines to avoid farming operations and other traditional land uses. This policy also indicates that the County shall only support new transmission lines when all opportunities have been used to accommodate increased demand by upgrading existing lines. The Proposed Project is inconsistent with Implementation Measure 26, which directs the County to request that the CPUC and other regulatory agencies ask transmission line applicants to obtain preliminary approval of a proposed alignment from the County, and to grant preliminary approval of an alignment based on a specific list of preferences. This list includes least preference for a new corridor that crosses agricultural, commercial, residential, or scenic areas.

Implementation Measure 1(d) directs that transmission lines shall not be located in wetlands, habitats of special status species, or wildlife refuges. Implementation Measure 27(c) directs that transmission lines shall be routed to avoid known raptor routes and raptor nests because of the potential for raptor collision with the lines. The Proposed Project would be consistent with these implementation measures if the mitigation measures for protection of these resources in Section C.3 (Biological Resources) are implemented.

Sierra County Zoning Ordinance. The Proposed Project would be inconsistent with allowed uses in areas zoned "General Forest" and "Agriculture" because public utility transmission facilities are not permitted in these zones.

Washoe County

The policies contained within the Washoe County Comprehensive Plan Conservation Element, High Desert Area Plan, and North Valleys Area Plan are similar to policies of Modoc and Lassen County. Any policies addressing visual resources are addressed in Section C.13.2 (Visual Resources) and are not repeated in this section.

1993 Washoe County Comprehensive Plan Land Use and Transportation Element

Land Use policies LUT.1.14 and LUT.1.15 encourage land use compatibility of new development and recommend buffers to ensure compatibility. Although the project has been routed to reduce land use conflicts with residential and other urban land uses, land use incompatibilities may occur in a few places where residences would be exposed to aesthetic impacts from the transmission line (See Sections C.13.2, Visual Resources and C.8.2, Land Use Impacts).

1991 Washoe County Comprehensive Plan Conservation Element

Land Resources policies C.2.1, C.2.3, C.2.4, C.2.15, C.2.16, and C.2.20 require or encourage minimization of impacts to resources (e.g., biology, soils, water resources, and vegetation removal). The Project would be consistent if mitigation measures identified in individual resource issue areas of this EIR/S are implemented.

Land Resources policy C.2.9 requires geological studies to identify potential hazards. The Proposed Project would be consistent with this provision since these types of studies have been conducted as part of this EIR/S.

1993 Washoe County Comprehensive Plan—High Desert Area Plan

Policies HD.1.1 and HD.2.1 are addressed in Section C.13.2, Visual Resources.

1993 Washoe County Comprehensive Plan—North Valleys Area Plan

Policies NV.1.1, NV.1.2, NV.2.1, NV.2.3, and NV.3.1 are addressed in Section C.13.2, Visual Resources. The natural resources of Peavine Mountain are formally recognized as Open Space in the Regional Open Space Plan (ROSP), adopted in 1994 by Washoe County and the Cities of Reno and Sparks, and in the text and policies of the North Valleys Open Space Plan. The County and City decision makers will determine if the Proposed Project is compatible with this land use designation. The North Valleys Area Plan also designates Peavine Mountain and its environs as "General Rural" to protect its watershed, scenic, and recreational qualities. This plan contains policies that call for maintaining the scenic qualities of the mountains and hills in the North Valleys Area, and preserving and enhancing the visual qualities as viewed from U.S. 395. The Proposed Project is inconsistent with these policies because it would affect the scenic quality of Peavine Mountain and the scenic view to the mountain from U.S. 395.

Policy NV.2.4 restricts development in land areas that present geologic hazards and which serve highly valuable ecological functions. The implementation measure for this policy requires maximum protection for areas of significant environmental concern. Geologic hazards would be mitigated to the extent feasible by measures identified in Section C.6.2 and impacts to significant biological resources would be mitigated by measures recommended in Section C.3.2. With implementation of these measures, maximum protection of resources should be provided.

The Washoe County Planning Commission has adopted Scenic Roadway Corridor Standards (Article 426) as part of the Washoe County Development Code. Article 426 designates U.S. 395 North, Golden Valley Road to the State Line, as a Scenic Roadway. The primary scenic view from the majority of this highway segment is of Peavine Mountain. The Proposed Project is inconsistent with Article 426 because it would affect the scenic view to Peavine Mountain from U.S. 395.

City of Reno

Since the CPUC has no jurisdiction over Nevada cities and counties, the City of Reno maintains discretionary jurisdiction over the Proposed Project and will require a Special Use Permit.

Master Plan/Policy Plan (1986). A very short segment of the Proposed Project would be located within the boundaries of the City of Reno. Applicable policies are related to compatibility of adjacent land uses.

- Policy II.B.6 requires landscape or other buffers between established neighborhoods and new development;
- Policy II.B.7 requires that the density or intensity of new developments in an established neighborhood is compatible with the existing neighborhood;
- Policy II.B.8 requires assurance that new development is compatible with surrounding land uses; and
- Policy II.B.9 requires tall buildings to be set back a reasonable distance from adjacent low density residential areas.

The Proposed Project would be located in close proximity to residential areas near the North Valley Road Substation, with no screening and little buffer area. However, there are existing transmission lines adjacent to these residential areas, thus the Proposed Project would not represent introduction of a new use in the proposed corridor. Decision makers will determine whether this intensification of transmission lines in close proximity to residences constitutes a significant policy conflict.

See the discussion of Peavine Mountain under "Washoe County Comprehensive Plan—North Valleys Area Plan."

C.8.2.4 Cumulative Impacts and Mitigation Measures

The primary types of cumulative impacts that could result from the Proposed Project and other future projects in Modoc, Lassen, Sierra, and Washoe Counties are the following: (1) disturbances during construction of the Proposed Project in combination with disturbances from other construction activities along or near the ROW would result in increased noise, impeded access, and general disruption to surrounding land uses; and (2) construction of new development would result in increases in population along or near the transmission line ROW or near the substation sites that could be subject to public safety and health risks.

Modoc County

The cumulative impacts of the proposed Tuscarora Gas Pipeline Project, four land subdivision projects, and a historic trail construction project in Modoc County may exacerbate impacts associated with construction of the Proposed Project, such as increased noise, dust, odors, and traffic; restricted, blocked, or detoured access to land uses; visual intrusion of construction vehicles, equipment, workers, and stored material; and other disturbances to surrounding land uses and sensitive uses. Most of the cumulative disturbances would be non-significant due to the short-term nature of construction activities, distance of the future projects from the Proposed Project, and rural characteristics of the project area. However, due to the potential construction of portions of the Tuscarora Gas Pipeline Project in the same corridor and at the same time as construction of the Proposed Project, cumulative impacts would be significant, but mitigable (**Class II**).

The future land subdivisions could bring in a larger population to the project area which could be subject to public safety hazards generated by the transmission line. In addition, the presence of a portion of the Infernal Caverns Battlefield Trail within the transmission line ROW could expose users of the trail to public safety risks generated by the transmission line. However, exposure would depend on the specific location of the residences or trail relative to the transmission line ROW. See Section C.10.2 for a discussion of the potential for and significance of public health risks of EMFs generated by the transmission line. Impacts on these future developments would be potentially significant (**Class II**).

Lassen County

The cumulative impacts of the future Tuscarora Gas Pipeline Project, LMUD Intertie, California Correctional Facility, fisheries water pumping project, ecosystem management project, and BLM/CDFG land exchange in Lassen County may exacerbate impacts associated with construction of the Proposed Project, such as increased noise, dust, odors, and traffic; restricted, blocked, or detoured access to land uses; visual intrusion of construction vehicles, equipment, workers, and stored material; and other disturbances to surrounding land uses and sensitive uses.

Most of the cumulative disturbances would not be significant, since two of the future projects would not involve construction (ecosystem management project and agency land exchange), one will be completed prior to construction of the Proposed Project (California Correctional Facility), and one will be constructed after the Proposed Project is completed (LMUD Intertie). In addition, the short-term nature of construction activities, distance of the future projects from the Proposed Project, and rural characteristics of the project area would diminish the significance of cumulative impacts. However, the cumulative effects of potential concurrent construction of portions of the Tuscarora Gas Transmission Line Pipeline Project in the same corridor would be significant, but mitigable (**Class II**).

The future California Correctional Facility and LMUD Intertie could bring in a larger population to the project area which could be subject to public safety risks generated by the transmission line. However, exposure to these risks would depend on the specific location of residences and other sensitive land uses relative to the transmission line ROW. See Section C.10.2 (Public Safety and Health) for a discussion of the potential for and significance of public risks generated by the transmission line.

Sierra County

The cumulative impacts of the future ski resort and golf course development in Sierra County may exacerbate impacts associated with construction of the Proposed Project, such as increased noise, dust, odors, and traffic; restricted, blocked, or detoured access to land uses; visual intrusion of construction vehicles, equipment, workers, and stored material; and other disturbances to surrounding land uses and sensitive uses. These cumulative disturbances would be adverse, but not significant (**Class III**) due to the short-term nature of construction activities and the distance of the proposed development from the Proposed Project.

Washoe County

The cumulative impacts of the proposed Evans Creek Watershed Dam Project in Washoe County could exacerbate impacts associated with construction of the Proposed Project, such as increased noise, dust, odors, and traffic; restricted, blocked, or detoured access to land uses; visual intrusion of construction vehicles, equipment, workers, and stored material; and other disturbances to surrounding land uses and sensitive land uses. Although the current construction schedules of the two projects do not overlap (the Evans Creek Dam Project is scheduled to begin in Spring 1997, whereas the Proposed Project is scheduled to begin in March 1996 and end in December 1996), the two projects could overlap if the Proposed Project were delayed. If the Proposed Project were delayed, and construction along Proposed Segment X overlapped construction of the Evans Creek Dam, the cumulative construction disturbances to land uses would be significant, but mitigable (**Class II**) due to the proximity of the two projects.

Mitigation Measures for Cumulative Impacts

Applicable mitigation measures for cumulative impacts are identified in this section (L-2 through L-5), and in Sections C.2.2 (Air Quality), C.9.2 (Noise), and C.12.2 (Transportation and Traffic). The following mitigation measures are also proposed to reduce significant cumulative impacts to a level of non-significance:

L-13 During the final design and permitting stages of the Proposed Project, the Applicant shall coordinate with the proponents of Proposed Projects within, adjacent to, or near (within one mile) the transmission line ROW or substation sites, and any affected agencies, to minimize cumulative construction impacts. This coordination shall include: (1) providing the transmission line route and construction schedule to the affected parties, (2) coordinating construction activities with the proponents of other construction projects, and (3) coordinating utility disruptions and road closures with the proponents of other construction projects. The Lead Agency shall designate the party responsible for monitoring this measure who shall ensure that the Applicant, proponents of other projects, and affected agencies meet to coordinate construction activities, utility disruptions, and road closures; review memorandums regarding the results of the coordination meetings; and review and approve the construction, operation and maintenance plan. The monitor of this mitigation measure will not have any decision making authority over other projects within the jurisdiction of Modoc, Lassen, Sierra, or Washoe Counties.

L-14 As part of the environmental review and approval process for proposed residential subdivisions or other development projects on parcels crossed by or adjacent to the Proposed Project, counties should establish a minimum setback of 300 feet for any future occupied structure.

L-15 If construction of the Proposed Project is delayed, the Applicant shall coordinate with the U.S. Natural Resource Conservation Service (NRCS) so that construction of Proposed Segment X does not overlap construction of the Evans Creek Dam. The Lead Agency shall designate the party responsible for monitoring this measure, who shall ensure that the Applicant and NRCS coordinate construction activities and review memorandums regarding the result of coordination meetings.

C.8.2.5 Unavoidable Significant Impacts

The only significant, unavoidable impacts of the Proposed Project are the degradation of the quality of residential and recreational uses as a result of the presence of the transmission line structures.

C.8.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

Unless indicated otherwise, the land uses on public undeveloped lands crossed by the alternative routes include grazing, recreation, open space, and wildlife habitat; and the land uses on private undeveloped lands crossed by the alternative routes include grazing, open space, and wildlife habitat. Table C.8-1 lists the sensitive land uses near the ROW (within 2000 feet of the centerline) of the alternative transmission line routes.

C.8.3.1 Alturas Alignment (Segment B)

Environmental Setting

The majority of Alternative Segment B is located on land designated as Agriculture by the Modoc County General Plan and is zoned either Agriculture or unclassified. The portion of Alternative Segment B north of Hwy 299 is located in a mixed zoning district that includes commercial and residential designations. Sensitive land uses near the alternative include a ranch, houses, church, and golf course (see Table C.8-1).

Alternative Segment B crosses mainly private land, two parcels of City of Alturas land, a Caltrans ROW for State Highway 299, and two SPTC ROWs. From about Angle Points BØ1 to BØ5, it crosses land that is relatively more developed and contains rural and low density suburban residential development and some commercial development. Around Angle Points BØ1 and BØ2, Alternative Segment B passes through rural residential land and near rural residential development and agriculture (i.e., grazing) to the north, east, and south; just south of the southern boundary of commercial and recreational development of the City of Alturas Arrowhead Golf Course to the west; within 80 feet of the northern boundary of a private, vacant field used as an informal golf driving range; and a utility line, a suburban low-density development along Warner Street, a trailer park, and a church to the south. Daphnedale Park, a City of Alturas park, is located about 0.75 mile northeast of BØ1.

At Angle Point BØ5, the alternative crosses just west of commercial development and then crosses State Highway 299. It crosses the SPTC about 0.75 mile southwest of BØ5, and crosses Centerville Road about 0.5 mile south of BØ8. From about BØ5 to its terminus, the private land crossed by Alternative Segment B contains scattered houses and agricultural structures. From about Angle Point BØ7 to one mile southwest along the route, it passes about one mile west of the Alturas Municipal Airport. From about 0.75 to one mile along the route southwest of BØ7, the route is about 0.25 mile west of the boundary of the Modoc National Wildlife Refuge. About Angle Point BØ8, the alternative passes just east of Three Sisters, a partially developed residential subdivision of 15 parcels, and about 1 mile east of a larger undeveloped residential subdivision of about 280 parcels.

Environmental Impacts and Mitigation Measures

The impacts to residential, recreational, and agricultural uses (i.e., grazing land) of constructing and operating the Proposed Project with Alternative Segment B would be similar to the impacts of constructing and operating Project Segment A, as described in Section C.8.2. In addition, constructing and operating the transmission line would impact sensitive residential uses near the ROW of Alternative Segment B, located along County Road 54, Hwy 299, Spicer Lane, and Warner Street (see Table C.8-1).

Constructing and operating Alternative Segment B would also impact recreational use of the informal golf driving range south of the Arrowhead Golf Course. The transmission line would cross about 80 feet south of the northern boundary of the driving range. Transmission line construction activities along this portion of the Alturas Alignment would temporarily preclude, and maintenance activities would interfere, with use of the driving range. In addition, the presence of the transmission line structures would result in the permanent loss of a small portion of the driving range at the sites where the structures are erected. The presence of the structures would also interfere with driving golf balls, as the structures would be obstacles to the path of moving balls. The loss of the use of the driving range during construction would be adverse, but not significant (**Class III**) due to the temporary nature of the construction activities at this location along the ROW. The interference of maintenance activities with the use of the driving range would also be adverse, but not significant (**Class III**) due to the intermittent and temporary nature of the maintenance activities. The permanent loss of the use of a small portion of the driving range and interference with driving golf balls as a result of the presence of the structures would be adverse, but not significant (**Class III**), because these impacts would not constitute a long-term degradation of the recreational value of a major recreational facility.

Constructing and operating Alternative Segment B could also impact religious uses at the Church of Christ, located about 900 feet from the centerline (see Table C.8-1). The presence of the transmission line and alternative Alturas Substation (i.e., Mill Substation) would degrade the quality of religious uses by changing the character of the environment in which the Church of Christ is located. The character of the environment would change as a result of the presence of the project structures near the church property, and in the views from the church. However, since the church is located abvout 900 feet from the centerline and alternative Alturas Substation site, and other development exists between the church and the centerline the transmission line and substation would not be highly visible from the church property. Thus, the impact of the presence of the project structures on the Church of Christ would be adverse, but not significant (**Class III**) due to the distance of the church from the centerline and alternative substation site.

The following mitigation measure would reduce the permanent loss of the use of a small portion of the informal golf driving range and interference with driving golf balls:

L-16 The Applicant should design the Proposed Project such that the transmission line structures are placed outside or on the boundary of the informal golf driving range south of the Arrowhead Golf Course, in locations such that the presence of the line structures would not interfere with driving golf balls. Locations of line structures shall be reviewed and approved by the Lead Agency. The Lead Agency should designate the party responsible for monitoring this measure by reviewing and approving the final plans for siting the transmission line structures.

Cumulative Impacts and Mitigation Measures

The cumulative impacts of the Proposed Project with Alternative Segment B would be the same as the cumulative impacts of the Proposed Project described in Section C.8.2.4.

Unavoidable Significant Impacts

The significant, unavoidable impacts of constructing and operating the Proposed Project with Alternative Segment B would be the same as the significant, unavoidable impacts of the Proposed Project described in Section C.8.2.5.

C.8.3.2 Madeline Plains Alternatives (Segments D, F, G, H, I)

Environmental Setting

The Madeline Plains Alternatives cross both BLM and private land. The federal land is undeveloped, and the private land consists of cropland (mainly hay), undeveloped residential subdivisions, and other undeveloped land. The Lassen County General Plan land use designations and zoning for the Madeline Plains Alternatives are the same as the land use designations and zoning for segments of the Proposed Project in the vicinity.

Alternative Segment D. Segment D crosses mainly undeveloped BLM and private land. From about Angle Point DØ3 to DØ5, the alternative crosses two undeveloped residential subdivisions, one of which is centered around Summit Spring. About 0.5 mile south of Angle Point DØ3, Alternative Segment D crosses Ash Valley Road.

Nelson Corral Reservoir, located about 0.75 mile west of Alternative Segment D between Angle Points C10 and DØ1, is used for fishing and big game and waterfowl hunting. The Juoc Mountain Bike Trail begins at the reservoir. The trail leads from a point about 0.25 mile north of the reservoir dam, across the dam and along a portion of the eastern boundary of the reservoir, across Harter Flat (which lies adjacent to the northern portion of Segment D), across Alternative Segment D just south of CØ10 to old U.S. 395, along the old highway to the Dry Creek Fire Station, back on to the old highway to South Fork Mountain Road, then along that road to the top of Likely Mountain. The Likely Mountain Bike Trail follows the same route as does the Juoc Mountain Bike Trail, but veers off South Fork Mountain Road about 2 miles from the top of Likely Mountain, about 1 mile west of CØ8. Williams Ranch, an educational and interpretive center, is located about 2.5 miles northeast of Angle Point DØ4. Big game hunting is the main recreational use in the area of the remaining portion of Alternative Segment D. Waterfowl hunting occurs at Spooner Reservoir located about 1 mile southwest of DØ7. Big game and upland game hunting occurs in the area from about Angle Points DØ8 to GØ1.

Alternative Segment F. Segment F crosses private land. From its beginning to about Angle Point FØ3, the alternative crosses mainly undeveloped residential subdivisions to the west and cropland (mainly hay) with scattered agricultural structures to the east. About 2.5 miles south of its beginning, Alternative Segment F crosses County Road #525. Some of the parcels in the area where the alternative crosses the road contain houses. Between Angle Points FØ2 and FØ3, Alternative Segment F crosses an irrigation canal. From Angle Points FØ3 (where the alternative turns east) to FØ4, it crosses mainly undeveloped residential subdivisions to the south and cropland to the north. Recreational uses in the area crossed by Segment F include big game and upland game hunting. Fishing occurs in a small pond on the hay fields located near Angle Point FØ2.

Alternative Segment G. Segment G crosses mainly private cropland (mainly hay) and one undeveloped BLM parcel. Scattered agricultural structures occur on the cropland. Between Angle Points GØ2 and GØ3, Alternative Segment G crosses a residential subdivision of four parcels that contains a house and some agricultural structures. At Angle Point GØ5, the alternative crosses about 1.5 miles west of an electrical substation. At GØ6, it crosses about 1 mile west of U.S. 395. Recreational uses in the area crossed by Alternative Segment G include big game and upland game hunting.

Alternative Segment H. Segment H crosses one private parcel of cropland and one undeveloped BLM parcel, and crosses near an undeveloped residential subdivision.

Alternative Segment I. Segment I crosses private cropland (hay) to the north and undeveloped BLM land to the south. Near Angle Point IØ1, the alternative crosses a SPTC ROW and U.S. 395.

Environmental Impacts and Mitigation Measures

The impacts to residential, recreational, and agricultural uses of constructing and operating the project with any of the Madeline Plains Alignments would be similar to the impacts of constructing and operating the Proposed Project described in Section C.8.2. However, the impacts to cropland would be more extensive for the Madeline Plains Alignments than they would be for the Proposed Project, as a majority of the Madeline Plains Alternative (Segments F, G, H, and I) cross cropland, whereas only a small portion of the Proposed Project (a short section of Proposed Segment E) crosses cropland.

Cumulative Impacts and Mitigation Measures

The cumulative impacts of implementing and operating the Alturas Reservoir Management Project (enhancing recreational fisheries in existing artificial reservoirs) would not exacerbate disturbances or other impacts associated with constructing and operating any of the Madeline Plains Alignments because this project would not involve construction. Therefore, the cumulative impacts of the Proposed Project within any of the Madeline Plains Alignments would be similar to the cumulative impacts of the Proposed Project described in Section C.8.2.4.

Unavoidable Significant Impacts

The significant, unavoidable impacts of constructing and operating any of the Madeline Plains Alignments would be similar to the significant, unavoidable impacts of constructing and operating the Proposed Project described in Section C.8.2.5.

C.8.3.3 Ravendale Alternative Alignment (Segment J)

Environmental Setting

Alternative Segment J crosses mainly undeveloped BLM land, private undeveloped land, and a SPTC ROW. The private land is concentrated in the northern portion of the route. Alternative Segment J crosses an undeveloped residential subdivision at Angle Point JØ3. About 1.5 miles south of JØ3, the alternative crosses Termo Grasshopper Road; about 0.5 mile east along this road is the proposed site of the Ravendale Elementary School on BLM land leased under the Recreation and Public Purposes Act. Alternative Segment J crosses the SPTC about 0.5 mile northwest of JØ8. Recreational use in the area of the alternative J is dispersed and consists mainly of sage grouse, pronghorn antelope, and deer hunting. Horse Lake Road off U.S. 395 is the main access route though the Horse Lake Mountain and Fredonyer Peak region west of Alternative Segment J. The Lassen County General Plan land use designations and zoning for Alternative Segment J are similar to the land use designations and zoning for Proposed Segment K.

Environmental Impacts and Mitigation Measures

The impacts to residential, recreational, and agricultural uses of constructing and operating Alternative Segment J would be similar to the impacts of constructing and operating the Proposed Project described in Section C.8.2.

Cumulative Impacts and Mitigation Measures

Constructing the Ravendale Elementary School would not further exacerbate the disturbances associated with constructing the transmission line because the construction activities required for the school would be relatively small in scale, and may occur over a longer time frame than would the construction activities for the transmission line near the school site. Therefore, the cumulative impacts of the Proposed Project with Alternative Segment J would be similar to the cumulative impacts of the Proposed Project described in Section C.8.2.4. Mitigation Measures L-12 and L-13 would reduce the cumulative disturbances during construction of the Proposed Project with Alternative Segment J and future projects in Lassen County.

Unavoidable Significant Impacts

The significant, unavoidable impacts of constructing and operating the Proposed Project with Alternative Segment J would be the same as the significant, unavoidable impacts of constructing and operating the Proposed Project described in Section C.8.2.4.

C.8.3.4 East Secret Valley Alignment (Segment ESVA)

Environmental Setting. The East Secret Valley Alignment crosses undeveloped BLM and private land. Grazing, recreation, and wildlife habitat are the main land uses along Alternative Segment ESVA. Along the northern portion of the alternative within the Shinn Mountains, the main recreational uses are deer, pronghorn antelope, and chukar hunting. In the area of Secret Valley west of Five Springs Mountain, the alternative crosses just west of Five Springs Mountain Wilderness Study Area (WSA; 48,000 acres) and one of the access routes to the WSA. The WSA provides opportunities for primitive recreation and solitude.

Grazing is the primary land use within Secret Valley. In the northern portion of Secret Valley, the alternative crosses a County road that runs from U.S. 395 northeast toward Five Springs Mountain. A ranch is located off this County road. Alternative Segment ESVA then crosses the Chalk Bluffs area. Pronghorn antelope, sage grouse, chukar, and dove hunting are the main recreational uses in this area. Recreational uses are dispersed just south of Chalk Bluffs. The alternative crosses Smoke Creek Road, the main access route in this area of the alignment, which runs between Five Springs Mountain and the Skedaddle Mountains.

South of Chalk Bluffs, Alternative Segment ESVA crosses about 0.125 mile west of the northwestern-most extent of the Skedaddle Mountains WSA (63,184 acres). Hunting, camping, hiking, horseback riding, and sightseeing are the primary recreational uses of the WSA. These uses occur primarily in the more mountainous parts of the WSA, three to four miles east of this portion of the alternative. The route crosses about 0.5 mile west of Little Mud Flat, used for pronghorn antelope and game bird hunting. In the area of the alternative south of Little Mud Flat, recreation is limited, dispersed, and consists primarily of pronghorn antelope and game bird hunting.

Environmental Impacts and Mitigation Measures. Alternative Segment ESVA would not impact residential uses. The impacts on agricultural and recreational uses and impacts of increased access of constructing and operating this alternative would be similar to the impacts of the Proposed Project described in Section C.8.2. However, Alternative Segment ESVA would avoid impacting a residence located within 150 feet of the centerline for Segment L (RES-11) and recreational uses at the Tule Patch Spring Rest Area. This alternative route would cross a small portion of the Five Springs WSA near Stony Creek, and would conflict with federal regulations that prohibit the BLM from issuing a ROW for any use within a WSA. This regulatory inconsistency could be alleviated by relocating Alternative

Segment ESVA outside of the WSA by moving the line slightly to the west within the 660-foot study corridor.

C.8.3.5 Wendel Alignment (Segment M)

Environmental Setting

Alternative Segment M crosses undeveloped BLM land, private land, and a SPTC ROW. The private land is mainly undeveloped. About 1.5 miles south of its beginning, Alternative Segment M crosses about 0.5 mile east of the site of the "rearing and finishing facility" of the California Pork Company's proposed commercial swine operation. The skeletons of the six rearing and finishing barns were visible during a field reconnaissance in June 1994. The Wendel Transfer Station, a County sanitary disposal site, is located about 0.25 mile northwest of MØ2. About one mile northwest of Angle Point MØ2, Alternative Segment M parallels the SPTC to the east for about 0.5 mile and crosses the railroad where it turns south toward the Town of Wendel. The rural residential and commercial development of the Town of Wendel is located about 1.25 miles south of Angle Point MØ2. Recreational use in the area of Alternative Segment M is low and consists mainly of scattered game bird and pronghorn antelope hunting. The Lassen County General Plan land use designations and zoning for Alternative Segment M are similar to the land use designations and zoning for Proposed Segment N.

Environmental Impacts and Mitigation Measures

The impacts to residential, recreational, and agricultural uses of constructing the Proposed Project with Alternative Segment M would be similar to the impacts of constructing and operating the Proposed Project described in Section C.8.2.

In addition, construction activities could affect operations at the Wendel Transfer Station, a County sanitary disposal site located about 0.25 mile northwest of Angle Point MØ2. An increase in traffic along Wendel Road as a result of constructing Alternative Segment M could impede the movement of trucks to and from the sanitary disposal site. Impeding truck traffic to and from the Wendel Transfer Station would be adverse, but not significant **(Class III)** due to the temporary nature of the traffic increase, and the fact that access to the sanitary disposal site would not be blocked.

Mitigation Measure T-1 identified in Section C.12.2 (Transportation and Traffic) and the following mitigation measure would reduce the adverse, but not significant impeding of truck traffic to and from the Wendel Transfer Station:

L-17 At least one month prior to construction, the Applicant shall notify the Lassen County Public Works Department as to the schedule for constructing Alternative Segment M, including days and hours of construction and the extent of use of Wendel Road. The Lead Agency shall designate the party responsible for monitoring this measure who shall review a copy of the notice mailed to the Lassen County Public Works Department.

Cumulative Impacts and Mitigation Measures

Constructing and operating a swine rearing and finishing facility would not further exacerbate the disturbances associated with constructing the transmission line because the construction activities required for the swine facility would be relatively small in scale and may occur over a longer time frame than would the construction activities for the transmission line near the swine facility. Therefore, the cumulative impacts of the Proposed Project with Alternative Segment M would be similar to the cumulative impacts of the Proposed Project described in Section C.8.2.4. Mitigation Measures L-12 and L-13 would reduce the cumulative disturbances during construction of the Proposed Project with Segment M and future projects in Lassen County.

Unavoidable Significant Impacts

The significant, unavoidable impacts of constructing and operating the Proposed Project with Alternative Segment M would be the same as the significant, unavoidable impacts of constructing and operating the Proposed Project described in Section C.8.2.5.

C.8.3.6 West Side of Fort Sage Mountains (Segment P)

Environmental Setting

Alternative Segment P crosses undeveloped and recreational BLM land, undeveloped State of California land, and undeveloped private land. The alternative starts at the boundary between the SIAD and the Doyle State Wildlife Area, managed by the CDFG. From about Angle Points PØ1 to PØ7, the alternative runs between the Fort Sage Mountains. From about Angle Points PØ3 to its terminus, the alternative runs east of Long Valley, comprised mainly of private grazing land with scattered houses and three rural towns (Doyle, Constantia, and Omira). The rural residential and commercial development of the Town of Doyle is located about 2.5 miles southwest of PØ4. From its beginning to about PØ1, Alternative Segment P crosses the Doyle State Wildlife Area. Near Angle Point PØ4, the alternative crosses east of a partially developed residential subdivision with scattered houses. Casual OHV use is the main recreational use in the area where Alternative Segment P joins Proposed Segment Q. Motorcycle riding and deer hunting are the main recreational uses in the Doyle Wildlife Area. Recreational uses south of the Town of Doyle include scattered OHV use and hunting.

From about Angle Points PØ1 to PØ5, Alternative Segment P crosses the Fort Sage OHV Area. The northern portion of Alternative Segment P crosses over and near a motorcycle and ATV trail loop, and a dirt access road of the OHV Area. In addition, the developed trailhead of the OHV Area is located less than 0.5 mile west of PØ3. This trailhead is a multiple use recreational site used for picnicking, camping, as a staging for horseback riders, and as a site for bird dog hunting trials.

The Lassen County General Plan land use designations and zoning for Alternative Segment P are similar to the land use designations and zoning for the Proposed Project.

Environmental Impacts and Mitigation Measures

The impacts to residential, recreational, and agricultural uses of constructing and operating the Proposed Project with Alternative Segment P would be similar to the impacts of constructing and operating the Proposed Project described in Section C.8.2.

Constructing and operating the transmission line would impact use of the Fort Sage Off-Highway Vehicle Area. Alternative Segment P crosses the motorcycle and ATV riding trail in one location, dirt access roads in several locations, and a paved access road in one location. The alternative also crosses near other motorcycle and ATV trails and dirt access roads. Activities within the ROW for constructing the transmission line, intermittent blading of rough areas within the ROW for constructing a single lane overland travel route, and upgrading of existing 4WD roads outside the ROW would degrade the recreational experience of the riders of the trails and access roads. Human activity, truck traffic, equipment operation, and construction operations would disturb the riders, reduce their safe riding speed, and restrict their use of the trails and access roads. After the transmission line is constructed, the presence of the structures could restrict use of the trails and access roads and pose hazards to rider safety if they are placed within or adjacent to established trails and access roads. Overall, degradation of the recreational experience of the riders of the trails of the Fort Sage OHV Area would be significant, mitigable (**Class II**) due to the potential temporary preemption of the recreational use of the Fort Sage OHV Area during the peak use season, long-term loss or degradation of the recreational value of the OHV Area, and conflict with established recreational uses of the OHV Area. Degradation of the use of Doyle Wildlife Area would be significant, but mitigable (**Class II**) as described for the Proposed Project.

Mitigation Measures L-4 and L-10 would reduce the significant, mitigable degradation of the recreational experience of riders at the Fort Sage OHV Area to a level of non-significance. If this alternative segment is approved, appropriate land compensation for impacts to the Doyle wildlife area would need to be developed, as described in Mitigation Measure L-11.

Cumulative Impacts and Mitigation Measures

The cumulative impacts of the Proposed Project with Alternative Segment P would be similar to the cumulative impacts of the Proposed Project described in Section C.8.2.4.

Unavoidable Significant Impacts

The significant, unavoidable impacts of constructing and operating the Proposed Project with Alternative Segment P would be the same as the significant, unavoidable impacts of constructing and operating the Proposed Project described in Section C.8.2.5.

C.8.3.7 Long Valley Alignments (Segments S, U, Z and WCFG Alternative)

Environmental Setting

The Lassen County General Plan land use designations and zoning for the Long Valley Alignments are similar to the land use designations and zoning for the Proposed Project.

Alternative Segment S. Segment S crosses mainly undeveloped BLM and private lands, one SPTC ROW, and two WPRR ROWs. From about Angle Points SØ3 to SØ5, the alternative crosses a former and potential future pozzolan mine area on BLM and private lands. For its length, Alternative Segment S generally parallels U.S. 395 about 0.25 to 1 mile to the west. The alternative crosses a SPTC ROW about 0.5 mile from its beginning and two WPRR ROWs around SØ2.

Alternative Segment U. Segment U crosses mainly undeveloped BLM and private lands and a Caltrans ROW for U.S. 395. Southeast of its beginning, the alternative crosses the pozzolan mine area described above under "Alternative Segment S" at about 0.25 mile, U.S. 395 at about 0.5 mile, and just west of a gravel mining pit at about 0.75 mile.

Alternative Segment Z. Segment Z crosses mainly undeveloped BLM land and undeveloped private land. Between Angle Points WNØ2 and WNØ3, the alternative crosses six parcels of a partially developed residential subdivision. Alternative Segment Z lies west of the Petersen Mountain Natural Area, a BLM-designated Natural Area of 9964 acres. See the discussion of Proposed Segment W under Section C.8.1.2 for a description of the recreational uses of this Natural Area.

Alternative Segment WCFG. The WCFG Alternative crosses mainly undeveloped CDFG land, undeveloped private land (the last 0.5 mile), a Caltrans ROW for U.S. 395, and a WPRR ROW. From about 1.75 miles southeast of its beginning for about 1.25 miles along the route, the alternative parallels U.S. 395 and the WPRR Row to the east. Alternative Segment WCFG then crosses the highway and railroad, generally parallels these corridors to the west for about 0.5 mile, then runs south of the highway and parallels the railroad to its terminus.Twelve residences are located near ROW of Alternative Segment WCFG near the Border Town Substation Site.

The impacts to residential uses of constructing and operaing the Proposed Project with any of the Long Valley Alignments, except alternative Segment WCFG, would be similar to the impacts of constructing and operating the Proposed Project described in Section C.8.2. The impacts to residential uses of constructing and operating the Proposed Project with Alternative Segment WCFG would be greater than the impacts of Proposed Segment W because it would cross near more residences. The impacts to recreational and agricultrual uses of constructing and operating the Proposed Project with any of the Long Valley Alignments would be similar to the impacts of constructing and operating the Proposed Project described in Section C.8.2.

Environmental Impacts and Mitigation Measures

Although impacts of Alternative Segment WCFG on the CDFG Hallelujah Junction Wildlife Area would be less than Proposed Segment W, land use impacts would still be significant (Class II). Mitigation, in the form of offsite land compensation, is identified in Measure L-1 and acreage calculations in Table C.8-3 would apply to Alternative Segment WCFG. Impacts to pozzolan mining operations are described in Section C.6.2 (Geology, Soils, and Paleontology).

Cumulative Impacts and Mitigation Measures

Constructing the Long Valley Alignments could impact constructing and operating future pozzolan mine recovery and processing facilities. Other cumulative impacts of the Long Valley Alignments would be similar to the cumulative impacts of the Proposed Project and other future projects in Lassen County described in Section C.8.2.4. The overall cumulative impacts of the Long Valley Alignments would be significant, but mitigable (Class II), to potential construction (and operation) of pozzolan mineral recovery and processing facilities over four 5-acre sites near the transmission line ROW at the same time as construction of the transmission line. Constructing and operating large-scale facilities of this nature in several areas would exacerbate the disturbances associated with constructing the transmission line. Mitigation Measures L-12 and L-13 would reduce the significant cumulative disturbances during construction of the Proposed Project and any of the Long Valley Alignments and future projects in Lassen County to a level of non-significance.

Unavoidable Significant Impacts

The significant, unavoidable impacts of constructing and operating the Proposed Project with any of the Long Valley Alignments would be similar to the significant, unavoidable impacts of constructing and operating the Proposed Project described in Section C.8.2.5, although recreation impacts would not be as severe, since recreational users of the lands along Alternative Segments S and U do not have the same expectations of high visual quality that are associated with recreational use of the designated Lassen Red Rocks Scenic Area crossed by Proposed Segment T.

C.8.3.8 Peavine Peak Alignment (Segment X-East)

Environmental Setting

Alternative Segment X-East crosses undeveloped Toiyabe National Forest land and undeveloped private land. The alternative parallels the western border of the partially developed Hoge Road residential subdivision, crossing parcels with existing houses. Alternative Segment X-East crosses about one mile southeast, one mile southwest, and 0.75 mile northwest of the Seneca Drive, Raleigh Heights, and Talus Drive residential subdivisions, respectively. Scattered mines are located in the general area crossed by the alternative. Sensitive land uses near Alternative Segment X-East include houses in the partially developed Hoge Road residential subdivision (see Table C.8-1). The Washoe County Comprehensive Plan land use designations and zoning for Alternative Segment X-East are similar to the land use designations and zoning for Proposed Segment Y.

Environmental Impacts and Mitigation Measures

The impacts to residential, recreational, and agricultural uses of constructing and operating Alternative Segment X-East would be similar to the impacts of constructing and operating the Proposed Project described in Section C.8.2. In addition, constructing and operating the transmission line would impact sensitive residential uses near the ROW of Alternative Segment X-East, which include two residences along Hoge Road (see Table C.8-1).

Cumulative Impacts and Mitigation Measures

The cumulative impacts of the Proposed Project with Alternative Segment X-East would be similar to the cumulative impacts of the Proposed Project described in Section C.8.2.5.

Unavoidable Significant Impacts

The significant, unavoidable impacts of constructing and operating Alternative Segment X-East would be the same as the significant, unavoidable impacts of constructing and operating the Proposed Project described in Section C.8.2.4.

C.8.3.9 Substation Alternatives

C.8.3.9.1 *Alturas (Mill Site) Substation*

Environmental Setting. The site of the alternative Alturas Substation (Mill Site) is located between Angle Points BØ6 and BØ7 of Alternative Segment B, in the City of Alturas. Located on private land, the land uses in the immediate vicinity of the site include rural residential development and agriculture (i.e., grazing) to the north, east, south, and west, and unoccupied commercial development of Alturas Lumber to the southeast. State Highway 299 runs east-west about 0.5 mile north of the site. The Mill Substation site is zoned Industrial and is currently vacant of any structures.

Impacts and Mitigation Measures. Constructing and operating the Alturas Substation at the Mill Site would impact residential, and agricultural uses; whereas constructing and operating the Devils Garden Substation would mainly impact recreational uses. The impacts of constructing and operating the Mill Substation would be similar to the impacts to residential, recreational, and agricultural uses of the Proposed Project described in Section C.8.2.3.

C.8.3.9.2 *Border Town Substation Site*

Environmental Setting. The alternative site of the Border Town Substation is located on undeveloped private land in Lower Long Valley owned by SPPCo. The site is zoned Open Space (20-acre minimum). The private land of the alternative Border Town Substation site is parcel # 7 of the Pine Valley Subdivision. The Pine Valley Subdivision is encumbered by Covenants, Codes, and Restrictions (CC&Rs) which indicate that on any parcel, only single-family dwellings and accessory outbuilding shall be permitted by the Pine Valley Ranch Architectural Committee. The CC&Rs also indicate that all parcels shall be designated as to their permissible uses, and only activities connected with these designated uses may be carried out on any parcel. The SPTC winds to the east and crosses near the southeastern corner of the alternative substation site. U.S. 395 is located about one mile east of the site. The residential and commercial development of Border Town is located about one mile north of the site. Scattered houses and agricultural structures are located on the private land of Lower Long Valley to the west and between the railroad and White Lake to the east of the site.

Impacts and Mitigation Measures. The impacts to residential, and agricultural uses of constructing and operating the Border Town Substation at the alternative site would be similar to the impacts of constructing and operating the Border Town Substation at the Proposed Project site included under "Impacts on Residential Uses" and "Impacts on Grazing" in Sections C.8.2.2.1 and C.8.2.2.2. In addition, constructing and operating the alternative Border Town Substation site would violate the CC&Rs of the Pine Valley Subdivision described above. The impacts for the alternative and proposed substation sites would be similar because the two sites are adjacent. However, the alternative site would be slightly closer to several residences in the area and would violate the Pine Valley Subdivision CC&Rs.

Cumulative Impacts and Mitigation Measures

The cumulative impacts of constructing and operating the alternative substations would be similar to the cumulative impacts of constructing and operating the proposed substations under the Proposed Project described in Section C.8.2.4.

Unavoidable Significant Impacts

Constructing and operating the alternative substations would not result in significant, unavoidable impacts.

C.8.4 NO PROJECT ALTERNATIVE

Under the No Project Alternative, the land use impacts associated with the construction and operation of the Proposed Project would not occur. However, SPPCo would need to augment its existing facilities by constructing a new major transmission facility comparable to the Proposed Project. Although the type of land use impacts of the Proposed Project and a comparable transmission facility would be similar (e.g., disturbances to land uses during construction and maintenance, temporary preclusion of particular land uses during construction and maintenance, and permanent preclusion of particular land uses due to the presence of project structures), the actual land uses affected would depend on the location of the new major transmission facility. If the new transmission facility were constructed through an area more developed and urbanized than the Proposed Project area, the land use impacts of that facility would likely be greater than the land use impacts of the Proposed Project.

The No Project Alternative would also involve augmenting existing transmission facilities and constructing a new combustion turbine at an existing power plant. Constructing these facilities would have relatively minor land use impacts compared to those of constructing the Proposed Project substations, because the construction activities would not result in new disturbances to existing land uses. Operating these facilities would have relatively minor land use impacts compared to those of constructing the Proposed Project substations, because the presence of the facilities would intensify existing land use impacts rather than result in new land use impacts.

C.8.5 MITIGATION MONITORING PROGRAM

Most of the mitigation measures for the Proposed Project required to reduce significant land use impacts to a level of non-significance, or recommended to further reduce non-significant land use impacts, would be implemented by the Applicant during project design, construction, or operation. The CPUC and BLM would ensure that the Applicant provided the required personnel or funding to implement the required mitigation measures. The CPUC BLM, or approved mitigation monitoring contractor would monitor and report on implementation of the mitigation measures. Table C.8-3 on the following pages presents the Mitigation Monitoring Program for land use impacts.

Table C.8-4 Mitigation Monitoring Program

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Disturbances to residential uses during project construction (Class III)	L-1 Provide advance notice of construction to property owners, residents, and tenants within 1000 feet of the 160-foot ROW, substation site, or access road.	All Proposed and Alternative Segments	BLM CPUC	Review and approve the Construction, Operation, and Maintenance Plan. Review and approve copies of mailed notices, bulletins, and published notices.	Timely and detailed notices, bulletins, and published notices. Less than 25 percent of affected property owners, residents, and tenants contact Applicant or other affected agencies to complain about construction disturbances.	At least one month before project construction in residential areas
Disturbances to residential uses during project construction (Class III)	L-2 Appoint a public affairs officer to be the point of contact to discuss public concerns or questions. See also Mitigation Measures A-3, U-1, N-3, T-1 through T-4, and V-1 through V-3.	All Proposed and Alternative Segments	BLM CPUC	Review memorandum regarding appointment of specific individual as public affairs officer. Review and approve copies of mailed notices, bulletins, and published notices.	Less than 25 percent of the individuals that contact the Applicant indicate that they were not aware of the existence of the public affairs officer, or complain that the public affairs officer did not adequately respond to their concerns.	Appoint officer prior to construction notification; monitor performance during and after construction
Disturbances to recreational uses during construction (Class III)	L-3 Provide advance notice of restricting, blocking, or detouring of access routes to known recreational areas or destinations. See also Mitigation Measure T-5.	Proposed Segments A,C,E,K,L,O,Q,T,W Alternative Segments B,D,F,G,J,P,Z	BLM CPUC USFS	Review and approve the Construction, Operation, and Maintenance Plan. Review copies of bulletins. Inspect affected access routes to recreational areas to observe whether the bulletins have been posted.	Timely and detailed bulletins posted in appropriate locations along affected access routes to recreational areas.	Provide notice at least two weeks before project construction near access routes to recreational areas.
Degradation of the recreational experience for riders at Fort Sage OHV Area during construction (Class II)	L-4 Provide notice of construction activities and access restrictions on specific roads or trails in Fort Sage OHV area.	Alternative Segment P (At Fort Sage OHV Area)	BLM CPUC	Review and approve the Construction, Operation, and Maintenance Plan. Visit the Fort Sage OHV Area to observe whether bulletins have been posted in the appropriate locations at the appropriate time.	Timely and detailed bulletins posted in appropriate locations in the Fort Sage OHV Area.	Notification at least one month prior to project construction in Fort Sage OHV Area

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Temporary loss of grazing land use and disturbance to grazing animals during construction (Class II)	L-5 Coordinate with USFS, BLM, and permittees to ensure protection of range improvements and livestock water sources.	Proposed Segments A,C,K,L,O,Q,R,T,W, X,Y Alternative Segments D,J,ESVA,M,P,S,U,V	BLM USFS	Ensure that the BLM, USFS, Applicant, and grazing permittees meet to identify subject range improvements and livestock water sources prior to construction. Review and approve the Construction, Operation, and Maintenance Plan.	Less than 20 percent of grazing allotment permittees contact the Applicant to complain about impacts to grazing during project construction.	Prior to project construction.
Loss of grazing animals through open fences or gates temporarily removed during construction (Class II)	L-6 Construct a temporary barrier across sections of removed fencing so that grazing animals cannot move through the open section of fencing; immediately after completing construction in an area, repair the section of removed fencing.	Wherever route crosses grazing fencing	BLM USFS	Applicant shall designate one member of each construction crew who shall be responsible for ensuring that the barriers are constructed immediately after the fencing sections are removed, and that the sections of removed fencing are repaired immediately after construction is completed. BLM shall periodically inspect the construction area to observe whether barriers have been constructed across sections of removed fencing, and inspect areas here the line has been constructed to observe whether sections of removed fencing have been repaired.	No open sections of fencing are observed during inspections of construction areas.	Designate crew member during project construction on grazing land, immediately after removing sections of grazing allotmen fencing; inspect during construction
	L-7 Close all gates immediately after they are opened to allow construction vehicles and equipment access to a construction area.			Applicant shall designate one member of each construction crew who shall be responsible for ensuring that all gates are closed immediately after they are opened. BLM shall periodically inspect the construction area to observe whether all gates are closed.	No open gates are observed during inspections of construction areas.	During project construction on grazing land

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Temporary loss of cropland use during construction (Class II)	**L-8a** Reimburse farmers along the ROW for crops lost due to Project construction (a stipulation in easement agreements with farmers) **L-8b** Work with County Cooperative Extension Service (CCES) to develop construction schedule that would avoid prime crop planting, growing, and harvesting seasons.	Proposed Segments A,E,K,O Alternative Segments B,F,G,H,I,W,X	CPUC	Ensure that CCES, Applicant, and farmers meet to develop adjusted construction schedule. Designate responsible party to monitor Applicant compliance with easement stipulation.	A detailed adjusted schedule for construction on cropland. Less than 20 percent of crop farmers contact the Applicant to complain about impacts to cropland during project construction and/or inadequate compensation for lost crops.	Develop schedule before project construction
Degradation of quality of residential uses resulting from permanent change in character of residential environment (Class I)	**L-9** Design Proposed Project such that transmission line structures are not placed within 300 feet of existing residences. The separation distance between receptors and the centerline shall be maximized for receptors located less than 300 feet from the centerline.	Proposed Segments L,X Alternative Segment X-East	BLM CPUC	Review and approve the final plans for siting the transmission line structures.	Approved final plans for siting the transmission line structures.	During project final design; prior to permit issuance
Degradation of recreational experience for riders at Fort Sage OHV area (Class II)	**L-10** Design Proposed Project to prevent placement of structures within or adjacent to motorcycle or ATV riding trails or roads.	Alternative Segment P (At Fort Sage OHV Area)	BLM CPUC	Review and approve the final plans for siting the transmission line structures.	Approved final plans for siting the transmission line structures.	During project design; prior to permit issuance
Degradation of recreational experience for users of Toiyabe National Forest (Class I)	**L-11** Provide Toiyabe National Forest with compensatory land suitable for recreational uses.	Proposed Segment X, X-East,Y	CPUC USFS	Review and approve land acquisitions proposed by SPPCo.	Provision of sufficient recreational lands.	Review proposed acquisition before project construction
Degradation of State Wildlife Areas due to presence of line structures (Class II)	**L-12** Provide CDFG with compensatory land contiguous to the Wildlife Areas to compensate for degraded areas.	Proposed Segment Q and Alternative Segment P (Doyle Wildlife Area) Proposed Segment W and Alternative Segment WCFG (Hallelujah Junction Wildlife Area)	BLM CPUC CDFG	Review and approve land acquisitions proposed by SPPCo.	Provision of sufficient contiguous wildlife areas.	Review proposed acquisition before project construction

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Cumulative disturbances during construction of the Proposed Project and other future projects in Modoc and Lassen Counties (Class II)	**L-2** through **L-4**, above **L-13** Coordinate with the proponents of other proposed projects within one mile of the ROW or substation sites to minimize cumulative construction impacts.	Wherever other projects are constructed within, adjacent to, or near the line ROW or substation sites in Modoc and Lassen Counties	BLM CPUC	Ensure that Applicant, proponents of other projects, and affected agencies meet to coordinate construction activities, utility disruptions, and road closures. Review memorandums regarding results of coordination meetings. Review and approve Construction, Operation, and Maintenance Plan.	Detailed memoranda regarding results of coordination meetings	Before project final design and permitting
	L-14 Recommend that Counties establish a 300-foot minimum setback for any future occupied structures along the ROW. **L-15** If construction of the Proposed Project is delayed, the Applicant shall coordinate with the U.S. Natural Resource Conservation Service (NRCS) so that construction of Proposed Segment X does not overlap construction of the Evans Creek Dam. The Lead Agency shall designate the party responsible for monitoring this measure, who shall ensure that the Applicant and NRCS coordinate construction activities and review memorandums regarding the results of coordination meetings.	Wherever other projects are constructed within, adjacent to, or near the line ROW or substation sites in Modoc, Lassen, and Sierra Counties	Counties	None required since implementation of this mitigation measure is subject to the discretion of the applicable counties.	Incorporation of setback requirements into local ordinances	Prior to development of future projects within proximity of the ROW
Permanent loss of a small portion of the driving range of the Arrowhead Golf Course due to the presence of line structures (Class III)	**L-16** Design the Proposed Project such that the transmission line structures are placed outside or on the boundary of the driving range of the Arrowhead Golf Course.	Alternative Segment B (At driving range of Arrowhead Golf Course)	BLM CPUC	Review and approve the final plans for siting the transmission line structures.	Approved final plans for siting the transmission line structures.	Prior to permit issuance

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Impeded movement of truck traffic to and from the Wendel Transfer Station (Class III)	**T-1**, below **L-17** Notify the Lassen County Public Works Department of the schedule for constructing Alternative Segment M.	Alternative Segment M (On Wendel Road near the Wendel Transfer Station)	BLM CPUC	Review copy of mailed notice to Lassen County Public Works Department.	Timely and detailed notice.	Notice mailed at least 30 days prior to project construction near the Wendel Transfer Station

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C.9.1 ENVIRONMENTAL BASELINE AND REGULATORY SETTING

This noise analysis focuses on the Proposed Project corridor segments (A, C, E, K, L, N, O, Q, R, T, W, X, and Y) and the alternative alignments. Refer to Land Use (Section C.8) and Traffic (Section C.12) for more detailed information and supporting analysis. The base maps at the end of Volume I show the Proposed Alturas Transmission Line corridor, and nearby roadways and airports that are principal noise sources in the study region.

C.9.1.1 Characteristics of the Study Region and Community Noise

General Characteristics of Community Noise

A noise environment consists of a base of steady "background" noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by, to virtually continuous noise from, for example, traffic on a highway.

To describe noise environments and to assess impacts on noise sensitive areas, a frequency weighing measure which simulates human perception is customarily used. It has been found that *A-weighting* of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is the one cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. A chart of dBA noise levels for common events is provided in Appendix G in Volume III.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day, night, or over a 24-hour period. These are decibel levels that are exceeded 50 percent of the time (and commonly designated by "L_{50}"). Noise levels are generally considered low when below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Examples of low levels are isolated natural settings, such as the Grand Canyon (20 dBA), and quiet suburban residential streets (43 dBA).[1] Examples of moderate level noise environments are urban residential or semi-commercial areas (55 dBA) and commercial locations (60 dBA). Although people often accept the higher levels associated with very noisy urban residential and residential-commercial (63 dBA) zones, as well as industrial (65 dBA) areas, they nevertheless are considered adverse.

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1 The descriptors and decibel levels of noise sources in this discussion are typical of those that have been recorded in various studies, including EPA, 1971 and Beranek, 1971. Individual locations meeting these descriptions can have levels that differ by a few decibels.

Various noise environments can be characterized by levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas, than in commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference can be less in rural areas away from roads and other human activity. Areas with full-time human occupation that are subject to nighttime noise that does not decrease relative to daytime levels are often considered objectionable.

Methodology for Determining the Ambient Project Noise Environment

Factors Entering the Analysis. The factors that enter into defining the ambient noise environment for a linear project and that are used to assess noise impacts are: location of noise-sensitive receptors; local noise sources along the transmission line corridors (location, type, and level); general terrain features; and ambient noise levels not attributable to individual noise sources. These factors have been identified along the transmission line corridor and were used to assemble Table C.9-1, that is based on the sensitive land uses (or "receptors") identified in Section C.8.1, Land Use. Noise sensitive receptors include residences, schools, churches, synagogues, hospitals, parks, and areas containing sensitive fauna. Clusters of residences in close proximity to the right-of-way are also listed and identified by their mileposts along the right-of-way (ROW).

Ambient median daytime noise levels were first determined by using accepted relationships between land use patterns and resulting community noise levels (e.g., EPA, 1971). Estimated levels were then adjusted to take into account major local noise sources when present. To accomplish this the ROW was first surveyed. Then, overflight video tape and USGS-based topographic strip maps with overlaid project features were reviewed and compared with the generalized land use-noise level correlation data. Surveys and research work by the land use, transportation, biologic, and visual teams were then reviewed to complete the analysis and compile the final ambient noise estimates.

Major Source and Distance Effects. Noise sources that affect the local noise environment and can partially or completely mask out project noise include nearby highways, major arterials, railroads, and industrial or commercial zones. The major noise sources in the vicinity of the proposed transmission line corridor and alternative line segments are roads and highways. Where the ROW is over or near a roadway, traffic noise is almost invariably the dominant noise source affecting existing ambient noise levels. Median daytime noise levels for transmission line segments (or portions thereof) near major roadways were estimated on the basis of traffic volumes, separation distance, and terrain factors (see Table C.12-1 in Section C.12, Transportation, for a summary of roadway data). Published peak hour traffic levels were used with a Federal Highway Administration (FHWA) noise model to estimate median daytime noise levels (FHWA, 1978).

There is a description in the Noise Appendix (Appendix G, Volume III) on how distance, terrain, and nearby noise sources can be factored into estimating ambient noise levels (as well as in the calculation of decibel noise increments that would result from short-term construction or long-term maintenance of project facilities). Under ideal conditions noise levels decrease by at least three decibels with each doubling of distance from a noise "line source," such as a roadway, and by six decibels or more when the source is highly localized. Soft soil, irregularly shaped ground surfaces or those with sound absorbing properties (e.g., vegetation) will result in an increased noise attenuation with distance.

Terrain and Barrier Effects. Terrain can act as a barrier between a noise source and sensitive receptor. Noise levels will be reduced whenever an obstacle breaks the line of sight between source and receptor. The degree of noise reduction depends upon several factors, but most important are height and continuity of the barrier (unlike visible light, audible sound "wraps around" a barrier). Generally, the higher the barrier, the greater the noise reduction, and a relatively long, continuous barrier is notably more effective than a broken barrier. On the other hand, a relatively flat, large surface behind a noise source can act as a reflector of sound, augmenting the noise level. Reflection is generally more pronounced where the topographic incline is steep and hard surfaced, such as a rock cliff, or nearby building.

Quantification of barrier and reflector effects is complex. Table C.9-1 summarizes their effects in broad categories (low, moderate and high). A "low" effect is the classic case of clear line of site with relatively flat ground surface between noise source and receptor point. A "high" effect represents a solid continuous barrier and will result in noise attenuation on the order of 10 dBA. A "moderate" effect is that from a broken barrier or one consisting of dense vegetation and soft intervening ground. Attenuation was approximated in these cases at 5 dBA. Individual evaluation is made in the few situations where both reflector and barrier effects are present, and the combined effect is determined in terms of one of the three generic noise effect categories.

Accuracy of Estimates. Given an adequate physical description of the area near a sensitive land use, it is possible to estimate the average workday noise level to within five decibels (5 dBA). This is discussed further in Appendix G. Noise elements and other published studies containing noise data, insofar as available for the affected areas, were used to verify the analysis.

Transmission Line Route Noise Environment

The ambient noise level resulting from innumerable small noise sources, large local noise sources, relative distance between these sources and a receptor, and intervening terrain characteristics have a strong bearing on the effective noise level at the sensitive receptor. Table C.9-1 provides the results of the detailed review of maps and other environmental data. The estimate of daytime median hour noise levels at sensitive receptors in the right column of the Table is based upon the methodology described in the previous subsection. Distances between sensitive receptors and the proposed transmission line and local noise sources were estimated to within 100 feet. Separations less than 100 feet were not estimated. Distances are measured from the closest edge of source and receptor.

Table C.9-1 Noise Sources and Median Daytime Noise Levels

Sensitive Receptor[1]	Segment	Milepost	Distance Between Proposed Project and Receptor (ft.)	Terrain Char.	Existing Significant Noise Sources (peak hour traffic volume)	Distance Between Existing Noise Source & Receptor (ft.)	Approx. Daytime Median Noise Levels at Sensitive Receptor (dBA)
Alturas (Modoc County)							
Residences (RES-1)	A	4.4	2000'	Low	SR 299 (250)	100'	56
Residence (RES-2)	A	4.6	2000'	Low	SR 299 (250)	1900'	40
Residence (RES-32)	A	3.9	3000'	Low	SR 299 (250)	1900'	40
Residences (The Three Sisters Area) (RES-3)	A	7.2	1000'	Low	Isolated	N/A	40
Residence[2] (RES-18)	B	BMP 0.1	400'	Low	Isolated	N/A	40
Residence[2] (RES-19)	B	BMP 0.1	700'	Low	Isolated	N/A	40
Arrowhead Golf Course[2] (REC-2)	B	BMP 0.1	200'	Low	Isolated	N/A	40
Church of Christ[2] (REL-1)	B	BMP 0.2	900'	Low	Isolated	N/A	40
Residence[2] (RES-20)	B	BMP 0.2	800'	Low	Isolated	N/A	40
Residence[2] (RES-21)	B	BMP 0.2	800'	Low	Isolated	N/A	40
Rattlesnake Creek Ranch[2] (RES-22)	B	BMP 0.9	1800'	Low	Isolated	N/A	40
Residences[2] (RES-23)	B	BMP 0.9	1500'	Low	Isolated	N/A	40
Residence[2] (RES-24)	B	BMP 1.7	600'	Low	Lumber Yard	2500'	41
Residences[2] (RES-25)	B	BMP 2.3	800'	Low	Isolated	N/A	40
Madeline Plains (Lassen County)							
Residences (RES-4)	E	39.6	1250-1900'	Low	U.S. 395 (Rail Road) (160)	2500'	40
Residence (RES-5)	E	46.1	700'	Mod.	U.S. 395 (Rail Road) (160)	500'	48
Residence[2] (RES-26)	F	FMP 2.4	1500'	Low	Isolated	N/A	40
Residence[2] (RES-27)	F	FMP 2.4	600'	Low	Isolated	N/A	40
Residence[2] (RES-28)	F	FMP 3.8	1500'	Low	Isolated	N/A	40
Residence[2] (RES-29)	F	FMP 3.9	1500'	Low	Isolated	N/A	40

Sensitive Receptor[1]	Segment	Milepost	Distance Between Proposed Project and Receptor (ft.)	Terrain Char.	Existing Significant Noise Sources (peak hour traffic volume)	Distance Between Existing Noise Source & Receptor (ft.)	Approx. Daytime Median Noise Levels at Sensitive Receptor (dBA)
Residence[2] (RES-30)	G	GMP 3.8	800'	Low	Isolated	N/A	40
Residence at Termo Junction (RES-6)	K	51.3	600'	Low	U.S. 395 (Rail Road) (160)	< 100'	64
Trailer (RES-7)	K	54.8	300'	Low	U.S. 395 (Rail Road) (160)	300'	55
Secret Valley (Lassen County)							
Tule Patch Spring Rest Area (REC-1)	L	71.9	300'	Low	U.S. 395 (160)	300'	54
Residence (RES-8)	L	74.6	1000'	Low	U.S. 395 (160)	1500'	41
Trailer (RES-9)	L	76.6	800'	Low	U.S. 395 (160)	300'	52
Residence (RES-10)	L	78.7	700'	Mod.	U.S. 395 (160)	1000'	44
Residence (RES-33)	L	79.2	2200'	Low	U.S. 395 (160)	1900'	40
Residence (RES-11)	L	79.3	150'	Low	U.S. 395 (160)	400'	50
Residence (RES-12)	L	80.5	400'	Low	U.S. 395 (160)	500'	48
Residence (RES-12a)	L	81.1	600'	Low	U.S. 395 (160)	150'	68
Residence (RES-31)	ESVA	ESMP 9.7	1300'	Low	Isolated	N/A	40
Residences (Wendel) (RES-13)	M/O	94-95	500-1500'	Low	Isolated	N/A	40
Doyle Wildlife Area	O/Q	111-117	0 plus	Low	Isolated	N/A	40
Long Valley (Lassen County)							
Residences (RES-40)	P	PMP 12.5	900'	Low	U.S. 395 (860)	6900'	45
Residence (RES-41)	P	PMP 13.3	1200'	Low	U.S. 395 (860	8200'	44
Residence (RES-14)	P/R	132.0	1500'	Mod.	U.S. 395 (Rail Road) (860)	1200'	55
Residence (RES-42)	W	140.1	800'	Low	U.S. 395 (900)	2500'	51
	Z	ZMP 1.7	1000'				

Sensitive Receptor[1]	Segment	Milepost	Distance Between Proposed Project and Receptor (ft.)	Terrain Char.	Existing Significant Noise Sources (peak hour traffic volume)	Distance Between Existing Noise Source & Receptor (ft.)	Approx. Daytime Median Noise Levels at Sensitive Receptor (dBA)
Reno Area (Washoe County)							
Hallelujah Junction Wildlife Area	WCFG	WMPO-2	0 plus	Low	U.S. 395 (1100)	0-5000'	40-75
Residences (RES-43)	W	150.0	5500'	Low	U.S. 395 (1100)	1900-2500'	51
	WCFG	WMP 2.7	2100'				
Residences (RES-44)	W	150.7	2500'	Low	U.S. 395 (1100)	850'	58
	WCFG	WMP 3.5	400'				
Residence (RES-34)	X	151.5	2500'	Low	U.S. 395 (1100) and local streets	7700'	45
Residences (RES-35)	X	156.7	1400'	Low	U.S. 395 (1100)	2500'	51
Residences (RES-36)	X	157.3	2200'	Low	U.S. 395 (1100)	3100'	50
Residence (Hoge Road)[2] (RES-16)	X X[3]	162.0 XEMP 1.6	4000' 1000'	Low	Isolated	N/A	40
Residences (RES-45)	X	162.0	3500'	Low	Isolated	N/A	40
	X[3]	XEMP 1.6	1700'				
Residence (Hoge Road)[2] RES-17)	X X[3]	162.1 XEMP 1.8	2200' 900'	Low	Isolated	N/A	40
Residences (RES-37)	X	163.0	1000-2000'	Low	North Virginia Road (200)	1600-3100'	42-44
North Foothill Apts.(RES-15)	X	163.3	260'	Mod.	North Virginia Road (200)	100'	55
Residences (RES-38)	X	163.8	1000-2000'	Low	North Virginia Road (200)	1600-3500'	42-44
Trailer Park (RES-39)	X	164.9	1200'	Mod.	U.S. 395 (1100) McCarran Blvd.	1700' 250'	61

Notes: Refer to Table C.8-1 for additional information on sensitive receptors.

[1] A name in parentheses corresponds to that name on the Base Maps at the end of Volume I for that sensitive receptor.
[2] sensitive receptor along an alternate segment alignment.
[3] Alternative Segment X-East

The Table includes sensitive noise receptors within 2,000 feet of the staked transmission centerline within the 660-foot wide study area (some sensitive land uses in Section C.8 are listed beyond this distance and are not included in the Table). In addition to the individually identifiable receptors, there are some clusters of residences that are identified as a group. Refer to Land Use, Section C.8, for a discussion of residential and other aspects of land use along the proposed corridor and alternative alignments.

Modoc County Noise Environment (Segments A and C). Modoc County for the most part consists of a rural setting and very quiet environment. A goal of the County Noise Element is to maintain those areas that are characterized as quiet and reduce in them those operations that are major noise sources. There is, however, community tolerance of relatively noisy seasonal activities that have superseded some of the overall standards and expectations. The seasonal industrial noise sources include sawmills, agricultural processes, and hunting. They are tolerated as long as the noise level does not interfere with residential use and enjoyment of private property.

Noise measurements, as described in the Modoc County General Plan (September, 1993), indicate that areas located away from major roads and industrial sources have relatively low noise levels. Noise levels are greater near major sources, such as U.S. 395, Highway 139, and Highway 299, which pass through Modoc County. The most prevalent noise source affecting the transmission line route is U.S. 395. Daily 1992 traffic volumes on U.S. 395 varied from 6,300 to 8,400 vehicles per day (VPD) in the Alturas area to approximately 1,600 VPD between the County line and the community of Likely (Caltrans, 1993). The peak hour 60 dBA noise contour varies from approximately 375 to 450 feet from the edge of U.S. 395 in the Alturas area to approximately 125 feet near Likely. Other noise contributors in the County include industrial facilities, railroad operations, airports, and race tracks. The only major non-road noise source near the Proposed Project corridor in the vicinity of sensitive receptors is a lumber yard. Table C.9-1 identifies the applicable sensitive receptors and major noise sources located along the proposed Alturas Transmission Line corridor in the four affected Counties, including Modoc.

Lassen County Noise Environment (Segments C, E, K, L, N, O, Q, R, T and W). Lassen County is also an area with very low ambient noise levels and has goals similar to those of Modoc County with respect to environmental noise. Major noise sources in the County include traffic on the primary highways and roads, railroad operations, and industrial activities. In the vicinity of the Proposed Project corridor, the principal noise source is U.S. 395. Other noise sources occur in the general vicinity of Madeline, Termo, and Ravendale. Current traffic levels on U.S. 395 vary from 1,600 VPD at the County line to 2,000 VPD near Madeline, Termo and Ravendale. From there south, the traffic volume increases. After U.S. 395 becomes a divided freeway near Hallalujah Junction, the volume significantly increases to approximately 10,800 VPD. The peak hour 60 dBA noise contour varies from approximately 135 feet from the edge of U.S. 395 near Madeline to approximately 600 feet near Hallelujah Junction. Table C.9-1 lists the noise sources, environmental factors, and ambient noise levels for identified sensitive receptors in Lassen County. Two listed receptors along Segment E and two others near Segments K are also affected by rail traffic of the Southern Pacific Transportation Company (SPTC). Rail noise occurs infrequently and adds only one or two decibels to the averaged ambient noise level.

Sierra County Noise Environment (Segments W and X). Noise levels in Sierra County, California, are not described in the Noise Element of the General Plan (Sierra, 1993). U.S. 395 is the principal noise source near the Proposed Project corridor. The traffic level on this short stretch of U.S. 395 between Hallelujah Junction and Border Town is approximately 10,800 VPD; and the peak hour 60 dBA noise contour is approximately 600 feet from the edge of the highway. The goals for desired noise levels for various land uses are stated interchangeably in the Noise Element in terms of the Day-Night (L_{dn}) and the CNEL metrics (these are daily averages that take into account the lower tolerance for noise in the evening and during the night). The noise goals are consistent with federal and state guidelines. There are no sensitive receptors identified along this stretch of the ROW, nor listed in Table C.9-1.

Washoe County, Nevada Noise Environment (Segment X). From the Nevada border to the outskirts of Reno, U.S. 395 is the principal noise source. Traffic levels near U.S. 395 are similar to those in Sierra County until the highway enters Reno. Near the Alturas Transmission Line terminus in Nevada the principal noise sources are McCarran Boulevard and U.S. 395. Table C.9-1 lists the noise sources, environmental factors, and ambient noise levels for identified sensitive receptors along the transmission line corridor in Washoe County.

C.9.1.2 Applicable Regulations, Plans, and Standards

Federal Standards and Regulations

There are no federal noise standards that directly regulate noise from construction or operation of the Proposed Project. Federal regulations safeguard the hearing of workers exposed to occupational noise, enforced by the Office of Safety and Health Administration [OSHA] (e.g. 29CFR1919.120). For example, it is illegal for employees to be exposed to noise levels in excess of 115 dBA for more than 15 minutes during any working day. The U.S. Environmental Protection Agency has developed guidelines on recommended maximum noise levels to protect public health and welfare (U.S. EPA, 1974). For example, 55 dBA is the maximum for the annual average day-night level in outdoor areas (U.S. EPA, 1978).

State Standards and Regulations

California and Nevada encourage each local government to perform noise studies and implement a noise element as part of their general plan. The California Occupational Safety and Health Administration (Cal OSHA) also has regulations to protect the hearing of workers. California Administrative Code, Title 4, has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The California Office of Noise Control implements the guidelines.

County and Municipal Standards and Regulations

Some counties and communities along the Proposed Project route and alternative segments use a noise ordinance to implement requirements in their noise element or general plan. Noise standards and regulations are enforced either using administrative codes or the police function. It often takes a filed complaint to initiate action, because of limited available funds. Construction is usually limited to specified daytime workday hours. Some jurisdictions limit the degree to which the ambient median noise level can increase during construction, typically five decibels. Some ordinances allow larger noise increments over specified shorter time periods. Most communities also limit the allowed operational noise level at the boundary of any noise emitting development. Table C.9-2 summarizes the ordinances, for each affected county or city that has implemented one or an alternative procedure for controlling noise. Some counties have developed time-limited noise-increment conditions, called "noise level performance standards," so that they can maintain an acceptable environment for the public under a range of conditions. Typical noise level performance standards (Lassen County) for new projects and developments, are listed in Table C.9-3.

Table C.9-2 Noise Ordinances

Jurisdiction	Ord. Number	Enforc.Agency	dBA Level	Hours	Allowed Increase
Modoc County and Cities					
Alturas	Nuisance[1]	Planning	60	Conditional[2]	Conditional
Rural County	Nuisance	Planning	60	Conditional	Conditional
Lassen County					
Rural County	Sect. 14.10	Code Enforce.	Conditional	7 am - 9 pm	Conditional
Sierra County					
Rural County	Conditional	Police	Conditional	Conditional	Conditional
Washoe County and Cities					
Reno	Nuisance	Housing Compliance Inspector	Conditional	Conditional	Conditional
Rural County	Sect. 110.414.05	Code Enforc.	Conditional	7 am - 7 pm	Conditional

Notes: [1] Nuisance: based upon a filed complaint
[2] Conditional = case by case basis.

C.9.1.3 Transmission Line Corona Noise

During humid conditions, transmission lines can generate a corona. In addition to faint blue light, corona activity will generate audible noise that can barely be heard in fair-weather conditions. During periods of rain, dense fog or snow, water drops collect on the conductors and increase corona activity so that a crackling or 120 Hz (Hertz, or cycles per second) hum may be heard within or near the corridor in a quiet environment. This noise is caused by small electrical discharges from the water droplets. Audible noise decreases with distance from the line. Noise levels for the proposed transmission line design were modeled and the results are listed in Appendix G in Volume III of the Final EIR/S.

Table C.9-3 Noise Performance Standards for New Projects
(Based on Lassen County)

Allowed Noise Levels - Exterior Noise Level Standards, dBA			
Category	Cumulative Minutes/Hour	Daytime: 7 a.m. - 10 p.m.	Nighttime: 10 p.m. - 7 a.m.
1	30	50 dBA	40 dBA
2	15	55 dBA	45 dBA
3	5	60 dBA	50 dBA
4	1	65 dBA	55 dBA
5	0	70 dBA	60 dBA

Note: Allowed levels as measured at any affected residentially designated land use.

C.9.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

C.9.2.1 Methodology

The prediction of noise levels and the subsequent estimation of impacts at sensitive receptors in the vicinity of a project requires consideration of three factors:

- Identification and location of construction equipment or operations which are significant noise sources
- Distances between the project noise sources and noise-sensitive receptor points
- Intervening obstacles or barriers to sound propagation.

The procedure involves estimating noise levels from expected equipment and then employing a noise propagation model to estimate levels at sensitive receptor points, taking into account the physical aspects of the intervening distance. Appendix G in Volume III provides a description of noise levels of equipment, the computer model for noise propagation, and methodology used in estimating the increase in noise over the ambient level and its duration.

C.9.2.2 Definition and Use of Significance Criteria

There are two criteria for judging noise impacts. First, noise levels projected for the planned facility must comply with the relevant federal, state, or local standards or regulations. Mitigation of noise impacts on worker safety and health is enforced by OSHA and by CalOSHA in California, but effectiveness depends on the vigilance of supervisors in seeing that workers use protective gear in high noise environments. Noise impact on the surrounding community is enforced through the local noise ordinance, supported by nuisance complaints and subsequent investigation. There are no regulatory significance criteria applicable to a project during construction or operation.

The second measure of impact recognized by noise analysts is the increase in noise levels above the existing ambient as a result of the introduction of a new source of noise. A change in noise level due to a new noise source can create an impact on people. The degree of impact is hard to assess because of the highly subjective character of individuals' reactions to changes in noise. Empirical studies have shown that persons in an urban environment begin to distinguish long-term changes in noise level of approximately five dBA (BBN, 1973; BLM, 1977).[2] Thus, average changes in noise levels less than 5 dBA may be considered as producing no adverse impact. For changes in level above five dBA, it is difficult to quantify impact beyond the obvious: the greater the noise level change, the greater the impact. A judgment commonly used in community noise impact analyses associates long-term noise increases of 5 to 10 dBA with "some impact." Noise level increases of more than 10 dBA are generally considered severe. In the case of short-term noise increases, such as those from construction, the 10 dBA threshold between "some" and "severe" impact is often replaced with a criterion of 15 dBA. These noise-averaged thresholds can vary when the noise level fluctuates, the noise has an irritating character with considerable high frequency energy, or the noise is accompanied by subsonic vibration. In these cases the impact must be individually estimated.

Adopted community noise standards are key factors in determining significance of noise impacts. Applicable local noise standards typically follow one of three approaches in regulating community noise:

- Threshold L_{dn} (day-night averaged) levels defined as permissible within various land uses that have been classified by sensitivity to noise
- Permissible changes in noise levels relative to measured or estimated ambient baseline levels
- Specific quantitative maximum noise levels defined as permissible for each zoning district in the jurisdiction.

Guidelines, goals or ordinances that specifically address construction noise are particularly relevant to this EIR/S. Some communities specify more stringent standards during nighttime hours (typically after 10 p.m.) or provide special exemptions for some or all types of construction noise during standard weekday work hours.

Impacts from noise would be considered significant if:

- Adopted local standards, noise elements, or ordinances would be exceeded in noise level, timing, or duration

- The Project would increase the ambient noise level above ordinance-specified limits for the land use zoning or by more than 3 dBA in areas already exceeding the limits

- An increase in noise levels of 15 dB or more would occur over a period of at least one-half day at a sensitive receptor at any ambient noise level; permanent increase of 10 dB would also be significant

- Long-term noise would conflict with state or local guidelines for interior noise levels; noise levels would exceed a L_{dn} level of 60 dBA at the nearest noise sensitive receptor (California Office of Noise Control)

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2 Long term noise changes as small as 3 dBA have been reported as noticeable. Rigorous laboratory tests, however, show that such small changes can be detected only as they occur. It is probable in cases with physically undetectable long-term noise level increases that observers see the changes in the environment, and when queried, assume an increased noise level.

- Noise increments to the ambient that are as low as 5 dB would occur during quieter hours at night (between 10 p.m. and 7 a.m.). There is no precise threshold as the character of the noise is also important.

C.9.2.3 Environmental Impacts and Mitigation Measures

Construction Impacts

Construction in the Corridor. Appendix G in Volume III contains a description of construction procedures, noise factors, and noise modeling assumptions. Most sensitive receptors would experience construction noise in the form of engine noise from tracked or wheeled vehicles. How long a given sensitive receptor would be exposed to construction noise at or above a certain level would depend upon the distribution of equipment, the rate of progress in constructing or improving access roads (where required) or installing transmission line structures and stringing wires, the distance of a receptor from the construction zone, the degree of noise masking provided by existing environmental noise, and the character of the intervening terrain. The duration and severity of noise impact at most sensitive receptors near the Proposed Project corridor cannot be known with precision. The only known locations where significant construction noise will be generated are the angle points, new access roads, and seven staging areas, as illustrated on Figures B.2-2a, b, c, d. . Transmission structures would be erected at the mapped angle points. In other cases, the erection of structures would occur at two locations up to 1,500 feet (1,200 feet average) in each direction along the corridor relative to the point in the corridor closest to the sensitive receptor. The impact of noise from construction equipment that string the conductors and shield wires is less certain than that from equipment used to erect structures, as the mobile stringing equipment would string 12 to 20 structures in one day. In many cases, a noise level that was modeled as severe would occur on only one day. Impact could occur on more than one day for sensitive receptors in the quietest environments of about 40 dBA. Some receptors would experience noise at a less than severe level. The significance criteria, along with the ambient noise level and terrain attenuation effect, as listed in Table C.9-1, are used by the noise model to determine which sensitive receptors would experience noise impact.

Installation of transmission line structures would generate noise levels of 60 dBA at a distance of approximately 1,000 feet from the construction zone. The duration and severity of impact would be high when the construction would be close to a sensitive receptor and the ambient noise level would be low. If either factor is missing, the impact diminishes considerably. Many of the sensitive receptors listed in Table C.9-1 are in quiet environments.

Table C.9-4 lists the identified receptors that were found to be susceptible to noise impacts using the methodology described above. The shortest distance between receptor and construction that is consistent with a distribution of structures 1,200 to 1,500 feet apart between angle points, was used to derive the highest feasible noise level.

Table C.9-4 Noise Impact At Sensitive Receptors

Sensitive Receptor[1]	Segment	Mile-post	Approx. Daytime Medium Noise Level at Sensitive Receptor (dBA)	Impact Level	
				Some[2]	Severe[3]
Residence (RES-2)	A	4.6	40	X	
Residence (RES-32)	A	3.9	40	X	
Residences (The Three Sisters Area) (RES-3)	A	7.2	40	X	X
Residence[1] (RES-18)	B	BMP 0.1	40	X	X
Residence[1] (RES-19)	B	BMP 0.1	40	X	X
Arrowhead Golf Course[1] (REC-2)	B	BMP 0.1	40	X	X
Church of Christ[1] (REL-1)	B	BMP 0.2	40	X	X
Residence[1] (RES-20)	B	BMP 0.2	40	X	X
Residence[1] (RES-21)	B	BMP 0.2	40	X	X
Rattlesnake Creek Ranch[1] (RES-22)	B	BMP 0.9	40	X	X
Residences[1] (RES-23)	B	BMP 0.9	40	X	X
Residence[1] (RES-24)	B	BMP 1.7	41	X	X
Residences[1] (RES-25)	B	BMP 2.3	40	X	X
Residences (RES-4)	E	39.6	40	X	X
Residence (RES-5)	E	46.1	48	X	
Residence[1] (RES-26)	F	FMP 2.4	40	X	X
Residence[1] (RES-27)	F	FMP 2.4	40	X	X
Residence[1] (RES-28)	F	FMP 3.8	40	X	X
Residence[1] (RES-29)	F	FMP 3.9	40	X	X
Residence[1] (RES-30)	G	GMP 3.8	40	X	X
Trailer (RES-7)	K	54.8	55	X	
Tule Patch Spring Rest Area (REC-1)	L	71.9	52	X	
Residence (RES-8)	L	74.6	41	X	X
Trailer (RES-9)	L	76.6	52	X	
Residence (RES-10)	L	78.7	44	X	
Residence (RES-33)	L	79.2	40	X	
Residence (RES-11)	L	79.3	50	X	X
Residence (RES-12)	L	80.5	48	X	X
Residence [2] (RES-31)	ESVA	ESMP 9.7	40	X	
Residences (Wendel) (RES-13)	M/O	94-95	40	X	X
Doyle Wildlife Area	O/Q	111-117	40	X	X
Residences (RES-40)	P	PMP 12.5	45	X	X
Residence (RES-41)	P	PMP 13.3	44	X	X
Residence (RES-42)	W	140.1	51	X	
Hallelujah Junction Wildlife Area	WCFG	WMP-2.0	40 plus	X	X
Residence (RES-44)	WCFG	WMP 3.5	58	X	
Residence (RES-34)	X	151.5	45	X	
Residence (RES-35)	X	156.7	51	X	
Residence (RES-36)	X	157.3	50	X	
Residence (Hoge Road)[1] (RES-16)	X	162.0	40	X	
	X[4]	XEMP 1.6	4-	X	X
Residences (RES-45)	X	162.0	40	X	
	X	XEMP 1.6	40	X	X
Residence (Hoge Road)[1] RES-17)	X	162.1	40	X	

Sensitive Receptor[1]	Seg-ment	Mile-post	Approx. Daytime Medium Noise Level at Sensitive Receptor (dBA)	Impact Level	
				Some[2]	Severe[3]
	X[4]	XEMP 1.8	40	X	X
Residences (RES-37	X	163.0	42-44	X	X
North Foothill Apts.(RES-15)	X	163.3	55	X	X
Residences (RES-38)	X	163.8	42-44	X	X

Notes: 1 Sensitive receptors along alternative segments.
2 At least 5 dBA noise level above ambient for up to one day, a Class III impact.
3 At least 15 dBA noise level above ambient for up to one day, a Class II impact.
4 Alternative Segment X-East alignment.

Some sensitive receptors would be subject to noise from helicopters used to deliver towers, poles, or subassemblies to remote sites or to those in biologically sensitive areas (approximately 88 dBA at 250 ft., 70 dBA or less at 2,000 ft., etc.). In almost all cases these locations would be distant from human sensitive receptors. Flyby noise would also occur in transit between these sites and construction staging areas. Helicopter noise would be longer lasting near the seven staging sites when picking up a tower or other assembly. Their locations are shown on Figures B.2-2a through B.2-2d, and in greater detail on Base Maps at the end of Volume I. Only the Ravendale staging area has sensitive receptors were not found in immediate proximity to these staging areas (as also discussed in Section C.8, Land Use). Provided helicopters operate only out of the other six staging sites, no significant noise impact from helicopters was identified **(Class III)**.

Ten sensitive receptors along the Proposed Project route were identified to be potentially subject to severe short-term noise impacts. The short-term significant noise impact for individual receptors can be mitigated to a less than significant level by postponing construction, if scheduled events would conflict with planned construction, or by closing windows facing construction[3]. Twelve additional residences or groups of residences and a roadside park within proximity to the Proposed Project route were identified that would experience some adverse noise impact. While severe short-term noise levels would occur near approximately 10 sensitive receptors during construction, the impact can be reduced to a level that is less than significant by implementing measures N-1 through N-3 **(Class II)**.

One of the sensitive receptors that were determined to be subject to severe short-term noise impacts is identified in the Table as a wildlife area. Wildlife species would be disturbed by noise and other human activities during construction. The affected species and the type of impact is discussed in Section C.3, Biological Resources. Table C.3-14 lists the affected species, their habitats, and avoidance period for each. Noise is one of the factors that would contribute to the impact on wildlife. A total of 12 species are identified. Not all species/habitats are mapped. Mitigation Measures B-13 through B-17 would also reduce significant noise impacts to a non-significant level **(Class II)**.

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3 Sound entering a residence through windows facing away from construction would be highly attenuated.

Construction of Substations. The maximum noise levels generated during construction of substations and the transmission line would be similar. During site preparation and erection of major components on the site, construction noise could be noticed by receptors within approximately 2,000 feet when the ambient noise level was about 50 dBA. The area where noise would be heard and impacts may occur would be larger in locations with very low ambient noise levels. The duration of peak construction activity would, however, occur intermittently over at most a few months. The Alturas Substation northwest of Alturas and the Border Town Substation would be constructed at greater than 2,000 feet from nearest sensitive receptors. Land uses in the immediate vicinity of the Border Town site are commercial/industrial. On the Washoe County, Nevada side there is rural residential zoning along with some industrial and commercial businesses. On the Sierra side there is also agricultural uses. The Alturas Substation site is in rugged terrain near a logging road on U.S. Bureau of Land Management (BLM) managed land north of Highway 299. Construction noise would be less severe in the vicinity of the North Valley Road Substation, as the site is developed, and hilly terrain would partially shield sensitive receptors from construction noise. Noise impact during construction of substations would be adverse, but less than significant (**Class III**).

Mitigation Measures for the Impact of Construction Noise

N-1 Conduct all construction activities involving motorized equipment between the hours of 7 a.m. and 7 p.m. Monday through Saturday, or for a shorter period if so stipulated in the applicable noise ordinance. Incorporate this restriction in all construction plans and scheduling prior to construction. Compliance during planning and construction is to be monitored by the city/county Public Works Department or by a CPUC/BLM-approved construction monitor.

N-2 Maintain proper mufflers on all internal combustion and vehicle engines used in construction to reduce noise to the maximum feasible extent. A CPUC/BLM-approved construction monitor shall see to compliance through periodic checks of the equipment and its operation, or by making use of noise measurements periodically over the complete construction schedule.

N-3 The Applicant/contractor shall provide notice to all sensitive receptors identified as potentially subject to either some or severe noise impact during construction (see Table C.9-4). Notification shall be by mail at least 10 days in advance of the start of construction in the area, with follow up notice by telephone. The announcement shall state where and when construction will be scheduled in the subject's area. It shall further provide advice on reducing noise intrusion, for example, by closing windows facing the planned construction. In addition, the noticing shall also advise the recipient on how to inform the Applicant and/or Lead Agencies, if the scheduled construction activity would conflict with a specific outdoor event. The Applicant's construction, operation, and maintenance plan shall include details regarding the notification of the sensitive receptors described above. The plan shall also include the process by which questions and complaints will be resolved. The Applicant shall document, investigate, evaluate, and attempt to resolve all project related noise complaints. Further, 10 days prior to the start of construction, and for a period of not less than one week, the applicant shall publish a telephone number and contact person in local the newspaper(s) for use by the public to report any severe and undesirable noise conditions associated with project construction. This measure can be combined with Mitigation Measure L-1 (Land Use) when preparing the Mitigation Monitoring Program.

Operational Impacts

Noise from operation of transmission.lines and substations is minimal. Corona noise would be inaudible during dry weather (28 dBA at the corridor edge, approximately 330 ft.), but audible during wet conditions (approximately 50 dBA at 330 ft.). Modeled corona noise levels are tabulated in the Appendix G in Volume III. Corona noise would produce a significant impact if the resulting hum would be at least 10 dBA greater than the ambient level (one of the significant impact criteria in Section C.9.2.2). Corona noise and the resultant level when combined with 40 dBA background noise for power lines are listed in Table G-3 in Appendix G. A significant noise increase could only occur under rainy or near-rainy weather conditions. With the possible exception of RES-18 along alternative alignment B, the residences listed in Sections C.8 and C.9 would not be subject to a significant noise impact during rain, as the listed lowest decibel level of 40 dBA in Table C.9-1 would then apply and the increment over the ambient would not exceed 10 dBA at residences. However, many of the sensitive receptors listed at the lowest median level (40 dBA) and within approximately 1,200 feet of the transmission line corridor would experience a significant noise increase after rain would stop at night (i.e., the noise from rain would cease, while the moisture conditions would still be present, and the ambient noise level would be less than 30 dBA). This could also occur when rain would stop during the day for those receptors within approximately 400 to 600 feet of the transmission line. This particular circumstance however, is not considered a significant, long-term noise impact, because the conditions are infrequent and residents would usually be indoors at that time with windows closed. The impact of corona noise is adverse, but not significant (**Class III**).

As described in Section B.2.4.2 (Maintenance of Patrol Facilities), there would occur two patrols per year along the length of the transmission line: one by vehicle and on foot, and one air patrol by helicopter. Vehicles used for maintenance and for an annual inspection of the ROW would produce occasional noise in very quiet environments. Noise levels that would result from light-duty trucks during inspections and maintenance would be on the order of 70 dBA at 50 feet (62 dBA at 100 ft., etc.). Higher noise levels might occasionally be produced by heavy construction equipment, such as welding equipment or cranes. This would rarely occur, at only a few locations along the transmission line corridor. The probability of a sensitive receptor being present nearby during such activity would be low. The annual flyby inspection would produce noise at a level and duration similar to that from a medivac helicopter (approximately 84 dBA at 250 ft., 72 dBA at 1,000 ft., 66 dBA at 2,000 ft., etc.). This noise is pulsed, as the highest level is produced when the blade 'slaps' the air in the direction of the observer. The noise impacts in all cases would be adverse, but less than significant (Class III). Mitigation measures N-1 and N-2 would apply to repair activities.

C.9.2.4 Cumulative Impacts and Mitigation Measures

Cumulative noise impacts would occur if other construction or repair projects were to occur in immediate proximity and simultaneously with the construction of the Alturas Transmission Line. Refer to Part B, Section B.5, for a listing of known cumulative projects. Possible projects include: the Tuscarora Pipeline Project, the Lassen Municipal Utility District Project, utility repair projects, roadway construction projects, or construction on a property near the transmission line construction zone. Many sections of the Tuscarora Pipeline Project would be constructed in or near the Proposed Project corridor, as shown on the base maps in Volume III. Any of 23 sensitive receptors could be subject to simultaneous construction noise if the two projects were to occur simultaneously at the same locations. The likelihood is very small.

The local noise level would be approximately 3 dBA higher than from either project alone, if the nearby construction project were to produce about the same level of construction noise. If the noise levels from the two sources are dissimilar, the noise increase relative to the louder noise source would be less than 3 dBA. The cumulative impact in either case would be less than significant. Therefore, no cumulative, incremental noise impacts would occur. The Ravendale staging area is planned for use by the Tuscarora Project and is located in a community having residences within 2,000 feet. Therefore, the Proposed Project would extend the duration of noise impacts. Applying measures N-1 through N-3 would reduce the impact to a less than significant level (Class III).

C.9.2.5 Unavoidable Significant Impacts

Significant short-term adverse noise levels could occur near approximately 10 sensitive receptors along the proposed transmission line route, namely, those identified as "severe" for Proposed Project segments in Table C.9-4. The impact on most sensitive receptors would be less than significant through coordination, scheduling of construction to avoid organized outdoor events, or by closing windows, as stipulated in the mitigation measures.

C.9.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

C.9.3.1 Alturas Area Alternative Alignment (Segment B)

Environmental Setting

Alternative Segment B would replace Proposed Segment A and would be located nearer Alturas. The alternative is aligned in a general north-south direction and would rejoin the proposed alignment at Angle

Point AØ6. The alternative mainly crosses BLM and private land, like the proposed alignment it would replace, and is a quiet environment. It also crosses Highway 299, a Southern Pacific Transportation Company ROW, and local roads—all noise sources. Alturas Municipal Airport is 1 mile east of this alternative and 1.6 miles east of Proposed Segment A. The airport produces intermittent noise.

Environmental Impacts and Mitigation Measures

While there is only one sensitive receptor near Proposed Segment A (a group of residences) that would experience severe, short-term levels of noise during construction, there are 10 receptors near Alternative Segment B, as listed in Table C.9-4. Severe construction noise impacts can be mitigated by implementing measures N-1 through N-3 (**Class II**). While some noise would be generated during inspection and maintenance operations, no significant noise impact would occur. Measures N-1 and N-2 could be required if significant repair activities were required near sensitive receptors (**Class II**). Another residence along Segment A would experience some noise impact (**Class III**).

C.9.3.2 Madeline Plains Alternatives (Segments D, F, G, H, I)

Environmental Setting

Alternative Segments D, F, G, H, I would replace Proposed Segment E and would be located near two-lane paved and graveled county roads in the Madeline Plains area, which provide access principally to farm land and undeveloped subdivisions west of U.S. 395. The environment is quiet. There are five sensitive receptors within 2,000 feet of these alternatives (four along Alternative Segment F and one along Alternative Segment G).

Environmental Impacts and Mitigation Measures

All five sensitive receptors along the Alternative Segments D, F, G, H, I would experience severe construction noise impacts. Two sensitive receptors are located along Proposed Segment E, one of which would be exposed to severe noise impact and the other to less than significant noise impact (**Class III**). With the implementation of Mitigation Measures N-1 through N-3, severe noise impact would become non-significant (**Class II**).

C.9.3.3 Ravendale Alternative Alignment (Segments J, I)

Environmental Setting

Alternative Segments J and I would replace Proposed Segment K. There are no sensitive receptors within 2,000 feet of alternatives J and I, while there are two near Segment K. There are two county roads encountered by Alternative Segment J that have low levels of noise generating traffic.

Environmental Impacts and Mitigation Measures

No sensitive receptors would experience noise impacts along these alternatives, while a trailer near Proposed Segment K would experience some noise impact (**Class III**).

C.9.3.4 East Secret Valley Alignment (Segment ESVA)

Environmental Setting

Alternative Segment ESVA would replace Proposed Segment L. While there is one sensitive receptor along this alternative, there are eight sensitive receptors along the portion of Proposed Segment L that would be replaced by the alternative.

Environmental Impacts and Mitigation Measures

The only sensitive receptor near Segment ESVA would experience less than significant noise impact along, as opposed to three sensitive receptors that would experience severe noise impacts and five others that would be exposed to some impact along Proposed Segment L.

C.9.3.5 Wendel Alternative Alignment (Segment M)

Environmental Setting

Alternative Segment M, like Proposed Segment N, is near two county roads. A group of residences are located near Segment M, while none are along Segment N.

Environmental Impacts and Mitigation Measures

The group of residences along Alternative Segment M would experience severe noise impacts that can be mitigated by Mitigation Measures N-1 through N-3 (**Class II**).

C.9.3.6 West Side of Fort Sage Mountains (Segment P)

Environmental Setting

Alternative Segment P replaces Proposed Segment Q and is located near more roads (refer to Table C.12-1 in Traffic). Consequently, average noise levels near Alternative Segment P are a few decibels higher than near Proposed Segment Q. There are two sensitive receptors near the alternative corridor and one along Segment Q.

Environmental Impacts and Mitigation Measures

One residence and a residential group would experience severe noise impacts along Alternative Segment P, while the Doyle Wildlife Area along Proposed Segments O/Q would experience a similar impact (**Class II**).

C.9.3.7 Long Valley Alignments (Segments S, U, Z, and WCFG)

Environmental Setting

There are no sensitive receptors located near Alternative Segments S, U, or Z, but two near Segment WCFG, which would replace Proposed Segment T and parts of Proposed Segment W. One of the sensitive receptors along Segment WCFG is the Hallelujah Junction Wildlife Area. Traffic on U.S. 395 is the major noise source in this area.

Environmental Impacts and Mitigation Measures

The Wildlife area along Segment WCFG would experience severe noise impacts and the residence some noise impact. One residence along Proposed Segment W that would be replaced, would also be exposed to some noise impact.

C.9.3.8 Peavine Peak Alternative Alignment (Segment X-East)

Environmental Setting

Table C.9-4 lists three sensitive receptors that are nearer Alternative Segment X-East than to Segment Y that would be replaced by this alternative.

Environmental Impacts and Mitigation Measures

The three sensitive receptors would experience severe short-term noise levels if the X-East option would be selected whereas the noise impact before mitigation would be non-significant if Proposed Segment Y would be the choice (**Class III**). along Alternative Segment X-East would experience some noise impacts (**Class III**). The impact can be mitigated through implementing measures N-1 through N-3 (**Class II**).

C.9.3.9 Substation Alternatives

Environmental Setting

The Alturas Mill Substation would be located on private land near Angle Point B-6. The environment is quiet, as described for Alternative Segment B, in Section C.9.3.1. The noise environment of the alternative Border Town Substation site is similar to that of the Proposed Project site. The sites are within 2,000 feet of one another. The noise environment is semi-rural, with U.S. 395, Long Valley Road, and railroad tracks being the principal noise sources. The ambient noise level during the day is approximately 50 to 55 dBA. Noise from U.S. 395 is partially shielded by hilly terrain. The sites are surrounded by commercial and industrial zoning. One residence (RES-34) is within 500 feet of the SPPCo property that would be used as the alternative substation site.

Environmental Impacts and Mitigation Measures

Sensitive receptors in the area, with the exception of RES-34, are sufficiently buffered by non-sensitive land uses. No noise impact is expected during construction at other residences. Ambient noise would also partially mask construction noise. Special steps shall need to be taken to mitigate construction noise at residence RES-34, especially during site preparation and erection of structures. The SPPCo property is considerably larger than the area needed for the substation. It is, therefore, feasible to increase the distance between the residence and construction by careful site selection within the property. The judicious application of Mitigation Measure N-3 would reduce noise impact further. Construction activities and the noise that would be produced are not unusual. Therefore, diligent application of Mitigation Measure N-3, etc., can reduce the impact to a less than significant level (**Class II**). Mitigation Measures N-1 through N-3 could be required to mitigate construction and future maintenance/repair noise impacts at other sensitive receptors in the area, as well.

C.9.4 THE NO PROJECT ALTERNATIVE

C.9.4.1 Environmental Impacts and Mitigation Measures

Under the No Project Alternative, the transmission line would not be constructed; therefore, no noise impacts would occur in the study area. The No Project Alternative could result in other construction projects. Augmenting existing Sierra Pacific Power Company transmission facilities or constructing new combustion turbines to compensate for not completing the Proposed Project could impact sensitive receptors near the construction sites. Measures N-1 and N-2 would be applicable to any construction project (**Class II**). Measure N-3 would apply to a transmission line construction project. Construction of an alternative transmission line would inevitably result in noise impacts similar to those from the Proposed Project or alternative alignments. The total number of potentially impacted sensitive receptors could be greater or less than those for the Proposed Project, depending on the routing of the alternative transmission line.

C.9.5 MITIGATION MONITORING PROGRAM

Table C.9-5 presents the Mitigation Monitoring Program recommended for mitigating significant noise impacts and outlines the location, responsible party, required monitoring activities, effectiveness criteria, and timing of each monitoring activity.

Table C.9-5 Mitigation Monitoring Program

Impact	Mitigation Measure	Location	Responsible Agency	Monitoring/Re-porting Action	Effectiveness Criteria	Timing
Impact on sensitive noise receptors (Class II)	N-1 Conduct construction activities between 7 a.m. and 7 p.m (Monday through Saturday), or for a shorter period if so stipulated in the applicable noise ordinance.	All Proposed and Alternative Segments	BLM CPUC County Public Works Depts.	Applicant/ construction contractor shall include the schedule in all construction plans.	Periodic inspections; no complaints received	Develop schedule prior to construction; monitor complaints
	N-2 Maintain proper mufflers on all internal combustion and vehicles engines used in construction to reduce noise to the maximum feasible extent.			Periodic checks of equipment and its operation, or use of noise measurements	Logs of inspections, findings, repairs, and reinspections, showing compliance	Modify equipment prior to construction; inspect during construction
	N-3 Notify by mail sensitive receptors potentially subject to construction noise impact.			Document and review all mailings, calls, and correspondence received. Check against list of expected sensitive receptors.	Periodic check of Applicant's logs, showing effective communication and consideration for the public	Provide 10 day notice prior to receptors that would be impacted by construction activities

C.9.6 REFERENCES

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C.10.1 ENVIRONMENTAL SETTING

C.10.1.1 Introduction

Overhead transmission lines are part of the electric supply system that provides service to homes and businesses. In recent years, interest has grown about what effects may be associated with the electrical environment around electric power lines, in particular, potential health effects of electric and magnetic fields (EMFs) associated with transmission lines. Because these issues are technically complex, this Section was prepared to summarize and explain the factors involved.

This Section describes EMFs, discusses possible effects of these fields, reviews the epidemiological studies completed to date and describes the regulations of field strengths for other states, identifies sources of EMFs in the study area, and summarizes public safety and engineering issues.

C.10.1.2 Electric and Magnetic Fields

C.10.1.2.1 *Electric Fields*

Electric fields are caused by the potential or voltage (electrical pressure) on an object. Any object with an electric charge has a voltage (potential) at its surface, caused by the accumulation of electrons, or their stripping away relative to the normal number comprising the material. The voltage effect is not limited to the surface of an object but exists in the space surrounding the object.

Electric fields can exert a force on other charges at a distance. The change in voltage over distance is known as the electric field. The units describing electric field strength are volts per meter (V/m) or kilovolts per meter (kV/m). This is a measure of the rate of change in electrical potential or voltage over distance expressed in metric units. The electric field is stronger near a charged object and decreases with distance from the object.

Electric fields are a very common phenomenon. They can be near constant static or vary over a period of one second or less. Static electric fields can result from friction generated when taking off a sweater or walking across a carpet. Body voltages have been measured as high as 16,000 volts due to static electric fields generated by walking on a carpet (Chakravarti and Pontrelli, 1976). Also, a normal fair-weather static field occurs around the earth due to the 300,000 to 400,000 volt potential difference between the ionosphere and the earth's surface (Veimeister, 1972; Merrill and McElhinny, 1983). At ground level, the mean value of the field strength is approximately 120 V/m. This means that a six-foot tall person would have a static potential of about 260 volts between the top and bottom of their body.

This normal, fair weather static electric field varies from month to month, reaching a maximum of about 20 percent above normal in January (when the earth is closest to the sun), and falling to about 20 percent below normal by July (when the earth is farthest from the sun). Much stronger static electric potentials can exist beneath storm clouds, where the electric potential (with respect to earth) can reach 10 to 100 million volts. Natural static electric fields under clouds and in dust storms can reach 3 to 10 kV/m (Chakravarti and Pontrelli, 1976).

All household appliances and other devices that operate on electricity create electric fields. However, these fields are different from the earth's static or direct current (DC) field. Fields produced by electrical appliances reverse direction at a rate of 120 times per second (60 Hz [Hertz or cycles per second]) because of the alternating current (AC) used to operate them (Note: in some other countries, this frequency is 50 Hz). The electric field in this case is caused by the changing electrocurrent and voltage in the appliance, and the field decreases rapidly with distance from the device. The field caused by point-source (small-dimension) household appliances generally attenuates more rapidly with distance than line-source fields (such as from power lines). Appliances need not be in operation to create an electric field. Just plugging an appliance into an electrical outlet creates an electric field around it. Typical values measured one foot away from some common appliances are shown in Table C.10-1.

Table C.10-1 Typical Electric Field Values for Appliances, at 12 Inches

Appliance	Electric Field Strength (kV/m)
Electric Blanket	0.25*
Broiler	0.13
Stereo	0.09
Refrigerator	0.06
Iron	0.06
Hand Mixer	0.05
Phonographs	0.04
Coffee Pot	0.03

* 1 to 10 kV/m next to blanket wires (Enertech, 1985)

Transmission Lines

Similar to an appliance, electric transmission lines also have 60 Hz electric fields. These fields result from the combined voltage of the transmission line phase conductors with respect to the ground. Electric field strengths from a transmission line decrease with distance away from the outermost conductor, typically at a rate of approximately one divided by the distance squared ($1/d^2$). As an example, if the electric field strength is 10 kV/m at a distance of one meter away, it will be approximately 2.5 kV/m at 2 meters away, and 0.63 kV/m at 4 meters away. In contrast, the electric field strength from a single conductor typically decreases at a rate of approximately one divided by the distance (1/d). As an example, a field strength of 10 kV/m at 1 meter away, would be approximately 5 kV/m at 2 meters away, and 2.5 kV/m at 4 meters away. Electric field strengths for a transmission line remain nearly constant over time because the voltage of the line is kept within bounds of about ±5% of its rated voltage.

Substations

Electric power substations also create electric fields. The equipment, or components of a substation, act as point-sources of an electric field, similar to appliances in a home. As the distance from these point-sources becomes greater than the physical size of the piece of equipment acting as a source, the field is greatly reduced; this is also true for substation components such as bus work. The electric fields external to a substation decrease at a rate of approximately one divided by the distance cubed ($1/d^3$), unless an overhead power line is nearby. For example, a field of 10 kV/m at one meter away, would be approximately 1.25 kV/m at two meters away, and 0.16 kV/m at four meters away. This contrasts with the line-source characteristics of transmission lines that vary as approximately one divided by the distance squared ($1/d^2$) where the field at two meters would be approximately 2.5 kV/m compared to 1.25 kV/m in a substation.

Substation electric fields outside the fenced area are typically very low because of shielding by metallic substation components themselves, as well as by the metal fencing surrounding the substation. Additional shielding can be provided by nearby shrubbery and trees.

C.10.1.2.2 *Magnetic Fields*

An electric current flowing in a conductor (electric equipment, household appliance, power circuits, etc.) creates a magnetic field. The most commonly used magnetic field intensity unit of measure is the Gauss (for convenience in reporting magnetic field magnitudes, the unit of milligauss [mG] is used, which is one thousandth of a Gauss). As a reference, the earth (as measured in central California) has a natural static direct current (DC) magnetic field of about 0.520 Gauss, or 520 mG (Merrill and McElhinney, 1983). As with electric fields, the magnetic fields from power circuits and appliances differ from static (or DC) fields because they are caused by the flow of 60 Hz alternating currents. Power frequency magnetic fields also reverse direction at a rate of 120 times per second corresponding to the 60 Hz operating frequency of the power systems in the United States.

Since the magnetic field is caused by the flow of an electric current, a device must be operated to create a magnetic field. Magnetic field strengths of a large number of common household appliances were measured by the Illinois Institute of Technology Research (IITR) for the U.S. Navy, and by Enertech Consultants for the Electric Power Research Institute (EPRI) (Gauger, 1985; Silva et al., 1983). Typical field values for these appliances are presented in Table C.10-2 to facilitate a better understanding of magnetic field strength values. The Enertech Consultants study for EPRI also found that mean resultant

Table C.10-2 Magnetic Field From Household Appliances

Appliance	Magnetic Field (mG)	
	12" Distant	Maximum
Electric Range	3 to 30	100 to 1,200
Electric Oven	2 to 25	10 to 50
Garbage Disposal	10 to 20	850 to 1,250
Refrigerator	0.3 to 3	4 to 15
Clothes Washer	2 to 30	10 to 400
Clothes Dryer	1 to 3	3 to 80
Coffee Maker	0.8 to 1	15 to 250
Toaster	0.6 to 8	70 to 150
Crock Pot	0.8 to 1	15 to 80
Iron	1 to 3	90 to 300
Can Opener	35 to 250	10,000 to 20,000
Mixer	6 to 100	500 to 7,000
Blender, Popper, Processor	6 to 20	250 to 1,050
Vacuum Cleaner	20 to 200	2,000 to 8,000
Portable Heater	1 to 40	100 to 1,100
Fans/blowers	0.4 to 40	20 to 300
Hair Dryer	1 to 70	60 to 20,000
Electric Shaver	1 to 100	150 to 15,000
Color TV	9 to 20	150 to 500
Fluorescent Fixture	2 to 40	140 to 2,000
Fluorescent Desk Lamp	6 to 20	400 to 3,500
Circular Saws	10 to 250	2,000 to 10,000
Electric Drill	25 to 35	4,000 to 8,000

(Gauger, 1985)

magnetic field strengths in residential homes are approximately 0.9 mG at about one meter above ground level (Silva, et al., 1983).

Magnetic field strength is affected by the distance from the source of the field, and the configuration of the source conductors. The magnetic field of an appliance decreases rapidly with distance away from the device. The magnetic field also decreases with distance away from line sources, such as transmission lines, but not as rapidly as it does from appliances. Magnetic fields from transmission lines attenuate at a rate of about one divided by the distance squared ($1/d^2$), whereas magnetic fields from appliances attenuate at a rate of about one divided by the distance cubed ($1/d^3$).

Unlike electric fields, which are easily shielded by common conductive objects, magnetic fields cannot easily be shielded. Most materials (such as those that make up buildings, trees, and the ground) do not effectively shield magnetic fields. Certain ferromagnetic materials (i.e., those containing iron, nickel, or cobalt), have properties that, when placed in the proper orientation and location, can shield fields. Eddy currents are induced in highly conductive metal used in conductive shielding and cancel the imposed magnetic field. Ferromagnetic materials shield by concentrating and redirecting magnetic flux within the body of the material.

Transmission Lines

Transmission line magnetic fields are generated by the current flowing along the phase conductors. Similar to the electric field, field strengths decrease with distance away from the line. Unlike static electric fields, the 60 Hz magnetic fields are not constant over time because the current on any power line changes in response to increasing and decreasing electrical load.

Substations

Substation magnetic field attenuation characteristics are similar to electric fields. Because a substation is a collection of electric components that can each be a magnetic field source, a substation complex is often treated as a single point-source for external field measurements. External magnetic fields associated with the substation (e.g. the collection of equipment or components) can be considered separately from the magnetic fields associated with the power lines that serve the substation. The manner in which substation component magnetic fields attenuate with distance is similar to that from appliances, where the field strengths diminish rapidly as the distance from the source grows larger than the dimensions of the source itself (for example, a transformer). Therefore, at distances on the order of 50 feet or more from the substation fence, the external field will have decreased to a much lower level than the level inside the substation.

In contrast to electric fields, the substation magnetic fields are not affected significantly (shielded) by most common objects.

C.10.1.2.3 *Health Effects of Electric and Magnetic Fields*

Overview

A number of studies in the 1960's and early 1970's generally found no conclusive evidence of harmful effects from typical power line and substation EMFs. However, some studies during this period did report the potential for harmful effects. Most of these studies focused on electric fields. More recent reports (since about 1979) have suggested a possible association between occupational and residential exposure to magnetic fields and adverse health effects, including cancer. The evidence for such an association is still inconclusive and contradictory, and studies are underway to obtain more definitive information on this subject.

The following sections are an overview of the reports and studies that have analyzed magnetic fields for potential health impacts. These overviews include the major findings and conclusions reached in the reports and studies.

New York State Power Lines Project

One of the more comprehensive recent programs of research was made up of sixteen studies and two follow-up projects, conducted during the period from 1985 through 1987. These studies, administered by the New York State Power Lines Project, were undertaken "to determine whether there are health hazards associated with EMFs produced by 60 Hz power transmission lines (especially 765 kV lines)". The $5 million research effort was funded by electric utilities that serve the State of New York and supervised by a scientific advisory panel reporting to the New York State Health Department.

Although the New York Power Lines Project considered high voltage lines in general, it had a primary focus on 765 kV lines proposed at the time of the study for construction in up-state New York. Less than 2,500 miles of 765 kV lines are in service today in the United States. This represents less that 1% of all the high voltage lines in this country, compared to 345 kV lines which represent about 15% of the high voltage transmission lines. For this reason the electric field levels used in the laboratory studies conducted in connection with this project were larger than typical fields from 345 kV lines.

The studies generally fall into the broad areas of epidemiology, laboratory animal, and cellular research. None of the studies showed significant adverse effects on reproduction, growth, or development from the laboratory-created fields. The studies also showed no significant evidence of genetic or chromosomal damage that might lead to inherited effects or that might cause cancer. Two of the project's epidemiological studies, however, also examined the effects of lower voltage distribution lines. These two studies evaluated childhood cancer in Denver and adult cancer in Seattle.

The Denver Study

The Denver study evaluated the incidence of cancer among children living in homes near different kinds of electric power lines (mostly distribution lines and a few transmission lines). Measurements were taken inside the home with appliances turned off (low-power condition) and turned on (high-power condition). In addition, wiring configuration codes based on external visual observations were used as a surrogate for likely historic magnetic field exposures over time in the home due to external power lines. The wiring code is an index loosely based on the type, number and diameter of conductors, the distance from house to power line, and the number of nearby service drops. The wire code scheme was originally developed by Dr. Nancy Wertheimer and Mr. Ed Leeper in their seminal work on the relationship between electrical wiring configurations and cancer (Wertheimer and Leeper, 1979 and 1982). The Denver study by Dr. David Savitz was essentially a replication of this earlier work.

The New York Scientific Advisory Panel interpreted the Denver study to show an association between the wiring codes and street addresses of the childhood cancer cases. The New York Panel reported that the study appeared to show an increase in the frequency of childhood cancer in Denver from about 1 in 10,000 children per year to about 1.7 in 10,000. However, the study results were puzzling in several respects. There appeared to be no correlation when high-power condition measurements were used (that is, with many electrical appliances turned on). No clear relationship between the level of exposure and the increased incidence of cancer could be discovered for the low-power conditions (appliances turned off) for which a correlation with childhood cancer was found. The New York Scientific Advisory Panel was also concerned about the study's low interview response rate and possible coincidental factors, such as traffic density, that could also affect the incidence of cancer. Nevertheless, this study was seen as a positive study (confirming the earlier work by Wertheimer and Leeper) and as a cause to conduct more research.

The Seattle Study

The other epidemiological cancer study funded by the New York State Power Lines Project was conducted in the Seattle area. The design of this study shared many features with the Denver study; for example, exposure to magnetic fields was assessed by field measurements and by the same wire coding system. In the Seattle study, the New York Scientific Panel found that "regardless of how exposure was characterized, no relationship with cancer incidence was disclosed" (Wertheimer and Leeper, 1979). In other words, the results of this study were negative—no association between cancer and magnetic field exposure (as estimated by the wire code system was found).

In evaluating the research results, the New York Scientific Advisory Panel cautioned that research has not found any biological mechanisms that could explain the role of magnetic fields in the development of cancer. The Panel also noted that methodological uncertainties exist in quantifying magnetic field exposure levels. The Panel concluded that the findings to-date could not, and should not, be translated into specific recommendations for regulating right of way widths, line heights, or the location of lines near homes.

The Los Angeles Study

A residential epidemiology study funded by the Electric Power Research Institute (EPRI), in an attempt to replicate the Denver Study, was completed in 1990 in Los Angeles, California. The results generally confirm the results of the Denver study (and the earlier Wertheimer-Leeper work). There was an increased risk of cancer associated with certain wire codes, but not for direct field measurements.

Results of this study of childhood leukemia, conducted by Dr. Stephanie London and Dr. John Peters in Los Angeles County, has been published (USC, 1991; EPRI, 1991; London et al., 1991). This study was essentially a replication of the Denver study, but in a different location. The researchers concluded that: "Our data offer no support for a relationship between measured electric field and leukemia risk, little support for the relationship between measured magnetic field exposure and leukemia risk, some support for a relationship between wiring configuration and leukemia risk, and considerable support for a relationship between children's electrical appliance use and leukemia risk". The reason why wiring configuration correlates with leukemia risk better than measured exposure was not clear.

It remains unresolved why a surrogate for magnetic fields, such as wire code, is associated with a positive finding, while direct field measurements are not. This is even more perplexing since this Los Angeles study had the most sophisticated direct measurements of magnetic fields to-date. Possible explanations for these apparently contradictory research findings are:

- Wire configuration coding is a better predictor of historic long-term average magnetic field exposure than 24-hour measurements.
- Wire code categories are a marker for some as-yet-unidentified biologically-effective characteristics of the magnetic field (e.g., transient pulses or intermittent fields).
- Some wire configuration code categories are associated with some confounding factor, or set of factors, in the urban environment that are the true cause of the increased risk, but are unrelated to magnetic fields.
- Relatively subtle biases in subject selection (especially for the controls) have produced a spurious association between wire codes and leukemia risk in the Denver and Los Angeles studies.

Swedish Studies

Two epidemiological studies were released in September, 1992 in Sweden. The first study, "Magnetic Fields and Cancer in People Residing Near Swedish High Voltage Power Lines" was a residential study of children and adults who live within 300 meters of 220 kV and 400 kV transmission lines in Sweden, authored by Dr. Maria Feychting and Dr. Anders Ahlbom (USC, 1991; EPRI, 1991). This residential study evaluated average magnetic field exposure via actual measurements and magnetic field calculations (for both contemporary and historical line loading). The study also included an evaluation based on various distances from the power lines. The study found a statistical association between childhood leukemia and calculated historical fields (the main exposure metric was selected as the annual average of the calculated magnetic field generated by the power line). The study also found an association with distance from the power lines. No association was found with actual magnetic field measurements. For brain tumors, and all childhood cancers together, there was little support for an association. The findings of an association with a surrogate (namely calculated historical magnetic fields), but not with actual field measurements, are consistent with earlier studies in Denver and Los Angeles. Similar results are achieved in this study by using distance from the power line. In this respect, this study is another "wire code" study since a distance criteria is used as the surrogate for magnetic field exposure.

The second study, "Occupational Exposure to Electromagnetic Fields in Relation to Leukemia and Brain Tumors: A Case-Control Study" is an occupational study of adult males authored by Dr. Birgitta Floderus, Dr. Tomas Persson, et al. (London et al., 1991). Based on the job held longest during the 10-year period before diagnosis, a statistical association between a certain subtype of leukemia and estimated magnetic field exposure was observed (no association was found with the leukemia subtype most often discussed in other occupational EMF studies). The exposure assessment details were not sufficiently reported to allow a complete evaluation, but in general, some contemporary magnetic field exposure measurements were used as a surrogate to estimate historical exposure for selected job categories. In the occupational study, the exposure metrics included the mean field exposure value, median, standard deviation and time above 2 milligauss (mG) for exposure categories that included quartiles of exposure intensity in the 90th percentile.

Both Swedish studies reported that they have essentially confirmed earlier residential and occupational study findings, with some exceptions (e.g., in the residential study there were no positive findings for brain tumors). The most interesting features of these new studies is the exposure assessment, which includes contemporary measurements and historical field calculations for the residential study; and job category personal exposure measurements for the occupational study. An important issue for both studies is that if the exposure surrogates prove to be accurate in estimating historical exposure, then this may suggest that future exposure assessment attention should be directed to average magnetic field values. In any event, these studies, added to our overall scientific knowledge, would seem to confirm portions of earlier work, and will direct future research to understand what aspect of wire codes and other surrogates are related to health risks.

Danish Residential Study

Jorgen Olsen and Annelise Nielsen of the Danish Cancer Society, and Gabi Schulgen of Albert Ludwigs University, prepared a study of children living near high voltage transmission lines for the Danish Cancer Registry (Olsen et al., 1993). This study was based on children under 15 years of age who had been diagnosed with leukemia, brain tumors, or malignant lymphoma between 1968 and 1986. The study was a case control study where the magnetic field exposure in the case and control dwellings was likely to be greater than 1 mG based on power line records. The study found no significant increase in risk of developing leukemia, or brain tumors, for field levels greater than 2.5 mG. An elevated risk was found for lymphoma. When the magnetic field was greater than 4 mG, there was an elevated risk for all cancers.

Danish Occupational Study

The Danish Cancer Registry also prepared a report studying the cancer incidence in all Danish workers over a 17-year period. Results were published in the August, 1993 issue of the British Journal of

Industrial Medicine. The study was performed by Pascal Guenel of INSERM, Povl Raskmark and Jorgen Bach Andersen of Aalborg University, and Elsebeth Lynge of the Danish Cancer Society (Guenel et al., 1993).

In this study estimates of magnetic field exposure for each occupation were divided into three categories: none, intermittent, or continuous above 3 mG. The report found a weak, but statistically significant, association with cancer for intermittent exposures to men, and an increased risk of leukemia in men with exposures greater than 3 mG. Similar associations were not observed for women. This study also evaluated, but did not find, association between magnetic field exposure and the incidence of breast cancer, melanoma, and brain and nervous system cancers in men and women.

French-Canadian Study

The French-Canadian Study, published in early 1994, was an epidemiological study to determine the cancer risks associated with occupation exposures to magnetic fields among utility workers. (EPA, 1990) This study compared cancer cases with controls from three electric utilities. Cumulative exposure to magnetic fields for the past and present were estimated from measurements of workers performing job tasks. An elevated risk of cancer was observed for leukemia and astrocytoma with magnetic field exposures above the mean, although the researchers note in their conclusion that:

> Despite the attempts made in this study to achieve adequate power [Note: "adequate power" as used by the study authors refers to statistical power, that is, finding a large number of cases and controls to include in the calculations of risk to achieve statistical significance], definitive evidence of an association between exposure to magnetic fields and leukemia and brain cancer has not been obtained. One of the main hypotheses tested was the association between magnetic fields and acute non-lymphoid leukemia (acute myeloid leukemia) that has been reported in several other studies. Considering that among all the cancers analyzed in our study, this is the one for which a statistically significant association was found, we believe our results speak for an association between occupational exposure to magnetic fields and at least one type of leukemia....

No associations were observed for all cancers combined or for any of the other 29 cancer types studied.

EPA Preliminary Draft Report

The U.S. Environmental Protection Agency prepared a preliminary draft report in 1990 on EMFs that was based on a review of the scientific literature (EPA, 1991). This report has been under review by the EPA Science Advisory Board, and will be rewritten and submitted for further scientific review before it is published.

The preliminary draft report evaluated the likelihood that EMFs pose a risk for the development of cancer in humans. In this preliminary draft report, the EPA concluded that, "with our current understanding, we can identify 60 Hz magnetic fields from power lines, and perhaps other sources in the home, as a possible, but not proven, cause of cancer in people." One problem cited by EPA is a poor understanding of the basic nature of the interaction between magnetic fields and biological processes. The EPA preliminary draft report states:

> For example, a real possibility exists that exposure to higher field strengths is actually less hazardous than exposure to low field strengths. Because of this uncertainty, it is inappropriate to make generalizations about the carcinogenicity of EM fields.

More recently, the EPA has reviewed the research needs for EMFs and has published a report which identifies the major research topics and their relative priorities (EPA, 1991). Exposure assessment research, and research into possible biophysical mechanisms, were listed as two "high priority" areas of future study. Definitive exposure data will be required to judge the validity of the suggested causal link between magnetic field exposure and cancer. A better understanding of possible biophysical mechanisms is needed to quantify which, if any, aspect of magnetic field exposure might be related to adverse health outcomes.

EPA Science Advisory Board

On January 29, 1992, the Non-ionizing EMFs Subcommittee of the Science Advisory Board's Radiation Advisory Committee submitted to the EPA Administrator its report on the EPA's draft report on electric and magnetic fields. In its report, the Science Advisory Board (SAB) Subcommittee concluded that "... there is insufficient information to designate specific values of magnetic-field strength that may be hazardous to human health." The SAB Subcommittee made two specific policy recommendations:

- **Policy Recommendation No. 1.** The Subcommittee is unanimous in its belief that the question of EMF effects on biological systems is important and exceptionally challenging, and that the Subcommittee's advice to the EPA should be that the report be rewritten by the EPA and then reviewed by the Science Advisory Board.

- **Policy Recommendation No. 2.** The EPA should complete its efforts with regard to radio frequency (RF) electromagnetic fields (including microwaves) and issue exposure guidelines independent of present issues pertaining to lower frequencies. The current EPA report inadvertently leads even the careful reader to conclude that the potential carcinogenicity of EMFs of extremely low-frequency (ELF) (i.e., power line) frequencies is the only -- or at least the principal -- subject of concern with regard to non-ionizing fields. Such a conclusion would reinforce the skewed and somewhat sensationalized picture presented to the public in recent years by the news media and government agencies responding to this publicity. The report should therefore declare explicitly that the attention given to non-ionizing EMFs derives, in the first place, from long-standing concern over the hazards of RF (including microwave) radiation. The EPA has expended substantial resources on the study of such radiation over a period dating back to the EPA's inception and the EPA should complete its efforts directed toward the issuance of RF exposure guidelines. RF fields present long-known and well-understood hazards such as temperature elevation in tissue and heat stress resulting from acute exposures against which users and the general public must be warned and protected. Any published exposure guideline should specifically identify the hazards from RF exposure.

Office of Technology Assessment - Background Paper

A fairly comprehensive background paper on the biological effects of EMFs was recently prepared for the U.S. Congress' Office of Technology Assessment (OTA) (CMU, 1989a). This extensive paper discusses the present state-of-knowledge on the health effects of extremely low-frequency (60 Hz) electric and magnetic fields. A small brochure was also prepared that more concisely summarizes the OTA report and various policy options (CMU, 1989b).

The OTA report provides a good overview of the sources and nature of EMF exposure. It points out that we do not yet know what field attribute, or combination of attributes, if any, could produce public health effects. This means that the simple assumption that "more is worse" may not be true. Because of this, simple field strength standards "can not be adequately supported by the science that is now available".

The OTA report also provides a summary of the basic areas for research: cellular experiments, whole animal experiments, exposure assessment, and epidemiological studies. Using the review of the scientific literature, the report states that:

> As recently as a few years ago, scientists were making categorical statements that on the basis of all available evidence there are no health risks from human exposure to power-frequency fields. In our view, the emerging evidence no longer allows one to categorically assert that there are no risks. But it does not provide a basis for asserting that there is a significant risk.
>
> If exposure to fields does turn out to pose a health risk, it is unlikely that high voltage transmission lines will be the only sources of concern. Power-frequency fields are also produced by distribution lines, wall wiring, appliances, and lighting fixtures. These non-transmission sources are much more common than transmission lines and could play a far greater role than transmission lines in any public health problems (CMU, 1989b).

The OTA report and brochure also consider the public policy question of what should be done, given our present knowledge. Three basic approaches suggested are:

1. Conclude that there is not yet enough evidence to warrant any action. Don't make any changes in the way we do things until new research tells us clearly whether there is a risk and, if so, how big it is.

2. Conclude that there is some basis for concern. Adopt a position of "prudent avoidance," which means limiting exposures which can be avoided with small investments of money and effort. Don't do anything drastic or expensive until research provides a clearer picture of whether there is any risk and, if there is, how big it is.

3. Conclude we have a real problem and spend some serious time and money on an aggressive program of limiting field exposures *now*, while recognizing that we may eventually learn that some or all of this effort and money has been wasted, either because it wasn't needed or we spent it the wrong way because we didn't understand the science well enough to spend it effectively (CMU, 1989b).

SEISS Report No.11

In the fall of 1992, the Danish Minster of Health convened an expert group to review the health risks related to non-ionizing radiation. A report by the expert group was published in January of 1994 (DNBH, 1989). The group had three charges:

- Make a comprehensive scientific review and assessment of the exposure of the general population to non-ionizing radiation and of the associated health risks.
- Consider the recommendations and regulations that currently are being used.
- Make a contribution to the basic documentation needed for subsequent political/administrative decision on the need for regulation.

The conclusion section of the report states:

> The opinion of the group is that both the Danish and the Swedish study support the hypothesis of previous studies that children living near high-current plants have an increased frequency of cancer, but the result do not exclude the possibility that the association might be due to chance. If the increased cancer risk is due to 50-Hz magnetic fields, the uncertainty in the assessment of exposures to magnetic fields would result in a decreased association and thus a possible underestimation of the potential risk.
>
> The expert group believes that neither the earlier nor the latest studies offer sufficient documentation to characterize 50-Hz magnetic fields in homes adjacent to high-current electricity supply plants as a cancer-inducing factor among children. The studies described do not, however allow this assumption to be dismissed.
>
> The group, therefore, finds no scientific justification for establishing standards with respect to high-current plants. New research results must be followed closely in the future.

The Committee on Interagency Radiation Research and Policy Coordination

The Oak Ridge Associated Universities established a panel in 1989, at the request of The Committee on Interagency Radiation Research and Policy Coordination, to perform an independent scientific review and evaluate the reported health hazards of exposure to extremely low frequency EMFs. The panel reviewed about 1,000 journal articles published within the last 15 years. The report panel completed their report in June of 1992.

In the conclusions to the report the authors state:

> This review indicates that there is no convincing evidence in the published literature to support the contention that exposures to extremely low-frequency EMFs (ELF-EMF) generated by sources such as household appliances, video display terminals, and local power lines are demonstrable health hazards.

It says later in the report:

> Although exposure to ELF-EMF does not appear to constitute a public health problem, there is evidence that these fields may produce some biological effects, such as changes in the pattern of secretion of the hormone melatonin and enhancement of healing of bone fractures. These findings and those described elsewhere in this report suggest areas of some scientific interest and warrant consideration for further research.

The report concludes with:

> This review does not provide justification for a major expansion of the national research effort to investigate the health effects of ELF-EMF. In the broad scope of research needs in basic science and health research, any health concerns over exposures to ELF-EMF should not receive a high priority.

Maryland EMF Status Report

The Maryland Department of Natural Resources and Public Service Commission of Maryland published a report in January 1994 that reviewed the latest research on the health effects of exposure to power frequency EMFs (MDPPR, 1994). The report reviewed epidemiology, animal tumor, reproductive and developmental, immune system, physiological, neurological and behavioral studies and cell level research. The following is taken from the conclusion section of the report:

- *Epidemiological Studies.* The two major topics of recent epidemiologic research have been childhood leukemia in relation to residential exposure to the EMF fields from outside power lines, and adult leukemia and brain cancer in relation to occupational EMF exposure. The other areas of interest are the effects of EMF on breast cancer and on reproductive outcomes. Five major residential and ten occupation epidemiological studies were reported this year from Denmark, Finland, France, the Netherlands, Norway, Sweden, Taiwan, and the United States. More than half of them reported at least one positive association between EMF and exposure and malignant disease, principally leukemia. Several of these studies attempted to overcome one of the major defects of earlier studies, namely the uncertainty regarding EMF exposure. In the Swedish residential study, historical records of power line load were used in an attempt to better estimate exposures during the critical period of tumor formation, five to fifteen years prior to diagnosis. However, despite this effort, the small number of cases in many of these studies, resulting from the relative rarity of the diseases of concern (childhood and adult leukemia, childhood brain cancer), prevented statistically strong conclusions from being drawn.

  The studies covered in this Status Report (taken singly or together) still do not provide evidence of an association between EMF and health outcomes that is more conclusive than that presented in previous reports. However, the results of several of the better epidemiologic studies are definitely suggestive of some effect and support earlier studies showing similar trends. The major strength of these studies is that they highlight the current limitation of using epidemiology to provide answers in this area.

- *Animal Tumor Studies.* Two major reviews of the EMF literature during the last year concluded that EMF is unlikely to have genotoxic effects and therefore unlikely to act as an initiator of carcinogenesis, although not all combinations of EMF intensity have been evaluated for possible genotoxic activity. However, there is still much uncertainty regarding the ability of EMF to act as a tumor promoter by enhancing the effects of mutagenic chemical or ionizing radiation. The data reported during the past year have been equally as contradictory as in previous years.

- *Reproductive and Developmental Studies.* Except for one report describing a higher incidence of spontaneous abortion for those exposed to ELF magnetic fields above 9 mG, most recent studies do not support earlier reports of an increased incidence of miscarriages among women working with video display terminals. The general conclusion is that job stress is the major factor involved.

- *Immunologic Studies.* It has been suggested that EMFs may interfere with the function of the immune system by some action at the cell membrane. However, it is difficult to come to any firm conclusions regarding the actions of EMFs on the immune system and their potential health implications. This reflects the many different measures of immunity that have been used in various studies, and the very inconsistent results obtained.

- *Physiologic and General Health Studies.* There were a wide variety of possible human health effects cited in this report. In general the health studies were divided into general physiological effects on humans and the effects on circadian rhythms. The report did not reach any conclusions on these health effects.

- *Neurological and Behavioral Studies.* In contrast to the dramatic but poorly documented reports of psychological responses in the early Soviet literature, recent studies represent well-documented human responses to ELF magnetic fields. The Neurological and Behavioral section included studies in Human Neurobehavior, Animal Behavior, and Nerve Growth and Membrane Reactivity. Such responses could possibly have subtle negative effects on human performance.

- *Cell-Level Research.* A wide range of changes has been observed in experiments involving exposure of isolated cells and tissues to EMF in vitro. Although many reports have described alterations in cell morphology, behavior, and biochemical properties which suggest the EMF can modulate the expression (that is the transcription and translation) of various important control genes, including proto-oncogenes, there is no universal agreement on this among different laboratories.

- *Summary of Maryland EMF Status Report.* Research on the potential health effects from exposure to power frequency EMF has expanded considerably over the past year and recently published studies have made important contributions to elucidating the nature of biological effects and to determining the possible implications of EMF exposure for human health. However, the Maryland EMF Status Report concluded that it is still not possible to arrive at definitive conclusions regarding the health effects from EMF exposure, based on the existing body of scientific evidence. There is no definitive indication that EMF exposure does or does not cause adverse health effects.

Long-term Health Effects of Electric and Magnetic Fields

The long-term health effects of EMFs have not been conclusively determined. Epidemiological studies are continuing to be conducted, as are studies into the biological mechanisms that may be causing health effects. Since the existing body of evidence does not conclusively support a link between health effects and magnetic fields, the California Public Utilities Commission (CPUC) recommended that utilities use low cost, or no cost, mitigation measures when constructing new electrical lines.

C.10.1.2.4 *Electric and Magnetic Field Standards*

Currently there are no Federal standards limiting EMFs from transmission lines or substation facilities. However, general transmission line safety standards in California are imposed by the CPUC GO95 (Rules for Overhead Electric Line Construction) and the NESC. These documents do not address concerns about potential health effects of electric and magnetic fields, but deal only with mechanical strength and electrical clearance issues. A few states have enacted some type of electric field standards and two states have a magnetic field standard. These standards were compiled and are summarized in Table C.10-3 (EPA, 1990; CMU, 1989b). The purpose of the standards is to make the field levels from new power lines similar to the field levels from existing lines, or to avoid nuisance effects from the electric fields of the larger transmission lines.

Table C.10-3 State Regulations that Limit Field Strengths on Transmission Line Rights-of-Way

State	Field Limit	
	Electric	Magnetic
Montana	1 kV/m at edge of ROWs in residential areas	
Minnesota	8 kV/m maximum in ROW	
New Jersey	3 kV/m at edge of ROW	
New York	1.6 kV/m at edge of ROW	200 mG at edge of ROW
North Dakota	9 kV/m maximum in ROW	
Oregon	9 kV/m maximum in ROW	
Florida	10 kV/m maximum for 500 kV lines in ROW; 2 kV/m maximum for 500 kV lines at edge of ROW; 8 kV/m maximum for 230 kV and smaller lines in ROW; 3 kV/m maximum for 230 kV and smaller lines at edge of ROW.	200 mG for 500 kV lines at edge of ROW; 250 mG for double circuit 500 kV lines at edge of ROW; and 150 mG for 230 kV and smaller lines at edge of ROW

The International Non-Ionizing Radiation Committee of the International Radiation Protection Association (IRPA) has published "Interim Guidelines on Limits of Exposure to 50/60-Hz Electric and Magnetic Fields" in the January 1990 issue of *Health Physics*. The guidelines were approved by the Committee on May 3, 1989; those guidelines relating to the general public are summarized in Table C.10-4.

Table C.10-4 Interim Guidelines on Limits of Exposure to 50/60 Hz EMFs

IRPA General Public Exposure Characteristics	Electric Field Strength[1] (kV/M)	Magnetic Flux Density[1] (mG)
Up to 24 hours/day	5	1,000
Few hours/day	10	10,000

[1] Note that these levels, particularly the magnetic field levels, are higher than fields in the vicinity of a 345 kV transmission line.

C.10.1.2.5 Sources for Electric and Magnetic Fields in the Study Area

EMFs are present near all types of electrical facilities and appliances. The Alturas Transmission Line Project and all other transmission, distribution, and secondary electrical facilities along the Proposed Project route will have both electric and magnetic fields. These lines will act as sources of magnetic fields, as will the electrical appliance and wiring within the residences close to the routes.

The interaction of EMFs from various sources must be carefully considered when calculating expected field levels near a collection of power lines. Depending on the phase relationship among the conductors of each circuit, and phase angle of the current flows in individual circuits, there may be either a cancellation effect reducing the magnitude of the resultant field compared to the field from a single line, or an additive effect increasing the magnitude of the resultant field. The addition of another power line should not be immediately taken as evidence that field levels will increase. Only a careful study of the situation can reveal the actual field levels.

It is important to note that in general, electric fields from transmission lines are greater at higher voltages than at lower voltages. This is not necessarily true with magnetic fields. Since magnetic fields are a function of current, magnetic fields from low voltage sources can be the same or greater than higher voltage lines.

C.10.1.3 Public Concerns

C.10.1.3.1 *Corona*

One of the more interesting phenomena associated with highly energized devices, including high voltage transmission lines, is corona - a luminous discharge associated with ionization of air next to a source of high voltage. Corona is one physical manifestation of energy loss, and can transform energy into very small amounts of light, sound, radio noise, chemical reaction, and heat. Because power loss is uneconomical on transmission lines, corona has been studied since the early part of this century. Consequently, it is well understood by engineers, and steps to minimize it are one of the major factors in line design. The line designer can control corona with good design practices.

When significant corona activity occurs on transmission lines, it is usually on high-voltage lines of 345 kV and above, and then mostly during rain or snow, or the period of high humidity after rain. The effects are local, and should be considered a possible nuisance, rather than a serious problem or hazard. For example, although radio noise in the AM broadcast band range can be generated by corona discharge, it is usually of such low intensity that it cannot be detected outside of the right-of-way of an effectively-designed 345 kV line. The same is true of television interference and audible noise (Veimeister, 1972; Merrill and McElhinny, 1983; CRC, 1981; Enertech Consultants, 1985).

C.10.1.3.2 *Visible Light*

Corona is a partial electrical discharge and, as such, it produces small clusters of electrical sparks that emanate from the high voltage conductor. These clusters resemble the bristles on a medium-sized artist's paint brush and appear to be about the same size. They manifest a faint, bluish light during the short-lived period of their existence. During heavy rain, many of these clusters of light may be seen at night along the transmission line if the observer looks carefully, and the night is especially dark. Although this light is visible to the careful observer, it is not bright enough to illuminate the landscape.

C.10.1.3.3 *Radio and Television Interference*

Overhead 345 kV transmission lines do not, as a general rule, interfere with normal radio or TV reception. There are two potential sources of interference: corona and gap discharges. As described in the corona section, corona discharges can sometimes generate unwanted electrical activity, including electromagnetic radiation, and may affect AM radios, while gap discharges can affect television, as well as radio, reception. Corona activity is lessened through proper design of the line and is almost never a source of interference.

Due to the large number of operating radios and various frequencies, concern over interference from transmission lines must be considered. The characteristic radio frequency emissions from transmission line corona activity occurs in the frequency range from about 100 kHz (kilo Hertz) to about 2 MHz (mega Hertz). Above 2 MHz, radio interference from transmission lines is usually traceable to broken or loose hardware as explained below (gap discharges). Therefore, radios (such as for operation of navigational aids; instrument landing systems; satellite positioning systems; police, fire, military, commercial, amateur, and citizen band radios; cordless and cellular telephones; and other radio communication systems) which operate above 2 MHz should not experience interference from normal transmission line operations.

In areas of weak television signals, sometimes a ghosting or displaced image may be visible on a TV screen. This is caused by signal reflections from near-by objects such as buildings, hills, or power line structures. These "ghosts" can generally be removed by repositioning the receiving antenna.

Gap discharges are a very different problem. They are caused by electrical discharges between broken or poorly fitting hardware, such as insulators, clamps, or brackets. Hardware is designed and installed to be problem-free, but wind motion, corrosion, gunshot damage, and other factors can sometimes create a gap discharge condition. When this condition develops, intermittent gaps at connection points between hardware items allow small arcs (electrical discharges) to occur. This phenomenon is not limited to transmission lines, and can often be found on distribution lines. The discharges act as small "transmitters" at frequencies that may be received on some radio and TV receivers. Gap discharge sources can be located and repaired by electric utility engineers. The severity of any interference depends upon the strength and quality of the transmitted signal, the quality of the radio or TV set and antenna system, and the distance between the receiver and interference source. It has been shown that radio and TV sets are influenced more by interference sources in the home itself, because of their proximity, than from transmission lines. The large majority of interference complaints are found to be attributable to: poor signal, poor antenna, heating pad, door bell, sewing machine, freezer, ignition systems, aquarium thermostat, appliances, fluorescent lights, etc. (Veimeister, 1972).

C.10.1.3.4 *Induced Currents*

EMFs of a transmission line can cause induced currents in objects (electrostatic induction) near the transmission line. Electrostatic induction occurs when an object within an electric field is insulated from ground. A person or animal coming in contact with the object may experience a spark discharge or brief transient shock similar to the spark experienced when walking across a carpet and touching a doorknob in the winter. A small alternating electric current may also flow through the body as long as the person or animal is in contact with the object. The magnitude of this induced short circuit current is dependent on electric field strength, the size of the object, and how well both the object and the person or animal are insulated from ground. The minimum level of short circuit current that a typical adult man can perceive is approximately one milliampere (mA) and for an adult woman approximately 0.7 mA. The National Electric Safety Code (NESC) requires that transmission lines be designed so that no more than 5 mA of short circuit current will flow through a person's body when contacting an object with large dimensions beneath a transmission line. This is based on experimental data that shows at what level of current flow through the body an adult can voluntarily let go of an energized conductor they have grasped. This level is then extrapolated from adults to children based on body weight with a margin of safety and results in the standard 5 mA value.

Induced currents from magnetic fields occur when conducting objects are parallel to transmission lines. Typical objects that might have an induced current from a transmission line are fences, pipelines, and wires. The magnetic flux from the transmission line induces voltages or currents in the parallel object. Current in the parallel object causes a voltage to develop between the object and the ground. The amount of voltage that develops is a function of the length of the parallel object, the current in the power line, the geometric relationship of the line and the parallel object, and the earth resistivity.

C.10.1.3.5 *Shock Hazards on Joint-Use Corridors*

In joint-use corridors where both pipelines and AC power transmission lines are present, the magnetic field produced by currents flowing in the transmission lines induces AC voltages throughout the length of the pipeline. During a line-to-ground fault on any of the transmission lines phases, energization of the earth by line supporting structures near the fault can result in large voltages appearing locally between the earth and the steel wall of any nearby pipeline. This usually requires some form of mitigation to reduce the voltages to acceptable levels for the protection of personnel, and of the pipeline itself.

Under normal load conditions on the power line, only inductive currents are present. The most common manifestation of this interference is encountered by field personnel who report slight shocks at valve stations, anode test stations or other exposed appurtenances. When the pipeline is uncovered for maintenance, workers may also encounter shocks when handling the pipeline. Induced potentials on unprotected pipelines can reach hundreds of volts at locations where the conductors/phases are switched (line transposition), or at locations where the pipeline and power line veer away from each other or cross each other. This is especially true when the pipeline coating has high electrical resistance, which is desirable from a cathodic protection point of view.

During single line-to-ground faults on the transmission line, the AC interference on the pipeline consists of both an *inductive* and a *conductive* component that are typically additive. Under fault conditions, induced potentials in an unprotected pipeline can reach thousands of volts. This results from the high magnitude current flow in the faulted power line phase. In addition, the faulted structure injects a high magnitude current into the earth and therefore raises soil potentials near the structure. If a pipeline is located near a structure where a ground fault has occurred, the earth near the pipeline will be at a high potential with respect to the pipeline potential, which will typically remain low, especially if the pipeline coating has high resistance. This is known as *conductive interference*. The difference of potential between the pipeline metal and the earth surface above the pipeline is the touch voltage to which a person would be subjected when standing near the pipeline and touching an exposed metallic appurtenance of the pipeline. This represents a safety hazard at exposed pipeline appurtenances. Another possible consequence is damage to the pipeline coating that could result in accelerated corrosion of the pipeline. In extreme cases, damage or even a puncture to the pipeline wall may occur.

The magnitude of the conductive interference is primarily a function of the following factors:

- Grounding resistance of the transmission line structure
- Separation distance between the pipeline and transmission line
- Size of the structure grounding system
- Soil structure along the length of the pipeline paralleling the transmission line
- Pipeline coating resistance.

If a pipeline is perpendicular to the power line, then no induction will occur and the conductive component will make up the entirety of the touch voltages and coating stress voltages appearing on the pipeline. If the pipeline is not perpendicular to the power line, then an induced potential peak and a conductive component will appear in the pipeline near the fault location. The composite effects of the inductive and conductive components must be considered in mitigation designs since they reinforce each other in terms of coating stress voltages and touch voltages.

C.10.1.3.6 *Cardiac Pacemakers*

An area of concern related to electric fields of 345 kV lines (and larger) has been the possibility of interference with cardiac pacemakers. There are two general types of pacemakers: asynchronous and synchronous. The asynchronous pacemaker pulses at a predetermined rate. It is practically immune to interference because it has no sensing circuitry and is not exceptionally complex. The synchronous pacemaker, however, pulses only when its sensing circuitry determines that pacing is necessary. Interference from the transmission line electric field may cause a spurious signal on the pacemaker's sensing circuitry. However, when these pacemakers detect a spurious signal, such as a 60 Hz signal, they are programmed to revert to an asynchronous or fixed pacing mode of operation, returning to synchronous operation within a specified time after the signal is no longer detected. Cardiovascular specialists do not consider prolonged asynchronous pacing a problem. As mentioned before, some pacemakers are designed to operate that way. Periods of operation in this mode are commonly induced by cardiologists to check pacemaker performance. So, while the transmission line electric field may interfere with the normal operation of some of the older model pacemakers, the result of the interference is generally not harmful, and is of short duration (EPRI, 1985 and 1979).

C.10.1.3.7 *Lightning*

Lightning has a tendency to strike tall conducting objects. Any tall conducting object like a tree or a transmission line structure will have an increased probability of sustaining a lightning strike. On a transmission line the phase conductors are protected from lightning strikes by a shield wire that is installed above the phase conductors. The shield wire works similar to a lightning rod; when lightning strikes the shield wire the electricity is conducted to the ground through the tower. In the unlikely scenario where someone is leaning against a tower during a lightning storm, it is possible that person could receive a fatal shock.

C.10.1.3.8 *Effects on Crops and Livestock*

High voltage transmission lines traverse thousands of miles of farm land where food-animal and crop production is commonplace under and near these lines. Questions concerning the biological effects of EMFs on crops and animals must be considered. There have been several hundred studies conducted and scientific papers published concerning the biological effects of EMFs on laboratory and farm animals and food crops.

In animals, measurements of biological effects include such things as growth, estrus, breeding efficiency, fetal effects, milk production, litter size, chemical, blood, and enzyme effects. The results from all these studies strongly support the conclusion that EMFs found under normally operating high voltage lines do not produce adverse effects in farm animals. Similarly, studies have been made of the effects of EMFs on crop production and yields. No adverse effects have been noted.

Apart from EMF effects, transmission line structures or support structures do occupy space on the land and will have a small effect on the amount of land within the right of way that can be used for production. In cultivated areas, the existing crop patterns may have to be changed to accommodate the location of the structures.

C.10.1.4 Public Safety Hazards

The major concern for public safety around transmission lines is the shock hazard. Concerns of lesser importance include fuel ignition and fire hazards.

C.10.1.4.1 *Shock Hazard*

All electrical facilities, including transmission lines, pose a risk of injury to the general public due to the hazard of electric shocks. Shocks can occur when objects or people come in close proximity to energized transmission lines conductors. Direct contact with a conductor is not necessary to get a shock, especially at transmission line voltages. When grounded objects come close to energized conductors, the electricity can "jump" from the conductor to a grounded object. However, the Alturas Transmission Line Project is being designed in accordance with CPUC GO95 (California Section) and the NESC (Nevada Section) guidelines for safe ground clearances designed to protect the public from this hazard.

It is also possible for induced voltages on conducting objects close to transmission lines to pose a shock hazard. Voltages can develop on metallic objects such as a fence or pipeline if they are insulated from electrical ground. This potential hazard can be eliminated by proper grounding of metallic objects near transmission lines.

Finally, there is the extremely remote possibility of getting shocked from a lightning strike on the shield wire of a transmission line. For this to occur a person would have to be touching a tower during a lightning storm at the exact instant lightning struck the line. In the area along the Proposed Project route, there are approximately ten thunderstorm days per year. This is in contrast to most of the continental United States where thunderstorm days are in excess of 50 days per year, and are in excess of 100 days per year in Florida. Because of the low thunderstorm activity in the area, the Proposed Project poses far less of a safety risk from lightning strikes than similar lines in other parts of the country.

C.10.1.4.2 *Fuel Ignition*

It is theoretically possible that, if a number of conditions exist simultaneously, a spark induced by the electric field from a transmission line could ignite gasoline vapors. The conditions that must exist are as follows: (1) a large gasoline powered vehicle would have to be parked in an electric field of 4-5 kV/m or greater; (2) a person would have to be refueling it while standing on damp earth and the vehicle is on dry asphalt or gravel with good insulating tires; (3) the fuel vapors and air would have to mix in an optimum proportion, and (4) the pouring spout would have to be metallic. The chances of having all these conditions necessary for fuel ignition to occur at the same time is extremely remote. There are no known cases of transmission line electric fields inducing spark ignition of gasoline in non-contrived situations. Despite the extremely low probability of fuel ignition, caution should be used when refueling vehicles near or under high voltage transmission lines.

C.10.1.4.3 *Fire Hazard*

Transmission lines may pose a threat of fire when a conducting object comes in close proximity to the transmission line, or when a live phase conductor falls to the ground. It is typical practice for the constructing utility to clear tall objects, such as trees, from the right of way during construction, and to continue to clear such hazards over time.

Phase conductors may cause a fire if they fall to the ground and create an electrical arc that can ignite combustible material; however, this is a very unlikely event. The mechanical and structural design, selection of materials, and construction of transmission lines, takes into account normal, and unusual, structural loads such as ice and wind, that could cause the phase conductors to break. If, for some reason, the phase conductor does break, high-speed relay equipment sense that condition and actuate circuit breakers to de-energize the line in about one tenth of a second. This procedure has proven to be a reliable safety measure, and reduces the risk of fire from high voltage transmission lines to an extremely low level.

C.10.1.4.4 *Hazardous Materials*

Bureau of Land Management (BLM) Instruction Memorandum (IM) No. 94-253 regulates the use of hazardous materials on rights of way on BLM-administered public lands. A hazardous substance is any substance that the Environmental Protection Agency (EPA) has designated as hazardous, dangerous, or toxic under the Clean Air Act, 42 U.S.C. 7401 et seq., the Clean Water Act, 33 U.S.C. 1251 et seq., or the Toxic Substances Control Act, 15 U.S.C. 2601 et seq., as well as any hazardous waste under the Resource Conservation and Recovery Act (RCRA) of 1976.

IM No. 94-253 requires that a right-of-way (ROW) applicant disclose any use, production, transportation, or storage of a hazardous substance on or within the ROW or any of the ROW facilities, or in the construction, operation, maintenance, or termination of the ROW or any of its facilities. Applicants are to provide the necessary information in Item 19 of Standard Form 299 (SF 299).

ROW applicants are to describe in detail the use, production, transportation, or storage of any hazardous materials and how spills, releases, fires, and other contingencies involving hazardous materials on the ROW will be handled by the applicant. When an environmentally preferable and economically feasible alternative to the use of hazardous materials cannot be found, the ROW applicant will be required to take all measures needed to protect the public health and safety and the environment. This requirement includes compliance with all existing and future applicable Federal, State, and local laws and regulations.

C.10.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

C.10.2.1 Introduction

In this Section, the environmental impacts of the EMFs from the proposed Alturas Transmission Line Project are investigated. The anticipated levels of EMFs are reported and the impacts and mitigation measures of the field levels are discussed. Calculated values are compared with other projects and literature to determine the level of impact the Proposed Project would have on the environment. In addition, this section addresses other public concerns associated with transmission line operation, including: corona, air ions, induced currents, shock hazards on joint-use corridors, cardiac pacemakers, lightning, and public safety hazards (shock, fuel ignition, and fire hazards).

C.10.2.2 Definition and Use of Significance Criteria

C.10.2.2.1 *Electric and Magnetic Fields (EMFs)*

This Section defines the standards used to determine the significance of EMF impacts resulting from the Proposed Project.

As discussed in Section C.1 0.1, there are no Federal or State standards limiting human exposure to EMFs from transmission lines or substation facilities in California and Nevada. While a few states have enacted some type of electric field standards and two states have a magnetic field standard, the purpose of the standards is to make the field level from new power lines similar to the field levels from existing lines, or to avoid nuisance effects from the electric fields of the larger transmission lines (see Table C.10-3). In addition, the International Non-Ionizing Radiation Committee of the International Radiation Protection Association (IRPA) has published "Interim Guidelines on Limits of Exposure to 50/60-Hz Electric and Magnetic Fields" in the January 1990 issue of *Health Physics* (see Table C.10-4).

No Federal, State, or International standards have been established for crop and livestock exposure to EMFs.

C.10.2.2.2 *Other Public Concerns*

Corona

Corona is a physical manifestation of energy loss resulting in very small amounts of light, noise, and radio and television interference.

- *Visible Light.* There are no standards for visible light from transmission lines.
- *Audible Noise.* The U.S. Environmental Protection Agency (EPA) has an outdoor activity noise guideline of 55 dBA. This value represents the sound energy averaged over a 24-hour period; it has a 10 dBA nighttime weighting (between 10:00 PM and 7:00 AM) (EPRI, 1982). The impact of corona noise is assessed in Section C.9.2.
- *Radio and Television Interference.* In the United States there are no local or federal regulations that regulate the radio and television interference from transmission lines. The Federal Communication Commission (FCC) places transmission lines in the category of an incidental radiation device which is defined as: "... a device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy." The FCC requires that the "device be operated so that the radio frequency energy that is emitted does not cause ... any emission, radiation or induction which endangers the function of a radio navigation service or of other safety services, or seriously degrades, obstructs, or repeatedly interrupts a radio communication service ..." (FCC, 1975).

Induced Currents and Shock Hazards on Joint Use Corridors

The NESC requires that transmission lines be designed so that no more than 5 mA of short circuit will flow through a person's body when contacting an object beneath a transmission line.

Cardiac Pacemakers

It has been reported that synchronous pacemakers can be affected by electric fields between 2 kV/m and 9 kV/m (EPRI, 1985; 1979). When a synchronous pacemaker is in a field in this range, a few older model pacemakers may revert to an asynchronous mode.

Lightning

CPUC GO95 and the NESC provide guidelines for practical safeguarding of persons during the installation, operation, or maintenance of overhead supply lines and their associated equipment.

C.10.2.2.3 *Public Safety Hazards*

Shock

CPUC GO95 and the NESC address shock hazards to the public by providing guidelines for practical safeguarding of persons during the installation, operation, or maintenance of overhead supply lines and their associated equipment.

Fuel Ignition

There are no regulations pertaining to fuel ignition near transmission lines. Under the unlikely chance the following conditions are met, fuel ignition could occur: a large gasoline powered vehicle would have to be parked in an electric field of 4-5 kV/m or greater, a person would have to be refueling it while standing on damp earth and the vehicle is on dry asphalt or gravel, the fuel vapors and air would have to mix in an optimum proportion, and the pouring spout would have to be metallic.

Fire Hazard

The significance of a fire hazard impact is based on the severity of the potential impact and the frequency of impact occurrence. A significant fire hazard impact would be characterized as having the potential for minor to severe public risk (property damage or loss, injury, or fatality) with a frequency of occurrence ranging from unlikely (an event which is not expected to occur during the project lifetime) to frequent (an event which would occur more than once a year on average).

Hazardous Materials

The use of hazardous materials within a ROW is considered significant if the hazardous materials are treated or disposed of as defined under RCRA.

C.10.2.3 Environmental Impacts and Mitigation Measures

C.10.2.3.1 *Electric and Magnetic Fields (EMFs)*

EMFs would not be present during the majority of construction of the Proposed Project, since the lines would not be energized during construction. When the line is energized, there would be some long-term impacts to the surrounding environment due to EMFs. These impacts are calculated and described in the following sections.

Calculation Assumptions

Line design details used for the EMF calculations for the Proposed Project were supplied by the Applicant. Two structure designs are proposed for the 345 kV section of the Alturas Transmission Line Project: a single-pole, steel structure with conductors arranged vertically, and a two-pole, steel, H-Frame structure with the conductors arranged horizontally. Configuration 1 (the vertical construction) and Configuration 2 (the H-Frame construction) are shown in Figure C.10-1.

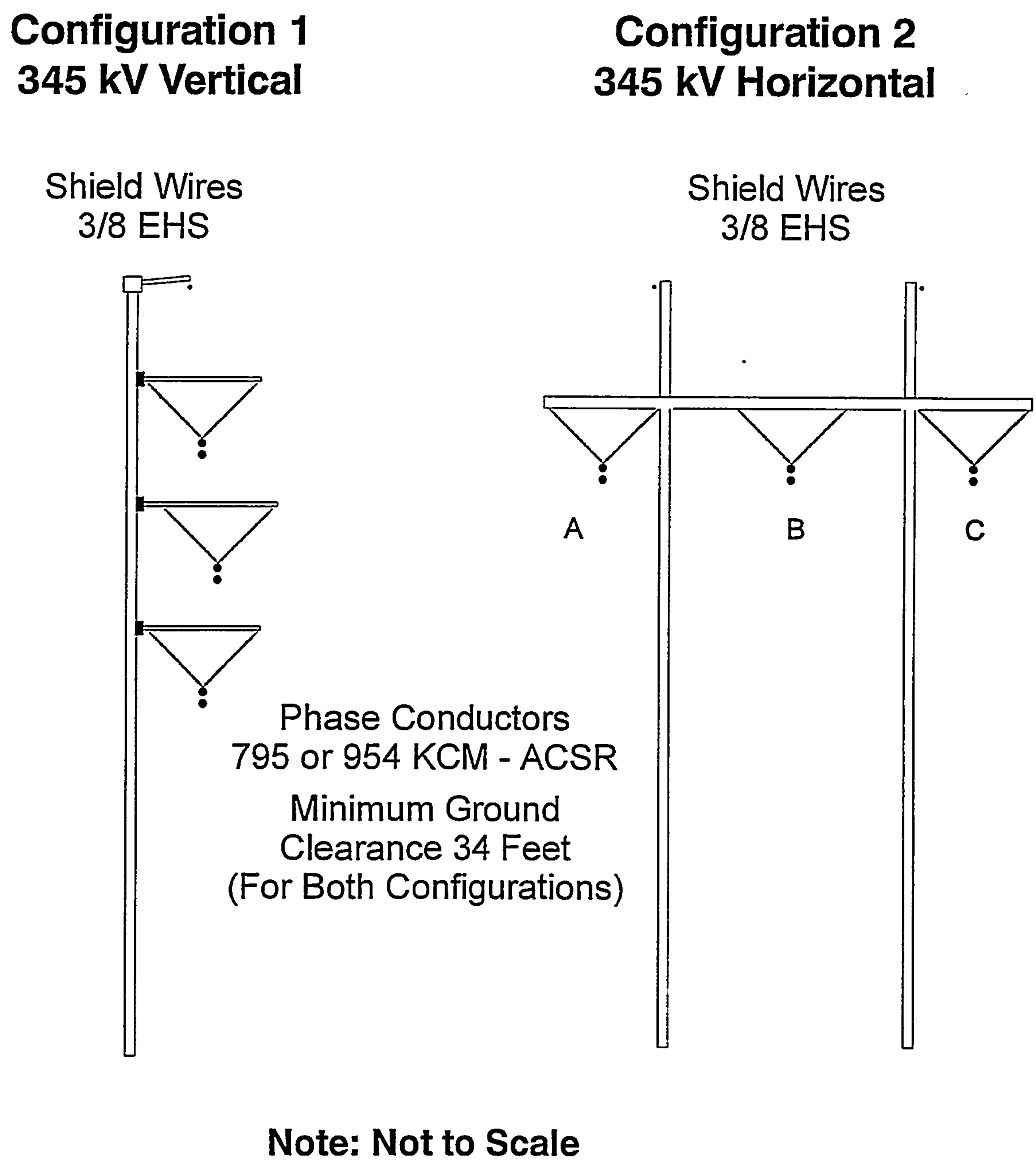
The 230 kV section of this project also has two proposed configurations: a single-pole, steel structure with conductors arranged vertically, and a two-pole, wooden, H-Frame structure with the conductors arranged horizontally. Both of these configurations have two circuits. Configuration 3 (the 230 kV vertical construction) and Configuration 4 (the 230-kV H-frame construction proposed for Route Segment A) are shown in Figure C.10-2.

The 345 kV and 230 kV electrical conductors would be in a vertical bundle (two subconductors per phase) spaced 18 inches apart. Two conductor sizes were studied: 795 and 954 KCM-ACSR (thousands of circular mils, aluminum conductor steel reinforced). Shield wires would be installed at the top of the poles. It is also assumed that the line would be built at a 34-foot minimum ground clearance.

In modern electrical systems, power is generated by three-phase generators. Each phase is connected to one conductor of the transmission line and called "Phase A," "Phase B," or "Phase C." This designation is followed through the entire system from generator to end-use device. Because the system operates with all generators in synchronism, currents in Phase A are displaced in time from currents in Phases B and C. By convention, SPPCo has designated Phase A equal to 0 degrees, Phase B equal to 240 degrees, and Phase C equal to 120 degrees. These values are essential to the calculations and are part of the assumptions made here, but they have no significance to anyone observing the transmission line.

To perform the calculations for the 345 kV H-frame construction, ABC phasing from east to west was used; for the vertical construction, ABC phasing top to bottom was used. A like phasing arrangement (ABC on the top or east circuit and ABC on the bottom or west circuit) was used for the 230-kV vertical line and H-frame construction.

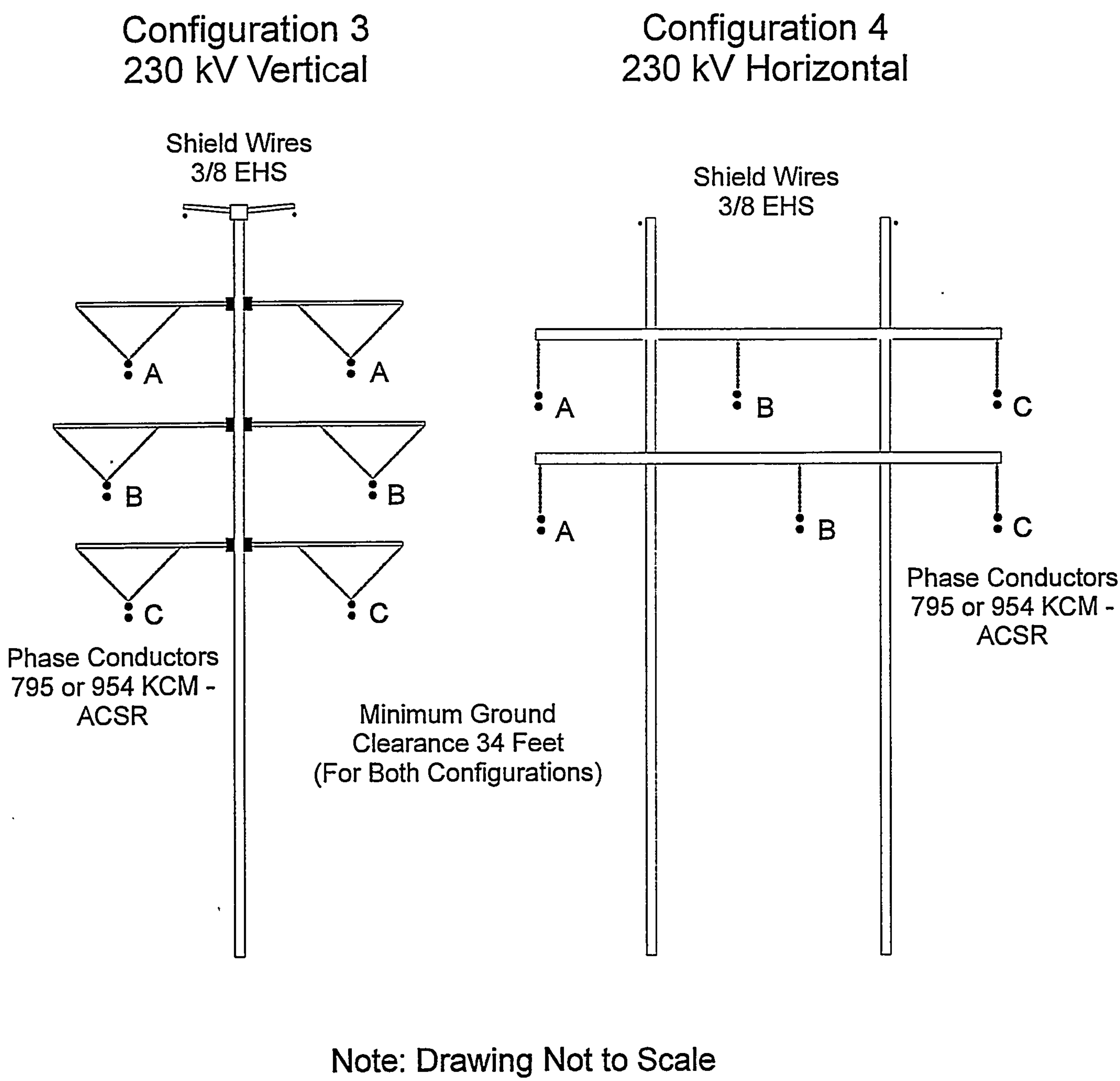
The right-of-way for the proposed 345 kV H-frame and angle point structures is generally 160 feet wide (the 345 kV single pole right-of-way- is 140 feet wide from Angle Point X13 to the North Valley Road Substation; the 230 kV H-frame right-of-way from the PPA interconneciton to the Alturas Substation is 125 feet wide). The H-Frame and vertical structures are placed in the right-of-way center. The Proposed Project would be designed to comply with the CPUC GO95 and the NESC.



ALTURAS TRANSMISSION LINE EIR/S

Figure C.10-1

345 kV Configurations



ALTURAS TRANSMISSION LINE EIR/S

Figure C.10-2

230 kV Configurations

The computer programs "ENVIRO" and "EFIELD" were used to perform the field calculations. These programs assume that the terrain is flat. Ground clearances and span lengths vary throughout the length of each of the transmission line segments due to the irregular terrain. Since these elevation variations are present, the minimum conductor ground clearance of 34 feet was assumed.

Angle structures were not specifically modeled in the calculations for the following reasons: magnetic fields values in most cases will not be significantly greater than the values calculated for other Alturas Transmission Line Project structures modeled (this is because the strongest fields usually occur away from the angle structure near the mid span of the transmission line), and angle structures make up a small percentage of the line.

Weather data was taken from REA Bulletin 1724E-200 to calculate corona, radio and television interference and ozone concentrations for the Proposed Alturas Transmission Line configurations (REA, 1992). In some cases, these assumptions were made to generate a reasonable worst case scenario for field calculation purposes. The assumptions were worst case, because the calculations were performed at the line locations with the highest fields. These assumptions included: voltages 5% greater than nominal; all minimum ground clearances and span lengths occur simultaneously for each configuration; and currents were balanced and had a phasing of A = 0 degrees, B = 240 degrees, and C = 120 degrees. It is important in these calculations to properly and consistently designate the phase relationship of the conductors.

Conditions differing from these assumptions could result in different calculated values.

Calculated Transmission Line Electric Fields

The electric field values were calculated for the 345 kV and 230 kV configurations with both 795 and 954 ACSR conductors (see Figures C.10-1 and C.10-2). Lateral profiles were calculated for the electric field (a lateral profile is a plot of the calculated maximum field as a function of distance away from the ROW center). All electric field calculations were made at 5% over voltage, assuming 34-foot minimum ground clearance at midspan.

Electric field graphs showing lateral profiles of the field extending away from both sides of the midspan for the 345 kV H-frame, and the single-pole configuration, are shown in Figures C.10-3 and C.10-4. Electric field lateral profiles were also calculated for both the 230 kV H-frame and vertical transmission line configurations and are shown in Figures C.10-5 and C.10-6. Graphs shown are only for the 954 ACSR conductor size only, since the 795 ACSR conductors did not significantly change the electric field. The electric fields for the ROW edge and the maximum fields on the ROW for 795 and 954 ACSR conductors are shown in Table C.10-5 (measured in kilovolts per meter [kV/m]). The maximum electric fields reported in the lateral profiles occur in a relatively small portion of the ROW, near midspan where the conductors sag closest to the ground. The electric field values at the ROW edge are less than typical 345 kV transmission lines, but are greater than the electric fields from typical distribution lines and appliances.

Table C.10-5 Electric Field Values for Alturas Transmission Line Configurations

Configuration	795 ACSR		954 ACSR	
	Maximum kV/m on ROW	Maximum kV/m at the Edge of ROW	Maximum kV/m on ROW	Maximum kV/m at the Edge of ROW
345 kV Vertical	5.03	.15[1] (0.31)[2]	5.08	.16[1] (0.32)[2]
345 kV H-Frame[1]	4.50	1.18	4.54	1.18
230 kV H-Frame (Double Circuit)[3]	4.80	2.39	4.83	2.40

[1] 160 foot right-of-way
[2] 140 foot right-of-way from Angle Poing X13 to North Valley Road Substation
[3] 125 foot right-of-way from BPA interconnection to Alturas Substation.

Calculated Transmission Line Magnetic Fields

The magnetic fields were calculated for all proposed configurations, for both normal and peak loading conditions (see Figures C.10-1 and C.10-2). The current values (amperes) used in the magnetic field calculations for the 230 and 345 kV normal and peak loading conditions are shown in Table C.10-6. Results of the calculations are presented as lateral profiles of the magnetic field on both sides of the line in Figures C.10-7 through C.10-10. The calculations are for midspan with an assumed minimum ground clearance of 34 feet. All values reported are the maximum magnetic field (semi-major axis of the field ellipse). The magnetic field values at the edge of the ROW are similar to the values found beneath distribution lines and close to some appliances (see Table C.10- 2).

Table C.10-6 Current Values for Magnetic Field Calculations

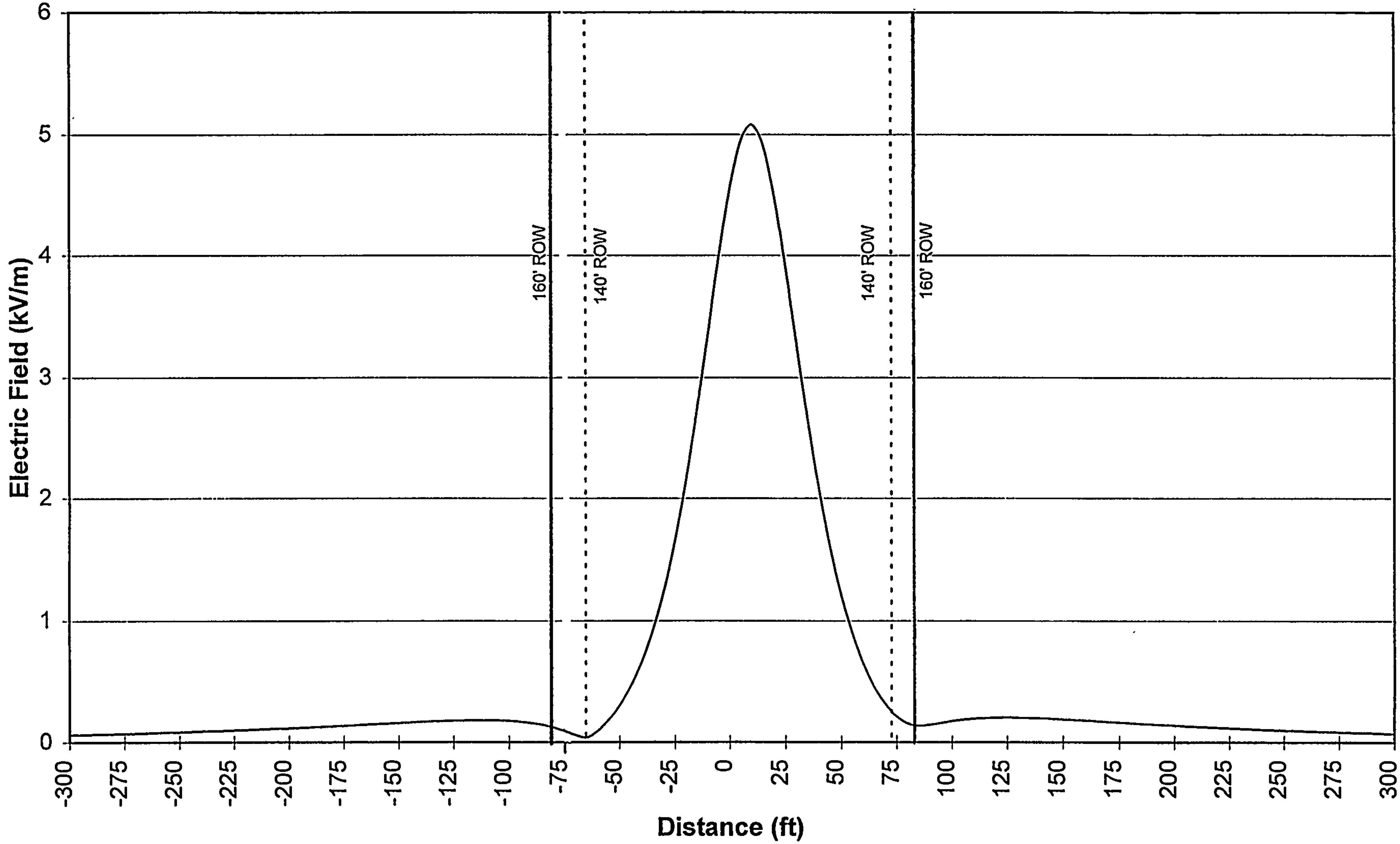
Loading Condition	345 kV	230 kV	
	Single Circuit (amperes)	Circuit 1 (amperes)	Circuit 2 (amperes)
Normal	300	450	0
Peak	500	710	45

For those configurations shown in Figures C.10-1 and C.10-2, Table C.10-7 shows the maximum magnetic field values within the ROW, and at the edge of the ROW, for normal and peak loading conditions. The results are measured in units of Milligauss (mG).

Table C.10-7 Magnetic Field Values for Alturas Transmission Line Configurations

Configuration	Normal Load		Peak Load	
	Maximum mG on ROW	Maximum mG at edge of ROW	Maximum mG on ROW	Maximum mG at edge of ROW
345 kV Vertical	33	10[1] (12)[2]	54	17[1] (20)[2]
345 kV H-Frame[1]	52	10	86	17
230 kV H-Frame[3]	38	19	77	36

[1] 160 foot right-of-way
[2] 140 foot right-of-way from Angle Poing X13 to North Valley Road Substation
[3] 125 foot right-of-way from BPA interconnection to Alturas Substation.



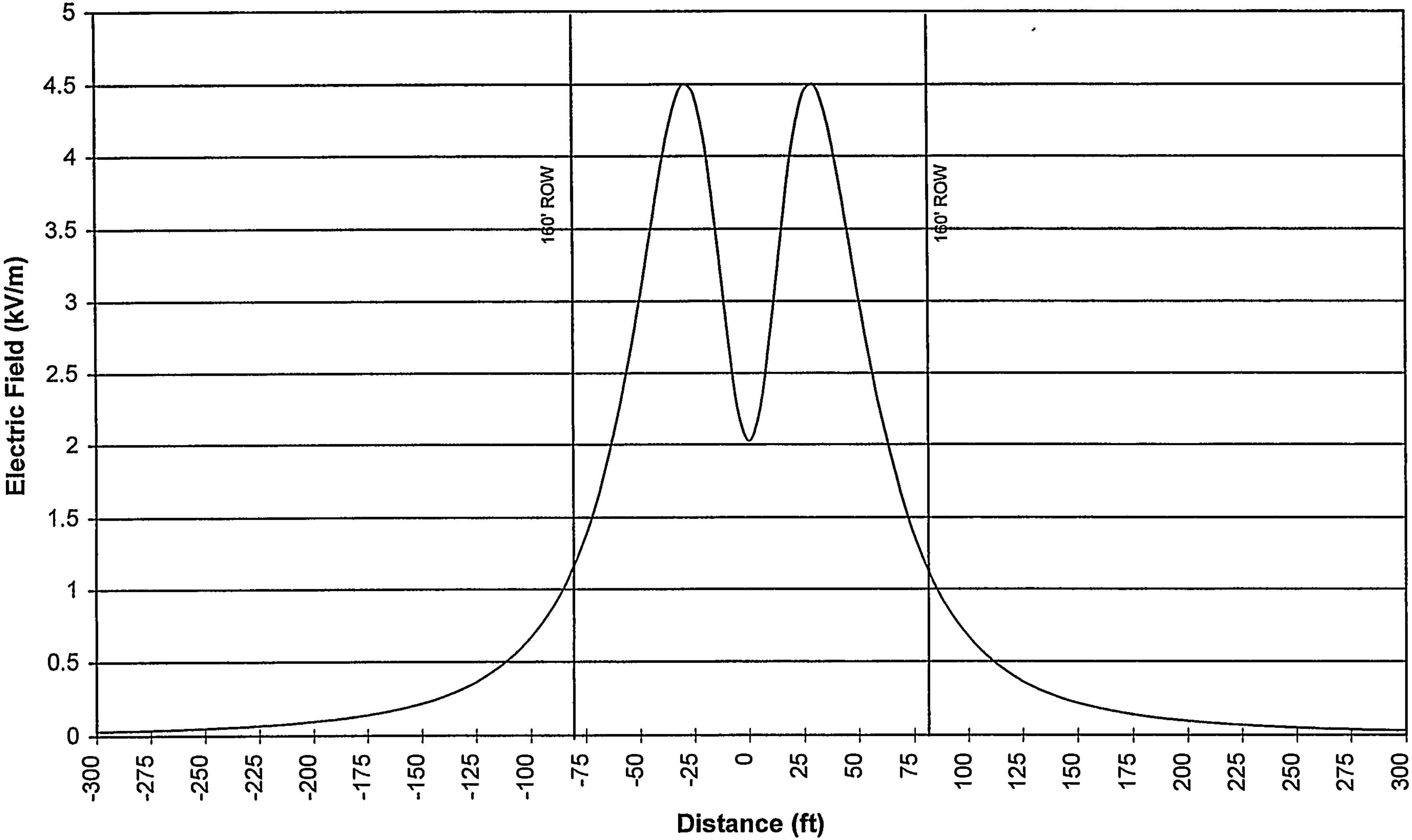
ALTURAS TRANSMISSION LINE EIR/S

Figure C.10-3

345 kV Vertical Configuration

Calculated Electric Field Lateral Profile

Note: Single pole section from angle pt. X13 to North Valley Road Substation, 140 ROW.

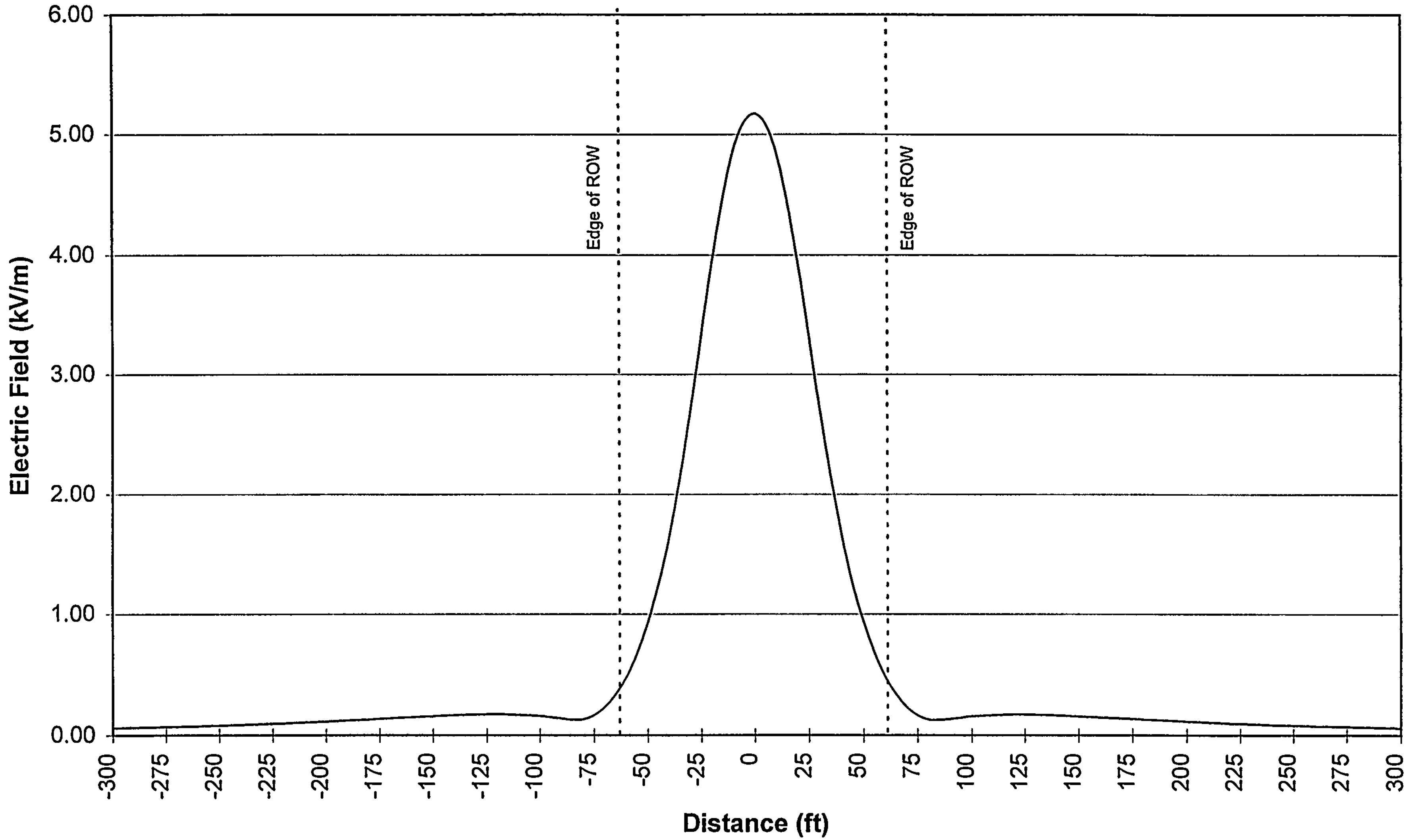


ALTURAS TRANSMISSION LINE EIR/S

Figure C.10-4

345 kV H-Frame Configuration

Calculated Electric Field Lateral Profile

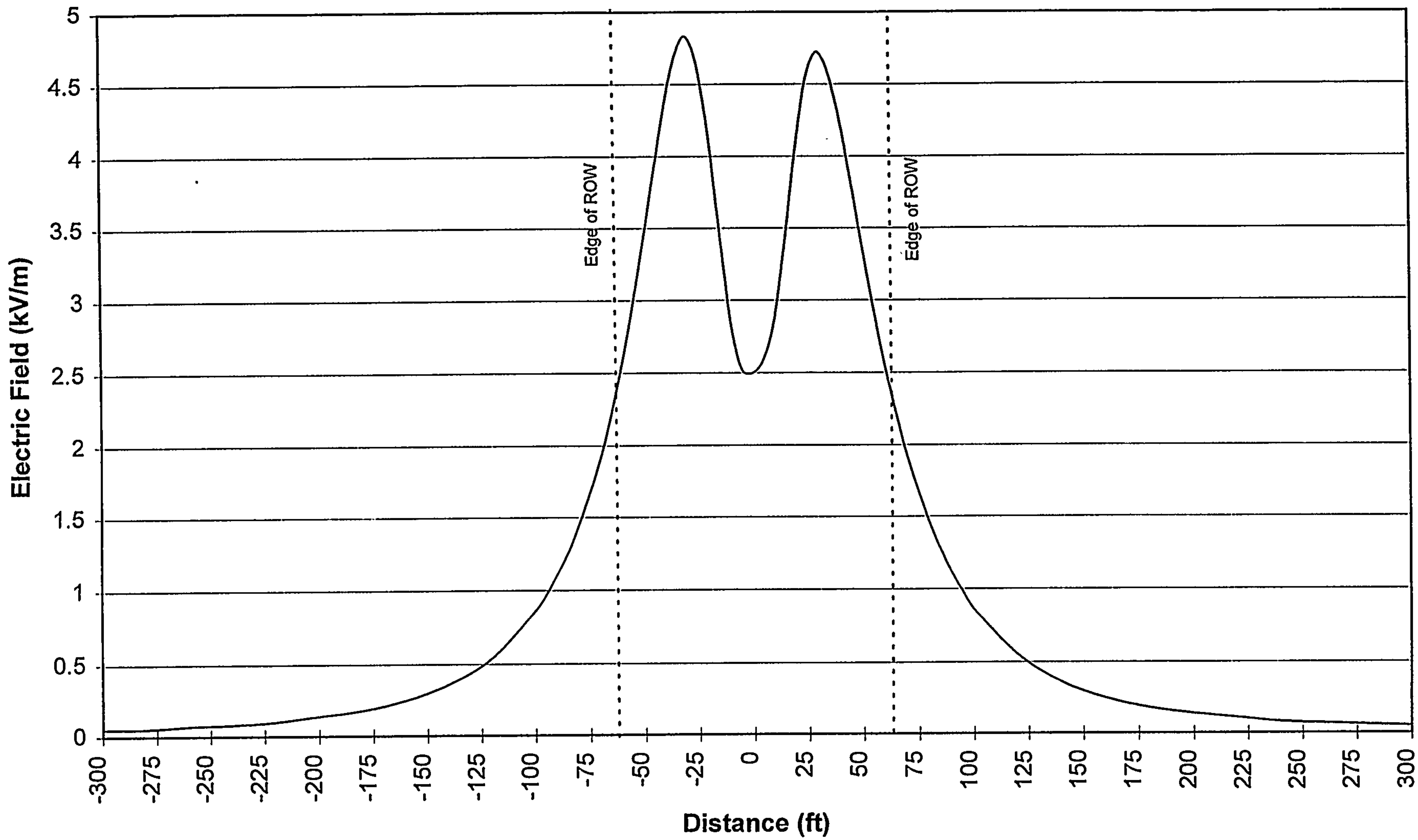


ALTURAS TRANSMISSION LINE EIR/S

Figure C.10-5

230 kV Vertical Configuration

Calculated Electric Field Lateral Profile

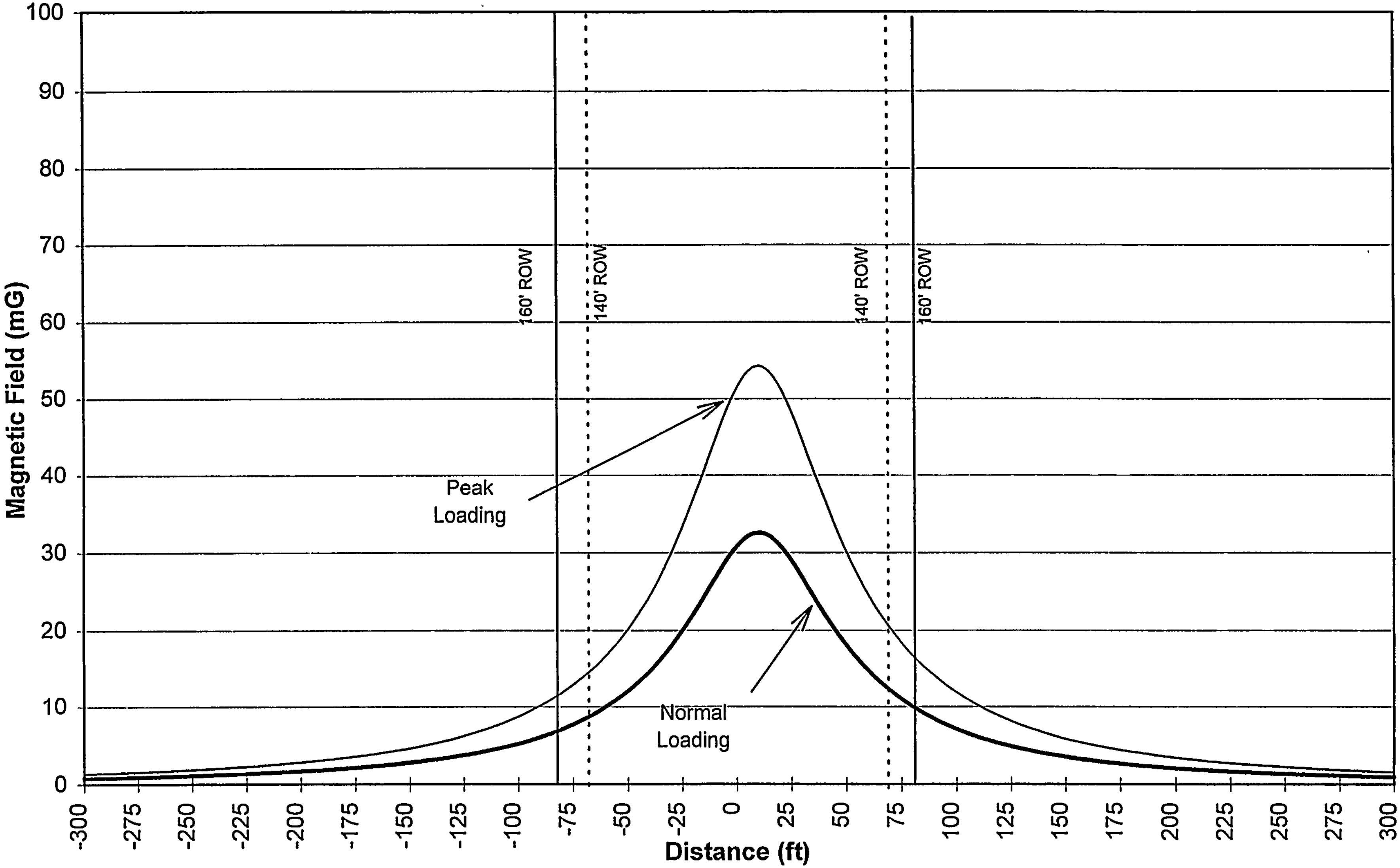


ALTURAS TRANSMISSION LINE EIR/S

Figure C.10-6

230 kV H-Frame Configuration

Calculated Electric Field Lateral Profile

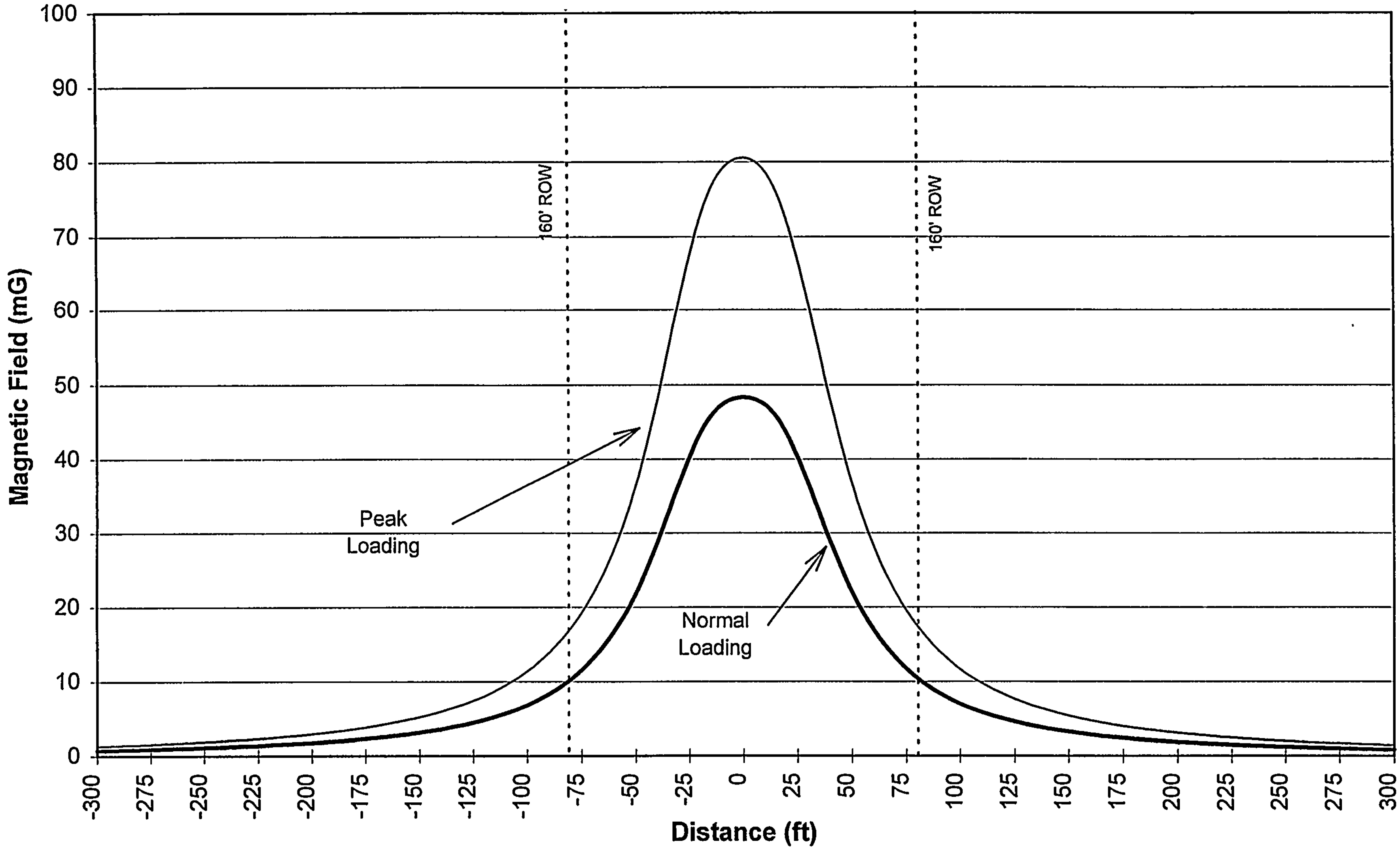


ALTURAS TRANSMISSION LINE EIR/S

Figure C.10-7

345 kV Vertical Configuration

Calculated Magnetic Field Lateral Profile-
Normal and Peak

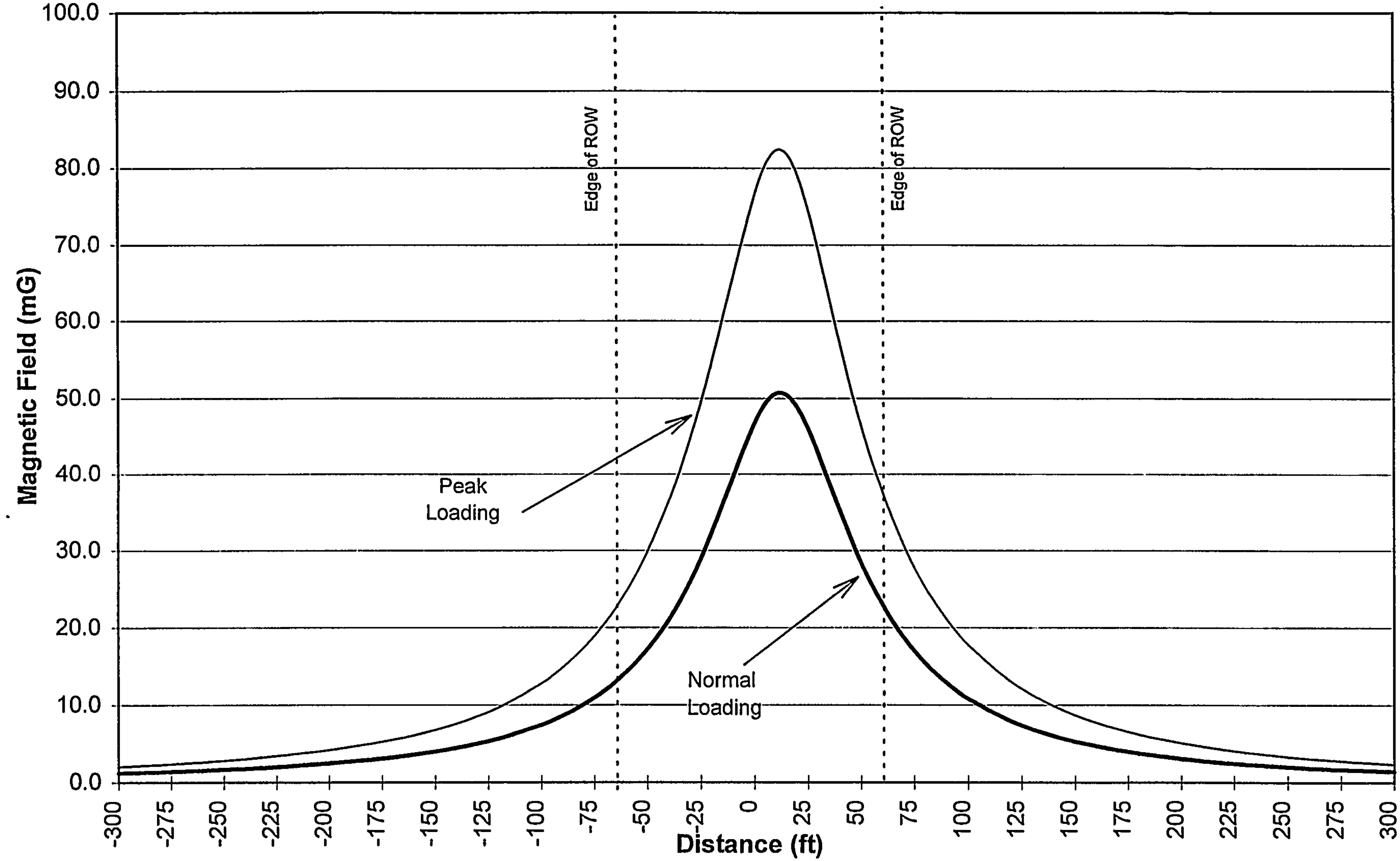


ALTURAS TRANSMISSION LINE EIR/S

Figure C.10-8

345 kV H-Frame Configuration

Calculated Magnetic Field Lateral Profile-Normal and Peak

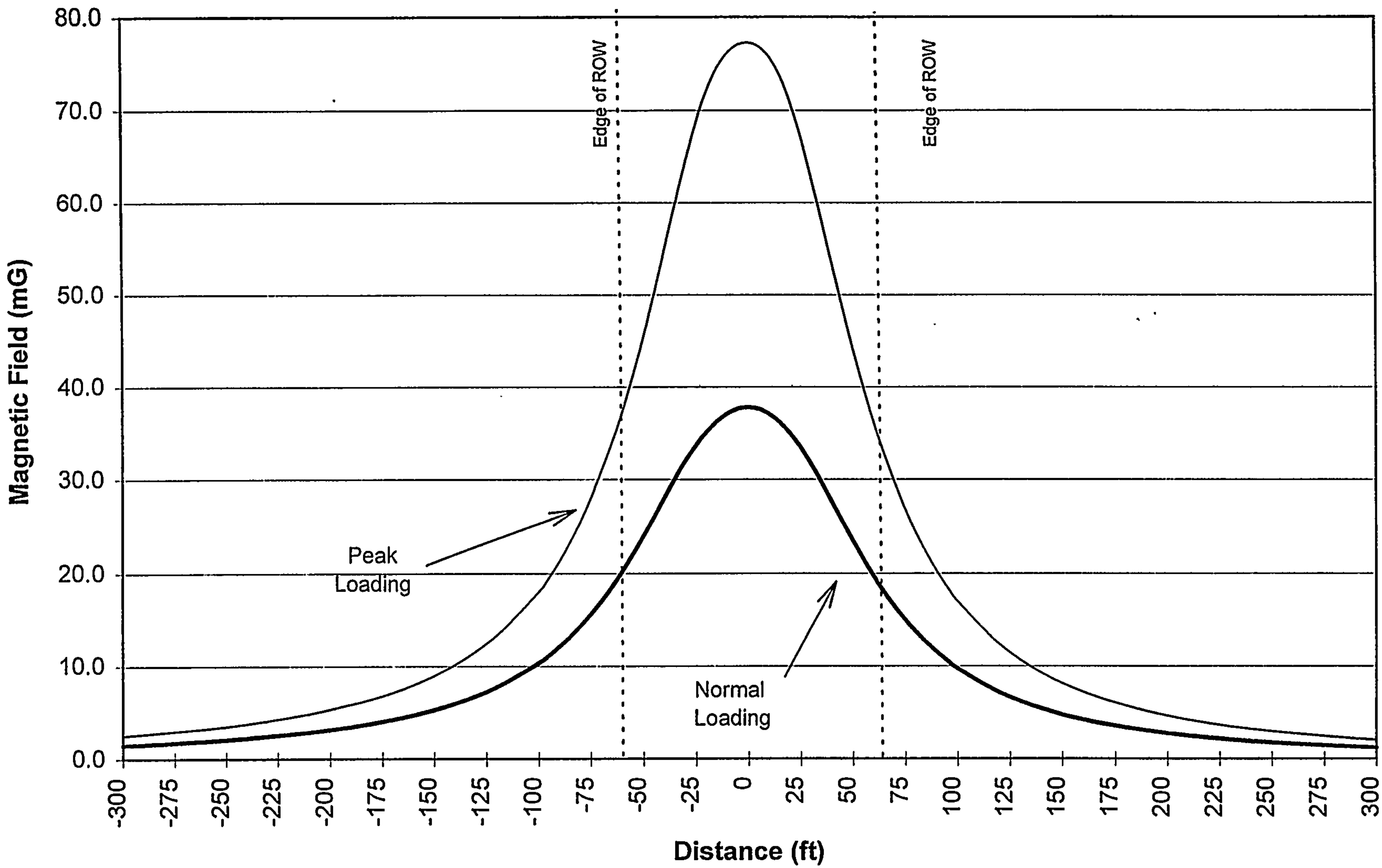


ALTURAS TRANSMISSION LINE EIR/S

Figure C.10-9

230 kV Vertical Configuration

Calculated Magnetic Field Lateral Profile-Normal and Peak



ALTURAS TRANSMISSION LINE EIR/S

Figure C.10-10

230 kV H-Frame Configuration

Calculated Magnetic Field Lateral Profile-Normal and Peak

Human Exposure to EMFs

At the edge of the ROW the Alturas Transmission Line Project meets the existing standards for all states with the exception of the residential limit imposed in Montana. The maximum electric field of 1.18 kV/m at the edge of the 160 foot right-of-way from the 345 kV H-frame section and 2.4 kV/m from the 230 kV H-frame section of the line will exceed the 1 kV/m Montana residential limit. However, since the Proposed Projet would be located at least 300 feet from most sensitive receptors, including residential areas (exceptions are a single-family residence on Segment L and an apartment complex on Segment X), at this distance the electric field values would be below the 1 kV/m Montana standard.

The long-term health effects of EMFs have not been conclusively determined. Epidemiological studies continue to be conducted, as are studies into the biological mechanisms that could be causing health effects. Since the existing body of evidence does not conclusively support a link between health effects and EMFs, the CPUC has recommended that utilities use low-cost or no-cost mitigation measures to reduce potential impacts when constructing new electrical lines.

CPUC No-Cost/Low-Cost EMF Mitigation Policy

On January 15, 1991, the CPUC issued an Order Instituting Investigation to develop policies and procedures for addressing the potential health effects of electric and magnetic fields of utility facilities (OII.91-01-012). The investigation was opened to consider the CPUC's potential role in mitigating health effects, if any, of EMFs created by electric utility powerlines and by cellular radio/telephone facilities. At the commencement of the investigation, the CPUC found that the scientific community had not yet isolated the impact, if any, of utility-related exposures on public health.

As part of OII.91-01-012, interested parties were invited to comment on specific EMF issues identified by the investigation. In response to the CPUC's invitation, comments were received from 23 independent organizations and individuals.

Consistent with the suggestion of some of the comments, the CPUC established a working group of interested parties to develop a collective report identifying interim policy steps that would potentially effect electric utilities. The working group, referred to as the "California EMF Consensus Group," consisted of 17 stakeholders representing citizen groups, consumer groups, environmental groups, State agencies, unions, and municipal and investor-owned utilities. The Consensus Group filed its report with the CPUC on March 24, 1992. In Decision No. 93-11-03, the Commission implemented the following recommendations:

- No-cost and low-cost steps to reduce EMF levels
- Workshops to develop EMF design guidelines
- Uniform residential and workplace programs

- Stakeholder and public involvement
- A $1,489,000 four-year education program
- A $5,600,000 four-year non-experimental and administrative research program
- An authorization of federal experimental research conducted under the National Energy Policy Act of 1992.

The decision, involving no/low-cost mitigation, was to be applied to new and reconstructed facilities and would be applicable to the Alturas Transmission Line Project. The decision included considerable discussion as to the meaning of "low-cost," and stated the following:

> "From Edison's analysis and DRA's few percentage points criteria, it is logical to define low cost to be in the range of 4 percent of the total cost of a budgeted project. We direct the utilities to use 4 percent as a benchmark in developing their EMF mitigation guidelines. We will not establish 4 percent as an absolute cap at this time because we do not want to arbitrarily eliminate a potential measure that might be available but cost more than the 4 percent figure. Conversely, the utilities are encouraged to use effective measures that cost less than 4 percent. Given the evolving body of research on EMF measures, we feel that 4 percent provides the utilities with sufficient guidance without hindering their ability to seek out or develop innovative measures and to reduce the cost to implement known measures...
>
> We further endorse the concept put forward by [Pacific Gas & Electric] and [San Diego Gas & Electric] that a mitigation measure should achieve some noticeable reduction. PG&E and SDG&E define significant EMF reduction as 15 percent and 20 percent, respectively. Again we decline to adopt specific numbers because there is not sufficient scientific evidence upon which to base such findings. As TURN notes in its brief, it is not possible to conduct a cost-benefit analyses of mitigation measures until we can associate benefits with different levels of reduction. We encourage the parties to further develop this issue in the EMF design guidelines workshop ordered below. If the design guidelines identify a particular EMF reduction measure as appropriate and justified in a given situation, then that measure should be available for a utility to implement in that situation."

Available EMF Mitigation

Mitigation measures that could be applied to a transmission line project can be broken down into three general categories. They are:

- Increasing the distance between the magnetic field source and the exposed individuals
- Changing the physical or electrical geometry of the magnetic field source
- Implement passive or active shielding techniques.

SPPCo has incorporated the following techniques for reducing EMF strengths resulting from the Proposed Project:

- Project routing such that the line will not be located within 265 feet of existing development
- Phase conductor spacing on the 345 kV H-frame construction that is smaller than other similar designs
- Cross phasing (proposed) on the 230 kV double circuit portion of the line.

The minimum separation distance required by GO-95, from line conductor to a structure (building, etc.), is 15 feet. There are no other separation distance requirements based on health and safety issues; the closest residence to the line along the route is at 265 feet.

Increasing the distance between the source and the exposed individuals, where possible, can be one of the most cost-effective ways to reduce exposure to EMFs. The distance between the source and the exposed individual can be increased by installing taller transmission structures, purchasing wider ROWs, or choosing transmission line routes and substation sites that are not near areas where people work and live. The feasibility of purchasing wider ROWs is dependent on the landowner's willingness to sell additional land and the cost of the land. In areas near residences or near potential development, these alternatives should be given consideration under the no/low-cost EMF reduction decision issued by the CPUC.

Sometimes it is possible to decrease magnetic fields from a source by changing the physical or electrical geometry of the line. In general, magnetic fields can be decreased by reducing the distance between phase conductors, changing the number of phase wires, optimizing the phase arrangement between two circuits, or by balancing the electrical current on the phase conductors or by undergrounding the electrical lines. The Proposed Project's H-Frame construction has a phase spacing of 22 feet. This spacing is smaller than most designs at this voltage level (according to the Transmission Line Reference Book), and thus, has lower magnetic fields than other similar H-frame designs. The 230 kV line has been proposed as a double circuit transmission line with phases in an optimized (unlike) phasing arrangement. Both of these proposed designs would be considered as effective, no-cost approaches to reducing magnetic fields.

In some situations, changing the number of phases for short stretches of the line could meet the low-cost mitigation criteria. The technique that could be used in this situation is a split phase arrangement. This arrangement adds two conductors on an additional cross-arm, and the current in two phases is split between two conductors. The conductors are arranged such that there is unlike phasing between the upper and lower conductors. It should be noted that this mitigation strategy would be limited to very short sections of line because of the high cost. In addition, split phasing would add approximately 25 feet to the height of the poles. Another consideration with this type of construction is that the additional conductors and their arrangement on the pole could result in considerably higher maintenance and operation costs. SPPCo has not proposed changing the number of phases as an EMF mitigation measure for the Proposed Project.

Undergrounding of transmission lines greatly reduces their EMF strengths. However, as discussed in Section B.3, due to the high cost of building underground transmission lines, the undergrounding of lines usually only occurs in areas where overhead transmission lines cannot be installed. Such areas include airports and dense urban cores. SPPCo has not proposed undergrounding for any portion of the Proposed Project.

Passive and active shielding for transmission lines and substations is another technique that can be utilized to reduce magnetic field levels. This technique can be accomplished through the use of electric conductors along the transmission line route or substation site. The added electrical conductors have a current induced into them that creates a magnetic field that effectively cancels the magnetic field produced by the transmission line or substation. Another passive shielding technique is to install ferromagnetic shielding materials. All of these shielding techniques are expensive to implement and are experimental at this time. SPPCo has not proposed the use of passive or active shielding for the Proposed Project.

Balancing the current between phases of the lines usually does not play an important role in reducing magnetic fields at voltages greater than 200 kV. Currents on transmission lines at these voltages are usually nearly balanced and net currents are very small.

SPPCo has incorporated some of the most cost-effective techniques currently available for the reduction of EMF strengths resulting from the Proposed Project. These measures are consistent with the CPUC No-Cost/Low-Cost EMF Mitigation Policy. No further mitigation measures are recommended (Class III).

C.10.2.3.2 *Public Concerns*

Corona

The corona impacts related to visible light, and radio and television interference are discussed below. Corona noise impacts are discussed in Section C.9.2.

Visible Light. The maximum surface gradients produced by the Alturas Transmission Line Project 345 kV and associated 230 kV line configurations are approximately 17.7 kV/cm and 13 kV/cm, respectively. The corona performance of the proposed 345 kV and 230 kV transmission lines will be as good as, or better than, other lines in these voltage classification (EPRI, 1982).

Visible light caused by corona discharge does not produce a significant amount of light. The tiny discharges can be seen by a careful observer, but do not produce enough light to illuminate the landscape. No mitigation measure is required or recommended (Class III).

Radio and Television Interference. For the proposed 345 kV and 230 kV line designs, the median radio noise level (l50) was calculated for the edge of the ROW during fair and rainy conditions with 795 and 954 ACSR conductors at an elevation of 5,000 feet. The units of measure were decibel microvolts per meter (dBuV/m) above a 1mv/m reference value. The results are shown in Table C.10-8.

Table C.10-8 Radio Interference Calculation Results

Configuration	795 ACSR (dBuV/m at Edge of ROW)		954 ACSR (dBuV/m at Edge of ROW)	
	Fair	Rainy	Fair	Rainy
345 kV Vertical	49.0	66.0	50.0	67.0
345 kV H-Frame	48.3	65.3	43.4	60.4
230 kV Vertical (Double Circuit)	30.4	47.4	28.0	45.0
230 kV H-Frame (Double Circuit)	32.9	49.9	30.5	47.5

Television interference was calculated for rainy conditions with the same transmission line configurations as the radio noise calculations. The results are shown in Table C.10-9.

Table C.10-9 Television Interference Calculation Results

Configuration	795 ACSR (dBuV/m at Edge of ROW)	954 ACSR (dBuV/m at Edge of ROW)
	Rainy	Rainy
345 kV Vertical	27.4	27.0
345 kV H-Frame	29.1	24.2
230 kV Vertical (Double Circuit)	9.4	7.1
230 kV H-Frame (Double Circuit)	11.8	9.4

Corona-generated interference decreases rapidly with distance, and beyond the edge of the ROW it decreases to low values. Radio and television interference effects are dependent upon the area's radio and television signal strength. In areas with weak signal strength, the effects of a transmission line would be more significant. Since the Federal Communication Council does not provide specific requirements on noise from transmission lines, utilities usually have programs to record, evaluate, and correct radio and television interference, when necessary, and corrective measures are taken as required. The Applicant has a radio and television interference program in place. Interference to radio or television reception from corona-generated sources on transmission lines is dependent on many factors such as strength of the radio or TV station signal at the location of the receiver, receiver antenna type and orientation, distance from the transmission line, time of day, weather conditions, and type of information being received (such as high-fidelity music versus a sports broadcast).

Data in Table C.10-9 indicates the range of television interference signals likely to exist at the edge of the transmission line ROW. Based on information developed by BPA, television reception on Channels 2 through 6 may be adversely affected in homes at the edge of the transmission line ROW in far fringe areas of the TV stations. Although picture quality in such far fringe areas is defined as very poor, these channels are watched by some people.

Data in Table C.10-8 give the range of values for radio interference signals at the edge of the ROW. When compared with typical 345 kV transmission line designs, radio noise performance of the Alturas line is found to be comparable. This means reception of local radio stations in homes over 1,000 feet from the line should not be affected. Radio receivers closer than 1,000 feet from the line may be experience interference during foul weather. Reception of radio stations at night, that are a long distance away, may be difficult even in fair weather under certain conditions of propagation. As part of the Applicant's radio and television interference program, the Applicant will assist residences near the line in resolution of any reception interference that occurs as a result of the project. No additional mitigation measures are required or recommended (**Class III**).

Induced Currents and Shock Hazards in Joint Use Corridors

Induced currents and voltages on conducting objects near the proposed 345 kV and 230 kV transmission lines do not pose a threat in the environment if the conducting objects are properly grounded. The following mitigation measure is recommended to reduce the potential impacts of induced currents (**Class II**):

P-1 As part of the siting and construction process for the Proposed Project, the Applicant shall identify objects (such as fences, conductors, and pipelines) that have the potential for induced voltages and work with the affected parties to determine proper grounding procedures (CPUC G095 and the NESC do not have specific requirements for grounding). The Applicant shall install all necessary grounding measures prior to energizing the line. 30-days prior to energizing the line, the Applicant shall notify in writing, subject to the review and approval of the Lead Agencies, all property owners within and adjacent to the Proposed Project ROW of the date the line is to be energized. In addition, the written notice shall provide a SPPCo contact person and telephone number for answering questions regarding the installation of potential voltage-induced objects after the line is energized and guidelines on what activities should be limited or restricted within the ROW. The Applicant shall respond to and document all complaints received and the responsive action taken. These records shall be made available to the Lead Agencies for review upon request. All unresolved disputes shall be deferred by the Applicant to the Lead Agencies for resolution.

The written notice shall describe the nature and operation of the line, and the Applicant's responsibilities with respect to grounding all conducting objects. In addition, the notice shall describe the property owner's responsibilities with respect to notifying SPPCo if new objects require grounding and guidelines for maintaining the safety of the ROW.

Cardiac Pacemakers

The electric fields associated with the Proposed Project's 345 kV line can exceed the 2 kV/m to 9 kV/m that can cause a few older model pacemakers to revert to an asynchronous pacing. Cardiovascular specialists do not consider prolonged asynchronous pacing to be a problem; periods of operation in this mode are commonly induced by cardiologists to check pacemaker performance. Therefore, while the transmission line's electric field may interfere with the normal operation of some older model pacemakers, the result of the interference is of short duration and is not considered harmful (EPRI, 1985; 1979) (**Class III**). No mitigation measures are required or recommended.

Lightning

The Alturas 345 kV transmission line is being designed in accordance with GO95 and the NESC. These codes provide a practical safeguarding for lighting safety. As a result no significant impacts are expected (**Class III**).

C.10.2.3.3 *Public Safety Hazards*

Shock Hazard and Fuel Ignition

As discussed in Section C.10.1.6, the primary public safety issues of concern regarding transmission lines include shock hazard, fuel ignition and fire hazard. Adherence to CPUC GO95 and NESC requirements (Mitigation Measure P-2) would result in minimal risk of shock hazard and fuel ignition risk during the installation, operation and maintenance of the transmission line and associated facilities. With the implementation of Mitigation P-2, this impact can be reduced to an insignificant level (**Class II**).

P-2 The Applicant shall incorporate CPUC GO95 and NESC requirements into the Project Construction, Operation, and Maintenance Plan. This Plan will be submitted to the Lead Agencies for approval prior to project approval. Adherence to this Plan will be monitored by the Lead Agencies or Lead Agency-approved monitor during the project design and construction phases. Monitoring shall include certification by an approved electrical engineer that the project complies with CPUC GO95 and NESC requirements prior to energizing the line.

Fire Hazard

The risk of fire hazard during project construction and operation can be minimized to an insignificant impact through application of Mitigation Measures P-3 through P-7 (**Class II**).

P-3 To minimize the risk of fire hazard associated with project construction, the Applicant shall prepare a Fire Prevention and Suppression Plan (FPSP) acceptable to the BLM, USFS, and appropriate Counties. In preparing the FPSP, the Applicant shall incorporate measures for prevention and suppression of fire on the ROW and on public land used or traversed by the Applicant in connection with the project. Prior to Plan implementation, the Applicant shall instruct project personnel as to individual responsibility in implementation and enactment of the FPSP. This Plan will be submitted to the Lead Agencies for approval prior to project construction. Adherence to the Plan during construction will be monitored by a Lead Agency-approved construction monitor. At a minimum, the Plan should meet the guidelines set forth in the State of California, Department of Forestry, Industrial Operations Fire Prevention Guide and be consistent with the approved Tuscarora Natural Gas Pipeline Project Fire Contingency Plan. In addition, the Plan must include procedures for de-energizing the line in the case of fire.

P-4 During project construction, operation, and maintenance, vehicles, gas-powered equipment and flues shall be equipped with USFS-approved spark arresters. Compliance with this spark arrestor requirement shall be monitored by a Lead Agency-approved monitor.

P-5 During construction, the Applicant shall maintain both a fire watch and fire-fighting equipment (e.g., shovels, backpack water pumps, fire extinguishers, etc.), at locations to be specified by the Lead Agencies or Agency granting the right of way.

P-6 When requested by the Lead Agencies or Agency granting the right of way, the Applicant's fire fighting equipment and operators (if already onsite) will be made temporarily available for fighting fires in the vicinity of the project. Payment for such services will be made at rates determined by the requesting Agency.

P-7 During conditions of extreme fire danger when fire restrictions are in effect, construction and maintenance activities shall be limited in accordance with the restrictions, unless the Applicant obtains a hazardous fire condition Special Use Permit from the BLM, USFS, or CDFG, as appropriate. Additional measures may be required by the Lead Agencies or Agency granting the right of way.

During operation of the Proposed Project, the risk of fire from a broken, energized conductor coming in contact with combustible material on the ground is extremely low. Standard high-voltage transmission line design incorporates high-speed relay equipment that de-energize the line upon breakage in approximately one-tenth of a second. In the unlikely event that a fire should occur from a fallen conductor, fire response agencies are located throughout the project area and, as discussed in Section C.11.1.4.1, have an adequate ability to provide fire protection service. With the implementation of Mitigation Measures P-4 through P-7, this impact can be reduced to an insignificant level **(Class II)**.

Hazardous Materials

During construction, operation, and maintenance of the Proposed Project, a number of hazardous substances will be used within the ROW and related facilities. These materials are presented below. Material Safety Data Sheets for each of the listed items are maintained by the Project Applicant and a Department of Transportation (DOT) Emergency Response Guidebook is carried in the Project Applicant's line trucks.

- 2-Cycle Oil (contains distillates and hydrotreated heavy paraffinic)
- ABC Fire Extinguisher
- Acetylene Gas
- Air Tool Oil
- Ammonium Hydroxide
- Automatic Transmission Fluid
- Battery Acid (in vehicles and in the meter house of the substations)
- Bee Bop Insect Killer
- Canned Spray Paint
- Chain Lubricant (contains methylene chloride)
- Connector Grease (penotrox)
- Contact Cleaner 2000
- Diesel Deicer
- Diesel Fuel Additive
- Explosives (detonators, detonator assemblies - non-electric, tubular primers, cap-type primers, ammonium nitrate fertilizers)
- Eye Glass Cleaner (contains methylene chloride)
- Gasoline
- Gasoline Treatment
- Hot Stick Cleaner (cloth treated with polydimethylsiloxane)
- Insulating Oil (inhibited, non-PCB)
- Lubricating Grease
- Mastic Coating
- Methyl Alcohol
- North Wasp and Hornet Spray (1,1,1-trichloroethene)
- Oxygen
- Petroleum Products (gasoline, diesel fuel, jet fuel A, lubricants, brake fluid, hydraulic fluid)
- Prestone 11 Antifreeze
- Propane
- Puncture Seal Tire Inflator
- Safety Fuses
- Starter Fluid
- Sulfur Hexaflouride (within the circuit breakers in the substations)
- Thinner, Paint
- Wagner Brake Fluid
- WD-40
- ZEP (safety solvent)
- ZIP (1,1,1-Tricholorethane)

Prior to project approval, the Project Applicant will be required to submit a complete SF 299, Section 19 Hazardous Materials list, and prepare and submit for approval a Blasting Plan, Spill Prevention Plan, and a Fire Suppression and Prevention Plan. These Plans, along with the Applicant's existing DOT Emergency Response Guidebook, will adequately control the use, production, transportation, and storage of hazardous materials on the ROW and in ROW-related facilities. In addition, the Applicant is prohibited by law from treating or disposing of any hazardous material outside of an approved treatment or disposal site. Therefore, no significant hazardous materials impacts are anticipated (**Class III**). However, to further enhance the potential for waste minimization and energy conservation, Mitigation Measure P-8 is recommended.

P-8 Prior to construction, the Applicant shall prepare and submit a Waste Minimization and Energy Conservation Plan for approval by the Lead Agencies. The Plan addresses measures to minimize waste and conserve energy during project construction and operation, and shall be implemented by the Applicant and its contractors under the direction of the Lead Agency approved monitor.

C.10.2.4 Cumulative Impacts and Mitigation Measures

There are no conclusively known cumulative impacts from transmission line and substation EMFs. No mitigation measures are required or recommended.

The Tuscarora Gas Pipeline will have increase the potential for shock hazards near the Alturas Transmission Line Project. When the pipeline is installed near the transmission line, the possibility for induced currents and potentials on the pipeline will increase. The impact can be reduced through proper grounding techniques.

The Tuscarora Gas Pipeline will increase the potential for shock hazards near the Alturas Transmission Line Project. Induction of currents and voltages on the pipeline are due to the proximity to the transmission line and the pipeline. The voltage that builds on the pipeline during normal or electrical fault conditions can create a shock hazard.

The NESC requires that transmission lines be designed so that no more than 5 mA of short circuit current will flow through a persons body when contacting an object with large dimensions beneath a transmission line. This requirement can be met through the use of proper grounding of the pipeline, when it is installed. Therefore, no significant cumulative impacts are anticipated.

C.10.2.5 Unavoidable Significant Impacts

EMF and other public concerns and safety hazard impacts can be controlled through proper design and routing of the Alturas Transmission Line Project and the incorporation of the mitigation measures defined in this section. For this reason, there will be no significant public safety and health impacts from the Proposed Project.

C.10.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

The proposed alternate alignments and substation sites would have similar EMF impacts due to the line design being similar for all of the proposed routes. Likewise, potential shock induced and public safety hazard impacts would be similar for all proposed routes, since the general design, construction, and operation of the transmission line would be the same regardless of the route chosen. Because of the similarity of the transmission line construction, the environmental impacts and mitigation measures, cumulative impacts and mitigation measures, and unavoidable significant impacts will be similar to those discussed in Section C.10.2.

C.10.4 THE NO PROJECT ALTERNATIVE

The No Project Alternative will also have EMF impacts, since other transmission lines would likely be built to provide SPPCo with desired transmission capacity if the Alturas Transmission Line Project does not go forward. The impacts of the EMFs effects would be similar to those of the Alturas Transmission Line Project, but the magnitude of the effects would be specific to the design of the No Project Alternatives.

C.10.5 MITIGATION MONITORING PROGRAM

Table C.10-10 presents the Mitigation Monitoring Program recommended for mitigating shock induced and public safety hazard impacts. This program outlines the location, responsible party, required monitoring activities, effectiveness criteria, and timing of each monitoring activity.

Table C.10-10 Mitigation Monitoring Program

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Potential for induced currents and voltages on conducting objects that are not properly grounded and are located near the proposed 345 kV and 230 kV transmission lines (Class II)	**P-1** In order to reduce the potential for induced currents and voltages, identify objects that have the potential for induced voltages and work with the affected parties to determine proper grounding procedures. Notify property owners of date line is to be energized, name and phone number of Applicant contact person, and guidelines for future activities within ROW.	All Proposed and Alternative Segments	BLM CPUC	Ensure that Applicant has identified potential current-inducing objects and that proper grounding procedures are formulated.	All objects located within the ROW are properly grounded.	30 days prior to energizing line
Potential for public safety hazards and accidents, such as shock hazard, fuel ignition, and fire hazard (Class II)	**P-2** In order to minimize the potential for public safety hazards and accidents, the Applicant will incorporate CPUC General Order 95 and National Electric Safety Code requirements into Project Design and Construction Plans.	All Proposed and Alternative Segments	BLM CPUC	Verify incorporation of CPUC GO95 and NESC requirements into project design and construction plans. Verify compliance with CPUC General Order 95 and NESC requirements.	Ensure that CPUC GO95 and National Electric Safety Code (NESC) requirements are incorporated into project design and construction plans. Confirm compliance with CPUC GO95 and NESC requirements.	Incorporate codes during design process; verify compliance after construction

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
	P-3 In order to minimize the potential for public safety hazards and accidents, prepare a Fire Prevention and Suppression Plan acceptable to the BLM, USFS, and Counties. At a minimum, the Plan should meet the guidelines set forth in the State of California, Department of Forestry, Industrial Operations Fire Prevention Guide and be consistent with the approved Tuscarora Natural Gas Pipeline Project Fire Contingency Plan. In addition, the plan must include procedures for de-energizing the line in the case of fire.	All Proposed and Alternative Segments	BLM CPUC CDF Counties USFS	Ensure preparation of adequate Fire Prevention and Suppression Plan (FPSP). During construction, conduct weekly site inspections to verify compliance with FPSP.	Ensure preparation of, and adherence to, Fire Prevention and Suppression Plan.	Prepare Plan during design & review process (prior to construction); ensure adherence to Plan during construction
	P-4 In order to minimize the potential for public safety hazards and accidents, equipment vehicles, gas-powered equipment and flues with Lead USFS-approved spark arresters.	All Proposed and Alternative Segments	BLM CPUC USFS CDF	Conduct weekly site inspection to verify use of USFS-approved spark arresters.	Ensure use of USFS-approved spark arresters.	Equip vehicles prior to construction; monitor during construction and maintenance
Potential for public safety hazards and accidents, such as shock hazard, fuel ignition, and fire hazard (Class II)	**P-5** In order to minimize the potential for public safety hazards and accidents, maintain both a fire watch and fire fighting equipment at locations specified.	All Proposed and Alternative Segments	BLM CPUC USFS CDF	Conduct weekly site inspection to verify maintenance of fire watch and availability of fire fighting equipment.	Verification that fire watch is maintained and fire fighting equipment is available.	During construction

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
	P-6 In order to minimize the potential for public safety hazards and accidents, fire fighting equipment and operators are to be made available for fighting fires in the vicinity of the Project.	All Proposed and Alternative Segments	BLM CPUC USFS CDF	Conduct weekly site inspection to verify maintenance of fire watch and availability of fire fighting equipment.	Verification that fire watch is maintained and fire fighting equipment is available.	During construction
	P-7 In order to minimize the potential for public safety hazards and accidents, during conditions of extreme fire danger when fire restrictions are in effect, limit or suspend construction and maintenance, unless Applicant obtains a hazardous fire condition special use permit.	All Proposed and Alternative Segments	BLM CPUC USFS CDF	Suspend construction and/or maintenance during extreme fire hazard.	Verify compliance with order through periodic site inspections.	During construction and maintenance
Excess generation of waste and/or consumption of energy (Class III)	P-8 To enhance waste minimization and energy conservation, prepare a Waste Minimization and Energy Conservation Plan.	All Proposed and Alternative Segments	BLM CPUC	Review, approve, and monitor Waste Minimization and Energy Conservation Plan.		Prepare Plan prior to construction

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PART C.11 SOCIOECONOMICS AND PUBLIC SERVICES

C.11.1 ENVIRONMENTAL BASELINE AND REGULATORY SETTING

This Section identifies relevant economic and demographic trends in the study area, and the governmental services and public fiscal environment that could be affected by the Proposed Project. Information presented in this Section was gathered from statistical sources, such as publications and analyses by the U.S. Census Bureau, California and Nevada State Agencies and Departments, and data from the four counties, several cities, and separate districts (schools, fire protection, etc.) in California and Nevada that would be potentially affected by the project. Telephone and personal interviews were also conducted with state and local officials.

C.11.1.1 Study and Project Area

The project and study corridor includes from north to south the California Counties of Modoc, Lassen, and Sierra, and Washoe County in Nevada. Alturas is approximately in the middle of Modoc County, and the Proposed Project goes south from there, transacts the entire north/south axis of Lassen County, and crosses a small northeastern corner of Sierra County, before entering Washoe County, approximately 25 miles northwest of Reno. At its closest point, the transmission line would pass approximately 20 miles east of Susanville, the county seat and major town in Lassen County.

The Reno area in Washoe County represents the only urban area in the study area. Most employment and demographic data is compiled at the metropolitan area or county level, so countywide data is used for much of the analysis.

C.11.1.2 Employment Patterns

Tables C.11-1 and C.11-2 illustrate labor force, industry characteristics, and unemployment trends in the study area during the past ten years. Modoc County has had a declining economy for some time, with 1993 employment levels 14 percent below those of 1984; the only county in the study area to have absolute employment declines. In 1993, employment in state, federal, and local government represented almost 50 percent of jobs in the county. The U.S. Bureau of Land Management (BLM) and Department of Agriculture's Modoc National Forest offices are located in Alturas, as are City, County, and school district functions.

Trade, agriculture, and services are the only other significant sectors. Unemployment rates in the County generally run 30 to 50 percent above the California statewide unemployment rates, and are highly seasonal as well. For example, the average Modoc County 1993 unemployment rate of 13.4 percent included rates of 17.6 to 19 percent from January through March and minimum rates of 10.2 percent in

Table C.11-1 Labor Force and Unemployment Trends

Year	Modoc County		Lassen County		Sierra County		Washoe County	
	Labor Force	Unempl. Rate	Labor Force	Unempl. Rate	Labor Force	Unempl. Rate	Labor Force	Unempl. Rate
1984	4,525	11.4%	8,975	12.5%	1,550	15.0%	128,008	6.2%
1985	4,200	10.9	8,950	11.6	1,500	12.9	132,700	6.8
1986	4,075	9.4	9,025	9.9	1,500	10.8	134,242	5.2
1987	4,000	8.1	9,400	8.2	1,450	9.9	137,083	5.7
1988	3,975	8.7	9,600	8.4	1,525	9.5	139,233	4.6
1989	4,125	9.1	10,025	8.4	1,675	9.8	136,850	4.7
1990	3,800	9.9	9,725	9.0	1,725	9.9	136,123	4.8
1991	3,875	12.3	10,075	10.0	1,725	10.2	137,680	5.0
1992	3,575	13.1	10,675	10.9	1,725	10.7	142,330	6.3
1993	3,870	13.4	11,370	11.4	1,850	10.9	145,822	6.4
1984-93 Growth Rate	-14%		27%		19%		14%	

Source: Gabriel-Roche, Inc. from California EDD, Labor Market Information Division (March 1992 Benchmark); and Nevada Employment Security Department.

Table C.11-2 1993 Labor Force and Unemployment Trends

Labor Force and Proportional Employment Sector	Modoc County	Lassen County	Sierra County	Washoe County
Total Industrial Employment[a]	2,470	8,730	1,070	147,600[b]
- Agriculture	10.1%	4.1%	.9%	0%
- Mining & Construction	2.0	4.9	6.5[c]	5.2%
- Manufacturing	3.2	7.6	19.5	6.8%
- Transportation, Communications & Utilities	3.2	3.0	c	6.6%
- Wholesale & Retail Trade	21.5	16.8	19.5	22.5%
- Finance, Insurance & Real Estate	2.4	2.1	c	4.7%
- Services	10.1	14.1	10.2	40.0%
- Government	47.0	47.7	44.0	13.9%

Source: Gabriel-Roche, Inc. from California Employment Development Department and Nevada Employment Security Department

[a] Employment by place of work - does not include self-employed.

[b] Does not coincide with labor force data, includes multiple job holders.

[c] 6.5% includes mining & construction; transportation, communications and utilities; and finance, insurance and real estate for Sierra County.

August and September. Only 30 to 60 individuals were employed in all construction and mining categories during 1993. Trucking, earth movement, and concrete delivery would be available in the local area, but projects requiring skilled trades would require workers to temporarily come to the area. Employment in resource based sectors, such as logging and sawmills, has declined considerably over the past 15 years.

Employment trends are more positive in Lassen County, which has had a 27 percent increase in jobs during the 1984-1993 time period, much of it during the latter years. However, although employment grew approximately 15 percent from 1990 to 1993, unemployment rates also increased from nine percent to 11.4 percent during the same years. Like Modoc County, government is the major employer in Lassen County, representing almost 48 percent of total employment. Service employment is higher than for the surrounding counties, reflecting greater tourism activities and support functions for a large segment of northeastern California. The Sierra Army Depot and a state prison are major employers. Because of seasonal recreational and resource industries, unemployment rates vary. For example, in 1993, unemployment ranged from nine percent in September to 16.1 percent in February.

Almost five percent of Lassen County employment is in the mining and construction sectors, a more typical proportion than the two percent in Modoc County. Approximately 410 persons were employed in mining and construction during 1993 in Lassen County. By fall 1994, a peak of 800 construction workers were expected to be working on the state prison expansion in Lassen County. Because of the specialized trades required, the majority of the workers are expected to come from other places for the duration of their employment. However, some local construction workers were expected to be employed on the project during 1994 and 1995.

There is little economic activity in Sierra County, with fewer than 2,000 people employed in the County in 1993, representing modest growth over the ten year period. Government jobs represent almost 45 percent of covered jobs. Trade and manufacturing are the next most significant sectors of the economy, each with approximately 20 percent of the jobs in the county. There is minimal employment in the northeast corner of this county crossed by the proposed transmission line right-of-way (ROW).

Washoe County, Nevada is the most urban county along the project route, and contains approximately 90 percent of the employment in the study area. With the exception of a dip in employment during 1989 and 1990, employment has grown at a consistent, but moderate pace over the 1984-1993 period. The 1993 unemployment rate of 6.4% is substantially lower than that of the more rural California counties, and it was consistently lower over the ten year period. As shown in Table C.11-2, Washoe County's economic base is very different as well, with significantly lower percentages of governmental employment relative to the California counties, and a much higher proportion of service employment, 40% relative to less than 15% for the more rural California counties. The major factors in this statistic are the strong tourism base associated with hotels and the gambling industry, and its role as a major medical center for northern Nevada and northeastern California.

Trade, construction, transportation, communications, and utilities employment levels are more representative of those in an urban area. Average annual construction employment in Washoe County has been between 7,000 and 7,580 jobs since 1988, peaking in 1993. Seasonal fluctuation is a consistent pattern as well, with monthly construction employment ranging from approximately 6,000 in winter to 8,000 in summer. Most skilled trades are represented in the Reno metropolitan area.

C.11.1.3 Population and Housing Patterns

Tables C.11-3 and C.11-4 indicate the population trends and demographic and housing characteristics for the Proposed Project study area. Approximately 87 percent of the population lives in Washoe County, a proportion that increased during the 1980-1993 time period as the county population grew faster than any other portion of the project study area. Population growth was less than 10% over this same time period in Sierra County, and under 20% in Modoc County, the two most rural counties in the study area. Approximately half of the population increase of 7,200 persons in Lassen County was accounted for by expansion of the state prison, resulting from an increase in inmates, as well as employees. The sudden jump in Susanville population between 1990 and 1993 illustrated in Table C.11-3 is a result of the city annexations, including the state prison.

Table C.11-3 Population Trends: 1980-1993

County City	1980	1990	1993	1980-90 % Change	1990-93 % Change
Modoc Alturas	8,610 3,025	9,678 3,231	10,300 3,380	12.4% 6.8%	6.4% 4.6%
Lassen Susanville	21,661 6,520	27,598 7,279	28,900 12,650	27.4% 11.6%	4.7% 73.8%
Sierra	3,073	3,318	3,370	8.0%	1.6%
Washoe Reno	193,623 100,756	255,370 134,930	271,770 143,780	31.9% 33.9%	10.6% 6.6%
Corridor Totals	226,967	295,964	314,340	30.4%	6.2%

Source: Gabriel-Roche, Inc. from the following sources: 1980 and 1990 data from U.S. Bureau of the Census. 1993 estimates from California Dept. of Finance and Nevada Department of Taxation.

In terms of demographic and housing characteristics, Modoc County is quite unique. The percentages of population under 18 and 65 and older are higher than for other counties, indicating a large elderly population and young families, with fewer than usual proportion of households headed by people in their 40s and 50s. This is consistent with the characteristic of an increasing population and decreasing level of employment. Native Americans account for four percent of the population, and there are few minority residents otherwise.

Table C.11-4 Demographic and Housing Characteristics: 1990

	Modoc County	Lassen County	Sierra County	Washoe County
Population	9,678	27,598	3,318	255,370
% under 18	27.1%	24.7%	26.2%	23.1%
% 65 or older	16.9%	10.4%	17.5%	10.3%
% White	87.6%	79.4%	92.2%	88.2%
% Black	.8%	6.1%	.2%	2.2%
% Asian	.4%	1.1%	.2%	3.9%
% American Indian	4.0%	2.9%	1.8%	1.9%
% Hispanic	7.2%	10.4%	5.5%	9.0%
Households(HH)	3,711	8,543	1,336	102,294
Persons/HH	2.49	2.66	2.45	2.43
# in Group Quarters	434	4,896	41	5,611
% Owner Occupied Units	69.6%	69.4%	68.1%	54.1%
% Mobile Homes	22.3%	24.7%	13.6%	12.7%
% Vacant (not seasonal)	13.9%	10.0%	6.6%	8.8%
Median Value	$49,600	$70,400	$79,300	$111,200
Median Rent	$328	$412	$280	$429
Per Capita Income	$10,971	$12,626	$13,731	$16,365
% below Poverty Level	14.4%	10.9%	9.1%	9.4%

Source: Gabriel-Roche, Inc. from U.S. Bureau of the Census.

The median home value of $49,600 is very low relative to the rest of the study area, and reflects both in the high owner occupancy ratio of almost 70 percent and the fact that 22 percent of housing units are mobile homes. The vacancy rate in 1990 among year round units was almost 14%. Finally, 1989 per capita income of less than $11,000 and 14% of persons living below the poverty level represent further indications of the poor economy, indicative of a county where employment dropped between 1984 and 1993.

In Lassen County, almost 18 percent of the 1990 population lived in group quarters, mostly inmates in the state prison. The age distribution of the population is more balanced than that of Modoc County. The owner occupancy rate of 69.4 percent is high and almost 25 percent of the housing stock consists of mobile homes. Per capita income was approximately $12,600 in 1989 and median home values and rents were higher than those in Modoc County. Sierra County has fewer than 1,500 households, high home ownership, and higher per capita income at $13,730 than the neighboring counties to the north.

Relative to the remainder of the study area, Washoe County shows more urban characteristics. A median 1990 housing value of $111,200 and median rents of $429 were the highest for the study area. Higher incomes offset the housing costs, with a per capita income of $16,365 in 1989. The proportion of mobile homes was 12.7%, the lowest for the study area, and the owner occupancy rate was 54 percent, 14 percent below that of any other county. Average household size was slightly smaller than for the other counties, and the housing vacancy rate, at almost nine percent, was relatively high for a growing metropolitan area.

Some of the vacant housing units reported in the 1990 Census were seasonal or recreational units, but in general, housing vacancy rates in the study area are significant. However, since the California counties are so low in total population, it does not take a large shift in demand to absorb vacant units.

Temporary housing resources are available to some degree in the study area, and the resources have been evaluated for other on-going or potential projects. According to the Tuscarora Gas Pipeline Project Proponent's Environmental Assessment, there are approximately 380 hotel and motel rooms available in Susanville and Lassen County, and approximately 180 in the Alturas area of Modoc County. Each county has about 150 full hookup RV sites, plus additional camp sites in nearby National Forests and National Parks (Tuscarora Pipeline Application, VII, August 1993, Section 5, p.12).

The EIR on the expansion of the state prison (California Correction Center) estimated in 1991 that there were approximately 1,200 apartment units, hotel or motel rooms, and mobile home/RV spaces in the Susanville housing inventory. A survey during the peak 1991 summer tourist season indicated a motel occupancy rate in Susanville of 79 percent, resulting in an average of 74 rooms available to rent (Michael Brandman Associates, 1991). According to staff with the construction management firm in charge of prison construction, approximately 400 persons are involved in the construction of the prison and housing availability has not become a problem for the construction labor force temporarily in the area (Allen, July 7, 1994).

C.11.1.4 Public Services

This Section on Public Services discusses the existing conditions along the Proposed Project route with respect to Fire Protection, Police Protection, Schools, Water Supply, Wastewater Treatment and Disposal, Solid Waste, and Public Finance.

C.11.1.4.1 *Fire Protection*

In terms of fire protection, most of the Proposed Project is within the jurisdiction of the BLM for first response. A portion of the Proposed Project is within the jurisdiction of the California Department of Forestry and Fire Protection (CDF), the Alturas Rural Fire Department, the Nevada Division of Forestry, and the Reno Fire Department. This setting section also discusses the Alturas City Fire Department and the Susanville Fire Department, because of the potential for construction workers and their families to locate in those cities. Table C.11-5 contains information on the location, staffing and equipment of all the fire stations discussed in this Section.

Table C.11-5 Location, Staffing and Equipment of BLM, Non-BLM, and CDF Fire Protection Stations Serving the Project Corridor

Station	Location	Staffing	Equipment
BLM and CDF			
CDF Alturas	702 East 8th Street Alturas, CA	In summer: 6 firefighters; 24 hrs per day; In winter: 2 firefighters; 7 a.m. - 5 p.m. Mon -Th.	Summer: 2 engines; Winter: 1 engine.
BLM West Valley	West Valley Rd Likely, CA	4 firefighters on 5-day schedule; 5 firefighters on 5-day schedule[a]	2 engines
BLM Ravendale	Highway 395 Ravendale, CA	4 firefighters on engine on 7 day schedule; 3 firefighters for helicopter on 7-day schedule[a]	1 engine; 1 helicopter
BLM Susanville	705 Hall Street Susanville, CA	4 firefighters plus 18-person hot shot Type I[b] hand crew; 5- day schedule [a]	1 engine
CDF Highway 36	1/4 mile east of Susanville	6 firefighters; 7 day schedule	2 engines; 1 D-6 bulldozer
BLM Carson City	1535 Hot Springs Rd., Suite 300, Carson City, NV	10 firefighters on 5-day schedule; 3 firefighters per engine[a]	2 engines
Non-BLM and CDF			
Nevada Div. of Forestry Anderson Station	Trail Drive and U.S. 395	10 volunteer firefighters	1 brush engine; 1 structure engine
Nevada Div. of Forestry Border Town Station	South Avenue Border Town	35 volunteer firefighters	3 brush engines; 1 structure engine
Alturas City Fire Department	103 South Howard Street Alturas	37 volunteer firefighters	4 pumpers; 1 rescue vehicle; 1 four wheel drive unit
Susanville Fire Department	1505 Main Street Susanville	7 paid firefighters; 35 volunteer firefighters	6 pumpers; 1 Jeep with plough; 1 crash truck
Alturas Rural Fire Department	310 Rine Street Alturas	30 volunteer firefighters	2 structure engines: 2 widland engines; 2 pumper tankers; 2 water tenders
Reno Fire Department Station No. 1	200 Evans Avenue	12 firefighters	1 engine; 1 truck; 1 rescue rig
Reno Fire Department Station No. 2	2500 Sutro Street	8 firefighters	1 engine; 1 truck
Reno Fire Department Station No. 10	5250 N. Virginia Street	4 firefighters	1 engine; 1 brush rig

Source: Gabriel-Roche Inc.; Series of Interviews

[a] Staffing is per day from 9:30 a.m. until 6 p.m.; June through September.

[b] Highest trained wildland firefighting personnel.

BLM and California Department of Forestry and Fire Protection

Proceeding from north to south with respect to BLM and CDF responsibilities along the Proposed Project route, the stations which would provide services for the project area are the CDF Station in Alturas, the BLM West Valley Station in Likely, the BLM Ravendale Station, the BLM Susanville Station, the CDF Station at Highway 36, and the BLM Carson City Station. BLM also has a Cedarville Station, 2.3 miles northeast of Alturas, but that station would not be needed except in the case of mutual aid.

The Susanville District Office of BLM manages the West Valley Station, which is five miles east of Likely; the Ravendale Station, which is 10 miles south of Termo; and the Susanville Station. These are the stations which would cover the study area from the point at which the CDF Station in Alturas leaves off until Hallelujah Junction. The Carson District BLM at Doyle would cover the Hallelujah Junction Area, Sierra County area, and Nevada area.

Dispatching in Modoc County is handled partly by the Modoc County Sheriff's Department and partly by the Susanville Interagency Fire Center. The Susanville Interagency Fire Center provides dispatch services for approximately one-third of Modoc County. In Lassen County, the Susanville Interagency Fire Center provides dispatch services to allow coordinated response throughout the County by the various fire protection districts, BLM, CDF, the Lassen National Forest, and Lassen Volcanic National Park. The response times from the various stations to the project area vary from 5 to 40 minutes, depending on the location of the incident.

CDF has mutual aid agreements statewide with BLM and the U.S. Forest Service (USFS). The Alturas Station's immediate back-up is with the Alturas Rural Fire Department, discussed below. The Modoc and Toiyabe National Forests also provide fire fighting services in Modoc and Sierra County, respectively. BLM also has a mutual aid agreement with the USFS. The District Fire Management Officer of BLM's Susanville District Office indicated that BLM's ability to provide services out of the West Valley, Ravendale, Susanville, and Carson City stations is good (Porter, June 27, 1994). The Operations Division Chief of CDF also indicated that their Highway 36 station's ability to provide services was good (Petersen, June 27, 1994). The CDF Area Forester for Modoc County indicated that their current ability to respond out of the Alturas Station is excellent unless simultaneous incidents occur, at which time their response drops radically. The Alturas Station has a "cover and move up" system. Their next cover is 30 minutes away. If they empty the station for a particular call, it will take 30 minutes for them to be covered (Ward, June 27, 1994).

Nevada Division of Forestry

Nevada Division of Forestry stations which would serve the project area, include the Anderson Station on Trail Drive and Highway 395, and the Border Town Station on South Avenue in Border Town. The

Fort Sage Mountains area, which is the area of the Proposed Project line further north in Nevada that jogs back into California, would be served by BLM.

Both of the Nevada Division of Forestry stations are volunteer stations. Anderson has 10 volunteers and Border Town has 35. The equipment at Anderson includes one small brush engine and one structure engine. The Border Town station has one structure engine and three brush engines. The Nevada Division of Forestry has mutual aid agreements for the project area with BLM and the Truckee Meadows Fire Department. Their current ability to provide services is good (Harper, July 1, 1994)

Alturas City Fire Department

The fire station for the City of Alturas is located at 103 South Howard Street. Current staffing of the station includes 37 volunteer firefighters, and equipment for the station includes four one thousand gallon per minute pumpers; one rescue vehicle; and one quick attack four wheel drive unit.

Response time within the City limits is a maximum of five minutes or less to the extreme City limits. The Department has a mutual aid agreement with the Alturas Rural Fire Department. There is a "trickle down" effort in terms of providing mutual support. BLM first calls on CDF, and then the Alturas Rural Fire Department, and the City backs up the Alturas Rural department. According to the Fire Marshall, the city's current ability to provide fire services is adequate (Waters, June 27, 1994).

Alturas Rural Fire Department

The Alturas Rural Fire Department has the biggest fire jurisdiction in Modoc County, 362 square miles. The Department's station is located at 310 Rine Street in Alturas. The current staffing is composed of 30 volunteers. The station has extensive equipment: two structure Class A engines; two wildland engines; two pumper tankers; and two water tenders.

The department's current response time to the proposed Alturas Substation is no longer than three minutes. They have mutual aid agreements with the Likely, Cedarville, Canby, and Davis Creek fire districts and with CDF, the USFS, and BLM, and their current ability to provide service is excellent (Jacques, June 30, 1994).

Susanville Fire Department

The City of Susanville has a fire department which includes seven paid firefighters and 35 volunteer firefighters. There is one firefighter for every 286 citizens. Equipment for the department include:

- 3 - 1000 gallon pumpers
- 1 - 1500 gallon pumper

- 1 - 500 gallon pumper with rescue medical capabilities
- 1 - 750 gallon permitted pumper
- 1 - Jeep with plough
- 1 - Crash truck.

The current response time of the department is three minutes. The department has mutual aid agreements with the Susan River Fire Protection District, Janesville Fire Protection District, and the CDF. The department's current ability to provide service within its jurisdiction is good (Waldron, July 1, 1994).

Reno Fire Department

The current staffing level of the Reno Fire Department consists of 198 suppression, 17 fire prevention, six administrative and seven training/support personnel. There are ten fire stations maintained by the department. The department has mutual aid agreements with the Sparks Fire Department, the Truckee Meadows Fire Protection District, and the Airport Authority Fire Department.

The three stations which would serve the Proposed Project are located, staffed and equipped as follows:

- Station No. 2 located at 2500 Sutro Street. This station houses one engine, one truck and eight firefighters.
- Station No. 10 located at 5250 N. Virginia Street. This station houses one engine, one brush rig and four firefighters.
- Station No. 1 located at 200 Evans Avenue. This station houses one engine, one trick, one rescue rig and 12 firefighters.

Station 2's response time to the North Valley Road Substation is two minutes. The department's ideal response time is four minutes or less, and the department meets that goal 61 percent of the time. According to a Battalion Chief, Reno's current fire protection delivery system is below recommended levels and is in need of three new fire companies (Gillies, 1994).

C.11.1.4.2 *Police Protection*

With respect to police protection, the major portion of the Proposed Project is within the jurisdiction of the counties along the route. This Secion discusses the existing conditions within the county sheriff's departments; the police department of the City of Reno, which is the proposed site for expansion of an existing substation and is a possible area in which workers and their families would temporarily live during construction; and the cities of Alturas and Susanville, because of the possibility of construction workers and their families temporarily living in these two cities.

Modoc County Sheriff's Department

The Modoc County Sheriff's Department has nine sworn field personnel, making the ratio of sworn personnel to population approximately 1/1,200. The Sheriff's station and jail is located at First and Court Street in Alturas.

The department's current response time for priority calls to the area of the Proposed Project is 10 to 15 minutes, an ideal time. There are no problems with the department's current ability to provide service on priority calls. Response for less important calls, such as for malicious mischief to equipment, is more difficult. The department covers 43,000 square miles, creating distances that make it necessary for nonpriority calls to wait (Mix, 1994).

Alturas Police Department

The Alturas Police Department has a staff of seven officers, including the chief and one clerical staff person. One of the officers is working half time on a drug enforcement task force. The ratio of sworn officers to population in Alturas is approximately 1/1000. Those charged with felonies are booked into Modoc County Jail. Those charged with misdemeanors are cited and released. The police station is located at 200 West North Street. The department's response time to any place in the city is two minutes or quicker, and the department's current ability to provide service is excellent (Pickett, 1994).

Lassen County Sheriff's Department

The Lassen County Sheriff's Department has a staff of twenty-two sworn personnel which provide non-traffic related police services for all unincorporated areas of the County. The California Highway Patrol has traffic-related responsibilities in the unincorporated areas of the county.

The Proposed Project route would be divided into three segments in Lassen County for police services purposes. In the Herlong area, the department maintains a station at Doyle which has two "resident posts," i.e. the coverage is run out of the officers' homes. Along the eastern portion of Honey Lake, either the Herlong posts or the Susanville main office would respond to calls. The Madeline Plains and Ravendale areas are covered by the Susanville office and the two resident posts in Big Valley North.

The department's response time to the Herlong area ranges from one to 30 minutes; to the Honey Lake area, from 30 to 45 minutes; and to the Madeline Plains area up to 45 minutes. A commander in the Lassen County Sheriff's Department indicated that the department does provide adequate services, but they could enhance their services if they had a larger staff (Warren, 1994).

Susanville Police Department

The Susanville Police Department has a staff of sixteen sworn personnel, including a Chief, four sergeants, one person assigned to a narcotics task force, and ten patrol officers. The ratio of sworn officers to population is 1/680. An ideal ratio would be 1/500 (Burk, 1994).

The department's current response time is three to four minutes, which meets an ideal response time standard. However, as a result of population increases, the ability to provide good service is becoming strained and it may be necessary to cut some services (Burk, 1994).

Washoe County Sheriff's Department

The Washoe County Sheriff's Department has approximately 325 sworn personnel. The station which would serve the area between Reno and Border Town is located at 911 Parr Boulevard in Reno and has approximately 120 sworn field personnel. The Fort Sage area would be served either by the Reno station or the Gerlach Station in Gerlach, which has two resident posts.

The Department's response time to the Proposed Project area from the Reno office is approximately five to 15 minutes. The response time to the Fort Sage area would be 40 to 60 minutes. According to the Washoe County Sheriff, the department's ability to provide services to its residents is good (Bergevin, 1994).

Reno Police Department

The Reno Police Department has 288 current sworn personnel, making the ratio of sworn personnel to population approximately 2/1000, a good ratio according to the Deputy Chief (Galli, 1994).

The station which would service the North Valley Road Substation construction is located at East Second and High streets, the only station in the department. The department does not have precincts. The department's current response time for emergencies in progress is under five minutes, which is the national average.

C.11.1.4.3 *Schools*

This Section on schools describes the existing conditions in those school districts which would most likely be affected if a portion of the construction workers were to move with their families into the vicinity of the project.

Modoc Joint Unified School District

The Modoc Joint Unified School District (MJUSD) serves both the City of Alturas and the major portion of Modoc County. There are two other systems in the County, Tule Lake Basin Joint Unified School District, which is in the northern part of the county at the Oregon Border; and Surprise Valley Joint Unified School District, which is twenty miles west of Alturas.

MJUSD includes six schools: three elementary schools serving grades K through five; one middle school serving grades six and seven; one high school serving grades eight through twelve; and a continuation high school. The total faculty of MJUSD is 125 full time employees and 25 to 30 substitute teachers. The teacher/student ratio is approximately 1/20, which is below the maximum goal allowed by contract of 1/32. The average class size is 28, which is on goal (Nelson, 1994).

There are approximately 1,200 students in the system. No increases are projected, as the population served by the school district is fairly static. Table C.11-6 depicts the total current enrollment along with the capacity of the schools, by grade level.

Table C.11-6 Current Enrollment and School Capacity Of Modoc Joint Unified School District

	Current Enrollment	Capacity
Elementary	600	700
Middle School	300	400
High School	300	400
Total	1,200	1,500

Source: Gabriel-Roche, Inc.; K. Nelson, Modoc Joint Unified School District

Lassen Union High School District

The Lassen Union High School District encompasses most of the area from the Modoc County border south to just north of Herlong, and from the Nevada border to west of Eagle Lake. This area includes the City of Susanville. There are two high schools in the district, Lassen High and Credence Continuation High, both of which serve grades 9 through 12. Table C.11-7 indicates the current enrollment of the schools and the school capacities:

Table C.11-7 Current Enrollment and School Capacity Of Lassen Union High School District

	Current Enrollment	School Capacity
Lassen High	1,000	1,048
Credence Continuation High	75	100

Source: Gabriel-Roche, Inc.; D. Groce, Lassen Union High School District

The district anticipates that during the construction phase of the Proposed Project, the enrollment at Lassen High will increase to 1,200. The district plans to increase its capacity by adding three portable structures in August of 1994. In addition, a new high school, or a high school expansion, is in the early planning stages. The District's average class size is 27, which exceeds the district goal of 25 by two students (Grose, 1994).

Susanville School District

The Susanville School District provides grades K through eight for the City of Susanville. The three schools in the district are McKinley Elementary and Meadow View Elementary, which serve grades K through five, and Diamond View Elementary, which serves grades six through eight. Table C.11-8 depicts the total current enrollment along with the capacity of the schools, by grade level.

The system has a faculty size of 60 full time teachers. The average class size is 26, which approximates the district's goal. The district anticipates an additional 50 students during the next school year (Evans, 1994).

Table C.11-8 Current Enrollment and School Capacity Of Susanville Joint Unified School District

	Current Enrollment	Capacity
Elementary	430	530
Middle School	520	530
High School	415	480
Total	1,365	1,540

Source: Gabriel-Roche, Inc.; G. Bengard and M. Evans, Susanville Joint Unified School District

Washoe County School District

The Washoe County School District provides schools for all of Washoe County, including Reno, Sparks, Gerlach, and Incline. There are 51 elementary schools in the system serving grades K through six; ten middle schools serving grades seven and eight; and ten high schools. The district has 4,800 employees, 2,440 of which are full time teachers, and 150 of which are administrators. Table C.11-9 gives the current and projected enrollment and capacities of the district's schools.

Table C.11-9 Current and Projected Enrollment and School Capacity of Washoe County School District

	Current Enrollment	1995 to '96 Projected Enrollment	School Capacity
Elementary	25,411	26,492	28,688
Middle	6,772	7,063	7,705
High School	11,115	11,623	12,009
Total	43,298	45,478	48,402

Source: Gabriel-Roche, Inc; L. Begbie and P. Killian, Washoe County School District

The district plans to build three new elementary schools next year and at least one new elementary school the following year. The district's average class sizes and teacher/student ratios are among the lowest in the state, and nationally they rank in the middle with respect to these measures (Killian, 1994).

C.11.1.4.4 *Water Supply*

This Section discusses the water supply systems along the Proposed Project route.

City of Alturas

The City of Alturas is responsible for both the water and sewer systems for the City. Most of the remainder of Modoc County is on individual wells and septic tanks. The City has one 1,000 foot well, which is the main source of water for the community, and three additional wells which can be brought on line. The total capacity of the system is approximately three million gallons per day (MGD). Between January and May of this year, the average daily use was 1.55 MGD. The City has no need for expansion of the water system in the foreseeable future (Bearden, 1994).

City of Susanville

Susanville's Department of Public Works provides water for the City of Susanville and for a few connections outside the city limits. Ravendale, Madeline and Termo are on individual wells, as is most of Lassen County.

The city's system capacity is two million gallons per day. The average daily water consumption per household is 150 gallons per day (GPD). Individual users use 65 GPD, and there are 2.3 users per meter on average. The system's users are 75% residential. The department anticipates accommodating five percent per year growth over the next five years.

Reno

The Sierra Pacific Power Company (SPPCo) provides water for Reno, Sparks and the central Washoe County area. In addition to SPPCo, the County and approximately six smaller companies serve the project area within Washoe County. SPPCo is the primary purveyor of water in the County, with approximately 60,000 accounts. The County is the next closest in size with 6,000 accounts. SPPCo is the only purveyor which uses surface water. Eighty-five percent of the water it delivers is surface, and the remainder is ground water. All the other systems use ground water (wells).

SPPCo's system capacity is 125 to 130 MGD. They deliver 105 MGD. The approximate per capita daily use is 270 gallons. Residential versus nonresidential use varies between summer and winter. In summer approximately 75 percent of the water used is residential. In the winter that figure drops to 50 percent.

In order to comply with the Safe Drinking Water Act, SPPCo is now building a 30 MGD addition to its facilities, but will take 50 MGD off line when the new addition goes into use in June of 1996. Around the year 2000, SPPCo plans to build a new water treatment plant, or retrofit an existing plant, and add 10 to 30 MGD capacity to the system.

The Utility Division of Washoe County is responsible for both water and wastewater, principally in unincorporated areas of the county. The County has 34 wells. In the Lemmon Valley area, in the location of the Proposed Project route north of Reno, approximately .2 MGD were consumed in May, as compared to a .226 MGD capacity. Water consumption is approximately 700 GPD on a metered system and 1,000 GPD on an unmetered system. The Lemmon Valley area is unmetered. Ninety-five percent of the Division's customers are residential.

C.11.1.4.5 *Wastewater Treatment and Disposal*

This Section discusses the wastewater treatment and disposal systems along the Proposed Project route.

City of Alturas

As mentioned above, the City of Alturas is responsible for both the water and sewer systems for the City. Most of the rest of Modoc County is on individual septic tanks. The City's sewer capacity is one MGD, and the average daily use is 470,000 gallons. The City has no need for expansion of its wastewater system in the foreseeable future (Bearden, 1994). Although the system is not currently operating at capacity, all available capacity is necessary to service the existing vacant lands. In addition, the plant is antiquated and the service lines need replacement (Kessler, 1995).

Susanville Consolidated Sanitary District

The Susanville Consolidated Sanitary District provides wastewater treatment for the City of Susanville and a few small areas outside the city limits. Most of the remainder of the County is on individual septic tanks. The district serves 3,875 customers, of which 311, or eight percent, are nonresidential accounts.

The system is currently at 67 to 68 percent of its 1.2 MGD hydraulic capacity. The District recently developed a wastewater master plan, and does not anticipate any enhancements to the system for a number of years.

Reno

The City of Reno's wastewater treatment system includes a joint treatment plant, which serves Reno and Sparks, and another treatment plant which serves Stead. The joint treatment plant has a capacity to filter and process 40 MGD; and the Stead plant has a 1.5 MGD capacity. The actual amount currently being processed at the joint treatment plant is 27 MGD, and at the Stead plant .7 MGD. The amount of waste water generated per capita, per day, is approximately 325 gallons.

The City projections indicate that the plants will reach capacity around the year 2003, and staff have already begun working on a facilities plan which will address the need for expansion. Other than the City's system, the County generally is on septic tanks.

C.11.1.4.6 *Solid Waste*

This Section discusses solid waste handling along the Proposed Project route.

Modoc County

Modoc County handles solid waste for the entire county. The County is not permitted for handling hazardous wastes. The County's landfill is the Alturas Landfill, which is about one mile south of Alturas on County Road 60. The landfill is permitted to accept 20 tons per day, but actually receives about eight tons per day. The Alturas Landfill is scheduled to close by the end of 1995, at which time it will be turned into a transfer station and the County will haul its waste to the landfill at Lockwood, Nevada, which is discussed below, under Reno.

Lassen County

Lassen County owns and operates all the landfills and transfer stations in the county. Hazardous wastes are not handled by the County. The City of Susanville has private pick-up by Lassen Waste Systems, which takes the waste to County-owned landfills. Lassen Waste Systems has a few customers outside the City limits, but with those exceptions, the rest of the County "self-hauls".

The three facilities which would serve the project area are the County's main landfill, Bass Hill Landfill, which is six miles outside of Susanville; Ravendale Landfill in the town of Ravendale; and a transfer station at Wendel, which has its waste sent to Bass Hill Landfill. The Ravendale Landfill is currently at capacity and is due to be converted to a transfer station within the next year. When it is converted, its waste will be sent to Bass Hill Landfill.

The Bass Hill Landfill has 20 to 30 years of remaining life. It currently accepts about 20 tons per day. The entire County generates about 50 tons per day. The County's ability to handle solid waste is excellent. In 1994, the Board approved a five to seven year operational plan. The plan calls for all outlying stations to be converted to transfer stations and for all waste to go to Bass Hill. A materials recovery station will be created at Bass Hill, and all solid waste will be cycled through that facility (Milar, 1994)

Reno

The Reno Disposal Company serves Reno and all of Washoe County for municipal solid waste and for construction demolition waste. It does not handle hazardous waste. Various other companies handle different kinds of hazardous waste. Two of the latter are Disposal Control Services and Safety Clean.

The disposal site for the County is Lockwood Regional Landfill, which is located 12 miles east of Reno. It has 550 acres of land permitted for landfill. Its maximum capacity is 65 million cubic yards, or 12 million tons. The company projects that it will last about 35 to 40 more years. Adjacent to the 550 acres are 1,000 additional acres owned by the company, which if permitted, would allow for expansion.

The current landfill is taking in about 2,200 tons per day, based on a five-day week. In general, households generate from four to seven pounds of solid waste per day, depending on the survey. The Reno Disposal Company is adequately handling the solid waste needs of the County (Franchi, 1994).

C.11.1.4.7 *Fiscal Setting*

Table C.11-10 indicates the 1993-94 county operating budgets by general category of expenditure. As should be noted, there is a strong and inverse correlation between county population and expenditure per capita. This is logical for several reasons. There are economies of scale in provision of public services; rural counties have much more mileage of roads per capita to maintain, and cities provide some services in larger areas, such as Washoe County. For example, the differences in expenditure per capita in costs of public protection range from a low of $167 per capita in Washoe County to a high of $774 in Sierra

County. Road and facility expenditures per capita in Washoe County were approximately $52 in 1993-94 compared to $267 in Lassen County, $441 in Modoc County, and $714 in Sierra County. The latter counties have many more miles of roadway per capita, and also have higher snow removal expenditures. Public assistance costs are also much higher in the rural California counties than in the more urban Nevada county.

Table C.11-11 illustrates the sources of operating budgets for the four counties. In each case, intergovernmental fund transfers are the primary source of funding. This includes state and federal grants to support health, welfare, and road funds (generally the three largest funds for county government). General Fund activities are principally those supporting general government, public protection, and recreation programs. For the three California counties, the property tax provides approximately 30 - 40 percent of funds to support the General Fund, while the proportion in Washoe County is approximately 50 percent.

As a result of poor economic conditions in California, state government has taken a portion of local property taxes, so property tax proceeds available to the counties have dropped in recent years. As will be noted by comparing the total revenues in Table C.11-11 to the total expenditures in Table C.11-10, each of the counties is using past reserves to fund deficits resulting from current revenues being inadequate to support required expenditure levels.

The other major tax source for California counties is the sales and/or use tax. While the tax rate is 7.25% only one percent is returned to counties for General Fund activities. An additional .25% is available for the Local Transportation Fund, and .5% is made available for public protection, but that proportion is collected by the state and returned on a formula basis which does not reflect actual location of sale or use. For the purchase of equipment, the proportion of the sales tax that goes to the county (or city) is based on point of sale. If equipment is purchased out of state, the use tax goes to the county of installation.

Table C.11-12 indicates the total assessed value for the four counties. In Modoc County, there is more assessed value in land than in improvements. Lassen and Sierra Counties have more proportional value in improvements, particularly Lassen where the value of improvements and personal property is almost double that of land. The comparative breakdown is not available for Washoe County. In both states, the value of utility property is assessed by the state rather than county Assessors.

Table C.11-10 County Operating Budgets by Category: 1993-94 Fiscal Year

County Function	Modoc County	Lassen County	Sierra County	Washoe County
General Government	$2,959,000	$3,208,500	$1,312,600	$34,943,300
Public Protection	$2,505,000	$7,702,000	$2,556,000	$42,759,300
Roads & Facilities	$4,277,000	$7,390,200	$2,355,700	$13,263,500
Health	$2,345,000	$2,947,900	$1,459,800	$14,044,000
Public Assistance	$5,086,000	$12,000,300	$1,467,100	$16,449,400
Education	$337,000	$123,500	$24,000	$444,300
Recreation	$112,000	$6,000	$0	$14,101,800
Other	$1,826,900	$3,291,000	$1,157,400	$26,880,000
Total	$19,447,600	$37,785,400	$10,394,800	$162,885,000
% Change 92-93/93-94	21.6%	21.4%	27.1%	14.3%
Expenditure/Capita	$2,010	$1,370	$3,130	$638

Source: Gabriel-Roche, Inc. from County Budgets 1993-94.

Table C.11-11 County Operating Revenue Sources: 1993-94 Fiscal Year

Revenue Source	Modoc County	Lassen County	Sierra County	Washoe County
Property Tax	$1,594,500	$2,265,000	$1,940,100	$61,709,600
Other Taxes	$782,200	$1,877,500	$438,000	$4,122,900
Licenses & Permits	$95,450	$303,700	$83,700	6,452,200
Intergovernmental Transfers	$10,957,800	$23,777,000	$5,487,300	$65,144,300
Charges for Services	$725,200	$6,093,200	$729,900	$8,098,400
Fines & Forfeitures	$108,600	$143,000	$11,700	$4,674,900
Miscellaneous Others	$2,086,100	$2,947,9000	$363,500	$4,745,900
Total[a]	$16,349,900	$37,407,200	$9,054,200	$154,948,200
% Change 92-93/93-94	5.3%	6.0%	10.6%	2.2%
Prop. Tax % of General Fund	32%	37%	32%	48%

Source: Gabriel-Roche, Inc. from County Budgets 1993-94.
[a] Differences between revenues and expenditures generally accounted for by expenditure of reserves.

C.11-12 Total Assessed Value by Category: 1993-94 ($000)

	Modoc County	Lassen County	Sierra County	Washoe County[a]
Land	$274,691.5	$396,927.2	$139,267.9	
Improvements	$265,189.3	$668,062.6	$178,461.2	
Personal Property	$39,882.1	$67,760.3	$9,293.9	
-exemptions	-$20,517.1	-$18,383.8	-$9,356.5	
Net Assessed Value	$559,245.9	$1,114,367.4	$317,666.5	$5,179,851.4

Source: Gabriel-Roche, Inc. from County Budgets 1993-94
[a] Washoe County Assessed Value not available in same breakout.

C.11.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

C.11.2.1 Definition and Use of Significance Criteria

C.11.2.1.1 *Methodology*

The Proposed Project could affect socioeconomic conditions and public services, both directly and indirectly. Construction and operation of the transmission line could create a direct demand for, or disruption to public services along the alignment. Importation of a labor force to construct the Proposed Project could impact local employment patterns, population growth, and demand for housing. These factors could have an indirect impact on public service demands. The operation of the facility could result in availability of new infrastructure in the area that could induce further employment and population growth, which would also directly impact need for public services.

The evaluation of employment impacts was developed by collection of background employment trends in the project corridor, verification of the Applicant's projections of construction labor force required, and assessment of the location and duration of construction employment generated by the project. Based on evaluation of impacts of other construction projects in the corridor and knowledge of impacts of construction of utility corridors in other rural areas, this analysis has projected the number of construction jobs, their duration, sources of labor force, and probability of workers bringing their families to the area for the duration of the employment. This information has been factored into temporary and permanent housing availability, and thus into demand for public services. Projections of direct project impacts on public services were generated based on knowledge of the nature of the projected-related activities and discussion with representatives of public service providers.

C.11.2.1.2 *Significance Criteria*

Socioeconomics

Temporary Employment. The impact of the project on construction period employment patterns could be either beneficial or adverse. If unemployment in the region were reduced without causing a large influx of new employees into the region, it would be considered a beneficial impact (Class IV). If, however, labor shortages result in a competition for labor that drives up wage rates or an influx of workers who compete for existing housing, the employment impacts could be adverse impacts (Class I or Class II).

Temporary Housing. The impact on temporary housing would be considered significant if the demand for such housing takes up more than 25% of the supply of such housing that is utilized by the visitor market during the peak visitor season. If competition for temporary housing took less than 25% of such supply, it would be considered an adverse, but not significant impact (**Class III**). If temporary housing demand were such that it utilizes housing that is normally vacant during the peak season, it would be a beneficial or **Class IV** impact.

Permanent Housing. The impact on permanent housing would be significant if demand for housing generated by project-induced inmigration resulted in: (1) increases in housing rent or prices by more than 10% or (2) decreased vacancy rates to less than five percent, or (3) decreased vacancy rates by more than 20% if already below five percent. Lesser housing impacts would be considered either adverse or beneficial depending on the circumstances.

Business in the Transmission Corridor. Project construction could impact businesses along the route by displacing them or by disrupting access and/or business activities. Any impact that caused the permanent displacement or relocation of a business would be a significant impact. The significance of temporary business disruption would depend on the nature and extent of disruption. Businesses that benefited by selling supplies to the contractors or labor force could be beneficially impacted (**Class IV**).

Property Values. An uncompensated, significant depreciation in property value may occur for parcels that have been identified as a sensitive land use in Table C.8-1 or been identified as subject to a significant, unavoidable **Class I** impact in Section C.13, Visual Resources. A lesser impact or an impact on property value where the owner is appropriately compensated would be a significant, but mitigable (**Class II**) or adverse, not significant (**Class III**) impact.

Community Attitudes and Values. A substantial project in a rural area could adversely affect local community attitudes and values. Temporary or permanent community growth or visual impacts resulting from the project could adversely affect community attitudes and values. Depending on the nature of such impacts, these effects could be classified between significant (**Class I**) and adverse, but not significant (**Class III**).

Public Services

Public Protection. Impacts would be considered significant if the project caused a temporary or permanent increase in need for police and fire protection personnel or equipment that is not matched by availability of such services and the financial resources to acquire such additional services.

Schools. For schools with available capacity, any project-related temporary or permanent increase in enrollment that exceeded such capacity or results in the need to hire additional teachers or staff would be a significant impact (**Class I** or **II**). For schools with no reserve capacity, any project-related enrollment increase would represent a significant (**Class I**) impact.

Water. A significant impact would occur if the project or project-related growth would generate a demand which exceeded the ability of water utilities to supply the needed water.

Wastewater. A significant impact would occur if the project or project-related population growth would result in wastewater flows that exceeded the capacity of the collection and treatment facilities.

Solid Waste. A significant impact on landfill capacity would occur if the project or project-related population growth generated solid waste in excess of landfill capacity.

Fiscal Impacts. Project-related fiscal impacts could be either potentially adverse or positive, and relate to the findings of the public services analysis. Cases where additional service costs were in excess of additional revenues by more than $5,000 annually would be considered significant impacts.

C.11.2.2 Environmental Impacts and Mitigation Measures

C.11.2.2.1 *Employment Patterns*

The primary impacts on employment would occur during the construction period, as operation of the transmission line would require limited monitoring and maintenance activity. Fewer than five full-time workers would be required to do on-site monitoring and maintenance; routine monitoring would be done from the proponent's Reno office.

Construction

The majority of the construction period for the Alturas Transmission Line Project would occur during a 12 month period starting in January 1996. Final mitigation measure implementation would be conducted in 1997. During 1996, construction and inspection personnel would range from a low of 56 during January, to a peak of 215 workers during June 1996. Total level of effort required would be 1,360 person months, or about 110 person years of labor. Table C.11-13 illustrates the anticipated number of workers required for each construction activity during the peak eight months of activity from March to October 1996.

Because the project includes over 160 miles of transmission line and three substations, the construction process is different than a major construction project built in a single location. Like any fixed project, the same workers are not employed over the duration of the project; different trades are involved. However, in this case the workers work in different locations as well. One or two spreads of workers would move up or down the corridor, with each group providing its function (clearing and grading, concrete pads, delivery of materials, tower erection, etc.) along the entire corridor.

Table C.11-13 Anticipated Peak Construction Labor Requirements: 1996

Construction Phase	March	April	May	June	July	Aug.	Sept.	Oct.
Material transport	40	40	40	40	40	40		
Inspection	12	12	12	12	12	12	12	12
Engineering support & mobilization	10	4	4	4	4	4	4	4
ROW clearing & roads	6	6	6					
Road pads	4	4	4					
Material spotting	6	6	6	6	6			
Pole excavation	4	4	4	4	4	4		
Anchor installation	4	4	4	4				
Anchor testing		2	2	2				
Structure assembly		10	10	10	10	10	10	
Structure erection		15	15	15	15	15	10	10
Wire spotting			6	6	6	6		
Wiring stringing			22	22	22	22	22	22
De-mobilization								4
Compliance monitoring	10	10	10	10	10	10	10	10
Substation construction	22	46	64	60	30	30	30	30
Mitigation measures	20	20	20	20	20	20	20	20
230 kV line construction							10	21
Total	138	183	207	215	179	173	145	139

Source: Gabriel-Roche, Inc. from Sierra Pacific Power Company.

There are three residential locations from which SPPCo could operate during the construction process. Based on size of community and accessibility to the 160 mile corridor, it is estimated that the southern 40% of the work would be done from a Reno base, providing the base for the southernmost 65 miles, and the North Valley Road and Border Town substations. Alturas is likely to be the base for the northern 40 miles (25% of the route) including the Alturas Substation, and Susanville and surrounding smaller communities are likely to be the base for the intermediate 56 miles (roughly 35% of the ROW). No substation construction would be conducted from the Susanville area.

In rural areas with insufficient local construction labor forces, construction workers often commute long distances, live in mobile homes and campers or rent rooms on a temporary basis. A small proportion actually move their families to an area temporarily. When a project is constructed in a large urban region, it is anticipated that the majority of the labor force would be workers already living in the area. Given the availability of labor force in the general construction trades and in the required specialty trades, there would be little need for construction workers to move to Reno to work on this project.

The potential impact of the project labor force would not be noticeable in the Reno economy. The Reno metropolitan area is a dynamic and growing region. At any given time, some companies and agencies are reducing their labor force while others are increasing. Although skills are not immediately transferrable, there is a movement of workers and households in and out of the area at all times, and the impacts generated by construction demands of the Proposed Project would not cause adverse impacts on the Reno employment market.

With the exception of tasks like site clearing and preparation and material delivery, few of the union trade workers who would be employed on the project are currently available in the Susanville and Alturas areas. As described in the Section C.11.1, unemployment rates in Lassen and Modoc Counties are relatively high. In those areas, any temporary employment of local workers, which probably would not exceed 10-15 jobs in individual counties, would be considered a beneficial impact, as opposed to one that would result in adverse competition within a tight labor supply situation (**Class IV**). There is presently a large temporary labor force working to construct a new prison near Susanville for the California Department of Corrections. It is anticipated to be virtually completed by the time the Proposed Project construction would be initiated.

Secondary Employment Impacts

Most materials purchased for the project, such as steel, wire, and substation components, would be purchased from vendors outside the project corridor. A limited number of local firms would benefit from selling consumable materials to the firms and crews working on the project, and motels and restaurants would benefit from temporary increases in demand. This is likely to represent a minor beneficial impact (**Class IV**). The construction process is not anticipated to cause the displacement or relocation of any existing businesses.

No direct permanent, secondary employment impacts are anticipated as a result of the project. Modoc County officials are seeking the installation of a fiber optic cable in conjunction with the project, and are hopeful that such capability would have positive impacts on potential expansion of employment opportunities in the Alturas area (Kessler, 1994).

The transmission line could result in minor disruption of grazing and crop activity during the construction period. With the land use mitigation measures suggested (L-5 and L-7), this should not result in a significant impact on employment or business activity (**Class II**).

C.11.2.2.2 *Population and Housing Demand*

Workers are likely to reside temporarily in the Susanville and Alturas areas during construction in those areas. Given the sequence of activities, the longest duration activity requiring on specific trade is approximately eight months. Splitting that in terms of residence location, it is likely that a crew would work out of Reno for about 14 weeks, from Susanville for 12 weeks, and from Alturas for nine weeks. The exception would be construction and installation activities associated with the substation in the Alturas area, which might require ten workers on site for three to six months.

At the income levels anticipated for construction employees, the few that may move to the Reno area temporarily should not have any difficulty finding housing in the metropolitan housing market. In terms of impacts on housing supply and public services, the impacts generated by relocating workers would not be significant.

Based on the projected labor force of 114 to 185 during the peak months of work, and a distribution by location based on the proportions above (plus the location specific substations), it is projected that a maximum Reno-based workforce would be 55 to 75 people. The maximum workforce based in Susanville would be about 30 to 45, and the peak in Alturas would be 35 to 45. If 5 to 15 workers are locally based in the rural counties, 20 to 40 outside workers would be temporarily working from Alturas or Susanville locations.

A peak project labor force of 20 to 40 workers based in Alturas or Susanville for 9 to 12 weeks is unlikely to generate a significant demand for housing that would have adverse impacts. Few, if any, workers are likely to relocate their families for such a short duration, and assuming workers share motel units on weeknights (and return home on weekends), the workforce would require about 10% of the motel rooms in Alturas and 5 percent of the rooms in Susanville. This is less than typical vacancy rates, and should not adversely affect availability of rooms during the peak visitor season. In addition, some workers may utilize RVs or camp sites, thus further reducing demand on existing temporary housing resources in the corridor communities. The impact on hotels and other visitor-related services would represent a minor beneficial impact (**Class IV**).

Operation of the transmission line would not adversely affect housing demand or availability in the corridor. Few workers would be required for maintenance and monitoring.

C.11.2.2.3 *Property Values*

Projects such as the proposed Alturas Transmission Line can have two offsetting impacts on property values. The acquisition of property and installation of improvements would cause an increase in property values with respect to property taxes. Table C.11-14 indicates the anticipated value of improvements associated with the Proposed Project. However, projects of this nature also generate concern about potential negative impacts on property values. The potential impacts of the Proposed Project, especially in noise, visual, or potential electric and magnetic field (EMF) radiation issue areas, could affect property values. The reader should review Sections C.9, C.10, and C.13 to determine noise, EMF, and visual impacts, respectively.

Table C.11-14 Projected Value of Improvements

Project Improvements	Modoc County	Lassen County	Sierra County	Washoe County	Total
Substations	$8,509,000		$13,666,000	$3,979,000	$26,154,000
Percent Pole Miles	15.2%	65.3%	2.8%	16.7%	100%
Transmission Lines	$14,236,000	$61,310,000	$2,618,000	$15,691,000	$93,846,000
Total Improvement Value	$22,745,000	$61,309,000	$16,284,000	$19,670,000	$120,000,000

Source: Gabriel-Roche, Inc. from SPPCo
Note: The anticipated value of improvements is based on SPPCo's estimate of total amortized project investment, including engineering and permit fees, property and easement acquisition, construction materials required for transmission lines and substation, and construction labor costs.

For any parcel that is acquired for the facility, either in fee title or as an easement, the property owner would receive fair market value. In a rural area, this would generally reflect the agricultural value of the land.

Impacts on parcels nearby the corridor are difficult to ascertain. Where a transmission line affects a viewshed, there may be some adverse impacts on property value that would not be compensated for if the line does not cross the property. Evidence does not point to a consistent and measurable impact of transmission lines on nearby residential properties. There are homes in Alturas within 200-400 feet of the 230 kV Bonneville line which was installed approximately five years ago. There have been few sales in the area so there is no statistical data, but no property owners have requested a reduction of assessment (Johnson, 1994).

In the Verdi area near Reno, the Washoe County Assessor's Office has data on lot sales near a transmission line. Sales of comparable one-acre lots along the Truckee River indicated some potential effect of proximity to an overhead transmission corridor. A lot within 100 feet of a 150-foot-wide utility corridor sold for $145,000, while a similar lot 600 feet from the utility corridor sold for $157,000, a difference of eight percent (Berg, 1994). If equivalent houses were on the two lots, the percentage difference would be a drop in property value of two to four percent. Assessors believe that potential impacts would be largest in areas of expensive homes, such as the above, where amenities are clearly valued.

Discussions with County Assessors indicate that reductions of property assessment are possible if a property owner can present a case to the Assessor (Johnson, Bunch, Berg, 1994). Because of the rural nature of much of the corridor, few cases are expected where there would be an uncompensated impact on property value. There may be isolated cases where the Proposed Project could have a significant, unavoidable impact on property values. The following mitigation measure, when feasible, could reduce potential impacts to residential property values to an insignificant level (**Class II**).

S-1 In order to minimize property value impacts, the Applicant shall attempt, wherever possible, to select a transmission line ROW that avoids proximity to neighboring residential parcels. Where a nearby property owner whose parcel has been identified as a sensitive land use in Table C.8-1 or been identified as subject to a significant, unavoidable Class I impact in Section C.13 (Visual Resources), the Applicant shall relocate angle points, reduce structure height, provide landscape screening, or take other reasonable steps to reduce potential impacts on property value, subject to the review and approval of the Lead Agencies. The criterion for successful implementation of this mitigation measure shall be that a minimal number of properties within the selected corridor are reduced in value as a direct result of the project.

C.11.2.2.4 *Public Services*

Direct Project Demands on Public Services

Fire Protection. The operation of heavy equipment, sparks from blasting or equipment moving over rocks, and fire hazards created by the construction crews are all possible sources of fires which could result from the Proposed Project. The fact that access by public fire personnel would be difficult to many parts of the Proposed Project ROW would make it necessary for the crews on site to have equipment and procedures in place to minimize the risk of fire and to quickly eliminate any small fires which might be started. Both California and Nevada have wildland fire laws and laws governing blasting with which the contractor would be required to comply. The laws specify the measures the contractor would be required to take in order to minimize fire risk. In Nevada, the Applicant would be required to obtain a permit from the Nevada Division of Forestry for any blasting which would be necessary. The permit would specify the measures the contractor would be required to take in order to assure safety during the blasting. The State of California requires a similar blasting permit; however, those permits are issued by the sheriff's department in each county in which blasting is to take place. In addition, Federal Occupational Safety and Health Administration (OSHA) requirements specify that companies are to burn boxes that have contained explosives. The boxes must be burned under special conditions in specific locations. The Applicant would be required to take out burning permits to comply with these OSHA requirements. The permits are issued by the land agency (BLM or CDF) which has jurisdiction in the area in which the blasting takes place (Steel, 1994).

The Applicant plans to apply for all required permits and to comply with all agency requirements which result from the permitting process. Those actions, along with the following mitigation measure would reduce the potential construction-related fire impacts to an insignificant level (**Class II**):

S-2 In order to reduce the possibility of construction-related fire impacts, the Fire Prevention and Suppression Plan proposed in Mitigation Measure P-3 shall address the issue of the possibility of human-caused fire due to construction processes. The Plan shall include such measures as safety precautions, training programs, initial response strategy, and interagency coordination. As with the remainder of the plan, prior to initiation of construction, the Applicant shall provide training to project personnel regarding implementation of these measures. Proper procedures and training will help to minimize human-caused fires. The criterion for successful implementation of this mitigation measure shall be that no human-caused fires occur as a result of the construction, operation, and maintenance of the project.

Police Protection. The Proposed Project would not generate any direct impacts on police protection.

Schools. The Proposed Project would not generate any direct impacts on schools.

Water Supply. Some water would be needed during the construction process and for revegetation after construction. The amounts of water needed, however, would represent an insignificant impact on the water supply along the Proposed Project route. For the majority of the ROW, water would need to be trucked to point of use.

Wastewater Supply. The project would not generate any direct impacts on the wastewater supply.

Solid Waste. Some minimal amounts of construction debris would be generated by the project. The amounts would represent an insignificant impact on solid waste services.

Population-Related Demands on Public Services

Section C.11.2.2.2, Population and Housing Demand, presents an analysis of the numbers of workers that might be based in Reno, Alturas and Susanville during the construction period of the project. The analysis indicates that the maximum Reno-based workforce would be 55 to 75 people and that the maximum temporary workers based in Alturas or Susanville would be 20 to 40. The analysis also indicated that few workers would move their families for the short period required for the construction.

Fire and Police Protection. The small number of construction workers who might move into the cities along the project corridor as a result of the project might exert some increased demand on fire and police protection services, but the level of impact would be negligible.

Schools. Since the Population and Housing Demand analysis concluded that few workers would move their families to the project corridor, the project would not have a significant impact on schools. However, even if a few workers brought families with school children, the schools along the corridor have some level of excess capacity and also would receive increased income from the State for each additional pupil.

Water Supply; Wastewater Treatment; Solid Waste. Representatives of water providers, wastewater treatment systems, and solid waste services along the project corridor indicated that the increased population of construction workers would have no impact on those services in their communities.

Fiscal Impacts

The Proposed Project would yield one-time sales and/or use tax proceeds to state and local governmental agencies, and would generate on-going property tax revenues to county government, schools, cities, and other special districts that receive a share of the property tax.

It is difficult to project the sales or use tax revenues that would be generated for local government by the Proposed Project. In California, the basic sales tax for the three counties is 7.25%. However, the majority goes to state government. One percent goes to city or county government, and .25% goes to the Local Transportation Fund. If items are purchased in the State, the sales tax goes to the county where the sale took place. If any item is purchased out of State, such as a major transformer or steel for poles, a use tax at the sales tax rate is applied to the purchase, and the county where the equipment is installed gets the local portion of the tax. However, the State also gives companies credit for sales taxes in the state of purchase, so depending on the origin of the company selling the material, the sales tax owed to California and the counties is reduced by the amount paid elsewhere. As a result, it is not possible to predict with any accuracy how much revenue the three California counties would receive in one-time sales or use taxes (Evans, 1994).

In Nevada, a somewhat higher portion of sales or use tax goes to local agencies: 2.25% goes to school districts, and 2.25% goes to cities and counties. Like California, tax distribution is based on point of sale, and on point of installation if purchased out of state. Based on component cost estimates by SPPCo, the maximum, potential one-time sales tax that would accrue to local agencies in Washoe County would be about $460,000. In the other counties, Modoc could receive up to $127,000, Lassen about $285,000, and Sierra about $117,000. As described, these represent the maximum local share of sales taxes, and the actual revenues are more likely to be 30 to 80% of these values.

Property tax revenues can be projected somewhat more accurately. Unlike most real estate, utility improvements are appraised by the state, and as pieces of industrial equipment, they depreciate rather than appreciate. Thus, the maximum tax revenue would be generated in the year following completion, and if depreciated over 40 years, the property tax would decline approximately 2.5% annually.

As shown in Table C.11-15, the estimated value of project improvements would represent approximately four to five percent of the County assessed value and property tax receipts in the three California counties, but only about 0.1% in the more urban Washoe County. The county share of the basic one percent property tax in the California counties ranges from about 20% to 55%, and can vary within the county by tax code area. The total increase in county revenues that would result from the project would range from less than 0.05% in Washoe County to approximately one percent in Modoc and Sierra

Counties. Lassen County would receive an additional $121,500 in property tax revenue the first year after completion, the single largest increase.

Table C.11-15 Projected Tax Revenue Generation: 1996-97

	Modoc County	Lassen County	Sierra County	Washoe County
Estimated Total Assessed Value - 1996-97 ($000)	$615,000	$1,225,000	$349,000	$5,700,000
Assessed Value of Project Improvements ($000)	$22,700	$61,300	$16,300	$6,885
Project Percent of County Assessed Value	3.7%	5%	4.7%	.1%
Project Total Annual Property Tax Generation	$227,000	$613,000	$163,000	$199,000
County General Fund Percent of Total Property Tax	23%	20%	55%	42%
Project County General Fund Annual Revenue	$52,200	$121,500	$89,500	$83,300
Property Tax Generated by Project as Percent of County Total	3.3%	5.4%	4.6%	.1%
Project Generated Prop. Tax % of County Total Revenue	about 1%	about .3%	about 1%	about .04%

Source: Gabriel-Roche from Sierra Pacific Power Company, County Budgets, and County Controllers.

Because of the lack of adverse fiscal impacts expected by local agencies, the fiscal impacts of the project are likely to represent a beneficial impact (Class IV).

C.11.2.3 Cumulative Impacts and Mitigation Measures

With the exception of the expansion of the state prison in Lassen County and the potential development of the Tuscarora Gas Pipeline Project, there is little proposed development in the project corridor. Both of the cited projects are scheduled to be completed prior to the scheduled initiation of the Proposed Project, and thus should have no cumulative impact on construction employment and related population and public service requirements.

If the Tuscarora Gas Pipeline and Proposed Project are constructed concurrently, there would be temporary shortages of housing in Alturas and possibly in Susanville as well. Given a fixed supply of housing, competition for housing between construction workers and tourists could result in temporary increases in rent for hotel and motel rooms. Increased demand for apartments would increase rental rates, making the community less attractive to other migrants who might have been attracted to the area. However, the duration of such impacts would be relatively limited. In order to attract a labor force of construction workers, contractors might need to provide temporary housing in the Alturas and Susanville areas, such as trailers or RV sites. Because of the temporary nature of the employment, concurrent construction of the Tuscarora Gas Pipeline and Proposed Project would still not be expected to have significant impacts on population growth or demand for public services.

While there are potential operations phase impacts of the prison on employment, population, and public services, the additional cumulative impacts of the Proposed Project would be less than significant. The fiscal impacts of the Proposed Project are positive, so cumulative impacts are not a concern for that subject area.

C.11.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

Each of the alternatives would pass through the same counties, and thus the socioeconomic and public services setting is the same. The same employment patterns, population trends, fiscal environment, and public services exist for each of the alternatives.

In terms of impacts, there will be few discernable differences between the alternatives. The labor force requirements will not be significantly different by alternative, and none of the alternatives will cause significant disruption of business or residential patterns in the corridor. A few miles more or less in a particular jurisdiction will cause slightly different results in the fiscal impacts, but the impacts described are approximate estimates rather than precise projections, so the differences are unlikely to be significant. Depending on visual impacts, each alternative may have slightly different impacts on property values in terms of individual properties which may be affected. The public service requirements are also likely to be comparable between the alternatives, so are unlikely to provide differential impacts.

C.11.4 THE NO PROJECT ALTERNATIVE

All current socioeconomic and public service trends would continue in the California counties as they are at present. If no alternative additional source of electric power is found by the applicant, shortages of electricity could result in conditions which might limit the future growth rate of the Reno urbanized area, leading to less growth than otherwise anticipated.

C.11.5 MITIGATION MONITORING PROGRAM

The mitigation measures required for the Proposed Project would be implemented through a Mitigation Monitoring Program approved by the CPUC, the BLM, or other agency with delegated authority. Mitigation Measure S-1 requires that the Applicant site project facilities in such a manner that land use and visual impacts are minimized. Mitigation Measure S-2 refers to the Fire Prevention and Suppression Plan mitigation monitoring which is described in the Public Safety and Health Section.

Table C.11-16 Mitigation Monitoring Program

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Property values could be adversely affected by the Proposed Project (Class II)	S-1 Avoid proximity to neighboring residential parcels; relocate structures, reduce structure heights, provide screening.	Those locations on Proposed and Alternative Segments subject to a Class I land use or visual impact	BLM CPUC	Review design of project structure locations, heights, and screening	Minimum number of properties incur reduced property value.	Prior to permit issuance
Fires could be caused during construction (Class II)	S-2 Fire Prevention and Suppression Plan shall include measures addressing safety/training, response strategy, interagency coordination.	All Proposed and Alternative Segments	BLM CPUC Local fire departments USFS	During Project Design Review process, ensure preparation of adequate Fire Prevention and Suppression Plan (FPSP). During construction, conduct weekly site inspections to verify compliance with FPSP.	Ensure preparation of, and adherence to, Fire Prevention and Suppression Plan.	Develop plan during design review process; monitor during construction

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PART C.12 TRANSPORTATION AND TRAFFIC

C.12.1 ENVIRONMENTAL BASELINE AND REGULATORY SETTING

C.12.1.1 Characteristics of the Study Region and Project Area

Regional Overview

The Proposed Project route would pass primarily through rural areas except for the southern end of the route which would traverse suburban areas of north Reno.

Beginning at Alturas in Modoc County, the transmission line would run south generally parallel to U.S. 395, crossing into Lassen County near the town of Likely and continuing past Madeline, Termo, and Ravendale to Honey Lake (east of Susanville). It would go around the east side of Honey Lake, passing through Wendel and running adjacent to the Sierra Army Depot east of Herlong, and would rejoin U.S. 395 south of Doyle near Constantia. The segment between the Sierra Army Depot and Constantia passes to the east side of the Fort Sage Mountains. The line would continue south along U.S. 395 past Hallelujah Junction into Sierra County and cross into Nevada at Border Town near the location where U.S. 395 crosses the state boundary. It would then head southeast to Reno, running generally parallel to and south of U.S. 395. The transmission line would terminate in north Reno near the junction of McCarran Boulevard and U.S. 395.

Existing Roadway Network

The roadway network that could potentially be affected by the proposed transmission line includes the streets and highways that would be crossed by the line, those that would run parallel and adjacent to the line, and those that would be used as an access route for construction workers and equipment. These roadways are listed in Table C.12-1, which shows the roadway name, the responsible jurisdiction, the existing number of travel lanes and road conditions for each potentially affected roadway, the average daily traffic volume and whether the roadway crosses, parallels, or provides access to the transmission line ROW. In addition to the roadways listed, there are numerous unpaved, unnamed roads which would also be affected by the Proposed Project.

Table C.12-1 lists the study area roadways for all of the project alignment alternatives. The routing currently proposed by the applicant follows Segments A, C, E, K, L, N, O, Q, R, T, W, X, and Y. The affected roadway network for the Proposed Project includes the streets and highways listed under these segments. Refer to the end of Volume I for base maps showing the roadways and their physical relationships to the right-of-way (ROW).

The Proposed Project route parallels U.S. 395 for much of its length. U.S. 395 is the only transportation artery on the east side of the Sierra Nevada and Cascade Ranges and constitutes the largest volume of visitor use in this region of California. The broad spectrum of vehicles on U.S. 395 includes a large number of travelers from Oregon, Washington, and Canada to Reno, Nevada.

Table C.12-1 Roadways Potentially Affected by Proposed Transmission Line

Roadway	Jurisdiction	# of Lanes/Surface - Daily Traffic Volume	Type of Impact		
			Crosses	Adjacent	Access
PROPOSED SEGMENT A					
County Road 73/Crowder Flat Road	Modoc Co.	2 G - 166		X	X
Highway 299	Caltrans	2 P - 2,000	X		X
County Road 76	Modoc Co.	2 P - 178			X
County Road 54/Centerville Road	Modoc Co.	2 P - 393	X		X
ALTERNATIVE SEGMENT B					
Warner Road	Alturas	2 P - 200	X	X	X
Spicer Lane	Alturas	2 P - 100	X		X
Highway 299	Caltrans	2 P - 2,000	X	X	X
4th Street	Alturas	2 P - 100	X	X	X
County Road 54/Centerville Road	Modoc Co.	2 P - 393	X		X
County Road 138	Modoc Co.	2P - 100	X		X
PROPOSED SEGMENT C					
County Road 54/ Centerville Road	Modoc Co.	2 P - 393			X
County Road 60/ Westside Road	Modoc Co.	2 P - 214			X
County Road 62/Bayley Reservoir Rd.	Modoc Co.	2 G - 48	X		X
County Road 189	Modoc Co.	2 P - 49			X
County Road 63/Brus Road	Modoc Co.	2 P - 79			X
S. Fork Mountain Road	Lassen Co.	2 G - 50	X	X	X
ALTERNATIVE SEGMENT D					
County Road 527/Ash Valley Road	Lassen Co.	2 P - 100			X
County Road 527/Ash Valley Road	Lassen Co.	2 G - 100	X		X
PROPOSED SEGMENT E					
County Road 527/Ash Valley Road	Lassen Co.	2 P - 100	X		X
County Road 530/ Antelope Road	Lassen Co.	2 G - 100	X		X
U.S. 395/South of Antelope Road	Caltrans	2 P - 1,200	X	X	X
County Road 535/ Mendibourne Road	Lassen Co.	2 G - 100	X	X	X
ALTERNATIVE SEGMENT F/H					
County Road 525/ Brockman Road	Lassen Co.	2 G - 100	X		X
County Road 531/ Fillman Road	Lassen Co.	2 G - 100	X		X
ALTERNATIVE SEGMENT G/H					
County Road 525/ Brockman Road	Lassen Co.	2 G - 100	X	X	X
County Road 531/ Fillman Road	Lassen Co.	2 G - 100	X	X	X
ALTERNATIVE SEGMENT I					
U.S. 395 North of Termo	Caltrans	2 P - 1,200	X	X	X
ALTERNATIVE SEGMENT J					
Termo Grasshopper Road	Lassen Co.	2 P - 150	X		X
Horse Lake Road	Lassen Co.	2 G - 100	X		X
PROPOSED SEGMENT K					
U.S. 395 North of Termo	Caltrans	2 P - 1,200		X	X

Roadway	Jurisdiction	# of Lanes/Surface - Daily Traffic Volume	Type of Impact		
			Crosses	Adjacent	Access
Old Mail Route	Lassen Co.	2 G - 100	X		X
U.S. 395 South of Termo	Caltrans	2 P - 1,200	X	X	X
School House Road	Lassen Co.	2 P - 100			X
Horse Lake Road	Lassen Co.	2 G - 100	X	X	X
PROPOSED SEGMENT L					
U.S. 395 Near Snowstorm Mountain	Caltrans	2 P - 1,200	X	X	X
Shinn Ranch Road	Lassen Co.	2 G - 100	X	X	X
Stoney Creek Road	Lassen Co.	2 G - 100	X		X
U.S. 395 South of Stoney Creek Road	Caltrans	2 P - 1,200		X	X
Smoke Creek Ranch Road	Lassen Co.	2 G - 100	X		X
ALTERNATIVE SEGMENT ESVA					
U. S. 395 Near Snowstorm Mtn	Caltrans	2 P - 1,200	X		X
Shinn Ranch Road	Lassen Co.	2 G - 100	X		X
Stoney Creek Road	Lassen Co.	2 G - 100	X		X
Smoke Creek Ranch Road	Lassen Co.	2 G - 100	X	X	X
ALTERNATIVE SEGMENT M or PROPOSED SEGMENT N					
Viewland Road	Lassen Co.	2 G - 100			X
Wendel Road	Lassen Co.	2 P - 200			X
PROPOSED SEGMENT O					
Wendel Road	Lassen Co.	2 P - 200	3X	X	X
Army Base North Access Road	Lassen Co.	2 G - 100	X		X
Duck Lake Road/Base Access Road	Lassen Co.	2 G - 100	X	X	X
ALTERNATIVE SEGMENT P					
County Road 327/Fort Sage Road	Lassen Co.	2 G - 100	X	X	X
Fort Sage Mountains Access Road	Lassen Co.	2 G - 50	X	X	X
Hackstaff Road	Lassen Co.	2 G - 100			X
Homestead Ranch Road	Lassen Co.	2 D - 50	X		X
PROPOSED SEGMENT Q					
Fort Sage Road	Washoe Co.	2 G - 100	X	X	X
Dry Valley Road	Washoe Co.	2 G - 100	X		
PROPOSED SEGMENT R					
U.S. 395 South of Constantia	Caltrans	2 P - 5,300		X	X
ALTERNATIVE SEGMENT S					
U.S. 395 South of Constantia	Caltrans	2 P - 5,300	X		X
Scott Road	Lassen Co.	2 D - 100	2X		X
PROPOSED SEGMENT T					
Red Rock Road	Lassen Co.	2 G - 100	X		X

Roadway	Jurisdiction	# of Lanes/Surface - Daily Traffic Volume	Type of Impact		
			Crosses	Adjacent	Access
ALTERNATIVE SEGMENT U					
U.S. 395 North of Hallelujah Junction	Caltrans	3 P - 5,300	X		X
PROPOSED SEGMENT W					
U.S. 395 North of Border Town	Caltrans	4 P - 8,600	X		X
ALTERNATIVE SEGMENT WCFG					
U.S. 395 at Border Town	Caltrans	4 P - 8,600	X		X
PROPOSED SEGMENT X & Y, AND ALTERNATIVE SEGMENT X-EAST					
Long Valley Road	Sierra Co.	2 G - 100	X	X	X
North Virginia Street	Washoe Co.	2 P - 500			X
Mar Mac Way	Washoe Co.	2 G - 50			X
Peavine Peak Road	Washoe Co.	2 G - 50	X		X
Stead Boulevard	Washoe Co.	2 P - 1,600			X
Seneca Drive	Washoe Co.	2 P - 1,000			X
Kiowa Way	Washoe Co.	2 P - 500			X
Lemmon Drive	Reno	2 G - 100			X
Hoge Road	Reno	2 P - 1,000			X
Parr Boulevard	Reno	2 P - 1,000			X
Business U.S. 395/ Virginia Street	Nevada Dept of Transport.	4 P - 34,000	X		X

Note: P = Paved, G = Gravel, D = Dirt. 2X = 2 Crossings

Existing Rail Facilities

The study region is served by two major rail companies: the Southern Pacific Transportation Company (SPTC) and the Union Pacific Railroad System (UPRS). The SPTC tracks enter northern California from Oregon near Klamath Falls, Oregon, and run southeast to Alturas. From Alturas the tracks run south, generally parallel to U.S. 395 through Likely, Madeline, Termo, and Ravendale to Wendel, north of Honey Lake. From Wendel, the tracks run southeasterly past the Sierra Army Depot to the California/Nevada state line. This SPTC line is used by freight trains. Another set of SPTC tracks runs east-west through northern California and Nevada parallel to Interstate 80 through Reno. This east-west main line, which is used by freight trains as well as Amtrak passenger trains, is located south of the proposed transmission line terminus and, therefore, would not be affected by the project.

The UPRS tracks enter the study area from the east, crossing the California/Nevada state line east of Herlong. After passing through the Sierra Army Depot, the UPRS tracks run south through Doyle and Constantia to Chilcoot, west of Hallelujah Junction, where the main line runs west toward Sacramento and a secondary line runs southeast along U.S. 395 to Reno. These UPRS tracks are used by freight trains.

Existing Aviation Facilities

There are several aviation facilities and various aviation activities within the study area that generate air traffic which could potentially be affected by the proposed Alturas Transmission Line. These include, general aviation airports, a commercial airport, emergency response agencies which use helicopters, the Sierra Army Depot, and private landing strips. The names, locations, and types of facilities as assembled from discussions with local agencies, field reconnaissance, map review, and responses to the Notice of Preparation are presented below. The locations of these facilities are shown on Figure C.12-1.

Commercial Airports

- Reno-Cannon International Airport

General Aviation Airports

- Alturas Municipal Airport
- California Pines Airport
- Ravendale Airport
- Herlong Airport
- Reno-Stead Airport

Military Establishments

- Sierra Army Depot - Amedee Airfield

Emergency Response Facilities

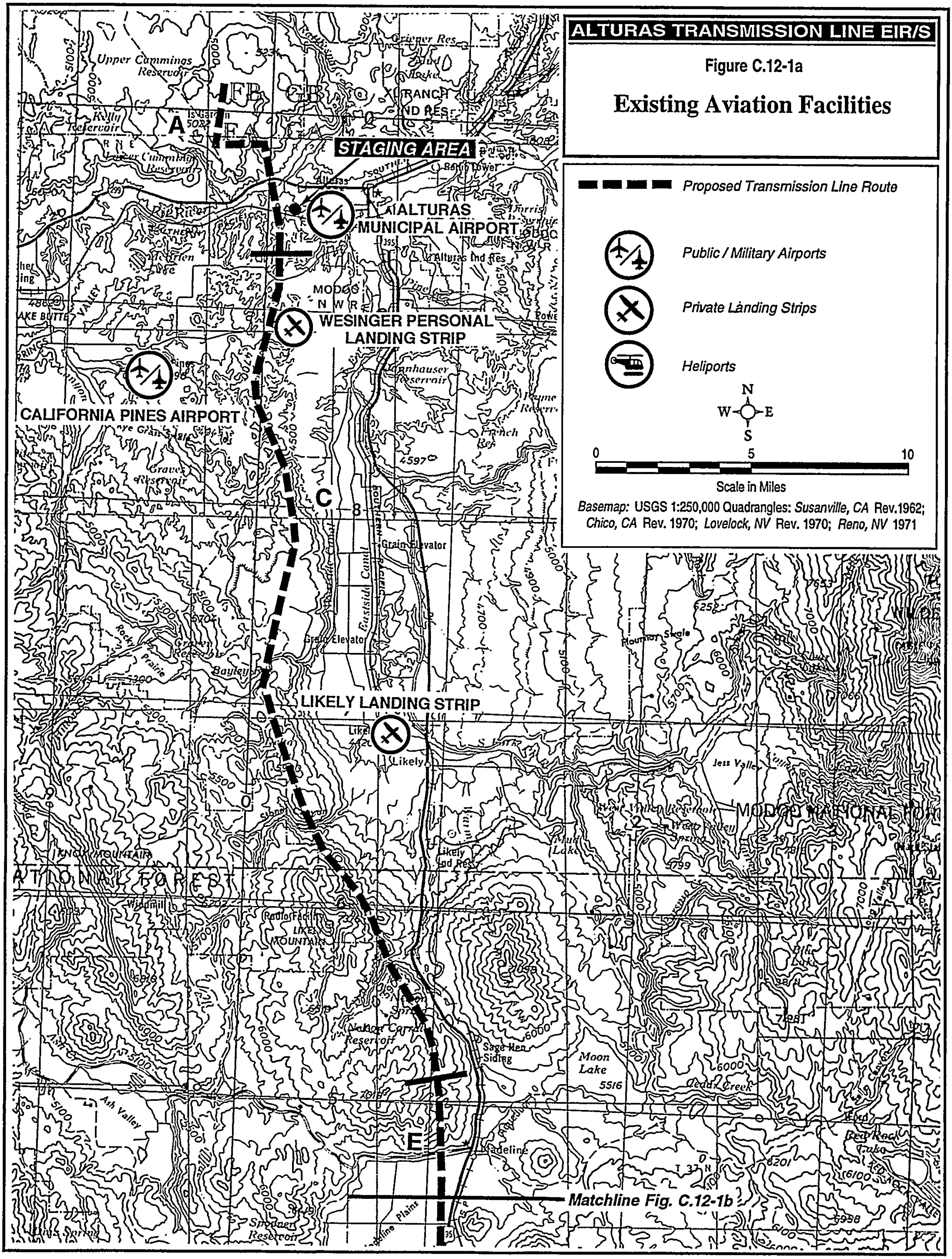
- BLM Ravendale Fire Station - Spanish Springs Heliport

Private Landing Strips

- Likely Landing Strip
- Wesinger Personal Landing Strip
- Lyneta Farms Landing Strip for Crop Spraying - Madeline

C.12.1.2 Applicable Regulations, Plans, and Standards

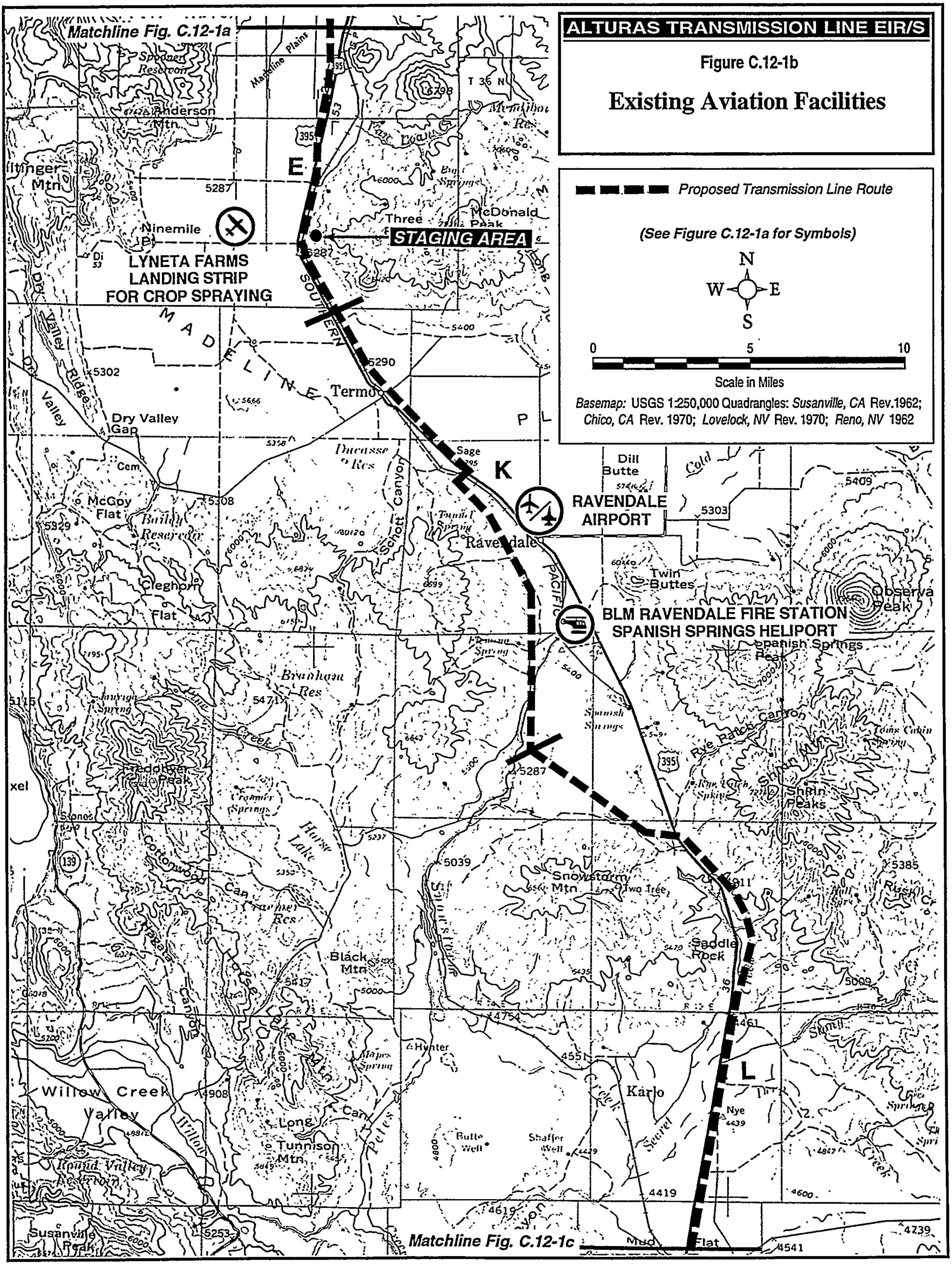
As construction of the proposed Alturas Transmission Line could potentially affect roadway conditions, access, traffic flow, and parking on public streets and highways, it would be necessary for the Applicant to obtain encroachment permits or similar legal agreements from the public agencies responsible for each affected roadway. Such permits are needed for roads that would be crossed by the transmission line, as well as any parallel roads in which construction activities would occur or that would require the use of the public right-of-way. These encroachment permits would be issued by the California Department of Transportation (Caltrans), the Nevada Department of Transportation (NDOT), the four affected counties (Modoc, Lassen, and Sierra Counties in California and Washoe County in Nevada), or one of the incorporated cities through which the alignment would pass (i.e., Alturas or Reno).

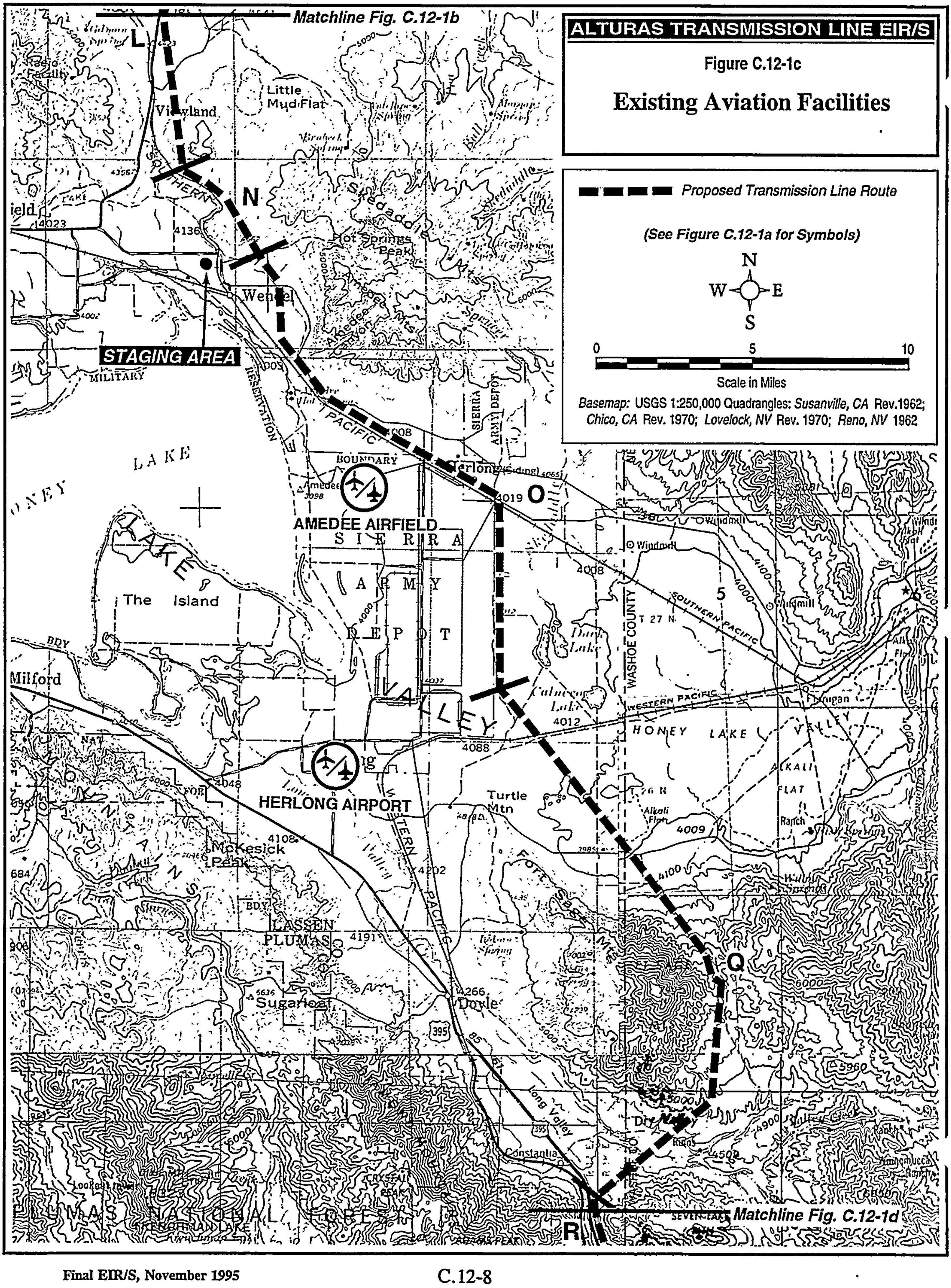

ALTURAS TRANSMISSION LINE EIR/S
Figure C.12-1a
Existing Aviation Facilities
Proposed Transmission Line Route
Public / Military Airports
Private Landing Strips
Heliports
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev.1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1971
STAGING AREA
ALTURAS MUNICIPAL AIRPORT
WESINGER PERSONAL LANDING STRIP
CALIFORNIA PINES AIRPORT
LIKELY LANDING STRIP
Matchline Fig. C.12-1b
A
C
E
Upper Cummings Reservoir
Likely
Moon Lake
Grain Elevator
Eastside Canal
NATIONAL FOREST
MODOC NATIONAL FOREST

ALTURAS TRANSMISSION LINE EIR/S

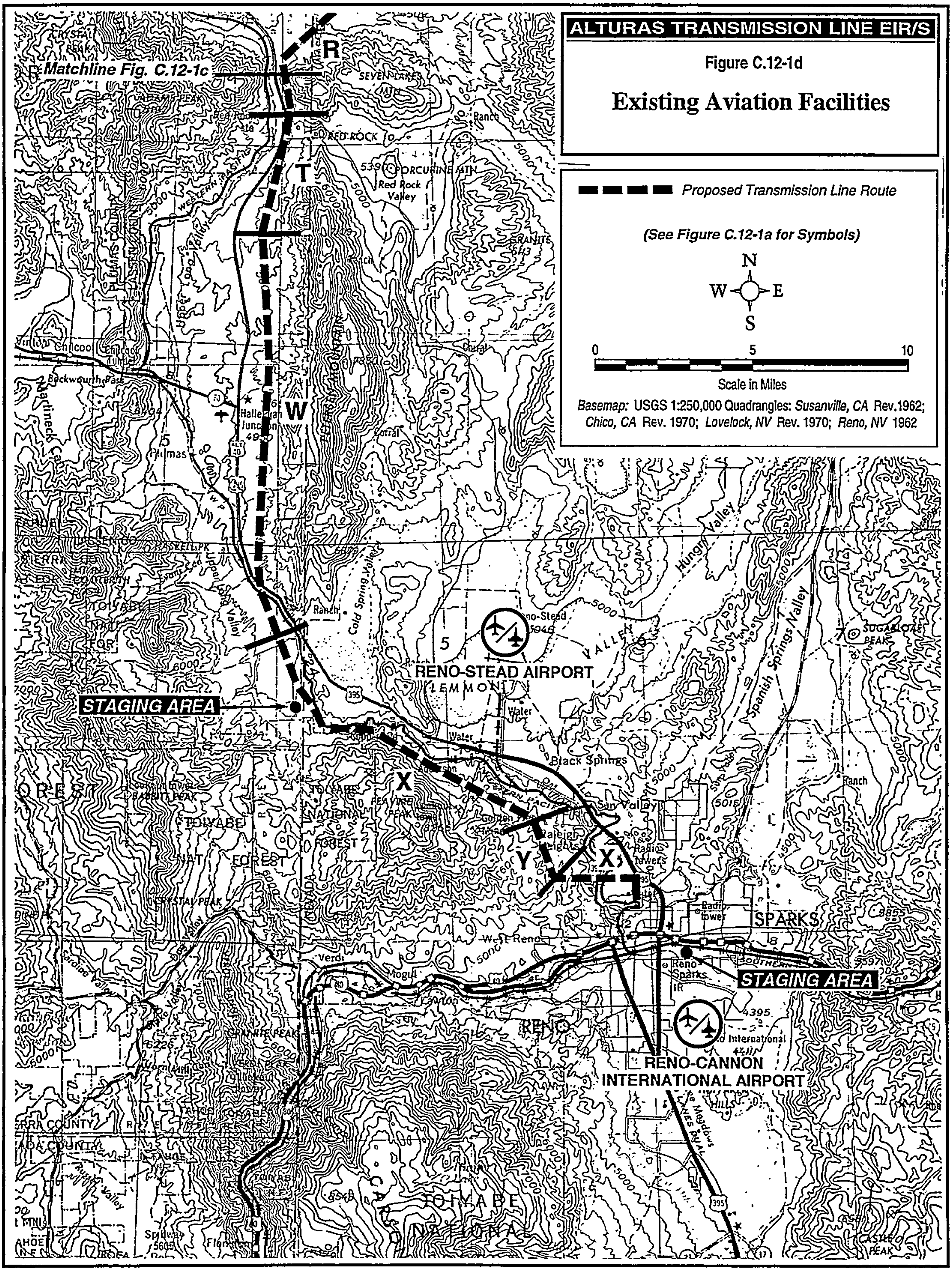
Figure C.12-1b

Existing Aviation Facilities





ALTURAS TRANSMISSION LINE EIR/S
Figure C.12-1c
Existing Aviation Facilities
Proposed Transmission Line Route
(See Figure C.12-1a for Symbols)
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev.1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1962
Matchline Fig. C.12-1b
Matchline Fig. C.12-1d
STAGING AREA
AMEDEE AIRFIELD
HERLONG AIRPORT
L
N
O
Q
R
Little Mud Flat
Viewland
Hot Springs Peak
Wendel
The Island
Milford
SIERRA ARMY DEPOT
HONEY LAKE VALLEY
WASHOE COUNTY
Turtle Mtn
McKesick Peak
LASSEN
PLUMAS
Sugarloaf
Doyle
Constantia
PLUMAS NATIONAL FOREST


ALTURAS TRANSMISSION LINE EIR/S
Figure C.12-1d
Existing Aviation Facilities
Proposed Transmission Line Route
(See Figure C.12-1a for Symbols)
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev.1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1962
Matchline Fig. C.12-1c
R
T
W
X
Y
STAGING AREA
RENO-STEAD AIRPORT
RENO-CANNON
INTERNATIONAL AIRPORT
SPARKS
RENO

Traffic control plans would be required for each location where the roadway would be directly affected or temporarily blocked by construction activities. Such plans would be subject to approval by the responsible jurisdictions. These traffic control plans shall incorporate the standards and techniques presented in such references as the Caltrans' Traffic Manual, Chapter 5, "Manual of Traffic Controls for Construction and Maintenance Work Zones;" the "Standard Specifications for Public Works Construction;" and/or the Manual on Uniform Traffic Control Devices (MUTCD), Part VI, "Traffic Controls for Street and Highway Construction, Maintenance, Utility and Emergency Operations," (U.S. Department of Transportation - Federal Highway Administration). The traffic control plans would include such features as detour routing, flagging operations, telephone numbers to call if there are problems during construction, methods of advance notification for affected residents, business owners, and emergency operations agencies near the construction area.

As the Proposed Project and support structures would encroach upon air space, the project shall comply with all appropriate regulations of the Federal Aviation Administration (FAA), and a Notice of Proposed Construction or Alteration (Form 7460-1) would be required of the applicant pursuant to Federal Aviation Regulations, Part 77.

C.12.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

C.12.2.1 Definition and Use of Significance Criteria

The traffic/transportation impacts of the Proposed Project would be considered significant if one or more of the following conditions were to occur as a result of the construction or operation of the proposed transmission line. These criteria are based on a review of the environmental documentation for other linear projects in California, as well as on input from staff at the public agencies responsible for the transportation facilities that could potentially be affected by the Proposed Project.

- Where the installation of the transmission line and related facilities within, adjacent to, or across a roadway would reduce the number of, or the available width of, one or more travel lanes, resulting in a temporary disruption to traffic flow and/or increased traffic congestion.

- A major roadway would be closed to through traffic as a result of construction activities and there would be no suitable alternative route available.

- Construction activities would restrict access to or from adjacent land uses and there would be no suitable alternative access,

- Construction activities would restrict the movements of emergency vehicles (police cars, fire trucks, ambulances, and paramedic units) and there would be no reasonable alternative access routes available or emergency access time would be lengthened.

- An increase in vehicle trips associated with construction workers or equipment would result in an unacceptable reduction in level of service on the roadways in the project vicinity, as defined by each affected jurisdiction.

- Construction activities would disrupt bus service and there would be no suitable alternative routes or bus stops.

- Construction activities within, adjacent to, or across a railroad right-of-way (ROW) would result in a temporary disruption to rail operations.

- Construction activities would impede pedestrian movements in the construction area and there would be no suitable alternative pedestrian access routes.

- Construction activities or staging activities would increase the demand for and/or reduce the supply of parking spaces and there would be no provisions for accommodating the resulting parking deficiencies.

- Construction activities or operation of the Proposed Project would conflict with any planned transportation projects in the study area.

- An increase in roadway wear in the vicinity of the construction zone would occur as a result of heavy truck or construction equipment movements, resulting in noticeable pavement or roadway surface deterioration.

- Construction activities or operation of the Proposed Project would result in safety problems for vehicular traffic, pedestrians, transit operations, or trains.

- Any of the project-related structures, wires, or cranes would permanently or temporarily extend more than 200 feet above ground level and thereby penetrate navigable airspace (according to the guidelines of the Federal Aviation Administration).

- Any of the project-related structures, wires, or cranes would permanently or temporarily be of greater height than an imaginary surface extending outward and upward at one of the following slopes: (1) 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of an airport with at least one runway more than 3,200 feet in length, (2) 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway of an airport with its longest runway no more than 3,200 feet in length, or (3) 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of a heliport. Airports and heliports included in these restrictions are those available for public use that are listed in the Airport Directory of the Airman's Information Manual or in the Pacific Airman's Guide and Chart Supplement and any airport that is operated by an armed force of the United States. In the project area, this includes the commercial and general aviation airports listed in Section C.12.1.1, the Amedee Airfield at the Sierra Army Depot, and the heliport at the BLM Ravendale Fire Station. It does not include the private landing strips.

C.12.2.2 Environmental Impacts and Mitigation Measures

A transmission line is inherently more likely to affect the ground transportation facilities (roadways and railroads) during construction than during operation, because there is typically only a minimal amount of surface activity required to operate a transmission line after construction is completed. Consequently, the bulk of the ground transportation analysis is devoted to the potential impacts during the construction phase. The aviation impacts, however, would occur during both construction and operation as these impacts are caused by physical impediments to the navigable airspace. The following sections present the construction impacts and the operational impacts of the Proposed Project on ground and air transportation. Each impact discussion is followed by a description of the mitigation measures that could be used to alleviate the adverse impacts. The impact classifications (**Class I, II, III,** and **IV**), as applied in this section, are defined in Section C.1. The phrase "affected public agencies" used throughout the discussion refers to the state and local agencies responsible for the roadways that would be impacted by the project; i.e., Caltrans, NDOT, the four counties (Modoc, Lassen, Sierra, and Washoe), and the cities of Alturas and Reno.

C.12.2.2.1 *Construction Impacts*

Roadway Blockages, Roadway Damage, and Traffic Congestion

Construction of the Proposed Project could physically block or damage public roadways at locations where the construction activities are located within the ROW of public streets and highways. The locations where such blockages could occur are shown in Table C.12-1. The potentially affected roadways are those that would be crossed by or those that would run adjacent to the Proposed Project on Segments A, C, E, K, L, N, O, Q, R, T, W, X, and Y.

As construction occurs at these locations, portions of the highway which are currently used for traffic circulation and/or parking may be temporarily unavailable as the construction activities and equipment utilize part of the public ROW. Any such blockages of roadways, and the resulting congestion and inconvenience to motorists, or any physical damage to roadways resulting from construction activities would be a significant impact, but mitigable by implementation of Mitigation Measures T-1 and T-2 below. The impact would, therefore, be **Class II**.

T-1 The Applicant shall develop a Transportation Management Plan prior to construction and implement such plan during construction to enhance safety for the traveling public. The Transportation Management Plan shall address every location at which construction activities would interact with the existing transportation system. In addition, the Transportation Manaement Plan shall include a detailed set of maps illustrating the roadways to be utilized to access the project right-of-way and substation sites, including all public and private roadways, new access routes, roadways requiring improvements, and overland travel routes. The identification of roadways shall also include a summary of which roadways will be utilized during project construction, operation, and maintenance. The Transportation Management Plan shall comply with the affected public agencies' requirements concerning restrictions on oversize or overweight vehicles and it shall require that any roadways or roadway surfaces damaged by construction activity or equipment shall be restored to their original condition. Input and approval from the Lead Agencies and affected public agencies shall be ascertained during plan preparation. The use of flagmen, warning signs, lights, barricades, cones, etc. shall be established according to standard guidelines outlined in the appropriate California and Nevada traffic manuals, the Standard Specifications for Public Works Construction, or the Manual on Uniform Traffic Control Devices (MUTCD).

T-2 In the Transportation Management Plan, the Applicant shall avoid lane closures or blockages where possible and shall minimize the duration of all closures that are required. Detours, including alternate lane routing, shall be coordinated at least 72-hours in advance of construction and shall be approved by the appropriate county sheriff; state highway patrols; and city, county, and state transportation agencies. Detours shall be arranged and properly signed at any location where the traffic stream is blocked, and advance signs shall be posted at all affected locations to notify motorists at least 72 hours prior to the impending road closure or blockage. Roadway closures or blockages shall be restricted to off-peak periods to minimize traffic congestion and delay during construction. For example, closures shall not occur between 6:30 to 9:00 a.m. and 4:00 to 6:30 p.m., or as directed by the affected public agency.

The objective of these mitigation measures is to minimize traffic delays, blockages, and driver inconvenience during construction. This objective will be accomplished by requiring the contractor to avoid roadway blockages and to use construction area traffic control measures at locations where disruptions must occur, in accordance with the standards of each affected public agency. The Transportation Management Plan shall include provisions for maintaining traffic flow through the construction zone, shall detail the method of traffic control to be used, and shall state any time restrictions that may be needed. These mitigation measures would be considered successful if the traffic delays are not excessive, as determined by the affected jurisdictions (i.e., no delays longer than five minutes per location), if no safety problems are created, and if all physical roadway damage is repaired. If compliance is not achieved, the public agencies would have the authority to revoke the encroachment permits and halt construction within the public right-of-way.

Traffic Safety

During construction of the Proposed Project, there would be a short-term increase in the potential for accidents involving motor vehicles, bicycles, and/or pedestrians. Drivers would be presented with unexpected driving conditions and obstacles because of temporary disruption to traffic flow, the removal of lanes, the presence of construction equipment in the public ROW, and the localized increase in traffic congestion. This could result in an increased occurrence of automobile accidents. Additionally, there may be disruption to bike routes, sidewalks, shoulders, and pedestrian crossings. Pedestrians and bicyclists may enter the affected streets and highways, and risk a vehicular-related accident. These impacts are considered to be significant (**Class II**), but mitigable by implementation of Mitigation Measure T-1.

Property Access

If construction activities were to occur in the outer lane or along the shoulder of a roadway, access to driveways would temporarily be blocked by the construction zone, thereby affecting access and parking for adjacent businesses, residences, agricultural land, and institutions. These impacts would be significant, but mitigable by implementation of Mitigation Measure T-3 (**Class II**).

T-3 The Applicant shall provide written notification to responsible public agencies and the property owners and tenants at properties which may be affected by access restrictions to inform them about the timing and duration of potential obstructions and to arrange for alternative access and parking provisions. If a property has more than one driveway, at least one access route shall remain open at all times. The arrangements/coordination shall occur at least one week prior to any blockages. The required Transportation Management Plan (Mitigation Measure T-1) shall include details regarding the notification of property owners and the process through which property owner questions and complaints will be resolved and/or alterative arrangements will be coordinated.

The objective of this mitigation measure is to ensure that access to affected properties will be maintained during construction. This objective will be accomplished by requiring the Applicant/contractor to provide an acceptable means of access or to schedule any closures during times that access would not be needed. This mitigation measure would be considered successful if access were to be maintained to the satisfaction of the property owners. This measure could be incorporated into the Transportation Management Plan so that the public agencies would have the authority to halt construction if acceptable access arrangements are not provided.

Pedestrian/Bicycle Circulation and Safety

Pedestrian/bicycle circulation would be affected by the construction activities as pedestrians and bicyclists would be unable to pass through the construction zone. This impact affects pedestrian/bike routes that cross the alignment, as well as those that are parallel to the alignment; i.e., sidewalks, shoulders, unpaved paths, and forest access routes. Safety could be compromised if pedestrians or bicyclists, whose routes are blocked, enter a roadway and risk a vehicular-related accident. This impact would be significant (**Class II**), but mitigable by implementation of Mitigation Measure T-4.

T-4 The Applicant shall provide alternative pedestrian/bicycle routes at all locations where an existing pedestrian or bicycle route would be obstructed by construction activities. The alternative routes shall be signed and marked appropriately. The required Transportation Management Plan (Mitigation Measure T-1) shall include details regarding pedestrian/bicycle travel routes.

The objective of this mitigation measure is to ensure that existing bicycle/pedestrian circulation is maintained and that safety is not sacrificed for bicyclists/pedestrians. This objective will be accomplished by requiring the Applicant to avoid complete blockages of any existing routes or to designate an alternative route if total closure is necessary. This mitigation measure would be considered successful if all existing bicycle and pedestrian routes are maintained to the satisfaction of the affected jurisdiction. This measure could be incorporated into the Transportation Management Plan so that the public agencies would have the authority to halt construction if acceptable circulation is not provided.

Emergency Response

Construction activities could potentially interfere with emergency response by ambulance, fire, paramedic, and police vehicles. The loss of a lane and the resulting increase in congestion could lengthen the response time for emergency vehicles passing through the construction zone. Moreover, there is a possibility that emergency services may be needed at a location where access is temporarily blocked by the construction zone. This impact is considered to be significant (**Class II**), but mitigable by implementation of Mitigation Measure T-5.

T-5 The Applicant shall conduct advance coordination with emergency service providers to minimize the chance of creating problems or delays for emergency vehicles. Police departments, fire departments, ambulance services, and paramedic services shall be notified in advance of the proposed locations, nature, timing, and duration of any construction activities and advised of any access restrictions that could impact their effectiveness. At locations where access to nearby property is blocked, the contractor shall be ready at all times to accommodate emergency vehicles by measures such as rapid removal of equipment, and use of short detours or alternate routes. The required Transportation Management Plan (Mitigation Measure T-1) shall include details regarding emergency services coordination and procedures.

The objective of this mitigation measure is to ensure that emergency service providers are aware of the construction activities and that emergency access would not be blocked. This objective will be accomplished by requiring the Applicant to document the advance coordination with all potentially affected emergency agencies and to be prepared at all times to accommodate access across the construction zone if a roadway or driveway were to be blocked. This mitigation measure would be considered successful if all emergency providers were informed about the construction activities and if there were no unacceptable delays to emergency access vehicles. This measure could be incorporated into the Transportation Management Plan so that the public agencies would have the authority to halt construction if acceptable coordination and/or emergency access are not provided.

Increased Traffic Volumes

During the construction phase, traffic volumes would increase on the roadways in the project area as construction workers, equipment, and material delivery trucks would travel to and from the construction zone. During peak construction, there would be approximately 185 workers along the construction route.

As a worst-case scenario, the 185 employees would arrive at one construction site in 185 private vehicles. A more realistic scenario is that the 185 workers would commute to one or more of the five construction staging areas (described in Section B.2.3.5) in approximately 62 private vehicles (average of 3 persons per vehicle), then they would be transported to one or more construction sites in approximately 23 crew trucks and pickup trucks (average of 8 persons per vehicle).

In addition to the workers' vehicles, construction activities would generate truck traffic on the roadways providing access to the construction site and staging areas. It is estimated that approximately 20 to 30 truck trips per day (round trips) would be generated by the construction activities per construction zone. The travel routes for these truck trips would be changing from week to week as the location of the construction zones would be continually changing.

The traffic generated by the construction workers would occur at two specific times during the day - arriving at the staging areas and construction zone in the morning and leaving in the afternoon (for a daytime shift). The truck trips would be distributed throughout the day. The location of construction worker and truck trips would be changing from week to week as the location of the construction zones would be continually moving as construction along the route progressed. The impacts of construction traffic would be adverse, but not significant (**Class III**).

There would also be a nominal increase in traffic during construction of the substations (described in Section B.2.2.3). It is estimated that this construction activity would require a maximum of 15 workers at each of the three sites, who would travel to/from each site in five to seven vehicles. It is also anticipated that there would be approximately ten truck trips per day delivering construction equipment and material to each site. The primary access route to the Alturas Substation Devils Garden site would be Highway 299 and County Road 73 (Crowder Flat Road). The primary access route to the Border Town Substation would be U.S. 395 and Long Valley Road. The primary access route to the North Valley Road Substation would be North McCarran Boulevard, Socrates Drive, and Southwest Gas Lane. The resulting traffic impacts on these access routes would be adverse, but not significant **(Class III)**.

Although the impacts of the traffic that would be generated during construction are not expected to be significant, the following mitigation measure is recommended to ensure that the traffic impacts are concentrated at the staging areas and minimized at the construction zones.

T-6 The Applicant shall provide crew trucks or buses to shuttle construction workers between the staging areas and the work site throughout the duration of the construction phase. This would minimize the traffic volumes and parking demand at the work site caused by the construction personnel. Off-street parking sufficient to accommodate all contractor and private vehicles shall be provided at the staging areas. Approval shall be obtained from the local jurisdictions for the staging areas prior to construction. The Transportation Management Plan (Mitigation Measure T-1) shall include details regarding the use of crew trucks or shuttle buses for transporting construction workers.

The objective of this mitigation measure is to reduce the volume of traffic that would be generated at the construction sites. This objective will be accomplished by requiring the contractor to use approved staging areas with shuttles to the work zone so that the number of vehicles at the work zone would be minimized. This mitigation measure would be considered successful if there were no significant adverse traffic impacts at the work zone. This measure could be incorporated into the Transportation Management Plan so that the public agencies would have the authority to halt construction if a staging area were not provided or if significant traffic impacts were to occur at the construction zone.

Equipment Storage and Parking Spaces

There would be a need to store such equipment as trucks, vans, backhoes, compressors, dozers, cranes, pullers, tensioners, and trailers at or near the construction site. The trucks and active equipment would likely be parked near the construction zone along the project ROW, while the equipment which is not actively in use would be stored at the staging areas. Although it is not an issue along most of the project route, there may be some locations in the more developed areas where the construction equipment would displace areas which otherwise would be used for public parking. This impact is considered adverse, but not significant **(Class III)**.

Although the impacts on parking are not anticipated to be significant, the following mitigation measure is recommended to minimize disruptions at locations which may be affected.

T-7 At locations where the construction activities would eliminate existing parking spaces, the Applicant shall post signs (at least 72 hours in advance) and notify responsible public agencies and nearby businesses/residents in writing of the location and duration of the parking displacement. If nearby businesses or residences inform the Applicant that the loss of spaces would create a hardship, alternative spaces shall be arranged by the Applicant, and appropriate guide signs installed. The Transportation Management Plan (Mitigation Measure T-1) shall include details regarding the notification of nearby businesses/residents and the process through which alterative arrangements will be made.

The objective of this mitigation measure is to reduce parking impacts and minimize the amount of equipment at the construction sites. This objective will be accomplished by requiring the contractor to use approved staging areas for the storage of equipment and to provide advance notification if existing parking spaces are to be displaced by the work zone. This mitigation measure would be considered successful if there were no significant adverse parking impacts at the work zone. This measure could be incorporated into the Transportation Management Plan so that the public agencies would have the authority to halt construction if significant parking impacts were to occur at the construction zone.

Rail Operations

The Proposed Project would cross over the SPTC railroad tracks at five locations (Segment A southwest of Alturas, Segment E at Madeline Plains, Segment K north and south of Ravendale, and Segment O near the Sierra Army Depot) and would cross the UPRS tracks at three locations (Segment Q near Herlong, Segment W near Border Town, and Segment X near the end of the alignment in north Reno). A railroad crossing would be constructed at the Segment A crossing so that construction equipment could cross the tracks at grade. This crossing would not be available for public use. The project would not likely have any adverse impacts on rail operations as there would be no disruption to train movements. All safety requirements of the CPUC and the railroad companies would be met. There is a possibility, however, that the construction activities could result in a safety problem if personnel or equipment inadvertently encroached on the rail alignment during a train passage. The impact would be adverse, but not significant **(Class III)**.

Although the rail impacts are not expected to be significant, the following mitigation measure is recommended to ensure that the construction activities do not result in any safety or compatibility problems.

T-8 The Applicant shall coordinate rail operations compatibility issues with SPTC and UPRS prior to construction and shall conduct activities within the railroad ROW only in the presence of appropriate railroad personnel. Railroad representatives shall be on site at all times when construction occurs within the active rail lines.

The objective of this mitigation measure is to ensure that the construction activities would not result in safety or operational conflicts with the railroads. This objective will be accomplished by requiring documented coordination with the affected railroad companies and by requiring railroad personnel to be present when construction occurs within an active rail line. This mitigation measure would be considered successful if the construction activities had no adverse impacts on rail operations or safety.

Aviation Activities

According to the guidelines of the FAA, construction of the Proposed Project would have a significant impact on aviation activities if a structure, crane, or wire were to be positioned such that it would be more than 200 feet above the ground or if an object would penetrate the imaginary surface extending outward and upward from a public or military airport runway or a helipad, as described in Section C.12.2.1. As the maximum height of the structures (and the wires in most circumstances) would be 130 feet and the maximum height of a crane would be approximately 165 feet, these project components would not extend into navigable airspace unless they were within the restricted area of a designated airport or helipad.

The FAA restrictions apply to the public airports within the study area (Alturas Municipal Airport, California Pines Airport, Ravendale Airport, Herlong Airport, Reno-Stead Airport, and Reno-Cannon International Airport) as well as the Amedee Airfield at the Sierra Army Depot and the helipad at the U.S. Bureau of Land Management Ravendale Fire Station. The Proposed Project was analyzed to determine if a 130-foot structure, the wires between the structures, or a 165-foot crane would protrude into the navigable airspace around these airports, either permanently or temporarily, as defined by the FAA. The analysis indicates that the Proposed Project alignment would have height constraints near the Alturas Municipal Airport, the Ravendale Airport, and the Amedee Airfield at the Sierra Army Depot as follows:

- As Segment A of the Proposed Project passes within 7,000 feet of a runway at the Alturas Municipal Airport, there would be a 70-foot height restriction along this segment (based on a 100 to 1 slope)
- As Segment K of the Proposed Project passes within 4,000 feet of the runway at the Ravendale Airport, there would be an 80-foot height restriction along this segment (based on a 50 to 1 slope)
- As Segment O of the Proposed Project passes within 5,500 feet of the Amedee Airfield runway at the Sierra Army Depot, there would be a 55-foot height restriction along this segment (based on a 100 to 1 slope).

It should be noted that these height restrictions would vary along the affected segments, depending upon the actual distance from the runways. The heights cited reflect the most restricted location based on the preliminary centerline alignment. None of the other public airports, nor the heliport, would be directly affected by the Proposed Project.

If the Proposed Project resulted in an encroachment of the airspace near a public or military airport, there would be a significant impact. The significant impacts can be avoided, however, by limiting the structures, cranes, and wires to heights that are below the FAA thresholds, as outlined in Mitigation

Measure T-9 (below). The resulting impacts would be **Class II**. If the height restrictions are infeasible and must be exceeded, then Mitigation Measure T-10 would be required.

T-9 The Applicant shall design and construct the project with height restrictions on the structures, cranes, and wires so that no object will affect the navigable airspace around a public or military airport, as defined by the FAA (see Section C.12.2.1). Based on the preliminary alignment for the Proposed Project, there shall be a height restriction of 70 feet on Segment A near the Alturas Municipal Airport, 80 feet on Segment K near the Ravendale Airport, and 55 feet on Segment O near Amedee Airfield at the Sierra Army Depot. Prior to permit issuance, actual locations of restricted structures shall be reviewed and approved by the Lead Agencies in consultation with the airport managers and FAA.

The objective of this mitigation measure is to ensure that the project would not penetrate into navigable airspace around a public or military airport. This objective will be accomplished by restricting the height of any structures, cranes, or wires to remain below the FAA thresholds. This mitigation measure would be considered successful if there were no encroachments into the navigable airspace around the public or military airports.

Although the airspace around private landing strips is not subject to the FAA restrictions, they were analyzed using the FAA guidelines to determine if the structures, wires, or cranes would penetrate the imaginary surface as defined for public and military airports. The analysis indicates that 70 to 130-foot structures (and hence the wires and cranes) along the project alignment in the vicinity of the Wesinger personal landing strip would protrude above the limits of the imaginary surface defined by the FAA. As Segment C of the Proposed Project passes within 700 feet of this private landing strip, it would not be feasible to mitigate the impact by reducing the height of the structures. Although this impact would be an adverse one for the peoperty owners, since private landing strips are not regulated and do not fall within the auspices of FAA, the impacts would be classified as adverse, but not significant (**Class III**).

The wires, in most locations, would be 130 feet above the ground or less as they would hang between structures which have a maximum height of 130 feet. The wires would not, therefore, affect navigable airspace under most circumstances. Although the wires and structures may create a safety hazard for crop sprayers and other private aircraft, the impacts would not be significant according to the FAA guidelines. They would be adverse, but not significant (**Class III**). Similarly, at locations where the alignment would pass through an established hang gliding area, as does Segment X near Peavine Mountain, the impacts would be adverse, but not significant. At such locations, the affected parties may submit a written request to the Applicant and/or the Lead Agencies to install spherical markers or similar devices to improve visibility, subject to review and approval by the Lead Agencies in consultation with the FAA.

There may be some locations along the Proposed Project alignment where the surface grade is depressed between adjacent structures and the wires would hang at an elevation greater than 200 feet above the ground. A classic example of this is a location where two adjacent structures are positioned on ridges and the wires extend across a valley. According to the FAA guidelines, this would be an obstruction of navigable airspace if any wire is higher than 200 feet above the ground below. Since the structure locations have not yet been specified, the locations of such airspace encroachments cannot yet be identified. It is anticipated, however, that there would be several locations where the transmission lines would extend across a valley at a height greater than 200 feet above the ground. This would constitute a significant impact (**Class II**), that is mitigable by implementing Mitigation Measures T-10 and/or T-11.

T-10 The Applicant shall notify the Western-Pacific Region of the FAA if any temporary or permanent feature of the Proposed Project will exceed an obstruction standard or encroach upon navigable airspace, as described in Section C.12.2.1 and further defined in the FAA Advisory Circular No.70/7460-21. The notification shall be made on FAA Form 7460-1, "Notice of Proposed Construction or Alteration," as required by Federal Aviation Regulations (FAR) Part 77, "Objects Affecting Navigable Airspace." The Applicant shall then incorporate the appropriate high-visibility markings and lighting to make the offending objects visible to pilots, as recommended by FAA.

The objective of this mitigation measure is to ensure conformance with FAA procedures if a wire or other feature were to encroach into navigable airspace. This objective will be accomplished by following the FAA requirements and installing any necessary markings and lights. This mitigation measure would be considered successful if all features are deemed acceptable by the FAA. The FAA has the authority to prohibit any features that do not comply with the guidelines.

T-11 The Applicant shall position structures at locations that would prohibit wires from extending more than 200 feet from the ground, where feasible. If not feasible, the Applicant shall notify the FAA, as defined by Mitigation Measure T-10.

The objective of this mitigation measure is to minimize the placement of wires in the airspace between adjacent ridges. This objective will be accomplished by encouraging the applicant to position structures so that the wires do not extend more than 200 feet above the ground. This mitigation measure would be considered successful if the 200-foot threshold is not exceeded or if the FAA approves the encroachment and the required markings/lighting at locations where it is not feasible to position the wires below 200 feet.

C.12.2.2.2 *Operational Impacts*

Ground Transportation System

Operation of the Proposed Project would have negligible impacts on the area's ground transportation system (highways and railroads) under normal circumstances, as the inspection and maintenance activities would generate limited vehicular traffic. If a major repair were required at a particular location, the temporary transportation impacts would be virtually the same as the construction impacts addressed above for each location.

If an accident or structural failure were to occur, there could potentially be adverse impacts on rail operations and highway traffic, as partial or complete blockages of transportation facilities may result.

If a major accident occurred, the impact would be significant and unmitigable (**Class I**). Mitigation Measure T-12 is recommended as an emergency response plan.

T-12 The Applicant shall prepare an Emergency Response Plan which addresses potential disruption to the transportation system in case of a major accident or structural failure. The Applicant/operator shall be prepared at all times to immediately respond to an accident which would affect any transportation facility so that necessary facility closures, detours, removal, and repair operations can be initiated expediently. Plan review and coordination with appropriate law enforcement agencies, public works departments, fire departments, and state agencies shall be required, prior to project operation and in the event of an upset. The Applicant shall submit the Emergency Response Plan with written concurrence from the appropriate agencies described above to the Lead Agencies for approval prior to energizing any portion of the Proposed Project.

The objective of this mitigation measure is to ensure that the Applicant and the potentially affected agencies are ready to quickly respond in the unlikely event that an accident or emergency would place structures or wires within a transportation corridor. This objective will be accomplished by preparing and annually updating the proposed Emergency Response Plan. This mitigation measure would be considered successful if all parties are knowledgeable regarding their roles during an emergency and if the chains of communication and authority are established. Ultimately, the measure would be considered successful if it were demonstrated during an actual emergency that all downed wires and/or structures were quickly removed from the transportation rights-of-way without any significant traffic delays or safety problems. As incidents involving high-voltage wires accidentally blocking a highway are extremely rare, it is not possible to collect dependable data regarding response times or removal techniques. The purpose of this mitigation measure is to be prepared in case an incident were to occur.

Aviation Activities

Operation of the Proposed Project would have the same aviation impacts as described in the construction section; i.e., the presence of structures and wires in navigable airspace would result in safety impacts to aircraft. Refer to the previous discussion in Section C.12.2.2.1 for details regarding significance of impacts and recommended mitigation measures. In addition, the Applicant may occasionally use helicopters and/or small planes for inspection and repair activities. The impacts of these occasional flights would be negligible.

C.12.2.3 Cumulative Impacts and Mitigation Measures

Cumulative traffic impacts would occur on the roadways affected by the Proposed Project if other construction activities such as utility projects, pipeline projects, other transmission lines, roadway construction and repair, or property development projects were to be implemented simultaneously with the construction of the Proposed Project. As the project's impacts on traffic conditions would occur during the construction phase and would be negligible during operation (except for a major accident), the cumulative traffic impacts would likewise occur during construction of the Proposed Project.

To identify projects which could potentially result in a cumulative traffic impact, information has been obtained from the public agencies whose jurisdictional areas would be traversed by the Proposed Project, as presented in Section B.5. The projects that could have a cumulative impact on traffic conditions during the construction of the proposed transmission line are those that share or cross the right-of-way of the Proposed Project. The projects that may have a direct cumulative traffic impact if construction took place simultaneously with that of the Proposed Project are listed on Table C.12-2. The most noteworthy of these cumulative projects is the Tuscarora Gas Transmission Pipeline Project, which would run adjacent to the Proposed Project for approximately 37 miles at various locations along Segments A, C, E, K, L, and O.

Table C.12-2 Projects with Potential Cumulative Traffic Impacts

Number	Location	Description
	Linear Projects	
L	Between Alturas and Herlong parallel to the Proposed Project at various locations along Segments A, C, E, K, L, and O	Tuscarora Pipeline - 20-inch underground gas transmission pipeline
	Other Projects	
6	Eastern Lassen County - Interties with Proposed Project at Segment O	Lassen Municipal Utility District power transmission line
8	East side of Fort Sage Mountains near Proposed Project Segment Q in Lassen County	Water line from Fish Springs Ranch Pumping Project
16	Between Moon Lake Reservoir and West Valley Reservoir on BLM lands - Interties with Proposed Project at Segment C	West Valley Pumped Storage Hydroelectric Plant - including transmission line
18	Northwest Reno, west of Virginia Street and south of Segment X	Evans Creek Dam

Note: L indicates linear projects from Table B- 9. Numbers indicate cumulative project numbers from Table B- 9.

The cumulative traffic impacts could be significant, if simultaneous construction activities resulted in roadway blockages or other transportation disruptions that affected a roadway to a greater extent than would the Proposed Project alone. For example, if construction of the Proposed Project requires a travel lane to be blocked at a particular location and if the construction of another project also requires a lane blockage at the same location and time, the cumulative impacts would be significant, unless the construction activities and traffic management plans were coordinated and compatible. The cumulative traffic impacts would be significant (**Class II**), but mitigable by implementing Mitigation Measure T-13.

In addition to the direct impacts of simultaneous construction discussed above, virtually all of the projects discussed in Section B.5 could have an indirect cumulative traffic impact if they were to be constructed prior to the construction of the Proposed Project, as they would generate additional traffic (during both construction and operation) on the roadways that would be impacted by the Proposed Project. There may also be an indirect associated with project-induced urban growth, which could potentially result in an increase in traffic volumes on the Reno area roadways. These impacts would be adverse (**Class III**), but not significant.

During operation of the Proposed Project, there could be a cumulative impact on the transportation system if a major earthquake, storm, or other catastrophic event were to cause multiple accidents involving the Proposed Project and other transmission lines or pipelines, resulting in the closure of roadways or rail lines. The Proposed Project would add to the cumulative risk and potential effects of such an event. The cumulative impact would be significant (**Class I**). The severity and duration of impacts could be mitigated by requiring all operators of transmission lines and pipelines that could potentially affect the transportation corridors to prepare and annually update an emergency response plan, and to be prepared to react immediately to an accident, as described in Mitigation Measure T-12 above for the Proposed Project.

T-13 To minimize cumulative traffic impacts, the Applicant shall maintain and document close coordination prior to and during construction with the agencies responsible for encroachment permits on each affected roadway and with the utility companies which have facilities along the same ROW. The required Transportation Management Plan (Mitigation Measure T-1) and Emergency Response Plan (Mitigation Measure T-12) shall both include details regarding Applicant, agency, and utility company coordination.

The objective of this mitigation measure is to ensure that the construction of the Proposed Project would not conflict with or create cumulative adverse traffic impacts with another construction project that may occur simultaneously. This objective will be accomplished by maintaining close coordination with the agencies that issue encroachment permits and with utility companies in the project area. This mitigation measure would be considered successful if simultaneous or cumulative adverse construction impacts are avoided.

C.12.2.4 Unavoidable Significant Impacts

With the implementation of the mitigation measures discussed above in Sections C.12.2.2 and C.12.2.3, all identified significant transportation impacts of the Proposed Project would be reduced to a level of less than significant, except that the occurrence of a major accident could result in a significant unmitigable impact if arterial roadways and/or railroad tracks were to be blocked for an extended period of time.

C.12.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

C.12.3.1 Alturas Area Alternative Alignment (Segment B)

Environmental Setting. Alternative Segment B is an alternative to Proposed Segment A at the north end of the project route. Located to the east of Proposed Segment A, this alternative would begin on the north side of Alturas at an existing transmission line and proceed first to the west, then to the south across Highway 299. The alternative would then pass to the west of the Alturas Municipal Airport, cross the Pit River and the SPTC railroad tracks, and rejoin the Proposed Project alignment at the Three Sisters area southwest of Alturas. Table C.12-1 lists the roadways that would potentially be affected by the Alternative Segment B.

Environmental Impacts and Mitigation Measures. The impacts of Alternative Segment B on the roadway network and traffic conditions would be similar to the Proposed Segment A, except the alternative would cross five versus two roadways (see Table C.12-1); both segments would cross Highway 299. The impacts of Alternative Segment B on rail operations would be virtually the same as described above in Section C.12.2.2 for the Proposed Segment A, except that the alternative would cross the SPTC railroad tracks at a location approximately 3,000 feet east of Proposed Segment A. Mitigation Measures T-1 through T-8 for construction impacts and Mitigation Measure T-12 for operational impacts are also applicable to Alternative Segment B.

With regard to aviation impacts, the impacts of Alternative Segment B are significant since the alignment of the alternative passes within 3,700 of a runway at the Alturas Municipal Airport (as opposed to 7,000 for Proposed Alternative Segment A). To stay below the FAA height limits, the maximum structure height would be 37 feet at this restricted location (based on a 100 to 1 slope). Mitigation Measures T-9 through T-11 would be required for Alternative Segment B since a 37-foot structure height would be infeasible given a required 34-foot minimum conductor ground clearance. With the implementation of Mitigation Measures T-9 through T-11, this impact would be reduced to an insignificant level (**Class II**).

Cumulative Impacts and Mitigation Measures. The cumulative impacts associated with Alternative Segment B and all other alternative alignments discussed in this Section would be virtually the same as those described in Section C.12.2.3 for the Proposed Project. Mitigation Measure T-13 would be required to minimize the cumulative traffic impacts. This discussion is not repeated for each of the following alternative alignments.

With the implementation of the mitigation measures discussed in Sections C.12.2.2 and C.12.2.3, all identified significant transportation impacts would be reduced to a level of less than significant (**Class II**), except that the occurrence of a major accident could result in a significant unmitigable impact if arterial roadways and/or railroad tracks were to be blocked for an extended period of time (**Class I**).

C.12.3.2 Madeline Plains Alternatives (Segments D, F, G, H, I)

Environmental Setting. The Madeline Plains Alternatives are located to the west of Proposed Segment E through the Madeline Plains area. Alternative Segment D leaves the proposed route at a point near U.S. 395, approximately midway between the town of Madeline and the Modoc/Lassen County line (at the south end of Segment C) and rejoins the proposed route near U.S. 395 north of Termo (at the north end of Proposed Segment K). The roadways that would potentially be affected by the Madeline Plains Alternatives are indicated in Table C.12-1 under Alternative Segments D, F, G, H, and I.

Environmental Impacts and Mitigation Measures. The impacts of the Madeline Plains Alternatives on the roadway network and traffic conditions would be virtually the same as described in Section C.12.2.2 for Proposed Segment E except that the affected roadways would be those listed under Alternative Segments D, F, G, H, and I instead of those listed under Proposed Segment E in Table C.12-1. Alternative Segments F and G are optional routes within this alternative alignment. The impacts of the Madeline Plains Alternatives on rail operations would also be similar to Proposed Segment E since

Alternative Segment I of the Madeline Plains Alternatives would cross the SPTC railroad tracks at a location approximately five miles south of the Proposed Segment E crossing at Madeline Plains north of Termo. Mitigation Measures T-1 through T-8 for construction impacts and Mitigation Measure T-12 for operational impacts, are also applicable to the Madeline Plains Alternatives (**Class II**).

With regard to aviation impacts, Alternative Segment G, would place the transmission line in an area that experiences frequent crop spraying activities and has an informal landing strip that is used by Lyneta Farms. Alternative Segment G, which would traverse an active crop spraying area and interfere with the existing takeoff and landing patterns, would result in safety impacts for these aviation activities as the structures and wires would obstruct the airspace. Although this impact would not be defined as significant according to the FAA criteria, it would be an adverse impact for the owners, pilots, and employees of Lyneta Farms. Since Alternative Segment F of the Madeline Plains Alternatives is routed along the western and southern edges of the active crop spraying areas, it would not be as disruptive or as unsafe as Alternative Segment G. According to a representative of Lyneta Farms, the Proposed Segment E is the preferred route as it is removed from the crop spraying activities. Of the two Madeline Plains Alternatives, Alternative Segment F is preferred over Alternative Segment G as it would be much less disruptive to the crop spraying activities. Mitigation Measures T-9 through T-11, as described in Section C.12.2.2.1 for the Proposed Project, are applicable to the Madeline Plains Alternatives for aviation impacts (**Class III**).

With the implementation of the mitigation measures discussed in Sections C.12.2.2 and C.12.2.3, all identified significant transportation impacts would be reduced to a level of less than significant (**Class II**), except that the occurrence of a major accident could result in a significant unmitigable impact if arterial roadways and/or railroad tracks were to be blocked for an extended period of time (**Class I**).

C.12.3.3 Ravendale Alternative Alignment (Segments J, I)

Environmental Setting. Alternative Segment J is an alternative to Proposed Segment K and is accessed by the same Alternative Segment I described above. The roadways that would potentially be affected by Alternative Segment J are listed in Table C.12-1.

Environmental Impacts and Mitigation Measures. The impacts of Alternative Segment J on the roadway network and traffic conditions would be less than those described for Proposed Segment K since the alternative would not cross U.S. 395. Alternative Segment J would also reduce the number of railroad crossings by one because Proposed Segment K crosses the SPTC railroad at two locations (once north of Ravendale and once south of Ravendale), while the alternative crosses the SPTC railroad once (south of Ravendale). Mitigation Measures T-1 through T-8 for construction impacts and Mitigation Measure T-12 for operational impacts, are also applicable to Alternative Segment J (**Class II**).

With regard to aviation impacts, Alternative Segment J would have less potential to intrude into navigable airspace since the alternative does not pass near an airport, as does Proposed Segment K. As discussed in Section C.12.2.2.1, there would be an 80-foot height restriction on Proposed Segment K in the vicinity of the Ravendale Airport (based on a 50 to 1 slope) since the alignment passes within 4,000 feet of the runway at the Ravendale Airport. Since Alternative Segment J does not pass near an airport, only the general 200-foot FAA restriction would apply. Mitigation Measures T-9 through T-11, as described in Section C.12.2.2.1 for the Proposed Project, are applicable to Alternative Segment J for aviation impacts **(Class II)**.

With the implementation of the mitigation measures discussed in Sections C.12.2.2 and C.12.2.3, all identified significant transportation impacts would be reduced to a level of less than significant **(Class II)**, except that the occurrence of a major accident could result in a significant unmitigable impact if arterial roadways and/or railroad tracks were to be blocked for an extended period of time **(Class I)**.

C.12.3.4 East Secret Valley Alignment (Segment ESVA)

Environmental Setting. While Proposed Segment L generally follows U.S. 395, Alternative Segment ESVA is located east of the highway, traversing the east side of Secret Valley. The roadways that would potentially be affected by Alternative Segment ESVA are shown on Table C.12-1.

Environmental Impacts and Mitigation Measures. The impacts of Alternative Segment ESVA on the roadway network and traffic conditions would be virtually the same as described in Section C.12.2.2 for Proposed Segment L, particularly since the alternative and Proposed Segment L would impact the same public roads. The only substantive difference is that the affected locations on each roadway would be different, as Proposed Segment L remains closer to U.S. Route 395 than the more easterly alternative. With regard to rail impacts, there would be virtually no difference between the alternative and Proposed Segment L because neither alignment crosses a rail line. Mitigation Measures T-1 through T-8 for construction impacts and Mitigation Measure T-12 for operational impacts, as described in Section C.12.2.2 for the Proposed Project, are also applicable to Alternative Segment ESVA. With regard to aviation impacts, there would be virtually no difference between the Alternative Segment ESVA and Proposed Segment L; neither segment would intrude into navigable air space.

With the implementation of the mitigation measures discussed in Sections C.12.2.2 and C.12.2.3, all identified significant transportation impacts would be reduced to a level of less than significant **(Class II)**, except that a major accident could result in a significant unmitigable impact if arterial roadways were to be blocked for an extended period of time **(Class I)**.

C.12.3.5 Wendel Alignment (Segment M)

Environmental Setting. Alternative Segment M is located to the west of Proposed Segment N, in the area immediately north of Wendel. While Proposed Segment N remains on the east side of the Southern Pacific railroad tracks, Alternative Segment M crosses to the west side of the tracks, proceeds south to Wendel Road, then crosses back over the tracks to rejoin the proposed alignment. The roadways that would potentially be affected by Alternative Segment M are listed in Table C.12-1.

Environmental Impacts and Mitigation Measures. The impacts of Alternative Segment M on the roadway network and traffic conditions would be virtually the same as described in Section C.12.2.2 for

Proposed Segment N, particularly since neither alignment crosses the ROW of a public road and since both alignments would be accessed on the same minor roads, (see Table C.12-1). Alternative Segment M would increase the number of railroad crossings by two because the alternative crosses the SPTC railroad at two locations north of Wendel, while Proposed Segment N remains on the east side of the tracks. Mitigation Measures T-1 through T-8 for construction impacts and Mitigation Measure T-12 for operational impacts, as described in Section C.12.2.2 for the Proposed Project, are also applicable to Alternative Segment M (**Class II**).

With regard to aviation impacts, there would be virtually no difference between Alternative Segment M and Proposed Segment N. Mitigation Measures T-9 through T-11, as described in Section C.12.2.2.1 for the Proposed Project, are applicable to Alternative Segment M for aviation impacts (**Class II**).

With the implementation of the mitigation measures discussed in Sections C.12.2.2 and C.12.2.3, all identified significant transportation impacts would be reduced to a level of less than significant (**Class II**), except that the occurrence of a major accident could result in a significant unmitigable impact if arterial roadways and/or railroad tracks were to be blocked for an extended period of time (**Class I**).

C.12.3.6 West Side of Fort Sage Mountains (Segment P)

Environmental Setting. Alternative Segment P, which is located on the west side of the Fort Sage Mountains, is an alternative to Proposed Segment Q, which goes around east side of the Fort Sage Mountains. The two alignments diverge near the southeast corner of the Sierra Army Depot and rejoin on the east side of U.S. 395 near Constantia. The roadways that would potentially be affected by Alternative Segment P are listed in Table C.12-1.

Environmental Impacts and Mitigation Measures. The impacts of Alternative Segment P on the roadway network and traffic conditions would be similar to the Proposed Segment Q except that the alternative would cross four versus two roadways; neither alignment would cross a major roadway (see Table C.12-1). Similarly, the impacts on rail operations would be virtually the same as described for Proposed Segment Q except that Alternative Segment P would cross the UPRS railroad tracks at a location approximately 1.3 miles west of the Proposed Segment Q crossing east of Herlong. In essence, it makes little difference from the perspective of traffic or rail impacts whether the alignment goes around the east or west side of the Fort Sage Mountains. Mitigation Measures T-1 through T-8 for construction impacts and Mitigation Measure T-12 for operational impacts, are also applicable to this alternative (**Class II**).

With regard to aviation impacts, the impacts of Alternative Segment P are virtually the same as Proposed Segment Q, except that the alternative is approximately 1.3 miles closer to the Herlong Airport than Proposed Segment Q. As both alignments are beyond the 20,000-foot distance that would render a location subject to reduced height restrictions, neither route would have a significant impact on airport navigations. Mitigation Measures T-9 through T-11, as described in Section C.12.2.2.1 for the Proposed Project, are also applicable to this alternative (**Class II**).

With the implementation of the mitigation measures discussed in Sections C.12.2.2 and C.12.2.3, all identified significant transportation impacts would be reduced to a level of less than significant **(Class II)**, except that the occurrence of a major accident could result in a significant unmitigable impact if arterial roadways and/or railroad tracks were to be blocked for an extended period of time **(Class I)**.

C.12.3.7 Long Valley Alignments (Segment S, U, Z, and WCFG)

Environmental Setting. The Long Valley Alignments are alternative routes which could be used instead of Proposed Segments T and W between Constantia and Border Town. While Proposed Segments T and W are located primarily on the east side of U.S. 395 through the Long Valley, Alternative Segment S runs along the west side of U.S. 395. Alternative Segment U is a short crossover link which could be used to extend the transmission line across U.S. 395 between the Proposed Project and the westerly alternative so that part of the line could be on the east side and part on the west side of U.S. 395 through this valley. Alternative Segments Z and WCFG would position the transmission line to the east of Proposed Segment W at two different locations. The roadways that could potentially be affected by these alternative alignments are listed in Table C.12-1 under Alternative Segments S, U, Z, and WCFG.

Environmental Impacts and Mitigation Measures. The impacts of the Long Valley Alignments (Alternative Segments S, U, Z, and WCFG) on the roadway network and traffic conditions would be virtually the same as described in Section C.12.2.2 for the Proposed Project (Segments T and W; see Table C.12-1). At the south end of Long Valley, both Proposed Segment W and Alternative Segment WCFG would cross U.S. 395, the primary difference being that the alternative route would cross approximately two miles south of the Proposed Segment W crossing. Alternative Segments S and U would add two additional crossings of the UPRS railroad tracks. Alternative Segment WCFG and Proposed Segment W would both cross the UPRS railroad tracks, the only difference being that the alternative crossing would be approximately two miles south of the Proposed Segment W crossing near Border Town. Mitigation Measures T-1 through T-8 for construction impacts and Mitigation Measure T-12 for operational impacts, are also applicable to the Long Valley Alignments (Alternative Segments S, U, Z, and WCFG) **(Class II)**.

With regard to aviation impacts, there would be virtually no difference between the Long Valley Alignments and the Proposed Project. Mitigation Measures T-9 through T-11, are applicable to the Long Valley Alignments (Alternative Segments S, U, Z, and WCFG) for aviation impacts **(Class II)**.

With the implementation of the mitigation measures discussed in Sections C.12.2.2 and C.12.2.3, all identified significant transportation impacts would be reduced to a level of less than significant **(Class II)**, except that the occurrence of a major accident could result in a significant unmitigable impact if arterial roadways and/or railroad tracks were to be blocked for an extended period of time **(Class I)**.

C.12.3.8 Peavine Peak Alternative Alignment (Segment X-East)

Alternative Segment X-East would replace Proposed Segment Y and would have virtually the same transportation impacts. This alternative would not result in any changes to the list of affected roadways, the railroad crossings, or the aviation impacts. The transportation impacts and required mitigation measures would, therefore, be the same as described in Sections C.12.2.2 and C.12.2.3 for Proposed Segment Y.

C.12.3.9 Substation Alternatives

The volume of traffic that would be generated by construction activities at the two alternative substation sites would be identical to the volume that would be generated at the proposed substation sites, as discussed in Section C.12 2.2.1. The primary access routes to the Alturas Substation Mill Site would be Highway 299 and Fourth Street. The primary access routes to the Border Town Substation Alternative site would be the same as for the proposed site; i.e., U.S. 395 and Long Valley Road. The Alternative site is located approximately one-half mile farther from U.S. 395 than the proposed site, which would require longer travel distances on Long Valley Road, a gravel road.

C.12.4 THE NO PROJECT ALTERNATIVE

C.12.4.1 Environmental Impacts and Mitigation Measures

Under the No Project Alternative, the transmission line would not be constructed; therefore, no adverse construction-related or operational traffic or aviation impacts would occur. If the demand for electrical power exceeded the capacity of the existing system, as anticipated, the No Project Alternative could result in other construction projects. In the short-term, improvements would be made to the existing system, which would result in minor temporary traffic impacts at each construction site. In the long-term, it may be necessary to construct another transmission line, which would likely result in traffic and aviation impacts similar to those of the Proposed Project.

C.12.5 MITIGATION MONITORING PROGRAM

Table C.12-3 presents the mitigation measures recommended for mitigating each significant transportation impact and outlines the location, responsible party, required monitoring activities, effectiveness criteria, and timing of each monitoring activity.

Table C.12-3 Mitigation Monitoring Program

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Increased accident risk for motorists, pedestrians, and bicyclists during construction (Class II)	**T-1** Prepare, obtain approval for, and implement detailed Transportation Management Plans.	All Proposed and Alternative Segments	BLM, CPUC, County Sheriff, State Highway Patrol, Transportation Agencies	Review and approve Transportation Management Plan	Increased accident rates, risk exposure, or congestion, as determined by affected public agencies.	Prepare and obtain approval for Plan prior to construction; implement during construction
Roadway blockages and traffic congestion during construction (Class II)	**T-2** Avoid lane closures or blockages where possible, minimize duration of closures, provide detours, and avoid peak period lane closures.	All Proposed and Alternative Segments	CPUC, BLM, County Sheriff, State Highway Patrol, Transportation Agencies	Review and approve Transportation Management Plan, and conformance to all required conditions.	Level of additional congestion, delay, or inconvenience caused by construction activities, as determined by affected public agencies.	Prior to and during construction
Blocked access to properties adjacent to construction zone (Class II)	**T-3** Advance notification to property owners and tenants who would have restricted access during construction. Provide alternative access if feasible.	All Proposed and Alternative Segments	CPUC, BLM, County Sheriff, State Highway Patrol, Transportation Agencies	Verify notification and coordination efforts with all affected owners and tenants.	If access and parking needs of the adjacent land uses are met.	Provide notice 72 hours prior to construction; provide alternative access during construction
Obstructed pedestrian or bicycle routes and reduced safety during construction (Class II)	**T-4** Provide alternative pedestrian/bicycle routes where blockages occur and use appropriate signs/markings.	All Proposed and Alternative Segments	CPUC, BLM, County Sheriff, State Highway Patrol, Transportation Agencies	Verify coordination with affected public agencies and preparation of detour signing and plans.	Construction activities do not block or unreasonably impair pedestrian or bicycle movements or safety.	Prior to and during construction
Restricted access for emergency response units during construction (Class II)	**T-5** Advance notification and coordination with emergency service providers. Remain prepared to immediately provide emergency access for any property isolated by construction activities.	All Proposed and Alternative Segments	BLM, CPUC, County Sheriff, State Highway Patrol, Transportation Agencies	Verify notifications and coordination with emergency service providers; verify capability to provide immediate access across construction zone.	Construction activities do not preclude access to emergency vehicles.	Provide notice 1 week prior to construction; maintain access during construction
Increased traffic volumes generated by construction activity (Class III)	**T-6** Use approved staging areas and shuttle employees to work site in crew trucks or buses. Sufficient off-street parking for contractor and private vehicles shall be provided at staging areas.	All Proposed and Alternative Segments	BLM CPUC Affected Jurisdictions	Verify receipt of approval for staging areas and provision of shuttles to the work zone.	Unacceptable traffic congestion or impacts on public street, as determined by affected jurisdictions.	Develop staging areas and shuttle plans prior to construction; monitor during construction
Increased parking demand for vehicles and equipment during construction and temporary loss of existing parking spaces (Class III)	**T-7** Provide off street parking for construction vehicles and equipment. Post advance signs and notify nearby businesses/residents and public agencies if spaces will be displaced. Provide alternative spaces if needed.	All Proposed and Alternative Segments	BLM CPUC Affected Jurisdictions	Verify provision of signage at locations where public parking spaces would be displaced.	No parking hardships are created for nearby residents/businesses.	Coordinate schedules prior to construction

Impact	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Possible encroachment and safety conflicts with rail operations during construction (Class III)	**T-8** Coordinate construction activity with railroads and arrange to have railroad representatives on site while working within active rail ROW.	All Proposed and Alternative Segments where construction is in railroad ROW	BLM CPUC	Verify coordination with railroad companies and demonstrated compliance with railroad and CPUC safety procedures.	Rail operations are maintained without disruption or decreased safety for trains or workers.	Coordinate schedules prior to and during construction
Interference with navigable airspace and decreased safety for aviation activities during construction and operation (Class II)	**T-9** Design and construct the structures and wires so that no object will penetrate the navigable airspace around a public or military airport, as defined by the FAA. **T-10** Notify the Western-Pacific Region of the FAA if any feature of the project will exceed an obstruction standard or encroach upon navigable airspace, as defined by the FAA. Use high-visibility markings and lighting to improve visibility to pilots, as directed by the FAA. **T-11** Position structures at locations that would prohibit wires from extending more than 200 feet above the ground, where feasible.	Proposed Segments C,E,K,O,Q,X	BLM CPUC Federal Aviation Administration (FAA).	Verify notification of FAA of temporary or permanent features exceeding obstruction standards or encroaching upon navigable airspace. Notification shall be made on FAA Form 7460-1, "Notice of Proposed Construction or Alteration."	FAA finds that an encroachment is acceptable and that the appropriate markings and lighting features are installed to the satisfaction of FAA.	Finalize design prior to permit issuance. Lighting and markings to be installed during construction & maintained for the life of the project.
An accident or structural failure could potentially result in blockages of highways and/or rail facilities (Class I)	**T-12** Prepare an Emergency Response Plan which addresses disruptions to the transportation system in case of a major accident or failure. Maintain constant readiness to implement plan if necessary.	All Proposed and Alternative Segments	BLM, CPUC, Local law enforcement agencies, CHP, NHP Caltrans, NDOT, local public works depts., and fire depts.	Review plan; verify preparedness on an annual basis.	Plan is deemed acceptable and would be effective in the event of an accident.	Plan shall be prepared prior to operation, then updated and tested annually for the life of the project.
Cumulative impact of simultaneous construction projects (Class II)	**T-13** Maintain coordination with agencies responsible for encroachment permits on each affected roadway and with utility companies.	All Proposed and Alternative Segments	BLM CPUC Affected local jurisdictions	Responsible agencies coordinate regarding timing of project construction and road closures	Roadway closures have minimal effect on local or regional transportation systems	Coordinate schedules before and during construction

C.12.6 REFERENCES

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PART C.13 VISUAL RESOURCES

C.13.1 ENVIRONMENTAL BASELINE AND REGULATORY SETTING

C.13.1.1 Regional Characteristics

The Proposed Project is located within the Basin and Range physiographic province. The Basin and Range Province consists of rough, rocky mountains formed by northerly trending fault blocks. These ranges are typically separated by arid basins and ranges. Wide valleys are frequently interconnected across low divides (Hunt, 1974).

Between Alturas (in Modoc County) and Honey Lake (in Lassen County), the Proposed Project route crosses the Northeast Volcanic Landscape Province including the Modoc Plateau (USFS, 1976). The Warner Mountains east of Alturas provide the only continuous mountain crest in a region that is otherwise characterized by long escarpments, or rims, enclosing plateau lands. Much of the province can be characterized as having an accumulation of lava flows and depressions with shallow lakes, marshes, meadows and intermittent lake beds. Many small streams terminate in enclosed basins such as Honey Lake. Vegetation in this region generally consists of shrub and grass flats, and juniper woodlands (USFS, 1976). The generally flat terrain in the vicinity and to the east of U.S. 395 (including the Madeline Plains), is punctuated by abrupt, jagged, or cone-shaped mountain peaks including Anderson Mountain, McDonald Peak, Shinn Mountain, Snowstorm Mountain, Shaffer Mountain, and the Skedaddle Mountains.

From Honey Lake south to Nevada, the Proposed Project route crosses the northeastern portion of the Sierra Nevada Landscape Province. This area is "characterized by mountain and interior valley lands that are transitional in character with the landscapes of the Basin and Range landscape character type to the east" (USFS, 1976). Prominent features in this area include the broad expanse of Honey Lake Valley, the Diamond Mountains on the west side of Long Valley, the Fort Sage Mountains, and the Petersen Mountains.

The region between the California/Nevada border and the Project's southern terminus near Reno, Nevada, is characterized by generally flat to hilly terrain, supporting sagebrush and shrub vegetation. The transmission line route crosses lands vegetated with sagebrush and shrub vegetation. Prominent features include the expansive chalk-white dry lake bed of White Lake and the dominant landscape feature in the area, Peavine Peak.

The regional character is rural and undeveloped. Land uses in the project region consist primarily of public range lands, agricultural operations, scattered rural residences, dispersed recreation facilities and areas, and small rural communities generally located along the U.S. 395 travel corridor between Alturas in the north and Reno in the south (see Section C.8, Land Use). Near the southern terminus, land uses begin to transition from rural to suburban. There are also a number of linear facilities in the region including the Southern Pacific Railroad, electric transmission and distribution lines, and communication lines.

Views in the project region are frequently expansive, across flat rangelands and basins in the foreground/middleground, to distant mountains, isolated peaks, and plateaus in the background. The typical viewers of the project would be local residents, recreationists, and motorists travelling U.S. 395 and other local roads.

C.13.1.2 Applicable Plans and Policies

C.13.1.2.1 Visual Resource Management Classes

Public lands crossed by the Proposed Project, and administered by the U.S. Bureau of Land Management (BLM), have a variety of visual values. These lands are subject to visual resource management objectives as developed using the BLM Visual Resource Management (VRM) System (BLM, 1984, 1986a, 1986b) and presented in the Resource Management Plan (RMP) or Management Framework Plan (MFP) for a given geographic unit. The BLM system identifies four VRM Classes (I through IV) with specific management prescriptions for each class. The system is based on an assessment of scenic quality, viewer sensitivity, and viewing distance zones.

Scenic Quality

Scenic Quality is a measure of the overall impression or appeal of an area created by the physical features of the landscape, such as natural features (landforms, vegetation, water, color, adjacent scenery, and scarcity), and human-made features (roads, buildings, railroads, agricultural patterns, and utility lines). These features create the distinguishable line, form, color, and texture of the landscape composition that can be judged for scenic quality using criteria such as distinctiveness, contrast, variety, harmony, and balance. Table C.13-1 presents the VRM scenic quality rating characteristics that are evaluated to arrive at one of three scenic quality ratings (A, B, or C) for a given tract of land. The three scenic quality ratings can be described as follows:

- **Scenic Quality Class A** - landscapes that combine the most outstanding characteristics of the region.
- **Scenic Quality Class B** - landscapes that exhibit a combination of outstanding and common features
- **Scenic Quality Class C** - landscapes that have features that are common to the region

Viewer Sensitivity

Viewer sensitivity is a factor used to represent the value of the visual landscape to the viewing public, including the extent to which the landscape is viewed. For example, a landscape may have high scenic qualities but be remotely located and, therefore, seldom viewed. Sensitivity considers such factors as visual access (including duration and frequency of view), type and amount of use, public interest, adjacent land uses, and whether the landscape is part of a special area (e.g. Wilderness Study Area or Scenic Area). The three levels of viewer sensitivity can generally be defined as follows:

Table C.13-1 Visual Resource Management (VRM) Scenic Quality Rating

VRM SCENIC QUALITY RATING			
Landform	High vertical relief (prominent cliffs, spires, or massive rock outcrops); severe surface variation, highly eroded formations (major badlands or dune systems); detail features dominant and exceptionally striking/ intriguing. 5	Steep canyons, mesas, buttes, and cinder cones; or interesting erosional patterns or variety in size and shape of landforms; or detail features which are interesting, though not dominant or exceptional. 3	Low rolling hills, foothills, or flat valley bottoms; or few, or no, interesting landscape features. 1
Vegetation	A variety of vegetative types as expressed in interesting forms, textures and patterns. 5	Some variety of vegetation, but only one, or two major types. 3	Little or no variety or contrast in vegetation. 1
Water	Clear and clean, appearing still; or cascading white water; dominant factor in the landscape. 5	Flowing or still, but not dominant in the landscape. 3	Absent, or present but not noticeable. 0
Color	Rich color combinations, variety of vivid color, pleasing contrasts in soil, rock, vegetation, water or snow fields. 5	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. 3	Subtle color variations, contrast or interest; generally mute tones. 1
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. 5	Adjacent scenery moderately enhances overall visual quality. 3	Adjacent scenery has little or no influence on overall visual quality. 0
Scarcity	One of a kind; or unusually memorable; or very rare within region. Consistent chance for exceptional wildflowering/ wildflower viewing, etc. 5	Distinctive, though somewhat similar to others within the region. 3	Interesting within its setting, but fairly common within the region. 1
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. 2	Modifications add little or no visual variety to area, and introduce no discordant elements. 0	Modifications add variety but are very discordant/promote strong disharmony. -4
Scenic Quality Rate:	A = 19 or more	B = 12-18	C = 11 or less

- **High sensitivity** - areas that are either designated for scenic resources protection, or receive a high degree of use (includes areas visible from roads and highways receiving more than 45,000 visits [vehicles] per year). Typically within the foreground/middleground viewing distance.

- **Medium sensitivity** - areas lacking specific, or designated, scenic resources protection, but are located in sufficiently close proximity to be within the viewshed of the protected area. Includes areas that are visible from roads and highways receiving 5,000 to 45,000 visits (vehicles) per year. Typically within the background viewing distance.

- **Low sensitivity** - areas that are remote from populated areas, major roadways, and protected areas or are severely degraded visually. Includes areas that are visible from roads and highways receiving less than 5,000 visits (vehicles) per year. Typically within the background, to seldom seen, viewing distance.

Viewing Distance Zones

Landscapes are generally subdivided into three distance zones based on relative visibility from travel routes or observation points. The foreground/middleground (f/m) zone includes areas that are less than three to five miles from the viewing location. The foreground/middleground zone defines the area in which landscape details transition from readily perceived, to outlines and patterns. The background (b) zone is generally greater than five, but less than fifteen, miles from the viewing location. The background zone includes areas where landforms are the most dominant element in the landscape, and color and texture become subordinate. In order to be included within this distance zone, vegetation should be visible at least as patterns of light and dark. The seldom-seen zone (s/s) includes areas that are usually hidden from view as a result of topographic or vegetative screening or atmospheric conditions. In some cases, atmospheric and lighting conditions can reduce visibility and shorten the distances normally covered by each zone (BLM, 1986b).

Visual Resource Management Classes

The VRM Class for a given area is typically arrived at through the use of a classification matrix similar to that presented in Table C.13-2. By comparing the scenic quality, visual sensitivity, and distance zones, the specific VRM class can be determined. The exception to this process is the Class I designation which is placed on special areas where management activities are restricted (e.g., wilderness areas).

Table C.13-2 Visual Resource Management (VRM) Classification Matrix

VRM Classification Matrix								
		VISUAL SENSITIVITY						
		High			Moderate			Low
SPECIAL AREAS		I	I	I	I	I	I	I
SCENIC QUALITY	A	II	II	II	II	II	II	II
	B	II	III	III/IV	III	IV	IV	IV
	C	III	IV	IV	IV	IV	IV	IV
DISTANCE ZONES		f-m	b	s/s	f-m	b	s/s	s/s

AMOUNT OF USE CLASSIFICATION TABLE			
TYPE AREA	HIGH	MODERATE	LOW
Roads & Highways	More than 45,000 visits/yr	5,000-45,000 visits/yr	Less than 5,000 visits/yr
River & Trails	More than 20,000 visits/yr	2,000-20,000 visits/yr	Less than 2,000 visits/yr
Recreation Sites	More than 10,000 visitors days/yr	2,000-10,000 visitor days/yr	Less than 2,000 visitor days/yr
DISTANCE ZONES			
f/m (foreground/middleground) = 3-5 miles	b (background) = 5-15 miles	s/s = seldom seen areas	

The objectives of each VRM classification as stated in the BLM VRM Visual Resource Inventory Manual are as follows:

- **VRM Class I** - The objective is to preserve the existing character of the landscape. This class provides for natural ecological changes, however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

- **VRM Class II** - The objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

- **VRM Class III** - The objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

- **VRM Class IV** - The objective is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Much of the Proposed Project is located on lands administered by the BLM and subject to VRM management objectives. For some of the BLM-administered lands, VRM classifications have been designated in the appropriate Resource Management Plan (RMP). Other BLM administered lands do not have RMP-approved VRM classifications, as is the case for the Cal-Neva and Honey Lake Planning Units. Accordingly, "Interim" VRM Classes have been developed by the BLM for lands crossed by the Proposed Project in the Cal-Neva and Honey Lake Planning Units. Table C.13-3 presents the VRM Class designations and Interim VRM Class designations for those segments comprising the Proposed Project route.

It is important to note that even though VRM designations have been developed for all segments of the Proposed Project, VRM Class objectives do not bind public lands not administered by the BLM, or private lands.

As shown in Table C.13-3, BLM-administered lands crossed by the proposed route are designated as either VRM Class II, III, or IV.

C.13.1.2.2 *Visual Quality Objectives*

Similar to the BLM's Visual Resource Management System, National Forests administered by the U.S. Forest Service are subject to the Visual Quality Objectives (VQOs) established by the Forest Service's Visual Management System.

There are five VQO categories: (1) Preservation, (2) Retention, (3) Partial Retention, (4) Modification, and (5) Maximum Modification. VQOs are established based on an evaluation of (1) Sensitivity Level (the public's concern for scenic quality - High, Moderate, and Low); (2) Variety Class (the diversity of natural features - Distinctive, Pleasing but Common, and Dull or Monotonous); and (3) Distance Zones (Foreground, Middleground, Background).

Table C.13-3 VRM Class Designation for the Proposed Route

Segment	Angle Points	VRM Class Designation
A	HSØ1+-AØ5+	II
	AØ5+-AØ6	III
C	AØ6-CØ3+	III
	CØ3+-CØ9	II
	CØ9-C10	III
E	C10-EØ8	III
K	EØ8-KØ1-KØ6-JØ8	IV
L	JØ8 - LØ1	IV
	LØ1 - LØ2	IV - III
	LØ2 - LØ7	III
	LØ7 - LØ8	III - IV
N	LØ8 - MØ3	IV
O	MØ3 - OØ5	IV
Q	OØ5 - QØ1	IV
	QØ1 - QØ5	III
	QØ5 - PØ9	III - IV - III
R	PØ9 - RØ1	III
	RØ1 - RØ2	II
T	RØ2 - TØ1	II
	TØ1 - TØ2	III
W	TØ2 - VØ5	III
X	VØ5 - XØ9	III
	X12 - X14	III - Unclassified
Y	XØ9 - X12	III

+ Indicates a starting or ending point beyond the referenced Angle Point

Table C.13-4 presents the landscape variety classes for the Northeast Volcanic Landscape Province. Within this province, the proposed route crosses lands administered by the Modoc National Forest.

VQOs (with the exception of Preservation) are typically arrived at by using a classification matrix similar to that presented in Table C.13-5. By comparing the sensitivity levels, landscape variety classes, and distance zones, VQOs for a specific land area can be determined. As stated in the Modoc National Forest Land and Resource Management Plan FEIS, *"Visual Quality Objectives are standards for the visual management of all Forest lands. They have been assigned to each acre of the Forest based on public concern for scenic quality as well as diversity of natural features."* The definition of each Visual Quality Objective, as presented in National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System is as follows:

- **Preservation (P)** - Only ecological changes are allowed. Management activities, except for very low visual impact recreation facilities, are prohibited. This objective applies to wilderness areas, primitive areas, other special classified areas, areas awaiting classification and some unique management units which do not justify special classification.

Table C.13-4 Visual Quality Objectives (VQO) Landscape Variety Class

VQO LANDSCAPE VARIETY CLASS			
	CLASS A Distinctive	CLASS B Common	CLASS C Minimal
Landform	Terrain is highly varied and distinctive; craggy peaks, volcanic cones, shields, volcanic craters, unique volcanic flows, edge of prominent lava flows, and/or sharply serrated ridges; or isolated peaks or peaks with distinctive form and color contrast that become focal points; or with deep canyons, chasms or distinctive gorges with vertical or near vertical walls and/or unusual confirmation and colors; or with massive outcrops, or talus slopes or lava tubes.	Terrain is moderately varied; broad slopes which may be steep but stable, with broad valleys or rolling plateaus that are not dramatically defined by adjacent landforms; or with rounded hills, ridges, smaller cones and peaks which are not visually dominant but surrounded by similar landforms; or with subordinate lateral canyons and drainages that lack distinctive configuration or colors; or with minor outcrops and talus slopes.	Terrain is unvaried; vast expanses of indistinctly dissected or unbroken landforms that provide little illusion of special definition or landmarks with which to orient.
Vegetation	Vegetation is highly varied and distinctive; strongly defined patters of such combinations as coniferous forest, deciduous forest, stringers of riparian vegetation, brushland, barren soil, barren rock, and/or west meadows; or with extra large, wind shaped, gnarled or dwarfed specimen stands of vegetation which may create unusual forms, colors or textures in comparison to surrounding vegetation.	Vegetation is moderately varied: predominately pine, fir, juniper, or brush cover, combined with some natural openings and/or riparian vegetation in patterns that offer some visual relief; or with some contrast caused by seasonal color; or with vegetative stands that exhibit the normal range of size, forms, colors, and textures and spacings.	Vegetation is unvaried: extensive areas of similar vegetation, such as sagebrush, juniper or lodgepole pine, and very limited variation in texture and color.
Water Forms	Waterforms are highly varied: flow characteristics such as waterfalls, cascades, rapids, and/or still pools with reflecting qualities; or with variations in types of waterbodies such as small rivulets, streams, rivers, ponds, marshes, small lakes, large lakes and/or reservoirs; or with unusual shoreline character and/or channel configurations; or with hot springs, geothermal veins.	Waterforms are moderately varied: meandering rivers or streams, marshes and/or small ponds and intermittent lakes; or with common shoreline character and/or channel configurations; or with medium water clarity and a moderate degree of visibility.	Water forms are unvaried: no waterforms present or with only intermittent flows, or small intermittent ponds; or with low water clarity and/or low degree of visibility to the point that they are not visually apparent except in the immediate foreground.

Table C.13-5 Visual Quality Objectives (VQO) Matrix

VQO Matrix							
Variety Class ↓	Sensitivity Level						
	1fg	1mg	1bg	2fg	2mg	2bg	3
Class A	R	R	R	PR	PR	PR	PR
Class B	R	PR	PR	PR	M	M	M MM
Class C	PR	PR	M	M	M	MM	MM
Distance Zones							
fg = foreground	mg = middleground	bg = background					

- **Retention (R)** - Only management activities which are not visually evident are allowed. Under Retention, activities may only repeat form, line, color, and texture which are frequently found in the characteristic landscape. Changes in their qualities of size, amount intensity, direction, pattern, etc., should not be evident. Immediate reduction in visual contrast (form, line, color, and texture) should be accomplished either during construction or immediately after.

- **Partial Retention (PR)** - Management activities are to remain visually subordinate to the characteristic landscape when managed according to the partial retention visual quality objective. Activities may repeat form, line, color, or texture common to the characteristic landscape but changes in their qualities of size, amount, intensity, direction, pattern, etc., remain subordinate to the characteristic landscape. Reduction of visual contrast to meet partial retention should be accomplished as soon after project completion as possible, or at a minimum, within the first year.

- **Modification (M)** - Management activities may visually dominate the original characteristic landscape. However, activities resulting in vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Reduction in visual contrast should be accomplished in the first year, or at a minimum, should meet existing regional guidelines.

- **Maximum Modification (MM)** - Management activities of vegetative and landform alterations may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding area or character type. When viewed as foreground or middleground, they may not appear to completely borrow from naturally established form, line, color, or texture. Alterations may also be out of scale or contain detail which is incongruent with natural occurrences as seen in foreground or middleground. Reduction in visual contrast should be accomplished within five years.

Table C.13-6 presents the Visual Quality Objectives for the portion of Modoc National Forest crossed by the proposed route, northwest of Alturas in the Devils Garden Area, and south of Alturas in the vicinity of Likely Mountain.

Table C.13-6 Applicable Modoc National Forest Visual Quality Objectives (VQO)

Segment	Angle Points	Visual Quality Objective
A	AØ1 - HSØ1	Modification - Partial Retention
	HSØ1 - ANP2	Modification - Maximum Modification
	ANP2 - AØ3	Maximum Modification
C	CØ6 - CØ7	Partial Retention

C.13.1.2.3 Scenic Highways

The preservation of scenic resources is particularly important within the viewshed of designated scenic highways and pathways, and sensitive land uses, including recreation areas, designated scenic areas, and wilderness study areas. Scenic highways are generally located within highly scenic areas or provide views to such areas. Views of such areas often form the most memorable impression of the geographic region, and thus, are given high priority for protection and enhancement. Two of the four counties crossed by the Proposed Project, Lassen County in California, and Washoe County in Nevada, identify Scenic Highway Corridors in their respective county planning documents.

Lassen County

The Lassen County General Plan identifies scenic highway corridors along certain highways and county roads within Lassen County. County-designated scenic corridors that are within the viewshed of the Proposed Project route are listed in Table C.13-7.

Table C.13-7 Lassen County Designated Scenic Corridors

Road	Location of Designation
U.S. 395	Entire length within Lassen County
State Route 70	Entire length within Lassen County
County Road 513	Between State Route 139 and U.S. 395

Washoe County

Washoe County has designated U.S. 395 from Cold Spring Valley (near Border Town and the California border) east to Panther Valley (north of Reno) as a Scenic Corridor.

C.13.1.2.4 Applicable Policies

Federal, state, and local regulations and planning agencies establish visual resource management objectives in order to protect and enhance public scenic resources. Policies addressing visual resource management objectives are typically contained in BLM Resource Management Plans and Management Framework Plans, National Forest Land and Resource Management Plans (Forest Plans), County General/Comprehensive Plans and Elements, and County Area Plans. Table C.13-8 presents a list of policies established in the federal and local visual resource management plans that are pertinent to the Proposed Project.

Visual resources management goals, objectives, and policies that apply to the Proposed Project can be categorized as follows:

- **Preservation of Natural Features.** Preserve natural features, landforms, and native vegetation to the maximum extent feasible. Minimize vegetation removal and manage development in hillside areas to protect their natural and scenic character.

- **Preservation of Visual Access.** Preserve unimpeded public visual access to local scenic resources including expansive open vistas; mountains, escarpments, foothills, and plateaus; unique geologic formations; water features; and agricultural lands.

- **Maintenance of Development Compatibility.** Where possible, design and/or site development such that structures are compatible with the character of the surrounding natural environment. Structures should be subordinate in appearance to natural landforms, follow the natural contours of the landscape, and be sited so as not to intrude into the skyline as seen from public viewing places. Design and/or site development to minimize grading and site preparation. conduct cut and fill operations so as to minimize the alteration of the natural terrain.

Table C.13-8 Applicable Plan Policies

SECTION/POLICY #	POLICY STATEMENT
	1988 Modoc County General Plan
Circulation #9	The location, distribution, and size of transmission lines and pipelines should be consistent with the land uses and development to minimize adverse social or environmental impacts. Such lines should avoid interference with adjacent land uses and assure that aesthetic values will not be degraded.
Timber/Vegetation #4	Protect timber resources for its wildlife habitat and scenic resources.
Safety #2	Any development on hillsides should be sited in the least obtrusive fashion, minimizing the extent of topographic alteration. In any case, development should be restricted to slopes of 30% or less.
	1993 Modoc County General Plan Energy Element
Energy Facilities #32	In the absences of compelling or contravening considerations, energy facilities should not be sited in sensitive natural resources areas, including: unstable geologic or soil areas; flood plains; wetlands; habitat of fish or wildlife species of rare, threatened or endangered status; known paleontological, archaeological, ethnographic, or historical sites; or designated scenic areas. If siting in such areas is unavoidable, it shall be limited to the smallest possible portion of the energy facility in question, and shall be mitigated in accordance with CEQA.
Energy Facilities #33	Whenever possible, increased demand for energy transmission shall be accommodated with existing transmission facilities. Where new capacity is necessary, priority shall be given to upgrading or reconstructing existing facilities, followed by new construction along existing transmission or other utility corridors. Any new transmission facilities shall be sited so as to minimize interference with surrounding land uses, and in ways that minimize their visual impacts.
Zoning Ordinance #3	The siting of transmission lines shall avoid interfering with scenic views, and shall be visually integrated with the surrounding setting to the greatest extent possible. Applicable visual mitigation includes, but is not limited to avoiding ridgelines or other visually prominent features, and using non-glare structures and non-specular lines which more readily blend into the natural landscape.
	1968 Lassen County General Plan
General Goals #1	Protection and appropriate use of the County's wildlife, natural beauty, and wilderness character.
Recreation Goals	Maintain the natural beauty of the County. See to it that any development does not pollute air, water or land and is not conducted at a level that might erode the long-term attractiveness of the County.
Recreation Goals	The natural resources of the County, both physical and scenic, should be protected by comprehensive zoning and subdivision regulations.
	1993 Lassen County General Plan Energy Element
Construction Policies p. Implementation	Structural design criteria, in regard to the visual impacts of the facility, will be prescribed by the County for each project permit, based on the extent of impact and the visual sensitivity of the site.
Transmission Lines and Natural Gas Pipelines #8	The siting of transmission lines shall minimize impacts on scenic views and shall be visually integrated with the surrounding setting. If located along a highway, the route shall favor the side of least scenic value. Siting of transmission lines on ridgelines or other visually prominent features should be avoided. Whenever possible, hills or topography should be used to screen transmission lines from the public field of view.
	1987 Lassen County Wendel Area Plan
Environmental Natural Resources #5-C	Provide for the appropriate retention of the area's natural vegetation to ensure rangeland, watershed, wildlife, fishery, and scenic values.
#5-H	Protect the character, scenic, and aesthetic values of the planning area by recognizing and protecting unique scenic features and by encouraging appropriate land uses.
Scenic Resources #8-A	Lassen County should protect, maintain, and establish scenic corridors in order to preserve the beauty of its landscapes. The scenic corridors designated are shown on the Land Use Map. These corridors shall protect the visual quality of unique scenic resources.
Scenic Resources #8.2 Implementation	New development in these corridors should be designed in harmony with the natural environment and should use natural materials and earthtone colors that blend into the landscape.

SECTION/POLICY #	POLICY STATEMENT
1984 Lassen County Hallelujah Junction Area Plan	
Goals and Objectives #1	Conserve all features of the natural environment to the highest degree possible by locating areas of development and activity in areas of least sensitivity and constraint.
Goals and Objectives #12	Retain the open, rural character and scenic quality of the landscape.
Goals and Objectives #18	Skill and care should be taken in the design, alignment and/or construction of all developments or improvements, including roads, so as not to impair the natural scenic beauty of the area.
Goals and Objectives #19	Designate U.S. 395 and State Highway 70 as scenic highways with the intensity, location, design and quality of development strictly regulated to insure the protection and enhancement of the scenic landscape.
Aesthetics and Noise #2	Recognize the Planning area's highly sensitive viewshed when considering development projects, particularly within approximately one and one-half miles either side of Highways 70 and 395.
Aesthetics and Noise #4	The design and appearance of structures, appurtenances, landscaping and other improvements within the Planning Area shall be visually compatible with the individual building site, with other development in the area, and the general environment of the area.
Aesthetics and Noise #4j Implementation	Above ground utilities should be minimized where allowed, telephone and power poles should be located along natural edges in vegetation, within forested areas, on opposite sides of roads from visual attraction, below ridge lines to avoid silhouetting on the sky line, and be raptor-proof. The underground placement of power and telephone utilities is encouraged and should use common trenches under road shoulders where possible.
Aesthetics and Noise #5	Require all new development to maintain natural vegetation wherever possible and to plant vegetation screens when necessary to make improvements blend in with the landscape. Developers would use plants and materials compatible with and appropriate to the surrounding landscape. All commercial and industrial uses shall be landscaped, including parking areas.
Topographical Constraints #1	Conserve all features of the natural environment to the highest degree possible by locating areas of development and activity in areas of least sensitivity and constraint.
Sierra County Policies	
Visual #7 [9(6) implementation]	Maintain Sierra County's rural character and scenic quality of the Long Valley Community.
1993 Washoe County Comprehensive Plan - Land Use and Transportation Element	
Land Use LUT.1.11	Encourage visual improvements to major entrances into the community and establishment of visual continuity of roadways through the various areas in Washoe County.
Land Use LUT.1.11.1 Implementation	The Washoe County Department of Comprehensive Planning will develop special standards for design, signage, and other factors having aesthetic impacts as part of the planning and development review process.
Land Use LUT.1.14.1b Implementation	Ensure that uses are visually compatible with surrounding uses (e.g., height).
1991 Washoe County Comprehensive Plan - Conservation Element	
Land Resources C.2.1	Protect environmentally sensitive and/or critical land, water, and wildlife resources that present development hazards or serve highly valuable ecological functions by requiring mitigation of adverse impacts or by regulating development in these areas.
Land Resources C.2.3.2 Implementation	During development review, the Washoe County Department of Development Review will ensure maximum retention of trees and other vegetation which stabilize steep hillsides, retain moisture, prevent erosion, and enhance the natural scenic beauty, and where necessary, require additional landscaping to enhance the scenic and safety quality of the hillside.
Land Resources C.2.16.2 Implementation	The Washoe County Department of Comprehensive Planning and Washoe County Department of Development Review will discourage any development that would have significant adverse impacts on: a) any species identified as rare, endangered, or threatened by the State of Nevada or the U.S. Department of the Interior; and b) any valuable and unique natural resource of habitat, unless there are significant overriding concerns for the public health, safety and welfare. The project sponsor shall demonstrate what, if any, adverse impacts will be incurred by any species and what mitigating measures will be provided to offset any losses.
Land Resources C.2.20	Ensure that all existing streams, playas, and other water bodies are recognized for their wildlife habitat, floodway, water quality enhancement and scenic value.

SECTION/POLICY #	POLICY STATEMENT
Land Resources C.3.4	Utilize design and construction practices for new development adjacent to permanent lakes, rivers, and streams that protect water quality, minimize erosion and sedimentation, and preserve natural drainage, habitat and aesthetic functions.
1993 Washoe County Comprehensive Plan - High Desert Area Plan	
Conservation HD.1.1	Maintain the rural character of the Planning Area and protect scenic resources, designated wilderness areas, and natural habitats and preserves.
Conservation HD.2.1	Allow use and development of natural resources under the following conditions: a) development of such resources shall not be detrimental to surrounding properties, land uses and the environment in general; b) review of special use permits required for such activity shall consider access, surrounding land use, visual aspects and site rehabilitation. Site rehabilitation shall include, as a minimum, provisions to return all affected areas to their original condition or better; and c) encroachment of uses around or onto areas having natural resource value, which would preclude or adversely affect resource development, should be avoided. In areas where natural resources are known to exist, residential use should be limited to a very low density in order to allow use and development of the resource.
1993 Washoe County Comprehensive Plan - North Valley Area Plan	
Conservation NV.1.1	Ensure that the scenic qualities of the mountain and hills in the North Valleys Planning Area are maintained.
Cultural and Scenic Resources NV.1.1.1 Implementation	Development on hillsides shall disturb the smallest area possible. Disturbed soils should be revegetated as soon as is practical. Drought tolerant/fire resistant species should be used where appropriate.
Cultural and Scenic Resources NV.1.1.2 Implementation	During development review, preference will be given to proposals that minimize hillside development or otherwise conserve steep slopes.
Cultural and Scenic Resources NV.1.2	Preserve and enhance the visual qualities of the North Valleys Planning Area as viewed from U.S. 395.
Cultural and Scenic Resources NV.1.2.2 Implementation	Proposed development shall be reviewed to ensure the view from U.S. 395 is preserved. Height limitations and setbacks will help preserve the visually prominent ridges and escarpments.
Land Resources NV.2.1	Designate Peavine Peak and its environ as generally rural in order to protect its watershed, scenic and limited recreational qualities.
Land Resources NV.2.1.2 Implementation	Changes in the type or intensity of land uses in areas designated as general rural for Peavine Peak should be deferred until the completion of the Management Plan for Peavine Peak.
Land Resources NV.2.3	Protect the natural resources of the North Valleys Planning Area.
Land Resources NV.2.3.1 Implementation	During development review of all use permits, Washoe County will require applicants to adequately address visual, natural resource, socioeconomic, and land use compatibility issues.
Water Resources NV.3.1	Ensure that all existing natural streams, playas and other water bodies are recognized for their wildlife habitat, floodway, water quality enhancement and scenic value.
NV.3.1.3 Implementation	Maintain a 50-foot setback from stream channels and riparian areas.
FEDERAL AGENCIES	
1991 Modoc National Forest Land and Resource Management Plan	
National Forest Program Goals - Visual Resources	Maintain or improve the scenic attractiveness of the Forest as seen from major public use areas. Manage visual resources to meet or exceed adopted Visual Quality objectives (VQOs).
Other Resource Program Objectives - Visual Resources	Manage visual quality by using the "medium" visual quality program (See EIS Appendix Q). Maintain all distinctive scenery, and all areas adjacent to major roads. Maintain some areas seen at background distances.
Forest Standards and Guidelines - Riparian Areas	Where uses conflict, favor protection of riparian-dependent resources (water, fish, vegetation, wildlife, and aesthetics) over other resources.
Forest Standards and Guidelines - Visual Resources	Manage visual resources to prevent unacceptable alteration of landscapes by designing and implementing management activities to meet or exceed adopted Visual Quality Objectives.
	Meet assigned VQOs when activities are planned within the foreground zone of State Highways 139 and 299.

SECTION/POLICY #	POLICY STATEMENT
1985 BLM Lahontan Resource Management Plan - Record of Decision & Management Decisions Summary/1994 BLM Lahontan Resource Management Plan Standard Operating Procedures Update	
Cultural Resources - Standard Operating Procedure	Avoidance of cultural properties is the preferred treatment. However, avoidance may be inappropriate or insufficient if, 1) the project will create on-going activity in the area, 2) the project will greatly increase access into the area, or 3) the project will alter the visual characteristics of the cultural property's setting. These conditions could lead to increased vandalism and/or accidental damage, or detract from the overall significance of the property. Significant cultural properties to be protected through avoidance will undergo baseline assessment in the field and be monitored on a periodic basis. Should avoidance appear not to be working, alternative mitigation will be developed and implemented.
Visual Resources/Visual Resource Management - Objectives	Manage public lands to protect scenic values and ensure that the visual impacts of management practices and development activities are minimized.
Visual Resources/Visual Resource Management - Standard Operating Procedures	Visual Resource Management objectives provide the visual management standards for the design and development of future projects and for rehabilitation of existing projects.
	Interim Visual Management objectives will be established where a project is proposed and there are no approved VRM objectives. Objectives will be developed using the guidelines established in BLM Manual Section 8410 and will conform with land use allocations set forth in the RMP. The establishment of interim VRM objectives will not require plan amendment unless the project itself requires one. The contrast rating process (Manual Section 8431) is used in project design and to assess projects during environmental review. These evaluations will consider the significance of the Proposed Project and the visual sensitivity of the affected area. If the visual contrast of a project exceeds the requirements of Visual Resource Management objectives, the impact is considered significant and mitigation measures and alternatives will be examined.
Forest Management - Standard Operating Procedures	Forest resources will continue to be evaluated on a case by case basis as part of project level planning. Such evaluation will consider the significance of the Proposed Project and the sensitivity of the forest resources in the affected area. Stipulations will be included to assure projects meet forest management objectives.
1982 Eagle Lake Resource Area, Cal-Neva Planning Unit Management Framework Plan	
Visual Resources Objective No. 6	Minimize the visual impacts of BLM land use management practices within a framework that maintains the effectiveness of the practices.
1983 Eagle Lake Resource Area, Willow Creek Planning Unit Management Framework Plan	
Recreation Areawide Decision	Manage the planning unit under designated Visual Resource Management class to maintain current landscape character. The Eagle Lake Basin and Tunnison Mtn. Wilderness Study Area are designated Class II and the remainder of the unit is designated Class III and IV.
Visual Resources Objective No. 1	Manage public lands to maintain the present landscape character of high and moderate quality scenic areas. Mitigate visual impacts in low quality scenic areas so that intrusions though readily visible, do not dominate the overall landscape character. Use the criteria established in BLM Visual Resource Management Classes to implement these policies.
Visual Resources Objective No. VRM-2	Reduce adverse visual impacts of cultural modifications affecting VRM Class II, III and IV areas.

C.13.1.3 Characteristics of the Proposed Project

The Proposed Project consists of thirteen (13) segments between Alturas, California (the north terminus), and Reno, Nevada (the south terminus). From north to south, the segments are: A, C, E, K, L, N, O, Q, R, T, W, X, and Y. The remainder of this section describes each segment's existing visual characteristics. Detailed discussions of visual characteristics of selected Key Observation Points are provided in Section C.13.2 (Impact Analysis).

C.13.1.3.1 *Segment A*

Segment A extends from the tap point with Bonneville Power Authority's 230 kV Transmission Line in the Devils Garden area, to the intersection with Alternative Segment B just south of County Road 54 at Angle Point AØ6. From Angle Point AØ1 to Angle Point HSØ1, the route crosses public lands managed by the Modoc National Forest. USFS VQOs for this segment range from Modification (for the northern two-thirds of the segment) to Partial Retention (for the southern one-third of the segment).

The AØ1-HSØ1 segment crosses mainly level to sloping sagebrush and juniper woodland. The route also crosses West Rock Creek, north of Angle Point HSØ1. Visual access into the area is limited to views from Crowder Flat Road (a juniper-lined dirt road) and a few four-wheel drive roads that lead into the area off of Crowder Flat Road. Northbound motorists on Crowder Flat Road view juniper woodlands in the foreground to background. Southbound motorists have relatively open views of juniper woodlands in the foreground/middleground and the Warner Mountains in the distant background. Southbound views become progressively screened as Crowder Flat Road and the route converge near Angle Point HSØ1. The Proposed Alturas Substation would be located in the vicinity of Angle Point HSØ1.

From Angle Point HSØ1 to Angle Point AØ3, the route crosses Devils Garden plateau and the upper portion of Daggert Canyon. Portions of this subsegment cross Modoc National Forest with Visual Quality Objectives ranging from Modification (HSØ1-ANP2) to Maximum Modification (ANP2-AØ3). Vegetation continues to be dominated by juniper and sagebrush. Visual access to this portion of the route is limited to intermittent views from Crowder Flat Road north of its intersection with State Route 299 (Hwy 299), a residence located on the west side of Daggert Canyon, and a brief view from Hwy 299 directly south of the canyon.

From Angle Point AØ3 the route crosses southwest across the plateau and then down the juniper-covered rim face. At the base of the rim the route crosses through juniper woodland to its intersection with Hwy 299. This portion of the route is visible from Hwy 299 and particularly so for westbound motorists as the view to the plateau rim (the predominant feature in that direction of travel) is relatively open and unobstructed. Eastbound motorists on Hwy 299 experience views of the route crossing that are considerably more screened by juniper on both sides of the highway, until relatively close to the crossing. Within this field of view, the distant Warner Mountains begin to draw the viewer's attention.

From Hwy 299, south to the convergence of Proposed Segment A and Alternative Route B, at Angle Point AØ6, the proposed route passes just east of a ranch and crosses Rattlesnake Creek, the Pit River, an existing power line, a railroad, and Centerville Road (County Road 54). South of the Hwy 299 crossing, the terrain is flat and contains primarily shrub vegetation, wetland vegetation associated with the Pit River, and some agricultural and grazing lands. Views from Hwy 299 south are open and expansive across the Pit River flood plain to low table lands and distant hills. Before reaching Angle Point AØ6, Segment A crosses low plateaus with exposed volcanic rims, and County Road 54, just east of its intersection with County Road 76. County Road 54 is the primary travel corridor to the Cal-Pines development, and the route crossing of County Road 54 will be visible to both westbound and eastbound motorists. Views are expansive, taking in the Warner Mountains to the east, Likely Mountain to the south, plateaus to the southwest, and juniper-covered hills to the west. Between Angle Points AØ5 and AØ6, the proposed route also crosses an existing overhead communication line.

C.13.1.3.2 *Segment C*

Segment C extends from Angle Point AØ6 in the north to the intersection of the C, D, and E routes at Angle Point C10, located southeast of Likely Mountain and northeast of Nelson Corral Reservoir, approximately 1¼ miles west of U.S. 395. From Angle Point AØ6, the Segment C travels southwest, up onto plateau lands south of County Road 54. From this point, down to approximately Angle Point CØ8, the predominant vegetation is grassland with some shrub and scattered juniper. Cattle grazing occurs on the broad flat plateaus. Most of the area is public land managed by the BLM. Primary access into the area is by County Road 62, a dirt road that provides access to Graves Reservoir, Graven Reservoir, Bayley Reservoir, and Delta Lake. Additional recreational access is provided by several four-wheel drive roads and a few hiking trails.

The route would be intermittently visible from County Roads 54 and 60 (in the north), County Road 62 (from midway between Angle Points CØ1-CØ2 to Angle Point CØ4), and a few four-wheel drive roads along the route. While some static or extended views of the route are possible (particularly from four-wheel drive road crossings and from Bayley Reservoir and Delta Lake), most often the route is hidden behind ridges and plateau rims, or screened by roadside juniper. Views often consist of expansive grass-covered plateau tops, rim escarpments, juniper-covered hills, and open grass-covered valley bottoms.

Just north of Angle Point CØ4, Segment C passes west of Infernal Caverns and the Battleground Memorial Marker. The route is minimally visible in this area as it is located back on the plateau and is partially screened by the plateau rim, topographic relief, and juniper. From Angle Points CØ4 to CØ8, the route passes east of Delta Lake and continues across grass and shrub-covered plateaus and then into forested foothills and ridges northeast and east of Likely Mountain. Visual access to this portion of the route is limited to a few four-wheel drive dirt roads and the Likely Mountain Radio Facility access road near Angle Point CØ8. Between Angle Points CØ6 and CØ7, the route crosses from Modoc County into Lassen County. Between Angle Points CØ8 and CØ9, the route crosses Dry Creek. As the route spans Dry Creek Canyon, it would be visible to motorists travelling on U.S. 395. Views from U.S. 395 would be relatively brief for northbound motorists. Views to the west, toward the route, for southbound motorists, would be effectively screened by roadside vegetation.

From Angle Point CØ9 to C10 (the southern terminus of Segment C) the route crosses a flat grass and shrub vegetated area known as Harter Flat. This portion of the proposed route would be visible to local ranchers and recreationists using the four-wheel drive dirt road that runs through Harter Flat to Nelson Corral Reservoir to the west.

C.13.1.3.3 *Segment E*

Segment E extends from its intersection with Segment C, south to the Madeline Plains. From Angle Point C10, Segment E crosses juniper and sage-covered ridges southeast of Likely Mountain. As the route descends down the ridges to its crossing of Ash Valley Road (County Road 527) west of Madeline, it would be visible to motorists travelling west and east on Ash Valley Road, and northbound on U.S. 395.

South of Ash Valley Road, the landscape is dominated by expansive views south into the Madeline Plains and distant McDonald Peak; to Spanish Springs Peak and Shinn Mountain in the southeast; and to forested ridges in the south and west. The proposed route would be visible to motorists on Ash Valley Road, and U.S. 395 as it travels south from Ash Valley Road across the flat, open, agricultural lands and shrub-covered terrain, and gradually converges on U.S. 395 at Angle Point EØ3. At this point the route crosses to the east side of U.S. 395 and Angle Point EØ4.

From Angle Point EØ4 to the end of Segment E at Angle Point EØ8, the route parallels U.S. 395 approximately 375 feet to the east. The route would be clearly visible to both southbound and northbound motorists along the remainder of Segment E.

In addition to U.S. 395, existing linear facilities along this segment include: a powerline (EØ4 - EØ5), overhead communication line (EØ4-EØ8), and railroad (EØ6-EØ8).

C.13.1.3.4 *Segment K*

Segment K begins at its intersection with Segment E and Alternative Segment I, and generally parallels U.S. 395 and the Southern Pacific Railroad across the Madeline Plains, first on the east side, and then on the west side of U.S. 395, until it reaches Angle Point KØ6. This portion of the route will be highly visible to motorists travelling northbound and southbound on U.S. 395, eastbound on the Termo-Grasshopper Road (in the vicinity of Angle Point KØ2), and north- and southbound on Horse Lake Road (in the vicinity of Angle Points KØ6 to JØ8). Views in this region continue to be dominated by the vast expanse of the Madeline Plains, ringed by distant mountains and ridges.

The route also parallels an existing overhead communication line from Angle Points KØ4 to KØ5. From Angle Point KØ6, the route heads due south to its intersection with Segment L and the foothills of Snowstorm Mountain. From Angle Point KØ6 south, the views of southbound motorists on U.S. 395 would be directed primarily to the southeast and Shinn Mountain, away from the route as it diverges to the south. The route would be more visible to northbound motorists in this same region as their primary field of view would be directed to the northwest across the Madeline Plains and the route's convergence with U.S. 395. To the northeast McDonald Peak will also compete for the viewer's attention. Segment K crosses lands designated by the BLM as VRM Class IV.

C.13.1.3.5 *Segment L*

Segment L begins at its junction with Segment K and Alternative Segment J, and travels in a southeasterly direction along the base of Snowstorm Mountain, to its crossing of U.S. 395 at Angle Point LØ2. This portion of the route would be more visible to southbound motorists on U.S. 395 as it converges toward the highway in front of Snowstorm Mountain, a moderate-height volcanic cone, heavily dissected by erosion. Conversely, the route would be less visible to northbound motorists as the route north from Angle Point LØ2 will diverge away from their field of view which will be drawn to the open expanses of the Madeline Plains to the north.

From Angle Point LØ2 and the crossing of U.S. 395 south to Angle Point LØ7 on Mud Flat, the route generally parallels, and is adjacent to, U.S. 395. Between Angle Points LØ2 and LØ4, the route crosses an overhead communication line and passes by Tule Patch Spring Rest Stop. This location is very scenic due to the topographic variety, subcoloration, angular volcanic landforms, and wetland vegetation associated with the spring and Secret Creek. Looking southeast and south from the Rest Stop, the route will be quite visible as it follows U.S. 395, curving to the right (south and west) in the field of view.

For motorists travelling southbound on U.S. 395, their views encompass the broad flat shrub and grass-covered plains of Secret Valley with the distant Skedaddle Mountains and Shaffer Mountain rising from the floor of the plains in the southeast and southwest respectively. Northbound motorists, likewise will experience panoramic vistas across Mud Flat and Secret Valley to Snowstorm Mountain and Shinn Mountain. The route would be within the immediate foreground viewshed of both directions of travel for an extended distance, as the route parallels the highway.

At Angle Point LØ7, the route begins to diverge to the southeast, away from U.S. 395, to its confluence with Proposed Segment N and Alternative Segment M, at Angle Point LØ8. Between Angle Points LØ7 and LØ8 the route traverses the western slopes of a ridge just east of the highway. This portion of the route will be within a very notable field of view for southbound motorists as it is along this stretch of U.S. 395 that the southbound motorist transitions from the Modoc Plateau to the Great Basin, and is afforded the first view, through a topographic gap, of Honey Lake Valley and the Fort Sage Mountains beyond. This area also contains a popular pull-out at the Noble Emigrant Trail Marker. Existing developed features also within this scenic field of view include an overhead communication line and the Southern Pacific Railroad.

From Angle Point JØ8 to midway between LØ1 and LØ2, Segment L crosses lands designated VRM Class IV by the BLM. From midway between Angle Points LØ1 and LØ2, to approximately LØ7, the route crosses lands designated by the BLM as VRM Class III. The remainder of Segment L is within VRM Class IV areas.

C.13.1.3.6 *Segment N*

From Angle Point LØ8, Segment N continues in a southeasterly direction along the southwesterly slopes of the Skedaddle Mountains and then generally follows the Southern Pacific Railroad, turning east toward the Skedaddle Mountains, and then southeast to its junction with Proposed Segment O and Alternative Segment M. This portion of the route crosses shrub vegetation north of Honey Lake and the Wendel Road, between U.S. 395 and Wendel. Segment N would be visible to westbound and eastbound motorists on the Wendel Road, particularly as it ascends and crosses the western-most proximity of the Skedaddle Mountains. Views include the three peaks of the Skedaddle Mountains to the north, and panoramic vistas to the east, south, and west across Honey Lake Valley to the Fort Sage and Diamond Mountains. A prominent developed feature in the viewshed north of the Wendel Road is the Honey Lake Power Plant. All of Segment N is designated by the BLM as VRM Class IV.

C.13.1.3.7 *Segment O*

Segment O begins at its junction with Proposed Segment N and Alternative Segment M, northeast of Wendel. Segment O then travels in a southwesterly direction between Honey Lake and the Skedaddle Mountains, paralleling the Southern Pacific Railroad between Angle Points OØ2 and OØ4, before turning south to parallel an existing dirt road along the eastern boundary of the Sierra Army Depot, to Angle Point OØ5 and its junction with Proposed Segment Q and Alternative Segment P. Most of the area is covered with sagebrush with some areas of barren alkaline soils, bitterbrush, and greasewood. Between Angle Points OØ4 and OØ5, the route crosses an area of small rolling sand dunes. Otherwise the valley floor is generally flat until it rises into the Virginia and Fort Sage Mountains to the south.

The route would be visible to motorists on the road between Wendel and Pyramid Lake. Between Angle Points OØ1 and OØ2 the route would be backdropped by the Wendel Cliffs, a large escarpment rising abruptly to an elevation approximately 1,500 feet above the valley floor. Between Angle Points OØ2 and OØ3, the route crosses within 1,000 feet of the Skedaddle Wilderness Study Area (WSA), which is located to the north and northeast in the Skedaddle Mountains, a popular hiking and off-road motorcycle area. The Skedaddle Mountains dominate the east side of Honey Lake Valley with the Wendel Cliffs being the most prominent portion of the WSA near Wendel. At Angle Point OØ1, Proposed Segment O abuts and, as proposed, the eastern half of the study corridor crosses the WSA boundary. At Angle Point MØ3 the Proposed Segment O ROW is within 500 feet of the WSA.

Segment O would also be visible to motorists on the roads in the eastern portion of the valley leading to Duck Lake and Cal/Neva Lake. Panoramic views in this area are dominated by the open vastness of Honey Lake Valley and the mountain ranges that border it including the Skedaddles to the north, the Virginia Mountains to the east, the Fort Sage and Petersen Mountains to the south, and the Diamond Mountains to the west. All of Segment O crosses lands designated by the BLM as VRM Class IV.

C.13.1.3.8 *Segment Q*

Segment Q crosses the southern portion of Honey Lake Valley, spanning an overhead communication line, then passing to the east of the Fort Sage Mountains. The route continues to wrap around to the south of the Fort Sage Mountains, crossing the relatively flat Dry Valley north of Seven Lakes Mountain, to the segment junction with Proposed Segment R and Alternative Segment P, at Angle Point PØ9, adjacent to, and east of, U.S. 395. The vegetation along this route is primarily sage and shrubs, with juniper on the east slopes of the Fort Sage Mountains. Visual access to the route is possible from several dirt roads located to the east and south of the Fort Sage Mountains. Views in this area are dominated by the jagged ridge line of the Fort Sage Mountains as well as the Virginia Mountains and, to a lesser extent, Seven Lakes Mountain. The southern portion of Segment Q will be visible to southbound motorists on U.S. 395 in Long Valley, as it crosses Dry Valley (flat with shrub vegetation) and the foothills of Seven Lakes Mountain (with scattered juniper), and converges in a southwesterly direction on U.S. 395. This portion of the route would generally be out of the field of view of northbound motorists.

From Angle Point 0Ø5 to QØ1, Segment Q crosses lands designated VRM Class IV by the BLM. From QØ1 to the south side of Dry Valley (south of Angle Point QØ5), the route falls within VRM Class III lands. From Dry Valley Segment Q crosses lands designated by the BLM as VRM Class IV (to the California border), and then Class III (to Segment R).

C.13.1.3.9 *Segment R*

Segment R is a short connecting segment that joins the proposed and alternative segments to the north of Angle Point PØ9, with the proposed and alternative segments to the south of Angle Point RØ2. Segment R passes through the narrow gap between Seven Lakes Mountain to the east and the Diamond Mountains to the west. Long Valley Creek runs through this gap that connects Long Valley (in the north) with Long Valley (in the south). Segment R is adjacent and to, and east of, U.S. 395, paralleling an overhead communication line, and would be visible to motorists travelling northbound and southbound. Views along this portion of U.S. 395 are drawn primarily to Long Valley Creek and its wetland vegetation including willows and cottonwoods directly west of the highway. To the west of Long Valley Creek the Southern Pacific Railroad is also within the field of view.

From Angle Point PØ9 to RØ1, Segment R crosses lands designated by the BLM as VRM Class III. From Angle Points RØ1 to RØ2, the route crosses the Lassen Red Rocks Scenic Area, which is designated as VRM Class II.

C.13.1.3.10 *Segment T*

Segment T extends from Angle Point RØ2, south to Angle Point TØ2, east of U.S. 395. Between Angle Points RØ2 and TØ1, the route parallels an overhead communication line, crossing the Lassen Red Rocks Scenic Area which contains unique red rock geologic features and spanning Red Rock Road. The 700-

acre Lassen Red Rocks Scenic Area has been assigned a VRM Class II rating by the BLM Lahontan Resource Area. As stated in the Lahontan Management Decisions Summary, 1987 Update: *"Scenic areas are established to identify areas of outstanding visual quality. Scenic areas will be managed to protect and enhance scenic qualities while allowing for appropriate recreation use. These lands are managed within Class II Visual Resource Management objectives where actions may be seen, but should not attract the attention of the casual observer. The level of change to the characteristic landscape would be low."* Segment RØ2 to TØ1 would be visible to motorists travelling northbound and southbound on U.S. 395 and eastbound and westbound on Red Rock Road. Between Angle Points RØ2 and TØ1, the Southern Pacific Railroad is also visible to the west of U.S. 395.

The route then extends parallel to, and east of, U.S. 395 at the base of the Petersen Mountains to Angle Point TØ2. From Angle Points TØ1 to TØ2, the route crosses rocky terrain covered with shrub vegetation. Northbound views are drawn directly to the dramatic red coloration of the Red Rocks formation, while southbound views are dominated by the abrupt and rugged Petersen Mountains directly east of the highway. From Angle Point TØ1 to the junction with Segment W, Segment T crosses lands designated by the BLM as VRM Class III.

C.13.1.3.11 *Segment W*

Segment W extends from Angle Point TØ2 in the north, to its juncture with Segment X and Alternative Segment V at Angle Point VØ5 to the south. The route stays to the east of U.S. 395 until reaching Angle Point WØ3, at which point it crosses to the southwest of the highway. Throughout this approximate 10-mile distance, the route would generally be visible as it crosses a series of finger ridges, drainage swales, and alluvial fans at the base of the Petersen Mountains, located immediately to the east of the highway. Motorists travelling northbound on U.S. 395 would be viewing both the dramatic rise of the Petersen Mountains immediately to the east, as well as the open expanse of Long Valley to the west and the Diamond Mountains beyond. Views of southbound motorists will similarly be drawn to the Petersen Mountains to the east and Long Valley to the west with forested ridges providing a backdrop for the pastoral setting of the valley foreground/middleground. Eastbound motorists on State Route 70, would have a direct perpendicular view of the route with the Petersen Mountains in the immediate background.

From Angle Point WØ3 to VØ5, the route crosses an existing overhead communication line and the Southern Pacific Railroad, and would then span U.S. 395. While the route would be readily visible to both northbound and southbound motorists, the northbound views would have fewer background land forms than the southbound views. On the other hand, southbound motorists would have a more direct view to the route as it crosses U.S. 395 and angles across the field of view to Angle Point VØ5. Segment W is located entirely on lands designated by the BLM as VRM Class III.

C.13.1.3.12 *Segment X*

Segment X extends from Angle Point VØ5 west of Border Town, southwest to Reno. At Angle Point XØ1, the route connects to the proposed Border Town substation located in Long Valley. The route would be more predominant in southbound U.S. 395 views than in northbound views as the route would be ascending low hills to the south directly in the field of view, before dropping into Long Valley. The crossing of Long Valley to the proposed Border Town Substation site and beyond to Angle Point XØ2 would be visible to motorists travelling the two, parallel, north-south dirt roads in the eastern portion of the valley; residences in the southern portion of the valley; and residences located on the ridge at Border Town. The substation would be located on a flat area immediately north of a slight rise between the two north-south parallel roads. Views in this area are generally directed across the sage- and grass-covered valley floor, to the forested hills to the south and west.

From Angle Point XØ2 to XØ6, the route generally follows the Southern Pacific Railroad. From XØ6 to XØ9 the Southern Pacific Railroad moves closer to U.S. 395 and into the foreground of the views from U.S. 395, while the proposed route remains in the middleground views. From Angle Point XØ2 to Angle Point XØ9 the route crosses the northern foothills of Peavine Peak, which are vegetated with shrubs and scattered juniper. Throughout this segment, the route would generally be visible to motorists travelling north and south on U.S. 395. The route would also be visible to residents of the community of Anderson. For the entire length of Segment X, Peavine Peak, with its sagebrush and shrub vegetation, is the dominant visual feature and will provide the backdrop for the route.

From Angle Point XØ2 to XØ6, the route parallels an existing overhead communication line and between XØ7 and XØ8 it crosses an overhead communication line. From Angle Point XØ3 to Angle Point X12, much of the route falls within the Peavine Peak Management Plan Area as designated by Washoe County. Peavine Peak is identified as an important scenic resource in Washoe County's North Valleys Area Plan. Also, U.S. 395 from Cold Spring Valley (near Border Town) to Panther Valley (north of Reno) is a County-designated Scenic Corridor.

The Proposed Project portion of Segment X skips to Angle Point X12 via Segment Y discussed below. From Angle Point X12 to X13, the route crosses through the northern suburbs of Reno. From Angle Point X12 the route travels to the east, passing south of the Hoge Road residential area, then crossing North Virginia Street (Business U.S. 395). It continues east, crossing barren land north of the University Ridge Subdivision, before turning south to cross a ridge line, down to the Proposed Project's southern terminus at the existing North Valley Road Substation. Between Angle Points X12 and the North Valley Road Substation, the proposed route crosses an overhead communication line and parallels several existing powerlines.

Views throughout this area tend to be dominated by a mix of urban and suburban development, intermixed with tracts of rugged open land. The route would be intermittently visible from various points including the Hoge Road residential area (north of X12), North Virginia Street (X12-X13 crossing), Parr Boulevard (north of Segment X12-X13), Sun Villa Estates (east of Segment X13-X14), Sutro Street (east of the substation), North McCarran Boulevard (south of the substation) and the University Ridge Subdivision (south of segment X12-X13). With the exception of that portion of Segments X12-X13-X14 located east of North Virginia Street, all of Segment X falls within areas designated by the BLM as VRM Class III.

C.13.1.3.13 *Segment Y*

Segment Y connects Angle Point XØ9 with Angle Point X12. This segment travels across the eastern foothills of Peavine Peak west of the Hoge Road residential development. The terrain is rocky and covered with sage and shrub vegetation. The route would be readily visible to residents and motorists at the western-most end of Hoge Road. Developed facilities in the field of view from Hoge Road include a powerline, two radio transmission towers, and several dirt roads.

C.13.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

C.13.2.1 Definition and Use of Significance Criteria

C.13.2.1.1 *Methodology*

Impacts on visual resources within the Proposed Project study area could result from various activities including: structure and line construction, substation construction, establishment of construction staging areas and access roads, and project operation. In order to assess the extent of project-related visual impacts in the study area, several techniques were employed.

Initially, the route was visually inspected from various public roads and vantage points to develop an overall assessment of the potential impacts by segment. In consultation with BLM, CPUC and USFS, a number of Key Observation Points (KOPs) were established to assess the potential project impacts on sensitive visual resources and scenic landscapes and vistas, as experienced from specific viewing locations of agency and public concern. Figures 13-A, B, C, D illustrate the location and view orientation of each KOP; the figures are provided in the addendum to this section. These KOPs were distributed along the route to evaluate impacts on visual resources with various levels of sensitivity, in different landscape types and terrain, and from various vantage points. KOPs are located: (1) along major or significant travel corridors, (2) at highway rest stops, (3) near residential areas, and (4) at existing or proposed recreation areas. Locations were selected in order to be fully representative of the typical public views to the Proposed Project and impacts that would occur along the route.

During the Project scoping meetings, visual simulations or the establishment of Key Observation Points (KOPs) were requested for specific parcels along the proposed route. In the Alturas area, the establishment of a KOP was requested for a parcel on the west side of Daggert Canyon. In response to this request, KOP No. 2 was established (on Crowder Flat Road above the parcel) and visual simulations 2B and 2D were prepared. In Long Valley, visual simulations were requested for several parcels with views to the proposed Border Town Substation. In response to this request, KOP 16 was established along the eastern-most access road to Long Valley and one visual simulation (16B) was prepared to characterize the visual impact of the proposed Substation. In the north Reno area, a visual simulation was requested to assess the visual impact to residents at the western end of Hoge Road. In response to this request, KOP 19 was established and one visual simulation (19B) was prepared for the view to the west from Hoge Road.

At each KOP, the existing visual setting and proposed route location have been evaluated in order to characterize the potential impacts on scenic quality and the viewer's experience. Additionally, Visual Contrast Ratings were conducted using the BLM's VRM System (BLM, 1984, 1986a). Appendix A provides the Contrast Rating Forms for each KOP. It is noted that the view direction indicated on the contrast rating forms in Appendix A generally encompasses a broader view, while the photographs and plate simulation provided in the Visual/Resources Section depict a more restricted view. Therefore, some view direction notation may differ between contrast rating forms and the photographs and photosimulations. The degree to which a project or activity affects the visual quality of a landscape depends on the visual contrast created between the project components and the major features, or predominant qualities, in the existing landscape. Visual contrast evaluates the project's consistency with the visual elements of form, line, color and texture already established in the viewshed. In a sense, visual contrast describes a particular landscape's ability to absorb a project's components and location without resulting in an uncharacteristic appearance. Other elements that are considered in evaluating visual contrast include the degree of natural screening by vegetation and landforms, placement of structures relative to existing vegetation and landforms, distance from the point of observation, and relative size or scale.

To aid in the assessment of project impacts, photosimulations have been prepared by altering photographs of the existing viewshed through the introduction of project elements such as substations or transmission line structures. The purpose of the photosimulation is to approximate the anticipated long-term appearance of the Proposed Project in the existing landscape.

Each segment has also been evaluated for its consistency with established public planning policies relative to the protection of scenic resources. Consistency determinations were made relative to the established management prescriptions of BLM VRM classifications and USFS VQOs, as well as policy guidance contained in County planning documents.

C.13.2.1.2 *Significance Criteria*

The factors considered in determining impacts on visual resources typically include: (1) scenic quality of the project site and vicinity, (2) available visual access and visibility, frequency and duration that the landscape is viewed, (3) viewing distance and degree to which the Proposed Project would dominate the view of the observer, (4) resulting contrast of the proposed activities or facilities with existing visual resources, and (5) the level of public interest in the existing landscape characteristics and concern over potential changes.

The criteria used to assess the significance of visual impacts resulting from the Proposed Project take into consideration the factors described above, as well as state and local policies and guidelines pertaining to visual resources. An impact on visual resources, whether on public or private land, is generally considered significant if it results in one or more of the following:

- Direct, permanent changes to the existing scenic character of a landscape that is viewed by a large number of viewers and/or one or more residences
- A condition that results in a long-term inconsistency with established BLM VRM Class Objectives or USFS VQO Management Prescriptions (applies only to public lands administered by the BLM or USFS)
- A high level of visual contrast as related to spatial characteristics, visual scale, texture, form, line, and color
- A change of a visual resource that would require more than three years to restore to its original character
- Changes that would add significantly to a cumulative visual alteration
- Changes that would generate new sources of glare that would be hazardous to motorists or pedestrians
- Changes that would generate new sources of light that would interfere with normal nighttime activities.

The impact analyses contained in Sections C.13.2.2 through C.13.2.4 evaluate the significance of project-related impacts on visual resources in accordance with the above criteria.

Note: Even though VRM designations have been developed for all proposed and alternative segments, VRM class objectives do not bind private land, or public lands not administered by the BLM (see Section C.13.1.2.1).

C.13.2.2 Environmental Impacts and Mitigation Measures

C.13.2.2.1 *Summary of Impact Significance and Consistency with Public Policy*

This section presents a summary of visual impact significance by segment and subsegment. Those segments or subsegments that are considered inconsistent with established visual resource protection policy are also indicated. A detailed discussion of visual impacts and policy consistency is provided in Section C.13.2.2.2. A guiding premise in conducting this impact analysis has been that all segments of the route would result in an adverse impact on the visual resources since every segment would be sufficiently visible from some location (even though it may be remote). However, the more important consideration will be the level of significance the impact is considered to impose.

There are occasions when a reduction in structure height, or the installation of vegetative screening (in close proximity to a viewpoint) can accomplish some level of impact-reduction. For a transmission line project of this scale, however, assuming 120-foot structure heights, there is relatively little opportunity, aside from route relocation, to mitigate visual impact to a level of non-significance. Table C.13-9 below presents a summary of impact significance for the segments. This table, as well as the discussions presented in the following sections, characterizes the project's potential visual impacts as, in most cases, either adverse but not significant (**Class III**), or as significant and unavoidable (**Class I**).

Table C.13-9 Summary of Impact Significance and Policy Consistency

Segment	Angle Point Subsegment	Impact Class++	Proposed Project Segments Inconsistent with Established Policies: BLM	USFS	Local
A	AØ1 → HSØ1	II			
	HSØ1 → ANP2	III			
	ANP2 → AØ3+	III			√
	AØ3+ → AØ5	I	√		√
	AØ5 → AØ6	I			√
C	AØ6 → CØ8	III			
	CØ8 → CØ9	I	√		√
	CØ9 → C10	III			
E	C10 → EØ2+	III			
	EØ2+ → EØ8	I	√		√
K	EØ8 → KØ5	I			√
	KØ5 → JØ8	III			
L	JØ8 → LØ1+	III			
	LØ1+ → LØ8	I	√		√
N	LØ8 → NØ2+	III			
	NØ2+ → MØ3	I			√
O	MØ3 → OØ1	I			√
	0Ø1	II	√		
	0Ø1 → 0Ø3	I			
	0Ø3 → 0Ø5	III			
Q	OØ5 → PØ9	III			
R	PØ9 → RØ2	I	√		
T	RØ2 → TØ2	I	√		
W	TØ2 → VØ5	III			√
X	VØ5 → XØ2	I			√
	XØ2 → XØ9	III			√
Y	XØ9 → X12	III			√

\+ Indicates a starting or ending point beyond the referenced Angle Point
++ Class I Significant; cannot be mitigated to a level that is not significant
Class II Significant; can be mitigated to a level that is not significant
Class III Adverse, but not significant
Class IV Beneficial impacts

C.13.2.2.2 *Short-term Construction Impacts and Mitigation Measures*

Construction impacts on visual resources would result from the presence of equipment, materials, and work force at the substation sites and staging areas and along the route, and from the temporary alteration of landforms and vegetation along the 160-foot right-of-way (ROW). Vehicles, heavy equipment, facility components and workers would be visible during site clearing, grading, substation construction or structure erection, conductor stringing, and site/ROW clean-up and restoration. Construction equipment and activities would be seen from the travel corridors and roads in close proximity to the project, and by residents or people seeking outdoor recreation activities in the vicinity of the route or substation. View durations would vary from brief to extended. Construction activities would be most visible for those portions of the Proposed Project adjacent to major travel corridors (such as U.S. 395 and State Route 299) or in close proximity to communities (such as Alturas). of landforms and vegetation along the 160-foot right-of-way (ROW). Vehicles, heavy equipment, facility components and workers would be visible during site clearing, grading, substation construction or structure erection, conductor stringing, and site/ROW clean-up and restoration. Construction equipment and activities would be seen from the travel corridors and roads in close proximity to the project, and by residents or people seeking outdoor recreation activities in the vicinity of the route or substation. View durations would vary from brief to extended. Construction activities would be most visible for those portions of the Proposed Project adjacent to major travel corridors (such as U.S. 395 and State Route 299) or in close proximity to communities (such as Alturas).

As described in Section B.2.3.5, seven construction staging areas would be utilized for the Proposed Project. These locations would generally be leveled and graveled over, and would contain equipment, materials and personnel. The first five staging areas described below are also proposed as part of the Tuscarora Pipeline Project; the last two are dedicated solely to the Proposed Project:

1. The Alturas Staging Area would be located south of the proposed location of the Alturas Mill Site Substation Alternative. This staging area would be located near the existing Alturas Lumber Yard and would appear as a distant middleground feature from Hwy 299 or residences on Mill Street. It would not significantly alter the scenic quality of the existing landscape.

2. A second staging area would be located south of Angle Point EØ7 and existing gravel pits. This staging area would be briefly visible to northbound and southbound motorists on U.S. 395 as a prominent foreground visual feature.

3. A third staging area would be located on a site east of Ravendale. This staging area would be a prominent foreground feature to northbound and southbound motorists on U.S. 395.

4,5. The fourth and fifth staging areas would be located near Wendel Road. These staging areas would be visible as a prominent foreground visual feature to motorists on Wendel Road.

6. The Border Town Staging Area would be located within the proposed Border Town Substation site. The staging area would result in a short-term construction impact but would be replaced by the long-term operational impact of the substation's presence.

7. The seventh staging area to be utilized by the Proposed Project would be the Applicant's existing material storage yard at the 11 Ohm Operations Center in Reno, Nevada. The use of this existing facility as a staging area for the Proposed Project would not result in a noticeable visual impact.

The construction of the transmission line and substations, and use of construction staging areas would result in the visual intrusion of construction vehicles, equipment, storage materials and workers. This would constitute an adverse, but not significant (**Class III**) visual impact of the Proposed Project, due to the relatively short duration of project construction.

Mitigation Measures. The following mitigation measures are recommended to reduce the visual impact due to construction:

V-1 Construction and excavated materials shall be stored away from highly visible segments along U.S. 395 and State Route 299 (Hwy 299) locations subject to approval by the Lead Agencies and appropriate permitting agencies. This action is to be taken by the Applicant during construction, and monitored by a Lead Agency-approved construction monitor.

V-2 Confine construction activities and materials storage to within substation sites, staging areas, designated access roads, and specified areas within the 160-foot transmission line ROW. This action is to be taken by the Applicant during construction, and monitored by a Lead Agency-approved construction monitor.

V-3 Prohibit the construction of access or spur roads for transmission line construction in highly scenic areas or areas of known public concern, if such activities result in strong levels of visual contrast. Construction of access or surface roads shall be restricted to specified areas identified by SPPCO, approved by the Lead Agencies, and incorporated into construction plans prior to permit issuance. Compliance will be monitored by a Lead Agency-approved monitor.

V-4 Whenever possible, construct access or spur roads at appropriate angles from the originating, primary travel facilities to minimize extended, in-line views of newly graded terrain. This action is to be taken by the Applicant during construction, and monitored by a Lead Agency-approved construction monitor.

C.13.2.2.3 *Summary of Long-term Impacts and Mitigation Measures*

Long-term visual resource impacts would result from the introduction of substations, transmission line structures, conductors and new or upgraded access roads into the existing viewsheds from residences, urban areas, travel corridors, and recreation areas. The significance of the impacts that result would depend on the quality and sensitivity of the existing visual resources, the degree to which the project components contrast with the established resource values, and the extent to which the impacts can be seen.

While the project is generally located in rural settings away from populated areas, there are two exceptions. Near the north end of the Proposed Project, the route passes on the western outskirts of Alturas, and at the southern end of the route the project comes in close proximity to rural and suburban residential developments outside Reno. These are considered sensitive areas due to the location of the route within the foreground and middleground distance-viewing zones from resident populations to which the project would be visible. In these areas, residents would perceive the Proposed Project as permanently degrading the scenic quality of the existing landscape. This negative perception would likely be exacerbated in rural areas where the project would be seen as an intrusion into more naturally appearing landscapes and agricultural fields. The project may visually contribute to the cumulative proliferation of built structures and the attendant sense of gradual urbanization, characteristics that many rural residents have actively sought to avoid. These impacts would be exacerbated by the daily viewing of the project. It should be noted that while a number of segments would result in an overall Class III (adverse but not significant) visual impact rating, an individual rural residence located along the route could experience a Class I (significant and non-mitigable) visual impact if it has an unobscured view of project structures as prominent foreground features in the landscape. Additional discussion of impacts on residences is presented in discussions of individual segments.

Portions of the route are also located in close proximity to the major travel corridors in this region. The visual impact on motorists travelling these corridors would be greatest when the route is located in the foreground viewing-distance zone, and particularly when the route parallels the travel corridor for extended distances (as it does in various locations along U.S. 395). This circumstance provides a significantly higher degree of exposure, resulting in a more significant visual impact.

In more remote areas of the route, particularly where there is recreational access, the number of viewers would be lower than along the major travel corridors (i.e., U.S. 395), but the expectations for unimpaired scenic quality would typically be greater.

In those cases where significant visual impacts occur, mitigation can generally be accomplished only in three ways: (1) relocate the route or structure to a less impact-sensitive location, (2) lower the structure height (appropriate and effective in some circumstances), and (3) install vegetation of sufficient height immediately adjacent to the viewing point to screen views of the project (appropriate and effective in very limited circumstances). These mitigation measures are proposed for specific segments based on analysis of local conditions; see Section C.13.2.2.4. In addition, the Applicant is proposing tower construction of corten steel which will oxidize to a natural rust color and use of non-specular conductors to reduce reflection and glare off of the conductors.

C.13.2.2.4 *Segment, Substation, Key Observation Point Impacts, and Mitigation Measures*

Specific long-term operational impacts and mitigation measures are discussed by segment in the following sections.

Segment A

Proposed Segment A would be visible from numerous public roads and several residences on the western outskirts of Alturas. Segment AØ1-HSØ1 would be visible to southbound motorists on Crowder Flat Road (north of the proposed substation location), but would not be noticeable to northbound motorists as their direction of view would generally be to the north and northwest away from the location of the route and the proposed substation site. KOP No. 1 was established on Crowder Flat Road approximately one mile north of the substation site access road, to assess the visual impacts on southbound motorists. As seen in the photosimulation prepared for KOP 1 (see Figures C.13-1A and C.13-1B), motorists would observe the transmission line converging toward Crowder Flat Road and the proposed Alturas Substation site, from left to center, in the distant middleground of the field of view. The tops of the transmission line corten steel H-frame structures would be visible slightly above the tree line. While the structures would be visible, they would remain subordinate to existing visual elements and would not significantly alter the existing scenic quality as perceived from Crowder Flat Road.

As viewed from KOP No. 1, the presence of transmission line structures in the existing landscape would result in a low degree of visual contrast. Thus, this segment of the Proposed Project is consistent with the USFS Visual Quality Objectives (VQOs) of Partial Retention and Modification applicable to this site. In addition, this segment of the Proposed Project is considered consistent with the visual resource protection policies in the Modoc County General Plan and General Plan Energy Element (which are applicable to this route location).

Views of the transmission line and substation site from that portion of Crowder Flat Road to the west, and immediately adjacent to the substation site, are currently well-screened by juniper adjacent to the road and between the road and the proposed substation site. If the substation access road is cut straight in from Crowder Flat Road to the substation, visual access to the substation would be provided, in-line with the new access road resulting in an adverse but not significant visual impact. The clearing of juniper adjacent to Crowder Flat Road as part of access road construction would reduce the screening effect and could result in greater visual access to the substation and transmission line structures. This would result in a potentially significant, but mitigable (**Class II**) visual impact.

Mitigation Measures. Mitigation Measures V-2 and V-4 as well as the following mitigation measures are recommended to insure that views from Crowder Flat Road are not significantly impacted:

V-5 Limit structure heights to 70 feet between milepost MP-1 and Angle Point HSØ1 and maintain a sufficient density of juniper between the proposed substation site and Crowder Flat Road immediately west of the substation site, to effectively screen views of the substation and transmission line from the road. Juniper shall be maintained immediately adjacent to the road shoulder to accomplish effective screening. Density requirements are to be determined by the BLM and USFS and incorporated into project construction plans prior to site preparation. Compliance during site preparation and construction is to be monitored by Lead Agency and USFS personnel.

V-6 Construct the Alturas Substation access road with appropriate angles and curves to prevent a direct line of sight to the substation from the intersection with Crowder Flat Road. No juniper shall be removed adjacent to Crowder Flat Road except for the substation access road (25-foot maximum width). Access road design, including appropriate angles and curves, is to be accomplished by the Applicant and submitted to the Lead Agency for approval as part of the construction plan submittal process prior to permit issuance. Adherence to the approved plans is to be monitored by a Lead Agency-approved construction monitor.

V-7 The Applicant shall design and install all lighting such that lights are not directly visible from nearby residences or roadways. Insure that all lighting structures for night-time illumination of the substation are fitted with appropriate lamp shields to minimize light scatter and glare outside the substation sites. The lighting and lamp shield design, is to be submitted by the Applicant to the Lead Agency for approval as part of the construction plan submittal process. Adherence to the approved lighting and lamp shield design will be determined by a Lead Agency-approved construction monitor.

Segment AØ1-HSØ1 and Segment HSØ1-ANP2 would be visible to people seeking outdoor recreational activities that are travelling on the back-country dirt and four-wheel drive roads into areas such as Indian Springs Reservoir, Upper Cummings Reservoir, and Mahogany Ridge. Some views from the back-country roads in the vicinity of the transmission line would be dominated by the transmission line and would result in an adverse impact. However, due to the relatively small number of visitors to this area, the impact is not considered significant **(Class III)**.

Segment ANP2-AØ5 crosses over the upper end of Daggert Canyon and out across a flat plateau, before descending down the face of the plateau to cross State Route 299, Rattlesnake Creek and the Pit River to Angle Point AØ5. KOP No. 2 was established on Crowder Flat Road just up from its intersection with State Route 299. As seen from KOP No. 2, the tops of transmission line structures would extend above the treeline as the transmission line crosses Daggert Canyon and the plateau. While this skylining effect would be noticeable (see Figures C.13-2A and C.13-2B), the structures would remain subordinate to the existing visual elements in the landscape. Similar views of this portion of the route would be afforded to locations in northern Alturas such as along Warner Avenue near the Golf Course, and to a private residence in Daggert Canyon. The skylining caused by the structures is considered an adverse visual impact. However the structures are located in the background viewing distance and would not significantly alter the scenic quality of the existing landscapes. The resulting visual contrast of the segment crossing the plateau would be low and this segment would be considered consistent with the established USFS Visual Quality Objective (VQO) of Partial Retention, and the BLM VRM Class II management goals. However, this portion of the route would be inconsistent with Modoc County Zoning Ordinance No. 3 which stipulates avoidance of ridgelines.

While the crossing of Daggert Canyon and the plateau would result in an adverse visual impact, it is not considered significant **(Class III)**. The impact could be further lessened by reducing structure heights.

Mitigation Measure. The following mitigation measure is recommended to reduce the visual impact of the ANP2-AØ3-Rim portion of the segment:

V-8 Reduce structure heights to the maximum extent feasible, as determined by the Lead Agencies, to lessen the skylining effect created by the transmission line structures as the route crosses upper Daggert Canyon and the plateau south of Angle Point AØ3. Structure heights and designs are to be submitted by the Applicant to the Lead Agencies for approval prior to permit issuance. Adherence to the approved structure design will be determined by a Lead Agency-approved construction monitor.

As the route descends the plateau face towards Hwy 299, the structures and conductors would be visible from Crowder Flat Road, Hwy 299, and Alturas. The structures would be a dominant feature in the landscape and would significantly alter the existing scenic quality. Tree removal proposed for this portion of the route would also increase the Proposed Project's visual contrast. From KOP No. 2, the transmission line would be located in the middleground distance viewing zone. The resulting visual contrast would be substantial and the degree of change in the characteristics of the landscape would be moderate (see Figures C.13-2C and C.13-2D).

Proposed Segment A would also be visible from westbound and eastbound Hwy 299. The visual impact would be greatest to westbound traffic, as the eastbound views are effectively screened by roadside juniper. KOP No. 3 was established on westbound Hwy 299 just east of the Hwy 299 crossing of Rattlesnake Creek. From this location, the transmission line appears as a dominant feature in the middleground landscape (see Figures C.13-3A and C.13-3B). The structure on the rim would cause a skylining effect, while the structures to the south would, for the most part, be backdropped by the existing terrain. From KOP No. 3, the existing scenic quality would appear adversely altered and a moderate level visual contrast would be created.

KOP No. 4 was established on eastbound Hwy 299 near the Rock Creek crossing, approximately two-tenths of a mile west of the route crossing of Hwy 299. From KOP No. 4, much of the route is screened by roadside juniper. However, structures located in proximity to Hwy 299 would appear as dominant features in the middleground of the view (see Figures C.13-4A and C.13-4B). Substantial visual contrast would be created and a moderate degree of change would occur to the landscape.

This portion of the route is inconsistent with established BLM VRM Class II management objectives. It would also be inconsistent with the following applicable Modoc County General Plan policies and ordinances (see table C.13-8 in Section C.13.1.2.4 for a description of the policies and ordinances): (1) Circulation Policy #9, (2) Timber/Vegetation #4, (3) Safety Policy #2, (4) Energy Facilities Policy #33, and (5) Zoning Ordinance #3. Therefore, this portion of the route would create a significant, unavoidable (**Class I**) visual impact.

Between Hwy 299 and Angle Point AØ5 to the south, the route would transition from a dominant foreground/middleground feature (as the route crosses a relatively open and pastoral landscape, Rattlesnake Creek and the Pit River), to a distant middleground/background subordinate feature. Impacted viewers would include (primarily) eastbound and westbound motorists on Hwy 299, and residences located south of Hwy 299 and west of the route. The scenic quality of the landscape would be adversely altered. This portion of the route would be inconsistent with BLM VRM Class II management objectives and the following Modoc County General Plan Policies and Zoning Ordinance: (1) Circulation Policy # 9, (2) Energy Facilities Policies #'s 32 and 33, and (3) Zoning Ordinance # 3. The resulting impact of this segment would be a significant, unavoidable (**Class I**) visual impact.

Segment AØ5 to AØ6 would constitute a distant middleground/background subordinate feature as viewed from Hwy 299 and would not constitute a significant adverse visual impact as viewed from that travel corridor. However, prior to Proposed Segment A's terminus at Angle Point AØ6, it crosses County Road 54, the primary travel corridor to the Cal-Pines development. As previously described (see Section C.13.1), the views along this road are expansive across relatively open landscapes. The proposed transmission line would appear as a dominant feature in the foreground and middleground landscape, as viewed from County Road 54, and is not consistent with the management prescriptions of the area's BLM VRM Class III rating. Thus, this portion of Segment A would result in a significant, unavoidable (**Class I**) visual impact.

Segment C

Segment C would extend from its confluence with Proposed Segment A and Alternative Segment B at Angle Point AØ6, south to the distant plateau lands, and forested hills and ridges, and its southern terminus at Angle Point C10, southeast of Likely Mountain. The northern-most portion of Proposed Segment C would be intermittently visible as a middleground/background feature from County Road 54 west of the route and County Road 60 to the east of the route. However, for most of the rest of its length, visual access to Segment C would be limited to the back-country dirt roads (including County Road 62) and four-wheel drive roads that access the public lands along the route and recreation areas including Graves Reservoir, Graven Reservoir, Bayley Reservoir and Delta Lake. Except where the route crosses, or is located in close proximity to, one of the access roads (where the transmission line would appear as a dominant foreground/middleground feature), it would be only intermittently visible as a middleground/background feature.

While the Proposed Project would be noticeable in this segment, with few exceptions it would remain a subordinate visual element. Much of the route across the plateau between Angle Points CØ2 and CØ6 would require intermittent blading to provide an overland travel route. This activity could leave noticeable ground scars. New access routes to be constructed near Angle Points CØ2 and CØ5, and upgraded roadways near CØ3, CØ6 and CØ7, would also result in land scarring. However, these impacts would be intermittent, and only seen by the few people that venture up on to the plateau. Therefore, it is considered an adverse, but not significant (**Class III**) visual impact.

Three Key Observation Points were established along Segment C to characterize the potential visual impact of the Proposed Route. KOP No. 5 was established immediately north of the Bayley Reservoir Dam to assess the visual impact on views to the east, as viewed by people seeking outdoor recreational activities. From this location, the transmission line would be noticeable as a background feature in the landscape (see Figures C.13-5A and C.13-5B). The subordinate nature of the Proposed Project would result in a low degree of change and visual contrast, based on the predominantly horizontal form and line of the existing landscape. Given the relatively small number of viewers in this area, the Proposed Project would generally not result in a significant visual impact.

KOP No. 6 is located south of Infernal Caverns, on an access road to an alternative location for the Infernal Caverns Trail System parking lot, trailhead, and interpretive sites (southeast of the currently proposed trail system). KOP No. 6 was originally proposed for the parking lot/trailhead location, however, the thick juniper adjacent to the location screened all views to the proposed route location. The KOP was subsequently moved back up the access to a point where there was a sufficient break in the juniper to glimpse a view of the Proposed Project. As can be seen from the photosimulation prepared for this location (see Figures C.13-6A and C.13-6B), only the very top of a transmission structure could be visible as a background feature, but would essentially be unnoticeable due to the screening of intervening terrain and juniper. As perceived from KOP No. 6, this segment of the Proposed Project is consistent with the applicable BLM VRM Class II management prescriptions, as no visual contrast would result and the level of change in the landscape would be very low. The Proposed Project's visual impact on views from this area and on a trail system originating from this area would be minimal. Thus, no significant, adverse visual impact is expected to occur in the vicinity of KOP No. 6.

KOP No. 7 was established at the Dry Creek Fire Station, the proposed location of a BLM campground and interpretive site adjacent to, and west of, U.S. 395, east of Likely Mountain. From this observation point, the route would appear as a prominent feature in the distant middleground. As depicted in the photosimulation from this KOP (see Figures C.13-7A and C.13-7B), the transmission line structures would extend above the ridgeline. The conductors spanning Dry Creek Canyon would also result in a skylining effect as they appear above the ridgeline in the background. The prominence of the Proposed Project in the landscape would attract viewers' attention and would result in a moderate level of visual contrast and change. Therefore, this segment of the Proposed Project is not consistent with the established BLM VRM Class II management prescriptions which require that the level of change to the landscape be low, allowing the Proposed Project to be seen by the casual observer, but not to attract attention.

This portion of Proposed Segment C would also be inconsistent with applicable Lassen County General Plan Energy Element, Transmission Lines and Natural Gas Pipeline (TL&NGPL) Policy No. 8, because the Proposed Project would not be well-integrated with the existing landscape and does not avoid visually prominent ridgelines. From KOP No. 7 the perceived impact would be considered a significant, unavoidable (**Class I**) visual impact.

Segment E

Proposed Segment E would extend from its confluence with Proposed Segment C and Alternative Segment D at Angle Point C10, south through the forested ridges north of Madeline and then across the open expanses of the Madeline Plains to its southern terminus at Angle Point EØ8. Between Angle Points C10 and EØ2, the transmission line would be screened by topography and vegetation, as would the upgrading of existing four-wheel drive roads in the vicinity of Angle Point EØ2 and the intermittent blading of areas along this portion of the route. Between Angle Points EØ2 and EØ3, the route would appear in the foreground and middleground as it descends the slopes north of Ash Valley Road, crosses the road, and passes west of Madeline across open scrub covered terrain and agricultural fields. The Proposed Project would appear as a dominant feature in the landscape as viewed from U.S. 395 (a County-designated scenic corridor), Madeline and Ash Valley Road. The Proposed Project would continue to be a dominant visual feature in the landscape as it converges on U.S. 395 at the crossover segment EØ3-EØ4 and parallels U.S. 395 to Angle Point EØ8.

Key Observation Point No. 8 was established on the northbound shoulder of U.S. 395 approximately one mile north of Angle Point EØ8. As can be seen in the photosimulation prepared for this location (see Figures C.13-8A and C.13-8B), the transmission line would appear as the dominant feature as it transitions from the foreground to the distant background, immediately adjacent to U.S. 395. The prominence of the Proposed Project would be increased by its close proximity to the highway and the in-line perspective afforded to motorists' field of view. The level of visual contrast and the change to the landscape would be high. This segment of the Proposed Project is not consistent with the established BLM VRM Class III management prescriptions, nor the Lassen County Energy Element, TL&NGPL Policy No. 8, because the Proposed Project would not be well-integrated with the existing landscape. The resulting impact for that portion of the segment between the Ash Valley Road crossing and Angle Point EØ8 is considered a significant, unavoidable (**Class I**) visual impact.

Segment K

Proposed Segment K continues south across the expansive Madeline Plains from Angle Point EØ8 to the junction with Alternative Segment J at Angle Point JØ8 (at the northern base of Snowstorm Mountain). Between Angle Points EØ8 and KØ5 the route would remain a dominant visual feature in the foreground of views from U.S. 395 (a County-designated scenic corridor). Although this portion of Proposed Segment K would be consistent with applicable BLM VRM Class IV management prescriptions, it is considered a significant, unavoidable (**Class I**) visual impact in this analysis, due to its dominance in the viewshed from U.S. 395.

At Angle Point KØ5, the Proposed Project begins to diverge away from U.S. 395 to the west and southwest until it reaches its most distant point from U.S. 395, approximately 3.5 miles west of the highway at Angle Point JØ8. Through this portion of the route, the Proposed Project would gradually transition from a prominent feature in the foreground views from U.S. 395, to a visible but subordinate visual background element at Angle Point JØ8. While much of this portion of Segment K constitutes a dominant or prominent visual feature in the landscape (as viewed from U.S. 395), it is consistent with the established VRM Class IV management objectives that allow high degrees of modification and domination of existing views. The resulting visual impact is adverse, but not significant (**Class III**).

Segment L

Segment L would extend east and then south from Angle Point JØ8, at the northern base of Snowstorm Mountain, through Secret Valley and across Mud Flat to its southern terminus at Angle Point LØ8, just north of Honey Lake Valley. Between Angle Points JØ8 and LØ2, the Proposed Project would transition from the background distance viewing zone to the foreground of views from U.S. 395 as it crosses the highway from west to east. Between Angle Points LØ1 and LØ2 the route crosses from lands designated BLM VRM Class IV to lands designated VRM Class III. At the crossing of U.S. 395, the Proposed

Project constitutes a prominent feature in the foreground views. It remains a foreground feature from Angle Points LØ2 to LØ3 and then diverges away from the highway to the east, becoming a distant middleground feature near Angle Point LØ4.

In the vicinity of Tule Patch Spring Rest Stop, the landscape to the northeast and southeast of U.S. 395 would become dominated by the Proposed Project between Angle Points LØ3 and LØ4. From LØ3 to LØ4 the project would be a subordinate element in views from U.S. 395. From Angle Point LØ4 the Proposed transmission line converges back toward the highway, from the middleground to foreground and remains in close proximity to the highway and dominates the land to the east of U.S. 395 until Angle Point LØ7, where the Proposed Project would be a prominent foreground feature to residences along U.S. 395, and northbound and southbound motorists traveling on U.S. 395. Proposed Segment L, from Angle Point LØ1 to LØ8, is inconsistent with applicable Lassen County Energy Element TL&NGPL Policy No. 8, because the Proposed Project would be sited along visually prominent terrain and would not minimize the impact on scenic views.

Two Key Observation Points were established along U.S. 395 (a County-designated scenic corridor) to assess the characteristic impact between Angle Points LØ2 and LØ7. KOP No. 9 is located at the Tule Patch Spring Rest Stop, viewing to the east and southeast. As seen in the photosimulation prepared for this location (see Figures C.13-9A and C.13-9B), the Proposed Project would transition from a dominant foreground feature to a visible, but subordinate, distant middleground feature in the landscape as viewed from the rest stop.

The foreground aspect of this segment would result in a strong visual contrast and a high degree of change in the landscape. It would also be inconsistent with established VRM Class III visual management objectives. The intermittent blading and tree removal that is proposed for Segment LØ2-LØ5 may also be visible from U.S. 395 and, if so, would contribute to the Proposed Project's visual contrast and overall impact on the existing landscape scenic quality.

The portion of Segment LØ2 to LØ5 that becomes distant middleground (crossing to the right of the field of view in the photosimulation) results in a low degree of visual contrast and change in the landscape. While it would be visible, it remains a subordinate visual feature and would be consistent with VRM Class III objectives. Overall, the LØ2-LØ5 portion of the route significantly diminishes the scenic quality of the panoramic view from the rest stop and is considered a significant, unavoidable **(Class I)** visual impact.

KOP No. 10 is located on U.S. 395 approximately 3.5 miles south of Angle Point LØ6 in Secret Valley. From this location the transmission line would appear as a dominant feature in the foreground and middleground of views from the highway. As seen in the photosimulation prepared for this key observation point (see Figures C.13-10A and C.13-10B), the transmission line would gradually transition from a dominant foreground/middleground feature to a visible, but subordinate, background feature, dominated by Shinn Mountain in the distant background. While this transition appears to reduce the scale of impact of more distant towers in the southern end of Secret Valley, the easterly view of the highway traveler through Secret Valley and by the Tule Patch Rest Stop would be dominated by large scale towers in the immediate foreground parallel to the highway.

The Proposed Project would contrast strongly with the existing visual features and would result in a high level of change to the landscape. Segment LØ5 to LØ7 through Secret Valley is not consistent with the established BLM VRM Class III management objectives which limit those allowable changes to the existing landscape to "Moderate," and require that the project not dominate views or be a major focus of the viewer's attention. The visual impact on motorists along this portion of U.S. 395 is considered a significant, unavoidable (**Class I**) impact.

After crossing Mud Flat to Angle Point LØ7, Proposed Segment L begins to diverge to the southeast, away from U.S. 395. Segment LØ7-LØ8 crosses the alluvial fans at the northwestern foot of the Skedaddle Mountains. The transmission line would be visible in the middleground/background of views to the northeast through southeast from U.S. 395.

KOP No. 11 was established on U.S. 395 just north of the Noble Emigrant Trail Marker, northwest of Angle Point LØ8. This location was selected because it is at this point that southbound motorists are afforded their first views of Honey Lake Valley and the Fort Sage Mountains (see Figure C.13-11A). The photosimulation prepared for this KOP (Figure C.13-11B) illustrates the moderate change that would occur in the landscape from the introduction of the Proposed Project and the resulting moderate level of visual contrast. The transmission line would repeat existing vertical features in the landscape created by communication poles and fence posts. The intermittent grading proposed to improve overland travel along this portion of the route may be visible, but would be minimally noticeable. This segment of the Proposed Project would attract attention, but would not dominate the viewshed. Therefore, it is considered consistent with the established BLM VRM Class III management objectives, and the resulting impact is considered adverse, but not significant (**Class III**).

Segment N

Proposed Segment N would extend southeast from Angle Point LØ8 to its junction with Proposed Segment O and Alternative Segment M, at Angle Point MØ3. This segment would be visible in background views from U.S. 395 (principally during the eastward views of northbound motorists adjacent to Tanner Slough in Honey Lake Valley) and middleground/background views from Wendel Road, north of Wendel. The route would be most prominent as it ascended the steep southern escarpment of the western Skedaddle Mountains and crested the upper ridge. The intermittent grading proposed for this portion of the route would contribute to the Proposed Project's overall visual contrast. From Wendel Road, the transmission line would appear as a prominent middleground feature in the landscape.

Proposed Segment N is consistent with the BLM management objectives for this VRM Class IV area. However, the Proposed Project would contrast relatively strongly with the existing rugged ridges, thus, diminishing the rather dramatic scenic quality of views to the Skedaddles. The Proposed Project would contribute to the cumulative alteration of scenic quality along Wendel Road. This segment of the

Proposed Project is inconsistent with applicable Lassen County Wendel Area Plan, Environmental Natural Resources Policy No. 5-C, which promotes the retention of scenic values. That portion of Segment N that would ascend the southern ridge of the Skedaddle Mountains would create a significant, unavoidable (**Class I**) visual impact.

Segment O

Proposed Segment O would extend from Angle Point MØ3 northwest of Wendel, southeast and south across flat scrub lands of eastern Honey Lake Valley to its southern terminus (Angle Point OØ5) and junction with Proposed Segment Q and Alternative Segment P, southwest of Duck Lake. Between Angle Points MØ3 and OØ1, Proposed Segment O would pass along the base of the Skedaddle and Amedee Mountains, in the vicinity of Wendel Road.

One KOP was located adjacent to Wendel Road to assess the visual impact on views of the Wendel Cliffs, an escarpment rising abruptly from the valley floor. This location was also selected to assess the visual impact of a direct view toward an angle structure. KOP No. 12 is located near the approximate location of Angle Point OØ1 adjacent to, and south of, Wendel Road. As can be seen from the photosimulation prepared for KOP No. 12 (see Figures C.13-12A and C.13-12B), eastbound views of the angle structure would be partially obscured by trees. The structure would transition from a subordinate background feature to a prominent foreground feature as viewers approach the structure. The escarpment to the east and the mountains to the north, would form a rugged backdrop to the transmission line. Moderate degrees of visual contrast and landscape change would result from this portion of the route.

This segment of the Proposed Project is inconsistent with Lassen County Wendel Area Plan, Environmental Natural Resources Policy No. 5-C, which promotes the retention of scenic values. The prominence, and resulting degradation of the scenic quality of the existing landscape would create a significant, unavoidable (**Class I**) visual impact. While most of Proposed Segment O is consistent with established BLM VRM Class IV management objectives, at Angle Point OØ1, the northeasterly half of the study corridor for the proposed route crosses the Skedaddle Wilderness Study Area (WSA) boundary and would be inconsistent with the established VRM Class I management objectives applicable to the WSA. This impact is considered a significant but mitigable (**Class II**) visual impact.

Mitigation Measure. Mitigation Measure V-9 is recommended to eliminate the crossing of the Skedaddle WSA and inconsistency with established VRM Class I objectives:

V-9 Relocate Angle Point OØ1 further south in order to avoid encroachment into the Skedaddle WSA.

From Angle Point OØ1, the route would cross Honey Lake Valley, passing north and east of the Sierra Army Depot. This area receives relatively little traffic and has been significantly modified by the development of the Depot. Views tend to be expansive across flat scrub lands to mountains that ring the valley. The tall, vertical transmission line structures would contrast with the flat, horizontal valley floor.

However, the existing landscape is rather uniform and non-distinct, the scenic quality of the area has been impacted by the Sierra Army Depot, and this segment of the Proposed Project is consistent with existing VRM Class IV management objectives. Therefore, the Proposed Project's visual impact in this area is considered an adverse, but not significant **(Class III)** impact. South of Angle Point O and northeast of Turtle Mountain, the route would cross the northern extent of the Fort Sage OH Area Main Loop Trail. Construction of the Proposed Project in this designated recreational riding area would create a long-term adverse but not significant **(Class III)** visual impact.

Segment Q

Proposed Segment Q would extend from Angle Point OØ5 in the southern end of Honey Lake Valley, southeast around the east side of the Fort Sage Mountains, before turning southwest to pass through Dry Valley to join Proposed Segment R and Alternative Segment P at Angle Point PØ9 adjacent to U.S. 395, southeast of Constantia. For most of its length, Proposed Segment Q passes through sparsely populated areas with relatively few motorists. Visual access would be achieved by travel on dirt roads and four-wheel drive roads east of the Fort Sage Mountains.

The route crosses back and forth between lands designated BLM VRM Class III and Class IV. The landscape remains fairly uniform with scrub, sage and juniper, the common vegetation. In addition, the Proposed Segment Q would traverse the State Doyle Wildlife Area. The Proposed Project could be visible in all three viewing distance zones depending on the viewer's location and view orientation.

The intermittent blading and tree removal proposed along Segment Q would likely increase the Proposed Project's contrast with the existing landscape characteristics. The blading and tree removal impact would only be intermittently noticeable depending on terrain and vegetation screening as well as the viewer's orientation.

Segment Q becomes most visible as it converges on U.S. 395 across Dry Valley (QØ5-PØ9). This segment is most visible to motorists in Dry Valley, and to southbound motorists on U.S. 395. To southbound U.S. 395 motorists, the Proposed Project would transition from a subordinate distant middleground/background feature, to a more prominent foreground/middleground feature, (briefly) backdropped by Seven Lakes Mountain. Segment Q would result in an adverse, but not significant **(Class III)** visual impact due to the non-distinct scenic quality of the route, limited visual access, and relatively small number of viewers that would see the Proposed Project.

Segment R

Proposed Segment R passes through a narrow gap between Seven Lakes Mountain and the Diamond Mountains, parallelling U.S. 395 in the immediate foreground. The transmission line would appear as a prominent or dominant feature in the narrow gap and would impair views to the Petersen Mountains to the south and diminish the scenic quality of the narrow canyon and Long Valley Creek and its wetland vegetation. Intermittent blading proposed along Segment R could also increase the Proposed Project's visual impact. This segment of the Proposed Project is not consistent with the applicable BLM VRM Class III management objectives. Proposed Segment R would result in a significant, unavoidable **(Class I)** visual impact.

Segment T

Proposed Segment T would extend from its junction with Proposed Segment R at Angle Point RØ2, south through the Lassen Red Rocks Scenic Area to its junction with Segment W at Angle Point TØ2 at the western base of the Petersen Mountains. Segment T would be visible as a dominant and prominent feature in foreground/middleground views from U.S. 395 and Red Rock Road. Due to the sensitive nature of the Lassen Red Rocks formations as a scenic resource, three Key Observation Points were established to assess the potential visual impact on views from U.S. 395 and Red Rock Road.

KOP No. 13 is located on U.S. 395 just north of the intersection with Red Rock Road. The southbound view depicted in Figure C.13-13A is dominated by the rugged Petersen Mountains in the distance. The photosimulation prepared for this observation point (Figure C.13-13B) illustrates the Proposed Project's transition from a prominent foreground feature to a subordinate distant middleground feature with the dominant Petersen Mountains as a backdrop. As viewed from this location, the scenic quality of the dramatic and natural appearing landscape would be noticeably diminished with the introduction of the prominent vertical, linear elements of the Proposed Project. Depending on the extent of grading, land scars resulting from intermittent grading along this segment may also be visible from U.S. 395 and Red Rock Road. As a result of the Proposed Project, a high level of change in the landscape would occur and a strong degree of visual contrast would result. This portion of Proposed Segment T is not consistent with the BLM management objectives of either the applicable VRM Class II or Class III designations. From KOP No. 13, Proposed Segment T would result in a significant, unavoidable **(Class I)** visual impact.

KOP No. 14 is located on Red Rock Road immediately east of the intersection with U.S. 395. Immediately north of Red Rock Road are the unique red rock formations for which the Lassen Red Rocks Scenic Area designation was made. As demonstrated in the photosimulation prepared for this KOP (see Figures C.13-14A and C.13-14B), the Proposed Project would appear as a dominant feature in the foreground/middleground of views from Red Rock Road and U.S. 395. The presence of the transmission line structure in the foreground would impair views to the red rock formations in the background. The introduction of the transmission line structures would result in a strong degree of visual contrast and a high level of change in the characteristics of the existing landscape. The result would be a diminishment of the landscape scenic quality. This portion of the Proposed Segment is not consistent with the established BLM VRM **Class II** management objectives. The result would be a significant, unavoidable **(Class I)** visual impact.

KOP No. 15 is located on U.S. 395 approximately 1.7 miles south of Red Rock Road. This KOP was established to assess the impact of the Proposed Project on northbound views of the Lassen Red Rocks formations to the north of the route. As demonstrated in the photosimulation for this KOP (see Figures

C.13-15A and C.13-15B), the Proposed Project would be visible as a prominent feature in the distant middleground. The Proposed Project would partially obscure the Red Rock formations, thus diminishing the scenic quality of the landscape. This segment of the Proposed Project would result in a moderate-to-strong degree of contrast with the characteristics of the existing landscape and is not consistent with the BLM VRM Class II management objectives for the Lassen Red Rocks Scenic Area. This segment would generate a significant, unavoidable (**Class I**) visual impact.

Segment W

Proposed Segment W would extend from its junction with Proposed Segment T at Angle Point TØ2, south along the western foothills of the Petersen Mountains to Proposed Segment X at Angle Point VØ5, west of Border Town. For most of its length, Segment W would be visible to northbound and southbound motorists on U.S. 395 (a County-designated Scenic Corridor). It would appear as a prominent feature in the middleground distance viewing zone with the Petersens rising abruptly in the background. This segment of the Proposed Project is inconsistent with Lassen County Hallelujah Junction Area Plan Goals and Objectives Nos. 12 and 19, and Aesthetics and Noise Policy Nos. 4 and 4j, which require the protection of existing scenic landscape and the siting of utilities along natural vegetation edges in order to achieve visual compatibility. Further, Proposed Segment W would be visible from CDFG lands designated for biological preservation and limited recreational uses. Between Angle Points WØ3 and VØ5, Segment W crosses U.S. 395 and would be more visible and for a longer duration in southbound views than for northbound views. Although Segment W would attract viewers' attention, it would generally not dominate views of the landscape except at the U.S. 395 crossing. Thus, this segment of the Proposed Project is consistent with established BLM VRM Class III management prescriptions and would result in an adverse, but not significant (**Class III**) visual impact.

Segment X

Proposed Segment X would extend from its intersection with Proposed Segment W at Angle Point VØ5, southeast across Long Valley and the northern and eastern foothills of Peavine Peak to its southern terminus at North Valley Road Substation. The Proposed Project portion of Segment X does not include Segment XØ9-X12 (Proposed Segment Y is included as part of the Proposed Project instead).

Segment X would be visible from U.S. 395 for most of its length. It would appear, variably, as a noticeable but subordinate middleground-to-background feature that would generally be backdropped by Peavine Peak.

The route would also be visible from several residential subdivisions along the route. Segment X, between Angle Points XØ1 and XØ9, is inconsistent with the Washoe County Comprehensive Plan Land Use and Transportation Element, Land Use Policy LUT.1.11 and Implementation LUT.1.14.1b, as well as the North Valleys Area Plan Conservation Policy NV.1.1 and, Cultural and Scenic Resources Policy NV.1.2. The Proposed Project: (1) would negatively impact the visual quality of a major entrance to Washoe County, (2) is not visually compatible with surrounding uses, (3) does not maintain the existing scenic quality of the hills that it crosses, and (4) does not preserve or enhance the visual qualities of the North Valley Area as viewed from U.S. 395.

Four Key Observation Points were established along Segment X to determine the characteristic visual impact of the transmission line and Border Town Substation on U.S. 395 motorists and residents in the vicinity. Segment VØ5-XØ2 and Border Town Substation would be visible to: southbound motorists on U.S. 395 as distant middleground to background features, motorists on the Long Valley access roads as prominent foreground to middleground features, rural residences located in the southern end of Long Valley as distant middleground features, and Border Town residences located southwest of U.S. 395 as prominent middleground features.

KOP No. 16 is located on the eastern-most access road to Long Valley, southwest of Border Town and U.S. 395. This location was selected to assess the visual impact of the proposed transmission line and Border Town Substation as prominent middleground features in the landscape. The substation is located in the vicinity of Angle Point XØ1. As demonstrated in the photosimulation prepared for this KOP (see Figures C.13-16A and C.13-16B), the transmission line and Border Town Substation would partially obscure views to Long Valley and the hills beyond. The proposed facilities would result in a strong degree of visual contrast and a high level of change in the existing landscape. The proposed facilities would be quite prominent, would attract viewers' attention, and would dominate the existing viewshed. Therefore, this portion of the Proposed Project is considered inconsistent with the established BLM VRM Class III management prescriptions. The visual impact is considered significant and non-mitigable (**Class I**).

KOP No. 17 is located on Copperfield Road in the residential community of Anderson, south of U.S. 395. This KOP was established to assess the visual impacts on local residents and to motorists on U.S. 395. The transmission line would appear as a prominent middleground feature as it passed to the south of the residential area along the alluvial fans and finger ridges at the base of Peavine Peak. As illustrated in the photosimulation prepared for this KOP (see Figures C.13-17A and C.13-17B), the transmission line would be backdropped by the northern foothills of Peavine Peak. In some locations (as shown in Figure C.13-17B), the structures and conductors would skyline as they crossed finger ridges. The Proposed Project would result in a moderate degree of visual contrast with the existing landscape characteristics, and a moderate level of landscape change. These effects are considered consistent with the allowable changes under the established BLM VRM Class III management prescriptions. The visual impact of the line in this region is adverse, but not significant (**Class III**).

Between Angle Points X12 and X13, the Proposed Route passes through more urbanized areas of North Reno. Due to the close proximity of urban development along this portion of the route, single-pole structures are proposed instead of the double-pole H-frame structures characteristic of the rest of the route. At the point where Segment X12-X13 crosses North Virginia Street, the Proposed Project would appear in the foreground views from residences on North Virginia Street and adjacent occupied structures. KOP No. 18 was established to identify the typical visual impacts on residents along the X12-X13 portion of the route. KOP No. 18 is located at the northeast corner of North University Park and University

Green, at the northern edge of the University Ridge Subdivision (located immediately south of the X12-X13 segment).

Viewing north from KOP No. 18, the proposed transmission line would appear as a prominent feature in the middleground distance zone (see Figures C.13-18A and C.13-18B). Portions of the existing landscape are disturbed and there are a number of built features in the viewshed including overhead electric transmission and distribution, and communication facilities.

While the proposed facilities would repeat the vertical elements associated with existing electric transmission and distribution facilities, the scale of the proposed transmission line would result in a moderate degree of visual contrast and moderate level of landscape change. This portion of the route has not been assigned a VRM classification. Although the proposed facilities would be very prominent as viewed from several locations (including adjacent residential subdivisions, North Virginia Street, Parr Boulevard, and Sutro Street) the anticipated visual impact would be adverse, but not significant (Class III) due to the disturbed nature of the existing landscape and the presence of urban development and several similar built features.

Mitigation Measure. Mitigation Measure V-10 is recommended to ensure that Applicant proposed landscaping for the Border Town Substation minimizes the visual impact of the substation in such a manner that is consistent with the existing character of the visual environment.

V-10 The Applicant shall submit a Landscaping Plan for the Border Town Substation to the Lead Agencies for review and approval prior to substation construction. The Plan shall describe specific measures to be implemented to visually shield the Border Town Substation, including: proposed berming, plant material (species, container size, and growth rates to be specified), and use of any other materials. The Plan shall also describe proposed maintenance materials. Renderings for each sensitive viewshed shall be provided in the Plan to illustrate expected results.

Segment Y

Proposed Segment Y connects Angle Points XØ9 and X12. Segment Y crosses the eastern foothills of Peavine Peak in a northwest-southeast trending direction. KOP No. 19 was established at the western end of Hoge Road to determine the visual impact on the western-most residents of this subdivision. As seen in the photosimulation prepared for this KOP (see Figures C.13-19A and C.13-19B), the transmission line would be visible as a prominent middleground feature in the landscape. Although there are a number of built, vertical features in the existing landscape (electric distribution line and radio structures) the Proposed Project would create a moderate degree of visual contrast due to the scale of the proposed facilities and the skylining effect that would occur as the transmission line crosses the western finger ridges. This segment of the Proposed Project is not consistent with North Valleys Area Plan, Conservation Policy NV.1.1, because the Proposed Project would negatively impact the scenic qualities of the hills in the North Valleys Planning Area. The resulting change in the landscape would be Moderate, and is consistent with the applicable BLM Class III VRM objectives.

Some land scarring from intermittent blading proposed for this portion of the route may be visible (depending on terrain screening) but it would be minimally noticeable and would not significantly increase the Proposed Project's visual contrast. Due to the relatively small number of viewers that would see this portion of the Proposed Route, the anticipated visual impact is considered an adverse, but not significant (Class III) impact.

C.13.2.3 Cumulative Impacts and Mitigation Measures

Assessment of cumulative visual impacts is dependent on site-specific location information on cumulative projects. Cumulative impacts may occur if one or more of the cumulative projects (see Section B.5) is constructed within the same viewshed as the Proposed Project. For example, if the transmission line or substations resulting from construction of the Proposed Project are visible or noticeable within the same field of view of containing a cumulative project (as identified in Table B-9), a cumulative impact will occur. It is also possible that a cumulative impact could occur if a viewer's perception is that the general visual quality of an area is diminished by the proliferation of visible structures (or construction effects such as ground scars), even if the structures are not all within the same field of view. The proliferation of visible structures and their associated visual impacts could be considered indirect effects of the Proposed Project if future projects (beyond those identified in Table B-9) are the result of project-induced urban growth.

The significance of the cumulative impact depends on the degree to which: (1) the viewshed is altered, (2) visual access to scenic resources is impaired, (3) scenic character is diminished, or (4) the visual contrast of the project is increased.

The planned Tuscarora Gas Pipeline has the most potential to result in cumulative visual effects since it would be located parallel to several intermittent sections of the Proposed Project for a total of approximately 37 miles. Construction of the gas line will be completed before the Proposed Project, but the Tuscarora project reclamation will not be completed. The primary visual concern would be the scarring of the pipeline ROW and the potential impacts of the Proposed Project on revegetation efforts. It is likely that construction of the Proposed Project would slow down revegetation efforts by re-distributing recently revegetated areas. Special precautions will be needed to ensure proper revegetation and avoidance of long-term ROW scarring. See Section C.3.2, Biological Resources, for a discussion of mitigation measures.

Those Proposed Segments that could result in short-term cumulative visual impacts due to concurrent or sequential construction with the Tuscarora Pipeline Project are identified in Table C.13-10. The resulting cumulative visual impacts would be considered adverse but not significant due to the short-term nature (during construction) of the impact, if revegetation efforts are successful.

There are also several non-linear cumulative projects that would be located sufficiently close to the Proposed Project such that cumulative visual impacts could occur. In Modoc County, three subdivision projects (Centerville Estates, Modoc Farms T00, and Wildlife Estates) are located approximately one-half

Table C.13-10 Proposed Segments That Could Result in Cumulative Visual Impacts with the Tuscarora Pipeline

Segment	Angle Point Subsegment
C	AØ6+ - CØ1
E	EØ2+ - EØ8
K	EØ8 - KØ4+
L	LØ1+ - LØ8
N	LØ8 - MØ3
O	MØ3 - OØ4+

+ Indicates a starting or ending point beyond the referenced Angle Point

mile west of Segment A6-C1 off of Centerville Road. These developments would likely be within the same field of view containing the Proposed Project as seen by motorists travelling on the Centerville Road (particularly westbound).

The clustering of these three projects as well as the close proximity of the transmission line and a fourth cumulative project (subdivision) located further west on Centerville Road could also contribute to a viewer's perception that a proliferation of built structures is occurring in this vicinity, and that the scenic quality of the rural landscape is diminishing. This impact would be considered significant and unavoidable **(Class I).**

In Lassen County, the LMUD Intertie with the Proposed Project could result in a significant and unavoidable cumulative visual impact if the LMUD Intertie is located within the viewshed of the Wendel Road that also includes Proposed Segment P.

The Proposed Project could also result in cumulative visual impacts with the Fish Springs Ranch Pumping Project which would be located less than 1,000 feet from Proposed Segment Q in the vicinity of Segment QØ4-QØ5. The above-ground facilities of the pumping project would be visible in the same landscape setting that contains the Proposed Route. However, due to the relatively few number of viewers that would experience this cumulative impact, it is considered an adverse but not significant (Class III) visual impact.

The Sierra Lady Mineral Project would also be visible with the Proposed Project (between Angle Points WØ1 and WNØ4) in the viewshed of U.S. 395, north of Hallelujah Junction. To the extent that above-ground built structures or surface modifications associated with Sierra Lady are apparent in views from the highway, the resulting visual impact could be significant and unavoidable **(Class I)**.

In Sierra County, the Proposed Project could result in cumulative visual impacts to the extent that portions of Proposed Segment WØ4-WØ5 are visible within the same landscape that would also contain the proposed Ski Resort/Golf Course in the Long Valley Falls Canyon area. Views of this area would be available to motorists on U.S. 395 (primarily southbound) as well as motorists on the unpaved access roads to Long Valley. The significance of the cumulative impact is expected to be adverse but not significant due to the relatively limited number of viewers and the anticipated rural-recreational appearance of the ski resort.

At the Border Town Substation sites, the proposed project would result in cumulative visual impacts if future substation expansion, including additional transmission lines to serve the north valleys result in a proliferation of visible structures. The resulting visual impact would be **Class I**.

In Washoe County, the Proposed Project would result in cumulative visual impacts to the extent that portions of Proposed Route Segments Y and X between Angle Points YØ1 and X13 are visible within the same views containing the proposed Evans Creek Watershed Project. Views of the two projects would primarily be from Rancho San Rafael Park and the residential subdivision located northeast of the proposed Evans Creek Dam and south of Proposed Route Segment X12-X13. The significance of the cumulative impact is expected to be adverse but not significant (**Class III**) due to the intermittent nature of views of both projects due to screening by terrain, and the relatively few number of viewers that will see the projects.

C.13.2.4 Unavoidable Significant Impacts

Several segments and subsegments of the Proposed Project would result in unavoidable, significant impacts (**Class I**). These segments and their associated impacts have been discussed in Section C.13.2.2 and are summarized in Table C.13-11.

C.13.3 ALTERNATIVE ALIGNMENTS AND SUBSTATION SITES

C.13.3.1 Alturas Area Alternative Alignment (Segment B)

Alternative Segment B extends from a proposed tap point with Bonneville Power Administration's (BPA) 230 kV Transmission Line (located north of Alturas), west and south to the intersection with Proposed Segment A, just south of County Road 54 at Angle Point AØ6. This segment would provide an alternative to Proposed Segment A (including the Alturas Substation Mill Site Alternative discussed in Section C.13.3.9).

C.13.3.1.1 *Environmental Setting*

Alternative Subsegment BØ1-BØ2 is a short segment that extends in a southwesterly direction from the BPA tap point, across agricultural lands to Angle Point BØ2, adjacent to the northern terminus of Warner Avenue. From Angle Point BØ2, the route turns west and crosses open, grass fields, to Angle Point BØ4. Alternative Subsegments BØ2-BØ4 pass approximately 500 feet south of the Alturas golf course, and north of a few rural residences that form the southern boundary of the grass field. Between Angle Points BØ1 and BØ4 the route crosses several powerlines and a telecommunications line. Visual access to Alternative Subsegments BØ1-BØ4 is primarily limited to motorists on Warner Avenue, recreationists

Table C.13-11 Summary of Unavoidable, Significant Impacts

Proposed Segment	Angle Point Subsegment	Description of Project Impact
A	AØ3+→AØ6	Project would be a prominent foreground feature, creating moderate to strong degree of visual contrast and moderate landscape change. Would result in structure skylining, diminished scenic quality. Inconsistent with public policy.
C	CØ8→CØ9	Project would be a prominent middleground feature, resulting in structure and conductor skylining and creating moderate visual contrast and landscape change. Would diminish scenic quality. Inconsistent with public policy.
E	EØ2+→EØ8	Project would be a dominant foreground feature, creating strong visual contrast and landscape change. Would result in structure skylining and impacts on views from County-designated Scenic Corridor. Inconsistent with public policy.
K	EØ8→KØ5	Project would be a dominant foreground feature, creating moderate visual contrast and landscape change. Would impact views from County-designated Scenic Corridor.
L	LØ1+→LØ8	Project would be a dominant foreground to prominent middleground feature, creating strong to moderate visual contrast and landscape change. Would diminish scenic quality and impacts views from County-designated Scenic Corridor. Inconsistent with public policy.
N	NØ2+→MØ3	Project would be a prominent middleground feature, creating strong visual contrast and moderate landscape change. Would result in structure skylining and diminished scenic quality. Inconsistent with public policy.
O	MØ3→OØ3	Project would be a prominent foreground to middleground feature, creating moderate visual contrast and landscape change and diminished scenic quality. Inconsistent with public policy.
R	PØ9→RØ2	Project would be a prominent foreground feature, diminishing scenic quality and impacting views from County-designated scenic corridor. Inconsistent with public policy.
T	RØ2→TØ2	Project would be a dominant foreground to prominent middleground feature, partially obstructing views and diminishing scenic quality. Would create moderate to strong visual contrast and landscape change, and impact views from County-designated scenic corridor. Inconsistent with public policy.
X	VØ5→XØ1	Border Town Substation would be a prominent foreground to middleground feature, creating a strong degree of visual contrast and a high level of change in the existing landscape. The substation would impact views from existing residences and existing roads to Long Valley.

+ Indicates a starting or ending point beyond the referenced Angle Point

using the golf course, residents located south of Alternative Subsegment BØ2-BØ3 in the vicinity of Warner Ave, and residents on the north side of Hwy 299. Views along this portion of the alterative primarily encompass the open grass fields west of Warner Avenue and north of Hwy 299, and the juniper-covered hills and plateau to the north and west of the alternative.

On Angle Point BØ4 the alternative turns due south, crossing Hwy 299 to Angle Point BØ5, and then southeast to Angle Point BØ6 and the Alturas Substation Mill Site Alternative, located in an open field south of Hwy 299. Alternative Subsegment BØ4-BØ6 would be visible to residents on the north side of Hwy 299, as well as westbound and eastbound motorists on Hwy 299, residents on Mill Street to the east of the alternative, and a few rural residences and motorists on the western-most portion of 4th Street. Views in this area are expansive, encompassing open, grass fields in the foreground and long vistas to the Warner Mountains in the east, distant hills to the south, and juniper-covered plateaus and hills to the southwest, west and north.

From Angle Point BØ6, south to the convergence with Proposed Segment A, the alternative turns south and then southwest, crossing the Pit River and its associated wetlands, a telecommunications line, a power line and a railroad. The terrain is relatively flat and primarily contains shrub vegetation, wetland vegetation, and some agricultural and grazing lands. Views from Hwy 299, as well as from the west end of 4th street south, are open and expansive, taking in the Pit River flood plain, low table lands and distant hills.

Before reaching the convergence point with Proposed Segment A, Alternative Segment B crosses low plateaus with exposed volcanic rims, as well as County Road 54 (Centerville Road), just east of its intersection with County Road 76. County Road 54 is the primary travel corridor to the Cal-Pines development, and the route crossing of County Road 54 would be visible to both westbound and eastbound motorists. Views are expansive along this road, taking in the Warner Mountains to the east, Likely Mountain to the south, and juniper-covered hills and table lands to the west and southwest.

C.13.3.1.2 *Environmental Impacts and Mitigation Measures*

Three Key Observation Points (KOPs) were established to assess the characteristic visual impact of Alternative Segment B. The first, KOP No. 20, is located on Warner Avenue, north of Hwy 299 and south of the Alturas Golf Course. As demonstrated in Figures C.13-20A and C.13-20B, Alternative Segment B will appear as a prominent middleground feature in the view north from KOP No. 20. As viewed from this location, the transmission line would add an additional vertical built element in the viewshed that would create a moderate degree of visual contrast and a moderate level of change in the existing landscape. To the extent that public lands would be crossed by the transmission line in this viewshed, the Proposed Project would be consistent with the established BLM VRM Class III management prescriptions. However, Alternative Subsegments BØ2-BØ3 would be inconsistent with Modoc County General Plan, Circulation Policy No. 9, and Modoc County General Plan Energy Element, Energy Facilities Policy No. 3, due to its degradation of scenic quality as experienced from residences (south of the alignment), the golf course (north of the alignment), and Warner Avenue (crossed by the alignment). The proximity of the alternative subsegment to residential and recreational uses, its scale in relation to existing built structures, and its prominence in views to the plateau lands to the north and west, would result in a significant, unavoidable (**Class I**) visual impact.

In order to characterize the visual impact to motorists travelling on Hwy 299, KOP No. 21 was located on the eastbound shoulder of Hwy 299 (west of the Alternative Subsegment BØ4-BØ5 crossing of Hwy 299). As viewed from KOP No. 21 (Figures C.13-21A and C.13-21B), the transmission line facilities would appear as a middleground feature, dominating the expansive views east to the Warner Mountains. This portion of Alternative Segment B would result in a strong degree of visual contrast and a moderate level of change in the existing landscape. This would not be consistent with the applicable BLM VRM Class II management prescriptions, nor with Modoc County General Plan Circulation Policy No. 9 and

Zoning Ordinance No. 3. Consequently, Alternative Subsegment BØ4-BØ5 would result in a significant, unavoidable (**Class I**) visual impact.

KOP No. 22 is located on the westbound shoulder of Hwy 299, west of Alturas. This KOP was established to assess the impact of Alternative Segment B on the expansive open vista to the south and southwest, as experienced from Hwy 299. As demonstrated in the photosimulation (see Figures C.13-22A and C.13-22B), the transmission line and substation alternatives would be visible as prominent middleground features and would partially impair views to distant hills in the background. As viewed from KOP No. 22, Alternative Subsegments BØ5-BØ8 would diminish the existing scenic quality as well as result in a moderate degree of visual contrast and a moderate level of change in the existing landscape. This alternative would not be consistent with the applicable BLM VRM Class II management prescriptions that allow project activities to be seen but not attract attention, and require any changes to repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. This portion of Alternative Segment B would also be inconsistent with Modoc County General Plan Circulation Policy No. 9, Energy Facilities Policy No. 33, and Zoning Ordinance No. 3, prohibiting the degradation of aesthetic values and impairment of scenic views. Alternative Subsegments BØ5-BØ8 and the substation alternative would generate a significant, unavoidable (**Class I**) visual impact.

Night-time illumination of the substation alternatives could result in excessive light and glare, as experienced by motorists on adjacent roadways and nearby residents. This would result in a significant, but mitigable (**Class II**) visual impact.

Mitigation Measure. Mitigation Measure V-7 is recommended to minimize the occurrence of excessive light and glare from the alternative substation.

From Angle Point BØ7 to the junction with Proposed Segment A at Angle Point AØ6, Alternative Segment B would transition from a prominent middleground feature to a subordinate background feature in the viewshed from Hwy 299. However, overall, this portion of Alternative Segment B would be experienced as a prominent to dominant middleground and foreground feature in views from westbound and eastbound County Road 54, the primary travel corridor to the Cal-Pines development. As previously described, the views along this road are expansive, across relatively open landscapes. Alternative Subsegment BØ7-BØ8 would degrade the existing scenic quality of the area and result in a moderate-to-strong degree of visual contrast, and moderate-to-strong level of change in the existing landscape. As a result, Alternative Subsegment BØ7-BØ8 would be inconsistent with the established BLM VRM Class II and III management prescriptions, as well as the Modoc County General Plan Circulation Policy No. 9 and Energy Element, Energy Facilities Policy No. 32 (discouraging the siting of facilities in sensitive natural resource areas such as wetlands). Alternative Subsegment BØ7-BØ8 would result in a significant, unavoidable (**Class I**) visual impact.

C.13.3.1.3 *Cumulative Impacts and Mitigation Measures*

No cumulative visual impacts are anticipated for Alternative Segment B.

C.13.3.1.4 *Unavoidable Significant Impacts and Mitigation Measures*

As viewed from Hwy 299, Fourth Street, and various residences in proximity to the alternative, all of Alternative Segment B would result in significant, unavoidable visual impacts due to its visual prominence, moderate-to-strong degree of visual contrast, and impairment of scenic views.

C.13.3.2 Madeline Plains Alternatives (Segments D, F, G, H, I)

These alternative segments allow for two, more westerly, crossings of the Madeline Plains as alternatives to Proposed Segment E that generally parallels U.S. 395.

C.13.3.2.1 *Environmental Setting*

Alternative Segment D

Alternative Segment D extends from the intersection of Proposed Segments C and E, south, to the intersection of Alternative Segments F and G at Angle Point DØ8, east of Anderson Mountain. The landscape along this alternative consists primarily of rolling hills and angular ridgelines covered by scrub vegetation and patchy-to-dense stands of juniper. From Angle Point C10 to Angle Point DØ1, the alternative passes southeast of Harter Flat and Nelson Corral Reservoir, where it parallels the Nelson Corral Reservoir unpaved access road and then crosses several four-wheel drive roads. Intermittent views of Alternative Subsegment C10-DØ1 would be available from the reservoir access road and four-wheel drive roads when the alternative is in close proximity. Otherwise, roadside juniper would often screen more distant views of the alternative. However, distant views of the alternative, stretching approximately two miles across relatively flat sage- and scrub-covered lands, would be available from Nelson Corral Reservoir. This portion of alternative Segment D crosses public lands designated BLM VRM Class II. The remainder of Alternative Subsegment C10-DØ1 crosses areas designated BLM VRM Class III.

From Angle Point DØ1 to Angle Point DØ7 the Alternative Segment D crosses juniper- and scrub-covered hills and several four-wheel drive roads, before reaching Sagebrush Flat at Angle Point DØ7. Between Angle Points DØ1 and DØ7, views are relatively confined by terrain and vegetation. From Angle Point DØ2 to DØ4, the alternative crosses lands designated BLM VRM Class III. Between Angle Points DØ3 and DØ4 the route crosses Ash Valley Road within Holbrook Canyon. The route would be more visible to westbound traffic on Ash Valley Road as the road descends down a long sloping grade which affords a more panoramic view of the area that the route would cross. Views of the route would be brief and limited to motorists and recreationists on Ash Valley Road, as well as the local four-wheel drive roads.

From Angle Point DØ7, Alternative Segment D extends southeast along the southeastern edge of Sagebrush Flat before passing through Anderson Canyon to Angle Point DØ8, paralleling the four-wheel drive access road to Spooner Reservoir. This area is designated BLM VRM Class IV. Although views are relatively constrained through Anderson Canyon, the alternative would be visible to travelers on the unpaved access road due to its close proximity in the immediate foreground. Alternative Subsegment DØ7-DØ8 would be particularly visible as it crosses the mouth of Anderson Canyon, where the canyon opens up to Sagebrush Flat.

Alternative Segment F

Alternative Segment F extends from Angle Point DØ8, east of Anderson Mountain south to its intersection with Alternative Subsegments G, J, and I, approximately two miles west of Angle Point EØ8 on U.S. 395. Alternative Segment F is the more distant of two north-south segments from Angle Point DØ8 (Alternative Segment G being the other). Alternative Segment F crosses the Madeline Plains approximately four to five miles west of U.S. 395. It passes approximately one-half mile east of Ninemile Point. The landscape crossed by Alternative Segment F is primarily agricultural fields and flat scrub-covered plains. Visual access to this portion of the alternative would be primarily from U.S. 395 and local farm access roads. Views from U.S. 395 are expansive with the flat plains and agricultural fields in the foreground/ middleground, and the north-south portion of the alternative in the background. Alternative Segment F would be backdropped by the distant hills to the west of the plains, becoming more visible as it turns east at Angle Point FØ3 toward U.S. 395. This portion of the alternative crosses public and private lands. These public lands have been designated BLM VRM Classes III and IV. In addition, between Angle Points DØ8 and FØ1, the alternative crosses an existing telecommunication line.

Alternative Segment G

Alternative Segment G extends from Angle Point DØ8, south to its intersection with the G, J, and I Segments at Angle Point FØ4/JØ1. Alternative Segment G crosses the Madeline Plains approximately three miles closer to U.S. 395 than Alternative Segment F does. The landscape and visual access would be similar to Alternative Segment F, however, Alternative Segment G would be located in the middleground of the views from the highway, whereas Alternative Segment F would be located in the background. Both Alternative Segments F and G cross private and public lands; the public lands are designated BLM VRM Classes III and IV.

Alternative Segment H

This alternative segment is a very short connector between Alternative Segments F and I with the same visual characteristics as Segment G.

Alternative Segment I

Alternative Segment I is a relatively short (two-mile) connecting segment that extends from Angle Point FØ4/JØ1, due east to Angle Point IØ1, immediately adjacent to U.S. 395, directly across from Angle Point EØ8. This alternative crosses agricultural areas and scrub vegetation as it converges on U.S. 395. From Angle Point IØ1 west to its origin at JØ1, Alternative Segment I would extend from the foreground to middleground of the views from U.S. 395. These views are expansive across the flat terrain of the

Madeline Plains. Alternative Segment I crosses lands designated BLM VRM Classes III and IV, and between Angle Point IØ1 and U.S. 395, the alternative would cross an existing telecommunication line.

C.13.3.2.2 *Environmental Impacts and Mitigation Measures*

Alternative Segment D

As described above, views to Alternative Segment D would be limited primarily to recreationists accessing the backcountry (particularly in the Harter Flat/Nelson Corral Reservoir and Sagebrush Flat areas), and motorists on Ash Valley Road in Holbrook Canyon. KOP No. 23 was established at the north end of Nelson Corral Reservoir to assess the characteristic visual impact to recreationists in this area. As seen in the photosimulation prepared for this KOP (see Figures C.13-23A and C.13-23B), the transmission line would appear as a background feature, resulting in a weak-to-moderate degree of visual contrast. This alternative would cause a low level of change in the existing landscape. However, due to the skylining effect that would be created, the structures will attract attention, and therefore, would not be considered consistent with the applicable BLM VRM Class II management prescriptions. In addition, the proposed upgrading of an existing four-wheel drive road to provide improved access to the route would result in a visible land scar, though minimally noticeable. Due to the relatively few viewers that would be impacted overall, Alternative Segment D would result in an adverse, but not significant **(Class III)** visual impact.

The remainder of Alternative Segment D would be minimally visible except for the crossing of Holbrook Canyon and Ash Valley Road, as well as that portion of the alternative that passes through Anderson Canyon. In these instances, Alternative Segment D would appear as a prominent-to-dominant foreground feature. Other factors contributing to the impact include: (1) visual access to the transmission line may be increased in the Holbrook Canyon area as a result of proposed tree removal activities, and (2) this portion of the alternative will require upgrading of existing four-wheel drive roads and intermittent blading along the alternative to permit overland travel. The scar left from the blading may be intermittently visible but would not appear as a prominent change in the landscape. In general, however, Alternative Segment D (from Angle Points DØ1 to DØ8) would be consistent with the applicable BLM VRM Class III and Class IV management prescriptions. The result would be considered an adverse, but not significant **(Class III)** visual impact.

Alternative Segment F

As viewed from U.S. 395, Alternative Segment F would be visible as a distant background feature, four to five miles to the east. From KOP No. 8 on U.S. 395 (previously established to assess the visual impact of Proposed Subsegment EØ7-EØ8), Alternative Segment F would appear as a subordinate, almost indistinguishable, feature in the distant background due to the distance from the viewing point as well as the backdrop provided by Ninemile Point and the hills west of the Madeline Plains (see Figures C.13-8C and C.13-8D). The resulting visual contrast would be weak and the level of change to the existing landscape would be low. Alternative Subsegment FØ3-FØ4 would transition from a distant background feature to a noticeable, yet distant middleground feature as it converges on U.S. 395. Alternative Segment F would be considered consistent with the applicable BLM VRM Class III and Class IV management prescriptions, and would result in an adverse, but not significant **(Class III)** visual impact.

Alternative Segments G & H

Alternative Segment G crosses the Madeline Plains in closer proximity to U.S. 395 than Alternative Segment F. As depicted in the photosimulation of this segment from KOP No. 8 (see Figure C.13-8E), Alternative Segments G and H would appear as a noticeable-to-prominent middleground feature in the flat, open Madeline Plains. These alternatives would create a weak-to-moderate degree of visual contrast and a low-to-moderate level of change in the existing landscape. Alternative Segments G and H would be considered consistent with the applicable BLM VRM Class III and Class IV management prescriptions. The visual impact associated with Alternative Segments G and H is considered adverse, but not significant **(Class III)**.

Alternative Segment I

As viewed from U.S. 395, Alternative Segment I would transition from a visible, but distant and subordinate, middleground feature in the relatively flat landscape of the Madeline Plains, to a dominant foreground feature as it converges on, and then crosses, U.S. 395 to Angle Point EØ8. The visual contrast that would result from the foreground aspect of Alternative Segment I would be moderate-to-strong and the change in the landscape would be moderate. The western portion of Alternative Segment I would be consistent with the applicable BLM VRM Class IV management prescriptions; however, the eastern portion of Alternative Segment I, which approaches and crosses U.S. 395, would dominate views from U.S. 395 and hence not be consistent with the applicable BLM VRM Class III objectives. The prominence of the transmission line in the expansive vistas to the west across the Madeline Plains would result in a significant, unavoidable **(Class I)** visual impact.

C.13.3.2.3 *Cumulative Impacts and Mitigation Measures*

Of Alternative Segments D, F, G, H, and I, only that portion of Alternative Segment D passing through Holbrook Canyon has the potential to cause cumulative visual impacts, in conjunction with the Alturas Reservoir Management Project. However, given the intended use of existing irrigation structures for the Reservoir Project, a cumulative visual impact would only occur if the Reservoir Project also included the construction of structures that would be visible within the same field of view encompassing Alternative Segment D. Any resulting visual impact would be considered adverse but not significant **(Class III)** given the relatively few viewers that would be impacted.

C.13.3.2.4 *Unavoidable Significant Impacts*

Of Alternative Segments D, F, G, H, and I, only Segment I (all) would result in a significant, unavoidable (**Class I**) visual impact, due to its presence as a dominant foreground feature in the viewshed from U.S. 395.

C.13.3.3 Ravendale Alternative Alignment (Segments J, I)

The visual impacts of Segment I are discussed in Section C.13.3.2.2, above.

C.13.3.3.1 *Environmental Setting*

Alternative Segment J extends from Angle Point FØ4/JØ1, south and southeast to the intersection of Proposed Segments K and L near Snowstorm Creek. This alternative would be more concealed than Proposed Segment K, which parallels U.S. 395 before diverging from the highway in the vicinity of Ravendale.

Alternative Segment J crosses the southern portion of the Madeline Plains before entering hilly terrain west, and southwest, of Ravendale. The landscapes along this alternative transition from the open agricultural and scrub lands of the Madeline Plains to the scrub- and juniper-covered hills to the south. Between Angle Points JØ3 and JØ4, the alternative crosses the paved, two-lane Termo-Grasshopper Road, which extends from Termo on U.S. 395, west to State Route 139 in Grasshopper Valley (Termo-Grasshopper Road is identified as a Scenic Highway Corridor in the Lassen County General Plan). From Angle Points JØ4 to JØ8 the alternative crosses Schott Canyon Road (to Horse Lake), Horse Lake Road, and several four-wheel drive roads in the hills and mountains northeast of Horse Lake. This portion of the alternative would require upgrading of existing four-wheel drive roads in the vicinity of Angle Points JØ4 and JØ5 as well as intermittent blading to allow overland travel. However, land scarring, where it occurs, would be minimally visible to only a few viewers (due to screening by vegetation and terrain). Alternative Segment J is located predominantly on public lands, all of which have been designated BLM VRM Class IV.

C.13.3.3.2 *Environmental Impacts and Mitigation Measures*

With the exception of the northern portion of the alternative in the Madeline Plains (and particularly in the vicinity of the Termo-Grasshopper Road crossing where the alternative would be visible to motorists), most of Alternative Segment J would only be intermittently visible due to screening by topography and vegetation. Views are generally dominated by the angular and rolling terrain, and from Angle Point JØ1 to JØ4, the alternative would be located in the middleground-to-background of views from U.S. 395. Between Angle Points JØ3 and JØ4, the alternative would be within the foreground-to-middleground of views from the Termo-Grasshopper Road. From Angle Point JØ4 to JØ8, the alternative would not be visible from U.S. 395 or other major travel corridors. The route would be visible where it crosses Horse Lake Road.

Alternative Segment J is consistent with the established BLM VRM Class IV objectives and would not significantly alter or degrade scenic quality as experienced from U.S. 395. Therefore, Alternative Segment J would result in an adverse, but not significant **(Class III)** visual impact.

C.13.3.3.3 *Cumulative Impacts and Mitigation Measures*

Alternative Segment J would result in a cumulative visual impact in conjunction with development of the Ravendale School, to be located on the Termo-Grasshopper Road, approximately 0.5 mile east of the Alternative Segment J road crossing. The terrain in the immediate vicinity is relatively flat with a slight rise intervening between the school site and the alternative. Westbound motorists would likely be able to see the school and the transmission line in the same field of view. Depending on the height of the school structures, terrain may screen the school from view to eastbound motorists until they have passed the transmission line. Thus, a cumulative impact would not occur unless the motorist perceives a proliferation of built structures in an otherwise relatively rural and open landscape and a subsequent diminishment of scenic quality. The resulting impacts would be considered adverse but not significant **(Class III)** due to the relatively few number of viewers that would be affected.

C.13.3.3.4 *Unavoidable Significant Impacts*

No unavoidable significant impacts are anticipated for the Ravendale Alternative Alignment.

C.13.3.4 East Secret Valley Alignment (Segment ESVA)

Alternative Segment ESVA would be approximately 1.5 miles east of Proposed Segment L and would extend from Angle Point LØ1 east and south, across the east side of Secret Valley, to Angle Point NØ2, north of Honey Lake Valley. The northern portion of this alternative traverses the southwestern flanks of Shinn Mountain before descending into the Stony Creek basin and the eastern portion of Secret Valley. Crossing Shinn Mountain, the alternative passes through scattered juniper and scrub vegetation. The remainder of the route, south to Angle Point NØ2, crosses sage- and scrub-covered lands.

C.13.3.4.1 *Environmental Setting*

With the exception of a few rural residences located in Secret Valley west of Five Springs Mountain, visual access to Alternative Segment ESVA would primarily be limited to intermittent, distant background views from U.S. 395, and more extended views from several unpaved roads that access the area east of U.S. 395 including Shinn Ranch Road northwest of Five Springs Mountain, Smoke Creek Road west and northwest of Skedaddle Wilderness Study Area, and four-wheel drive roads to Rush Creek Mountain, Five Springs Mountain, Deep Creek, and Horsecamp Reservoir. Views along the ESVA Alternative encompass flat, expansive plains (in the vicinity of Stony Creek, Smoke Creek Road, and Little Mud Flat), ringed by the ridgelines of Shinn Mountain, Five Springs Mountain, and the Skedaddle Mountains. Views to the west include the open expanse of Secret Valley and Mud Flat with Snowstorm Mountain and Shaffer Mountain beyond.

Alternative Segment ESVA crosses BLM lands designated VRM Class III along most of the alternative and VRM Class IV through the southernmost three miles. The northern portion of the alternative crossing the flanks of Shinn Mountain would not be consistent with Lassen County Energy Element TL&NGPL Policy No. 8, which stipulates that projects should not be sited on ridgelines or other visually prominent features. While that portion of the alternative crossing Shinn Mountain would be intermittently visible to northbound motorists on U.S. 395, the transmission line would appear as a distant background feature, backdropped by Shinn Mountain and partially screened by intervening terrain and vegetation. Therefore, it would not significantly affect the views of Shinn Mountain from U.S. 395.

C.13.3.4.2 *Environmental Impacts and Mitigation Measures*

Several KOPs were established to assess Alternative Segment ESVA's characteristic visual impact. Two KOPs were selected along U.S. 395 (a County-designated scenic corridor). KOP No. 9 was previously established to assess the visual impact of Proposed Segment L on views from the Tule Patch Rest Stop. From KOP No. 9, the northern portion of this alternative would be screened from view by terrain immediately adjacent to U.S. 395. Further south (southwest of Five Springs Mountain), at an approximate line-of-sight distance of 6.5 miles from KOP No. 9, the transmission line could conceivably be visible as a relatively non-distinct feature in the seldom-seen viewing distance zone. However, as viewed from KOP No. 9, the non-distinct appearance of the transmission line would not result in an adverse visual impact.

KOP No. 10 was previously established on U.S. 395 approximately 3.5 miles south of Angle Point LØ6 in Secret Valley to assess the visual impact of Proposed Segment L. From KOP No. 10, Alternative Segment ESVA would appear as a subordinate feature in the background of views from U.S. 395. As seen in the photosimulation prepared for this view (see Figure C.13-10D), the transmission line would be visible as a background feature. Portions of the alternative would skyline where structures extend above the ridgeline. However, views from U.S. 395 are drawn primarily to Shinn Mountain and Snowstorm Mountain in the north and Skedaddle Mountains to the south. This alternative, as viewed from KOP No. 10, would be consistent with established BLM VRM Class III management prescriptions and would result in a low degree of visual contrast and landscape change. The resulting visual impact as viewed from KOP No. 10 would be adverse but not significant (**Class III**).

KOP Nos. SVA-1 and SVA-2 were established on Shinn Ranch Road to assess the visual impact of Alternative Segment ESVA on eastbound and westbound views (respectively). As viewed from KOP Nos. SVA-1 and SVA-2, the alternative would transition from a distant subordinate background feature to a dominant foreground feature and then back to a distant background feature as it approached, crossed, and then travelled away from Shinn Ranch Road. The duration of views of the transmission line would be relatively extended, as the alternative crosses the open basin between Five Springs Mountain and Shinn Mountain. Viewing west toward the transmission line from the eastern portion of Shinn Ranch Road, the transmission line would skyline as the structures projected above the horizon created by the ridges to the west of Secret Valley and U.S. 395. The visual dominance of the transmission line as it crossed Shinn Ranch Road would not be consistent with BLM-established VRM Class III management prescriptions as it would result in a moderate degree of both visual contrast and landscape change. However, due to the small number of viewers on Shinn Ranch Road, the resulting visual impact is considered adverse, but not significant (**Class III**).

KOP Nos. SVA-3 and SVA-4 were established on Smoke Creek Road to assess the visual impact of Alternative Segment ESVA on eastbound and westbound views (respectively). As viewed from KOP Nos. SVA-3 and SVA-4, this alternative would transition from a distant subordinate background feature to a dominant foreground feature as it crossed, and then parallelled, Smoke Creek Road. The alternative would then diverge from the road and transition to a subordinate background feature. The transmission line would be visible for extended periods due to the relatively flat terrain crossed by the alternative. At various points along Alternative Segment ESVA, the transmission line would skyline as the structures projected above the horizon created by distant ridgelines. The visual dominance of skylining, in the vicinity of Smoke Creek Road, would not be consistent with the BLM-established VRM Class III management prescriptions as the transmission line would result in a moderate degree of both visual contrast and landscape change. However, due to the small number of viewers of this portion of the route, the resulting visual impact is considered adverse, but not significant (**Class III**).

C.13.3.4.3 *Cumulative Impacts and Mitigation Measures*

No cumulative visual impacts are anticipated as a result of Alternative Segment ESVA.

C.13.3.4.4 *Unavoidable Significant Impacts*

No unavoidable significant visual impacts are anticipated as a result of Alternative Segment ESVA.

C.13.3.5 Wendel Alternative Alignment (Segment M)

C.13.3.5.1 *Environmental Setting*

Alternative Segment M, which would cross Honey Lake Valley, would replace Proposed Segment N, Alternative Segment M extends from its junction with Proposed Segments L and N at Angle Point LØ8, south and east around the base of the foothills of the Skedaddle Mountains before rejoining Proposed Segment N (Angle Point MØ3) at its junction with Proposed Segment O, northeast of Wendel. Alternative Segment M stays at a lower elevation than Proposed Segment N and parallels the Southern Pacific Railroad between Angle Points MØ1 and MØ2. Alternative Segment M generally crosses scrub vegetation in northern Honey Lake Valley. Views in this vicinity are generally dominated by the Skedaddle Mountains to the north and east, and panoramic vistas to the east, south and west across Honey Lake Valley to the Fort Sage and Diamond Mountains in the distance. Alternative Segment M would be visible from Wendel Road. Existing developed features, also within the same field of view as Alternative Segment M, include the Honey Lake Power Plant, an overhead telecommunications line, and the Southern Pacific Railroad. Alternative Segment M crosses private lands, as well as public lands that have been designated BLM VRM Class IV.

C.13.3.5.2 *Environmental Impacts and Mitigation Measures*

Alternative Segment M would transition from a distant background feature to a dominant foreground feature as Alternative Segment M and Wendel Road converge near Angle Point MØ2. From Angle Point M2 eastward to Angle Point MØ3, Alternative Segment M will transition into a background feature. The resulting visual contrast with the existing landscape will vary from low to strong. The closer the transmission line is to Wendel Road, the stronger the visual contrast will be with the natural and rugged-appearing ridges of the Skedaddles, which would backdrop the transmission line throughout the length of this alternative. The more prominent the transmission line becomes in views from Wendel Road, the more diminished the scenic quality of those views.

Alternative Segment M would be inconsistent with Lassen County Wendel Area Plan, Environmental Natural Resources Policy No. 5-C, which promotes the retention of scenic values. Although this alternative segment would be consistent with the BLM management objectives for this BLM VRM Class IV area, the prominence of the transmission line, the moderate-to-strong degree of visual contrast and landscape change that would occur (along portions of the segment), and the partial obstruction and degradation of scenic views to the Skedaddles would result in an unavoidable, significant (**Class I**) visual impact.

C.13.3.5.3 *Cumulative Impacts and Mitigation Measures*

Alternative Segment M would be located in the vicinity of a proposed hog farm. While this alternative may be located within the same field of view of the hog farm, a cumulative visual impact is not anticipated due to the likely rural appearance of the hog farm.

C.13.3.5.4 *Unavoidable Significant Impacts*

That portion of Alternative Segment M that converges on Wendel Road (Alternative Subsegment MØ1-MØ2) would result in an unavoidable, significant visual impact as viewed from Wendel Road. This impact would occur as a result of the transmission line's visual prominence, moderate-to-strong degree of visual contrast and landscape change, and impairment of scenic views.

C.13.3.6 West Side of Fort Sage Mountains (Segment P)

C.13.3.6.1 *Environmental Setting*

Alternative Segment P would replace Proposed Segment Q located on the east side of the Fort Sage Mountains. Alternative Segment P extends from Honey Lake Valley (Angle Point OØ5), south along the western foothills of the Fort Sage Mountains, and on the west side of Long Valley, before intersecting Proposed Segments Q and R at Angle Point PØ9. Alternative Segment P would be visible to motorists on U.S. 395, which is approximately three miles west of the northern portion of the segment and converges to within less than one-half mile of the southern end of the segment. The terrain between U.S.

395 and the alternative consists of expansive, flat, scrub-covered plains. The northern portion of the alternative would appear as a distant background feature with the Fort Sage Mountains beyond. The southern portion of the route would be considerably more visible due to its closer proximity to U.S. 395, appearing as a foreground-middleground visual element to the dramatic backdrop of the steeply rising Fort Sage Mountains.

The dominant visual features in the vicinity of Alternative Segment P are the rugged peaks of the Fort Sage Mountains, the Petersen Mountains further south, the Diamond Mountains to the west of U.S. 395 and the Fort Sage Mountains, and the expansive Long Valley corridor and Honey Lake Valley to the north. Public lands crossed by this alternative have been designated VRM Class III.

Alternative Segment P would also be visible to a number of rural residences northeast and east of the town of Doyle, as well as to recreationists using the numerous four-wheel drive trails in both the Fort Sage Off-Highway Vehicle (OHV) Area and the Doyle State Wildlife Area (located northeast of Doyle). The alternative would be located within the middleground of eastward views from the Fort Sage OHV staging area and trailhead, with the rugged peaks of the Fort Sage Mountains in the background. A prominent feature in the landscape is Sail Rock, an isolated, exposed granite rock formation that appears darker in color than the surrounding landforms. Looking west and southwest from the Middle Loop OHV trail and ridge portions of the Main Loop trail, the alternative would appear in the middleground with the panoramic expanses of Long Valley in the background, and Diamond Mountains beyond.

Between Angle Points OØ5 and PØ1, Alternative Segment P crosses an existing overhead telecommunication line. Other developed features within the field of view of motorists on U.S. 395 in the vicinity of this alternative include the Southern Pacific Railroad to the west (and south) of the highway, and an overhead powerline and telecommunication line that generally parallel the railroad.

C.13.3.6.2 *Environmental Impacts and Mitigation Measures*

For most of its length, Alternative Segment P would appear as a prominent feature in a landscape backdropped by the ruggedly scenic Fort Sage Mountains. The presence of a built feature (such as the proposed transmission line) in an otherwise naturally appearing viewshed would result in a moderate-to-strong degree of visual contrast. KOP No. 24 was established at the Fort Sage OHV staging area and trailhead to assess the visual impact of Alternative Segment P on this recreational facility. As depicted in the photosimulation for this KOP (see Figures C.13-24A and C.13-24B), this portion of Alternative Segment P would appear as a dominant feature in the middleground, with Sail Rock in the distant background. The resulting visual contrast would be strong and the level of change in the landscape would be moderate-to-high. This alternative segment would not be consistent with established BLM VRM Class III objectives and the resulting visual impact would be significant and unavoidable (**Class I**).

Further to the south, Alternative Subsegment PØ5-PØ8 parallels U.S. 395, emerging as a noticeable middleground feature, that would not dominate the views from U.S. 395. Visual contrast would be moderate, as would the level of landscape change. Therefore, while this portion of Alternative Segment

P is generally consistent with the established BLM VRM Class III management objectives, it would introduce visual elements (vertical and horizontal transmission line facilities) that would not be consistent with the natural features of the existing landscape.

From Angle Point PØ7 to Angle Point PØ8, as the alternative crosses the mouth of Dry Valley, the transmission line would become a more prominent middleground feature in U.S. 395 southbound views. From Angle Point PØ8 to Angle Point PØ9, this portion of Alternative Segment P would converge on U.S. 395, becoming a dominant foreground feature resulting in a significant, unavoidable (**Class I**) visual impact.

C.13.3.6.3 *Cumulative Impacts and Mitigation Measures*

No cumulative visual impacts are anticipated for the West Side of Fort Sage Mountains Alternative Alignment.

C.13.3.6.4 *Unavoidable Significant Impacts*

The prominence of Alternative Subsegments PØ2-PØ9 as a foreground-middleground feature (as viewed from a number of rural residences, the Fort Sage OHV Trailhead, and U.S. 395), and the resulting impairment of scenic views to the Fort Sage Mountains, would result in a significant, unavoidable (**Class I**) visual impact.

C.13.3.7 Long Valley Alignments (Segments S, U, Z, and WCFG)

The Long Valley Alternative Alignments include Alternative Segments S, U, Z, and WCFG (Segment WCFG identified by the California Department of Fish and Game). The combination of Alternative Segments S and U provide a routing alternative to Proposed Segment T. Alternative Segment Z provides a more easterly route to Proposed Segment W between Angle Points WØ1 and WNØ4. The Alternative Segment WCFG provides a more easterly routing alternative to Proposed Segment WØ3-XØ1 near the Border Town Substation site.

C.13.3.7.1 *Environmental Setting*

Alternative Segments S, U

Alternative Segment S extends from its northern junction with Proposed Segment R at Angle Point RØ2 (adjacent to U.S. 395 and just north of the U.S. 395/Red Rock Road intersection), south to its junction with Alternative Segment U. Alternative Segment S crosses U.S. 395 at Angle Point RØ2 and travels in a southwest direction, crossing to the west side of the Southern Pacific Railroad, west of Long Valley Creek. Generally, it then parallels the railroad to its southern terminus at Angle Point SNØ1. This alternative would be visible to motorists travelling north and south on U.S. 395, particularly that portion of the alternative that crosses U.S. 395 near Angle Point RØ2. Once Alternative Segment S crosses to the west of U.S. 395, Long Valley Creek, and the Southern Pacific Railroad, it would be located within the middleground-to-background of views from U.S. 395.

From U.S. 395, views to the south are panoramic, dominated by the riparian landscape of Long Valley Creek in the foreground-to-middleground, scrub vegetation in the middleground-to-foreground, and Long Valley and the Petersen Mountains in the background. East-west and northern views are confined by the narrowness of the gap between the Fort Sage Mountains to the east and the Diamond Mountains to the west, through which U.S. 395 passes. Public lands crossed by this alternative have been designated BLM VRM Class III.

There are also several existing developed features in the landscape that Alternative Segment S crosses, including the Southern Pacific Railroad, a powerline, two overhead communication lines, and mining facilities.

Alternative Segment U is a relatively short (approximately two miles) crossover that connects Alternative Segment S (at Angle Point SNØ1) with Proposed Segment W (at Angle Point WNØ1). Alternative Segment U travels in a northwest-southeast direction, crossing an existing overhead telecommunication line and U.S. 395. Alternative Segment U crosses a relatively flat, scrub- and sage-dominated landscape with scattered juniper. This alternative would be visible to both northbound and southbound motorists on U.S. 395, transitioning from the foreground at the highway crossing to the middleground at its two terminal angle points. Public lands crossed by this alternative have been designated BLM VRM Class III. BLM Manual objectives for management of VRM Class III areas, such as Segments S and U are to partially retain the existing character of the landscape.

Alternative Segment Z

Alternative Segment Z is located approximately one-half mile to the east (at its most distant point) of Proposed Segment W, between Angle Points WØ1 and WNØ4. This alternative was located to bypass private property approximately two miles northeast of Hallelujah Junction. The visual characteristics of Alternative Segment Z landscape are similar to that of Proposed Segment W (described in Section C.13.1.3.11). Alternative Segment Z would be located further to the east and, hence, at a slightly higher elevation, as it crosses a series of finger ridges and foothills at the base of the Petersen Mountain. Eastward foreground views from U.S. 395 consist of a pastoral, flat, valley floor setting, dominated by scrub vegetation. Alternative Segment Z would appear in the middleground with the Petersen Mountain rising abruptly in the background.

Alternative Segment WCFG

Alternative Segment WCFG provides an alternative route, north of U.S. 395, to Proposed Segments W and X between Angle Point WNØ5 (just north of Angle Point WØ3) and Border Town Substation near Angle Point XØ1. Between Angle Points WNØ5 and WNØ7, the alternative crosses numerous finger ridges in the southwestern foothills of the Petersen Mountain. Between WNØ7 and WNØ8, the alternative crosses U.S. 395 before turning southeast and then south to the Border Town Substation site. Between WNØ9 and WN1Ø this alternative passes within 200 to 300 feet of residences located at Border Town. Vegetation along Alternative Segment WCFG is primarily scrub and sagebrush. Visual landscape elements in northbound U.S. 395 views include the Petersen Mountains rising dramatically to the north, expansive vistas over Long Valley to the west and northwest, and the Sierra Mountains in the distant background to the west. Southbound U.S. 395 views would include the Petersen Mountains to the north, Long Valley to the south and Peavine Peak to the southeast. In both directions of travel, Alternative Segment WCFG would appear prominently in the foreground and/or middleground. Other existing, developed, features in the landscape include the Southern Pacific Railroad and an overhead telecommunication line, both adjacent to U.S. 395. Public lands crossed by Alternative segment WCFG have been designated BLM VRM Class III.

C.13.3.7.2 *Environmental Impacts and Mitigation Measures*

Alternative Segments S, U

From U.S. 395, Alternative Segment S would appear as a dominant foreground feature as it crosses U.S. 395 (a County-designated Scenic Corridor) near Angle Point RØ2. For southbound motorists, the transmission line would immediately recede from view as U.S. 395 and the alternative diverge and then parallel each other. The alternative would then transition from a noticeable middleground feature (to the west of the highway) to a dominant foreground feature as the route turns toward U.S. 395 at Angle Point SNØ1 and converges on, and then crosses, U.S. 395, as Alternative Segment U. The reverse would be true for northbound motorists as Alternative Segment U diverges away from U.S. 395, and then converges on, and crosses, the highway as Alternative Segment S. The prominence of these alternatives and the moderate level of visual contrast and scenic degradation that would occur (particularly on southbound U.S. 395 scenic views of Long Valley and the wetlands of Long Valley Creek) would result in a significant, unavoidable (**Class I**) visual impact. This impact, however, would not be as substantial as the visual impacts of Proposed Segment T on the Lassen Red Rocks Scenic Area.

Alternative Segment Z

Alternative Segment Z would appear as a prominent middleground feature in northbound and southbound views from U.S. 395, backdropped by the Petersen Mountains. Although this alternative segment would attract the viewer's attention, it would not dominate views of the landscape, and hence, would be consistent with established BLM VRM Class III management objectives. Alternative Segment Z would result in an adverse, but not significant (**Class III**) visual impact.

Alternative Segment WCFG

As a result of Alternative Segment WCFG's foreground and middleground prominence (particularly between Angle Points WNØ6 and WNØ9, where the alternative is adjacent and parallel to U.S. 395 before crossing to the south of the highway, and between WNØ9 and WN10, where the alternative passes within 200 to 300 feet to the west of residences at Border Town oriented toward Long Valley), this alternative would create a moderate degree of visual contrast and moderate level of change in the existing landscape. The resulting impact would be considered significant and unavoidable (**Class I**).

C.13.3.7.3 *Cumulative Impacts and Mitigation Measures*

Alternative Segment Z of the Long Valley Alternative Alignments would be located within the vicinity of the proposed Sierra Lady Mineral Project, north of Hallelujah Junction. To the extent that above-ground built structures or surface modifications associated with Sierra Lady are apparent in views from U.S. 395 that also encompass the transmission line project, a cumulative visual impact could occur and could be significant and unavoidable (**Class I**).

C.13.3.7.4 *Unavoidable Significant Impacts*

Significant, unavoidable (**Class I**) visual impacts would occur as a result of: (1) the dominance of the transmission line as a foreground feature, (2) the contrast of the introduced project components with existing landscape characteristics, and (3) the impairment of scenic views. These impacts will result with the implementation of the following portions of the Long Valley Alternative Alignments: Alternative Segment S (RØ2-SØ1, SØ2-SNØ1); all of Alternative Segment U; and Alternative Segment WCFG (WNØ5-WNØ8, and WNØ9 and WN1Ø).

C.13.3.8 Peavine Peak Alternative Alignment (Segment X-East)

C.13.3.8.1 *Environmental Setting*

Alternative Segment X-East consists of the eastern portion of Proposed Segment X between Angle Points XØ9 and XØ12. Alternative Segment X-East provides a more easterly alternative to Proposed Segment Y, crossing the eastern foothills of Peavine Peak. Alternative Segment X-East crosses similar landscapes to that described for Proposed Segment Y in Section C.13.1.3.13 with the exception that Alternative Segment X-East is slightly lower in elevation (approximately one-half mile at its most distant point) to the east of Proposed Segment Y. The alternative generally parallels an existing overhead powerline and would be located in the foreground/middleground of views from residences at the western-most end of Hoge Road. Other developed features in the landscape include a radio transmission tower and fence lines.

C.13.3.8.2 *Environmental Impacts and Mitigation Measures*

Alternative Segment X-East would appear as a prominent middleground to dominant foreground visual feature as viewed from the western portion of the Hoge Road Subdivision. The alternative would result in a moderate degree of visual contrast and moderate level of change in the existing landscape, and therefore would not be consistent with the applicable BLM VRM Class III management prescriptions, nor with North Valleys Area Plan Conservation Policy NV.1.1. The result would be considered a significant, unavoidable (**Class I**) visual impact.

C.13.3.8.3 *Cumulative Impacts and Mitigation Measures*

This alternative would result in cumulative impacts, because the residents of Hoge Road are likely to perceive that the Project structures, together with the existing power lines and radio towers, constitute a proliferation of structures in the foreground view from their residences.

C.13.3.8.4 *Unavoidable Significant Impacts*

The prominence of Alternative Segment X-East as a foreground feature, as well as its proximity to the Hoge Road Subdivision would result in an significant, unavoidable (**Class I**) impact.

C.13.3.9 Alturas Substation Alternative

C.13.3.9.1 *Environmental Setting*

The Alturas Substation Alternative, known as the Mill Site, is located adjacent to Alternative Segment B between Angle Points BØ6 and BØ7. The site is an open, grass and scrub vegetated field south of Hwy 299 and immediately north of the western end of 4th Street, west of Alturas. From the north, the site would be visible to residents adjacent to, and motorists on, Hwy 299. The site would also be visible to residents on Mill Street to the east, motorists on 4th street immediately to the south, two rural residences to the southwest, and a rural residence to the west.

As described previously for Alternative Segment B, views from the various vantage points in the vicinity of the Mill Site Alternative are expansive, encompassing open grass fields in the foreground and extended vistas to the Warner Mountains in the east, distant hills to the south, and juniper-covered plateaus and hills to the southwest, west and north.

C.13.3.9.2 *Environmental Impacts and Mitigation Measures*

As previously discussed in Section C.13.3.1.2, the Alturas Substation Mill Site Alternative would be visible as a prominent middleground feature as viewed from nearby residences and Hwy 299 (and KOP No. 22). The alternative substation and transmission line (Alternative Segment B) would partially obstruct views to distant hills in the background and diminish the scenic quality of the existing viewshed. The alternative would not be consistent with the applicable BLM VRM Class II management prescriptions, nor with Modoc County General Plan Circulation Policy No. 9. As depicted in the photosimulation prepared for KOP No. 22 (see previous Figures C.13-22A and C.13-22B), the Mill Site Alternative and associated transmission line (Alternative Segment B) would generate a significant and unavoidable (**Class I**) visual impact.

C.13.3.9.3 *Cumulative Impacts and Mitigation Measures*

This substation alternative would not generate any cumulative impacts.

C.13.3.9.4 *Unavoidable Significant Impacts*

The Mill Site Alternative would result in a significant, unavoidable (Class I) visual impact due to its visual prominence, moderate degree of visual contrast, and impairment of scenic views. This impact would be experienced by motorists on Hwy 299 and Fourth Street, and residences surrounding the alternative site.

C.13.3.10 Border Town Substation Alternative

C.13.3.10.1 *Environmental Setting*

The Alternative Border Town Substation site is located on a parcel just to the south side of the proposed station site. The visual setting for the alternative site is the same as that described for the proposed site in Section C.13.1.3.12.

C.13.3.10.2 *Environmental Impacts and Mitigation Measures*

The visual impacts and mitigation measures associated with the Alternative Border Town Substation site would be the same as those described for the Proposed Border Town Substation site in Section C.13.2.2.3.

C.13.3.10.3 *Cumulative Impacts and Mitigation Measures*

The cumulative impacts associated with the Alternative Border Town Substation site would be the same as those described for the proposed Border Town Substation site.

C.13.3.10.4 *Unavoidable Significant Impacts*

Unavoidable significant impacts (Class I) associated with the Alternative Border Town Substation site would be similar to those associated with the Proposed Project substation site.

C.13.4 THE NO PROJECT ALTERNATIVE

C.13.4.1 Environmental Impacts and Mitigation Measures

Under the No Project Alternative, the proposed Alturas Transmission Line Project would not be built and no adverse visual impacts associated with the construction and operation of the Proposed Project would occur. However, in order to compensate for existing system limitations and anticipated load growth, short- and long-term actions would be required.

Over the short-term (one to three years) the augmentation of the existing system may be necessary and could include the construction of small transmission and generation projects. Visual impacts could occur from these projects if the projects are sited in locations visible to the public. The significance of the impact would depend on the degree of visual access (the extent to which the project is visible to large numbers of viewers), the degree to which scenic landscapes are altered or scenic views are impaired, visual absorption capability of the existing landscape (the ability of the landscape to contain the project without resulting in moderate or high degrees of visual contrast), and the consistency of the action with established public visual resource protection policies.

Over the long-term new transmission capacity would be required to satisfy the projected growth in system loads. Such long-term projects would include the construction of a major transmission facility comparable to the Proposed Project with similar visual impacts. As discussed above, the significance of the impact would depend on visual access, landscape sensitivity and visual absorption capability, and established public policy.

For both short- and long-term projects, Mitigation Measures V-1 through V-4 in Section C.13.2.4 would mitigate the associated construction visual impacts. Visual impacts associated with the long-term operation of a project can generally be mitigated only in three ways: (1) relocate the route, structure, or facility to a less impact-sensitive location, (2) lower the structure or facility height to reduce visibility (appropriate and effective in some circumstances), (3) install vegetation in appropriate locations to screen the project from sensitive views, and (4) paint the facilities an appropriate natural tone color to blend the facility into the existing landscape.

C.13.4.2 Cumulative Impacts and Mitigation Measures

Cumulative visual impacts could occur as a result of construction and/or operation of a project within the same field of view of either short-term or long-term actions as described in Section C.13.4.1. For example, if either a short- or long-term system upgrade is constructed such that it would be visible within the same field of view of an existing or planned future project, a cumulative visual impact would occur. It is also possible that a cumulative impact could occur if a viewer perceives that the scenic quality of a specific area is diminished by the proliferation of visible structures, even if the structures are not within the same field of view. If cumulative impacts occur as a result of constructing either short- or long-term augmentations to the existing system, the mitigation measures described in Section C.13.4.1 should be applied as appropriate.

C.13.4.3 Unavoidable Significant Impacts

While it is not possible, at this time, to determine if significant, unavoidable impacts would occur as a result of some future system augmentation under the No Project Alternative, it can be stated that an unavoidable significant visual impact would occur if the action results in the following:

(1) The project is visible to a large number of viewers
(2) The project is a prominent to dominant foreground feature in the landscape
(3) The affected landscape is highly scenic
(4) The affected landscape undergoes a moderate to strong degree of change
(5) The project creates a moderate to strong degree of visual contrast
(6) The project is inconsistent with established public visual resource protection policy
(7) The impact can not be mitigated to a level of non-significance through re-location, re-design, or screening.

C.13.5 MITIGATION MONITORING PROGRAM

Table C.13-12 Mitigation Monitoring Program

Impact	Mitigation Measure		Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Short-term visual impact due to construction activities (Class III)	V-1	In order to reduce the short-term visual impact due to construction activities, store construction materials and excavated materials away from highly visible route segments along US 395 and State Route 299.	All Proposed and Alternative Segments	BLM CPUC Local jurisdictions	Lead Agency-approved Monitor conducts site inspections during Project Construction to confirm adherence to contract specifications regarding storage of construction materials.	Ensure that construction materials and excavated soils are minimally visible from adjacent travel corridors.	During project construction
	V-2	In order to reduce the short-term visual impact due to construction activities, confine construction activities and materials storage to within substation sites,access roads, staging areas, and designated areas within the 160-foot transmission line ROW and require full cleanup of all construction sites, ROW, and adjacent lands.	All Proposed and Alternative Segments	BLM CPUC USFS Local jurisdictions	Lead Agency-approved Monitor conducts weekly site inspections during Project construction to confirm adherence to contract specifications regarding confinement of construction activities and storage of construction materials.	Ensure that construction activities and material storage are confined within substation sites, staging areas and ROW.	During and after project construction
	V-3	In order to reduce the short-term visual impact due to construction activities, prohibit the construction of access or spur roads for transmission line construction in highly scenic areas or areas of known public concern, if such activities result in strong levels of visual contrast.	All Proposed and Alternative Segments	BLM CPUC USFS Local jurisdictions	Construction of access roads restricted to specified areas identified and incorporate into Construction Operation & Maintenance Plan approval process prior to construction. Compliance to be monitored by a Lead Agency-approved monitor.	Ensure that access or spur roads do not encroach upon designated prohibited areas.	Prohibited area identification prior to permit issuance; avoidance of prohibited areas during construction

Impact	Mitigation Measure	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
	V-4 In order to reduce the short-term visual impact due to construction activities, whenever possible, construct access or spur roads at appropriate angles from the originating, primary travel facilities to minimize extended, in-line views of newly graded terrain.	All Proposed and Alternative Segments	BLM CPUC USFS Local jurisdictions	BLM and USFS to review design of access and spur roads for appropriate alignments during Construction Operation & Maintenance Plan review and approval process, prior to construction. Compliance with construction plan specifications to be monitored weekly by Lead Agency-approved monitor.	Ensure that views of newly graded terrain are minimally visible from primary and/or adjacent travel corridors.	Design review prior to permit issuance; monitoring during construction
Excessive visual access to Alturas Substation and transmission line structures resulting from the clearing of juniper adjacent to Crowder Flat Road as part of access road construction (Class II)	V-2 and V-4, above V-5 In order to minimize the visual access to the Alturas Substation site, limit structure heights to 70 feet between Milepost MP-1 and Angle Point HSØ1 and maintain a sufficient density of juniper between the proposed substation site and Crowder Flat Road immediately west of the substation site.	Milepost MP-1 to Angle Point HSØ1 and proposed Alturas Substation (Crowder Flat Road, immediately adjacent to Proposed Segment A)	BLM CPUC USFS	Review and approve structure design for 70-foot height limitation prior to permit issuance. Monitor adherence to the approved structure design. Determine juniper density requirements and incorporate into project construction plans prior to site preparation. Monitor compliance weekly during site preparation and construction.	Ensure that structures are limited to 70-foot maximum height between milepost MP-1 and Angle Point HSØ1. Ensure that visual access to Alturas Substation and Proposed Segment A are minimally visible from that portion of Crowder Flat Road immediately adjacent to the substation.	Tower design review prior to permit issuance; monitoring during construction. Juniper density requirements determined prior to construction; monitoring during construction
Excessive visual access to Alturas Substation as viewed along substation access road from Crowder Flat Road (Class II)	V-6 Construct the Alturas Substation access road with appropriate angles and curves to prevent a direct line of sight to the substation from the intersection with Crowder Flat Road. No juniper shall be removed adjacent to Crowder Flat Road.	Proposed Alturas Substation site	BLM CPUC USFS	Review access road design, including appropriate angles and curves, prior to permit issuance. Monitor adherence to the approved plans weekly.	Ensure that direct line-of-sight views to Alturas Substation are not available to motorists on Crowder Flat Road.	Design review prior to permit issuance; monitoring during construction

Impact		Mitigation Measure	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Potential to view light and glare from night-time illumination of Alturas Substation, Border Town Substation, and the Alternative Alturas Substation (Class II)	V-7	Ensure that all lighting structures for night-time illumination of the substation are fitted with appropriate lamp shields to minimize light scatter and glare outside the substation sites.	Proposed and Alternative Substation sites	BLM CPUC OSHA	Review and approve lamp shield design as part of the construction plan submittal process. Monitor adherence to the approved lamp shield design will be determined.	Ensure that excessive light and glare are not visible to motorists on Crowder Flat Road (Alturas Substation); the Upper Long Valley access roads (Border Town Substation); or motorists on State Route 299, Mill Street and Fourth Street, or nearby residents (Alternative Alturas Substation).	Design review prior to construction; Night-time inspection following Substation construction completion
Structure skylining would occur for that portion of Proposed Segment A crossing the upper end of Daggert Canyon and the plateau in the vicinity of Angle Points ANPØ2-AØ3+ (Class III)	V-8	Reduce structure heights to the maximum extent feasible to lessen the skylining effect created by the transmission line structures as the route crosses upper Daggert Canyon and the plateau south of Angle Point AØ3+.	Proposed Segment ANPØ2-AØ3+	BLM USFS CPUC	Review and approve structure designs prior to permit issuance. Monitor adherence to the approved structure design.	Ensure that skylining of Proposed Segment ANPØ2-AØ3+ is minimized as viewed from Crowder Flat Road, State Route 299, and North Alturas.	Design review prior to permit issuance
Proposed Route Segment O would encroach into Skedaddle Wilderness Study Area and be inconsistent with WSA applicable BLM VRM Class I management objectives (Class II)	V-9	Relocate Angle Point OØ1 further south in order to avoid encroachment into the Skedaddle WSA.	Route Segment O in the vicinity of Angle Point OØ1	BLM CPUC	During the EIR/S and project review and approval process, approve an acceptable relocation of Angle Point OØ1	Ensure that Proposed Segment O does not encroach into the Skedaddle WSA.	During project review and approval process
Long-term visual impact due to presence of Border Town Substation (Class I)	V-10	Prepare and implement a Landscaping Plan for the Border Town Substation.	Border Town Substation	BLM CPUC	Review and approve Landscaping Plan. Monitor adherence to Plan requirements.	Renderings of expected results shall be provided for each sensitive viewshed.	Final Landscaping Plan to be approved prior to substation construction

C.13.6 REFERENCES

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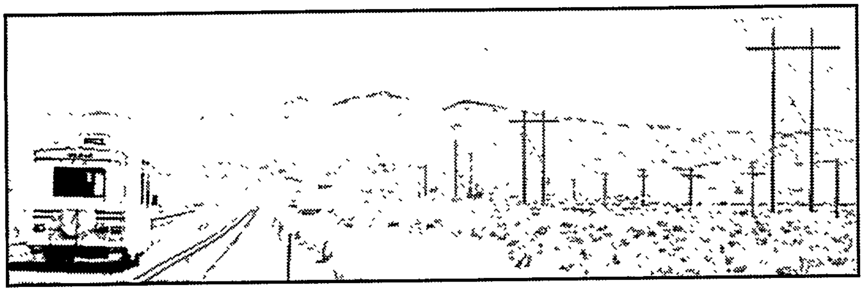
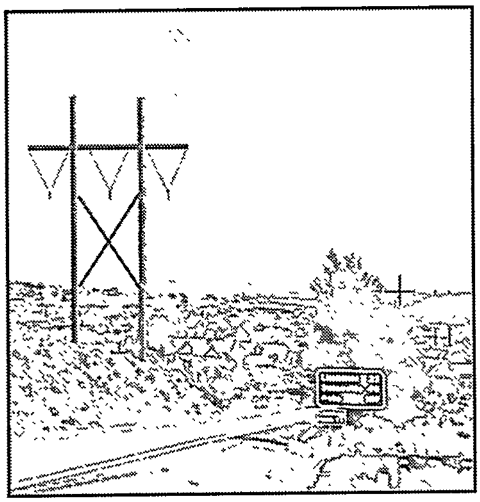
ADDENDUM
VISUAL RESOURCES
FIGURES

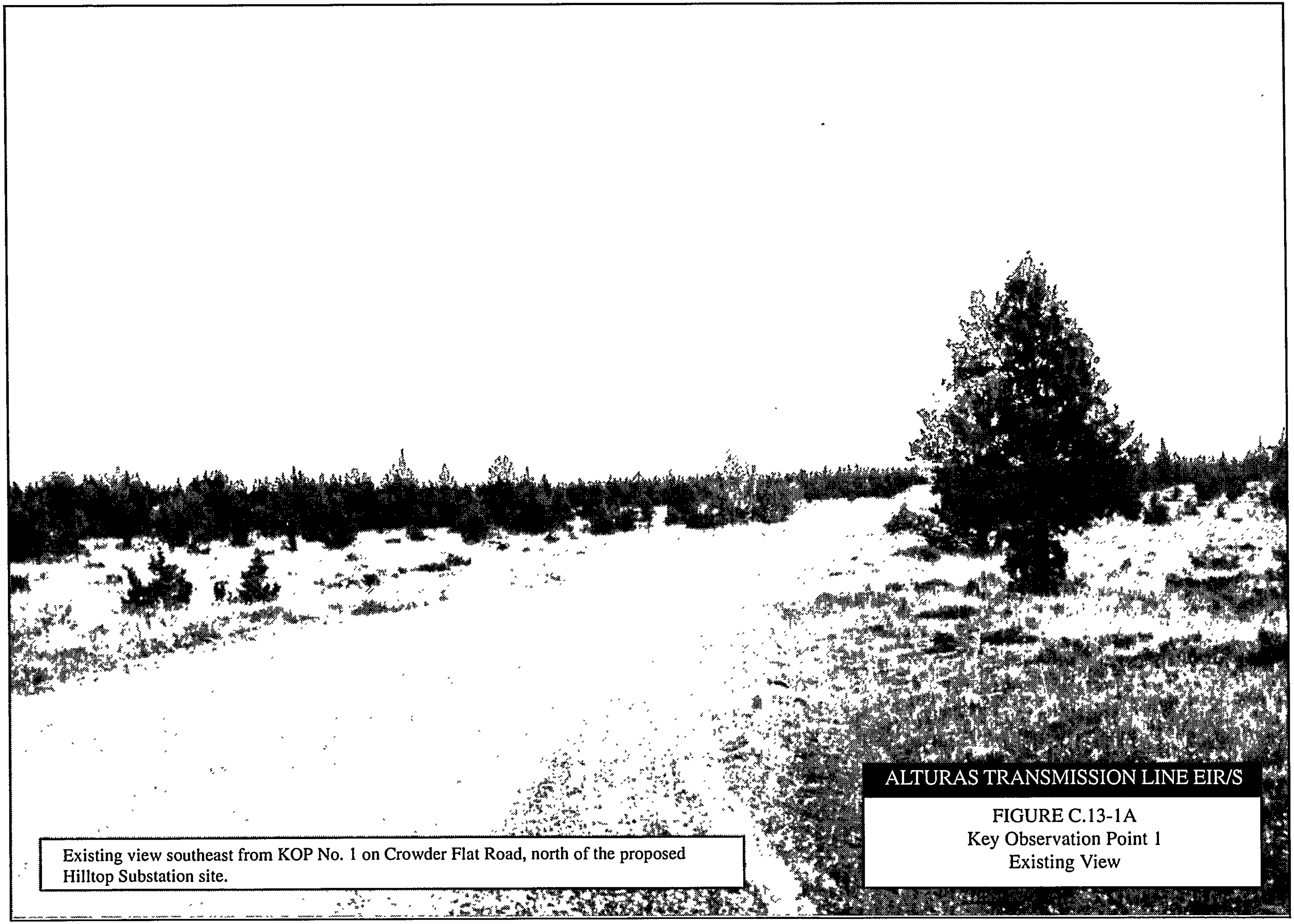
VISUAL RESOURCES LIST OF FIGURES





PHOTOSIMULATIONS

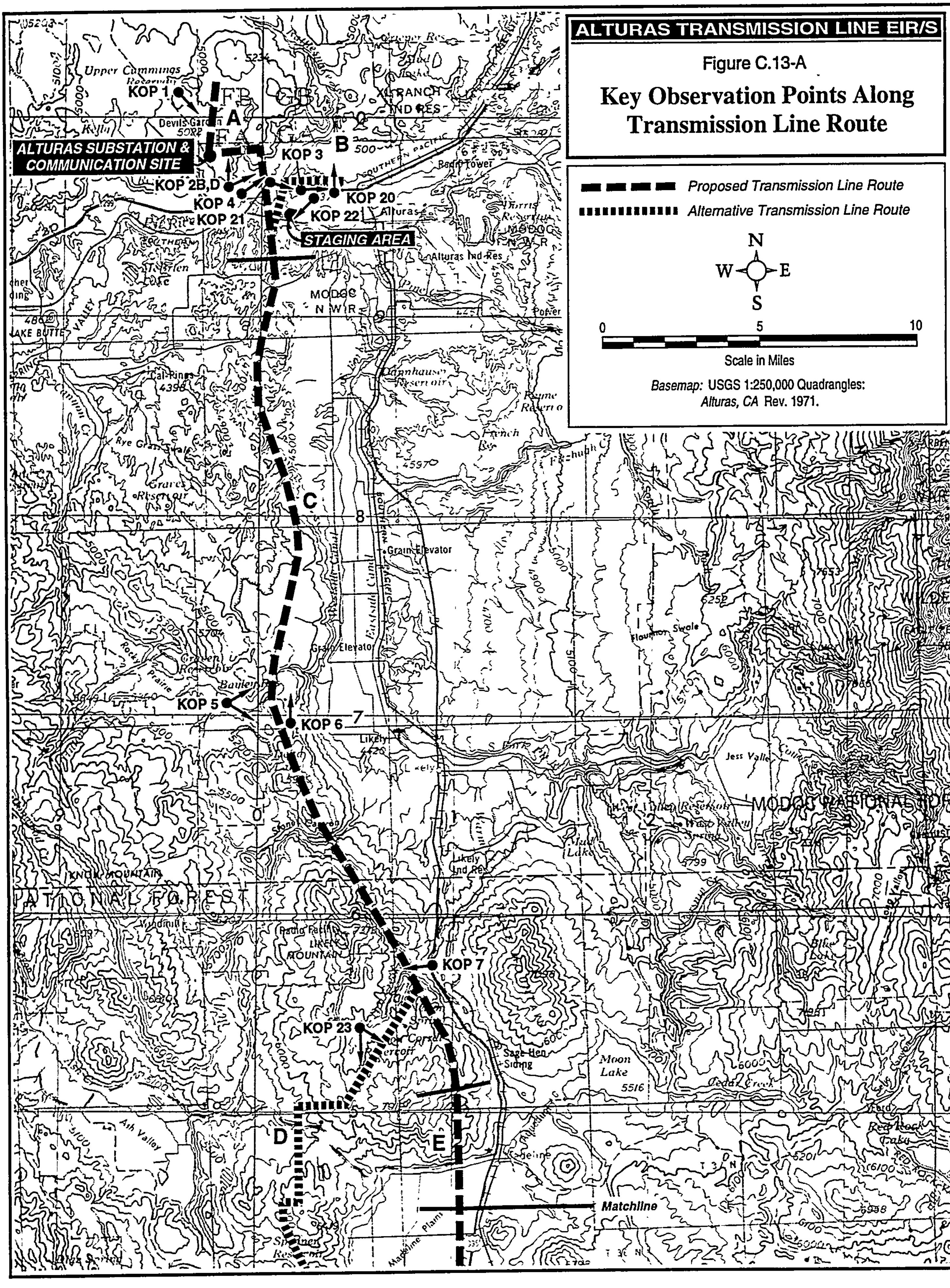
Alturas Transmission Line Project EIR/S

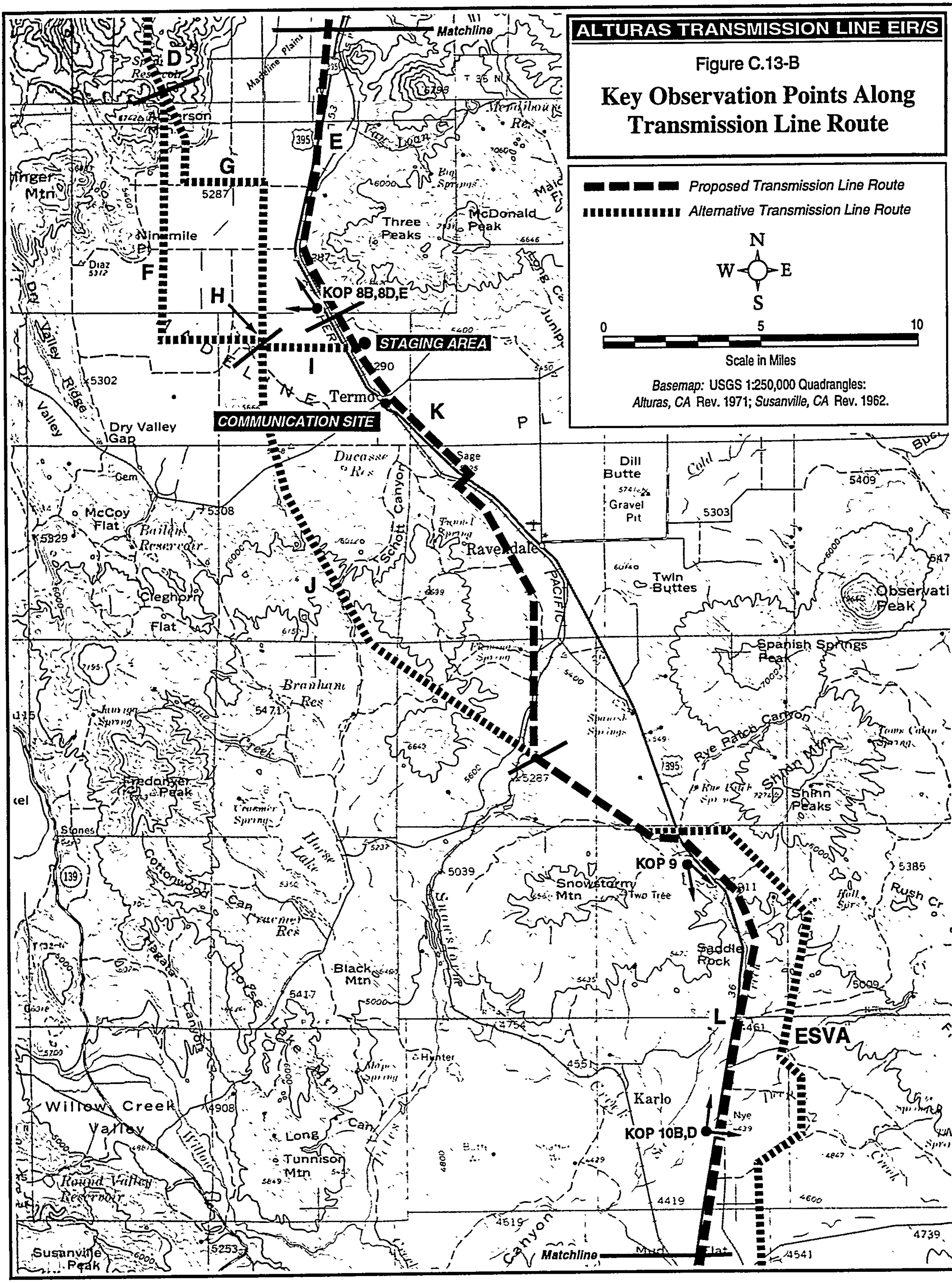


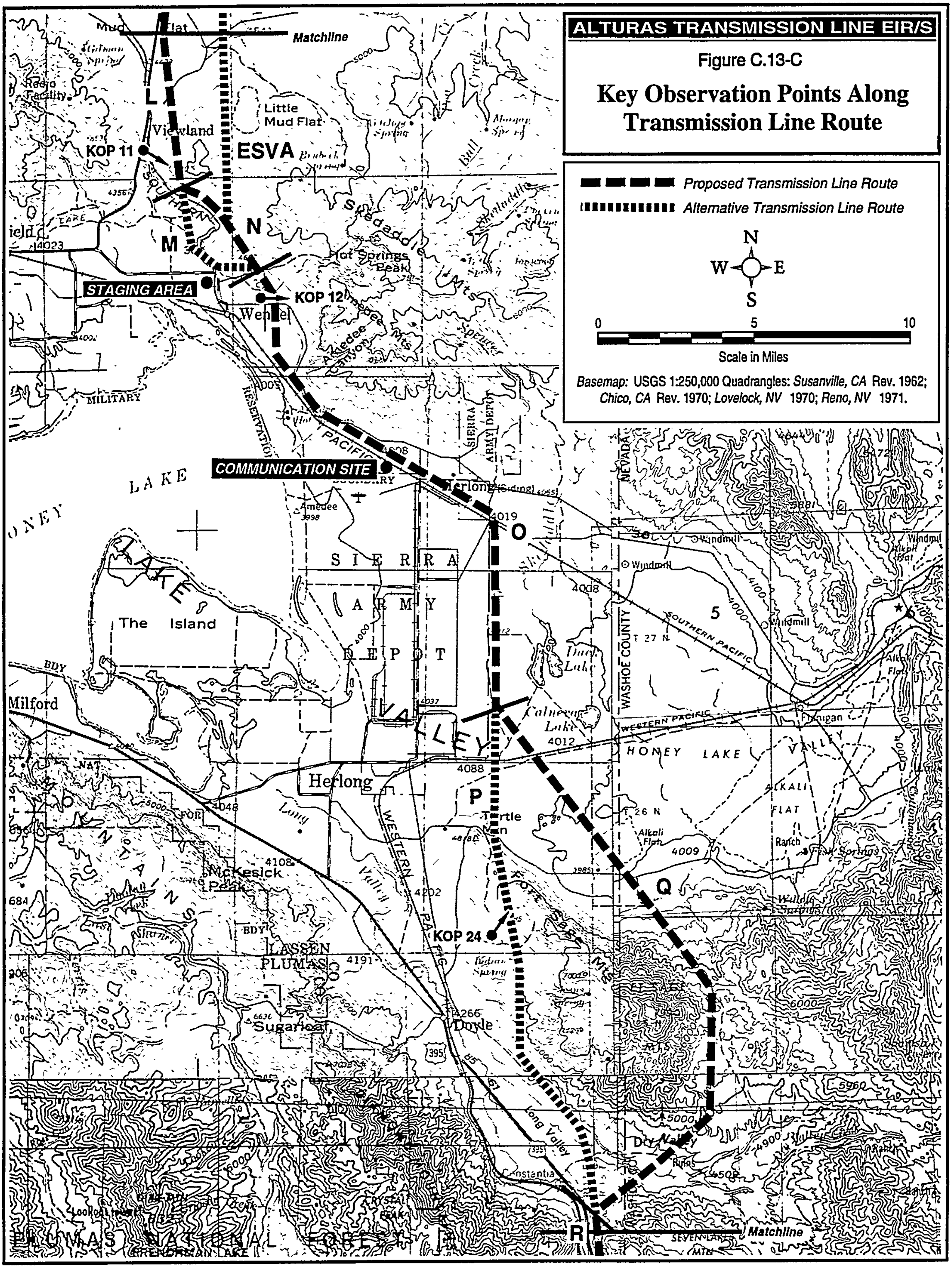
ALTURAS TRANSMISSION LINE EIR/S

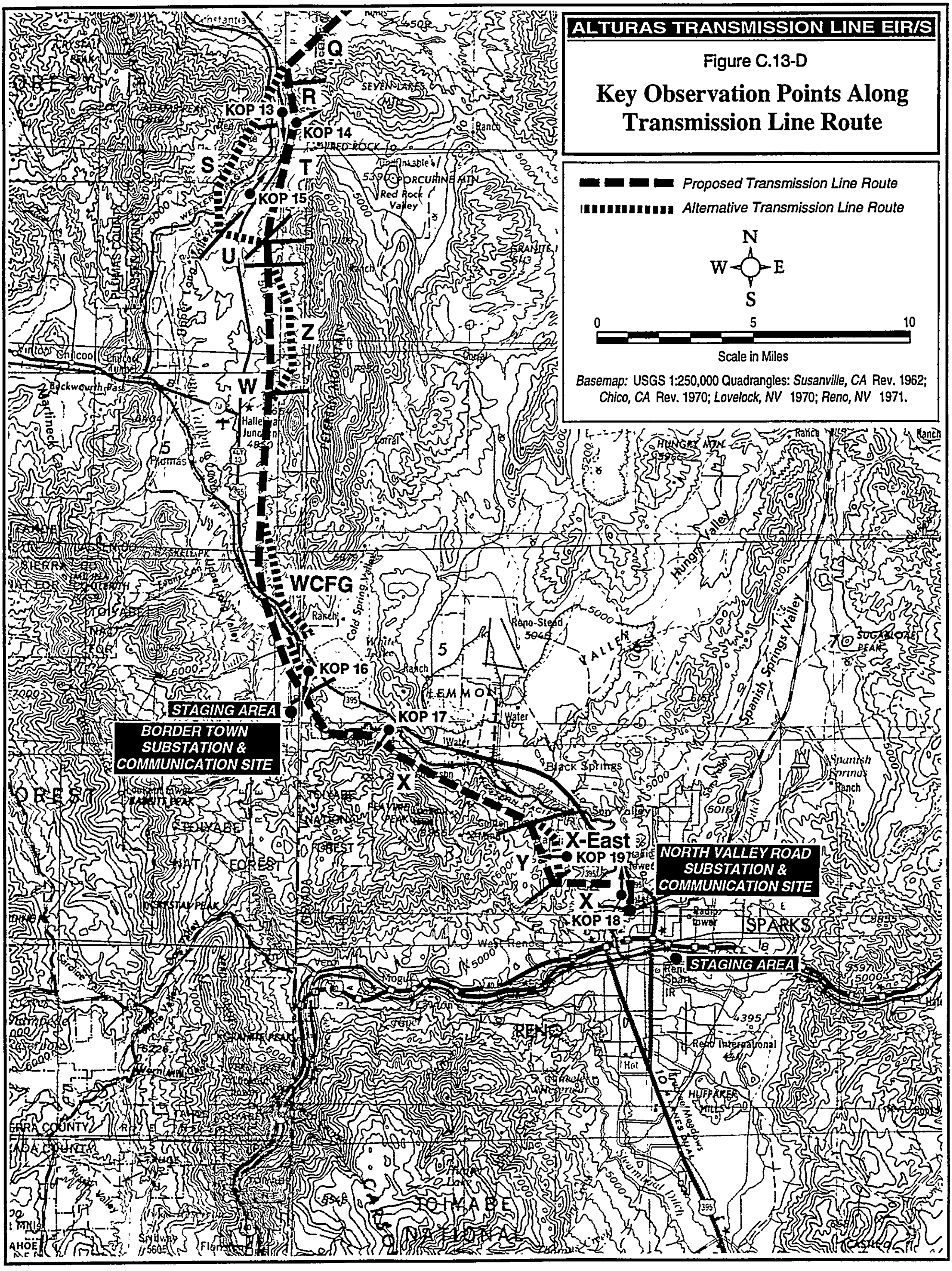
FIGURE C.13-1A
Key Observation Point 1
Existing View

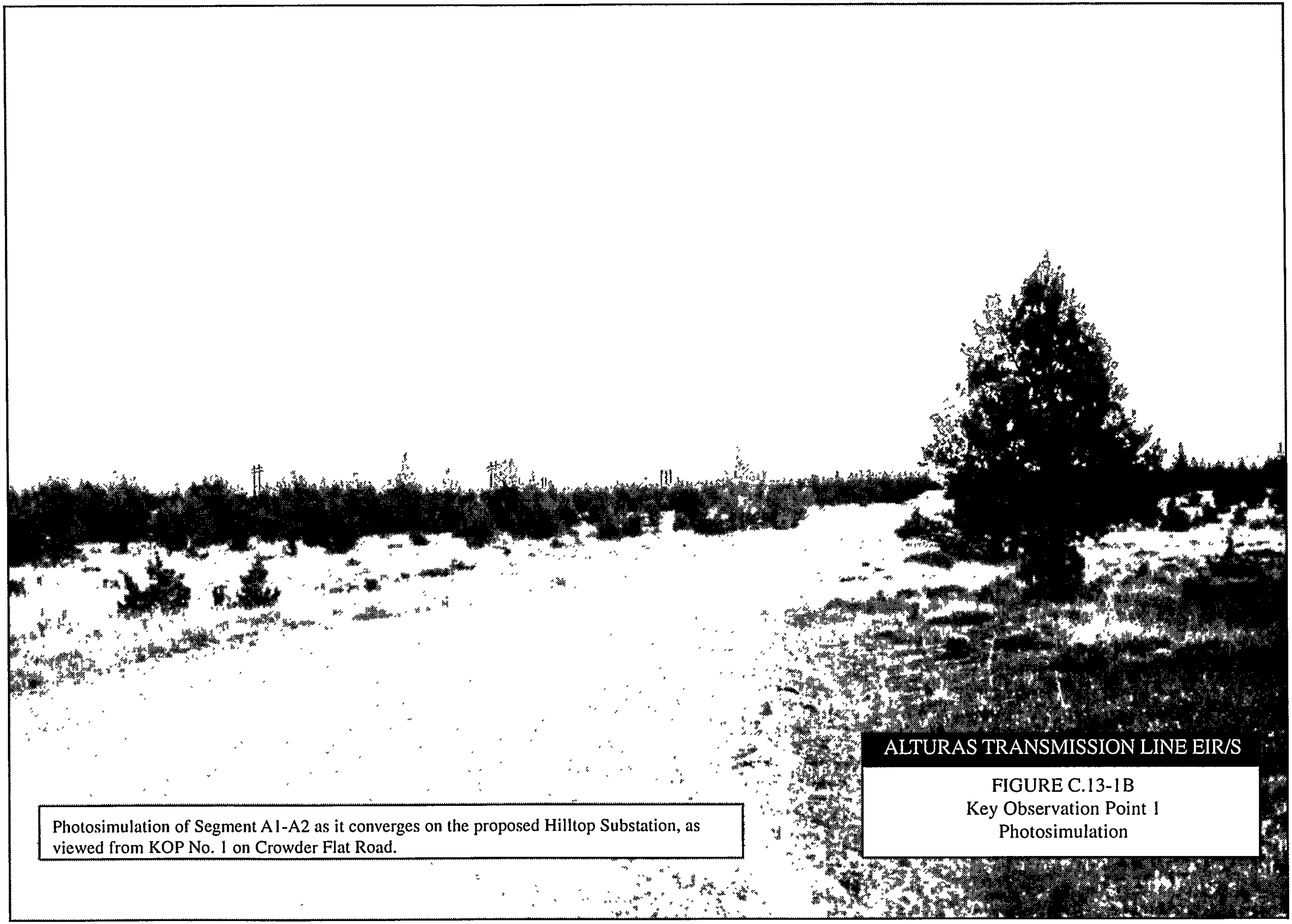
Existing view southeast from KOP No. 1 on Crowder Flat Road, north of the proposed Hilltop Substation site.


ALTURAS TRANSMISSION LINE EIR/S
Figure C.13-A
Key Observation Points Along Transmission Line Route
Proposed Transmission Line Route
Alternative Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Alturas, CA Rev. 1971.
ALTURAS SUBSTATION & COMMUNICATION SITE
STAGING AREA
KOP 1
KOP 2B,D
KOP 3
KOP 4
KOP 5
KOP 6
KOP 7
KOP 20
KOP 21
KOP 22
KOP 23
A
B
C
D
E
Matchline


ALTURAS TRANSMISSION LINE EIR/S
Figure C.13-B
Key Observation Points Along Transmission Line Route
Proposed Transmission Line Route
Alternative Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Alturas, CA Rev. 1971; Susanville, CA Rev. 1962.
Matchline
D
E
G
F
H
I
J
K
L
KOP 8B,8D,E
STAGING AREA
COMMUNICATION SITE
KOP 9
KOP 10B,D
ESVA
Three Peaks
McDonald Peak
Ninemile
Diaz
Dry Valley Gap
Termo
Sage
Dill Butte
Gravel Pit
Ravendale
Twin Buttes
McCoy Flat
Cleghorn Flat
Spanish Springs Peak
Snowstorm Mtn
Two Tree
Saddle Rock
Black Mtn
Karlo
Nye
Long
Tunnison Mtn
Willow Creek Valley
Susanville Peak
Stones
Hunter
Matchline


ALTURAS TRANSMISSION LINE EIR/S
Figure C.13-C
Key Observation Points Along Transmission Line Route
Proposed Transmission Line Route
Alternative Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev. 1962; Chico, CA Rev. 1970; Lovelock, NV 1970; Reno, NV 1971.
Matchline
KOP 11
ESVA
L
M
N
Little Mud Flat
Viewland
STAGING AREA
KOP 12
Wendel
Hot Springs Peak
COMMUNICATION SITE
Herlong
O
P
Q
R
KOP 24
The Island
SIERRA ARMY DEPOT
HONEY LAKE VALLEY
Milford
Doyle
Sugarloaf
McKesick Peak
LASSEN
PLUMAS
WASHOE COUNTY
NEVADA
SOUTHERN PACIFIC
WESTERN PACIFIC
Flanigan
PLUMAS NATIONAL FOREST
Matchline

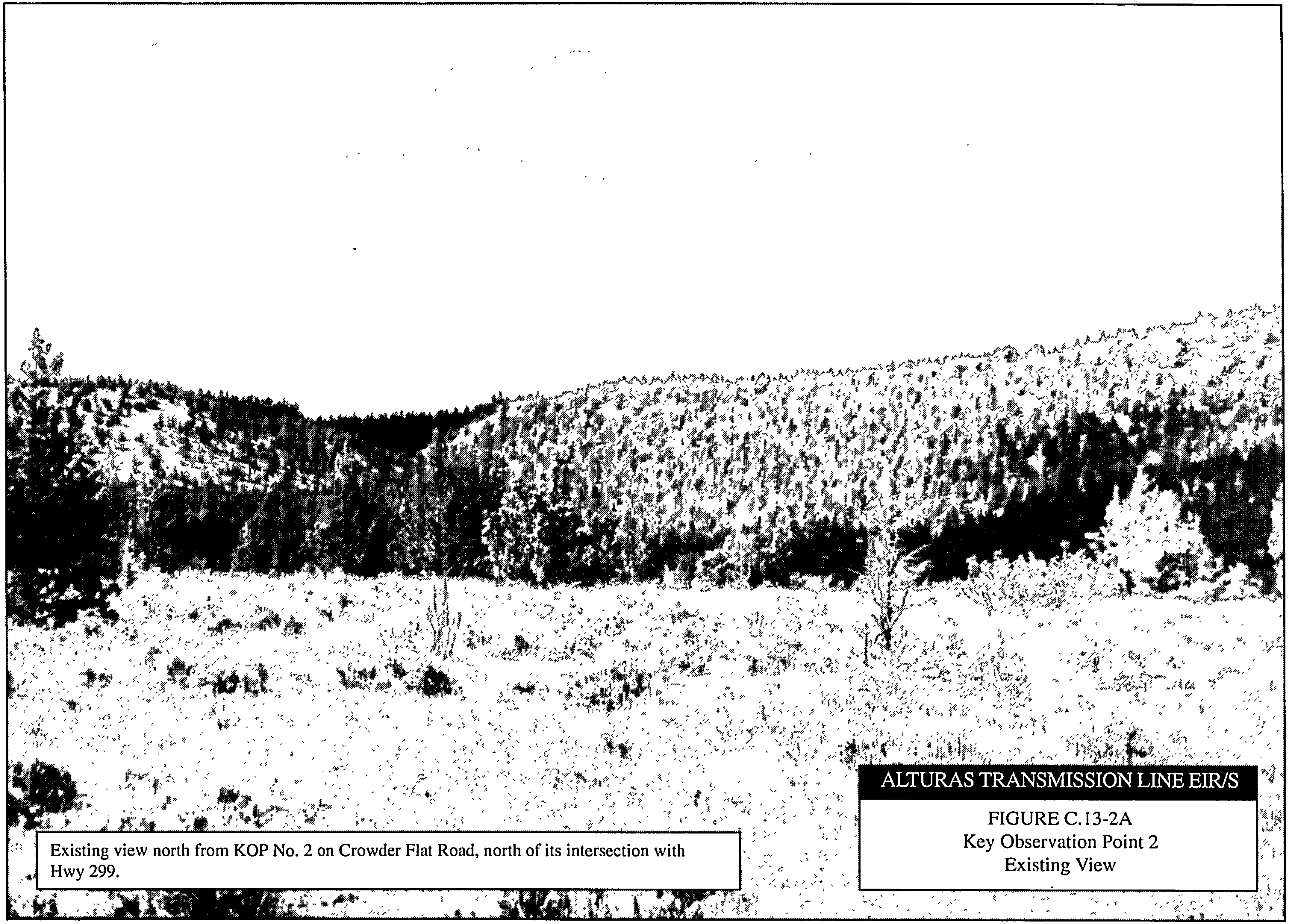

ALTURAS TRANSMISSION LINE EIR/S
Figure C.13-D
Key Observation Points Along Transmission Line Route
Proposed Transmission Line Route
Alternative Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev. 1962; Chico, CA Rev. 1970; Lovelock, NV 1970; Reno, NV 1971.
Q
R
KOP 13
KOP 14
S
T
KOP 15
U
Z
W
WCFG
KOP 16
STAGING AREA
BORDER TOWN SUBSTATION & COMMUNICATION SITE
KOP 17
X
X-East
KOP 19
Y
NORTH VALLEY ROAD SUBSTATION & COMMUNICATION SITE
X
KOP 18
STAGING AREA
SPARKS
RENO
Black Springs
Lemmon
Reno-Stead
Spanish Springs Valley
Hungry Valley
Cold Spring Valley
Red Rock Valley
Seven Lakes Mtn
Porcupine Mtn
Sun Valley
Chilcoot
Beckwourth Pass
Hallelujah Junction
Reno International
Huffaker Hills
Toiyabe National Forest



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-1B
Key Observation Point 1
Photosimulation

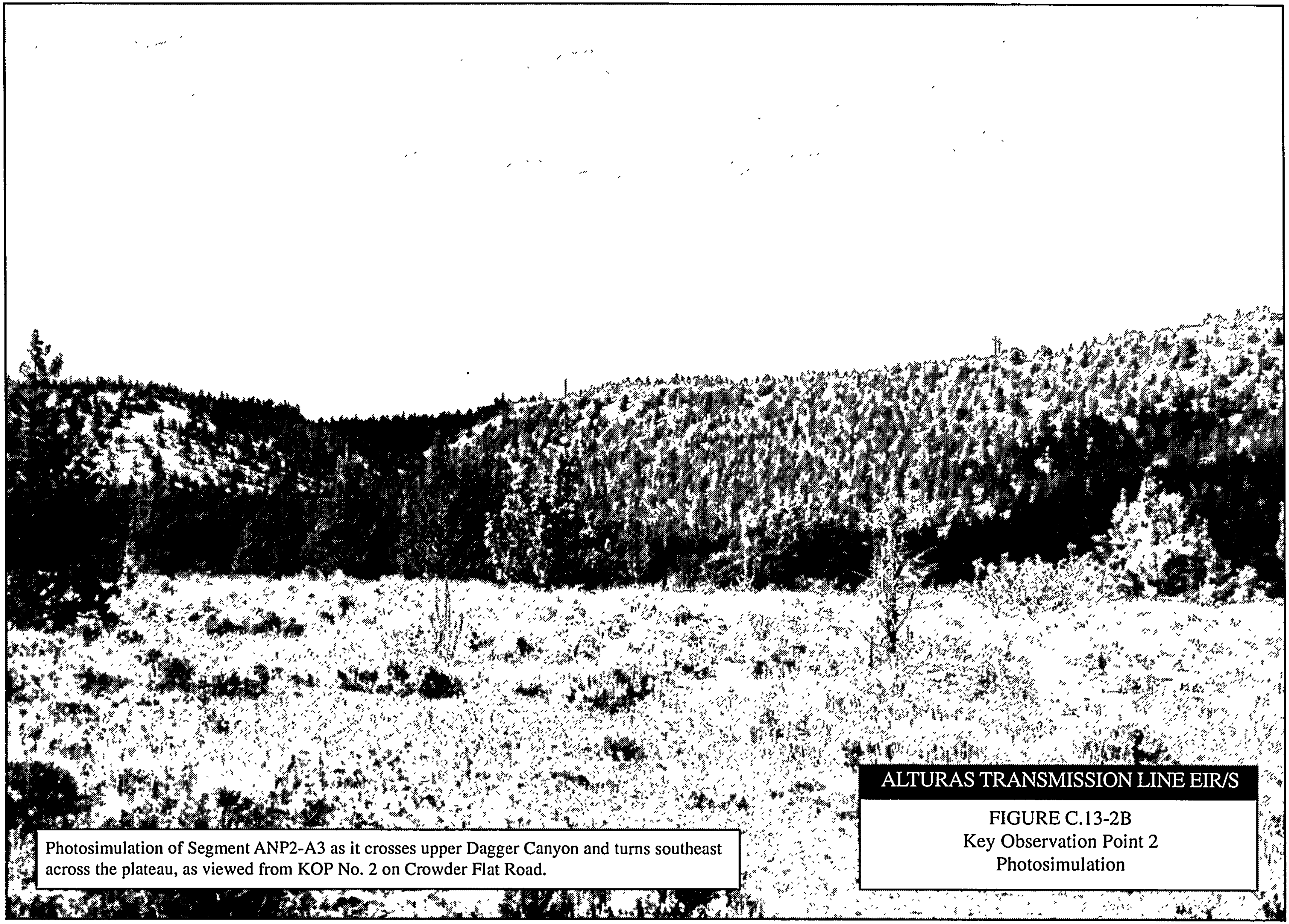
Photosimulation of Segment A1-A2 as it converges on the proposed Hilltop Substation, as viewed from KOP No. 1 on Crowder Flat Road.



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-2A
Key Observation Point 2
Existing View

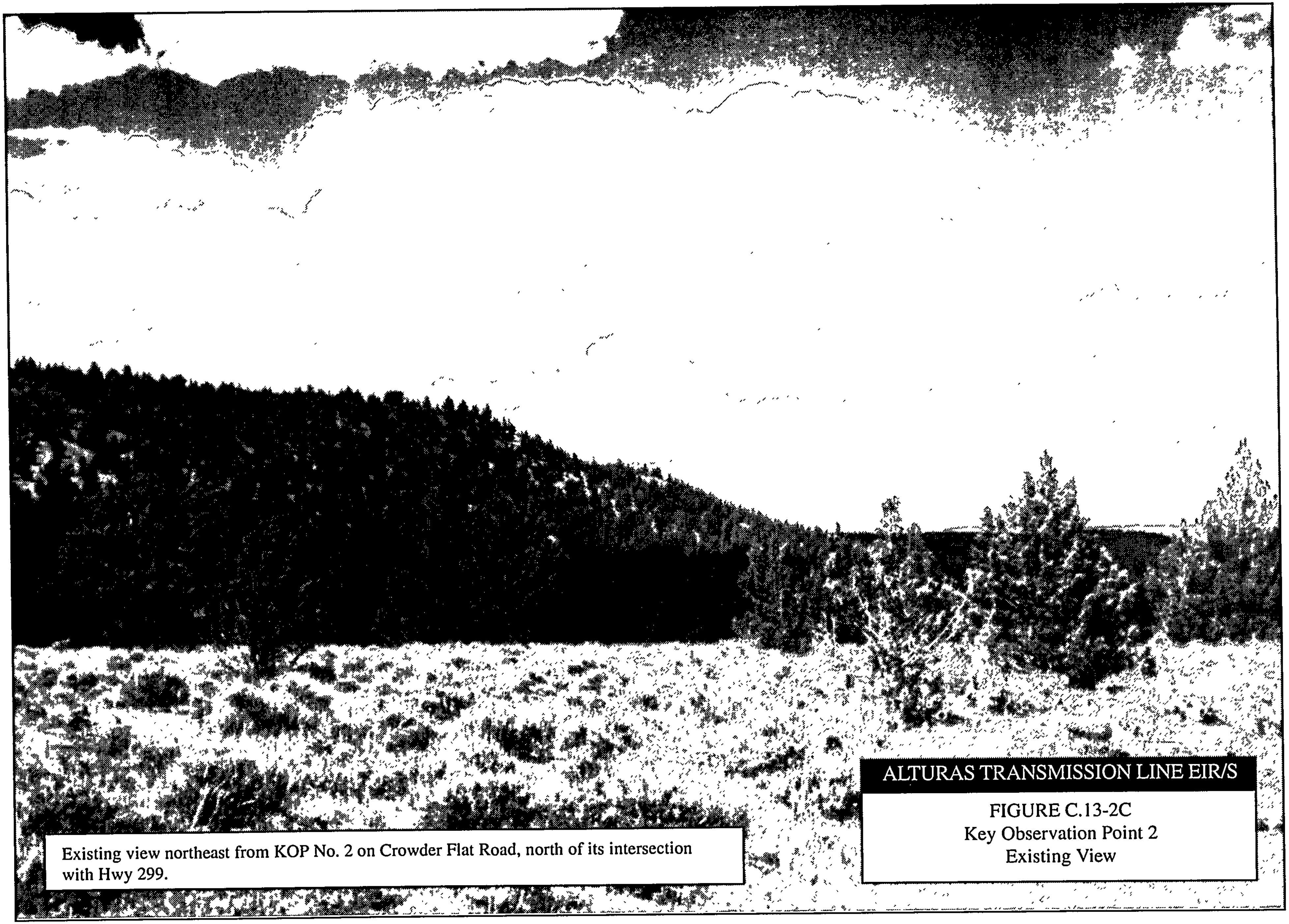
Existing view north from KOP No. 2 on Crowder Flat Road, north of its intersection with Hwy 299.



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-2B
Key Observation Point 2
Photosimulation

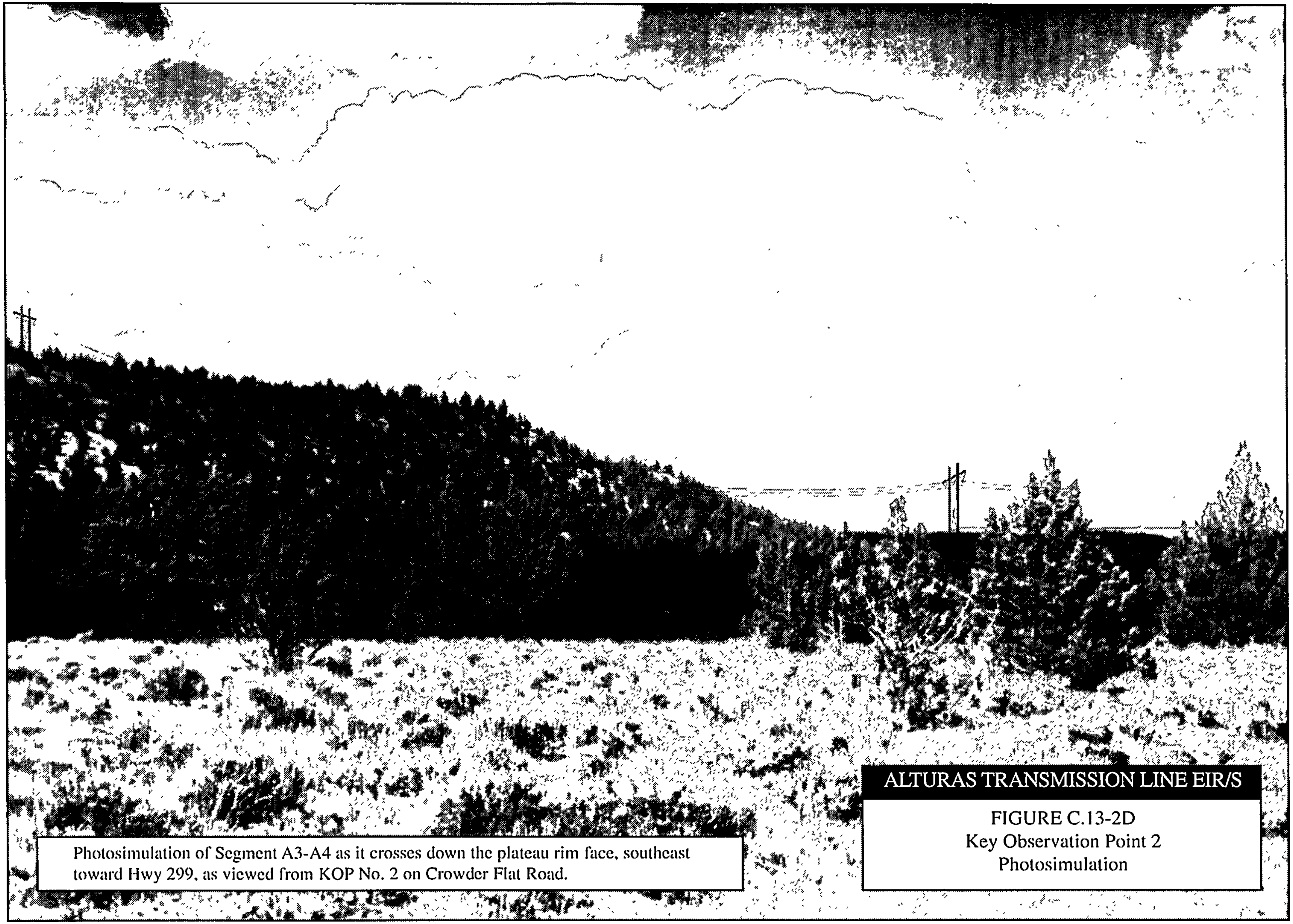
Photosimulation of Segment ANP2-A3 as it crosses upper Dagger Canyon and turns southeast across the plateau, as viewed from KOP No. 2 on Crowder Flat Road.



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-2C
Key Observation Point 2
Existing View

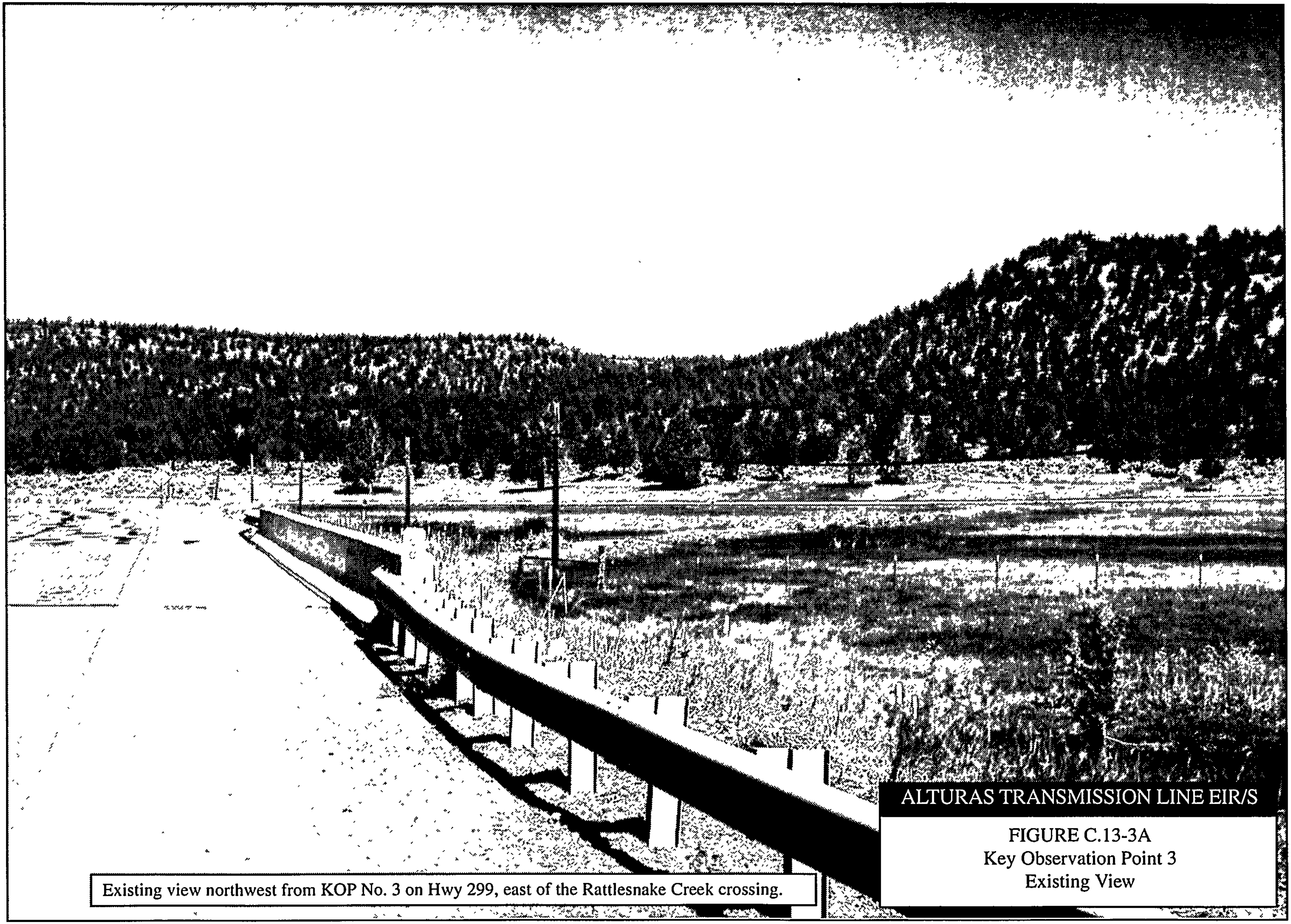
Existing view northeast from KOP No. 2 on Crowder Flat Road, north of its intersection with Hwy 299.



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-2D
Key Observation Point 2
Photosimulation

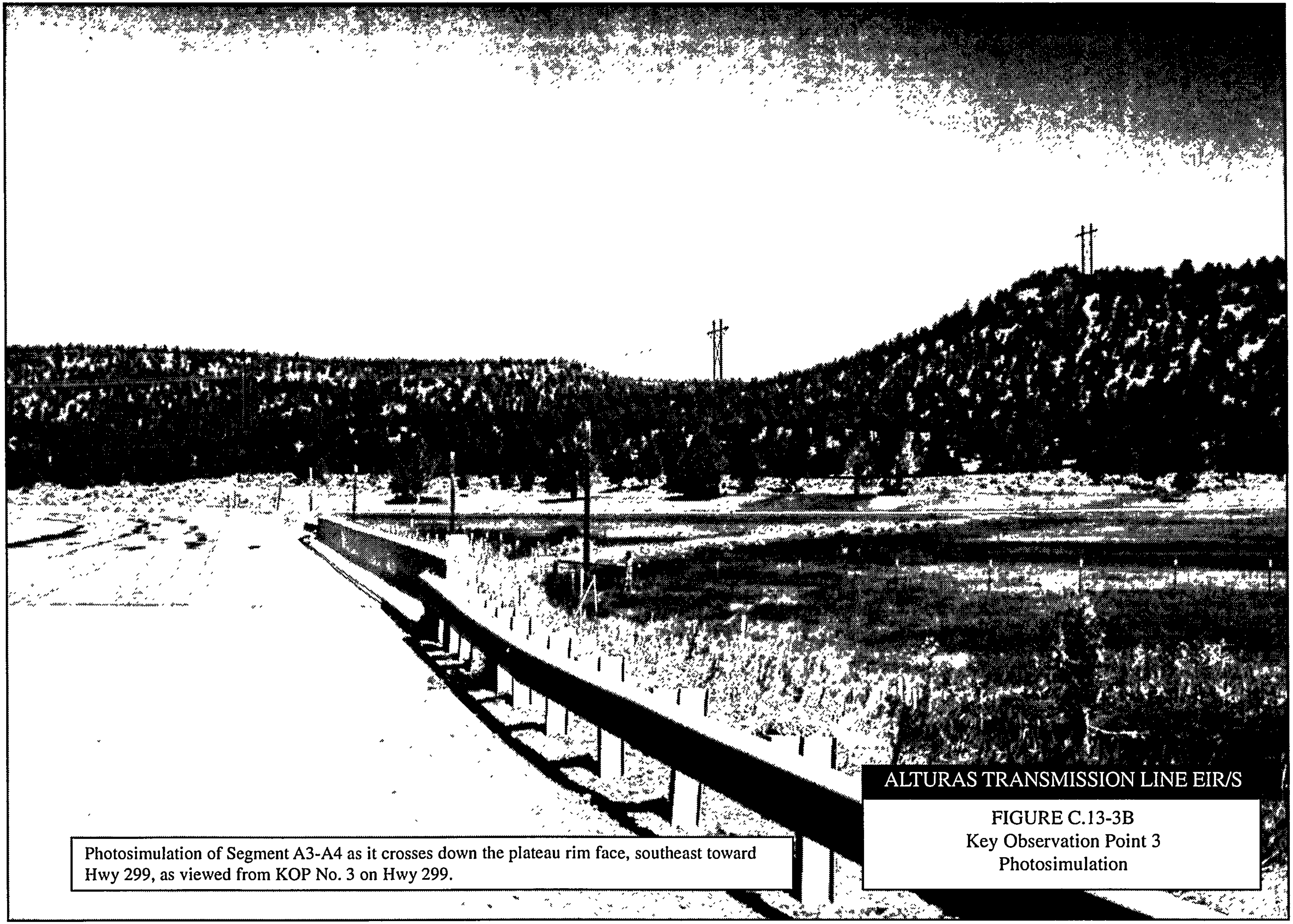
Photosimulation of Segment A3-A4 as it crosses down the plateau rim face, southeast toward Hwy 299, as viewed from KOP No. 2 on Crowder Flat Road.



Existing view northwest from KOP No. 3 on Hwy 299, east of the Rattlesnake Creek crossing.

ALTURAS TRANSMISSION LINE EIR/S

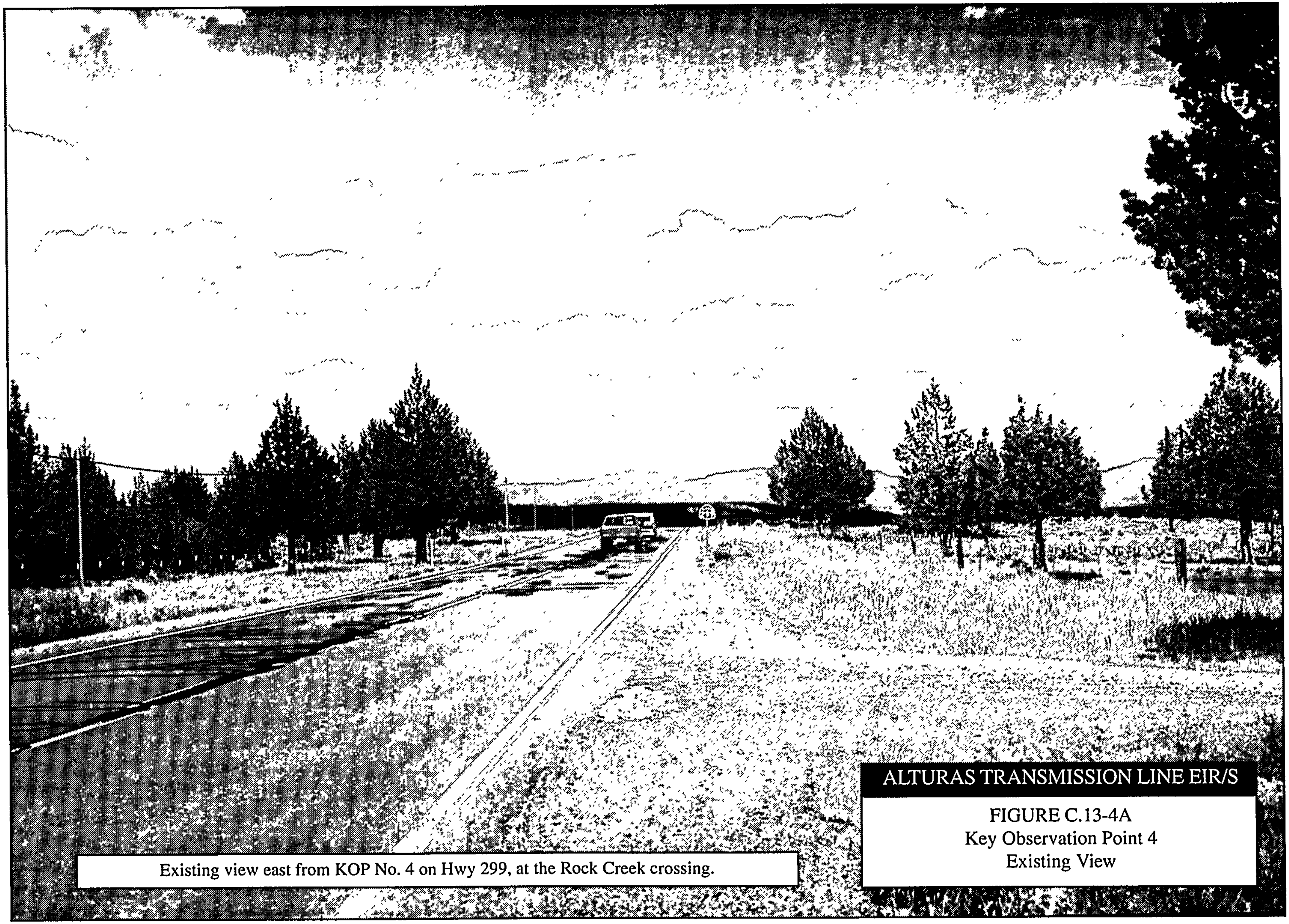
FIGURE C.13-3A
Key Observation Point 3
Existing View



Photosimulation of Segment A3-A4 as it crosses down the plateau rim face, southeast toward Hwy 299, as viewed from KOP No. 3 on Hwy 299.

ALTURAS TRANSMISSION LINE EIR/S

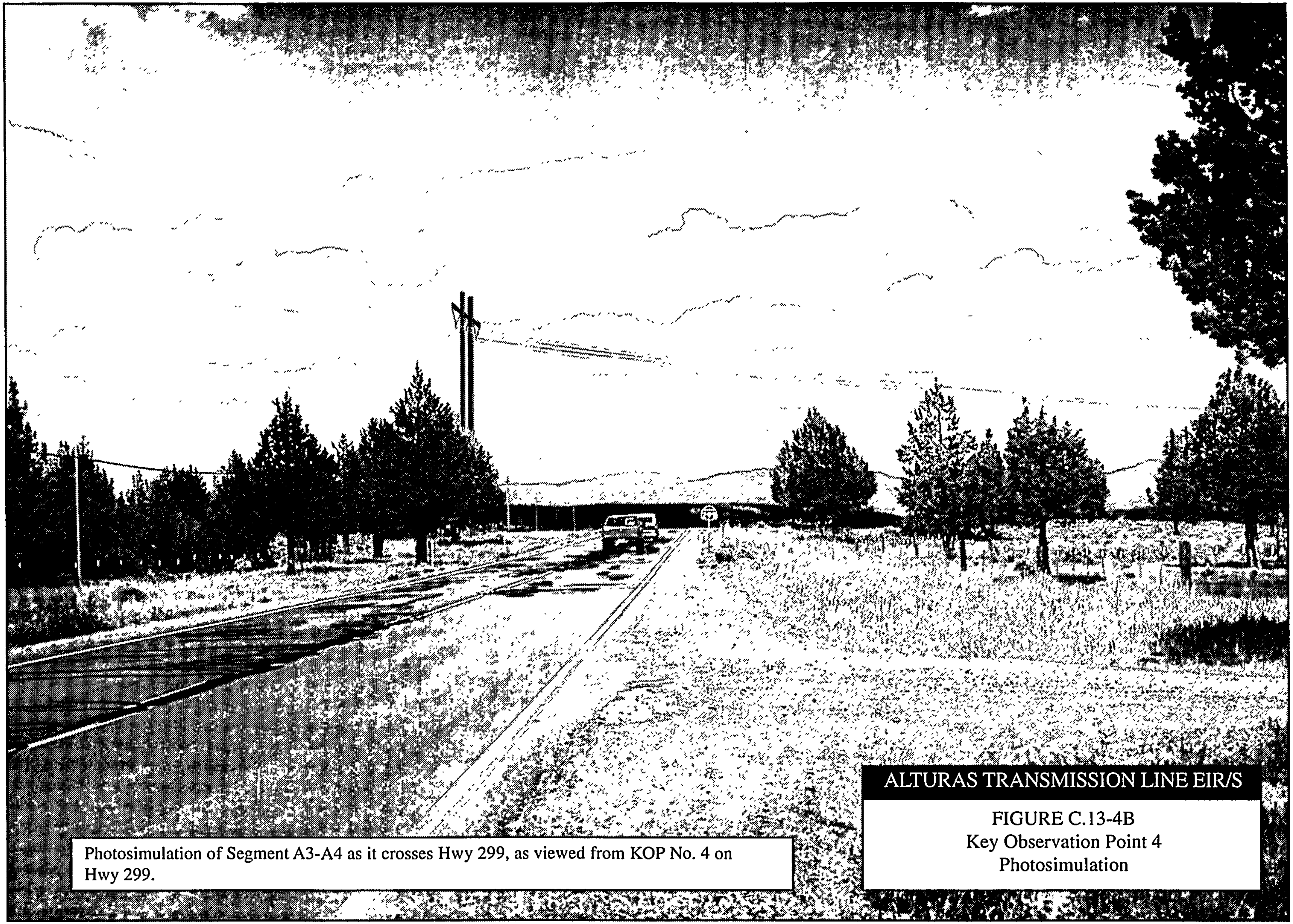
FIGURE C.13-3B
Key Observation Point 3
Photosimulation



Existing view east from KOP No. 4 on Hwy 299, at the Rock Creek crossing.

ALTURAS TRANSMISSION LINE EIR/S

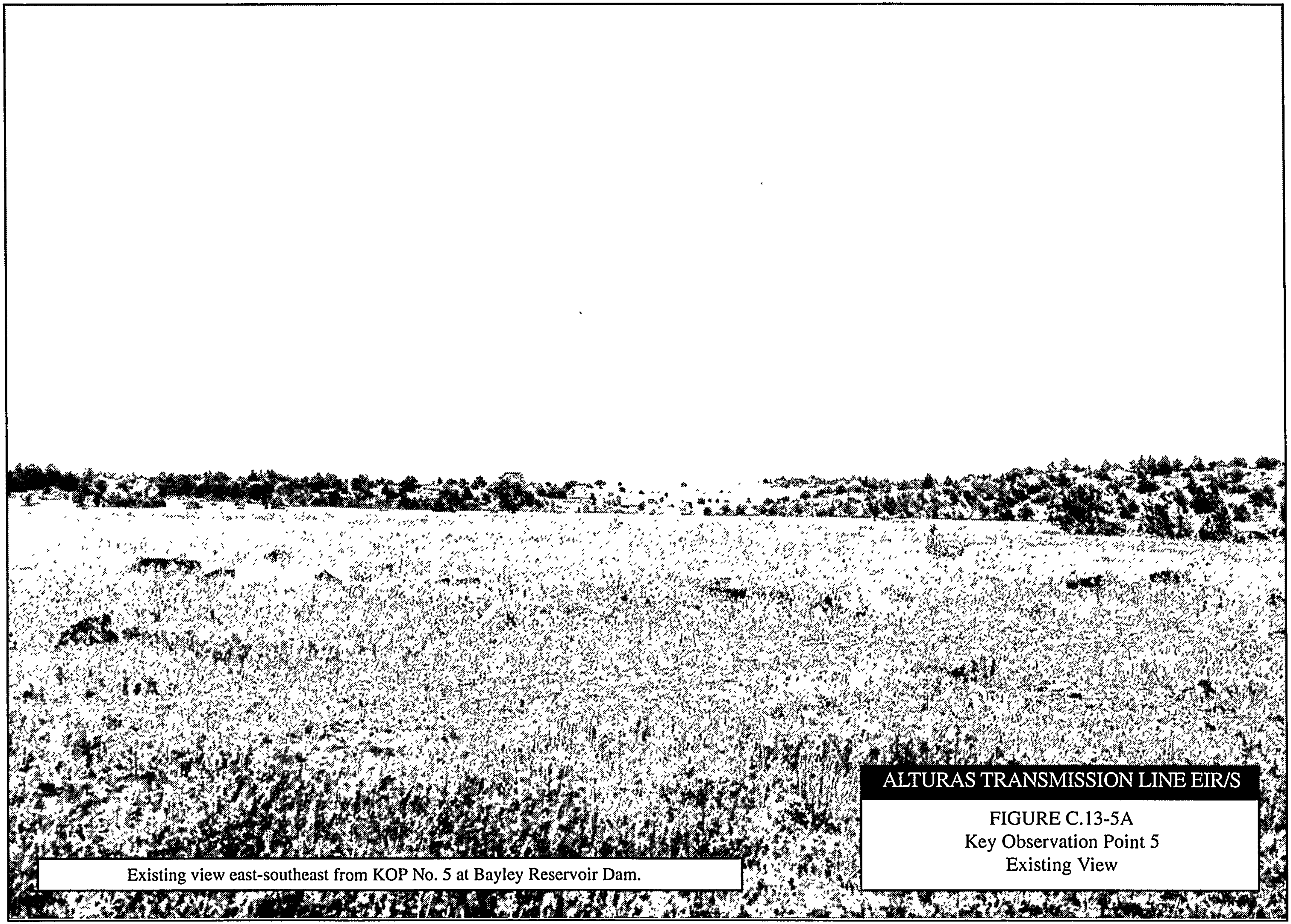
FIGURE C.13-4A
Key Observation Point 4
Existing View



Photosimulation of Segment A3-A4 as it crosses Hwy 299, as viewed from KOP No. 4 on Hwy 299.

ALTURAS TRANSMISSION LINE EIR/S

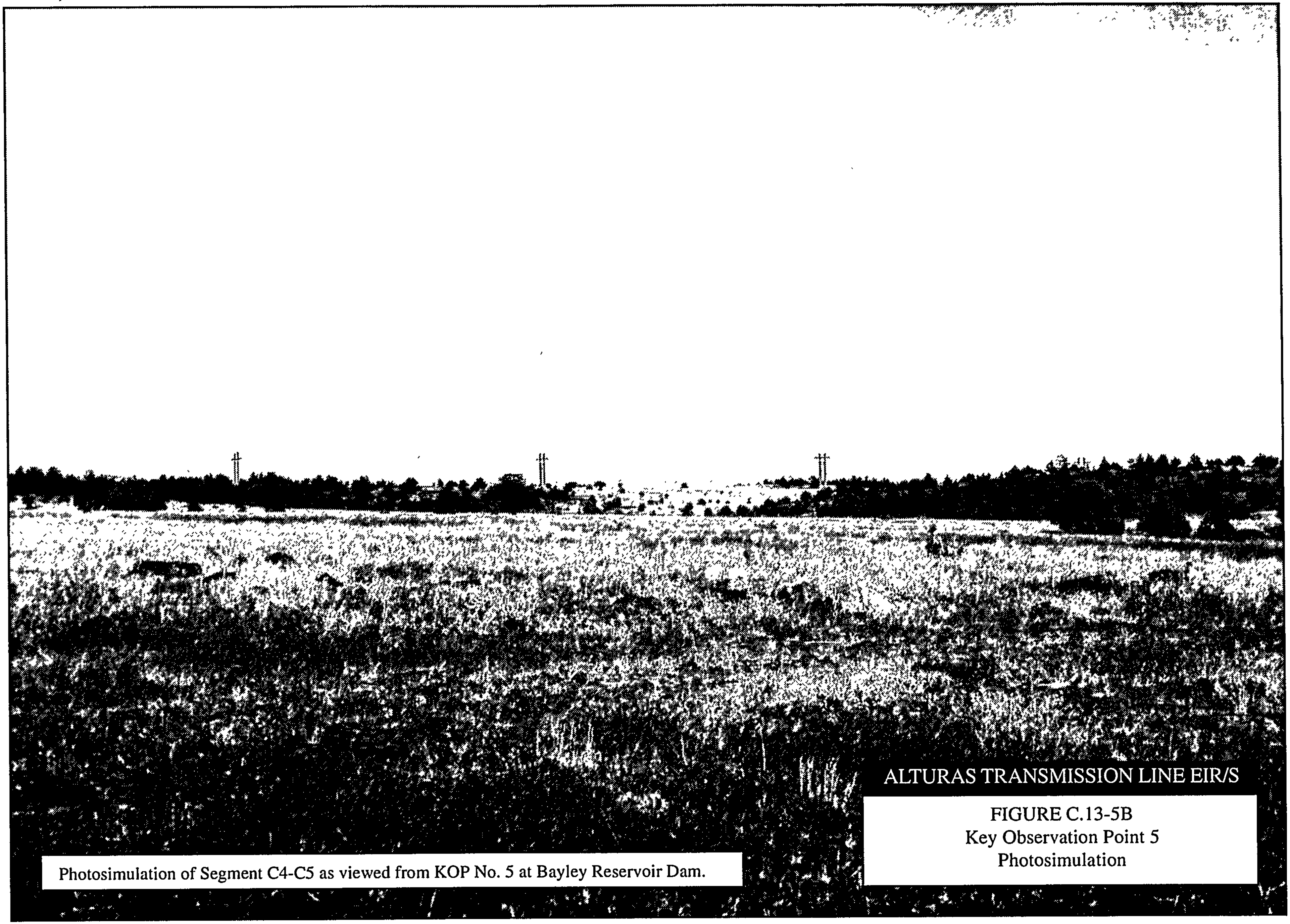
FIGURE C.13-4B
Key Observation Point 4
Photosimulation



Existing view east-southeast from KOP No. 5 at Bayley Reservoir Dam.

ALTURAS TRANSMISSION LINE EIR/S

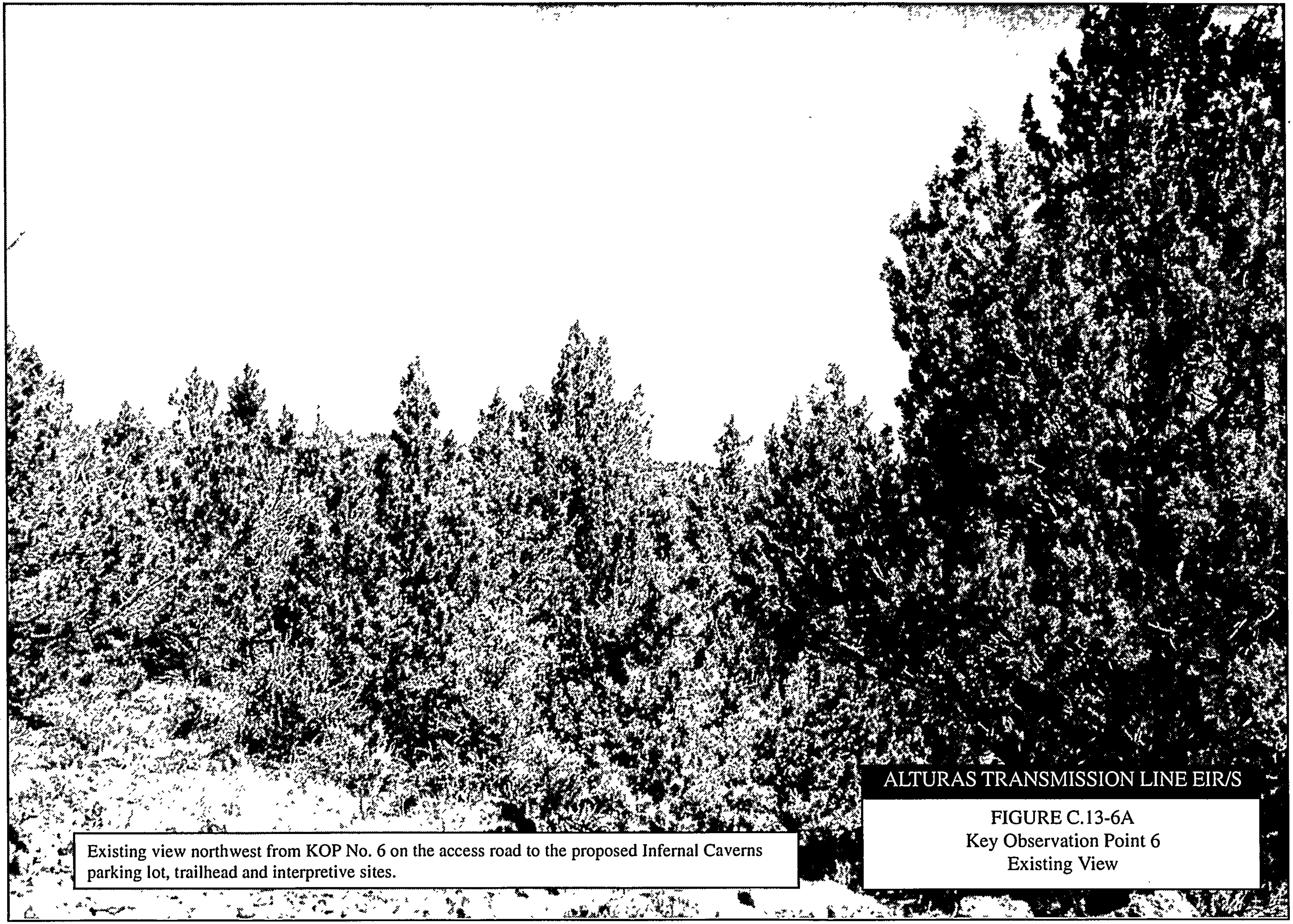
FIGURE C.13-5A
Key Observation Point 5
Existing View



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-5B
Key Observation Point 5
Photosimulation

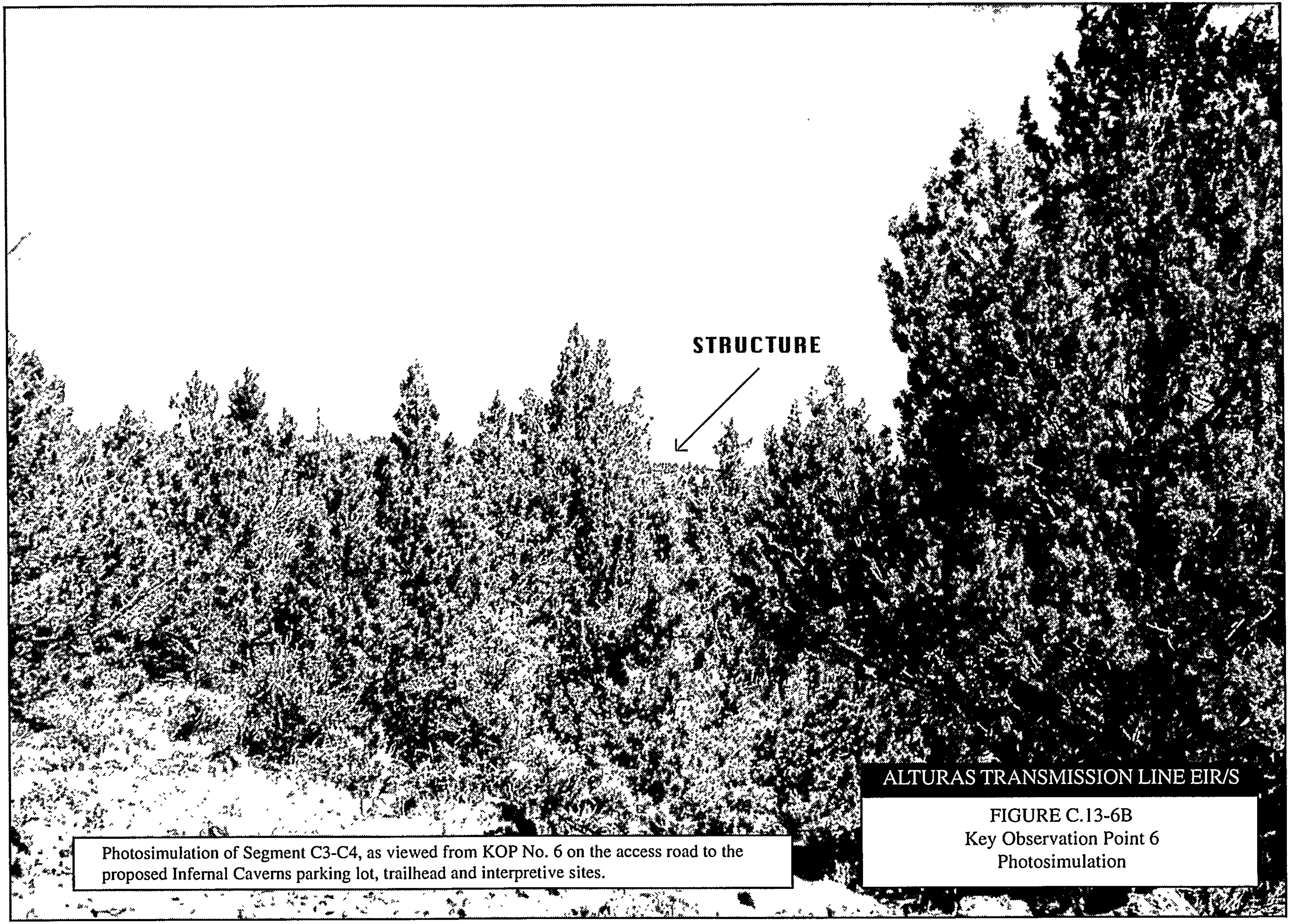
Photosimulation of Segment C4-C5 as viewed from KOP No. 5 at Bayley Reservoir Dam.



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-6A
Key Observation Point 6
Existing View

Existing view northwest from KOP No. 6 on the access road to the proposed Infernal Caverns parking lot, trailhead and interpretive sites.



Photosimulation of Segment C3-C4, as viewed from KOP No. 6 on the access road to the proposed Infernal Caverns parking lot, trailhead and interpretive sites.

ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-6B
Key Observation Point 6
Photosimulation

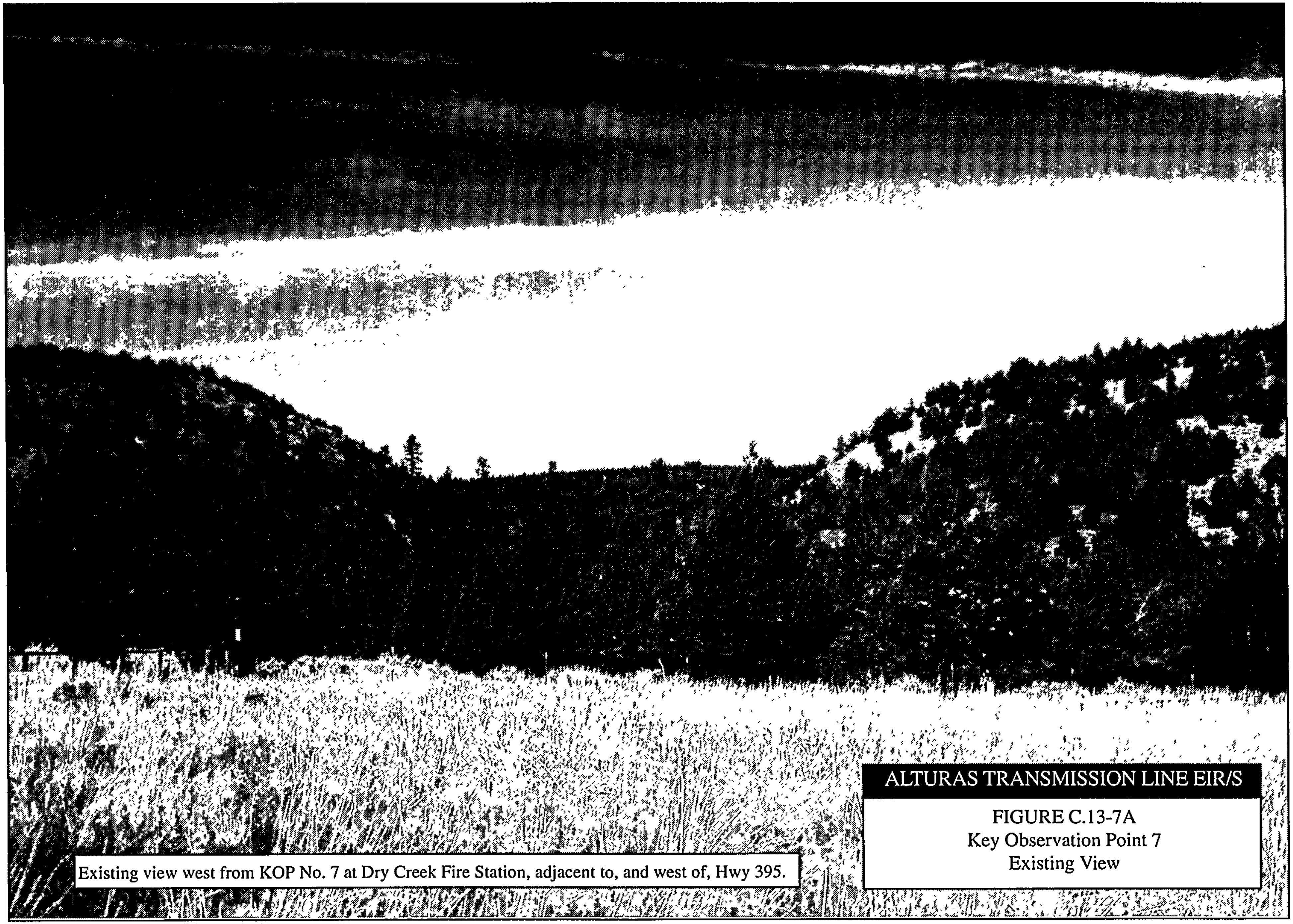
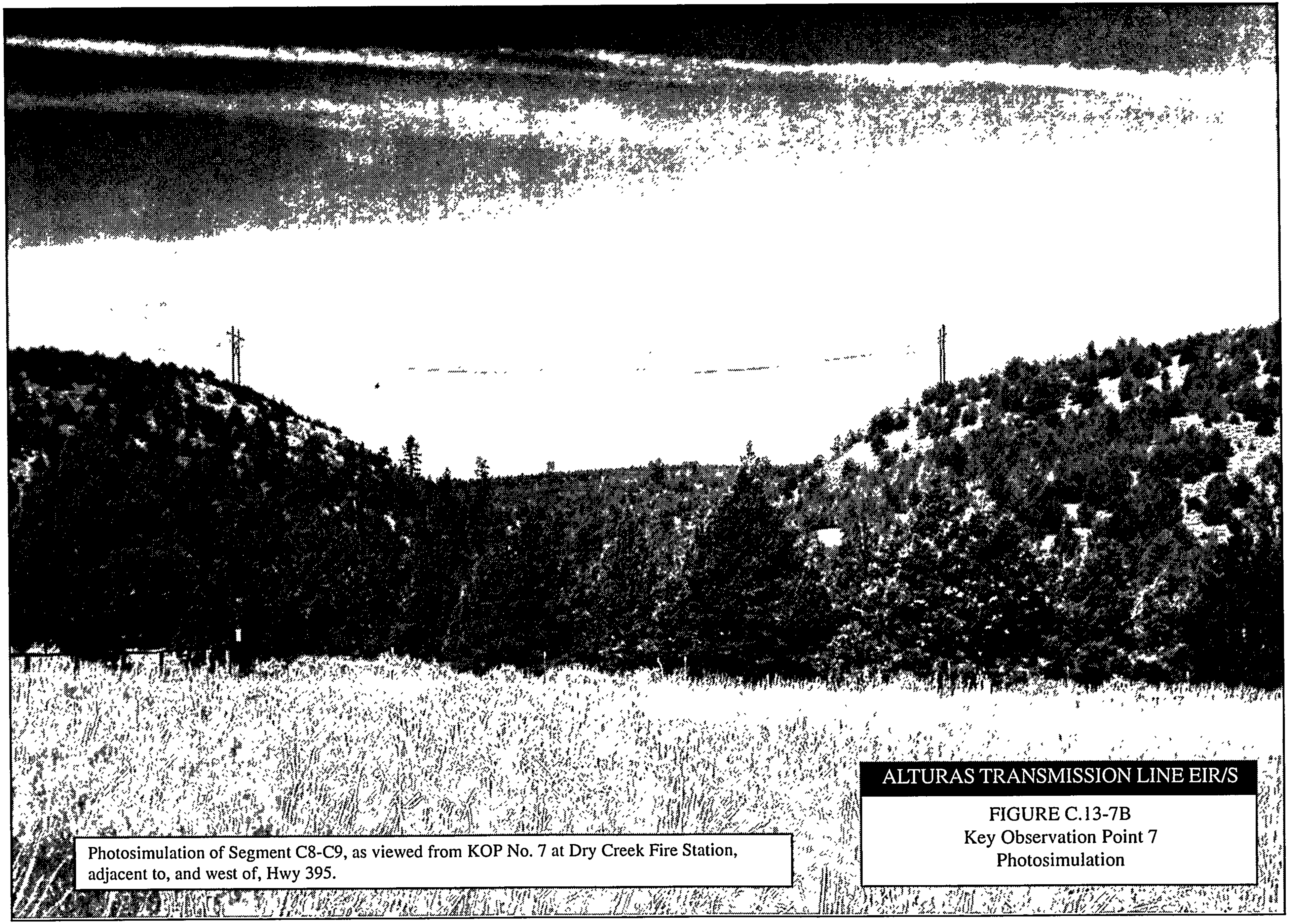


FIGURE C.13-7A
Key Observation Point 7
Existing View

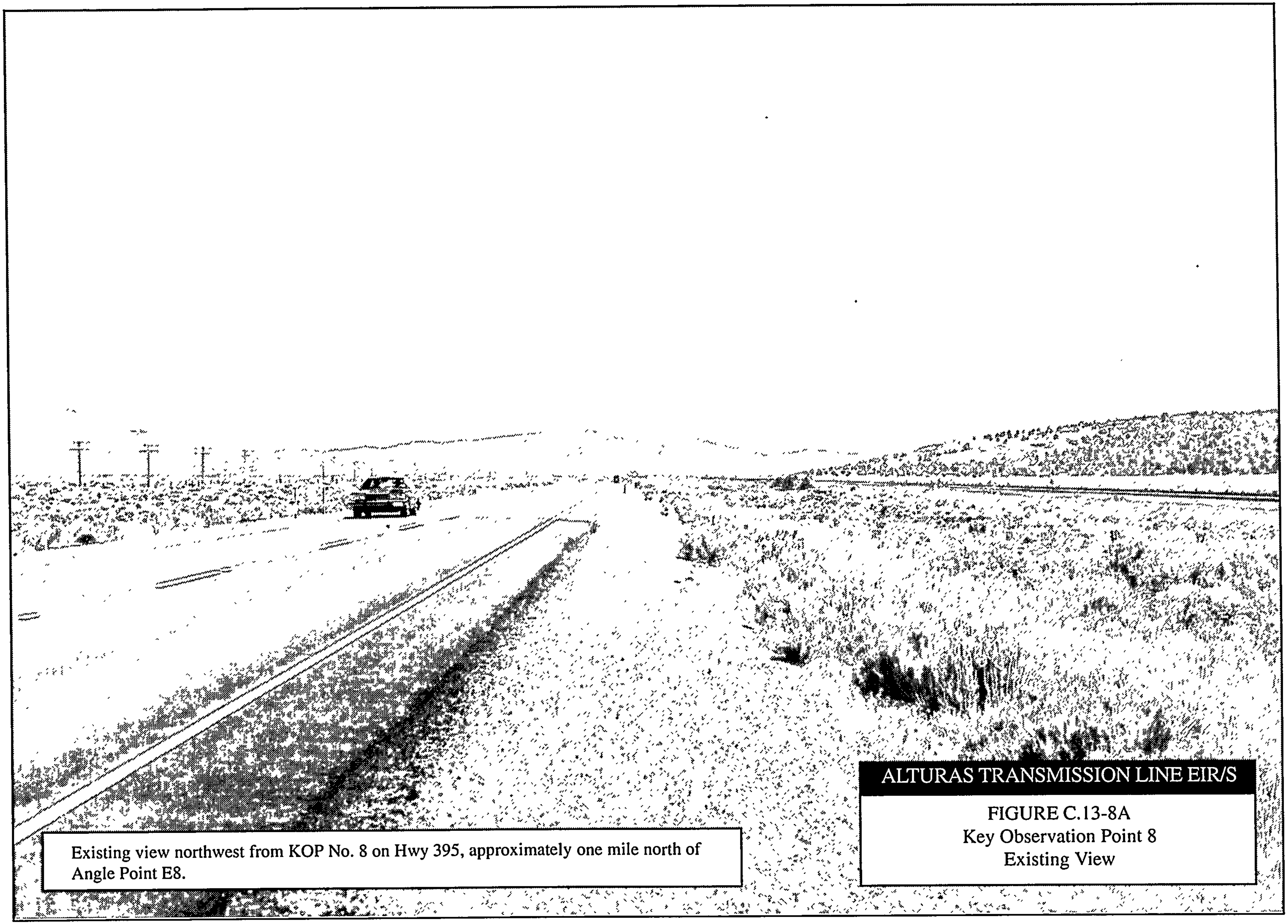
Existing view west from KOP No. 7 at Dry Creek Fire Station, adjacent to, and west of, Hwy 395.



Photosimulation of Segment C8-C9, as viewed from KOP No. 7 at Dry Creek Fire Station, adjacent to, and west of, Hwy 395.

ALTURAS TRANSMISSION LINE EIR/S

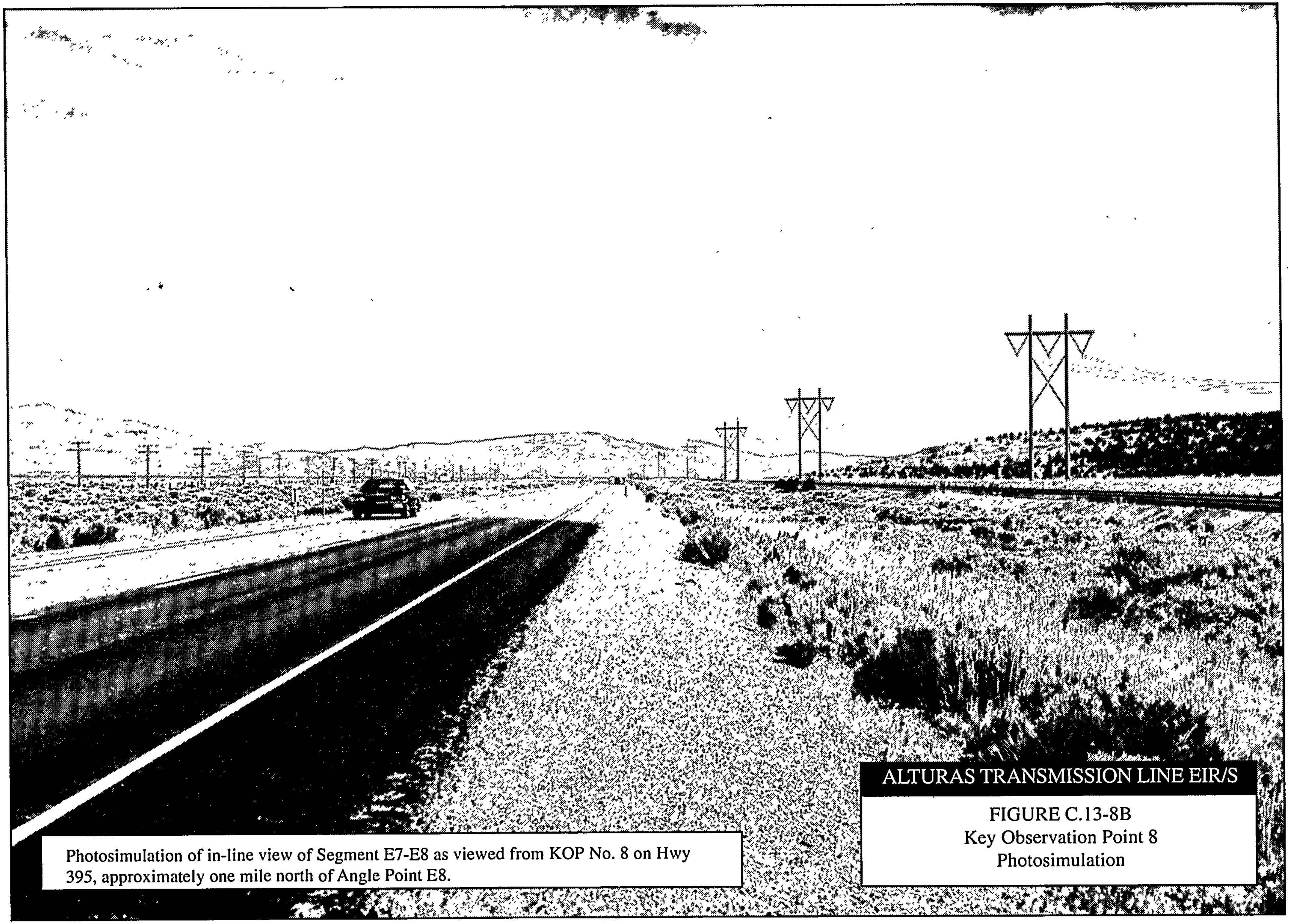
FIGURE C.13-7B
Key Observation Point 7
Photosimulation



Existing view northwest from KOP No. 8 on Hwy 395, approximately one mile north of Angle Point E8.

ALTURAS TRANSMISSION LINE EIR/S

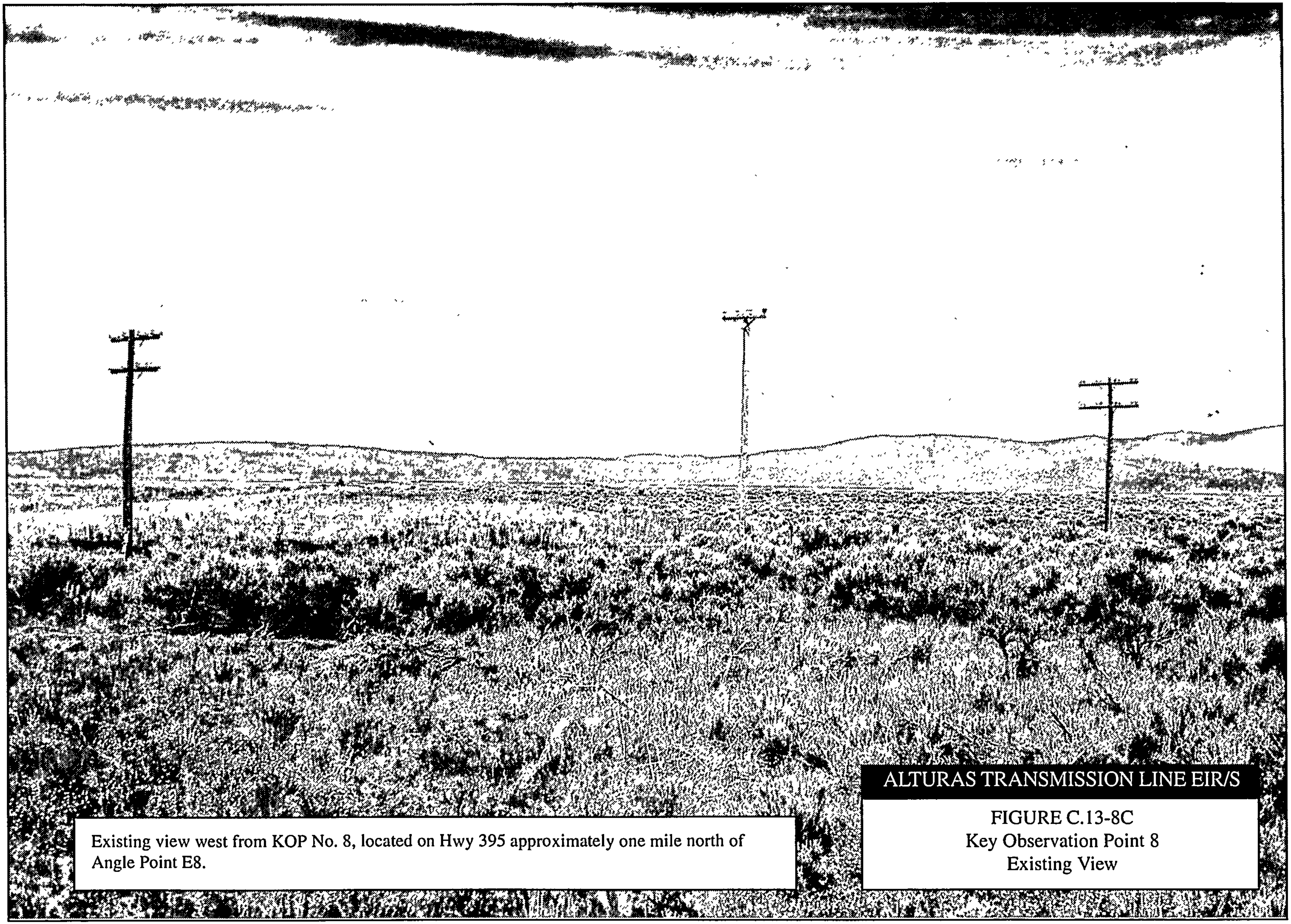
FIGURE C.13-8A
Key Observation Point 8
Existing View



Photosimulation of in-line view of Segment E7-E8 as viewed from KOP No. 8 on Hwy 395, approximately one mile north of Angle Point E8.

ALTURAS TRANSMISSION LINE EIR/S

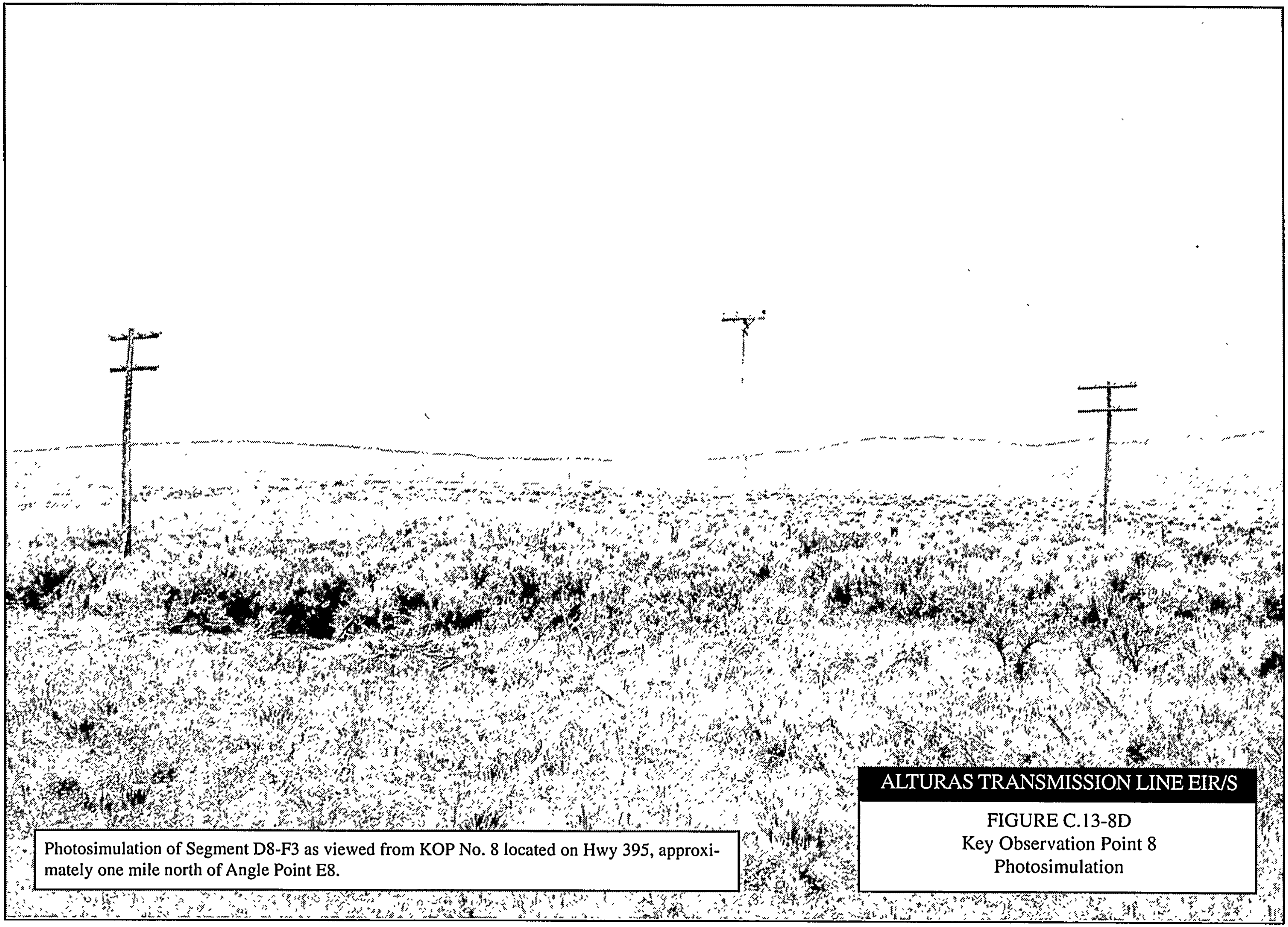
FIGURE C.13-8B
Key Observation Point 8
Photosimulation



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-8C
Key Observation Point 8
Existing View

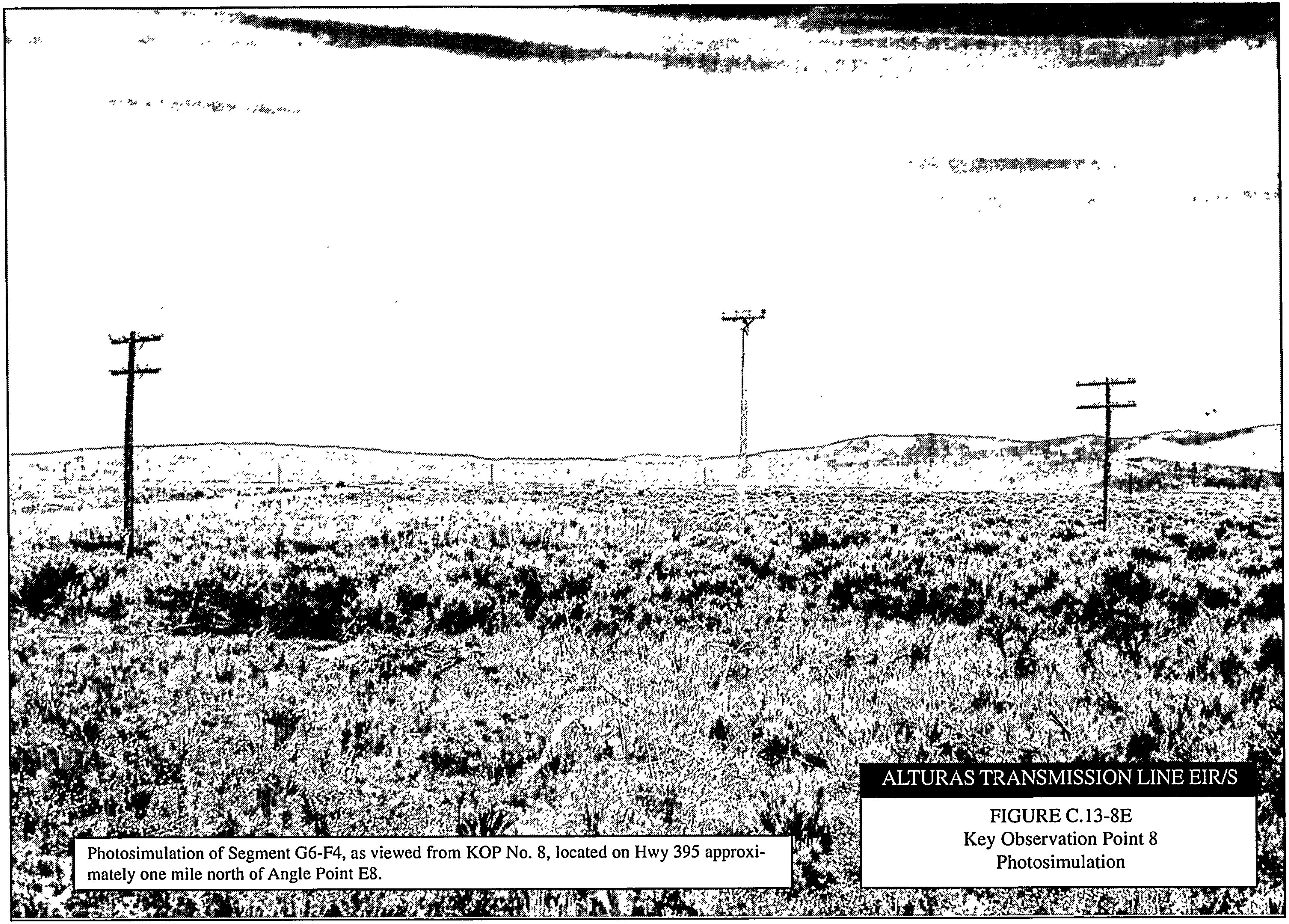
Existing view west from KOP No. 8, located on Hwy 395 approximately one mile north of Angle Point E8.



Photosimulation of Segment D8-F3 as viewed from KOP No. 8 located on Hwy 395, approximately one mile north of Angle Point E8.

ALTURAS TRANSMISSION LINE EIR/S

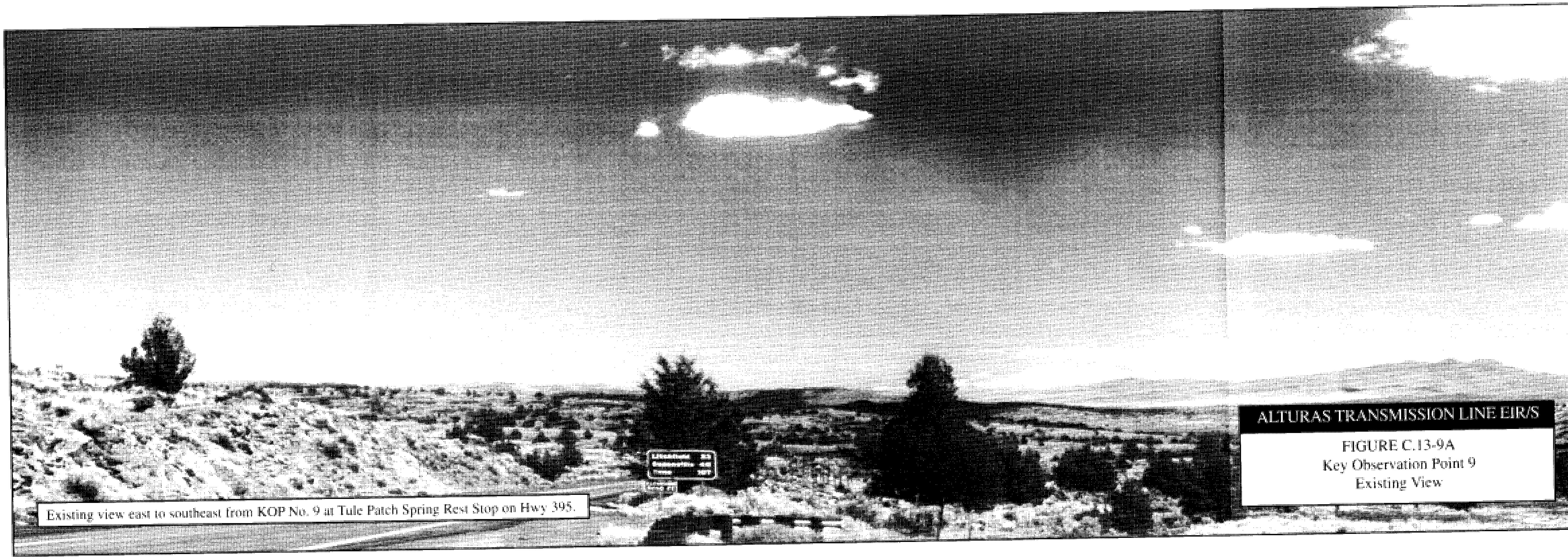
FIGURE C.13-8D
Key Observation Point 8
Photosimulation



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-8E
Key Observation Point 8
Photosimulation

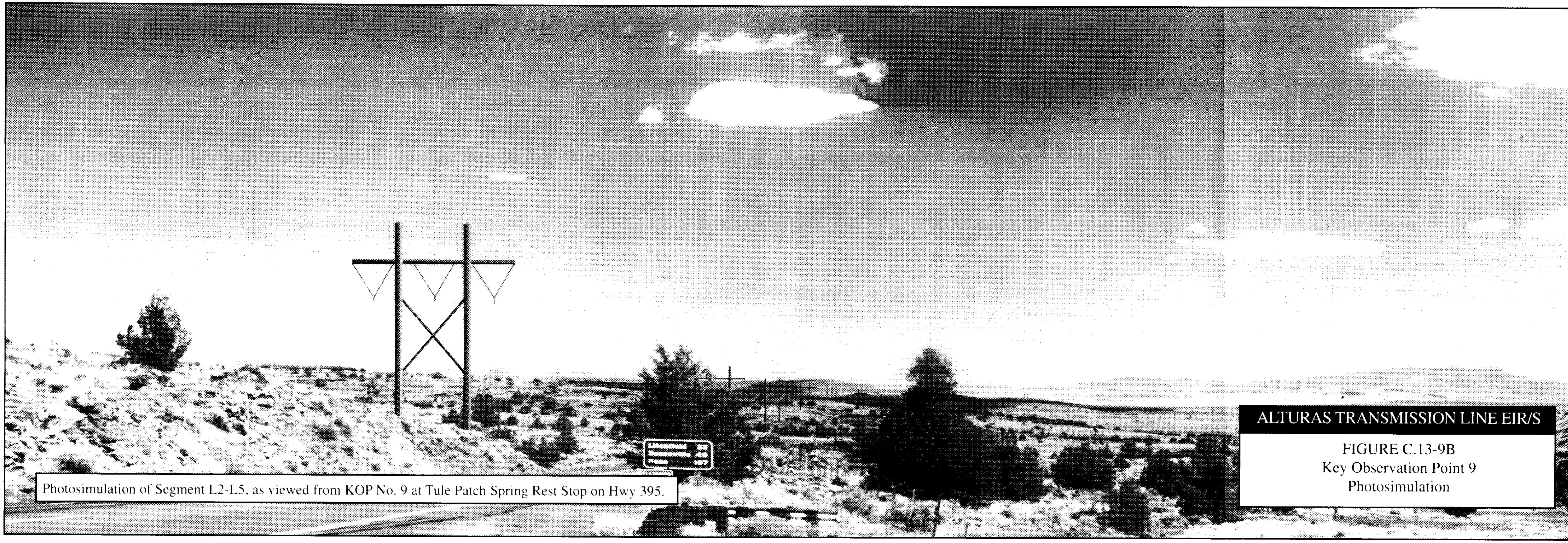
Photosimulation of Segment G6-F4, as viewed from KOP No. 8, located on Hwy 395 approximately one mile north of Angle Point E8.



Existing view east to southeast from KOP No. 9 at Tule Patch Spring Rest Stop on Hwy 395.

ALTURAS TRANSMISSION LINE EIR/S

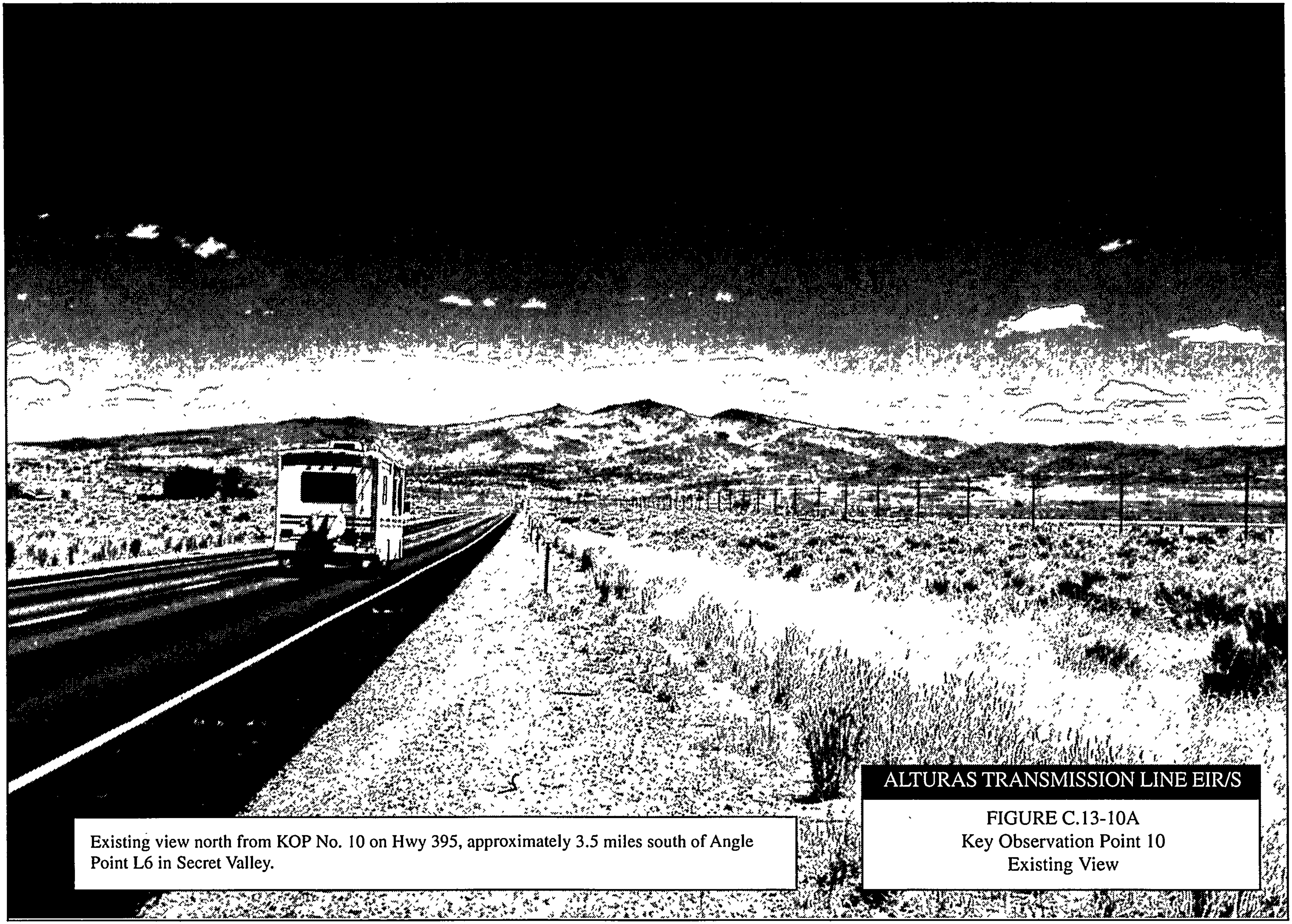
FIGURE C.13-9A
Key Observation Point 9
Existing View



Photosimulation of Segment L2-L5, as viewed from KOP No. 9 at Tule Patch Spring Rest Stop on Hwy 395.

ALTURAS TRANSMISSION LINE EIR/S

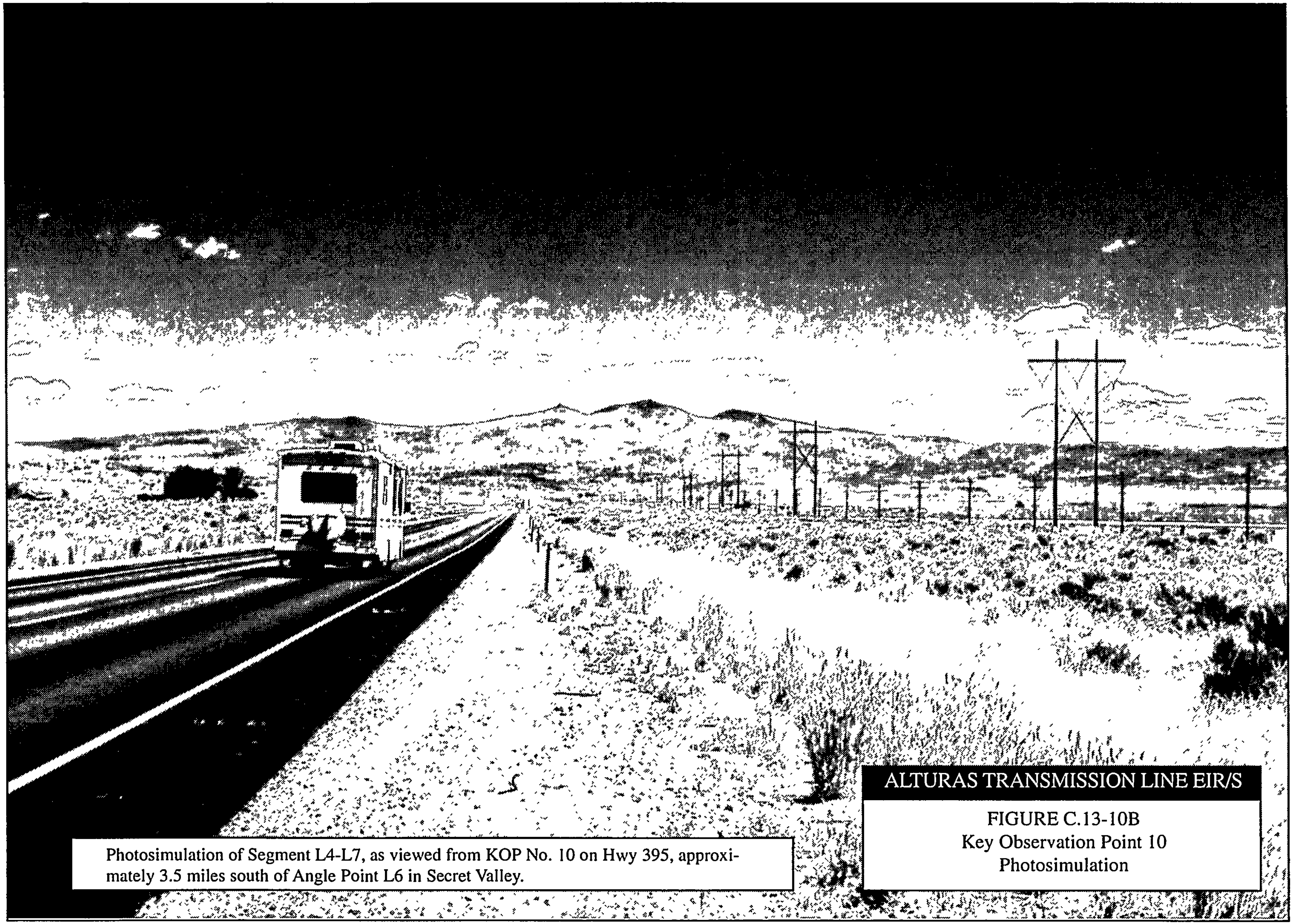
FIGURE C.13-9B
Key Observation Point 9
Photosimulation



Existing view north from KOP No. 10 on Hwy 395, approximately 3.5 miles south of Angle Point L6 in Secret Valley.

ALTURAS TRANSMISSION LINE EIR/S

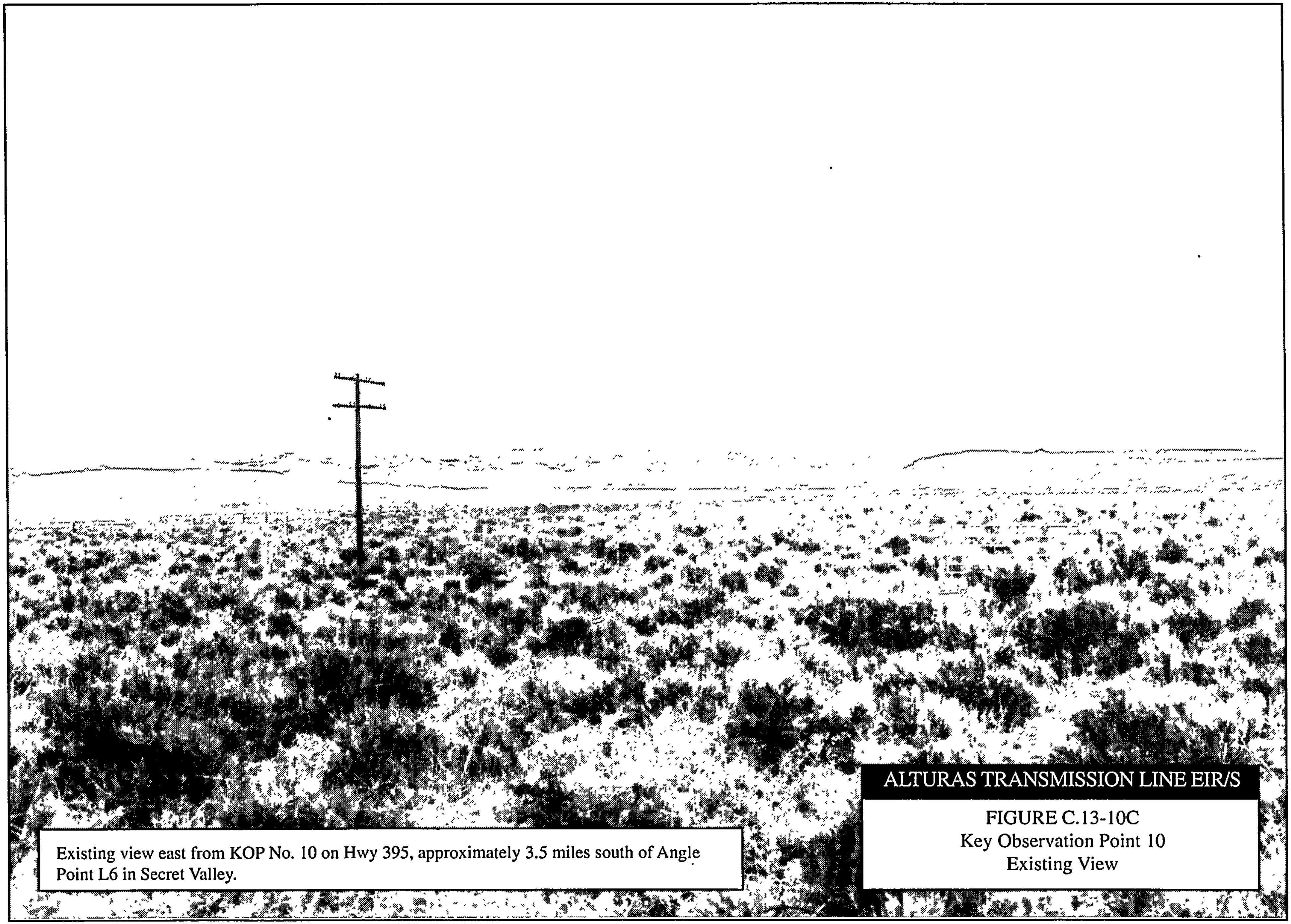
FIGURE C.13-10A
Key Observation Point 10
Existing View



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-10B
Key Observation Point 10
Photosimulation

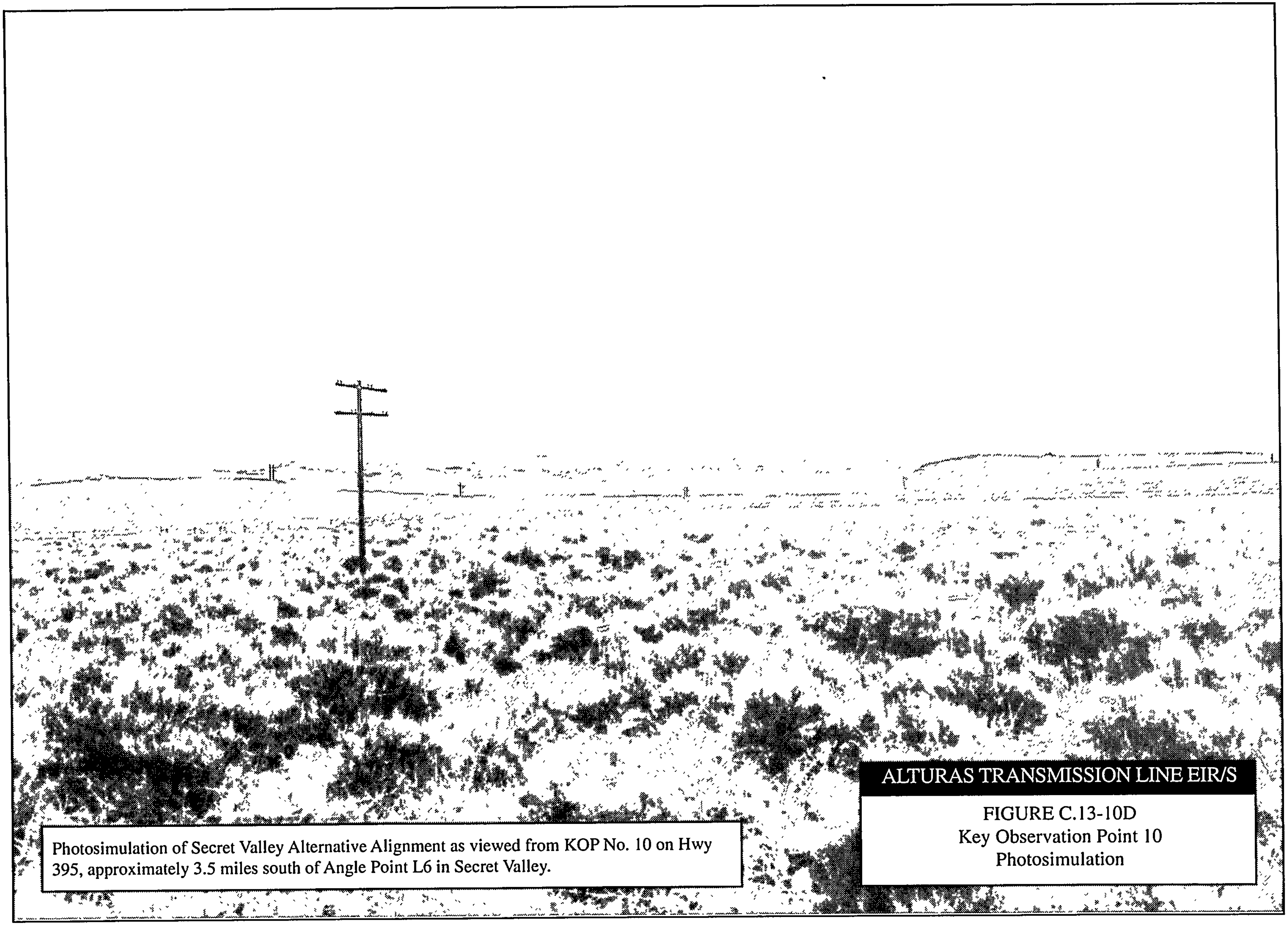
Photosimulation of Segment L4-L7, as viewed from KOP No. 10 on Hwy 395, approximately 3.5 miles south of Angle Point L6 in Secret Valley.



Existing view east from KOP No. 10 on Hwy 395, approximately 3.5 miles south of Angle Point L6 in Secret Valley.

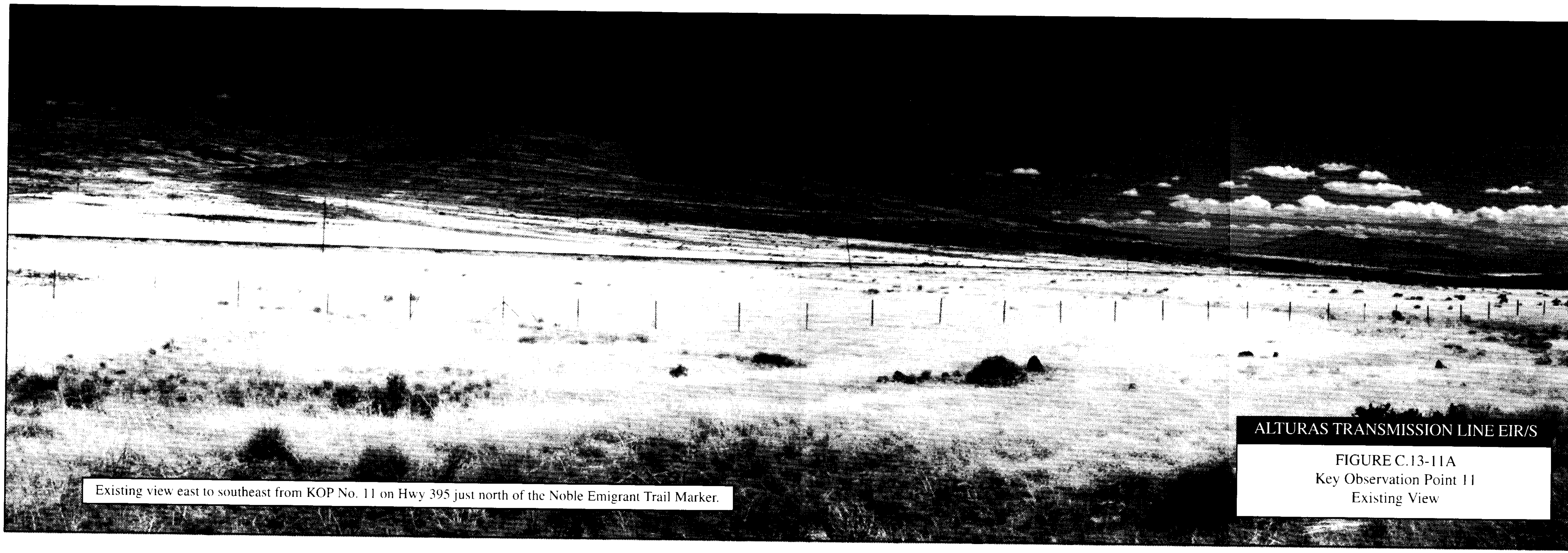
ALTURAS TRANSMISSION LINE EIR/S

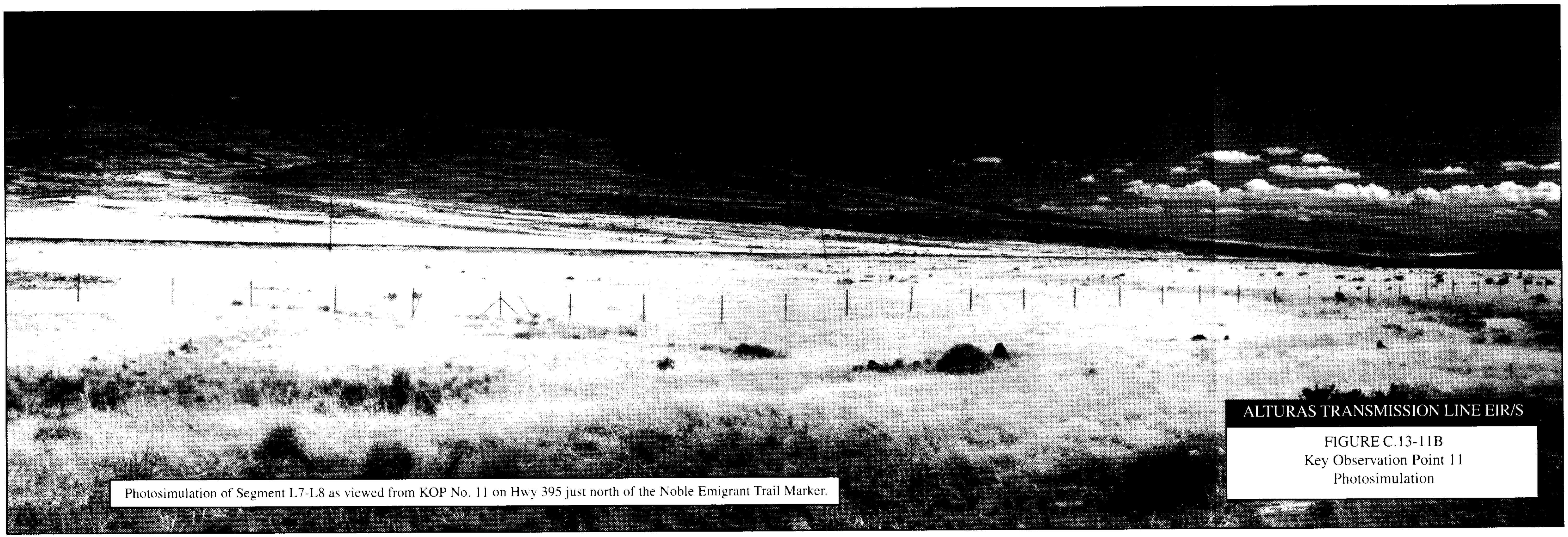
FIGURE C.13-10C
Key Observation Point 10
Existing View



Photosimulation of Secret Valley Alternative Alignment as viewed from KOP No. 10 on Hwy 395, approximately 3.5 miles south of Angle Point L6 in Secret Valley.

FIGURE C.13-10D
Key Observation Point 10
Photosimulation

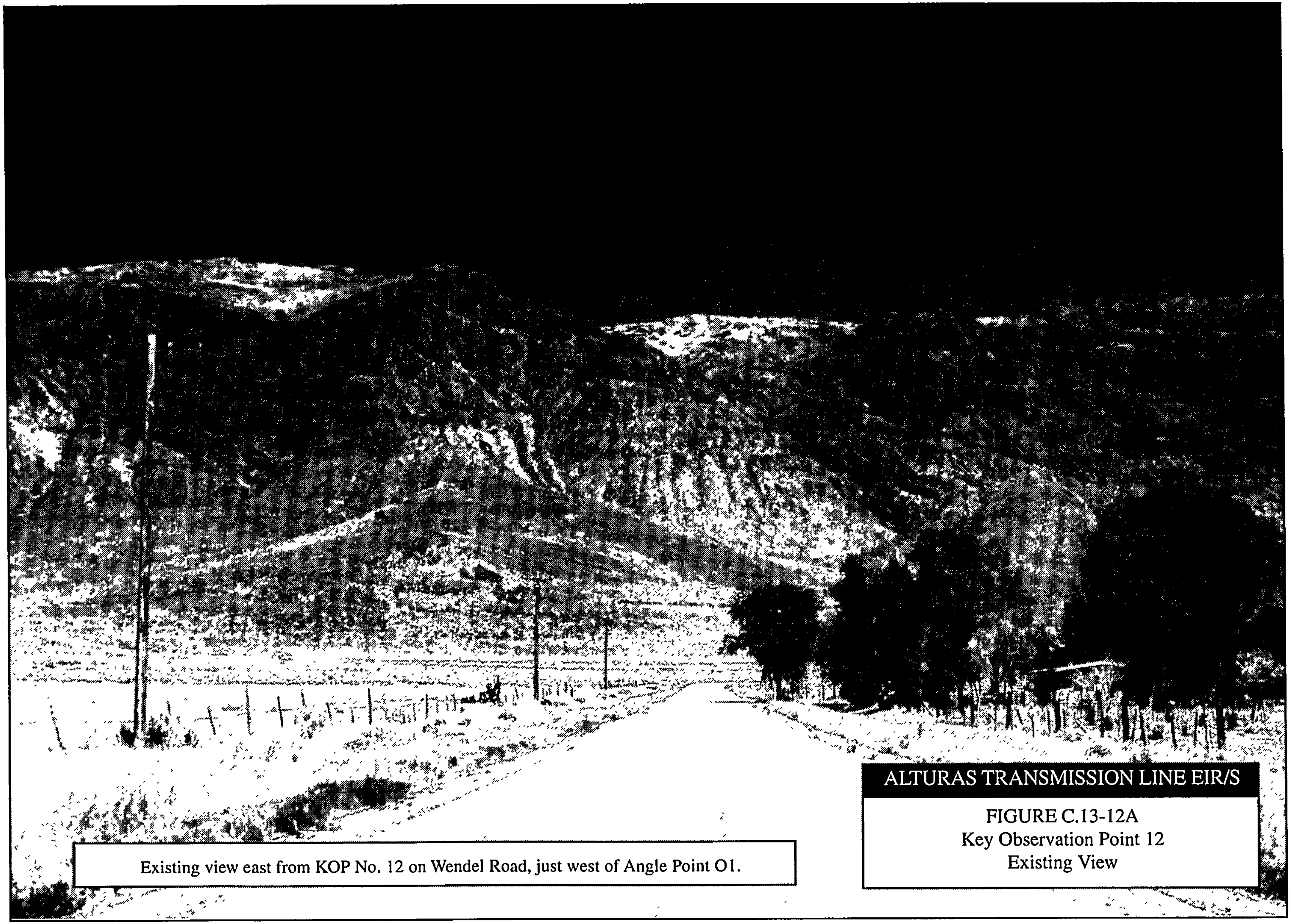

Existing view east to southeast from KOP No. 11 on Hwy 395 just north of the Noble Emigrant Trail Marker.
ALTURAS TRANSMISSION LINE EIR/S
FIGURE C.13-11A
Key Observation Point 11
Existing View



Photosimulation of Segment L7-L8 as viewed from KOP No. 11 on Hwy 395 just north of the Noble Emigrant Trail Marker.

ALTURAS TRANSMISSION LINE EIR/S

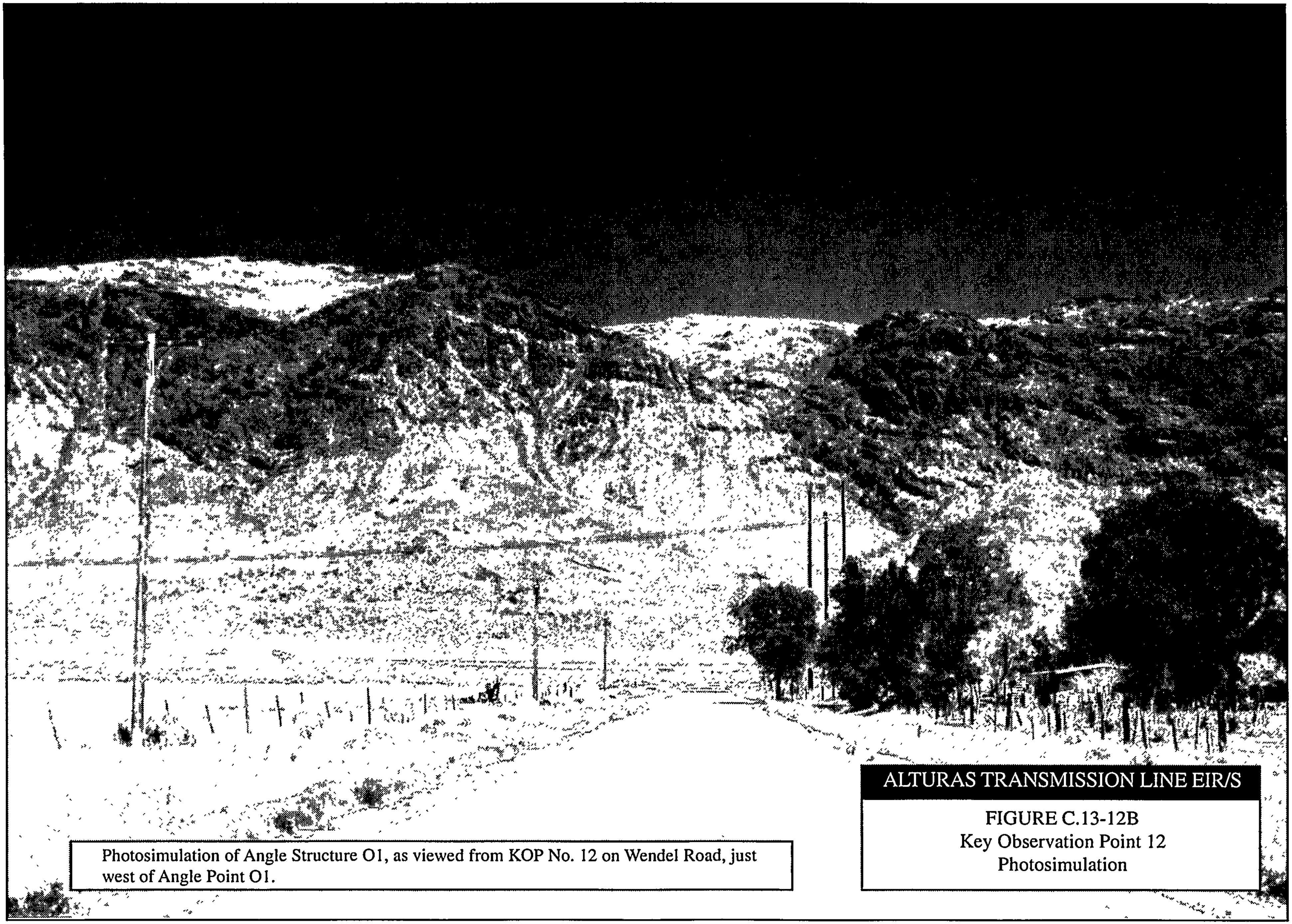
FIGURE C.13-11B
Key Observation Point 11
Photosimulation



Existing view east from KOP No. 12 on Wendel Road, just west of Angle Point O1.

ALTURAS TRANSMISSION LINE EIR/S

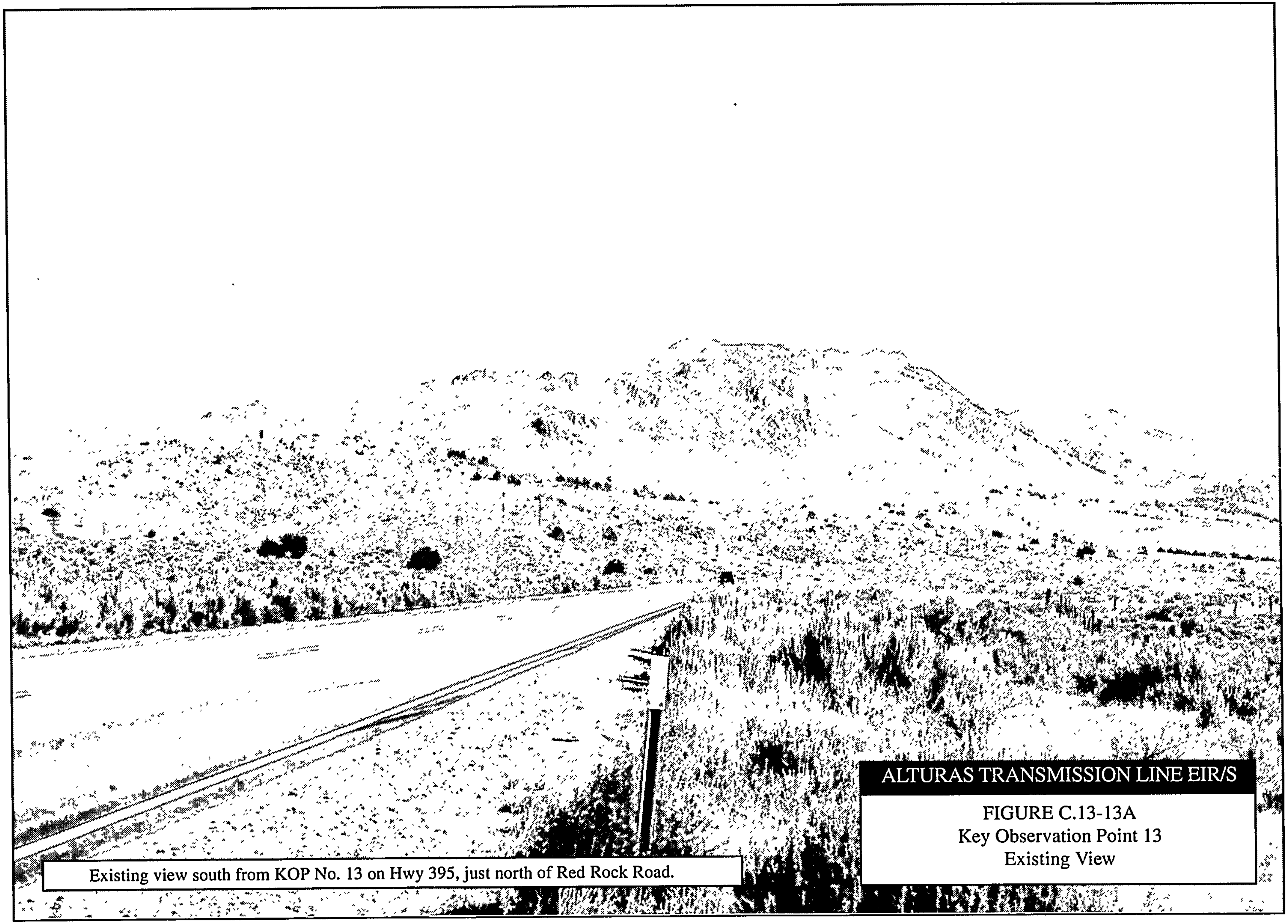
FIGURE C.13-12A
Key Observation Point 12
Existing View



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-12B
Key Observation Point 12
Photosimulation

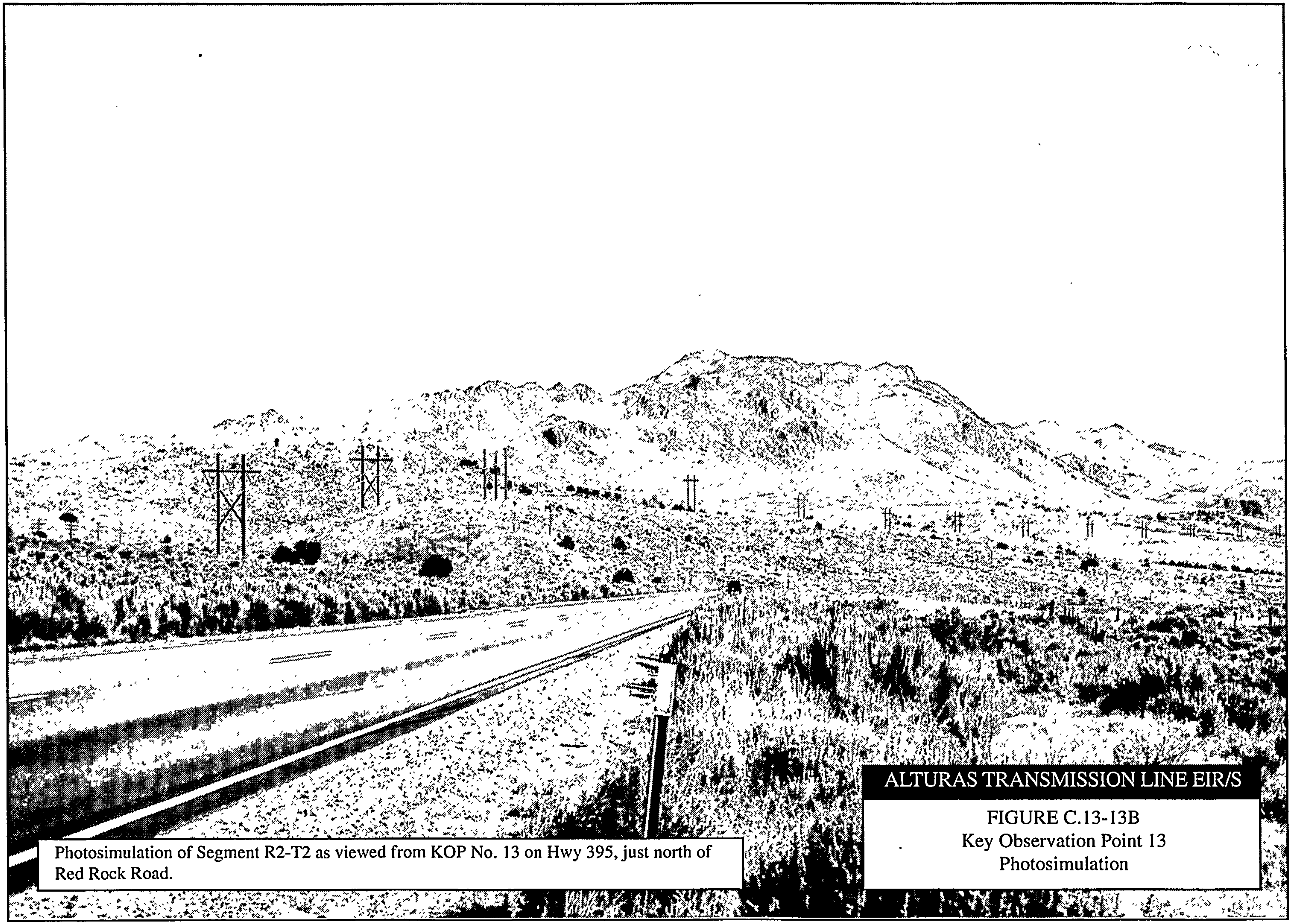
Photosimulation of Angle Structure O1, as viewed from KOP No. 12 on Wendel Road, just west of Angle Point O1.



Existing view south from KOP No. 13 on Hwy 395, just north of Red Rock Road.

ALTURAS TRANSMISSION LINE EIR/S

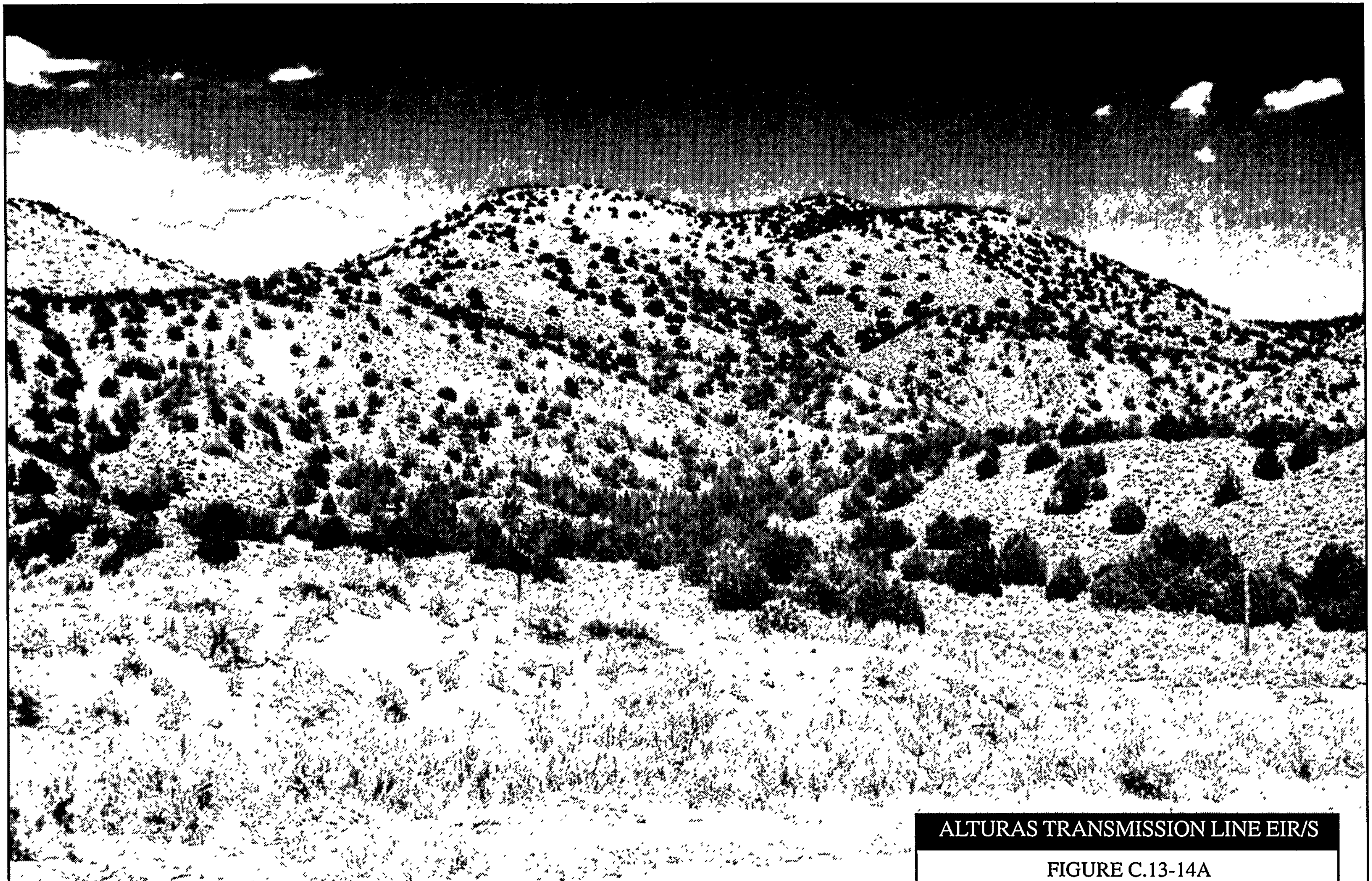
FIGURE C.13-13A
Key Observation Point 13
Existing View



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-13B
Key Observation Point 13
Photosimulation

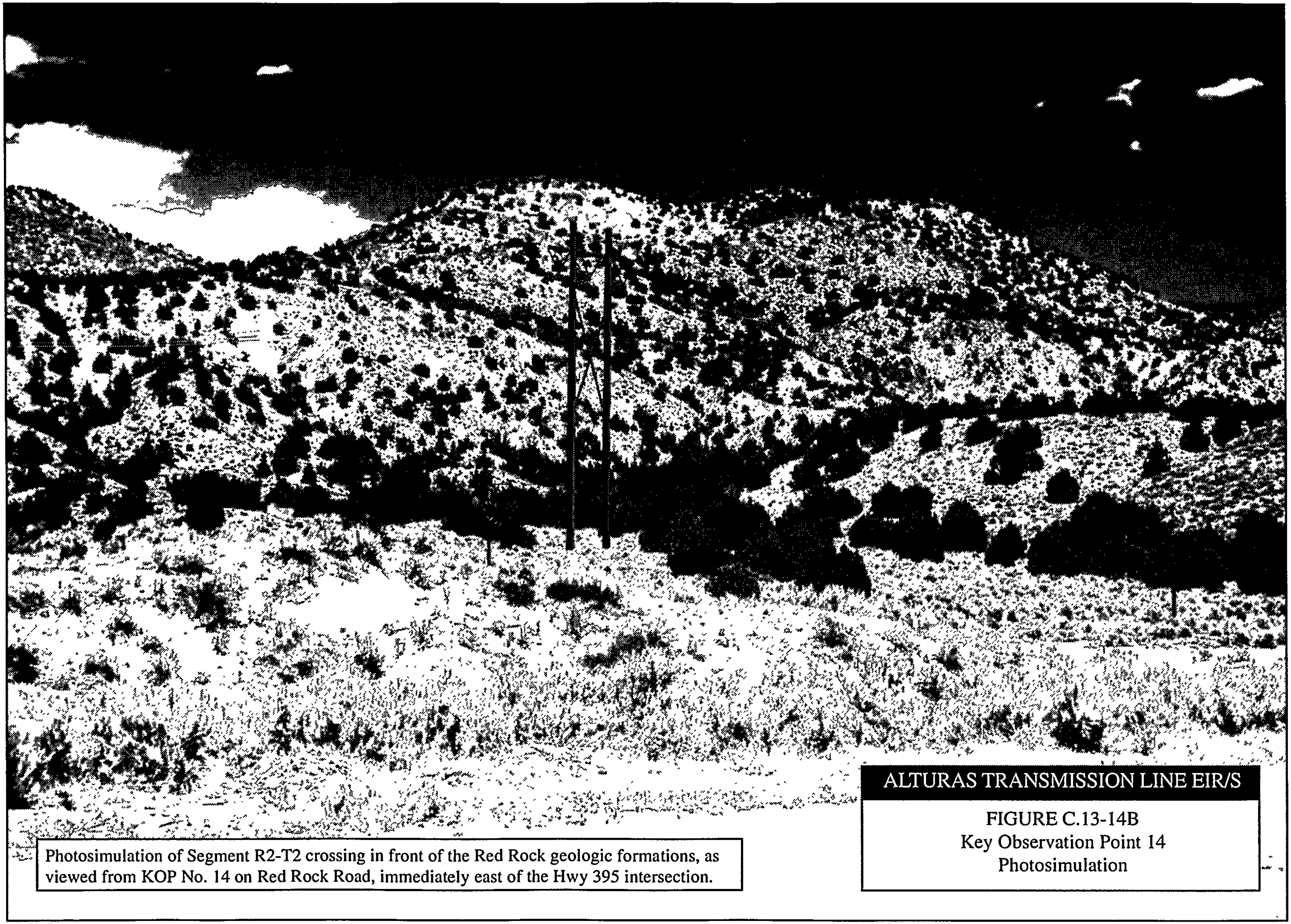
Photosimulation of Segment R2-T2 as viewed from KOP No. 13 on Hwy 395, just north of Red Rock Road.



Existing view east-northeast from KOP No. 14 on Red Rock Road, immediately east of the Hwy 395 intersection.

ALTURAS TRANSMISSION LINE EIR/S

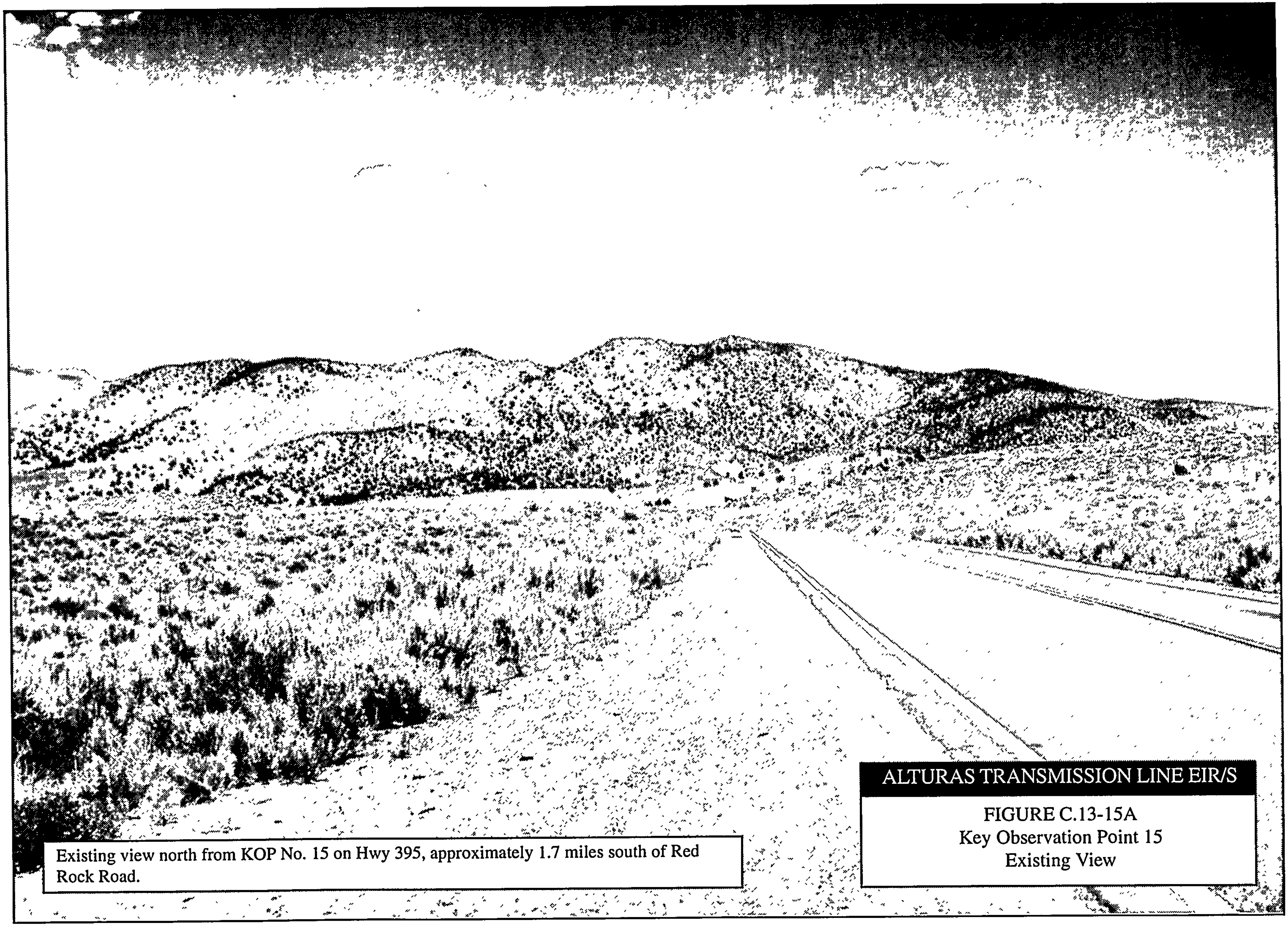
FIGURE C.13-14A
Key Observation Point 14
Existing View



Photosimulation of Segment R2-T2 crossing in front of the Red Rock geologic formations, as viewed from KOP No. 14 on Red Rock Road, immediately east of the Hwy 395 intersection.

ALTURAS TRANSMISSION LINE EIR/S

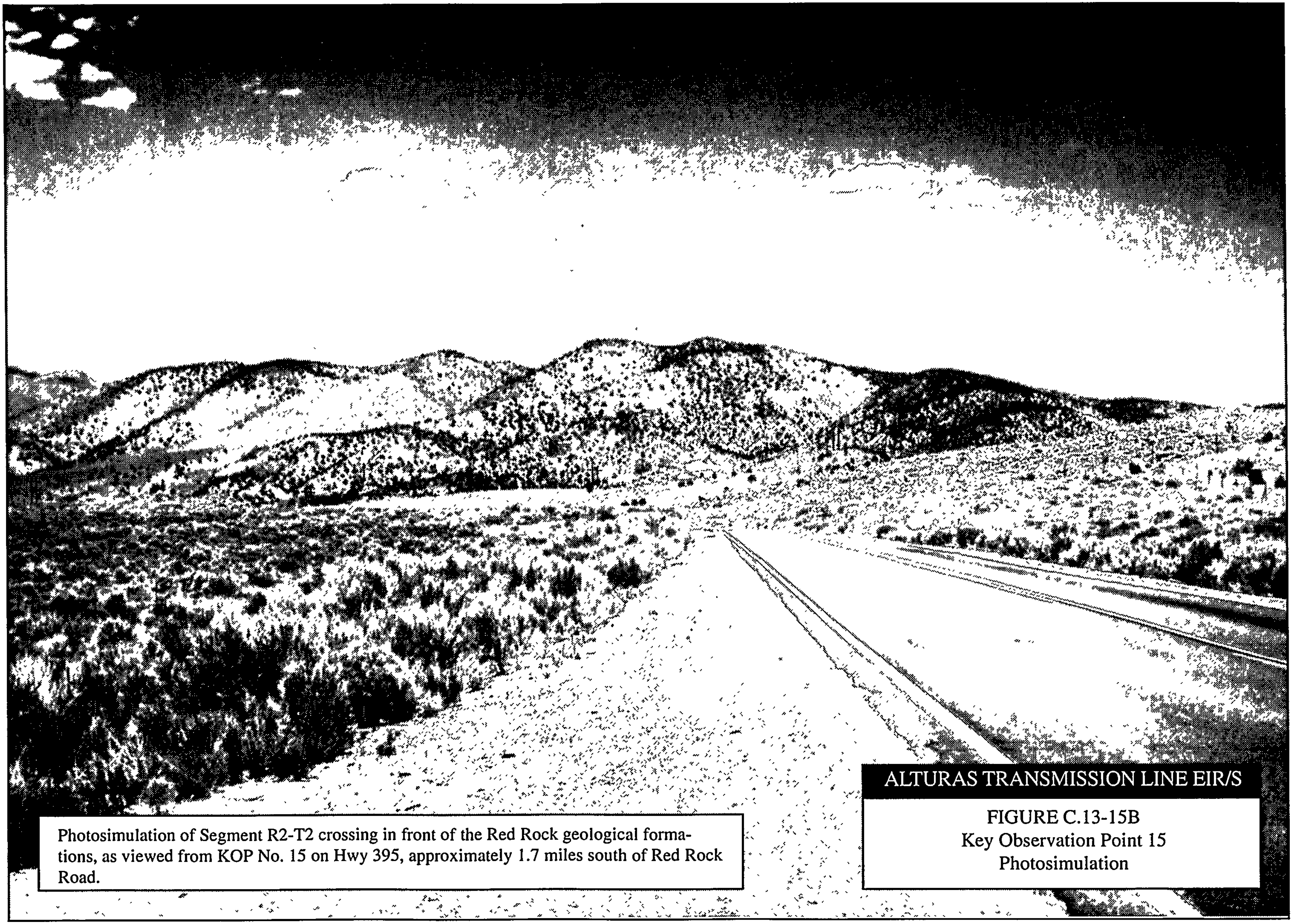
FIGURE C.13-14B
Key Observation Point 14
Photosimulation



Existing view north from KOP No. 15 on Hwy 395, approximately 1.7 miles south of Red Rock Road.

ALTURAS TRANSMISSION LINE EIR/S

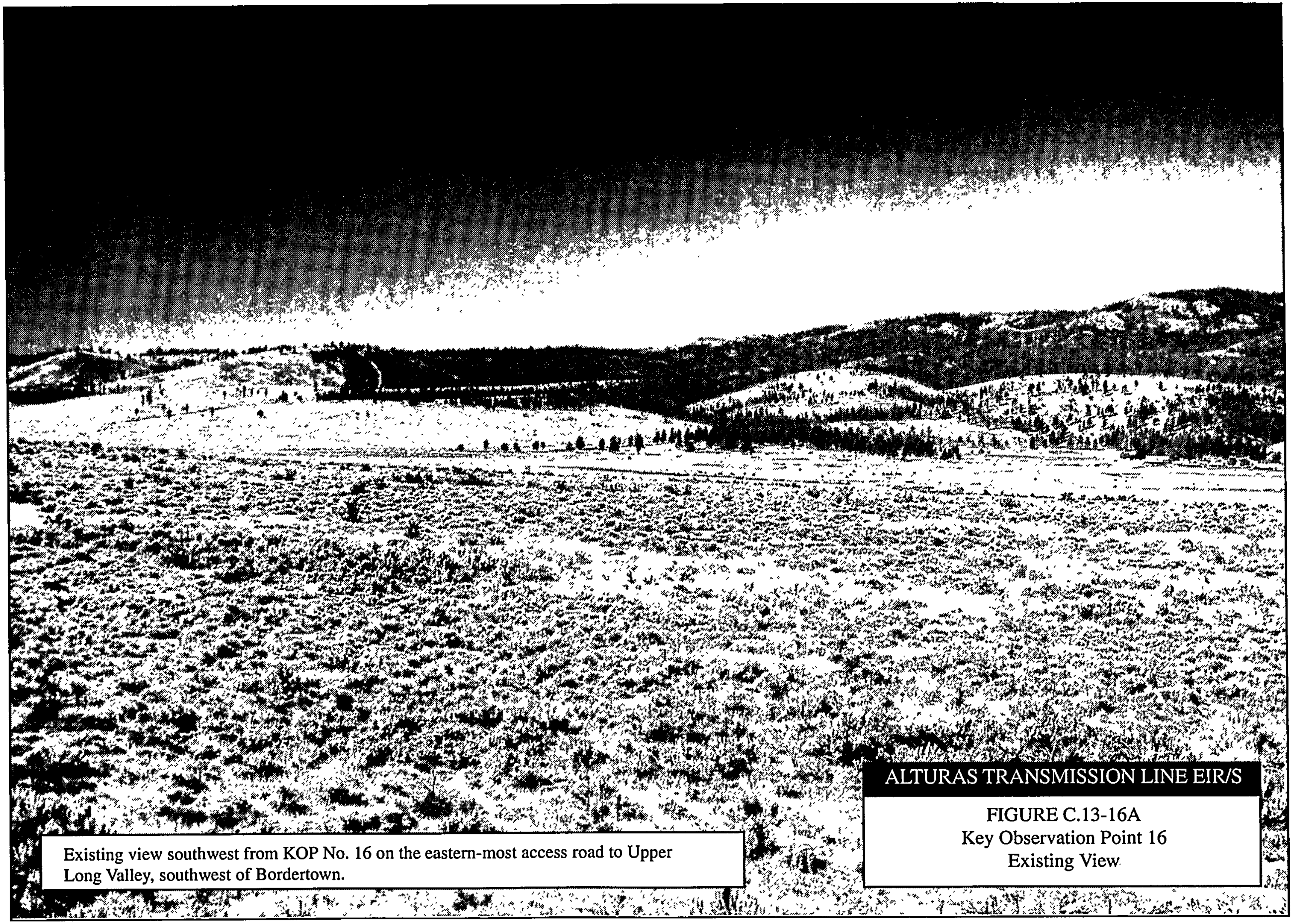
FIGURE C.13-15A
Key Observation Point 15
Existing View



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-15B
Key Observation Point 15
Photosimulation

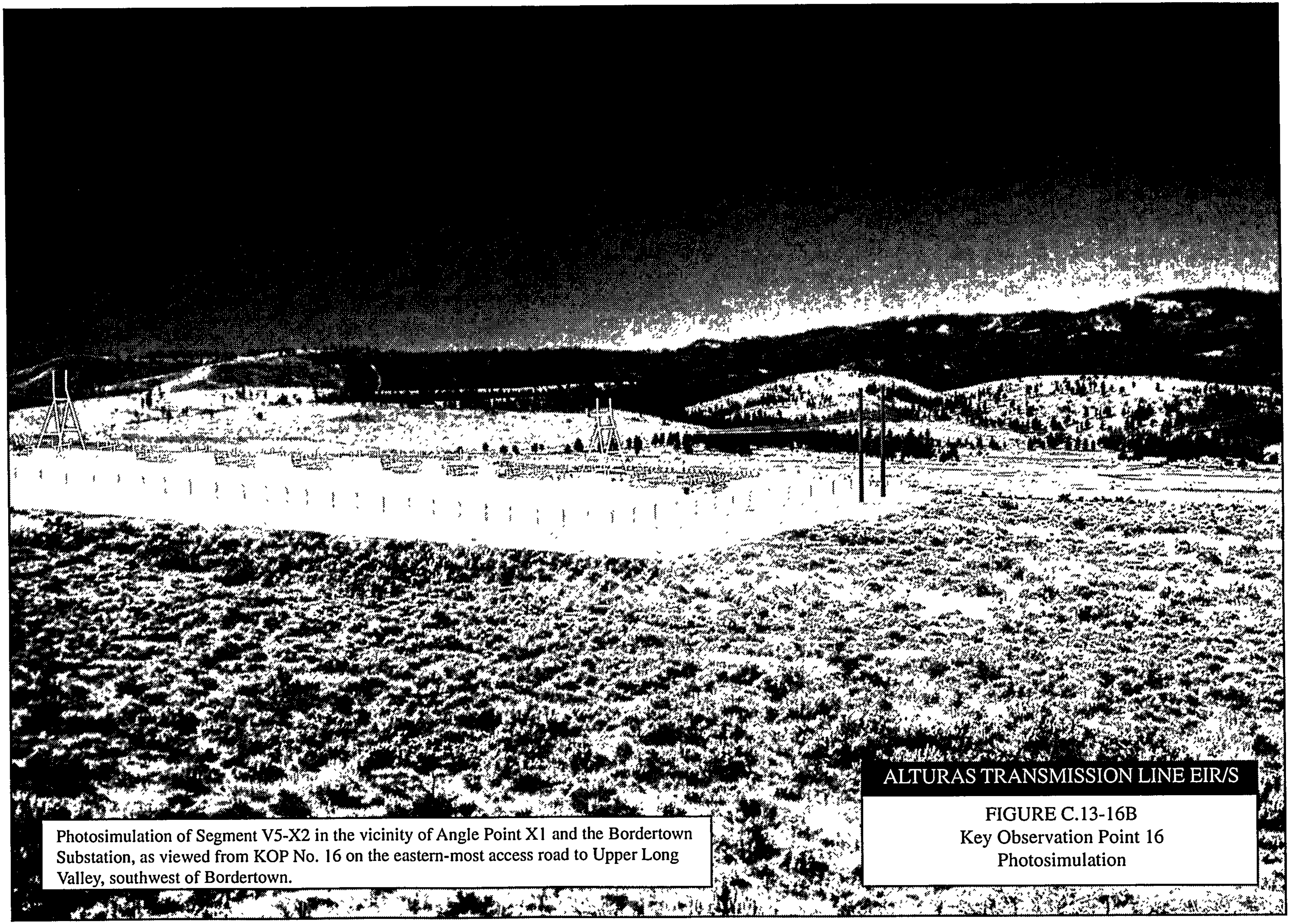
Photosimulation of Segment R2-T2 crossing in front of the Red Rock geological formations, as viewed from KOP No. 15 on Hwy 395, approximately 1.7 miles south of Red Rock Road.



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-16A
Key Observation Point 16
Existing View

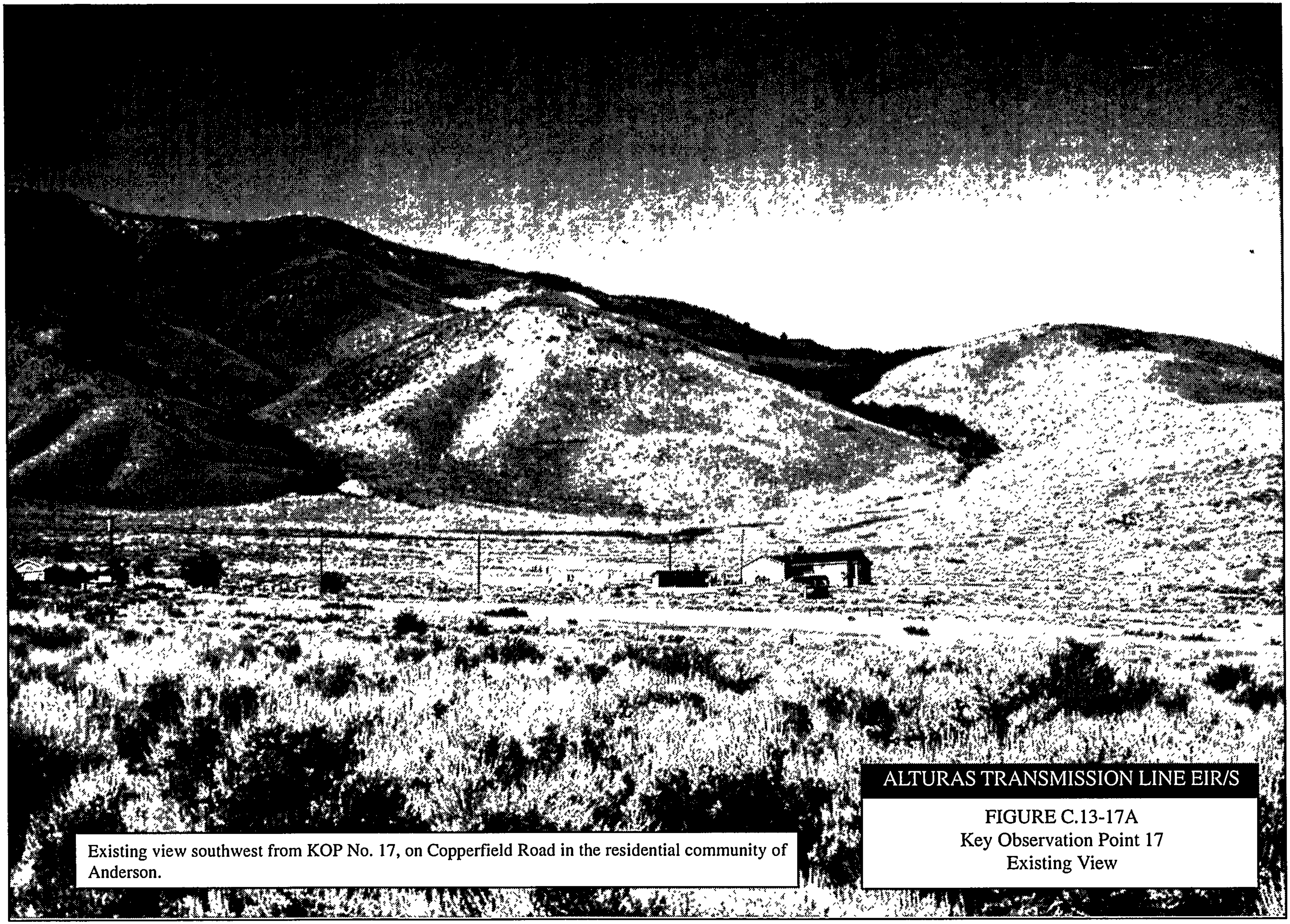
Existing view southwest from KOP No. 16 on the eastern-most access road to Upper Long Valley, southwest of Bordertown.



Photosimulation of Segment V5-X2 in the vicinity of Angle Point X1 and the Bordertown Substation, as viewed from KOP No. 16 on the eastern-most access road to Upper Long Valley, southwest of Bordertown.

ALTURAS TRANSMISSION LINE EIR/S

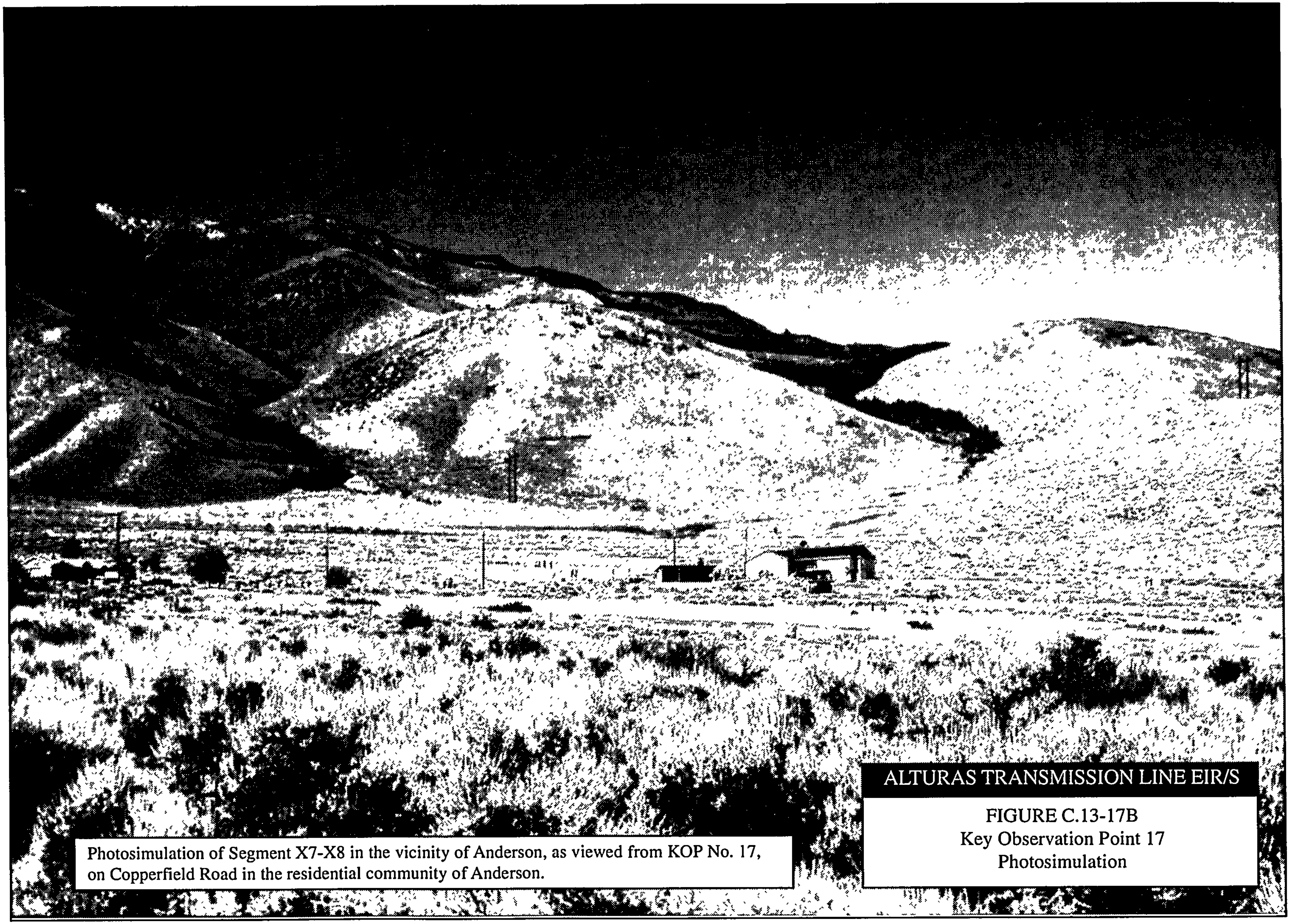
FIGURE C.13-16B
Key Observation Point 16
Photosimulation



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-17A
Key Observation Point 17
Existing View

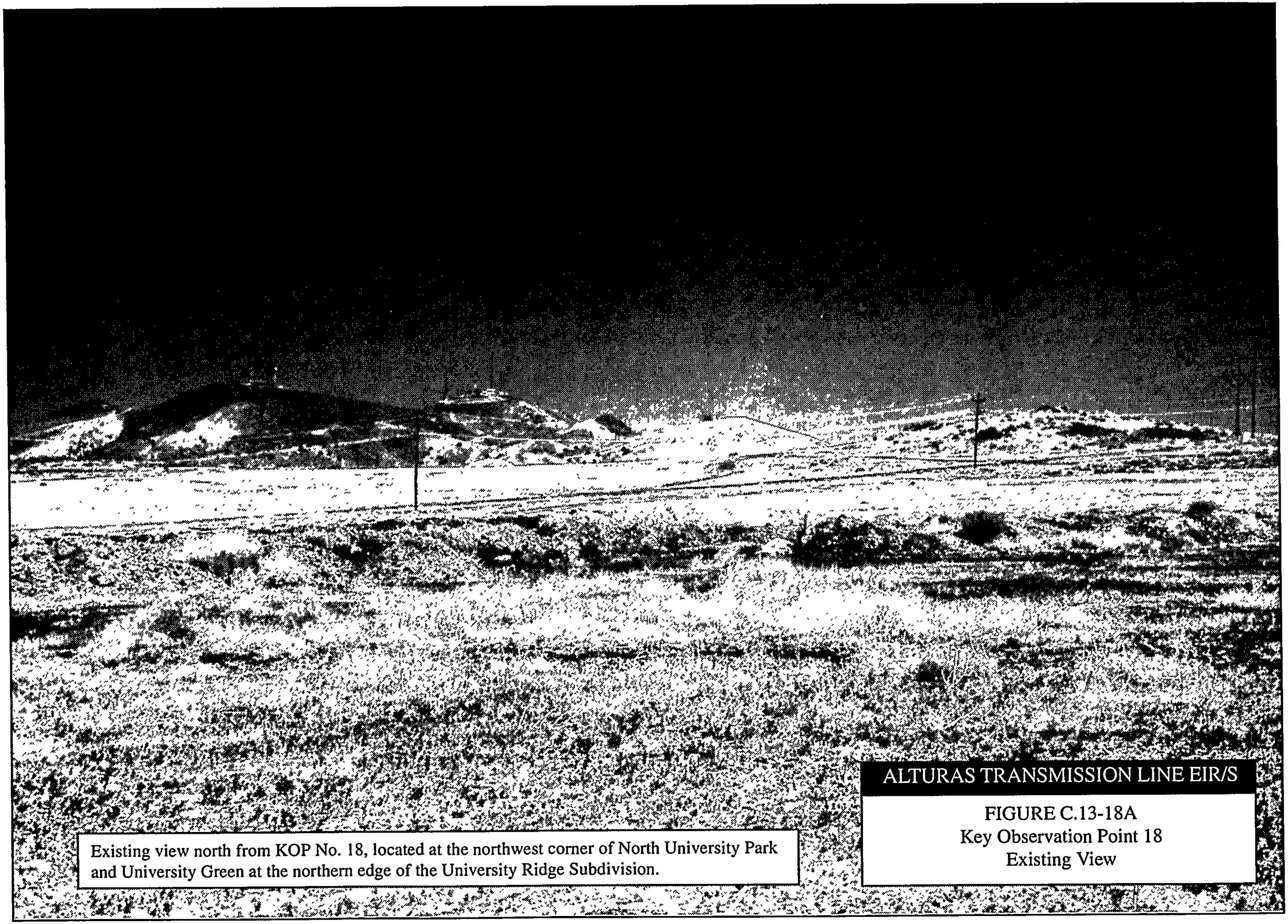
Existing view southwest from KOP No. 17, on Copperfield Road in the residential community of Anderson.



Photosimulation of Segment X7-X8 in the vicinity of Anderson, as viewed from KOP No. 17, on Copperfield Road in the residential community of Anderson.

ALTURAS TRANSMISSION LINE EIR/S

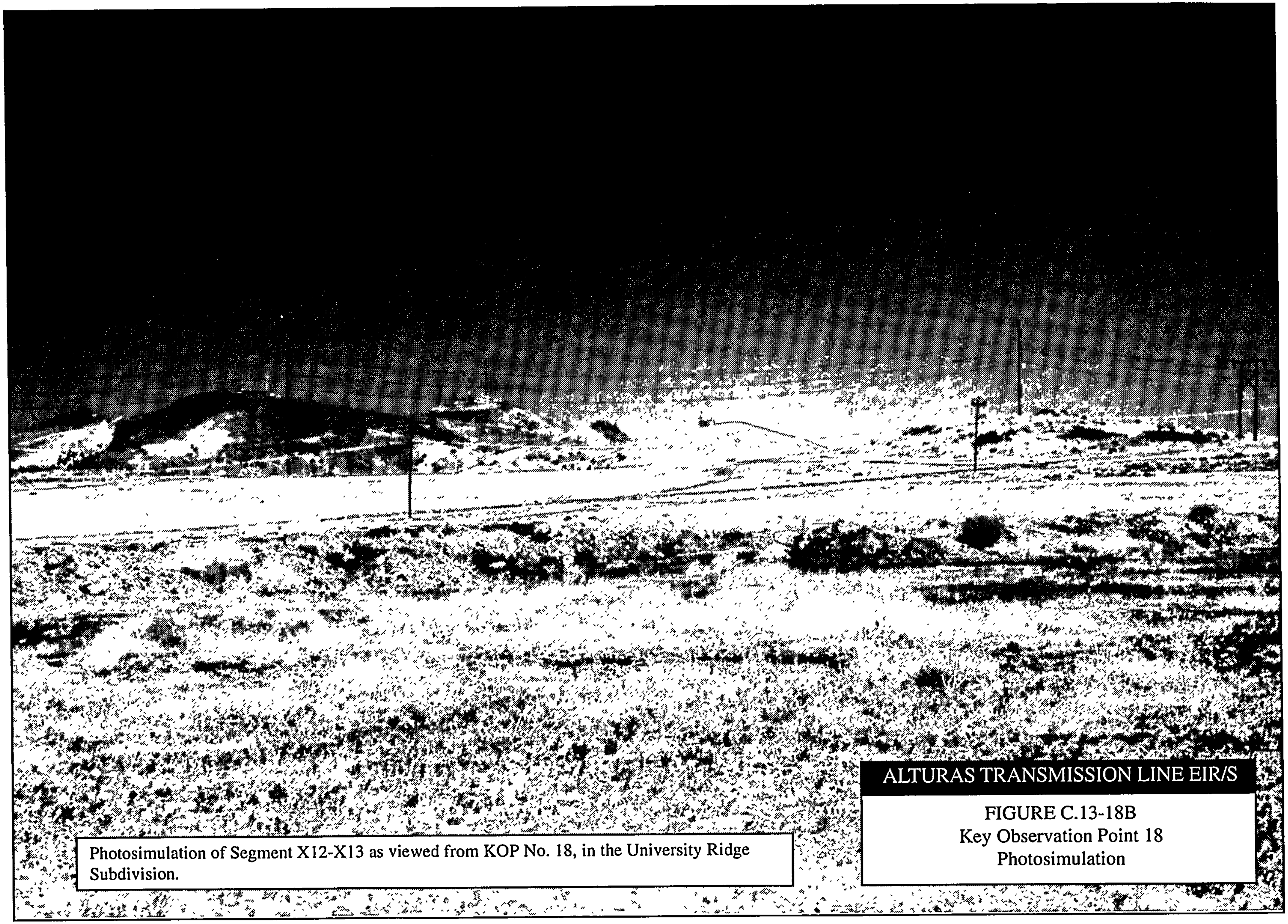
FIGURE C.13-17B
Key Observation Point 17
Photosimulation



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-18A
Key Observation Point 18
Existing View

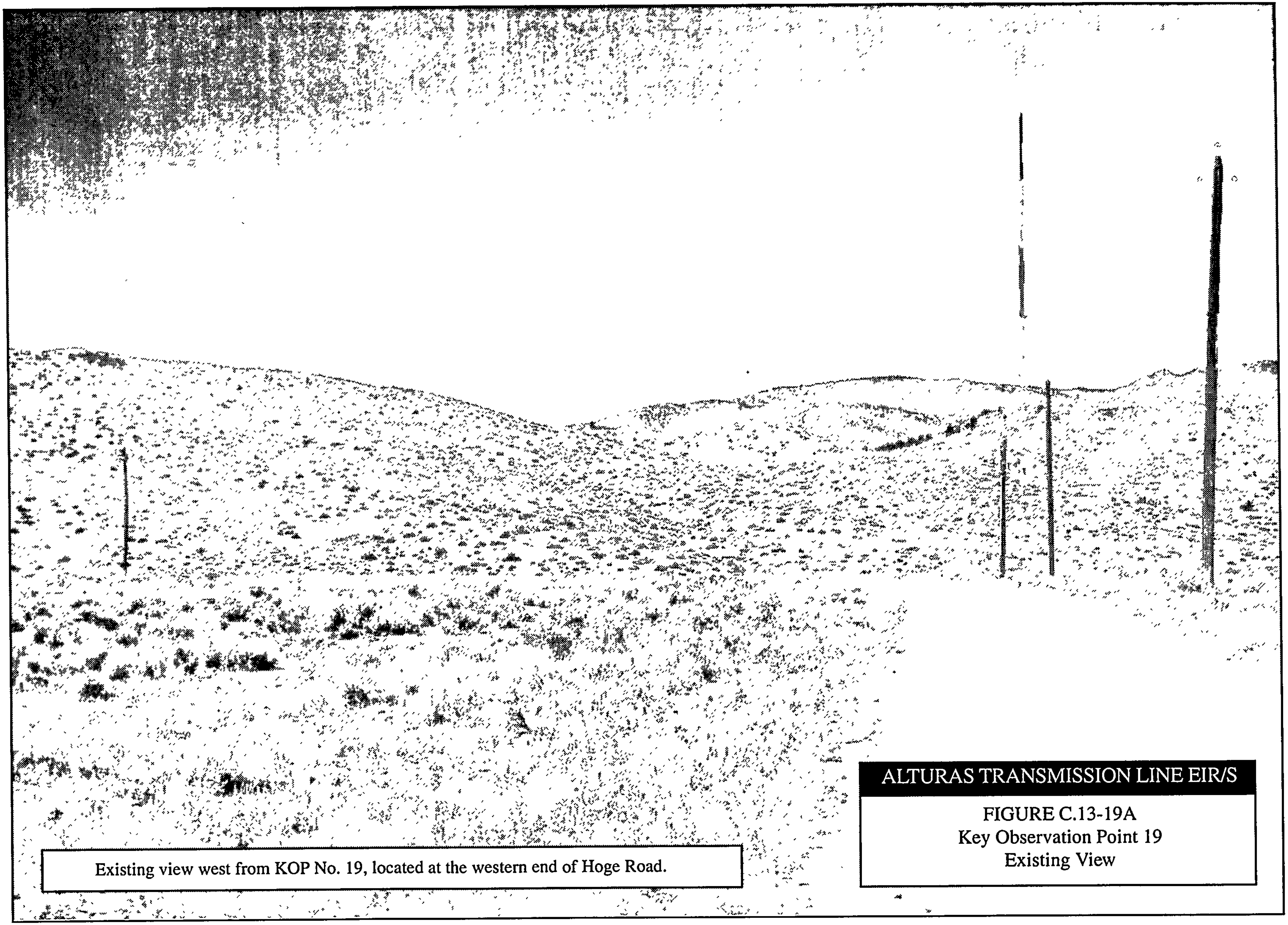
Existing view north from KOP No. 18, located at the northwest corner of North University Park and University Green at the northern edge of the University Ridge Subdivision.



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-18B
Key Observation Point 18
Photosimulation

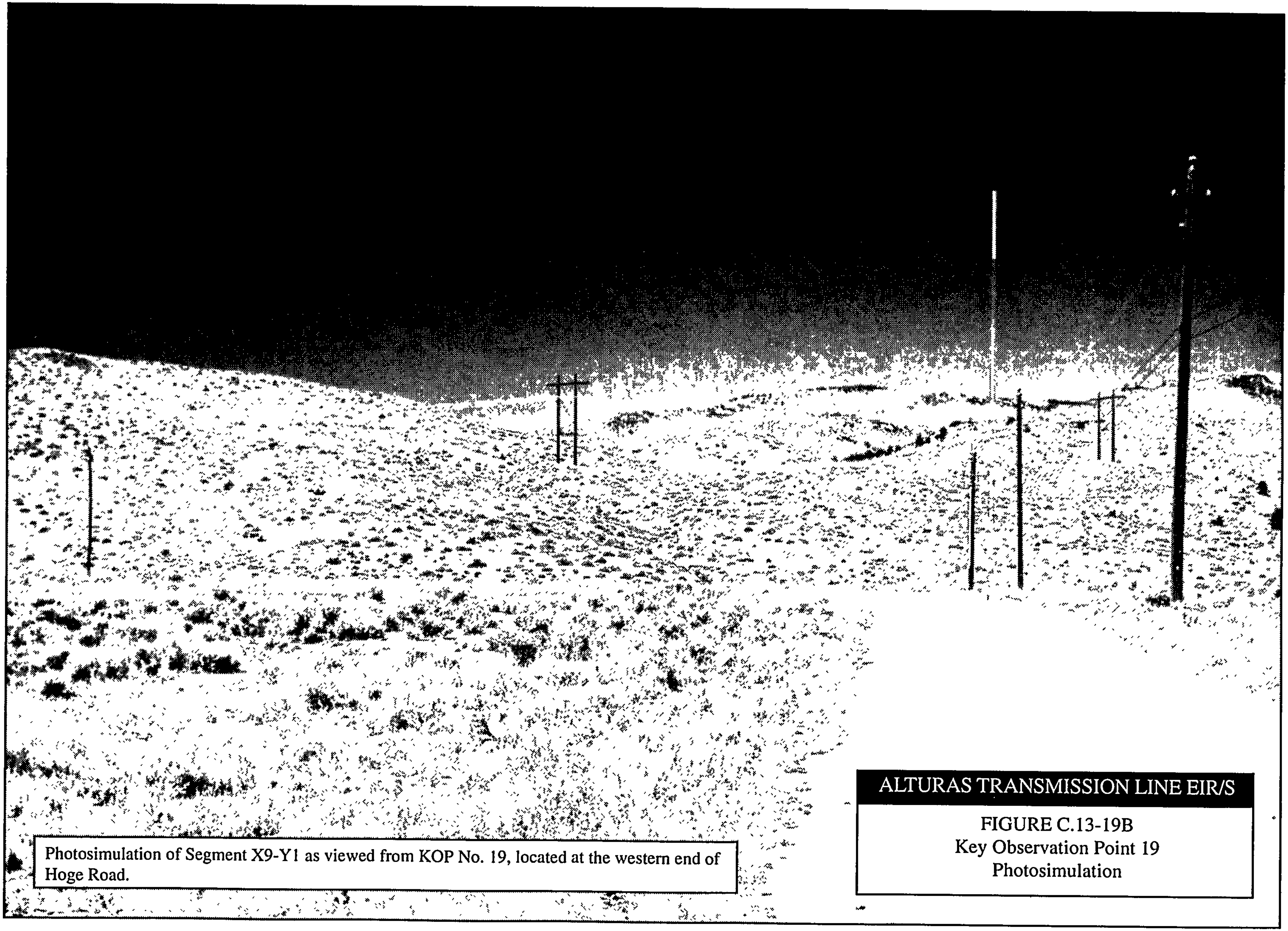
Photosimulation of Segment X12-X13 as viewed from KOP No. 18, in the University Ridge Subdivision.



Existing view west from KOP No. 19, located at the western end of Hoge Road.

ALTURAS TRANSMISSION LINE EIR/S

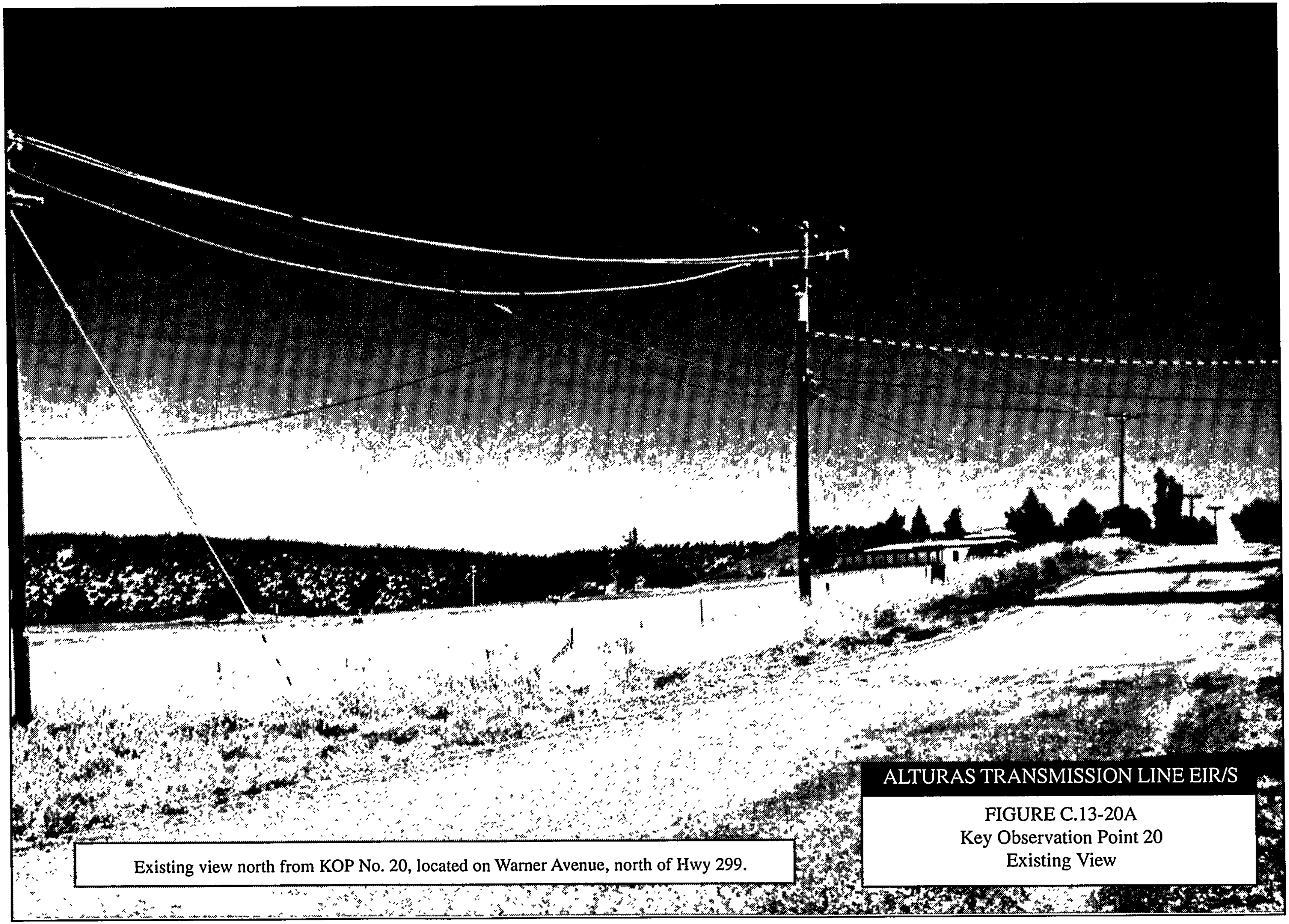
FIGURE C.13-19A
Key Observation Point 19
Existing View



Photosimulation of Segment X9-Y1 as viewed from KOP No. 19, located at the western end of Hoge Road.

ALTURAS TRANSMISSION LINE EIR/S

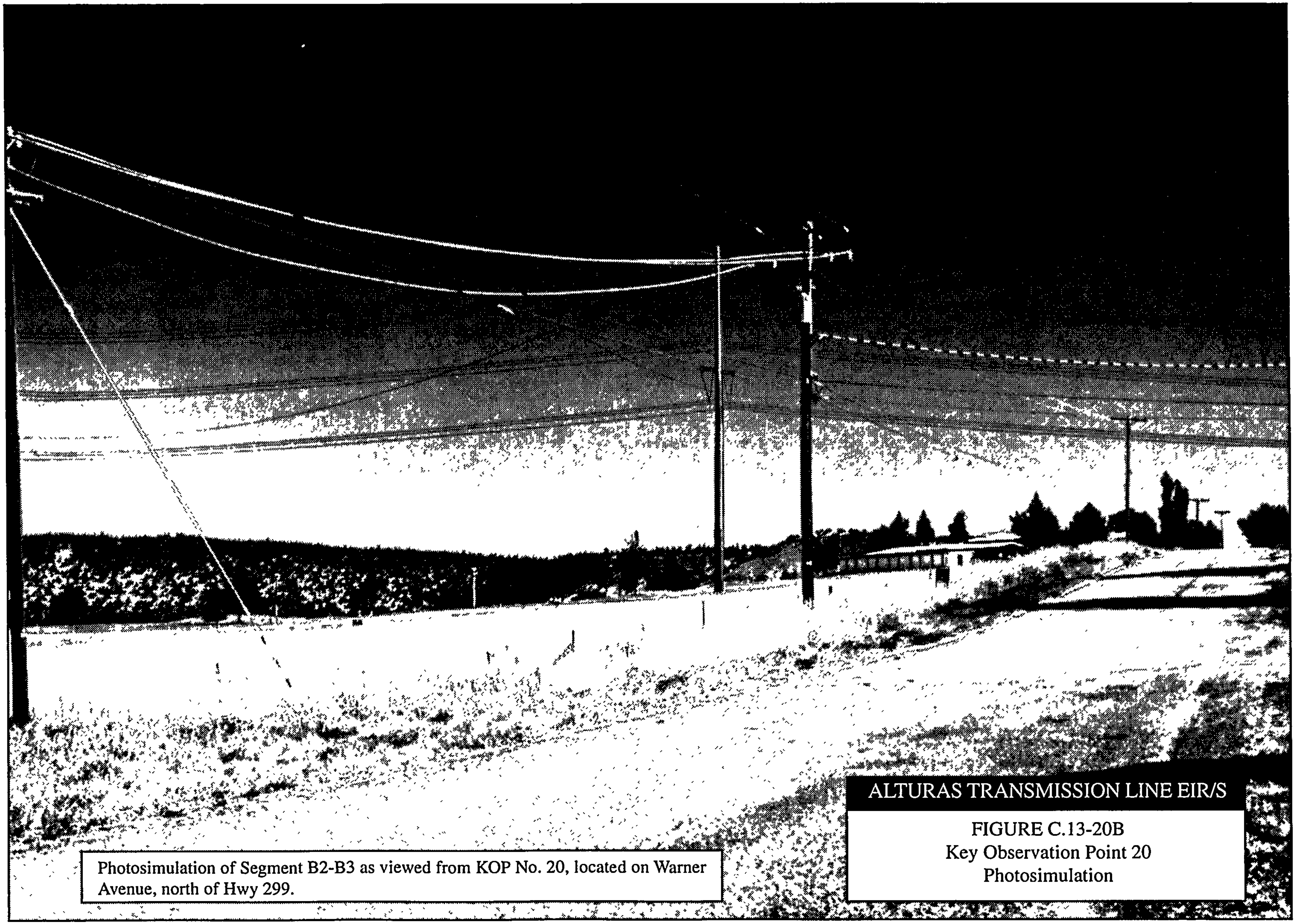
FIGURE C.13-19B
Key Observation Point 19
Photosimulation



Existing view north from KOP No. 20, located on Warner Avenue, north of Hwy 299.

ALTURAS TRANSMISSION LINE EIR/S

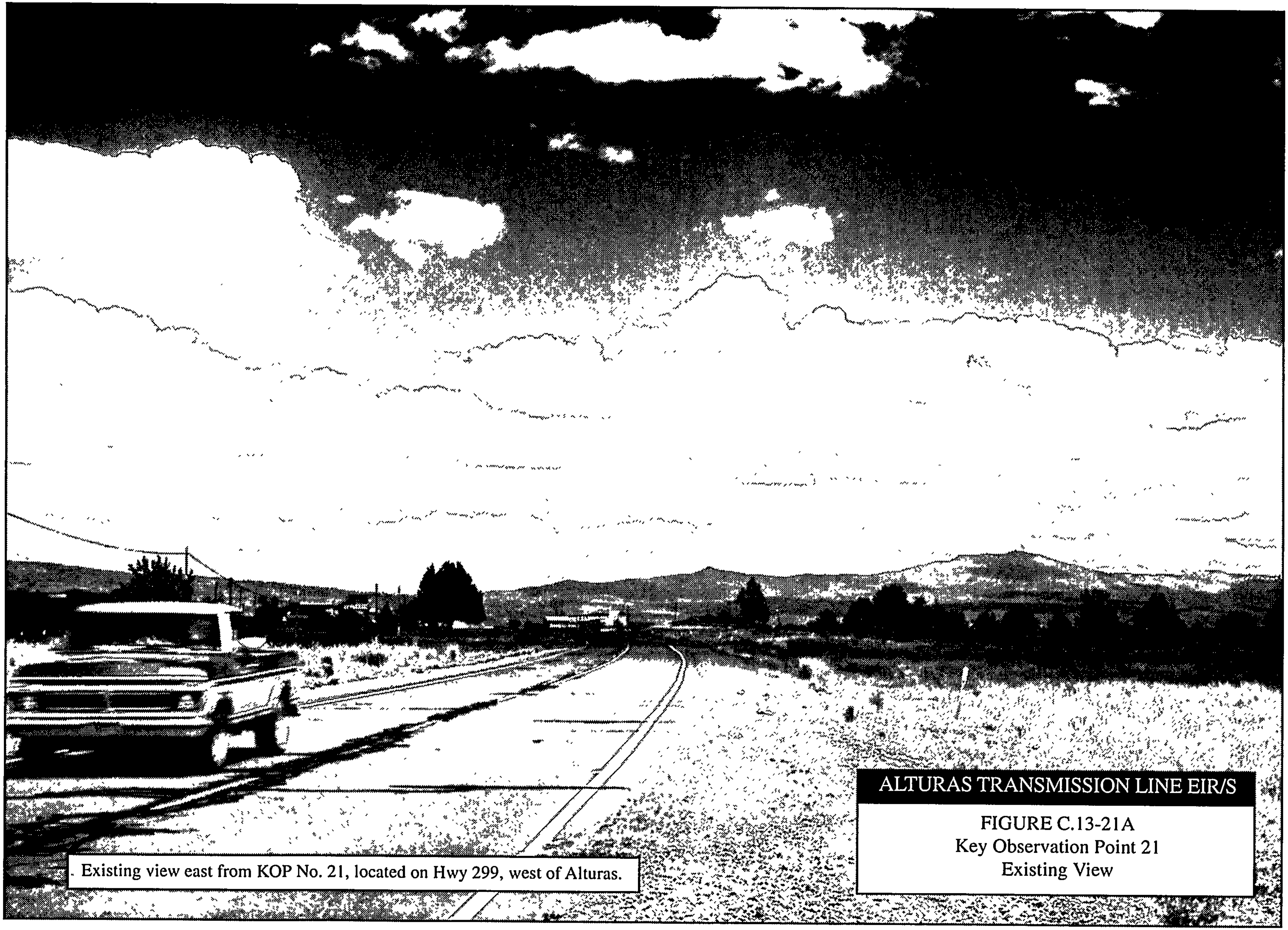
FIGURE C.13-20A
Key Observation Point 20
Existing View



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-20B
Key Observation Point 20
Photosimulation

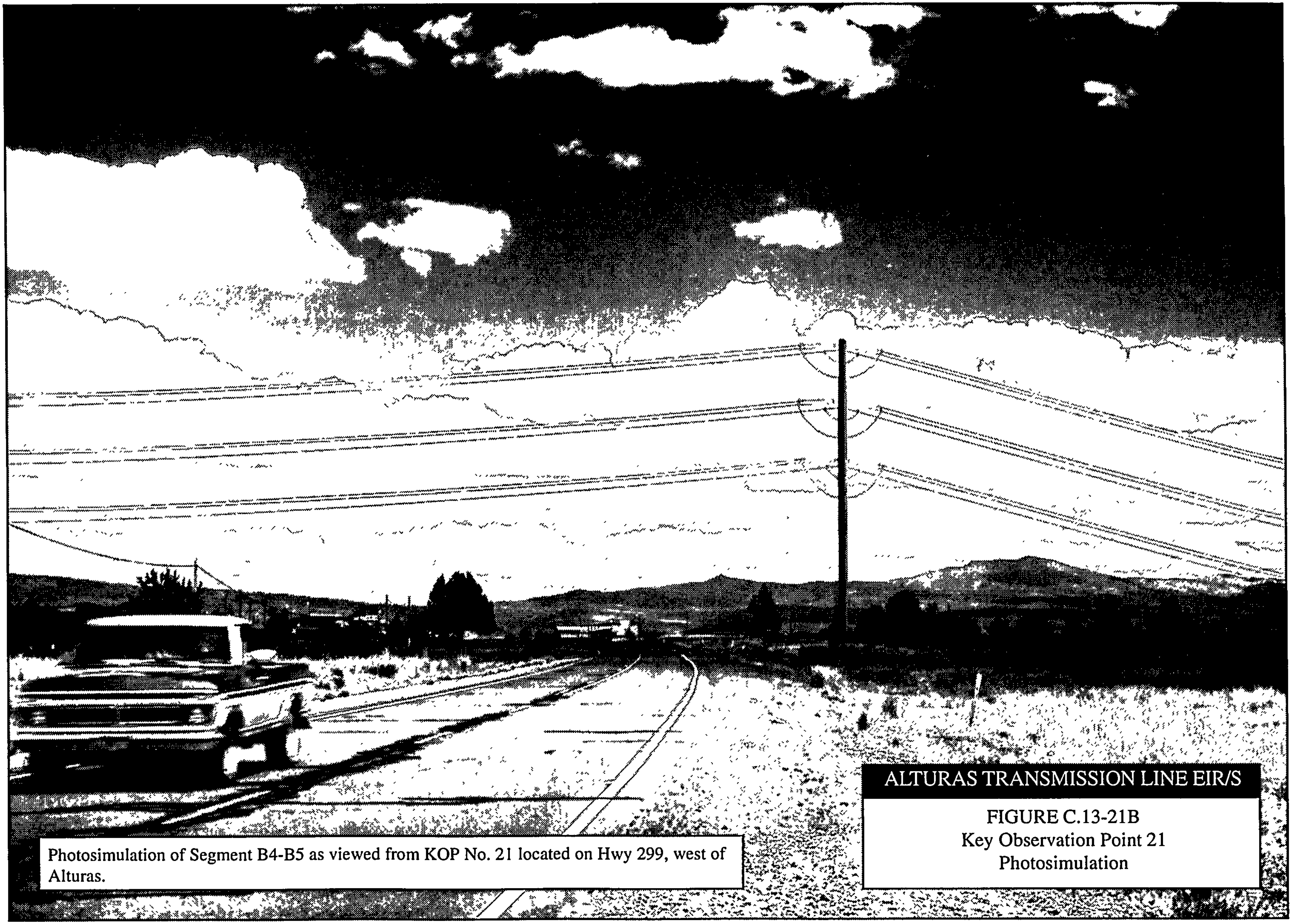
Photosimulation of Segment B2-B3 as viewed from KOP No. 20, located on Warner Avenue, north of Hwy 299.



Existing view east from KOP No. 21, located on Hwy 299, west of Alturas.

ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-21A
Key Observation Point 21
Existing View



Photosimulation of Segment B4-B5 as viewed from KOP No. 21 located on Hwy 299, west of Alturas.

ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-21B
Key Observation Point 21
Photosimulation

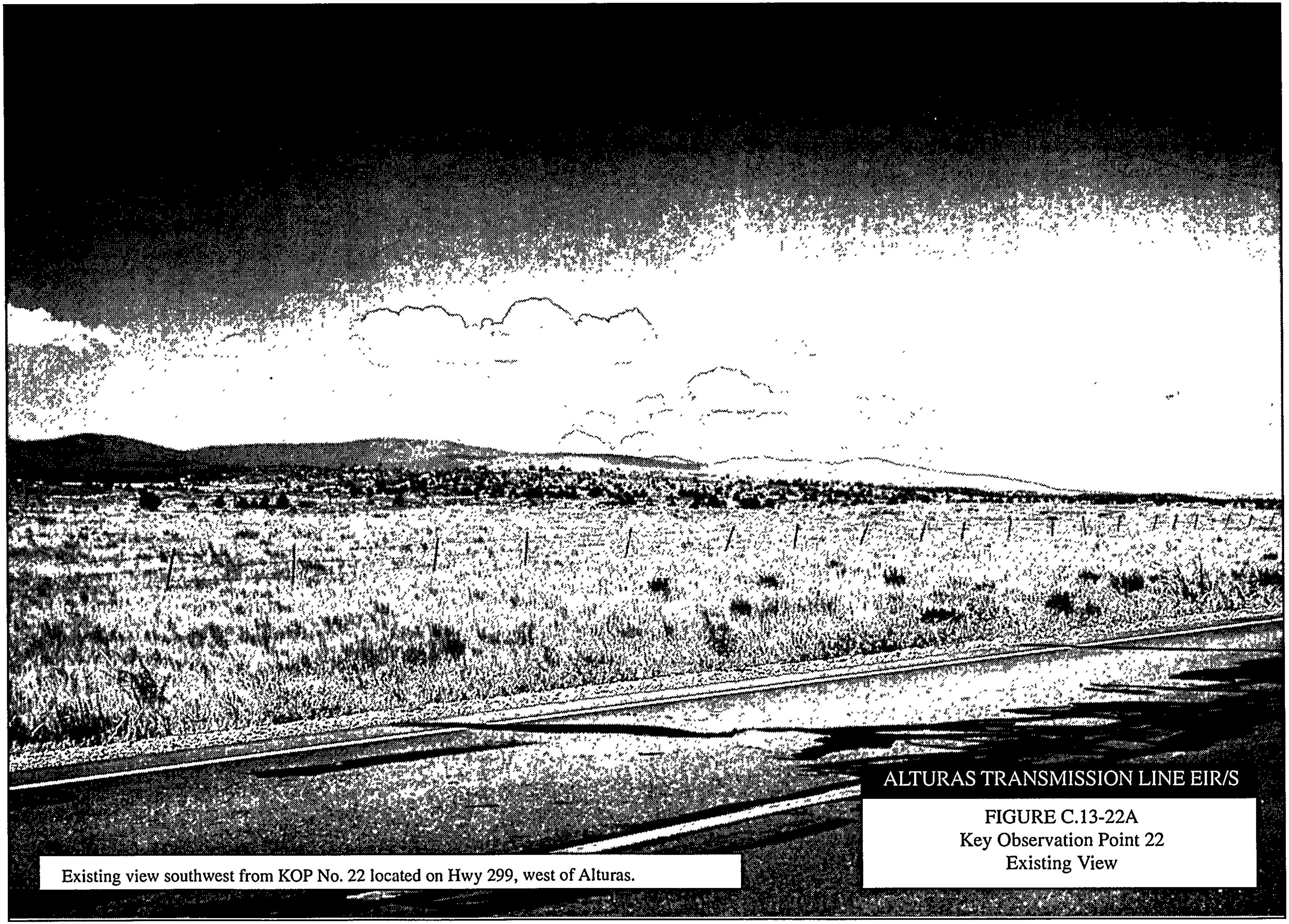
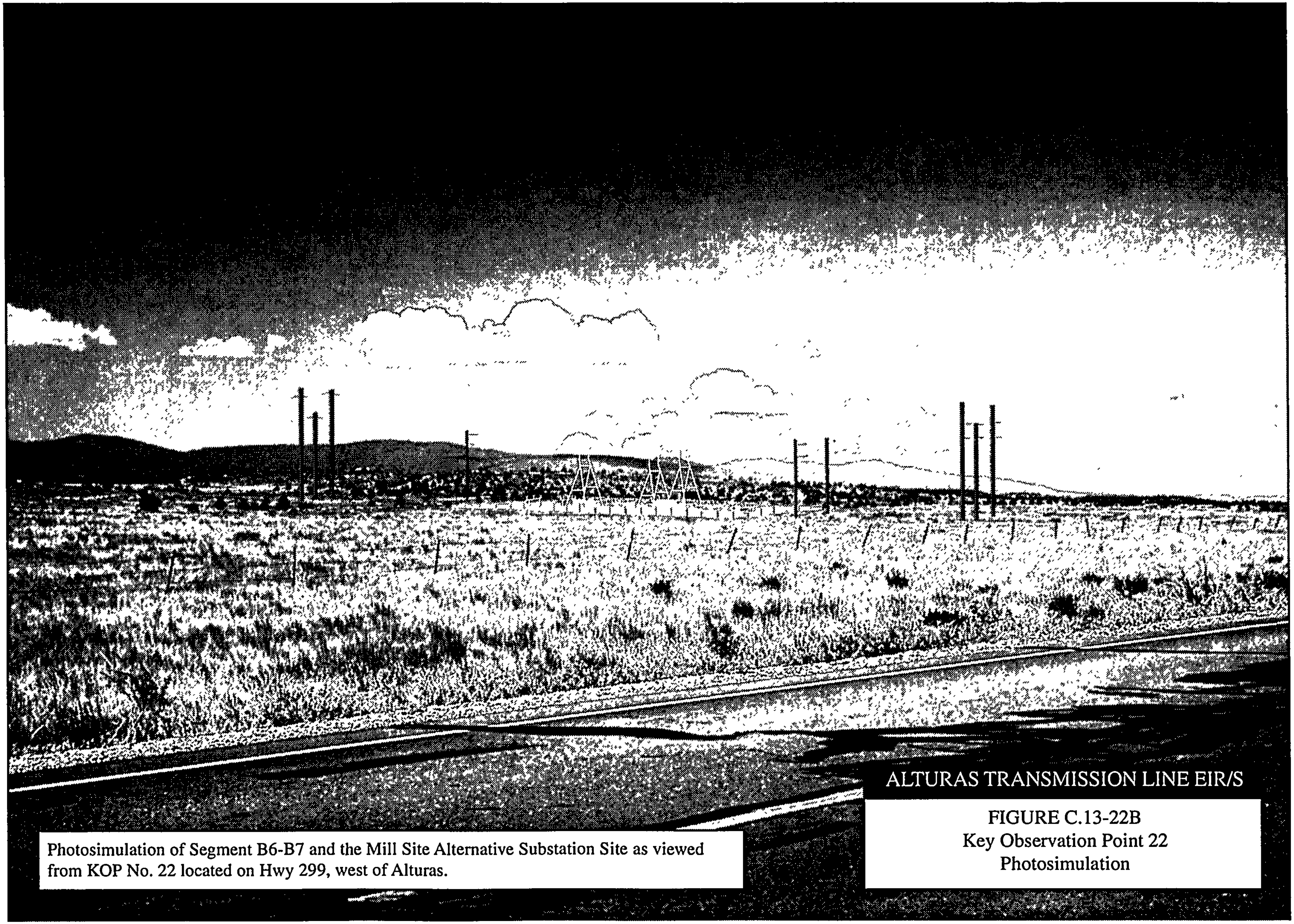


FIGURE C.13-22A
Key Observation Point 22
Existing View

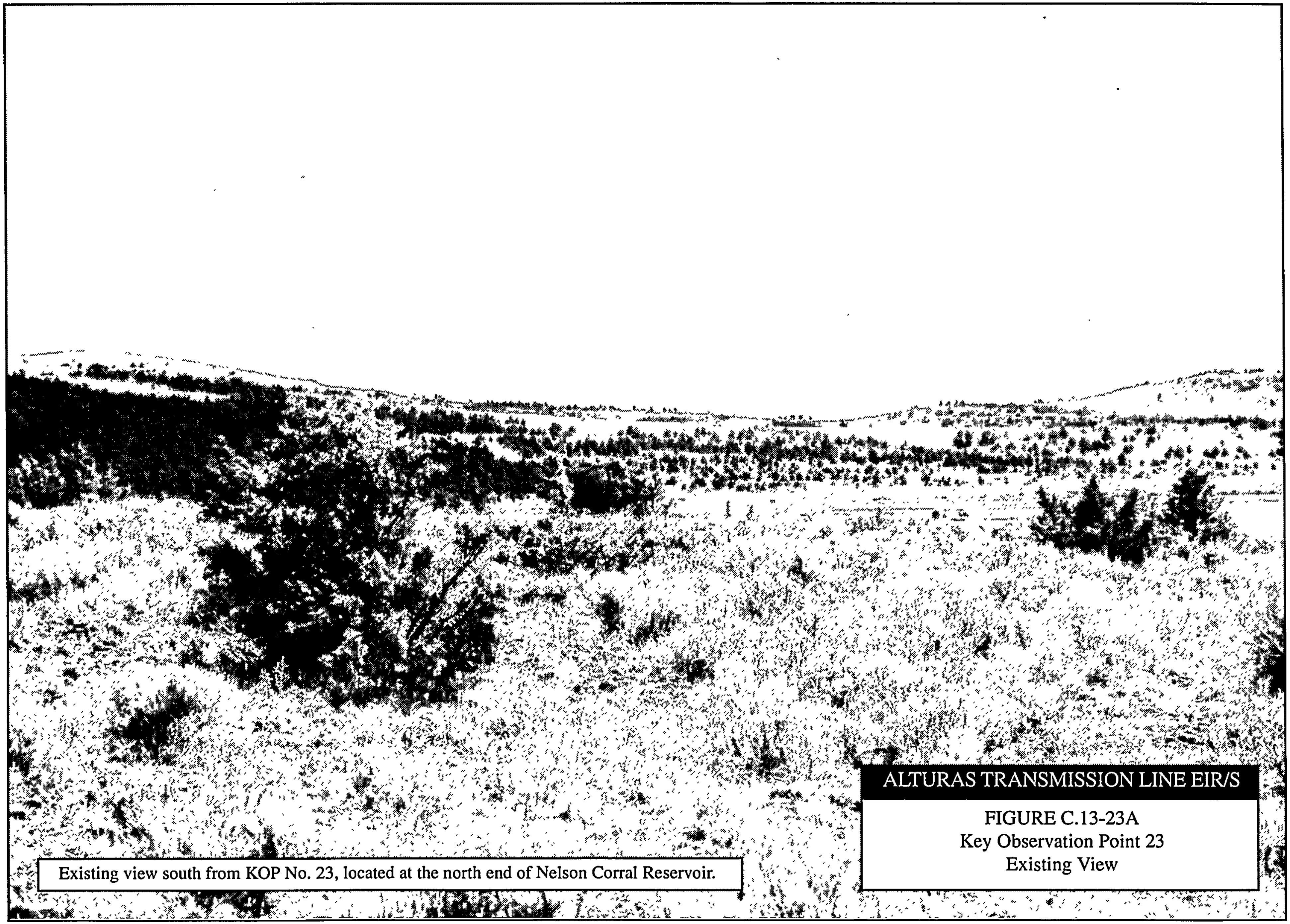
Existing view southwest from KOP No. 22 located on Hwy 299, west of Alturas.



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-22B
Key Observation Point 22
Photosimulation

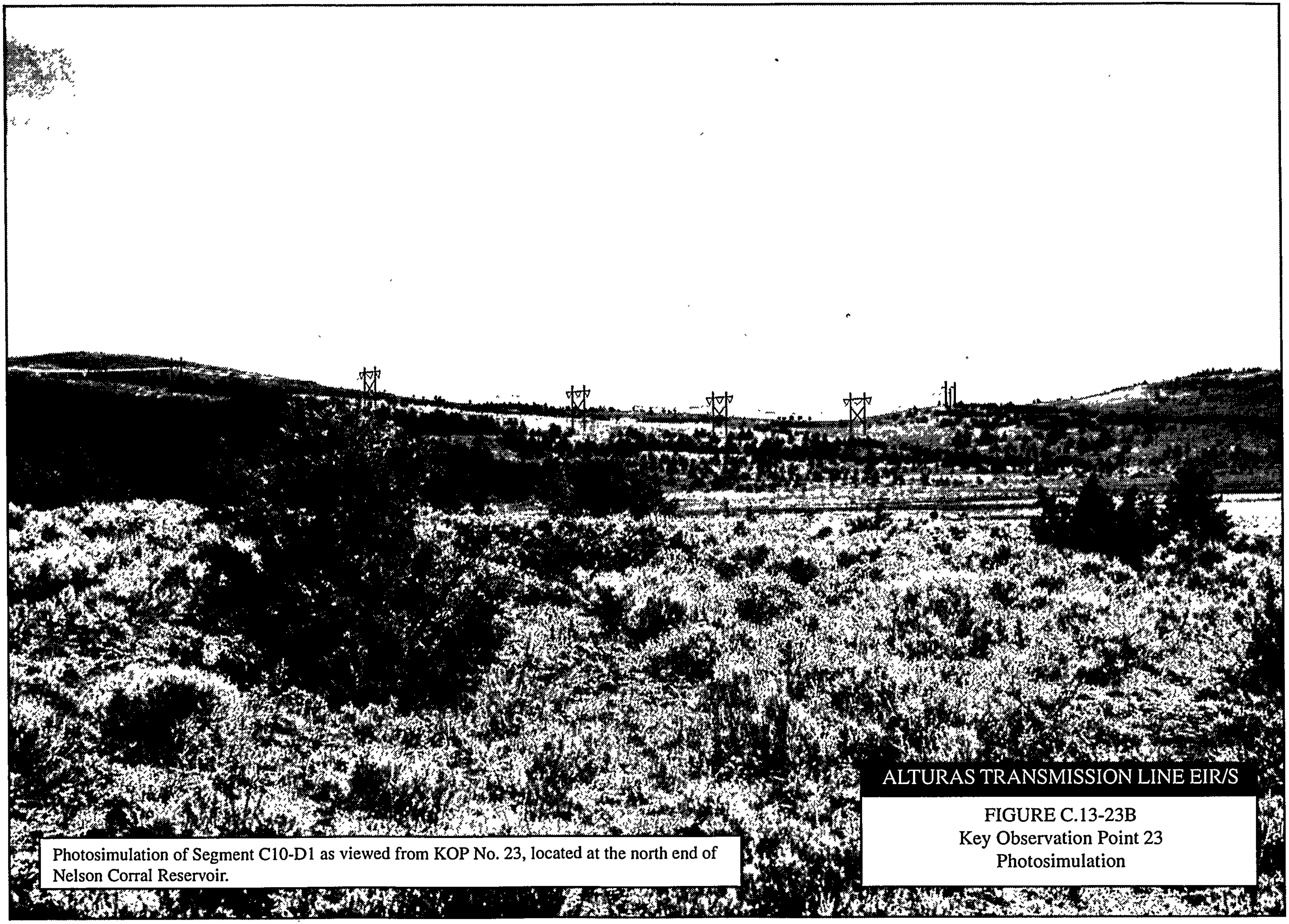
Photosimulation of Segment B6-B7 and the Mill Site Alternative Substation Site as viewed from KOP No. 22 located on Hwy 299, west of Alturas.



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-23A
Key Observation Point 23
Existing View

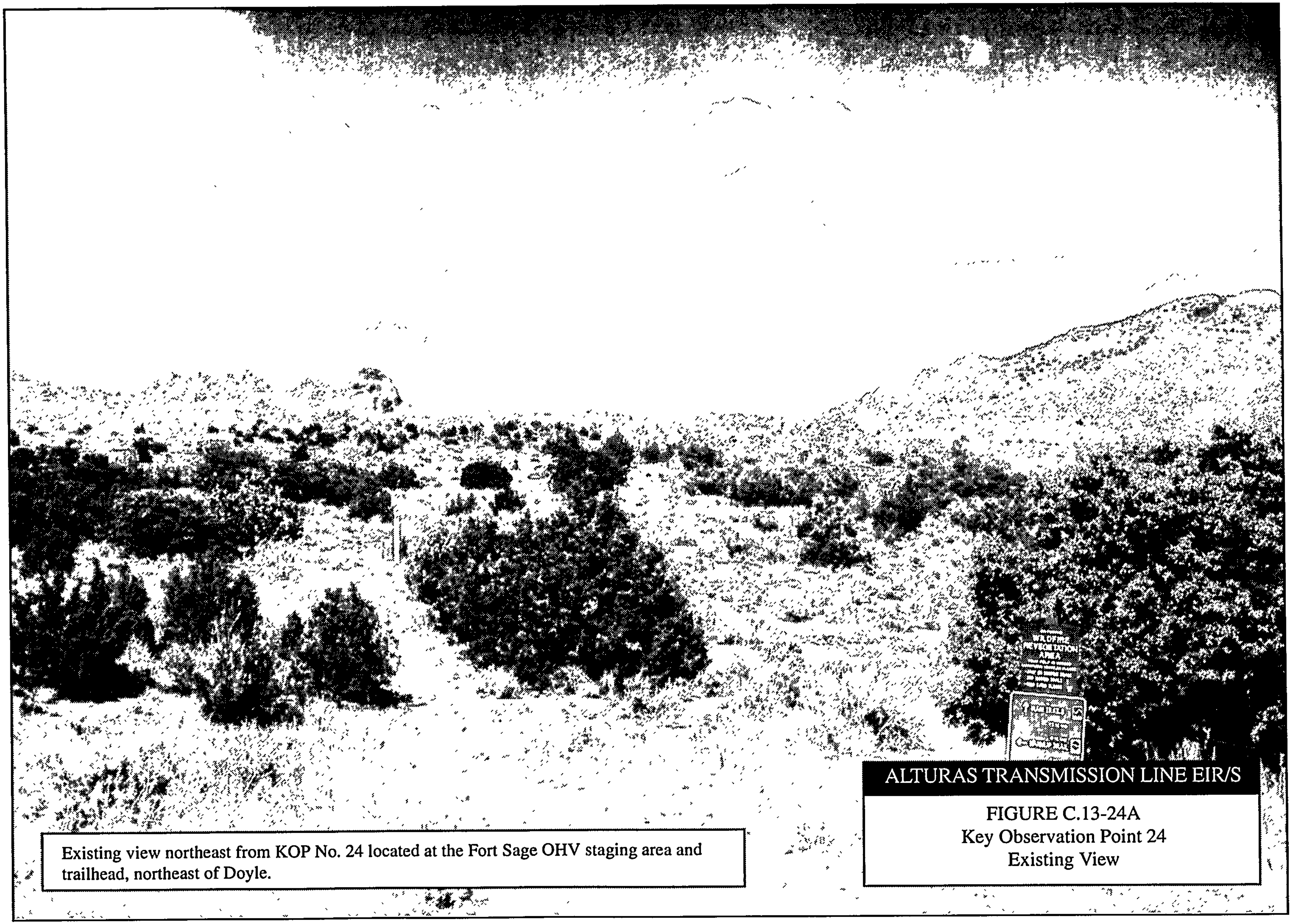
Existing view south from KOP No. 23, located at the north end of Nelson Corral Reservoir.



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-23B
Key Observation Point 23
Photosimulation

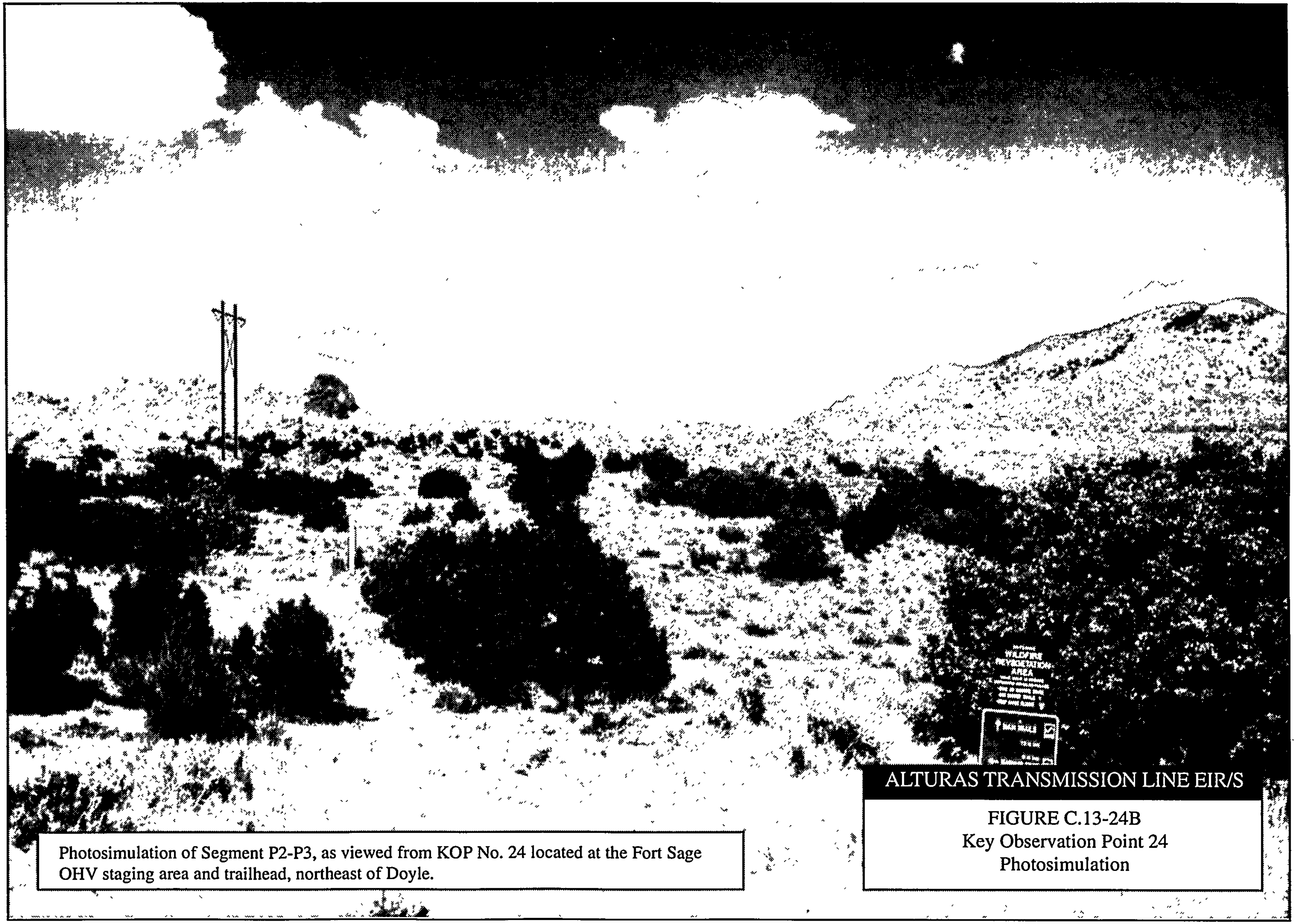
Photosimulation of Segment C10-D1 as viewed from KOP No. 23, located at the north end of Nelson Corral Reservoir.



Existing view northeast from KOP No. 24 located at the Fort Sage OHV staging area and trailhead, northeast of Doyle.

ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-24A
Key Observation Point 24
Existing View



ALTURAS TRANSMISSION LINE EIR/S

FIGURE C.13-24B
Key Observation Point 24
Photosimulation

Photosimulation of Segment P2-P3, as viewed from KOP No. 24 located at the Fort Sage OHV staging area and trailhead, northeast of Doyle.

C.14 POTENTIAL FOR IMPACTS ON MINORITY AND LOW-INCOME POPULATIONS

Note: (The text in this section is new in its entirety)

On February 11, 1994, President Clinton issued an "Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." This Order is designed to focus Federal attention on environmental and human health conditions in minority communities and low-income communities. The Order is further intended to promote non-discrimination in Federal programs substantially affecting human health and the environment and to provide for information access and public participation relating to such matters.

This Section addresses the question of whether the impacts of the Proposed Project and alternatives may disproportionately affect minority populations and low-income populations by analyzing the distributional patterns of these populations on a regional basis. The process of analysis is shown in Figure C.14-1. The demographic analysis in this Section demonstrates that the distribution of minority and low-income populations along the Proposed Project route, including consideration of alternative routes and projects, does not offer the potential for disproportionate impact.

C.14.1 Study Area and Definitions of Minority Populations and Low-Income Populations

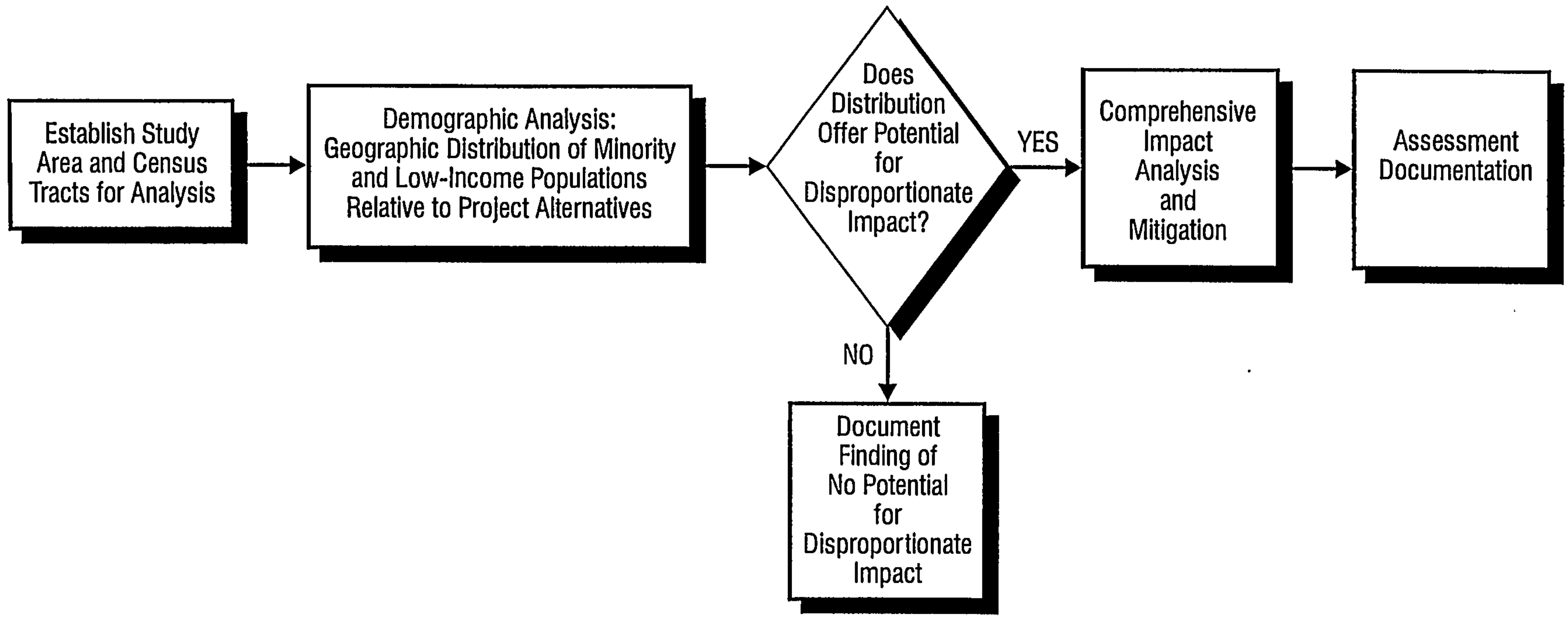
The study area for this analysis consists of the Counties of Modoc, Lassen, and Sierra in California, and Washoe County in Nevada. The unit of analysis in this EIR/S for analysis of potential impacts on minority populations and low-income populations is the census tract. There are approximately 61 census tracts in the study area, with census tracts generally having a total population size of about 5,000 to 10,000 persons per tract. Baseline data provided in this section is from the 1990 U.S. Census of Population and Housing (with 1992 revisions). For each of the census tracts the following information is included:

- Black/African-American population
- Hispanic population
- Asian/Pacific Islander population
- Native American population
- Total population
- Unemployment rate
- Median family income
- Per-capita income.

The total minority population and unemployment rate for each census tract, for the purposes of this analysis, have been calculated as follows:

- Total minority population = Black/African-American + Hispanic + Asian/Pacific Islander + Native American (without double-counting non-white Hispanics falling into the Black/African-American, Asian/ Pacific Islander, and Native American categories)

- Unemployment rate = Total unemployed ÷ Total labor force.



ALTURAS TRANSMISSION LINE EIR/S

Figure C.14-1

Process for Analysis of Potential Disproportionate Impacts

C.14.2 Demographic Information

Table C.14-1 provides population, income, and employment data for counties within the study area and totals for the states of California and Nevada.

Table C.14-1 County and State Summary Data

State/ County	Total No. of Census Tracts	Total Population	Average No. of Persons per Tract	Minority Percentage (%)	Per Capita Income	Median Household Income	Unemployment Rate
California	**5,858**	**29,760,021**	**5,080**	**41.58%**	**16,409**	**40,559**	**7.5%**
Modoc Co.	2	9,678	4,839	11.50%	10,971	27,407	10.5%
Lassen Co.	6	27,598	4,599	20.10%	12,626	31,803	9.02%
Sierra Co.	1	3,318	3,318	7.08%	13,731	29,911	9.81%
Nevada	**196**	**1,201,833**	**6,131**	**20.65%**	**15,214**	**35,837**	**5.5%**
Washoe Co.	58	254,667	4,390	16.04%	16,365	38,225	5.08%

Source: Census, 1990.
Census, 1994.

Table C.14-2 provides population, income, and employment data for census tracts potentially affected by the Proposed Project and its segment alternatives, or other routes considered as alternatives to the proposed route. There are three basic transmission line routing options into the Reno area, all of which would terminate at the North Valley Substation in Reno, Nevada. These three options include the Proposed Project route and its segment alternatives; routing from northeastern California and then from west into Reno, routing from northeastern California and then from the north into Reno (e.g., East Side Route), and routing through northwestern Nevada and then from the east. The census tracts potentially affected by these routing options are marked in Table C.14-2 with the following designations:

- (PP/A) = Proposed Project and Segment Alternatives, approaching Reno from the west
- (N) = Routing from the north into Reno
- (E) = Routing through northwestern Nevada and then from the east into Reno.

The North Valley Substation is located in the northern portion of census tract number 15 in the City of Reno, in Washoe County. Since this tract could potentially be affected by all three routing options; population, income, and employment data are provided for the four block groups within the census tract in Table C.14-3.

C.14.3 Proposed Project and Segment Alternatives

The Proposed Project and its segment alternatives would traverse a total of five census tracts in northeastern California. See Table C.14-2 and Figure C.14-2 for a map of census tracts in the California portion of the study area. These census tracts are relatively large due the low population density in the area. Therefore, all of the segment alternatives to the Proposed Project fall within the same census tracts potentially affected by the proposed route.

Table C.14-2 Census Tract and County Data

Potentially Affected Tracts	Minority %	Per Capita Income ($)	Median Family Income ($)	Unemployment Rate (%)
MODOC COUNTY				
#101 (PP/A)	11.37	11,013	27,795	10.61
#102 (PP/A)	11.67	10,918	26,808	10.35
County Total	**11.50**	**10,971**	**27,407**	**10.5**
LASSEN COUNTY				
#401 (PP/A)	13.04	13,658	34,107	3.91
#406 (PP/A)	12.33	11,331	24,655	10.51
County Total	**20.10**	**12,626**	**31,083**	**9.02**
SIERRA COUNTY				
#100 (PP/A)	7.08	13,731	29,911	9.81
County Total	**7.08**	**13,731**	**29,911**	**9.81**
WASHOE COUNTY				
#1 (E)	28.08	11,969	23,730	12.55
#12 (E)	10.92	15,648	27,059	4.61
#15 (PP/A)(N)(E)	33.33	11,235	30,012	5.41
#17 (E)	29.78	11,877	31,250	5.06
#25 (PP/A)	11.28	18,117	43,511	3.79
#26.01 (N)	16.64	10,793	32,610	7.58
#26.03 (PP/A)(N)	10.40	13,321	36,496	5.2
#26.04 (PP/A)(N)	10.17	13,816	42,014	7.2
#27.01 (N)	13.45	11,368	28,947	7.69
#27.02 (N)(E)	12.00	11,527	29,399	5.76
#28 (E)	15.58	14,801	34,029	4.58
#29.01 (E)	10.17	15,697	45,033	2.85
#29.02 (E)	11.80	14,246	41,361	4.04
#31.01 (E)	17.61	13,459	26,565	5.29
#31.03 (E)	11.44	17,089	52,320	2.89
#31.05 (E)	19.13	15,149	41,034	1.96
#31.06 (E)	11.67	16,592	45,953	3.35
#33.01 (E)	28.70	9,161	9,626	13.53
#34.98 (N)(E)	17.60	14,199	39,132	4.94
County Total	**16.04**	**16,365**	**38,225**	**5.08**

Source: Census, 1990.

Route Designations: (PP/A) = Proposed Project and Segment Alternatives
(N) = Routing from the north
(E) = Routing from the east

ALTURAS TRANSMISSION LINE EIR/S

Figure C.14-2

Modoc, Lassen, & Sierra County Census Tract Map

Source: Thomas Bros. Maps, 1994

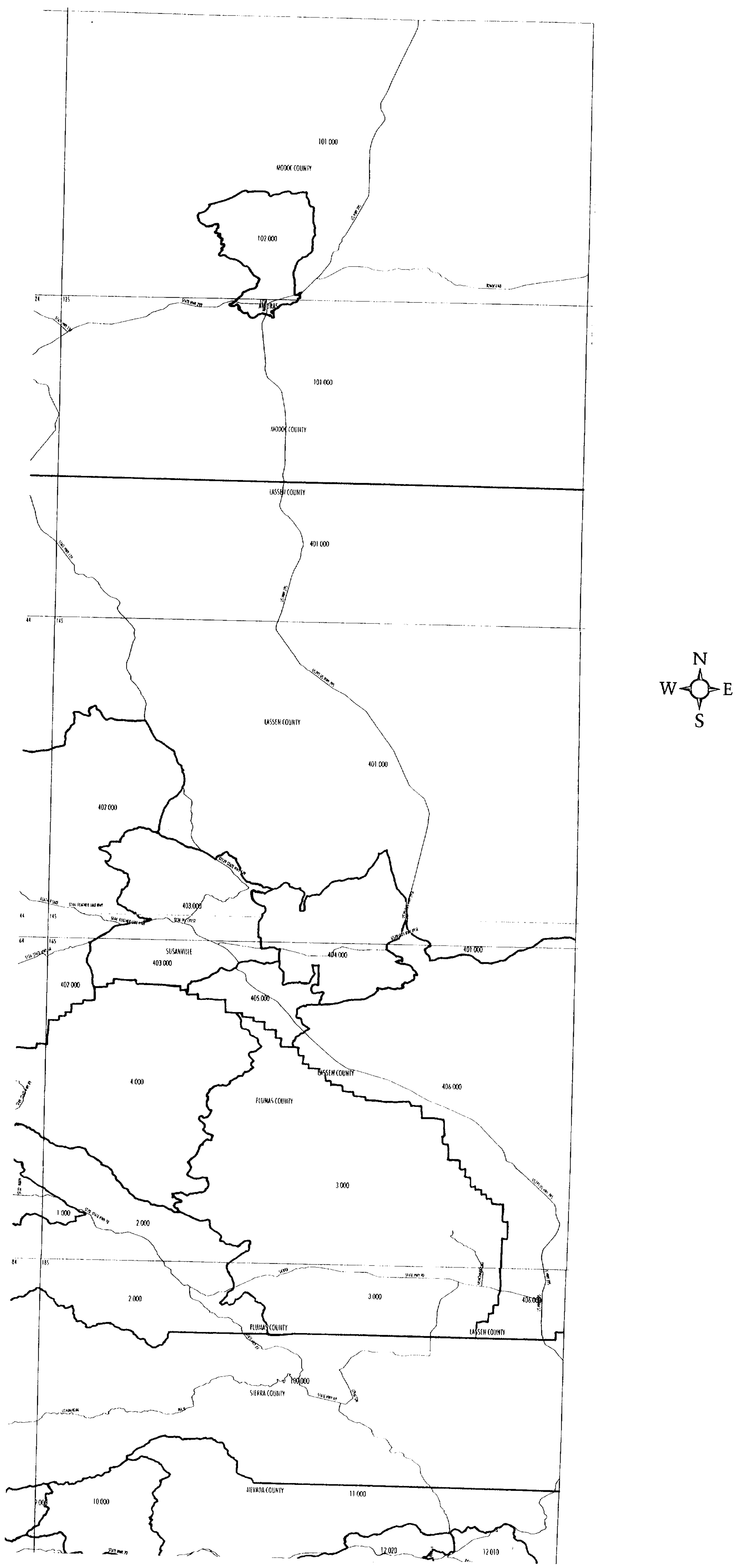


Table C.14-3 Block Group Data for Census Tract #15 (Washoe County)

Block Group Number	Minority %	Per Capita Income ($)	Median Family Income ($)	Unemployment Rate (%)
#15.001 (PP/A)(N)(E)	7.49	23,138	40,000	3.69
#15.002	28.24	8,076	26,563	5.70
#15.003	44.29	10,922	29574	8.92
#15.004	42.88	9,048	21250	3.15

Source: Census, 1990.

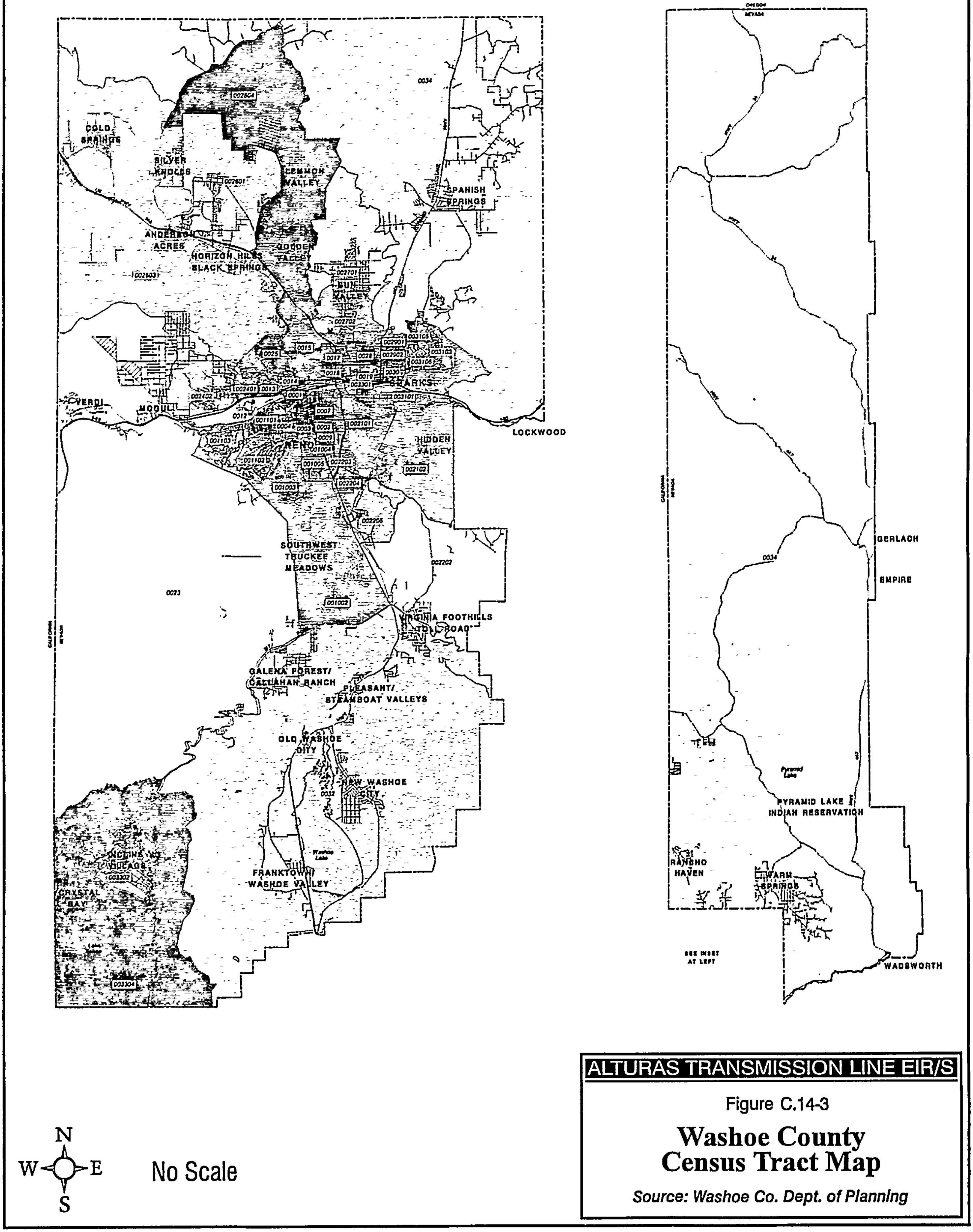
Route Designations: (PP/A) = Proposed Project and Segment Alternatives
(N) = Routing from the north
(E) = Routing from the east

In the State of Nevada, the Proposed Project and segment alternatives would traverse or run adjacent to a total of four census tracts in Washoe County. See Table C.14-2 and Figures C.14-3 and C.14-4 for a map of census tracts in the Nevada portion of the study area. For a detailed description of the Proposed Project and Segment Alternatives, see Part B (Project Description).

Minority Percentages

Minority percentages within the potentially affected tracts in Modoc County are similar to the minority percentage for the County as a whole. The City of Alturas is within the boundary of census tract number 102 which has a minority percentage of 11.67 percent. In comparison with the Modoc County Minority percentage of 11.5 percent, there appears to be a similar distribution of minority population throughout Modoc County. In Lassen County, the two potentially affected census tracts have considerably lower minority percentages (13.04% and 12.33%) in comparison to the county total minority percentage (20.10%). Sierra County only has one census tract due to the low population within the county (3,318 persons). Therefore, the County and census tract boundary are the same. Sierra County has a minority percentage of 7.08 percent which is considerably lower than the state and the other four potentially affected tracts within California; it should also be noted that all of the potentially affected census tracts in California have minority percentages substantially lower than for the State as a whole. Therefore, there would be no potential for disproportionate impacts on minority populations within Modoc, Lassen, and Sierra Counties as a result of the Proposed Project and segment alternatives.

There is also no potential for disproportionate impacts as a result of the Proposed Project in Washoe County, because three of the four potentially affected tracts have relatively low minority percentages (below 11.38%) in comparison with the county total (16.04%). The other tract, census tract number 15, has the highest minority percentage (33.3%) of any potentially affected tract within the study area. Table C.14-3 presents minority percentages at the block group level within census tract number 15. By looking at the minority percentages, however, it is evident that the tract's minority population is concentrated within block group numbers 15.002, 15.003, and 15.004. All of these block groups are south of McCarran Boulevard and considerably far away from the potential effects of the Proposed Project

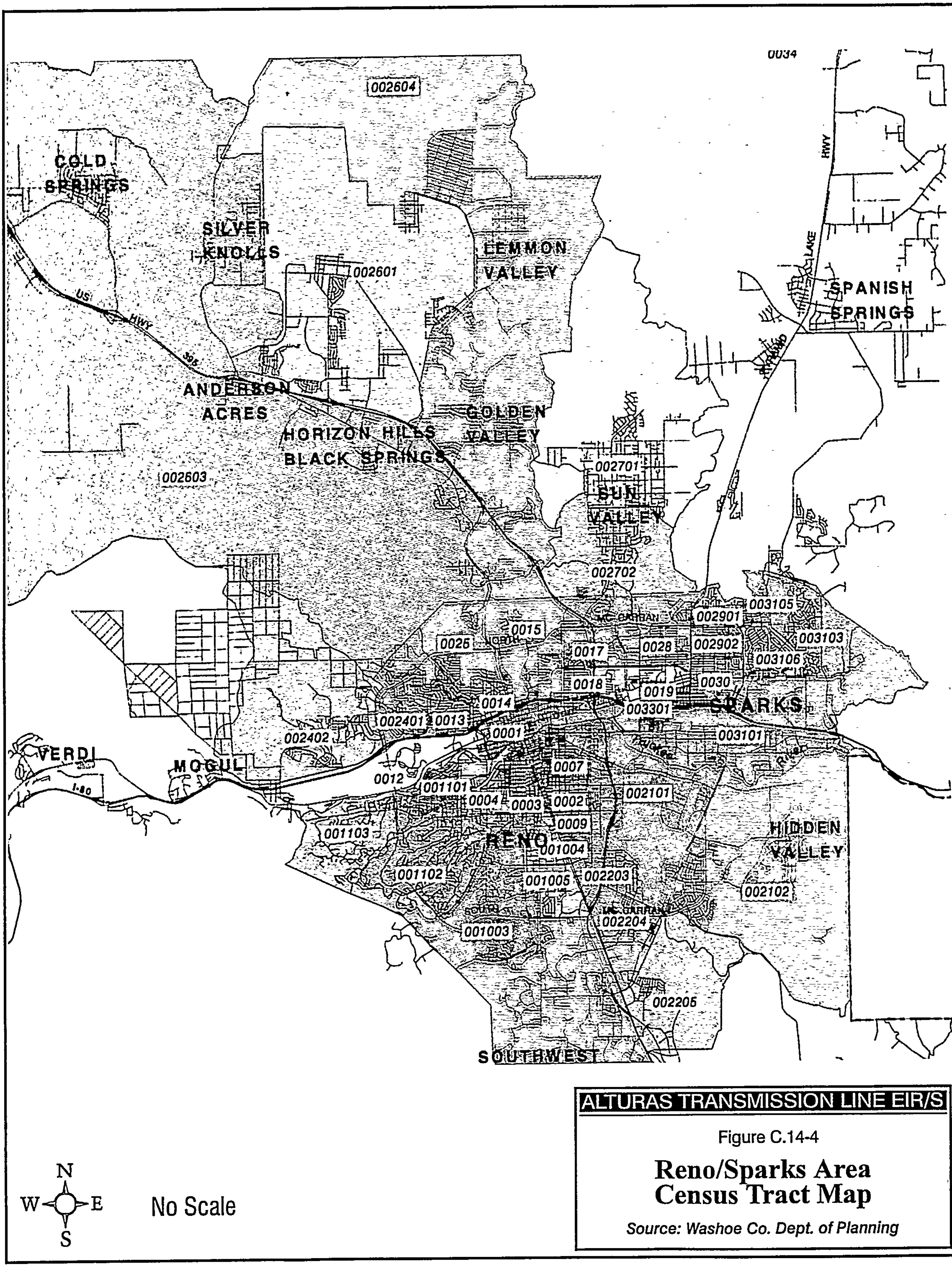


ALTURAS TRANSMISSION LINE EIR/S

Figure C.14-3

Washoe County Census Tract Map

Source: Washoe Co. Dept. of Planning



ALTURAS TRANSMISSION LINE EIR/S

Figure C.14-4

Reno/Sparks Area Census Tract Map

Source: Washoe Co. Dept. of Planning

(Bonnenfant, 1995). North Valley Road Substation is located in block group 15.001, north of McCarran Boulevard; this block group has a minority percentage of 7.49 percent - lower than half the minority percentage for the entire county. Therefore, since the termination point of the Proposed Project would be at the North Valley Road Substation, there would be no potential for disproportionate impacts on the minority population within census tract number 15.

Income and Unemployment

As seen in Table C.14-2, per capita income, median family income, and unemployment for the two potentially affected census tracts in Modoc County are similar to each other and represent Modoc County as a whole, since they are the only two tracts in the county. While Modoc County unemployment levels are slightly higher than for the state as a whole and income levels are lower, these levels are typical of rural areas in the state. Furthermore, the County has no particular subareas of substantially higher unemployment or low income than for the County as a whole, or for northeastern California as a whole (e.g., compare with income data for Siskiyou, Shasta, Tehama, Plumas, and Butte Counties in Table C.14-4 as well as data for Lassen and Sierra Counties in Table C.14-1). Of the two potentially affected tracts in Lassen County, the unemployment rate for tract number 401 (3.91%) is less than half of the overall county unemployment rate. This tract also has per capita and median family income levels higher than the county totals. The income and unemployment levels for tract number 406 are similar to the county totals. The Sierra County unemployment rate is lower than the rates for three of the four other potentially affected tracts in California. Per capita and median family income levels for Sierra County are higher than the four other potentially affected census tracts in California and are similar to those of the other rural northeastern California Counties presented in Table C.14-4. Therefore, the Proposed Project and segment alternatives would not be expected to result in disproportionate impacts on low-income populations within Modoc, Lassen, and Sierra Counties.

Table C.14-4 Income Data For Other Rural Northeastern California Counties

County	Per Capita Income	Median Family Income
Butte	12,083	28,314
Plumas	12,952	29,967
Shasta	12,381	30,332
Siskiyou	11,610	26,073
Tehama	10,990	25,946

Per capita and median family income levels for three of the four potentially affected census tracts in Washoe County are similar to the income levels for Washoe County and Nevada as a whole, resulting in no disproportionate impact to low-income populations in those tracts. However, similar to the high distribution of the minority population, the income levels for tract number 15 are considerably lower than Washoe County and Nevada income levels. Once again, block group data in Table C.14-3 show that income levels for block group number 15.001, where the Proposed Project would terminate, are higher than for Washoe County and Nevada income levels. Therefore, the Proposed Project would not be expected to have any disproportionate impacts on low-income populations within tract number 15.

Of the four potentially affected census tracts in Washoe County, the unemployment rates for tract numbers 15, 25, and 26.03 (5.41%, 3.79%, and 5.2% respectively) are lower than or similar to unemployment rates for the entire county (5.08%). Tract number 26.04 is the only potentially affected tract that has an unemployment rate (7.02%) higher than for Washoe County and Nevada as a whole. The majority of the population in tract 26.04 is concentrated in the Lemmon Valley and Golden Valley areas which are considerably far from the effects of the Proposed Project at the southern tip of the tract, which is adjacent to tract number 15. See Figures C.14-2 and C.14-3 for the location of tract number 26.04 relative to tract number 15. It should also be noted that tract number 26.04 has income levels similar to those of Washoe County and Nevada as a whole as discussed above.

C.14.4 Other Alternatives

This section analyzes Washoe County demographic data for census tracts that could potentially be affected by transmission line routing alternatives approaching the North Valley Road Substation from the north or the east. Census tract number 15 would be affected by both transmission line routing from both of these directions. For the analysis of the demographic data for census tract number 15, see the discussion in Section C.14.3 (above); this tract will not be addressed in this section.

Routing From the North

Section B.3.4.1 in Part B (Project Description) provides a detailed description of transmission line routing alternatives approaching the Reno area from the north and terminating at the North Valley Substation.

Minority Percentages. Six census tracts in Washoe County, including tract number 15, could potentially be affected by routing alternatives from the north (see Table C.14-2). The minority percentages for four of the tracts are lower than the County total by two percent or more. Census tract number 26.01 has a minority percentage (16.64%) similar to the County total (16.04%). Thus, as for the Proposed Project and segment alternatives, transmission line routing from the north would not have a disproportionate impact on potentially affected census tracts in Washoe County.

Income and Unemployment. Three of the six tracts potentially affected by transmission line routing alternatives from the north, tract numbers 26.01, 27.01, and 27.02, have considerably lower per capita and median family income levels than the Washoe County and Nevada income levels. Furthermore, three of the six tracts have unemployment rates between seven and eight percent. These unemployment rates are approximately two percent higher, on average, than the Washoe County and Nevada overall unemployment rates. Thus, routing from the north has a greater potential of affecting low-income populations than the Proposed Project and segment alternatives.

Routing From the East

Section B.3.4.6.2 in Part B (Project Description) provides a detailed description of transmission line routing alternatives (including the Nevada Alternative) approaching the Reno area from the east and terminating at the North Valley Substation.

Minority Percentages. Fourteen census tracts in Washoe County, including tract number 15, could potentially be affected by routing alternatives from the east (see Table C.14-2). Except for census tract 15, which has been discussed in detail previously for the Proposed Project, none of these fourteen tracts have a minority population percentage of greater than 30%. Six have minority percentages higher than the Washoe County average (16.04%), but the other eight have minority percentages lower than that average. The average minority percentage for these fourteen tracts taken together is 18.3%, which is a value close to the county percentage. Therefore, there does not appear to be any particular basis for expecting disproportionate impacts on minority populations for routing from the east.

Income and Unemployment. Of the fourteen potentially affected tracts, eight have median family income levels lower than the county average and twelve have per capita income levels lower than the county average. In addition, two tracts (#1 and #33.01) have unemployment rates substantially higher than Washoe County and Nevada rates. Therefore, routing from the east could have disproportionate impacts on low-income populations, if such routing were to be selected. However, as discussed in Section B.3.4.6.2, such routing was dropped from detailed consideration in this EIR/S.

C.14.5 REFERENCES

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PART D. COMPARISON OF ALTERNATIVES

D.1 INTRODUCTION

D.1.1 BACKGROUND

Part D of this EIR/S summarizes and compares the environmental advantages and disadvantages of the various project alternatives fully evaluated in this EIR/S and presents the environmentally superior alternative pursuant to CEQA Guidelines Section 15126. This discussion is provided to help the reader understand the major differences in impacts that are anticipated with the project alternatives.

Upon conducting a screening analysis, appropriate alternatives were selected for full consideration in this EIR/S (see Sections B.3 and B.4). In Part C of this document, the environmental impacts associated with the Proposed Project and these selected alternatives are assessed. A substantial amount of information is presented in Part C because numerous alternatives are discussed and their potential effects extend over many miles of varied terrain. Alternatives that were screened out because they were either infeasible or did not offer the potential for overall reduction in significant environmental impacts, are described in Section B.3 and are not included in this comparative analysis. The following summary comparison focuses on the significant impacts of the fully analyzed alternatives and their major differences, or trade-offs, in impacts. The comparative analysis presented in this Part is intended to provide decision makers with information so that they may make balanced, reasoned decisions on the pending transmission line applications that have been submitted to the CPUC, BLM, and Modoc and Toiyabe National Forests.

D.1.2 COMPARISON METHODOLOGY

The Proposed Project and project alternatives would result in adverse impacts, some of which cannot be mitigated to levels that are not significant. There are many environmental, policy, and economic tradeoffs associated with the alternatives. The environmental analysis upon which the comparison of alternatives and selection of the environmentally superior alternative was based is largely presented in two major parts of the EIR/S as noted below:

- Part C (Environmental Analysis) - Provides a comprehensive and detailed assessment of impacts and mitigation measures for the Proposed Project, each alternative alignment, and the No Project Alternative; parallel, easily comparable treatments are provided in Part C for each issue area.

- Impact Summary Tables (which are part of the Executive Summary of this document) - Tabulate in concise form all the significant impacts and mitigation measures documented in Part C, organized by class of impact, environmental issue area, and alternative.

To assist in the selection of the environmentally superior alternative, a comprehensive alternatives comparison table (Table D.5-1) has been developed, which appears at the end of Part D in Section D.5. In this table, short- and long-term Class I and II impacts are compiled in a matrix format allowing easy comparison among the project alternatives (including the Proposed Project). Within the comparison matrix, general impact parameters are characterized in the far left column (grouped by environmental issue area in the order of their presentation in Part C and the Executive Summary of the EIR/S — e.g., Air Quality, Biological Resources, etc.). For each impact parameter characterized, entries are provided for each of the alternative alignments and their corresponding Proposed Project segments. These entries describe the impacts of each alternative alignment with respect to the general impact parameter or impact type and, where appropriate, indicate comparative or contrasting features.

The issue areas of biological resources, land use, and visual resources are major factors in this comparison due to the potential magnitude or severity of impacts in these areas. In addition, impacts that are of a long duration, or are widespread, are considered to be more important in the comparative analysis than short-term, localized impacts. However, short-term impacts were considered in context of their collective effect, especially in those cases where the long-term impacts were comparable. Other factors such as economic considerations are referenced where they are important for overall environmental evaluation of an alternative, but do not form the critical basis for determining environmental superiority. Pursuant to the CEQA Guidelines (Section 15126), alternatives shall be considered even if they are more costly. It will be up to decision makers to make final determinations on the environmental, economic, and policy tradeoffs associated with the project and alternatives.

The analysis in the following sections begins with identification of the environmentally superior alternative (Section D.2), followed by a comparative discussion which is divided into two sections: Section D.3, a comparison of the Proposed Project with alternative transmission line route alignments and substation locations; and Section D.4, a comparison of the No Project Alternative to the Proposed Project.

D.2 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

D.2.1 ALTERNATIVE ALIGNMENTS

Table D.2-1 presents a summary side-by-side comparison of the Proposed Project and Alternative Alignments. Table D.2-1 reflects consideration of both short- and long-term impacts within each issue area. As Table D.2-1 shows, different alternative alignments are superior in certain issue areas, and in some issue areas there are only slight differences among the alternatives. In order to meet the CEQA requirement to identify an environmentally superior alternative, we focused on the importance of issue areas (e.g., biological resources, land use, and visual resources) that have potential long-term, widespread significant impacts. Even in these limited issue areas, determining a superior alternative was difficult because of the tradeoffs associated with different transmission line alignments. As shown in Table D.2-1 and as discussed below in Section D.3, the Proposed Project and alternative alignments have closely matched impacts such that, in some cases, the clear superiority of one cannot be easily demonstrated.

Table D.2-1 Summary Side-by-Side Comparison of Proposed Project and Alternative Alignments

Environmental Issue Area	Proposed Project	Alternative Alignment
	Segment A	Segment B
Air Quality (short-term)		+
Biological Resources		++
Cultural Resources		+
Energy and Utilities	+	
Geology, Soils, and Paleontology		+
Hydrology	N	N
Land Use	++	
Noise	+	
Public Safety and Health	+	
Socioeconomics and Public Services	N	N
Transportation and Traffic	++	
Visual Resources	++	
	Segment E	Segments D, F, G, H, and I
Air Quality (short-term)	+	
Biological Resources	++	
Cultural Resources	+	
Energy and Utilities	N	N
Geology, Soils, and Paleontology	+	
Hydrology	++	
Land Use	+	
Noise		+
Public Safety and Health	N	N
Socioeconomics and Public Services	N	N
Transportation and Traffic	+	
Visual Resources		++
	Segment K	Segments J and I
Air Quality (short-term)	+	
Biological Resources	++	
Cultural Resources		++
Energy and Utilities		+
Geology, Soils, and Paleontology	++	
Hydrology	+	
Land Use		+
Noise	N	N
Public Safety and Health	N	N
Socioeconomics and Public Services	N	N
Transportation and Traffic	N	N
Visual Resources		+

Environmental Issue Area	Proposed Project	Alternative Alignment
	Segment L	Segment ESVA
Air Quality (short-term)	N	N
Biological Resources	++	
Cultural Resources	++	
Energy and Utilities	N	N
Geology, Soils, and Paleontology	+	
Hydrology	N	N
Land Use		++
Noise		+
Public Safety and Health	N	N
Socioeconomics and Public Services	N	N
Transportation and Traffic	N	N
Visual Resources		++
	Segment N	Segment M
Air Quality (short-term)	N	N
Biological Resources	N	N
Cultural Resources	++	
Energy and Utilities	N	N
Geology, Soils, and Paleontology		+
Hydrology		+
Land Use	++	
Noise	N	N
Public Safety and Health	N	N
Socioeconomics and Public Services	N	N
Transportation and Traffic	+	
Visual Resources	+	
	Segment Q	Segment P
Air Quality (short-term)		+
Biological Resources		+
Cultural Resources		+
Energy and Utilities	N	N
Geology, Soils, and Paleontology	+	
Hydrology	+	
Land Use	++	
Noise	N	N
Public Safety and Health	N	N
Socioeconomics and Public Services	N	N
Transportation and Traffic	+	
Visual Resources	++	

Environmental Issue Area	Proposed Project	Alternative Alignment
	Segment T	Segments S and U
Air Quality (short-term)	N	N
Biological Resources	++	
Cultural Resources	+	
Energy and Utilities	+	
Geology, Soils, and Paleontology	+	
Hydrology	+	
Land Use		+
Noise	N	N
Public Safety and Health	N	N
Socioeconomics and Public Services	N	N
Transportation and Traffic	+	
Visual Resources		++
	Segment W (WØ1 to WNØ4)	Segment Z
Air Quality (short-term)	N	N
Biological Resources	N	N
Cultural Resources	N	N
Energy and Utilities	N	N
Geology, Soils, and Paleontology	N	N
Hydrology	N	N
Land Use		+
Noise	N	N
Public Safety and Health	N	N
Socioeconomics and Public Services	N	N
Transportation and Traffic	N	N
Visual Resources	N	N
	Segment W (WØ3 to XØ1)	Segment WCFG
Air Quality (short-term)	N	N
Biological Resources		++
Cultural Resources		+
Energy and Utilities	N	N
Geology, Soils, and Paleontology	N	N
Hydrology	N	N
Land Use	++	
Noise	+	
Public Safety and Health	+	
Socioeconomics and Public Services	N	N
Transportation and Traffic	N	N
Visual Resources	++	

Environmental Issue Area	Proposed Project	Alternative Alignment
	Segment Y	Segment X-East
Air Quality (short-term)	N	N
Biological Resources		+
Cultural Resources		++
Energy and Utilities	N	N
Geology, Soils, and Paleontology	N	N
Hydrology	N	N
Land Use	++	
Noise	+	
Public Safety and Health	+	
Socioeconomics and Public Services	N	N
Transportation and Traffic	N	N
Visual Resources	+	

++ Clear environmental advantage
+ Minor environmental advantage
N No discernible advantage

Based on information in Tables D.2-1 and D.5-1, the following route alignments, listed from north to south, are considered environmentally superior under CEQA (and are the NEPA lead agency-preferred project alternative, except where noted):

- **Proposed Segment A**, including the proposed Alturas (Devils Garden) Substation site, due primarily to the fact that this route would avoid many of the visual and land use impacts associated with Alternative Segment B that cannot be fully mitigated.

- **Proposed Segment C** (no alternative alignment was identified that offered the potential for environmental advantage)

- **Proposed Segment E**, a somewhat clear choice due to shorter length and avoidance of significant biological effects that could result from Alternative Segments D, F, G, H, and I which would cross a variety of habitats and cause substantial potential impacts to bird species moving up, down, and across the area.

- **Proposed Segment K**, a narrowly superior choice over combined Alternative Segments J and I because of avoidance of substantial grading and associated long-term biological disturbance along Segment J, and avoidance of significant bird collisions associated with east-west trending Segment I and northern portion of north-south trending Segment J in the southern Madeline Plains.

- **Proposed Segment L**, because of clear environmental advantages to biological and cultural resources.

- **Proposed Segment N**, because of clear environmental advantages to visual resources, land use, and cultural resources.

- **Proposed Segment O** (no alternative alignment was identified that offered the potential for environmental advantage)

- **Proposed Segment Q**, due to substantial advantages in the issue areas of land use and visual resources.

- **Proposed Segment R** (no alternative alignment was identified that offered the potential for environmental advantage)
- **Alternative Segments S and U**, considered the **NEPA lead-agency preferred alternative** because of the avoidance of significant, unmitigable impacts on visual and recreational resources in the immediate vicinity of the formally-designated Lassen Red Rocks Scenic Area, which is managed by BLM. Additionally, the BLM has determined that Proposed Segment T would conflict with visual management objectives identified in the Lahontan Resource Management Plan for the designated scenic area. **Proposed Segment T** is considered the **CEQA environmentally superior alternative** based on concerns regarding potentially higher levels of impact on biological, cultural, and transportation resources associated with Segments S and U.
- **Proposed Segment W**, except for Alternative Segment Z, as discussed below (no other alternative was identified that offered the potential for environmental advantage; W considered superior over WCFG due to avoidance of the land use and visual impacts associated with Segment WCFG).
- **Alternative Segment Z**, due to the avoidance of a residential subdivision and associated land use conflicts.
- **Proposed Segment X** (no alternative alignment was identified that offered the potential for environmental advantage).
- **Proposed Segment Y**, because of the avoidance of significant land use and visual impacts associated with Alternative Segment X-East in the vicinity of Hoge Road.

Section D.3 describes the basis for these conclusions, and presents a summary comparison of the impacts of the Proposed Project and alternative alignments.

D.2.2 SUBSTATION SITES

Alternative sites for both the proposed Alturas Substation and Border Town Substation were evaluated in each issue area in Part C.

D.2.2.1 Alturas Substation

The alternative site to the proposed Devils Garden site for the Alturas Substation is located in Alturas on property known as the Mill Site. This site would be utilized only if Alternative Segment B is selected over Proposed Project Segment A. Similar to Segment A, this site would not be environmentally superior due to significant land use and visual impacts associated with the site's location in close proximity to sensitive land uses and public views. Therefore, the proposed Alturas Substation (Devils Garden site) would be environmentally superior.

D.2.2.2 Border Town Substation

The alternative Border Town Substation site is located just to the south of the proposed substation site and is located on a parcel owned by SPPCo. The impacts of this site are very similar to those identified for the proposed site. The primary difference between the two sites is that the Proposed Project site is further from residences in the area. Therefore, the Proposed Project site is considered to be environmentally superior to the alternative site.

D.2.3 NO PROJECT ALTERNATIVE

Under the No Project Alternative, impacts associated with constructing and operating the Proposed Project would not occur. However, when considering the alternative projects that SPPCo would need to implement to reduce existing system limitations and accommodate future growth, the proposed Alturas Transmission Line Project is considered to be environmentally superior to the No Project Alternative. See Section D.4 for further discussion.

D.3 COMPARISON OF ALTERNATIVE ALIGNMENTS

To facilitate a clear understanding of the relative merits of the various alternative alignments, this Section highlights the major differences among the numerous alternative alignments, including the Proposed Project, with respect to environmental impacts. These alignments would replace a portion of the Proposed Project route, therefore, are compared to the segment of the Proposed Project that they would replace. See Section B.4 (Project Description) for a description of these alternative alignments. Again, please refer to the detailed comparison matrix in Table D.5-1 for supporting information.

D.3.1 ALTURAS AREA ALTERNATIVE SEGMENT B VERSUS PROPOSED PROJECT SEGMENT A

Relative to Segment A of the Proposed Project route, Alternative Segment B would offer the following principal environmental advantages:

- Construction air emissions would be lower due to the fact that the alternative is shorter than Proposed Segment A.
- Impacts on vegetation and special status plants would be reduced as the total amount of affected juniper woodland would be decreased by six acres and only one occurrence of special status plants would be impacted (vs. 16 occurrences on Segment A); reduced overall impacts on wildlife.
- Five potentially significant cultural resources sites would be affected by Alternative Segment B vs. 17 sites along Proposed Segment A.
- Alternative Segment B would require less blasting and would avoid crossing a potentially active fault.

The above advantages of Alternative Segment B would be offset by the following important environmental disadvantages, which result in Proposed Segment A being environmentally superior:

- Alternative Segment B would cross a greater number of sensitive land uses and more developed land uses (residential, commercial, and recreational).
- Alternative Segment B would result in greater visual impacts to the public due to greater prominence of the line and substation and closer proximity to Alturas.
- There would be a greater potential for conflict with utility easements, roadways, and the Alturas Municipal Airport, given the close proximity to the urban area of Alturas.

D.3.2 MADELINE PLAINS ALTERNATIVE SEGMENTS D, F, G, H, I VERSUS PROPOSED PROJECT SEGMENT E

A combination of alternative segments could replace Proposed Segment E. This set of alignments would move the route further from U.S. 395, which has both advantages and disadvantages. The primary environmental advantages include:

- Significant visual impacts along U.S. 395 would be avoided (note that Alternative Segment F would be preferred over Alternative Segment G due to F's greater distance from U.S. 395).
- By completely avoiding U.S. 395 and associated utility easements along the highway, impacts on transportation and utilities would be reduced.
- Eleven potentially significant cultural resources sites would be affected vs. twelve sites along Proposed Segment E.

Key disadvantages, which lead to selection of Proposed Segment E as environmentally superior, include:

- Impacts on vegetation, wildlife, and special status species would be increased because of more and greater variety of habitats crossed, and the potential for bird collisions would be greater due to the fact that Alternative Segments D,F,G,H, and I would run both east-to-west and north-south, effectively bisecting the habitats in two directions. In addition, these agricultural areas are used more frequently by birds than lands along Proposed Segment E which stays to the east side of the northern Madeline Plains.
- More special status plant species would be potentially impacted by the Madeline Plains alternative segments (46 occurrences vs. 9 occurrences of four species).
- Substantially more grading, road improvements, and blasting would be required along Alternative Segment D.
- Alternative Segments F, G, H, and I would have a greater potential for collision impacts on crop-dusting aviation operations, due to their location and combined north-south and east-west alignments
- Greater construction air emissions would occur due to longer route length and more grading.

D.3.3 RAVENDALE ALTERNATIVE SEGMENTS J AND I VERSUS PROPOSED PROJECT SEGMENT K

Environmental advantages compared to Proposed Segment K include:

- Less visual access, visual contrast, and impacts on views from U.S. 395 would occur due to the fact that Alternative Segment J would avoid 5 miles of route along U.S. 395.
- The alternative would be located at a much greater distance from the Ravendale Airport, thus minimizing potential air traffic conflicts.
- Two cultural resources sites would have potentially significant, but mitigable impacts vs. nine sites along Proposed Segment K.

Although Alternative Segment J would be environmentally superior in visual resources to Proposed Project Segment K, the connecting Segment I would result in significant visual impacts, thus reducing the overall visual advantages of this alternative. Other disadvantages of Segments J and I (all of which combine to render Proposed Segment K environmentally superior) include:

- Overall access to the line along Alternative Segment J would be much more difficult due to its remote location and rugged terrain, requiring construction of new access roads (some of which would be permanent) and significantly more grading and blasting.

- The combination of Alternative Segments J and I would result in significantly greater biological impacts due to a longer overall line length (19.2 miles vs. 15.4 miles) and associated habitat disturbance (big sagebrush scrub, juniper woodland, silver sagebrush scrub, and sage grouse brood habitats) and due to substantial grading needed for access to Segment J. Also, the combination of a north-south route (Segment J) with an east-west route (Segment I) would increase the potential for bird collisions.

- Increased grading and blasting would have the potential to cause greater erosion and potential impacts to groundwater flow.

- Alternative Segment I would present air traffic risks because it is in a crop dusting area.

D.3.4 EAST SECRET VALLEY ALIGNMENT (ESVA) VERSUS PROPOSED PROJECT SEGMENT L

The environmental advantages of Alternative Segment ESVA include the following:

- The primary environmental advantage offered by Alternative Segment ESVA would be avoidance and reduction of significant visual impacts along the U.S. 395 corridor.

- Land use impacts would be reduced by avoiding several residences along U.S. 395.

Despite substantial environmental advantages in land use and visual resources, Alternative Segment ESVA would result in the following disadvantages:

- Impacts on cultural resources would have the potential to be substantially greater along this alignment since this alternative presents impacts of substantially greater degree of difficulty for successful mitigation. In addition, this alternative has the potential of opening new access routes into previously undisturbed areas, thus increasing potential vandalism.

- A greater areal extent of cumulative impacts associated with construction of the Tuscarora Pipeline would occur because the transmission line route would no longer closely parallel the Tuscarora pipeline route through Secret Valley.

- Moving the route away from U.S. 395 would require development of more access roads and would result in more disturbance to previously undisturbed areas, thus causing greater impacts on biological resources, particularly sage grouse leks, big game habitats (pronghorn antelope kidding areas and winter range), and wetland plant communities.

D.3.5 WENDEL ALTERNATIVE SEGMENT M VERSUS PROPOSED PROJECT SEGMENT N

Alternative Segment M would have the following environmental advantages over Proposed Segment N:

- Much less grading would be required.

Relative environmental disadvantages which make this alternative alignment inferior overall to Proposed Segment N include:

- Alternative Segment M would have higher visibility to motorists on Wendel Road.
- There would be greater potential for land use conflicts due to the close proximity of the alternative to a swine facility and the Wendel Solid Waste Transfer Station.
- Potentially significant impacts on cultural resources would occur at two sites along Alternative Segment M versus no sites on Proposed Segment N.

D.3.6 WEST FORT SAGE MOUNTAINS ALTERNATIVE SEGMENT P VERSUS PROPOSED PROJECT SEGMENT Q

Relative environmental advantages of Alternative Segment P include:

- A shorter length (17.6 miles vs. 21 miles for Proposed Segment Q) would result in less construction disturbance.
- Only three significant cultural resources site would be potentially impacted versus five sites along Proposed Segment Q.

However, Alternative Segment P was found to be environmentally inferior to Proposed Segment Q because of the following significant environmental disadvantages:

- Land use impacts would be substantially greater due to closer proximity to Long Valley residential development and crossing of the Fort Sage OHV Area and the Doyle Wildlife Area.
- Greater visual impacts would occur due to closer proximity to a major travel corridor and effects on the scenic quality of the Fort Sage Mountains.

D.3.7 LONG VALLEY ALTERNATIVE SEGMENTS S, U, Z, and WCFG VERSUS PROPOSED PROJECT SEGMENTS T and W

Alternative Segments S and U were found to have reductions in visual and land use impacts due to moving the transmission line further away from the Lassen Red Rocks Scenic Area. However, impacts on biological resources, cultural resources, geology, hydrology, traffic, air quality, and energy would be greater than for the Proposed Project Segment T. Impacts on biological resources would be greater along Segments S and U because of the crossing of wetland habitats of Long Valley Creek twice, including potentially greater bird collision impacts in this important year-round habitat and migration corridor. These stream crossings would also increase the potential for hydrological impacts. In addition Segments S and U have a greater fault potential and zones of high corrosivity and erodibility within the stream channels. Furthermore, Segments S and U would require crossing U.S. 395 twice, thus increasing traffic and public safety impacts.

For the reasons stated above, on balance Proposed Segment T is considered to be the environmentally superior alternative under CEQA requirements. As noted above in Section D.2, the NEPA Lead Agency

(BLM)-preferred alternative is the combined Alternative Segments S and U on the basis of significant, unmitigable visual and land use management impacts on the Lassen Red Rocks Scenic Area (designated as a scenic area in the BLM Lahontan Resource Management Plan) associated with Proposed Segment T.

Alternative Segment Z would result in avoidance of a residential subdivision that would otherwise be crossed by Proposed Segment W. There are no clear distinctions between the two routes in any other issue area, so Alternative Segment Z is considered environmentally superior.

Alternative Segment WCFG would offer reductions in impacts on biological resources through avoidance of some deer winter range and meadow/riparian habitats and reduced impacts on the Hallelujah Junction Wildlife Area; however, it would result in substantially greater visual and land use impacts because of a closer proximity to U.S. 395 and to residences at Border Town. Therefore, Proposed Segment W is considered environmentally superior to Alternative Segment WCFG for this portion of the route.

D.3.8 PEAVINE PEAK ALTERNATIVE SEGMENT X-EAST VERSUS PROPOSED PROJECT SEGMENT Y

The primary advantage of Alternative Segment X-East is avoidance of potential impacts on three cultural resources sites along Proposed Segment Y and minor reductions in impacts on vegetation and wildlife species due to the fact that this alignment is in a more disturbed area. However, major disadvantages are associated with long-term land use impacts. Alternative Segment X-East would be located in very close proximity to several residences at the end of Hoge Road, thus subjecting them to visual impacts, public safety and health concerns, and noise impacts. Therefore, Proposed Segment Y is considered the environmentally superior route.

D.4 COMPARISON WITH NO PROJECT ALTERNATIVE

Under the No Project Alternative, the impacts associated with constructing and operating the Proposed Project would not occur. However, as discussed in Section A.6.2, SPPCo would need to augment its existing facilities and add new transmission and generation capacity to compensate for existing system limitations and future growth. Section B.3 of this EIR/S discusses the various system alternatives that SPPCo assessed in its selection of the Alturas Transmission Line Project as its preferred project to bring forward for permitting. The system alternatives considered included generation, system enhancement, alternative technologies, and transmission alternatives. These alternatives, in addition to the Nevada Route Alternative that was identified during the scoping period, were assessed in this EIR/S for their ability to satisfy the existing and projected needs of SPPCo's electric power distribution system (see Section A.6, Purpose and Need and Sections B.3.4.3 through B.3.4.6). This analysis concluded that only the various Transmission Alternatives evaluated in Section B.3.4.6.2 were capable of supplementing SPPCo's system in such a manner that existing limitations could be mitigated and future growth accommodated. This evaluation was conducted to provide information on the possible options available to SPPCo in the event that the No Project Alternative is deemed preferable.

In Section B.3.4.6.2, the transmission alternatives capable of satisfying the project objectives were assessed for their potential environmental impacts. Since these alternatives have only been preliminarily studied by SPPCo, no site-specific information was available. Therefore, the evaluation of these alternatives in Section B.3.4.6.2 is limited to a qualitative assessment. Based on the analysis presented in Section B.3.4.6.2 , none of the Transmission Alternatives were found to offer environmental advantage in comparison to the Proposed Project and therefore, were eliminated from further consideration under CEQA (see Section B.3.2 for a discussion of CEQA alternative screening criteria. Considering the analysis in Section B.3.4.6.2, as well as the issue area-by-issue area analysis of the No Project Alternative in Section C.2 - C.13, the Proposed Project is considered to be environmentally superior to these alternatives (including the No Project Alternative). The following factors were taken into consideration in reviewing the candidate Transmission Alternatives in the event the No Project Alternative was selected.

(1) **Potential Environmental Impacts.** In order for the Proposed Project, or any transmission or generation alternative, to improve service reliability to the Reno/Lake Tahoe area, connection to SPPCo's North Valley Road Substation would be required. This need is based on existing limitations of the Tracy-to-North Valley Road connections and projected load increases in the Reno/Lake Tahoe area. For each Transmission Alternative identified, in order to access the North Valley Road Substation, the route would likely need to cross a severely constrained and rapidly growing area of northern Sparks and Reno. These growing urban areas are also located within the Truckee Meadows Air Basin, a non-attainment classified air basin for both State and Federal ambient air quality standards. This routing could result in significant property ownership constraints and potentially significant land use (densities range from 3 to 21 dwelling units per acre), visual, and air quality impacts. In addition, given that the alternative would be traversing an urban area, electric and magnetic field (EMF) concerns would be significant, since the separation distances between the alternative and sensitive receptors would be restricted because of existing development.

(2) **Utility Corridor Concerns.** The Transmission Alternatives would travel primarily within designated utility corridors. Under each transmission alternative scenario (individual or collective), the construction of about 15 miles of transmission line (in most cases 345 kV line) would be required from Tracy to SPPCo's North Valley Road Substation, traversing the City of Sparks and northern Reno area. An existing SPPCo transmission line corridor could be utilized by the alternatives. This corridor contains a 345 kV transmission line and a 120 kV transmission line. To comply with WSCC Operating Criteria, adequate separation distances between transmission lines would be required to avoid simultaneous failures. In rural environments, separation distances range from the span between structures of approximately 1,000 feet; (LADWP recommended) to 2,000 feet (approved for the Southwest Intertie Project in most locations). In urban environments, the proposed Transmission Alternatives could be sharing an existing corridor that includes 345 kV and 120 kV lines. This corridor traverses existing urban development and in many places encroaches to the edge of the existing development (generally residential; 3 to 21 dwelling units per acre). The expansion

of the corridor to include an additional 345 kV line (or multiple smaller lines) could require the demolition of existing residences.

(3) **Permitting, Design, and Construction Timelines.** SPPCo has only conducted preliminary technical feasibility analyses for the Transmission Alternatives considered in this EIR/S, except for the Nevada Route Alternative which was identified during EIR/S scoping. Given the time required to permit, design, and construct projects of this magnitude, SPPCo estimates that these alternative facilities would not be available for operation until the year 2000. Given SPPCo's existing system limitations, SPPCo is currently unable to operate within prudent, WSCC Operating Criteria. This existing system shortcoming will be exacerbated as loads continue to grow (see Section A.6, Purpose and Need). Because SPPCo is a WSCC member utility, failure of the SPPCo system could also have ramifications on the service provided by other WSCC utilities. Interruptions of service in the Reno/Lake Tahoe area would impose economic impacts on all affected commercial and industrial activities. In addition, such interruptions could affect the responsiveness of emergency services. However, since permitting time lines are the responsibility of the Applicant, the timing implications of the Transmission Alternatives have been given only minimal consideration in this analysis.

D.5 ALTERNATIVE ALIGNMENTS COMPARISON MATRIX

Table D.5-1 presents the comparison of the Proposed Project and alternative alignments, by environmental issue area and impact parameter for Class I and Class II impacts. Overall conclusions based on this matrix are presented in Section D.2 (Environmentally Superior Alternative) and Section D.3 (Comparison of Alternatives).

Table D.5-1 Alternative Alignments Comparison Matrix

PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS								
ENVIRON. IMPACT PARAMETER	Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi)	Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi)	Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi)	ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.)	Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2)	W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi)	Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi)	Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi)
AIR QUALITY								
Class I: No impacts identified.								
Class II Impacts:								
Particulate emissions from construction and maintenance activity	Segment B emissions 50% less than Segment A.	Segment D, F, G, H, I emissions 45-65% greater than Segment E.	Segment J: 35% more emissions than Segment K.	Segment ESVA: 10% more emissions than Segment L.	30% increase in emissions on Segment M.	Segment P: 25% less construction emissions.	Alternatives are slightly longer; may result in more emissions.	Only minor differences.
BIOLOGICAL RESOURCES								
Class I Impacts: None identified.								
Class II Impacts:								
Removal, disturbance, or degradation of plant communities and wildlife habitat.	Alt. Segment B would have reduced impacts on juniper woodland, big sagebrush scrub, montane meadow, volcanic gravels, and low sagebrush. Proposed Segment A would result in a slightly greater impact of raptor predation enhancement on nearby sensitive Pit River Valley communities.	The Madeline Plains alternatives would have substantially greater impacts on juniper and sagebrush habitats and their value to pronghorn, deer, and sage grouse due to Segment D, but similar general habitat impacts within the Madeline Plains proper.	Alternative Segment J would have substantially greater impacts on big sagebrush scrub, juniper woodland, and silver sagebrush scrub and their associated value to wildlife, but lesser impacts on the volcanic vertisols community.	Greater impacts for Alt. Segment ESVA (pronghorn antelope kidding areas & winter range, sage grouse, and wetlands) due to absence of existing access and roughness of terrain which will require more surface disturbance. Greater cumulative effects of ESVA with Tuscarora project.	Alternative Segment M would have greater impacts on big sagebrush scrub and sand dune habitats, but lesser impacts on chenopod scrub. Both alignments would have similar overall impacts on general wildlife habitat value.	Proposed Segment Q would have greater impacts on juniper woodland, sage/bitterbrush, and sand dune communities and associated deer habitat, but lesser impacts on big sagebrush scrub and pygmy rabbit habitat. However, Alt. Segment P would cross and adversely affect the CDFG Doyle Wildlife Area and its associated deer winter range.	Proposed Segment T and Alternative Segments S and U would have somewhat similar impacts in the removal/disturbance of plant communities (e.g., juniper woodland and sagebrush/bitterbrush), however S and U combined would be longer and would enter and cross (twice) the sensitive (waterfowl, shorebirds, bank swallows, potential willow flycatcher) habitats in the bottomlands of Long Valley Creek.	There is little difference in impacts on plant communities and animal habitats between Proposed Segment Y and Alternative Segment X-East, except that X-East is already in a more disturbed condition.

Table D.5-1 Alternative Alignments Comparison Matrix

	PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS							
ENVIRON. IMPACT PARAMETER	Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi)	Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi)	Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi)	ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.)	Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2)	W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi)	Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi)	Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi)
							Segment W would remove or disturb some deer winter range and montane meadow habitat including impacts on CDFG Hallelujah Junction Wildlife Area, which Segment WCFG would help to avoid. Segment Z, except for its slightly longer length would have no appreciable differences in impacts from those of the corresponding portion of Segment W.	
Removal or disturbance of special status plant populations.	Proposed Segment A would potentially disturb up to 12 occurrences of 4 species/Alternative Segment B would disturb one occurrence of one species	The Madeline Plains alternatives would potentially disturb up to 46 occurrences of 4 species/Proposed Segment E only 15 occurrences of 6 species.	Proposed Segment K would potentially disturb 10 occurrences of 5 species/Alternative Segments I and J only 7 occurrences of 4 species.	Proposed Segment L would potentially disturb 49 occurrences of 7 species; Alternative Segment ESVA, 77 occurrences of 7 species.	Alternative Segment M would potentially disturb 2 occurrences of 1 species/ Proposed Segment N only 1 occurrence of 1 species.	Proposed Segment Q would potentially disturb 5 occurrences of 2 species/Alternative Segment P only 3 occurrences of 1 species.	Neither Proposed Segments T and W nor the Alternatives would have impacts on special status plants.	Both alignments would traverse 1 isolated occurrence of a special status plant and an altered andesite community.

Table D.5-1 Alternative Alignments Comparison Matrix

ENVIRON. IMPACT PARAMETER	PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS: Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi)	Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi)	Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi)	ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.)	Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2)	W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi)	Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi)	Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi)
Construction disturbance to wildlife or indirect impacts of increased access on natural communities.	Greater impact for Prop. Segment A (e.g., Swainson's hawk, bald eagle, sandhill crane) due to greater length, much less developed character, and proximity to prime habitat areas of Pit River and Warm Springs Valley.	Greater impacts for Madeline Plains alternatives (e.g., sandhill crane, sage grouse, Swainson's hawk, prairie falcon) due to greater length, less developed character, access development magnitude, and habitat variety crossed.	Greater impacts for Alt. Segment J (e.g., pronghorn, deer, raptors, sage grouse) due to greater existing isolation/less developed character, access development magnitude, and habitat variety crossed.	Greater impacts for Segment ESVA due to isolated location and greater access development (Swainson's hawk, sage grouse pronghorn, mule deer, loggerhead shrikes). Greater cumulative effects of ESVA with Tuscarora project.	Slightly greater impacts for Prop. Segment N (e.g., pronghorn, deer) due to slightly less developed character of area away from road and Wendel.	Slightly greater impacts for Prop. Segment Q (e.g., deer, sage grouse, Swainson's hawk, short-eared owl) due to greater length, isolation/less developed character, and habitat variety of area crossed.	Probably slightly greater impacts for Alternative Segments S and U (vs. T) due to greater length and habitat variety. No significant differences with Segment Z. Reduced impacts with WCFG due to greater avoidance of meadow/riparian habitats.	Slightly greater impacts with Segment Y due to existing less developed character.
Injury and mortality due to collision or electrocution.	Segment B would result in reduced bird collision potential.	Greater collision potential for Madeline Plains alternatives due to presence, right angle turn(s) of line in sensitive Madeline Plains areas (cranes, waterfowl, and other shorebirds).	Slightly greater collision potential for Prop. Segment K due to greater length in the sensitive Madeline Plains area (sandhill cranes, waterfowl, and other shorebirds).	No significant difference.	Possible slightly greater collision potential for Alt. Segment M due to closer proximity to floor of Honey Lake Valley and its associated waterfowl and shorebird habitats.	Possible slightly greater collision potential for Prop. Segment Q due to greater length, longer crossing of eastern Honey Lake Valley, and perpendicular crossing of Dry Valley.	Greater collision potential for Alternative Segments S and U (over T) due to two crossings of Long Valley Creek-bottom area, greater length, and perpendicular direction change within creek bottom area. No significant differences with Segment Z. Possible slightly greater collision impacts with Segment WCFG (vs. portion of W) due to line direction changes.	Negligible differences among these alternatives.

Table D.5-1 Alternative Alignments Comparison Matrix

ENVIRON. IMPACT PARAMETER	PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS: Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi)	Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi)	Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi)	ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.)	Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2)	W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi)	Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi)	Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi)
CULTURAL RESOURCES								
Class I Impacts								
Potentially unavoidable adverse effects on a significant cultural resource site.			Potential impacts to 2 historic sites on Proposed Segment K, with potentially difficult to mitigate impacts associated with setting, feeling, or association for potentially NRHP eligible site under criterion (a).	Potential impacts to one site on Alt. Segment ESVA vs. no Class I impacts on Proposed Segment L.			Potential impacts to a historic site on Alt. Segment S with potentially difficult to mitigate impacts associated with setting, feeling, or association for potentially NRHP eligible site under criterion (a).	
Class II Impacts								
Surface removal and disturbance of surface or subsurface cultural resource sites. Increased vandalism or unauthorized collection at cultural resource sites. Impacts to integrity of setting, feeling, or association.	Proposed Segment A would have potentially significant impacts on 17 sites. There would be potentially significant impacts on 5 sites for Alternative Segment B.	Proposed Segment E would have potentially significant impacts on 12 sites. Alternative Segment D would have potentially significant impacts on 10 sites. Segment G would have potentially significant impacts on 1 site, and potential minor adverse impacts on 1 site.	Proposed Segment K would have potentially significant impacts on 9 sites. Alternative Segment J would have potentially significant impacts on 2 sites, and potential minor adverse impacts on 2 sites.	Potentially significant impacts on 7 sites on Segment ESVA vs 13 potentially significant impacts on Proposed Segment L and Class II impacts; sites on Segment ESVA contain a higher percentage of significant data.	Alternative Segment M would have potentially significant impacts on 2 sites. Proposed Segment N would have potentially significant impacts on no sites.	Proposed Segment Q would have potentially significant impacts on 5 sites. Alternative Segment P would have potentially significant impacts on 3 sites.	Alternative Segments S and U (combined) would have potentially significant impacts on 2 sites. Proposed Segment T would have potentially significant impacts on no sites. Alternative Segment Z would have potentially significant impacts on 1 site. The corresponding portion of Proposed Segment W would have potentially significant impacts on the same site.	Proposed Segment Y would have potentially significant impacts on 3 sites. Alternative Segment X-East would have potentially significant impacts on no sites.

Table D.5-1 Alternative Alignments Comparison Matrix

PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS								
ENVIRON. IMPACT PARAMETER	**Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi)**	**Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi)**	**Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi)**	**ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.)**	**Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2)**	**W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi)**	**Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi)**	**Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi)**
				Cumulative impacts of Segment ESVA would be greater due to larger area of disturbance required for 2 separate corridors (Tuscarora).			Alternative Segment WCFG would have potentially significant impacts on 3 sites. The corresponding portion of Proposed Segment W would have potentially significant impacts on no sites.	
ENERGY AND UTILITIES								
Class I Impacts: None identified								
Class II Impacts								
Disruption of service if excavation damages other utility lines.	Potential for disruption of utility service during construction would be higher, because of a greater number of crossed overhead electrical lines, than for the Proposed Project segment.	Density of overhead utilities along the proposed alternative alignments are comparable to those for the Proposed Project.	Density of utilities is less along alternative J than for Proposed Segment K.	Density of utilities is low and comparable to those for Proposed Segment L.	Impacts would be comparable to those of the Proposed Segment N.	Potential for disruption of utility service would be similar to that for the Proposed Project	Impacts for the alternatives would be greater than those of the Proposed Project.	Impacts would be comparable to those of the Proposed Project.
GEOLOGY, SOILS, AND PALEONTOLOGY								
Class I Impacts: None identified								
Class II Impacts								
Ash fall from major volcanic eruption.	Regional impact - negligible differences between alternative and proposed segments.							

Table D.5-1 Alternative Alignments Comparison Matrix

PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS								
ENVIRON. IMPACT PARAMETER	Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi)	Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi)	Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi)	ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.)	Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2)	W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi)	Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi)	Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi)
Fault displacement of structure foundation causing collapse of structure; or displacement between structures causing stress on wires.	Proposed Segment A crosses a potentially active fault; Alt. Segment B does not.	Proposed Segment E crosses a potentially active fault twice; Alt. Segment D crosses once, but would have to connect to either Segment I or J (both of which cross faults).	No significant differences.	No significant differences.	No significant differences.	Both segments cross active faults, but Alt. Segment P is also along a fault with unknown potential, requiring further studies that could result in a required route shift if fault is found to be active.	Alternative Segment S crosses potentially active fault; Segment T does not. However Segment S fault is not highly active. No significant differences for other segments.	No significant differences.
Earthquake shaking could damage structures or substations.	A major earthquake would result in ground shaking across the entire region; there would be no significant differences in impacts between route segments.							
Landslides/slope failure caused by excavation, undercutting, loading, earthquakes, or blasting.	Segment B would probably require less blasting than Segment A.	Segment D would require more blasting than Segment E.	Segment J would require more blasting than Segment K.	Alternative Segment ESVA would require more blasting than Proposed Segment L.	No significant differences.	No significant differences.	No significant differences.	No significant differences.
Restricted access to or loss of minerals or energy resources.	No significant impacts identified.							There is a small potential source of crushed aggregate on Alternative Segment X-East.
Construction would result in grading and ground disturbance (erosion impacts).	Segment B would require less grading and potential for erosion.	Alternative Segment D would require substantially more grading & road improvement than Proposed Segment E.	Proposed Segment K would require much less grading than Alternative Segment J.	More grading would be required for Segment ESVA.	Alternative Segment M would require less grading than Segment N.	No significant differences.	Alternative Segment S (with Segment U) would require slightly more grading than Segment T. No significant differences for other segments.	No significant differences.

Table D.5-1 Alternative Alignments Comparison Matrix

PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS								
ENVIRON. IMPACT PARAMETER	**Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi)**	**Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi)**	**Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi)**	**ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.)**	**Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2)**	**W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi)**	**Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi)**	**Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi)**
HYDROLOGY								
Class I Impacts: None identified.								
Class II Impacts								
Erosion due to construction in or near streams or floodplains and resultant sedimentation and water quality impacts.	Alternative Segment B has less length in 100-year floodplain than Proposed Segment A.	No significant differences.	No significant differences.	Alternative Segment ESVA has less length in 100 year floodplain than Proposed Segment L.	No significant differences.	Alternative Segment P has greater chance of impacting perennial stream in Long Valley.	Proposed Segment T has no stream crossings and Alternative Segments S and U feature stream crossings. No significant differences for other segment pairs.	No significant differences.
Flooding during construction could interfere with construction and affect water quality. During operations, flooding could add to scour and erosion impacts.	Segment B has less length in 100-year floodplain.	No significant differences.	Alternative Segment I and J crosses more floodplains and streams.	No Significant differences.	No significant differences.	No significant differences.	No significant differences.	
Sediment loading of surface waters could result from construction.	No significant differences.	Alternative Segment D would require more grading & road improvement; more likely to cause erosion and sediment loading.	No significant differences.	No significant differences.	No significant differences.	No significant differences.	No significant differences.	
Excavation in areas of shallow groundwater may interrupt, redirect, or reduce flow to springs or wetlands.	Negligible differences.	Negligible differences.	Negligible differences.	No significant differences.	Proposed Segment N has more chance to affect groundwater during construction, but conditions are not well known.	Alternative Segment P is more likely to affect groundwater in Long Valley area.	Negligible differences.	

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Blasting may affect groundwater flow paths.	Negligible differences.	Alternative Segment D would require more blasting.	Alternative Segment J would require more blasting.	Alt. Segment ESVA would require more blasting.	Negligible differences.	Negligible differences.	Negligible differences.	
LAND USE, RECREATION, AND EDUCATIONAL, RELIGIOUS, OR SCIENTIFIC USES								
Class I Impacts								
Degradation of quality of residential uses as a result of permanent change in character of residential environment due to presence of project structures (e.g., visual impacts and EMF concerns).	Would have a greater impact on residential uses along Alternative Segment B because it would impact more sensitive land uses - several residences and a ranch compared to two residences for Proposed Segment A.	Alternative route would impact the same number of residences as Proposed Segment E; would have a greater impact on residential uses because it would cross near several undeveloped residential subdivisions and closer to a residence than Segment E.	Alternative Segment J would not impact sensitive residential uses, whereas Proposed Segment K would impact two residences.	Alt. Segment ESVA would avoid impacts on all but one residence; Proposed Segment L would potentially affect six residences.	Same impact on residential uses.	Alternative Segment P would have a greater impact on residential uses than Proposed Segment Q because it would cross closer to the rural residential development of Long Valley and to the towns of Doyle, Constantia, and Omira; it would also cross near a partially developed residential subdivision.	Alternative Segment Z would have less impact on residential uses because it would avoid crossing a partially developed residential subdivision. Segment WCFG would have a greater impact on residential uses because it would pass close to a dozen residences at Border Town. Other Segments would have same impacts as Proposed Project.	Alternative Segment X-East would impact more sensitive residential uses - an apartment complex and two residences compared to no residences for Proposed Segment Y.
Degradation of quality of recreational uses as a result of change in character of recreational environment due to presence of project structures (e.g., visual impacts).	Alternative Segment B would have minor adverse effects on city golf course, but Proposed Segment A would have minor adverse effects on recreational uses of Modoc NF.	The Madeline Plains alternative would have a greater impact than Proposed Segment E because it would cross an area that receives relatively greater recreational use, and it would cross closer to a fishing pond.	Segment J would have a greater impact than Proposed Segment K because it would cross an area that receives relatively greater recreational use.	Alt. ESVA would avoid impacts of Proposed Segment L on Tule Patch Spring Rest Area but be located on border of the Five Springs WSA.	Same impacts on recreational use.	Segment P would have a greater impact on recreational uses than Proposed Segment Q because it would cross a larger portion of the Fort Sage OHV Area.	Alternative Segments S and U would have less impact on recreational uses than Proposed Segment T because they would cross further away from the Lassen Red Rocks Scenic Area and would not have a Class I impact on this recreation area.	Same impacts on recreational uses.

Table D.5-1 Alternative Alignments Comparison Matrix

PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS								
ENVIRON. IMPACT PARAMETER	Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi)	Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi)	Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi)	ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.)	Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2)	W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi)	Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi)	Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi)
Class II Impacts								
Temporary loss of use of grazing land within and outside the ROW and disturbance to grazing animals during construction.	Alternative Segment B would have less impact because it would cross less grazing land than Prop. Segment A.	Same impacts on grazing land.	Same impacts on grazing land.	Slightly greater impacts on grazing land along Segment ESVA.	Same impacts on grazing land.	Alternative Segment P would have less impact because it would cross less grazing land than Proppposed Segment Q.	Alternative Segments would have less impact on grazing land because they would cross less grazing land than the Proposed Project.	Segment X-East would have less impact because it would cross less grazing land than Proposed Segment Y.
Temporary removal of sections of fencing and opening of gates along grazing allotments and loss of grazing animals during construction.	Segment B would have less potential for loss of animals because it would cross less grazing land than Proposed Segment A.	Same potential for loss of animals.	Same potential for loss of animals.	No significant difference.	Same potential for loss of animals.	Alternative Segment P would have less impact because it would cross less grazing land than Segment Q.	Alternative Segments would have less potential for loss of animals because they would cross less grazing land than the Proposed Project.	Segment X-East would lower impacts because it would cross less grazing land than Proposed Segment Y.
Temporary loss of use of cropland during construction.	Not of significant concern.	The Madeline Plains alternatives would have greater impact because they would cross more cropland than Proposed Segment E.	Slightly more cropland crossed by Segment I & J than Proposed K.	No significant difference.	Not of significant concern.	Not of significant concern.	Not of significant concern.	Not of significant concern.
Disturbances to residential, recreational, and agricultural uses due to increased human intrusions into relatively undeveloped areas, as a result of improved access.	Alternative Segment B would have less impact because it crosses land that has more existing access routes.	Similar increases in opportunity for human intrusion into undeveloped areas.	Increases in opportunity for human intrusion into undeveloped areas with Alt. Segment J vs. no increase for Proposed Segment K.	Alternative Segment ESVA would have a greater increase in opportunity for human intrusion in undeveloped areas.	Similar increases in opportunity for human intrusion into undeveloped areas.	Segment P would have less increase in opportunity for intrusion than Proposed Segment Q, because it would cross land that has more existing access routes.	Alternative Segments would have less increase in opportunity for intrusions than the Proposed Project, because it would cross land that has more existing access routes.	Segment X-East would have less impact than Proposed Segment Y, because it would cross land that has more existing access routes.

Table D.5-1 Alternative Alignments Comparison Matrix

ENVIRON. IMPACT PARAMETER	Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi)	Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi)	Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi)	ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.)	Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2)	W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi)	Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi)	Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi)
PROPOSED PROJECT VERSUS ALTERNATIVE SEGMENTS								
Cumulative construction impacts with other future projects in project area.	Similar.	Similar.	Similar.	Alternative Segment ESVA would have greater extent of impacts due to separation from Tuscarora pipeline route vs Proposed Segment L which parallels the Tuscarora corridor.	Similar.	Similar.	Segments S and U would have greater impacts than Proposed Segment T because it would be closer to the development of future pozzolan facilities.	Similar.
NOISE								
Class I Impacts: None identified								
Class II Impacts								
Sensitive receptors could be disturbed by construction noise.	Alternative Segment B: 10 receptors would experience severe, short-term noise impact; Proposed Segment A includes 1 such sensitive receptor.	The alternatives contain 5 sensitive receptors that would experience severe impact, whereas Proposed Segment E has none.	Neither Segments I and J nor Proposed Segment K have severely impacted receptor.	No sensitives receptor on Alt. Segment ESVA experiencing severe impact;3 receptors on Proposed Segment L exposed to severe impact.	One sensitive receptors along Segment M appearing severe construction noise, with none present along Segment N.	Two sensitive receptors along Segment P and one along Proposed Segment Q severely impacted.	The alternative contains no sensitive receptors; the proposed route contains one. One receptor along Segment WCFG severely impacted, and none along Proposed Segment W.	Selection of the X-East Alignment would result in severe noise at three receptors, which would not occur with selection of Segment Y.
PUBLIC SAFETY AND HEALTH								
Class I Impacts: None identified								
Class II/III Impacts								
Potential exposure to EMFs of cumulative increase in population in project area.	Alternative Segment B area more likely to attract future residential development and result in greater exposure.	Similar potential for exposure of a larger population.	Alternative Segment J would have a greater potential for exposure of a larger population because it would cross near the Ravendale Elementary School.	Slightly less potential for Alt. Segment ESVA due to more remote location.	Similar potential for exposure of a larger population.	Similar potential for exposure of a larger population.	Similar potential for exposure of a larger population, except for Alternative Segment WCFG which would have greater potential impacts because it crosses near existing residential development	Alt. Segment X-East would have greater potential impacts because it crosses near existing residential development that is more likely to attract future development.

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ENVIRON. IMPACT PARAMETER	**Alturas Area Alternative Segment B (4.6 mi) vs. Proposed Project Segment A (7.1 mi)**	**Madeline Plains Alternative Segments D,F,G,H,I (approx. 25 mi) vs. Proposed Project Segment E (18.1 mi)**	**Ravendale Alternative Segments J and I (19.2 mi) vs. Proposed Project Segment K (15.4 mi)**	**ESVA Alternative Segment (23 mi.) vs. Proposed Project Segment L (21.1 mi.)**	**Wendel Alternative Segment M (3.6 mi) vs. Proposed Project Segment N (3.2)**	**W. Fort Sage Mtns. Alternative Segment P (17.6 mi) vs. Proposed Project Segment Q (21.0 mi)**	**Long Valley Alt. Segments S,U (5.9 mi) vs. T (4.9 mi) Z (4.5 mi) vs. W (3.8 mi) WCFG (4.2 mi) vs. W (4.0 mi)**	**Peavine Peak Alt. Segment X-East (2.3 mi) vs. Proposed Project Segment Y (2.1 mi)**
SOCIOECONOMICS AND PUBLIC SERVICES								
Class I Impacts: None								
Class II Impacts: There would be similar potential impacts on property values and public services for all proposed and alternative segments.								
TRANSPORTATION AND TRAFFIC								
Class I Impacts								
An accident or structural failure could potentially result in blockages of highways and/or rail facilities; this would be compounded by the cumulative effects of multiple accidents in the event of a major catastrophe.	Similar impacts since both segments cross Route 299.	Similar impacts.	Alternative Segments I and J have slightly less impacts due to distance from U.S. 395.	Less potential for Alt. Segment ESVA due to separation from U.S. 395.	Proposed Segment N has less impacts since alternative crosses S railroad tracks twice, whereas proposed segment doesn't cross tracks.	Similar impacts.	Proposed Segment T has less impacts since Alternative Segments S and U add two additional UP railroad and U.S. 395 crossings.	Similar impacts.
Class II Impacts								
Construction roadway blockage and traffic congestion resulting in increased accident risk, and restricted emergency access.	Proposed Segment A affects less roadways (3 vs. 5); both affect Route 299.	Alternative routes are farther from U.S. 395, thereby minimizing traffic disruptions.	Alternative Segment J is farther from U.S. 395, thereby reducing traffic disruptions.	Slightly less potential for Alt. Segment ESVA due to separation from U.S. 395.	Similar impacts.	Similar impacts.	Proposed Project preferred since it is farther from U.S. 395, thereby minimizing traffic disruptions.	Similar impacts.
Interference with navigable airspace and decreased safety for aviation activities.	Alternative Segment B is closer to Alturas Municipal Airport and impacts would be much more difficult to mitigate.	Proposed route least disruptive to crop spraying. F less disruptive than G.	Proposed Segment K is closer to airport, but Alt. Segment I is in crop dusting area.	No difference.	Similar impacts.	Alternative Segment P is closer to Herlong Airport.	Similar impacts.	Similar impacts.

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VISUAL RESOURCES								
Class I Impacts								
Significant degradation of scenic quality and creation of moderate-to-strong visual contrast and landscape change. Generally has high degree of visual access.	Alternative Segment B would have greater visual impacts because its 230 kV double circuit line and substation would be more prominent and located closer to residential and recreational development in the City of Alturas.	Use of the Madeline Plains alternatives would have less visual impacts because it would have relatively restricted visual access, would generally appear as a subordinate background feature, and would not be located as close to U.S. Highway 395.	Segment J would have less visual impacts than Proposed Segment K because it would have significantly less visual access, visual contrast, and visual impact on views from U.S. Highway 395, but Segment I would have Class I visual impacts.	Alternative Segment ESVA would have lower level of visual impacts due to avoidance of U.S. 395 corridor.	Similar impacts.	Alternative Segment P would have substantially greater visual access due to proximity to a major travel corridor and would have an adverse impact on the scenic quality of the Fort Sage Mts.	Alternative Segments S and U would have less visual impact than Proposed Segment T because they would avoid significant degradation of views to the Lassen Red Rocks Scenic Area. Alternative Segment WCFG (from WNØ6-WN10) would have greater visual impact than Proposed Segment W because it would be located closer to U.S. Hwy 395 (for greater length) and residences at Border Town.	Segment X-East would have greater visual impacts because it would be located closer to the Hoge Road Subdivision and would have greater prominence as a foreground visual feature.
Class II Impacts								
Short-term impaired scenic quality resulting from the presence of equipment, materials and workforce during construction, and the construction of access and spur roads.	Alternative Segment B would have greater impacts because it would be located closer to the City of Alturas and to the staging area near the Alturas Lumber Yard. However, Segment A would result in excessive visual access to Alturas Substation through cleared juniper forest.	Proposed Segment E would have greater impacts because it would be located closer to U.S. Highway 395 and to the staging area near E07 and the gravel pits.	Alternative Segment J would have less impacts because it would have significantly less visual access and be located further away from U.S. 395.	Alternative Segment ESVA would have significantly lower level of visual impacts due to avoidance of U.S. 395 corridor.	Segment M would have greater impacts because it would be located closer to the staging area on Wendel Road.	Alternative Segment P would have greater impacts because it would have substantially greater visual access due to its proximity to a major travel corridor.	Segments S and U would have less impacts than Proposed Segment T because they would be located further away from the Lassen Red Rocks Scenic Area.	Segment X-East would have greater impacts than Proposed Segment Y because it would be located closer to a residential area and would have greater prominence as a foreground visual feature.

PART E. ADDITIONAL LONG-TERM IMPLICATIONS

E.1 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY OF THE ENVIRONMENT

Under CEQA Guidelines, Section 15126(e), an EIR must give special attention to effects which narrow the range of beneficial uses of the environment or pose long-term health and safety risks. In addition, the reasons why the project applicant believes the Proposed Project is justified now, rather than reserving an option for future alternatives, should be explained.

The Proposed Project involves construction and operation of a transmission line and associated substations. Sierra Pacific Power Company (SPPCo) anticipates an indefinite life expectancy for the project, assuming regular maintenance and repairs. Because most of the proposed transmission line would be located in rural areas, the project is not expected to significantly restrict existing land uses in the vicinity of the transmission line. Future uses that require structures (e.g., residences, commercial businesses) would be prohibited within the 160-foot transmission line right-of-way (ROW). However, cattle grazing and agricultural uses which are predominant uses along the route would not be prohibited within the ROW.

The operation of the transmission line would present an additional source of electric and magnetic fields (EMFs) along the proposed transmission line ROW. As discussed in Section C.10 (Public Safety and Health), at the edge of the project ROW (80 feet from transmission line), the calculated EMF level would meet the existing standards for those states with standards (California and Nevada have no standards), with the exception of the residential limit imposed in Montana. In addition, all residences within the vicinity of the Proposed Project would be at least 300 feet away from the transmission line, with the exception of a single-family residence on Segment L and an apartment complex on Segment X. As presented on Figures C.10-3 through C.10-10, at a distance of 300 feet, the EMF values would be comparable to common household appliances (see Tables C.10-1 and C.10-2).

The Applicant asserts that the Proposed Project is justified now because of existing system limitations and the need to accommodate anticipated growth. As discussed in Section A.6 (Purpose and Need for the Project), insufficient transmission capability restricts SPPCo's ability to serve existing wholesale customers within prudent utility practices. In addition, an augmentation of SPPCo's system would be required by the summer of 1997, if projected growth rates are realized. Postponement of this project would likely result in development of another transmission line project in the region to satisfy projected demand and system reliability concerns. As discussed in Section A.6.2.2, SPPCo expects to continue utilizing geothermal resources as part of its supply base through its Request for Proposal process, as has been historically done.

E.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Pursuant to Section 15126(f) of the CEQA Guidelines, significant irreversible environmental changes must be identified and may include the following:

- Use of non-renewable resources during the initial and continued phases of the project which would be irreversible because a large commitment of such resources makes removal or nonuse thereafter unlikely;
- Primary impacts and, particularly, secondary impacts which commit future generations to similar uses (such as a highway improvement that provides access to a previously inaccessible area); and
- Irreversible damage which may result from environmental accidents associated with the Project.

The transmission line construction phase would require an irretrievable commitment of natural resources from direct consumption of fossil fuels, construction materials, the manufacture of new equipment that largely cannot be recycled at the end of the project's useful lifetime, and energy required for the production of materials. Furthermore, construction of the transmission line would necessitate vegetation and habitat removal. If the transmission line ROW was properly restored and revegetated through mitigation measures recommended in this EIR/S, permanent loss of biological resources would be confined to project structure locations and new access roads.

During the project's operational phase, the transmission line would allow for the transport of additional electrical power generated from renewable resources (hydroelectric) and the transport of power generated from non-renewable resources (e.g., coal, natural gas), since the project would improve the ability of the Applicant to transmit additional power generated within and outside of its service area (see Section A.6, Purpose and Need). Therefore, operation of the transmission line does commit the future use of potentially significant amounts of non-renewable resources.

With regard to irreversible damage, the potential exists for a transmission line accident which could cause a fire along the proposed ROW. An accidental fire could result in loss or damage to sensitive biological resources, residential uses, and cultural resources or sites. The potential risk and consequences of transmission line accidents and associated fires are mitigated to the extent possible with implementation of numerous mitigation measures outlined in this document. However, the risk cannot be completely eliminated, thus the potential for irreversible damage remains.

E.3 GROWTH-INDUCING IMPACTS OF THE PROPOSED PROJECT

E.3.1 INTRODUCTION

CEQA requires discussion of the growth-inducing impacts of a proposed action. NEPA does not have a similar requirement. Section 15126(g) of the CEQA Guidelines states:

> *Discuss the ways in which the Proposed Project could foster economic or population growth, or the construction of additional housing, whether directly or indirectly, in the surrounding environment.*

Included in this are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may further tax existing community service facilities so consideration must be given to this impact. Also discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, whether individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

Potential growth-inducing impacts of the proposed Alturas Transmission Line Project could be manifested in several ways:

- Growth resulting from the direct and indirect employment needed to construct and operate the Proposed Project
- Growth resulting from the additional power that would be transmitted by the Proposed Project
- Growth resulting from the presence or expansion of project facilities.

E.3.2 EXISTING SETTING

Several geographic areas could be subject to growth-inducing impacts resulting from the Proposed Project: (1) the Proposed Project alignment; (2) SPPCo's service area, which would receive the new power supply and which encompasses a small portion of California (Truckee and Tahoe) and the northwest Nevada region (including the Reno/Sparks urban area); (3) Lassen County, California, which is crossed by the project route and is slated for future tie-in to the proposed transmission line (year 2004 at the earliest); and (4) other areas that would receive additional power because of an increase in SPPCo's import capacity.

Population growth in the above areas is described in Section C.11, Socioeconomics and Public Services. Growth projections for SPPCo's service area were reviewed for this analysis. In general, the Nevada economy has begun to recover from the recession more rapidly than either the nation or California. According to *Nevada Business and Economic Indicators* (University of Nevada, 1994), taxable sales, gaming revenues, industrial employment, and personal income growth increased in the second half of 1993. Also, forecasts suggest that 1994 taxable sales and gaming revenues will grow 10 to 14 percent and industrial employment at about five percent.

The State of Nevada experienced a 4.1 percent increase in population in 1993 versus a 1.1 percent increase nationwide for the same year. Washoe County, Nevada, which comprises a large section of SPPCo's service area, grew 2.3 percent in 1993. While an average annual growth rate of 1.7 percent is projected for Washoe County through 2015, the years 1994 - 2000 are expected to experience as high as 2.4 percent annual growth.

E.3.3 POTENTIAL GROWTH-INDUCING EFFECTS

E.3.3.1 Project Employment-Related Growth

As described in Section C.11, Socioeconomics and Public Services, the direct and indirect employment needed to construct and operate the proposed transmission line would not result in significant population inmigration into the study area. Most of the required labor force would be needed on a short-term basis during the construction phase. Over the long-term, operation of the Proposed Project would require very few employees and, therefore, the Project would have a negligible effect on population growth.

E.3.3.2 Growth Related to Provision of Additional Electrical Power

By providing a means to transmit a substantial amount of additional electric power into and through SPPCo's service area, the Alturas Transmission Line Project could significantly contribute to growth in SPPCo's service area, Lassen County, and other regions serviced by utilities who are interconnected to SPPCo.

E.3.3.2.1 *SPPCo Service Area*

Based on projections for residential and industrial growth in the service area, SPPCo predicts an average growth rate in power demand of 4.31 percent for the years 1993 to 1997. Given existing service system constraints, the enhancement of SPPCo's system with the Proposed Project would facilitate growth in SPPCo's service area, but would not directly induce growth. For example, the land use planning process for the various Reno region jurisdictions define areas of future development and desired densities through a public process and appropriate decision body approval(s). The Proposed Project did not cause these future community growth goals, but rather, SPPCo is responding to growth through the projected land use planning process. SPPCo's population projections are generally consistent with local jurisdiction growth projections in the region. It is noted that commercial and industrial growth in SPPCo's service area has been encouraged and promoted both by local agencies and SPPCo. Furthermore, the provision of an inexpensive source of electricity would be an incentive to industries to locate within Sierra's service area. The establishment of new industrial facilities would result in direct and indirect population growth from industry-related employment and support facilities. In some cases, businesses may relocate from California to Nevada in response to the provision of inexpensive power and encouragement from SPPCo and local commerce groups (as has been the case in recent years).

E.3.3.2.2 Lassen County

The Alturas Transmission Line Project could also significantly contribute to growth in Lassen County if an interconnection is established between the Proposed Project and LMUD. SPPCo has indicated that it would make its system available for a tie-in with LMUD, through a Memorandum of Understanding (MOU) executed between LMUD and SPPCo, reserving 50 MW of transmission service for LMUD from January 1, 1996 until January 1, 2005. No specific plans have been proposed, however SPPCo anticipates making an intertie in approximately the year 2004. At the time such plans are developed, new applications would be required to be filed with appropriate agencies. Future applications would be subject to a separate CEQA process. A future LMUD interconnection would facilitate future growth within the LMUD service area, but would not directly induce growth.

E.3.3.2.3 *Other Regions*

As discussed in Section A.6.2.3, other utilities, which are imbedded in SPPCo's system, utilize SPPCo's transmission system to wheel electric power from other utilities who are outside the SPPCo service area. With the Alturas Project, the amount of power to be wheeled into and through SPPCo's system would increase (since SPPCo's import capacity would increase), as evidenced by the wheeling requests received by SPPCo (see Table A-4 and Section A.6.7.1). Future growth would be facilitated in the areas that are serviced by utilities requesting this additional power, but additional wheeling capabilities would not directly induce growth.

E.3.3.3 Growth Related to Existence or Expansion of Project Facilities

The Proposed Project and its associated facilities could entice future growth by virtue of their presence, as follows:

- Expansion of Border Town facilities to service new growth within SPPCo's service area
- Interconnection to Proposed Project facilities by other utilities and Independent Power Producers
- Construction of additional transmission lines parallel to the Proposed Project
- Development of additional generation in the Pacific Northwest
- Growth in communities along the transmission line that could gain fiber optic service.

E.3.3.3.1 *Expansion due to New Growth in SPPCo Service Area*

The Proposed Project PEA and SPPCo's 1993 Electric Resource Plan both refer to future expansion of the Border Town Substation facilities into the North Valleys area. There has been some concern expressed over this future expansion and associated growth-inducing impacts. At this time, SPPCo does not have a definite long-term expansion plan for the Border Town Substation, but through its planning process, SPPCo has identified the use of the Border Town Substation for future expansion into the North Valley area as an option.

Because of restrictions on water and sewer service availability in the North Valleys area, the majority of recent and projected growth in the area has occurred in Stead, which is located within the North Valleys, but is under the jurisdiction of the City of Reno. The North Valleys planning area is defined in part by the Antelope Valley, Cold Spring Valley, Lemmon Valley and Long Valley Hydrographic Basins. These basins are designated groundwater systems. Given present conditions, all ground waters in the North Valleys planning area are totally appropriated and as a result growth within the unincorporated North Valleys area has been severely restricted (Washoe County, 1993). Stead does not have the same growth restrictions placed on it as does the unincorporated North Valleys area, since water service to the eastern portion of Stead is provided by pipeline from the Truckee River; a major source of water for the Reno region. Currently, about 900 acre feet per year of water is delivered to the Stead area, with system capacity of up to 3000 acre feet per year.

As growth in the Stead area occurs, expansion of additional transmission facilities to the area would be required. Currently, Stead is served by an existing 60 kV transmission system that is capable of reliably serving approximately 43 MW of load. In 1994, the peak demand was 26.5 MW. Depending on the rate of growth, a 120 kV transmission addition could be required within the next 5 to 10 years (SPPCo, 1995c).

In its long range planning studies, SPPCo has identified two options for servicing future Stead growth: 1) a 120 kV source into Silver Lake Substation from Tracy and 2) a 120 kV source into Silver Lake Substation from Border Town. If the Alturas Transmission Line Project were approved as proposed, and growth in the North Valleys warranted a 120 kV transmission addition, then SPPCo would consider the addition of a 345/120 kV transformer at the Border Town Substation and a 120 kV transmission feed to the Silver Lake Substation. At the time such plans are developed, new applications would be required by responsible agencies. Future applications would be subject to a separate environmental review process.

Similar to the growth facilitation aspects that the Proposed Project provides land uses within SPPCo's system, the expansion of the Border Town substation facilities and expansion of a 120 kV line to the Stead area would not directly induce growth in the Stead area, but would facilitate growth planned or projected by the local jurisdictions. However, expansion of the Border Town Substation and construction of a 120 kV line to Stead could occur. Construction of these required facilities would impose additional environmental impacts, especially visual and land use impacts. Given that no definite plans have been designed for future facility expansion, any further identification of impacts associated with the expansion would be speculative at this time.

SPPCo has also indicated that a second 345 kV phase shifter might be required in the future for two reasons: (1) to maintain system reliability by providing a secondary backup phase shifter, especially as total system imports increase over time, and (2) depending on the resultant operation of the western utility system with the Proposed Project, desired transfer capacity might not be realized (Nelson, 1995). The addition of a second phase shifter at the Border Town Substation would contribute to growth within SPPCo's system by facilitating service, but would not directly induce growth.

E.3.3.3.2 *Interconnection to Proposed Project Facilities*

Concern has been expressed as to the potential of SPPCo or other utilities to interconnect future transmission or generation projects to the Proposed Project, particularly at the Border Town Substation. This concern has been propagated by several factors: 1) The designation of the Border Town region as an intersection for several existing and proposed transmission corridors in the 1992 Western Regional Corridor Study prepared by the Western Utility Group (WUG) (see Figure E-1); 2) the identification of

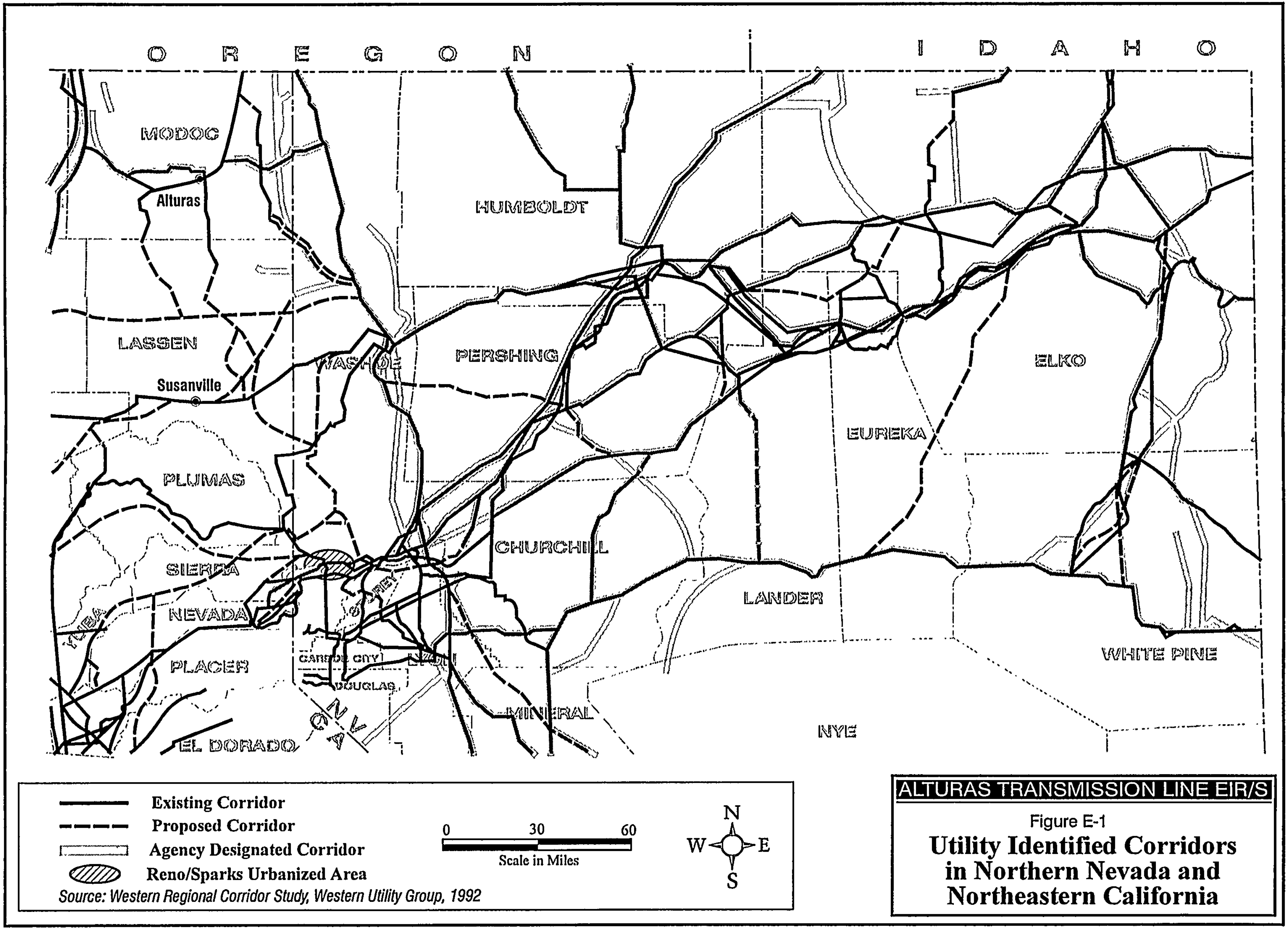

Figure E-1

Utility Identified Corridors in Northern Nevada and Northeastern California

potential alternative alignments that traverse the Border Town region for a future Transmission Agency of Northern California (TANC) transmission line project; and 3) a list of potential transmission and generation projects presented in SPPCo's 1995 - 2014 Electric and Gas Integrated Resource Plan (1995 IRP).

It should be noted that the utility corridors identified in the 1992 Western Regional Corridor Study have been identified by the WUG. The BLM and USFS utilize the corridor study as a reference document in the development of Land Management Plans and Forest Plans, respectively, and when considering land use decisions. However, simply because the WUG identified a future corridor, does not mean that the corridor is considered permittable by the appropriate agencies.

The BLM made inquiries of TANC and Plumas-Sierra Rural Electric Cooperative (a local utility and member of TANC) as to its intentions with respect to future interconnections at Border Town. In its response, TANC stated that its primary objective is to increase the transmission capacity between Central California and Southern Nevada, generally referred to as the Central California-Desert Southwest Transmission Project (CCDSW) (TANC, 1995).

In pursuit of this objective, during 1992 and early 1993, TANC conducted internal studies to assess the potential feasibility of alternative methods whereby the transmission system transfer capability between the southern terminal of the California-Oregon Transmission Project in central California and the desert Southwest could be firmed up and increased. During late 1993 and the first four months of 1994, TANC, PG&E, the Southern California Edison Company, and the Los Angeles Department of Water and Power conducted planning-level studies which identified and evaluated certain alternative transmission projects (either the upgrading of existing facilities or the development of new facilities) that would meet the goals of the parties. The original alternatives outlined by TANC focused on options traversing the high desert area northeast of the Los Angeles Basin. However, as the studies progressed, options were added that extended from southern California to the Marketplace/Allen area in southern Nevada, and subsequently, options were added that would cross the Sierra Nevada north of Lake Tahoe and then continue in a south-westerly direction towards the Marketplace/Allen area. According to TANC, the trans-Sierra options would pass near the area of the Border Town Substation, but would not interconnect with Border Town or any existing or proposed transmission facilities in the area northwest of Reno.

Since the fall of 1994, TANC and several other parties have been undertaking certain joint planning activities to determine if interest might exist in selecting a potential project for future evaluation and study. These studies are anticipated to be completed in late 1995 or early 1996. To date (September, 1995), neither a description of a project or a permitting/construction schedule have been developed. According to Plumas-Sierra Rural Electric Cooperative, it is opposed to and is discouraging a CCDSW project, including a trans-Sierra option (Plumas, 1995).

SPPCo also conducted an investigation to determine if the needs of TANC could be met with the Alturas Transmission Line Project or a modified Alturas Project. Since TANC's and SPPCo's needs, including timing, differed significantly, SPPCo concluded that a joint project would not successfully meet both parties' needs (SPPCo, 1995d). SPPCo has listed the TANC project and the trans-Sierra alternative as future options to be considered to meet system and customer requirements in its 1995 IRP. However, the 1995 IRP states that SPPCo does not believe a trans-Sierra tie is a viable transmission alternative at this time.

Given the objective of TANC to increase transmission capacity between Central California and Southern Nevada, an interconnection to SPPCo's system, regardless of whether an interconnection point were at Border Town or elsewhere, is not a stated a sub-objective of TANC. However, an interconnection with SPPCo would add another customer to TANC's customer base for power sales and might provide SPPCo with some improvement in import capacity, both aspects being desirable from a utility perspective. As suggested by Plumas-Sierra Rural Electric Cooperative, if a route were to be built that connects TANC and SPPCo, the two most likely alignments are a northern route going from Redding to SPPCo, somewhere through northern Lassen County, or a re-building of the existing 115 kV line that runs along I-80 from Truckee to Sacramento. At this time, it appears to be unlikely that the expansion of the Border Town Substation would be required because of TANC's plans for the CCDSW project.

SPPCo's 1995 IRP also states that SPPCo is requesting approval from the Public Service Commission of Nevada to expend $600,000 over a three-year period to investigate and select a site, option land, install an air quality monitoring tower, and begin permitting and development of a new generation site in its Northern Nevada service territory. Potential sites to be addressed in this analysis include the Carlin Trend, Oreana, middle to northern Washoe County, or northeastern California (along the proposed Alturas Transmission Line Project and Tuscarora Pipeline routes). The Valmy Power Plant site is also to be considered.

In summary, no growth-inducement impacts are expected related to the future expansion of the Border Town Substation; however, interconnection of another major transmission or generation project along the Proposed Project, other than Border Town, could occur in the future. However, the likelihood, character, and impacts of such an interconnection are virtually impossible to project since no plans exist at this time and any further analysis would be extremely speculative. Any such project would be subject to additional environmental review at the time that concrete proposals are brought forward.

E.3.3.3.3 *Expansion as a Utility Corridor*

Figure E-1 illustrates the existing and proposed utility corridors (as proposed by WUG) within northeastern California and northern Nevada. Many of these utility corridors contain major transmission lines. In some cases, the corridors have been designated as "right-of-way corridors" by the BLM and/or USFS. Concern has been raised as to the potential of future transmission facilities being constructed within or parallel to the proposed Alturas Transmission Line Project right-of-way.

Section C.8.2.3.2 of this Final EIR/S presents California Senate Bill 2431, which provides guiding policies for planning and developing new transmission facilities, as follows:

(1) Encourage the use of existing right of way by upgrading existing transmission facilities where technically and economically feasible.

(2) Encourage expansion of existing right of way, if technically and economically feasible, whenever construction of new transmission lines is required.

(3) Provide for the creation of new right of way if justified by environmental, technical, or economic reasons, as determined by the appropriate licensing agency.

(4) Seek agreement among all interested utilities on the efficient use of new transmission capacity whenever there is a need to constrict additional capacity.

The California Energy Commission, in cooperation with the California Public Utilities Commission, is responsible for the implementation of the Senate Bill 2431 policies. As new transmission facilities are proposed, the noted State agencies would assess the consistency of the proposed projects with the above policies (a consistency analysis for the proposed Alturas Transmission Line Project with California Senate Bill 2431 policies is presented in Section C.8.2.3.2). Depending on the objectives of future projects, the proposed Alturas Transmission Line Project could facilitate the implementation of policies (1) and (2) above.

The Proposed Project traverses lands of both the Modoc and Toiyabe National Forests. In their review of the Proposed Project, both National Forests are considering the amendment of their respective Forest land management plans to designate the Proposed Project alignment as a "right-of-way corridor." If the "right-of-way corridor" designation were to be applied, the land management regulations and policies that direct the operations of both National Forests would require the Modoc and Toiyabe Forests to encourage, but not require, the siting of future utilities, including transmission facilities, within the designated right-of-way corridors.

The Bureau of Land Management (BLM) mandates regarding designated corridors are contained in the regulations and BLM Manuals. Section 2800.0-5(l) of Title 43, Code of Federal Regulations, defines a "designated right-of-way corridor" as follows:

> *Designated right-of-way corridor means a parcel of land either linear or areal in character that has been identified by law, by Secretarial Order, through the land use planning process or by other management decision as being a preferred location for existing and future right-of-way grants and suitable to accommodate more than 1 type of right-of-way or 1 or more rights-of-way which are similar, identical or compatible;*

The BLM is <u>not</u> proposing to amend its Land Management Plan(s) to designate the Proposed Project alignment through BLM lands as a "right-of-way corridor." However, the Proposed Project would satisfy the federal definition of "transportation and utility corridor" in Section 2800.0-5(n) of Title 43, Code of Federal Regulations:

> *Transportation and utility corridor means a parcel of land, without fixed limits or boundaries, that is being used as the location for 1 or more transportation or utility right-of-way.*

It should be noted that portions of the proposed route for the Proposed Project currently meet this definition due to the presence of existing transportation and utility rights-of-way such as Highway 395 and various railroads, telephone and power lines, and county roads. In addition, BLM policy concerning the use of designated right-of-way corridors is contained in BLM Manual 2801.11.A, Corridor Philosophy.

> *BLM will manage right-of-way use of public land through a system of designated corridors. Use of designated right-of-way corridors for future right-of-way grants will be actively encouraged by BLM. The presence of a designated right-of-way corridor or a system of designated right-of-way corridors does not preclude the granting of a right-of-way on public land outside a designated corridor, whenever appropriate.*

The State and Federal policies identified above would encourage, but not require, these respective agencies to site future utility projects within or adjacent to the Proposed Project right-of-way. For example, the Modoc National Forest has an existing designated right-of-way corridor that travels in an easterly direction from Alturas to the Los Angeles Department of Water and Power 1000 kV DC transmission line. However, the Forest has stated that this designated right-of-way corridor would be inappropriate for the Nevada Route Alternative (Henderson, 1995). In addition to the State and Federal policies guiding the planning and location of transmission lines, other factors that would be taken into consideration would include the objectives of future projects, available alternatives, environmental impacts, and technical and regulatory feasibility. However, if the Proposed Project were to be approved and constructed, it would impose a growth-inducement potential, especially in light of the noted State and Federal regulatory direction.

E.3.3.3.4 *Development of Additional Generation in the Pacific Northwest*

There is also the possibility that tapping into the Bonneville Power Administration (BPA) system would encourage further development of electric power resources in the Pacific Northwest (BPA transmits hydroelectric and nuclear power generated in the Pacific Northwest). Although an in-depth analysis of the impact on Pacific Northwest power production is beyond the scope of this EIR/S, exporting more electric power from that region could theoretically stimulate new or expanded Pacific Northwest power production, including hydroelectric, natural gas, coal, and nuclear.

Hydroelectric. Hydroelectric power production is dependent on snowfall and runoff; therefore, power supply varies on a seasonal basis. BPA does not have a firm agreement with SPPCo and thus is not committed to supplying fixed amounts of power on a regular basis. With the Proposed Project in place, additional demand for this generation resource might occur because purchasers, other than SPPCo, could utilize the increased capacity of SPPCo's system to acquire hydroelectric power. However, like SPPCo, these purchasers would not have firm agreements with BPA, given the varying availability of hydroelectric power. Finally, as described in Section A.6.9.1, hydroelectric operations in the Pacific Northwest are undergoing a federal System Operation Review (SOR) process which could result in a reduction in current regional hydroelectric power generation. Therefore, there is little potential for an increase in hydroelectric production as a result of the Proposed Project.

Natural Gas, Coal, Nuclear. The western U.S. energy market relies on diverse energy sources, including natural gas, coal, hydroelectric, and nuclear. If available hydroelectric resources were depleted because of the SOR process to such a level that additional supply were needed, additional natural gas, coal, or nuclear generation could be developed in the Pacific Northwest. However, this event is unlikely because, as discussed in Section A.6, the electric power system of the western United States is interconnected via an integrated system of transmission lines. Over this collective transmission system, excess generation is transferred from one utility to another. A supply shortfall in one region of the western United States could likely be satisfied by other regions. With the Proposed Project in place, the ability of the Pacific Northwest to purchase power from other regions would be enhanced.

As discussed in Section A.6.9.1, even without access to economy energy from the Pacific Northwest, the Proposed Project is still required based on the other project objectives (increased import capacity, improved service reliability).

E.3.3.3.5 *Growth Due to Fiber Optic Service*

As described in Section B.2.2.4, SPPCo's proposed communication facilities would expand fiber optic facilities to areas without such service (e.g., Alturas). If the Proposed Project were to be approved, with the fiber optic communication facilities in place, other utilities could connect to the facilities (subject to the discretion of SPPCo) and provide fiber optic service to the local region. The provision of this improved communication service could increase competition among service providers and stimulate growth in that area, subject to applicable regulations.

E.3.3.4 Growth-Related Environmental Impacts

Several of the jurisdictions within SPPCo's service area are experiencing impacts to resources, public facilities, city services, and housing markets as a result of recent growth. Projected growth that is facilitated by the Proposed Project may exacerbate these impacts. One natural resource of particular concern in Nevada is potable water supply. Air quality is another critical issue since portions of Washoe County are non-attainment areas for carbon monoxide, ozone, and particulate matter. However, it is the responsibility of local cities and counties to place planning controls on new development in order to not overtax natural resources and public services; the degree to which they may accomplish this is largely dependent on their respective political processes and, ultimately, their responsiveness to public and environmental needs and concerns.

The construction of another transmission line within or parallel to the proposed Alturas Transmission Line Project right-of-way would impose similar environmental impacts as the Proposed Project; however, cumulative visual and land use impacts would be more severe since multiple transmission lines would be in place. The impacts associated with a future transmission line or generation facility interconnection would be dependant on the location, physical characteristics, and construction procedures for such a project.

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PART F. PROPOSED MITIGATION MONITORING, COMPLIANCE, AND REPORTING PLAN

F.1 INTRODUCTION

Part F describes the mitigation monitoring process for the Proposed Project and the roles and responsibilities of government agencies in implementing and enforcing the selected measures.

This EIR/S includes provision for a Mitigation Monitoring Program for the mitigation measures proposed herein for the Alturas Transmission Line Project. The purpose of a Mitigation Monitoring Program is to ensure that measures adopted to mitigate or avoid significant impacts are actually implemented as intended. In addition, the Mitigation Monitoring Program would be used to ensure that measures incorporated as part of the Project Description to avoid or mitigate potential impacts (e.g., no placement of structures within river or stream beds) are realized in the final project design and construction.

To guide the Mitigation Monitoring Program, a Mitigation Monitoring, Compliance, and Reporting Plan (MMCRP) is defined herein. The California Public Utilities Commission (CPUC) and Bureau of Land Management (BLM), the State and Federal Lead Agencies for the project, respectively, and any monitors they may designate, would utilize the MMCRP as a working guide to monitor the implementation of mitigation measures by the Applicant, Sierra Pacific Power Company (SPPCo), and its contractors. Designated Lead Agency monitors would be present during all phases of project construction to ensure that the MMCRP is adhered to. The U.S. Forest Service (USFS) would also implement the MMCRP on National Forest System lands, including the Modoc and Toiyabe National Forests.

F.2 ORGANIZATION OF THE FINAL MITIGATION MONITORING, COMPLIANCE, AND REPORTING PLAN

In Part C (Environmental Analysis) of this EIR/S, mitigation measures were identified for each impact assessed. For each environmental issue area, a mitigation monitoring program that summarizes the requirements of each identified mitigation measure was developed and presented at the end of each section (C.2 to C.13). In addition, the mitigation monitoring programs are presented in their entirety in Section F.6. Many of the mitigation measures proposed in Part C require the preparation of a plan detailing the specific techniques to be utilized in mitigating identified impacts. In most cases, the objectives and guidelines for the plan are identified within the mitigation measure. However, in the case of the Community and Habitat Restoration Plan, the specific requirements of the plan are identified in Appendix E.3 (see Volume III).

If the Alturas Transmission Line Project is approved, an MMCRP would be adopted by the Lead Agencies (CPUC and BLM) to implement the mitigation monitoring program included in this EIR/S. The suggested outline for the MMCRP is presented below for the Proposed Project that reflects the mitigation measures identified in Part C. Subsequent to project approval, the Lead Agencies would finalize the MMCRP in consideration of additional information that may be received from affected jurisdictions, the Applicant, the public, and the agencies' mitigation monitoring experience.

ALTURAS TRANSMISSION LINE PROJECT
MITIGATION MONITORING, COMPLIANCE, AND REPORTING PLAN

General Outline

1. INTRODUCTION

1.1 Plan Overview [including Mitigation Monitoring Program Summary Table (from EIR/S, CEQA Findings, and ROD)]
1.2 Authority and Purpose of Plan/Agency Roles and Responsibilities
1.3 Plan Adoption

2. PLAN OF DEVELOPMENT: PROJECT CONSTRUCTION, OPERATION, AND MAINTENANCE

[to be provided by SPPCo per CPUC/BLM requirements, and to include detailed photo alignment maps showing structure sites and construction details such as access routes, bladed and cleared areas, tree clearance plans, etc.]

3. PRE-CONSTRUCTION PLANS AND COMPLIANCE CRITERIA

3.1 Earth Resources:
- Seismic and Geotechnical Studies/Design
- Soil Conservation and Erosion Control Plan
- Blasting Plan

3.2 Biological Resources:
- Construction Access Field Surveys and Mitigation Plan
- Stream Crossings and Wetlands Protection Plan
- Community and Habitat Restoration Plan [summary, with reference to Appendix]
- Wildlife Construction Disturbance Prevention Plan
- Off-Site Habitat Compensation Plan

3.3 Cultural Resources:
- Historic Properties Treatment Plan [summary, with reference to separately bound (and confidential) report]
- Construction Monitoring Plan

3.4 Other Environmental Resources:
- Fugitive Dust Control
- Utilities Coordination
- Landowner/Community Construction Notice and Coordination
- Fire Prevention and Suppression Plan

- Transportation Management Plan
- Visual Impact Minimization

3.5 Resource Mapping and Construction Flagging

4. EDUCATION AND TRAINING

4.1 Monitoring and Agency Personnel
4.2 SPPCo and Construction Personnel

5. MITIGATION MONITORING PROGRAM ORGANIZATION AND MANAGEMENT

5.1 Program Organization
- Team Overview/Organizational Chart
- Specific Roles, Responsibilities, Qualifications, and Authorities of Team Members [mitigation compliance, monitoring, enforcement, management, quality assurance]

5.2 Communication
5.3 Dispute Resolution
5.4 Scheduling and Resource Allocation and Control

6. MITIGATION MONITORING PROGRAM IMPLEMENTATION

6.1 Training and Start-Up Coordination [with reference to Section 4]
6.2 Monitoring Procedures
6.3 Documentation and Reporting
6.4 Contingency Plan for Changes or Corrective Action

APPENDIX

Community and Habitat Restoration Plan [including contingency plan for restoration failures to meet success criteria]

HISTORIC PROPERTIES TREATMENT PLAN [separately bound (and confidential) document]

F.3 ROLES AND RESPONSIBILITIES

This Section provides the recommended framework for the implementation of the MMCRP as it would be managed by each of the two Lead Agencies: the CPUC and BLM. The role of the Applicant is also described.

F.3.1 CALIFORNIA PUBLIC UTILITIES COMMISSION

The Public Utilities Code in numerous places confers authority upon the California Public Utilities Commission (CPUC) to regulate the terms of service and the safety, practices, and equipment of utilities subject to its jurisdiction. It is the standard practice of the CPUC, pursuant to its statutory responsibility to protect the environment, to require that mitigation measures stipulated as conditions of approval be implemented properly, monitored, and reported on. In 1989, this requirement was codified statewide as Section 21081.6 of the Public Resources Code. Section 21081.6 requires a public agency to adopt a Mitigation Monitoring Program when it approves a project that was subject to preparation of an EIR and where the EIR for the project identifies significant adverse environmental effects.

The purpose of a Mitigation Monitoring Program is to ensure that measures adopted to mitigate or avoid significant impacts are implemented. The CPUC views the Mitigation Monitoring, Compliance, and Reporting Plan (MMCRP) as a working guide to facilitate not only the implementation of mitigation measures by the project proponent, but also the monitoring, compliance and reporting activities of the CPUC and any monitors it may designate.

The Commission will address its responsibility under Public Resources Code Section 21081.6 when it takes action on the Alturas Transmission Line Project application. If the Commission approves the application, it will also adopt a final MMCRP which includes the mitigation measures ultimately made a condition of approval by the Commission.

As the lead agency under CEQA, the CPUC is required to monitor this project to ensure that the required mitigation measures are implemented. The CPUC will be responsible for ensuring full compliance with the provisions of this mitigation monitoring program and has primary responsibility for implementation of the monitoring program. The purpose of the monitoring program is to document that the mitigation measures required by the CPUC are implemented and that mitigated environmental impacts are reduced to the level identified in the program.

Because of the geographic extent of the Proposed Project, the CPUC may delegate duties and responsibilities for monitoring to other environmental monitors or consultants as deemed necessary, and some monitoring responsibilities may be assumed by responsible or trustee state and federal agencies. The CPUC will assign at least one environmental monitor to each construction site to coordinate implementation of the MMCRP for the designated area. The CPUC or its designee(s), however, will ensure that the person delegated any duties or responsibilities is qualified to monitor compliance.

Any Request For Qualifications (RFQ) or contract associated with the Commission's independent environmental monitor(s), shall contain a provision clearly stating that the terms and conditions of the RFP or contract do not reduce, in any way, the scope of the mitigation monitoring program, the requirements set forth therein, or the authority of the Commission or its environmental monitor, as described in the MMCRP adopted by the Commission.

Any mitigation measure study or plan that requires the approval of the CPUC must allow at least 60 days for adequate review time. When a mitigation measure requires that a mitigation study or plan be developed during the design phase of the project, the Applicant must submit the final documents to CPUC for review and approval for at least 60 days before construction begins. Other agencies and jurisdictions may require additional review time. It is the responsibility of the environmental monitor(s) to insure that appropriate agency reviews and approvals are obtained.

The CPUC or its designee will also ensure that any deviation from the procedures identified under the MMCRP is approved by the CPUC. Any deviation and its correction shall be reported immediately to the CPUC or its designee by the environmental monitor assigned to the construction spread.

F.3.2 BUREAU OF LAND MANAGEMENT AND U.S. FOREST SERVICE

As the Federal Lead Agency for the Proposed Project under NEPA, the BLM will be responsible for monitoring the performance and effectiveness of mitigation measures on BLM land. Similarly, the USFS will be responsible for MMCRP implementation and monitoring on the Modoc and Toiyabe National Forests. Where the Proposed Project crosses land outside of the jurisdiction of the BLM, the BLM recommends the mitigation measures included in this EIR/S for the consideration of the cooperating and responsible agencies with the authority to adopt them. In the Record of Decision (ROD) based on the Final EIR/S, the BLM Eagle Lake Area Manager (the Authorized Officer) will adopt the mitigation measures appropriate to the BLM portion of the Right-of-Way (ROW). The measures would then be monitored and enforced by the BLM as part of normal permit administration.

F.3.3 SIERRA PACIFIC POWER COMPANY

The Applicant, SPPCo, will be responsible for successfully implementing all the mitigation measures identified in the MMCRP. For each issue area in Part C (Environmental Analysis), detailed significance criteria are presented that establish a minimum threshold for successful mitigation. Standards for successful mitigation also are implicit in many mitigation measures that include such requirements as obtaining permits or avoiding a specific impact entirely. Other mitigation measures include detailed success criteria. Additional mitigation success thresholds will be established by applicable agencies with jurisdiction through the permit process, and through the review and approval of specific programs for the implementation of mitigation measures.

F.4 GENERAL MONITORING PROCEDURES

F.4.1 ENVIRONMENTAL MONITOR

The majority of the monitoring procedures would be conducted during the construction phase of the project. The CPUC/BLM and the Lead Agency-designated environmental monitor(s) are responsible for integrating the mitigation monitoring procedures into the construction process, in coordination with SPPCo. To oversee the monitoring procedures and to ensure success, the environmental monitor assigned to each construction site must be onsite during that portion of construction that has the potential to create a significant environmental impact or other impact for which mitigation is required. The environmental monitor is responsible for ensuring that all procedures specified in the MMCRP are followed. The environmental monitor will have the authority, as designated by the Lead Agencies, to terminate construction activities if required mitigation is not being strictly adhered to.

The environmental monitor shall inform the CPUC and BLM, in writing, of any mitigation measures that are not or cannot be successfully implemented with respect to the success criteria for each issue area. The CPUC/BLM, or their designee, will assess whether alternative mitigation is appropriate and specify to SPPCo and its contractors the subsequent actions required.

F.4.2 CONSTRUCTION PERSONNEL

A key feature contributing to the success of mitigation monitoring will be obtaining the full cooperation of construction personnel and supervisors. Many of the mitigation measures require action on the part of the construction supervisors or crews for successful implementation. To ensure success, the following actions, detailed in specific mitigation measures included in the Final MMCRP, will be taken:

- Procedures to be followed by construction companies hired to do the work will be written into contracts between SPPCo and the construction companies. Procedures to be followed by construction crews will be written into a separate agreement that all construction personnel will be asked to sign, denoting agreement.

- One or more preconstruction meetings will be held to inform and train all construction personnel about the requirements of the monitoring program (as detailed in the MMCRP).

- A written summary of mitigation monitoring procedures will be provided to construction supervisors for all mitigation measures requiring their attention.

F.4.3 GENERAL REPORTING PROCEDURES

Site visits and specified monitoring procedures performed by other individuals will be reported to the environmental monitor assigned to the relevant construction spread. A monitoring record form will be submitted to the environmental monitor by the individual conducting the visit or procedure so that details of the visit can be recorded and progress tracked by the environmental monitor. A checklist will be developed and maintained by the environmental monitor to track all procedures required for each mitigation measure and to ensure that the timing specified for the procedures is adhered to. The environmental monitor will note any problems that may occur and take appropriate action to rectify the problems. The Applicant shall provide the CPUC/BLM with regular written reports of the project, as specified in the Final MMCRP, which shall include progress of construction, resulting impacts, mitigation implemented, and all other noteworthy elements of the project.

F.4.4 ENFORCEMENT RESPONSIBILITY

The CPUC is responsible for enforcing the procedures adopted for monitoring through the environmental monitor assigned to each construction spread. The environmental monitor shall note any problems with mitigation implementation notify appropriate agencies or individuals about any problems, and report the problems to the CPUC or its designee.

The CPUC has the authority to halt any construction, operation, or maintenance activity associated with the Alturas Transmission Line Project if the activity is determined to be a deviation from the approved project or adopted mitigation measures. The CPUC may assign this authority to the environmental monitor for each construction spread. The BLM, USFS, and Sierra Army Depot (SIAD) have the authority to halt any construction, operation, or maintenance activity associated with the Alturas Transmission Line Project on Federal lands under their respective jurisdictions, if such activity is determined to be a deviation from the terms of the right-of-way grant or other use authorization on Federal lands.

F.4.5 DISPUTE RESOLUTION

It is expected that the Final MMCRP will reduce or eliminate many potential disputes. However, even with the best preparation, disputes may occur. If the Commission approves the application, it will delegate the responsibility for supervision of the Mitigation Monitoring Program to the Commission Advisory and Compliance Division (CACD). Should any disputes or complaints regarding the implementation of evaluation of the Program or mitigation measures arise, they should be directed first to CACD's Project Manager for resolution. CACD's Project Manager will attempt to initiate enforcement or compliance action to address deviations from the Proposed Project or adopted Mitigation Monitoring Program.

If a dispute or complaint regarding the implementation or evaluation of the Program or the mitigation measures cannot be resolved informally or through enforcement or compliance action by CACD's Project Manager, any affected participant in the dispute or complaint may file a written "notice of dispute" with the CPUC's Executive Director. This notice should be filed in order to resolve the dispute in a timely manner, with copies concurrently served on the other affected participants in the dispute. Within 10 days of receipt, the Executive Director or designee(s) shall meet or confer with the filer and the other affected participants for purposes of resolving the dispute. The Executive Director shall issue an Executive Resolution describing his/her decision, and serve it on the filer and other affected participants.

Parties may also seek review through the existing complaint procedures specified in the Commission's Rules of Practice and Procedure, although a good faith effort should first be made to use the foregoing procedure.

Disputes regarding Federal use authorizations on Federal lands will be resolved according to the established compliance and enforcement procedures of the BLM, USFS, or SIAD, as appropriate.

F.4.6 CONDITION EFFECTIVENESS REVIEW

In order to fulfill its statutory mandates to mitigate or avoid significant effects on the environment and to design a mitigation monitoring program to ensure compliance during project implementation (CEQA § 21081.6), the Commission may, on its own motion, institute a separate investigation or proceeding to review the project conditions of approval. This separate review would be conducted in a manner consistent with the Commission's Rules of Practices and Procedure.

F.4.7 PUBLIC ACCESS TO RECORDS

The public is allowed access to records and reports used to track the Mitigation Monitoring Program. Monitoring records and reports will be made available for public inspection by the CPUC/BLM or its designee on request.

F.5 SEASONAL CONSTRUCTION LIMITATIONS

Table C.3-14 in Section C.3, Biological Resources, summarizes time periods during which construction would be prohibited due to vulnerable life stages of species of concern (e.g., breeding, wintering, nesting), or during which times biological surveys would have to be carried out to determine the presence of various sensitive species that would have to be avoided. These time periods are delineated in mitigation measures in this document.

F.6 MITIGATION MONITORING PROGRAMS

The following table incorporates the mitigation monitoring programs presented at the end of each issue area in Part C. The programs are compiled here so that a separate and complete document is available to agencies and monitors.

MITIGATION MONITORING PROGRAM: ALL ISSUE AREAS

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
			AIR QUALITY			
Particulate emissions from construction activity (Class II)	A-1 Submit a Construction, Operation, and Maintenance Plan, detailing measures (A-2 through A-4) to mitigate potential impacts. Describe the construction boundaries (staging areas, ROW, substation), schedule for watering and water transportation and storage. A-2 Reduce particulate emissions (dust) by applying water to disturbed construction areas until the soil coatings or other approved dust control measures are applied. Cover stockpiled soil; cover soil loads while in transit. A-3 Increase dust control watering when wind speeds exceed 15 miles per hour, depending upon the soil moisture content. A-4 Confine construction activities to specified areas within the ROW, substation sites, staging areas, and designated access routes.	All Proposed and Alternative Segments	BLM CPUC APCDs USFS	Review and approve Construction, Operation and Maintenance Plan; monitor construction activity for compliance with Plan.	Compliance with Plan	Plan approved prior to permit issuance; monitor activities during construction

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
BIOLOGICAL RESOURCES: VEGETATION						
Temporary and permanent loss of plant communities (Class II)	**B-1** Flag allowable travel routes and construction areas to avoid surface removal of significant plant communities; where not avoided, use restoration and offsite compensation per Community and Habitat Restoration Plan (with Contingency Plan) and Offsite Compensation Plan to be prepared by SPPCo under the supervision of responsible agencies. **B-2** Avoid surface removal of volcanic vertisol plant communities; flag allowable travel routes and construction areas to avoid; cease activities if ruts form greater than 6" deep for more than 100 feet in vertisol soils; cease activities if ruts form greater than 3" deep for more than 100 feet on all other soils.	Proposed Segments A,C,E, K,L,N,Q,R,T,W,X,Y,Z; Devils Garden and Border Town Substations Alternative Segments D,G, J,ESVA,M,P,S,U,Z, WCFG,X-East	BLM CPUC CDFG USACE USFS	Monitor identification of allowable travel routes and construction areas based on avoidance of sensitive resources, prior to construction; monitor construction. After construction, verify where restoration is required. Monitor revegetation effectiveness for 5 years; activate Contingency Plan requiring additional offsite compensation in case of failure to meet success criteria.	Compliance with avoidance zone; achievement of annual criteria for revegetation effectiveness in terms of coverage, species composition, and viability in comparison with reference plots; compensation land transfer completed.	Plans in place 60 days before and allowable travel and construction areas flagged before construction; avoidance during construction; evaluate avoidance and conduct restoration after construction; effectiveness monitoring for 5 years after construction.
Temporary and permanent loss of special status plants and habitats (Class II)	**B-3** Avoid special status species if possible; flag allowable travel routes and construction areas prior to construction; if not avoided, use restoration and offsite compensation, per restoration and compensation plans.	Proposed Segments C,E,K, and L Alternative Segments D,J, and ESVA	BLM CPUC CDFG USACE USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above
Overland travel disturbing plant communities (Class II)	**B-4** Reduce surface impacts on plant communities by using avoidance, restoration, and offsite compensation or enhancement, per restoration and compensation plans.	All Proposed and Alternative Segments	BLM CPUC CDFG USACE USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above
Overland travel disturbing special status plants and habitats (Class II)	**B-5** Reduce surface impacts on plant communities by using avoidance, restoration, and offsite compensation or enhancement.	Proposed Segments A,E,K, L, and Q Alternative Segments B,D, F,I,J,M,P	BLM CPUC CDFG USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Increased access to sensitive vegetation resources (Class II)	**B-6** Replace existing barriers to overland travel following blading and place new barriers at access points to non-bladed overland travel routes.	All Segments except Proposed Segment R and Alternative Segments H and U	BLM CPUC CDFG USFS USFWS	Replace or enhance existing barriers to overland travel and restore new or upgraded roads to pre-existing conditions. Monitor mitigation to evaluate success or failure. Contingency plan in case of failure to meet success criteria.	Access not used for one year after construction.	Place barriers after construction; monitor after construction to evaluate success
Erosion and sedimentation (Class II)	**B-7** Implement Soil Conservation and Erosion Control Plan (Mitigation Measure **G-11**).	All Proposed and Alternative Segments except Alternative Segments H and I	BLM CPUC CDFG RWQCB USACE USFS	Review and approve Plan for application to biological resources. Monitor compliance and trigger contingency plan as appropriate.	See Mitigation Measure **G-11**; no adverse effects on vegetation, wetlands, or riparian areas.	See **G-11** below
Introduction of non-native plant species (Class II)	**B-8** Implement Noxious Weed Control Plan, flag existing weed populations, and control equipment and materials transported to the project corridor during and after construction.	All Proposed and Alternative Segments	BLM CPUC CDFG USFS	Plan review/approval; monitor flagging and construction/revegetation; post-construction success evaluation/trigger of remedial action	Seeds and straw to be certified weed-free by CDFA; fill materials to pass County Agriculture Commissioner certification	Plans in place 60 days before construction; monitor effectiveness during and after construction.
BIOLOGICAL RESOURCES: WILDLIFE						
Loss of mule deer winter, holding, and migration habitat (Class II)	**B-9** Restoration/reclamation to include forbs and shrubs appropriate for each habitat type and offsite compensation per Mitigation Measure **B-1**.	Proposed Segments A,C,E, K,L,N,O,Q,R,W Alternative Segments F,G, H,J,M,P	BLM CPUC CDFG USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above
Loss of pronghorn winter, migration, and kidding habitat (Class II)	**B-10** Same as for **B-9**, with restoration to include browse and other species preferred by pronghorn.	Proposed Segments A,C,E, K,L,N Alternative Segments B,D, G,J	BLM CPUC CDFG USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above
Loss of sage grouse brood habitat (Class II)	**B-11** Same as for **B-9**, with restoration of sage and forbs required by young grouse.	Proposed Segments A,C,E, K,L,N Alternative Segments F,G, H,I,J,ESVA	BLM CPUC CDFG USFWS USFS	See **B-1** and **B-2** above	See **B-1** and **B-2** above	See **B-1** and **B-2** above
Loss of pygmy rabbit habitat (Class II)	**B-12** Flag allowable construction areas and use existing roads whenever possible; remove pygmy rabbits where avoidance is not possible.	Proposed Segments L,N, O,Q Alternative Segments ESVA,M,P	BLM CPUC CDFG USFWS USFS	Monitor identification of allowable construction areas and removal of rabbits prior to construction.	No mortalities. No rabbits crushed in burrows.	Flag allowable construction areas before construction and ensure avoidance during construction

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Overland travel disturbing big game habitat (Class II)	**B-13** Monitor natural recovery and locate areas where restoration may be needed. Offsite compensation for failed recovery.	Proposed Segments A,C,E, K,L,O,Q,R,W Alternative Segments B,F, G,J,ESVA,M,P	BLM CPUC CDFG USFS	Prepare plan for mitigation and monitoring during and after construction. Monitor to evaluate recovery. Require offsite compensation where remedial actions are necessary.	Meet success criteria for natural recovery of habitat, or for offsite compensation where needed.	Prepare plan before permit issuance; during and after construction, monitor and identify areas needing remedial action for 5 years
Disturbance to special status species and habitats, including special status bats, pygmy rabbits, raptor nest sites, and sage grouse lek locations (Class II)	**B-14** Flag allowable travel areas to avoid habitat per species-specific buffers and seasonal avoidance periods; utilize biological monitor during construction. **B-15** Overland travel to be limited to areas identified in biological monitoring plan. Riparian and perennial stream habitats to be avoided.	Sensitive sites located on all Proposed and Alternative Segments	BLM CPUC CDFG USFWS USFS	Flag allowable travel areas and monitor construction to ensure no overland travel occurs outside these areas.	No disturbance to sensitive areas.	Flag allowable travel areas before construction and ensure avoidance of outside areas during construction
Direct mortality of individual animals (Class II)	**B-16** Construction specifications to include speed limits, firearms and pet restrictions, and litter removal program. Include construction worker training.	All Proposed and Alternative Segments, substations, access roads, staging areas	BLM CPUC CDFG USFS	Prepare Wildlife Construction Disturbance Prevention Plan. Prepare crew education materials. Conduct pre-field "tailgate" sessions. Prepare monitoring report.	Compliance with construction specifications. No observations of mortality or evidence collected by biological monitor.	Prepare plan and provide education before construction; monitor during construction
Indirect impacts to wildlife due to increased human presence (Class II)	**B-17** Construction to be scheduled to avoid critical seasons and establish buffer distances for sensitive areas. See **B-14** and **B-15** above	All Sensitive sites on all Proposed and Alternative Segments	BLM CPUC CDFG USFS	Construction monitoring to verify that avoidance requirements are met.	Compliance with construction specifications. No observations of distressed wildlife by biological monitor	Prepare location lists before construction; monitor during construction
Indirect impacts to wildlife due to increased access to remote habitat (Class II)	**B-18** Improved roads to be returned to preconstruction condition. Existing barriers to be replaced. See also **B-6** above.	All segments with improved or new access roads	BLM CPUC CDFG USFS	Mitigation monitoring for 5 years to evaluate success of mitigation measure. Contingency plan in case of failure to meet success criteria. Require additional offsite compensation in case of failure to meet success criteria.	Compliance with construction specifications. Achievement of habitat recovery.	Block roads and monitor effectiveness after construction

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Bird electrocution at substation locations (Class II)	**B-19** Substation design to eliminate attraction of perching and roosting and to minimize electrocution hazard.	All Proposed and Alternative substation locations	BLM CPUC CDFG USFWS USFS	Review/approve designs. Conduct monitoring program for 5 years after construction is complete to document and evaluate avoidance. Require additional offsite compensation in case of failure to meet success criteria.	No increase in bird electrocutions.	Monitor after construction - two surveys per year, plus contact with maintenance staff.
Potential bird collisions with transmission lines (Class II)	**B-20** Mark powerlines with bird flight diverters. **B-21** Use Rock Creek modification to Proposed Segment A.	Proposed Segments A,C,E, K,O,Q,T,W,X Alternative Segments B,F, G,I,ESVA,S,U,X-East	BLM CPUC CDFG USFWS USFS	As required by USFWS, conduct lifetime monitoring program during critical periods. Annual report to be provided. Require additional offsite compensation in case of failure to meet success criteria.	No increase in bird collision mortality.	Monitor 3 times per year (approximately on Nov. 1, Apr. 15, and June 15) after construction for lifetime.
	B-22 With application of **B-20**, off-site compensation would be required to reduce residual impacts to level that is not significant for greater sandhill cranes.			Monitoring of offsite habitat acquired to determine nesting success. Evaluate effectiveness after 5 years of monitoring. Require additional offsite compensation in case of failure to meet success criteria.	Confirmation of one nest success in a 5-year period.	Monitor for 5 years after construction - Annual 5-day survey during month of April to assess nest success and photo-document habitat condition.
Increased perching opportunities for raptors and ravens and displacement of sage grouse	**B-23** Install perch deterrents on structures located within 2-mile radius of sage grouse leks and in vicinity of waterfowl nesting habitat.	Proposed Segments A,C,E,K,L,N,O Alternative Segments B,D, F,G,H,I,J,ESVA,P	BLM CPUC CDFG USFWS USFS	Conduct 2-year post-construction surveys to document and evaluate success of measure.	No significant increase in predation of upland game birds. No more than 5 observations of raptors perching on transmission line structures annually.	Monitor after construction - during winter season when raptor population is high.
	B-24 Prepare and implement Habitat Enhancement Plan for sage grouse habitat.	Proposed Segments C,E,K, L,N	BLM CPUC CDFG	Review/approve Habitat Enhancement Plan. Monitor enhanced areas for 5 years. Require additional offsite compensation in case of failure to meet success criteria.	Use of enhanced areas by grouse	Plan in place 60 days prior to construction; monitor after construction during post-breeding season (May)

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
CULTURAL RESOURCES						
Construction activities disturbing or removing surface or subsurface significant/un-evaluated cultural resource sites (Class II)	**C-1** Avoid all significant/unevaluated cultural resource sites by flagging/monitoring.	Proposed Segments A,C,E, K,L,O,Q,W Alternative Segments B,D, G,J,ESVA,M,P,S,Z,WCFG	BLM CPUC SHPO USFS	Prepare monitoring and Historic Properties Treatment Plan, flag sensitive areas for avoidance, monitor construction activities, prepare monitoring report. Conduct post-construction survey and documentation to evaluate success of avoidance.	Avoidance of all significant/unevaluated cultural resource sites.	Following agency review/approval of reports: Flag sites before construction; monitor construction; survey after construction
	C-2 Sites recommended as eligible to NRHP, or unevaluated sites, will be treated as significant cultural sites. In the event 100% avoidance is not possible, the Applicant through the provisions of BLM's Programmatic Agreement will implement site-specific steps necessary to reduce or eliminate adverse effects to historic property.			Prepare treatment plan and/or implement procedures set forth in PA. Conduct evaluations/data recovery/research as required. Report results to Lead Agency(s).	Upon conclusion of evaluations, data recovery/research program exhausts potential of site to yield further important information.	Complete Programmatic Agreement before construction; implementation following agency review/ approval of treatment plans
Construction, operation, maintenance or public use disturbing significant or unevaluated cultural resource sites (Class II)	**C-1** and **C-2**, above **C-3** Restrict vegetation management activities in sensitive areas to pedestrian access only. Avoid sensitive cultural resource locations during maintenance activities requiring overland travel.	Proposed Segments A,C,E, K,L,O,Q,W Alternative Segments B,D, G,J,ESVA,M,P,S,Z,WCFG	BLM CPUC SHPO USFS	Prepare monitoring and treatment plan, flag sensitive areas for avoidance, monitor construction activities, prepare monitoring report.	Post-construction and maintenance surveys, document success of avoidance.	Prepare maintenance plan after construction; survey after construction and during maintenance
Unauthorized collection and/or vandalism of significant or unevaluated cultural resource sites (Class II).	**C-4** Prior to construction, inform crews of cultural resource values/regulatory protections and required procedures regarding avoidance of sensitive cultural resources.	Proposed Segments A,C,E, K,L,O,Q,W, Alternative Segments B,D, G,J,ESVA,M,P,S,Z,WCFG	BLM CPUC USFS	Prepare monitoring plan. Prepare crew education materials. Conduct pre-field "tailgate" sessions. Prepare monitoring report. Conduct post-construction surveys to evaluate effectiveness of mitigation.	Post-construction surveys of sensitive areas, document success of measures.	Prepare plan and educate crew before construction; survey after construction
	C-5 Post-construction: block public access to all new or improved access roads.			Conduct post-construction inspection of blocked roads.	Post-construction surveys of blocked roads, document success of measure.	Block roads after construction
Disturbance to context, setting, feeling, or association of cultural resource sites (Class I or II)	**C-1** and **C-2**, above. **C-6** Place permanent facilities as far as possible from significant cultural resource sites.	Proposed Segments K,O Alternative Segments ESVA,S	BLM CPUC SHPO	Agency/SHPO may require project modification to further mitigate impacts.	Project modifications result in no adverse effect to context, setting, feeling, or association.	Prior to final project design

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
	C-7 Acquire land and develop interpretive trail at Infernal Caverns Battlefield area.	Segment C (Infernal Caverns Battlefield area)	BLM CPUC SHPO	BLM develops plan for land exchange/interpretive trail in concert with Applicant. EA prepared by BLM prior to implementation. Conduct post-implementation evaluation of trail.	Minimal intrusion on setting and context.	Complete plans prior to construction of project
ENERGY AND UTILITIES						
Conflict with buried utilities (Class II)	U-1 The Applicant shall submit final construction plans to all affected utilities for their review and shall obtain written approval 30-days prior to the commencement of construction. In addition, the Applicant/contractor shall provide 72-hour written notice to all utility owners whenever construction activities are scheduled within 100 yards of an existing utility. P-2, below.	All Proposed and Alternative Segments	BLM CPUC USFS	Inspect documentation of coordination with affected utilities and confirm that all conditions have been met prior to construction.	No disruption of a utility service during or after construction	Provide notice 30 days prior to construction
Restricted access for utility emergency response units (Class III)	T-5, below.					
Cumulative impacts of simultaneous construction projects. (Class II)	T-13 , below.					
GEOLOGY, SOILS, AND PALEONTOLOGY						
Disturbed ground or unique geologic formations (Class III)	G-1 Regrade and recontour disturbed areas. Avoid unique geologic formations.	All Proposed and Alternative Segments	BLM CPUC CDFG CDMG NBMG USACE USFS	Review plans; inspect route during construction	Compliance with approved plans; construction monitored; disturbed ground regraded and/or recontoured to minimize residual affects	During construction

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Fault displacement collapsing transmission line structures or substation (Class II)	G-2 Avoid placement of structures within active fault zone. G-3 Avoid placement of structures within potentially active fault zones, where possible. G-4 Conduct geological and/or geotechnical studies to determine amount of fault displacement; design transmission line to withstand expected maximum fault displacement.	Proposed Segments A,C,E, L,N,O,Q,X Alternative Segments D,J, M,P,S,U,Z,WCFG	BLM CPUC CDMG Counties NBMG USFS	Review alignment plans to ensure avoidance; review geologic and geotechnical studies; review as-built maps	Active and potentially active faults are identified on maps of project alignment; no structures to be located in fault zones. Fault displacement are quantified; design is adequate to resist collapse during expected events. Permits issued; post-construction verification.	Review Plans before permit issuance; inspect after construction
Strong ground shaking collapsing transmission line structures or substation facilities (Class II)	G-5 Conduct geotechnical study to determine seismic criteria for designing structures to withstand strong ground shaking. G-6 Determine and apply earthquake-resistant design.	All Proposed and Alternative Segments	BLM CPUC CDMG NBMG USFS	1) Review and approve plans 2) Review as-built plans to ensure design was implemented	Compliance with approved plans; facilities built with adequate safety factor to resist damage during large earthquakes.	1) Prior to permit issuance (G-5) or construction (G-6) 2) After construction
Landslides/slope instability damaging structures (Class II)	G-7 Perform engineering geological and/or geotechnical investigations for structures on slopes within known landslide areas. G-8 Develop blasting plan to avoid causing landslides or rock falls.	Proposed Segments C,E,L, N,Q,R,T,W,X Alternative Segments B,D, J,M,P,X-East	BLM CPUC County Building & Safety NBMG	Review investigation report and approve geologist/engineer's recommendations. Review and approve blasting plan. Monitor construction.	Potentially unstable slopes identified and recommendation for corrective action complied with	Perform studies and prepare plans prior to construction.
Loss of or reduced accessibility to mineral resources (Class II)	G-9 In siting structures and ROW access roads, avoid existing and planned mineral extraction sites and access routes.	Proposed Segments R,T,W, X, and Border Town Substation Alternative Segments M,S, U,WCFG, and Alternative Border Town Substation (SPPCo Site)	BLM CPUC CDMG	Review plans for placement of structures and substations	No structures or substations located on or preventing access to mine roads or known reserves	Prior to permit issuance
Ash fall from major volcanic eruption in region (Class II)	G-10 Develop Emergency Preparedness Plan to identify project components at risk, and develop procedures to minimize impacts.	All Proposed and Alternative Segments	BLM CPUC Counties FEMA NBMG USFS	Review plan	Compliance with approved plan that describes measures to be undertaken during an ash fall.	Prior to permit issuance

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Construction resulting in grading and ground disturbance and erosion (Class II)	**G-11** Applicant shall prepare Soil Conservation and Erosion Control Plan; minimize new grading and road upgrading; use special equipment; revegetate.	All Proposed and Alternative Segments	BLM CPUC USFS	Review plan, monitor construction	Compliance with approved plan. Graded areas protected from erosion, special equipment used where appropriate, drainage across construction sites controlled, disturbed areas revegetated, no construction during wet periods, no deep tire ruts, stream crossings minimized and banks protected.	Prior to permit issuance
Loss of agricultural lands (Class III)	**G-12** Negotiate with landowners and compensate for loss or reduction of agricultural land	Proposed Segments A,E,K, O,W,X Alternative Segments B,F, G,H,I	CPUC	Review negotiated agreements	Agreements mutually agreed upon	Complete negotiations prior to construction
Steel or concrete corrosion resulting from corrosive soils (Class II)	**G-13** Test soils for corrosion potential; design to prevent corrosion where potential is high.	Proposed and Alternative Segments A,C,E,K,L,N,O, Q,T,W Alternative Segments D,F, G,H,I,J,M,P,S,X-East	BLM CPUC Counties USFS	Review plans	Compliance with approved plan; structures designed to resist corrosion	Complete testing and design prior to construction
Damage to project from expansive soils (Class II)	**G-14** Test soils for shrink-swell potential; design facilities to withstand expansivity.	Proposed Segments A,E,K, L,O,Q,R,T,X Alternative Segments D,F, G,H,I,J,M,X-East	BLM CPUC Counties USFS	Review plans and geotechnical reports	Compliance with recommendations of geotechnical report; facilities designed and built to withstand expansive soils	Complete testing and design prior to permit issuance
Loss, destruction, or alteration of paleontological resources (Class II)	**G-15** Develop paleontologic data inventory and sampling plan; inspect drill cuttings and excavations.	Proposed Segments A,C,L, M,O,Q,R,T,W Alternative Segments J,P, Border Town Alternative Substation (SPPCo Site)	BLM CPUC CDMG NBMG USFS	Review plans; inspect excavations; develop site-specific measures if fossils are found	Compliance with approved plan; fossils catalogued and/or collected and placed in repositories	Develop plan prior to construction; implement during construction

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
HYDROLOGY						
Scour and erosion of stream beds (Class II)	**G-11**, above **H-1** Prepare Stream Crossing and Wetlands Protection Plan. **H-2** Maximize distance of ROW from waterways.	Proposed Segments A,C,L, N,Q,R,T,W,X Alternative Segments B,D, M,P,S,U,Z,WCFG, Border Town Alternative Substation (SPPCo Site)	BLM CPUC CDFG CDWR USFS	Review Construction, Operation and Maintenance Plan; monitor construction	Compliance with approved plan. No extensive alteration of stream channels; erosion is minimal; stream banks are protected during construction and catch basins are in place were necessary	Design stream crossings prior to permit issuance; inspect during construction
Flooding of construction activities at stream crossings; flood damage to structures (Class II)	**H-3** Construction to occur only during low flow periods. **H-4** Permanent structures and facilities shall be located outside of stream and river beds. Structures located in floodplains shall be designed based on site-specific analyses.	Proposed Segments A,K,L, O,Q Alternative Segments B,F, G,H,I,P,S,WCFG	BLM CPUC CDFG CDWR USFS	Review Construction, Operation and Maintenance Plan; monitor construction	Compliance with approved plan. No construction during floods. Structures designed and built to resist damage during floods	Design facilities prior to permit issuance; inspect during construction
Accidental contamination of surface waters and ground water (Class II)	**H-5** Perform refueling away from streams.	All Proposed and Alternative Segments	BLM CPUC CDFG CWRCB RWQCB USACE USFS	Review plans; monitor construction	Compliance with Best Management Practices. Permits issued; inspections show no significant impacts. No hazardous spills near stream channels or accidental spills effectively cleaned up	During construction
	H-6 Develop Best Management Practices; clean up spills; obtain 404 and storm water permits.					Prior to permit issuance
Ground water flow affected by construction, drilling, or blasting (Class II)	**G-8 and H-1**, above **H-7** Avoid locating structures in wetlands; avoid travel in wetlands; construct during dry seasons. Develop procedures for construction in wetland areas.	Proposed Segments A,W,X Alternative Segments B,D, F,G,H,I,ESVA,P,U,WCFG	BLM CPUC CDFG CDWR RWQCB USACE USFS	Review construction plans; monitor construction; review blasting plan	Compliance with approved plans and procedures; no change in ground water flow; no permanent disturbance of wetlands; no deep ruts	Determine structure locations and prepare plans & procedures prior to permit issuance; monitor during construction
	H-8 Avoid blasting; if necessary, prepare a Blasting Plan for each site.	Proposed Segments A,C,E, K,L,Q Alternative Segments D;J,P				

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
LAND USE, RECREATION, RELIGIOUS USES						
Disturbances to residential uses during project construction (Class III)	**L-1** Provide advance notice of construction to property owners, residents, and tenants within 1000 feet of the 160-foot ROW, substation site, or access road.	All Proposed and Alternative Segments	BLM CPUC	Review and approve the Construction, Operation, and Maintenance Plan. Review and approve copies of mailed notices, bulletins, and published notices.	Timely and detailed notices, bulletins, and published notices. Less than 25 percent of affected property owners, residents, and tenants contact Applicant or other affected agencies to complain about construction disturbances.	At least one month before project construction in residential areas
Disturbances to residential uses during project construction (Class III)	**L-2** Appoint a public affairs officer to be the point of contact to discuss public concerns or questions. See also Mitigation Measures **A-3**, **U-1**, **N-3**, **T-1** through **T-4**, and **V-1** through **V-3**.	All Proposed and Alternative Segments	BLM CPUC	Review memorandum regarding appointment of specific individual as public affairs officer. Review and approve copies of mailed notices, bulletins, and published notices.	Less than 25 percent of the individuals that contact the Applicant indicate that they were not aware of the existence of the public affairs officer, or complain that the public affairs officer did not adequately respond to their concerns.	Appoint officer prior to construction notification; monitor performance during and after construction
Disturbances to recreational uses during construction (Class III)	**L-3** Provide advance notice of restricting, blocking, or detouring of access routes to known recreational areas or destinations. See also Mitigation Measure **T-5**.	Proposed Segments A,C,E,K,L,O,Q,T,W Alternative Segments B,D,F,G,J,P,Z	BLM CPUC USFS	Review and approve the Construction, Operation, and Maintenance Plan. Review copies of bulletins. Inspect affected access routes to recreational areas to observe whether the bulletins have been posted.	Timely and detailed bulletins posted in appropriate locations along affected access routes to recreational areas.	Provide notice at least two weeks before project construction near access routes to recreational areas.
Degradation of the recreational experience for riders at Fort Sage OHV Area during construction (Class II)	**L-4** Provide notice of construction activities and access restrictions on specific roads or trails in Fort Sage OHV area.	Alternative Segment P (At Fort Sage OHV Area)	BLM CPUC	Review and approve the Construction, Operation, and Maintenance Plan. Visit the Fort Sage OHV Area to observe whether bulletins have been posted in the appropriate locations at the appropriate time.	Timely and detailed bulletins posted in appropriate locations in the Fort Sage OHV Area.	Notification at least one month prior to project construction in Fort Sage OHV Area

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Temporary loss of grazing land use and disturbance to grazing animals during construction (Class II)	L-5 Coordinate with USFS, BLM, and permittees to ensure protection of range improvements and livestock water sources.	Proposed Segments A,C,K,L,O,Q,R,T,W, X,Y Alternative Segments D, J, ESVA,M,P,S,U,V	BLM USFS	Ensure that the BLM, USFS, Applicant, and grazing permittees meet to identify subject range improvements and livestock water sources prior to construction. Review and approve the Construction, Operation, and Maintenance Plan.	Less than 20 percent of grazing allotment permittees contact the Applicant to complain about impacts to grazing during project construction.	Prior to project construction.
Loss of grazing animals through open fences or gates temporarily removed during construction (Class II)	L-6 Construct a temporary barrier across sections of removed fencing so that grazing animals cannot move through the open section of fencing; immediately after completing construction in an area, repair the section of removed fencing.	Wherever route crosses grazing fencing	BLM USFS	Applicant shall designate one member of each construction crew who shall be responsible for ensuring that the barriers are constructed immediately after the fencing sections are removed, and that the sections of removed fencing are repaired immediately after construction is completed. BLM shall periodically inspect the construction area to observe whether barriers have been constructed across sections of removed fencing, and inspect areas here the line has been constructed to observe whether sections of removed fencing have been repaired.	No open sections of fencing are observed during inspections of construction areas.	Designate crew member during project construction on grazing land, immediately after removing sections of grazing allotment fencing; inspect during construction
	L-7 Close all gates immediately after they are opened to allow construction vehicles and equipment access to a construction area.			Applicant shall designate one member of each construction crew who shall be responsible for ensuring that all gates are closed immediately after they are opened. BLM shall periodically inspect the construction area to observe whether all gates are closed.	No open gates are observed during inspections of construction areas.	During project construction on grazing land

Impact	Mitigation Measures		Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Temporary loss of cropland use during construction (Class II)	L-8a L-8b	Reimburse farmers along the ROW for crops lost due to Project construction (a stipulation in easement agreements with farmers) Work with County Cooperative Extension Service (CCES) to develop construction schedule that would avoid prime crop planting, growing, and harvesting seasons.	Proposed Segments A,E,K,O Alternative Segments B,F,G,H,I,W,X	CPUC	Ensure that CCES, Applicant, and farmers meet to develop adjusted construction schedule. Designate responsible party to monitor Applicant compliance with easement stipulation.	A detailed adjusted schedule for construction on cropland. Less than 20 percent of crop farmers contact the Applicant to complain about impacts to cropland during project construction and/or inadequate compensation for lost crops.	Develop schedule before project construction
Degradation of quality of residential uses resulting from permanent change in character of residential environment (Class I)	L-9	Design Proposed Project such that transmission line structures are not placed within 300 feet of existing residences. The separation distance between receptors and the centerline shall be maximized for receptors located less than 300 feet from the centerline.	Proposed Segments L,X Alternative Segment X-East	BLM CPUC	Review and approve the final plans for siting the transmission line structures.	Approved final plans for siting the transmission line structures.	During project final design; prior to permit issuance
Degradation of recreational experience for riders at Fort Sage OHV area (Class II)	L-10	Design Proposed Project to prevent placement of structures within or adjacent to motorcycle or ATV riding trails or roads.	Alternative Segment P (At Fort Sage OHV Area)	BLM CPUC	Review and approve the final plans for siting the transmission line structures.	Approved final plans for siting the transmission line structures.	During project design; prior to permit issuance
Degradation of recreational experience for users of Toiyabe National Forest (Class I)	L-11	Provide Toiyabe National Forest with compensatory land suitable for recreational uses.	Proposed Segment X, X-East,Y	CPUC USFS	Review and approve land acquisitions proposed by SPPCo.	Provision of sufficient recreational lands.	Review proposed acquisition before project construction
Degradation of State Wildlife Areas due to presence of line structures (Class II)	L-12	Provide CDFG with compensatory land contiguous to the Wildlife Areas to compensate for degraded areas.	Proposed Segment Q and Alternative Segment P (Doyle Wildlife Area) Proposed Segment W and Alternative Segment WCFG (Hallelujah Junction Wildlife Area)	BLM CPUC CDFG	Review and approve land acquisitions proposed by SPPCo.	Provision of sufficient contiguous wildlife areas.	Review proposed acquisition before project construction

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Cumulative disturbances during construction of the Proposed Project and other future projects in Modoc and Lassen Counties (Class II)	L-2 through L-4, above **L-13** Coordinate with the proponents of other proposed projects within one mile of the ROW or substation sites to minimize cumulative construction impacts.	Wherever other projects are constructed within, adjacent to, or near the line ROW or substation sites in Modoc and Lassen Counties	BLM CPUC	Ensure that Applicant, proponents of other projects, and affected agencies meet to coordinate construction activities, utility disruptions, and road closures. Review memorandums regarding results of coordination meetings. Review and approve Construction, Operation, and Maintenance Plan.	Detailed memoranda regarding results of coordination meetings	Before project final design and permitting
	L-14 Recommend that Counties establish a 300-foot minimum setback for any future occupied structures along the ROW. **L-15** If construction of the Proposed Project is delayed, the Applicant shall coordinate with the U.S. Natural Resource Conservation Service (NRCS) so that construction of Proposed Segment X does not overlap construction of the Evans Creek Dam. The Lead Agency shall designate the party responsible for monitoring this measure, who shall ensure that the Applicant and NRCS coordinate construction activities and review memorandums regarding the results of coordination meetings.	Wherever other projects are constructed within, adjacent to, or near the line ROW or substation sites in Modoc, Lassen, and Sierra Counties	Counties	None required since implementation of this mitigation measure is subject to the discretion of the applicable counties.	Incorporation of setback requirements into local ordinances	Prior to development of future projects within proximity of the ROW
Permanent loss of a small portion of the driving range of the Arrowhead Golf Course due to the presence of line structures (Class III)	**L-16** Design the Proposed Project such that the transmission line structures are placed outside or on the boundary of the driving range of the Arrowhead Golf Course.	Alternative Segment B (At driving range of Arrowhead Golf Course)	BLM CPUC	Review and approve the final plans for siting the transmission line structures.	Approved final plans for siting the transmission line structures.	Prior to permit issuance
Impeded movement of truck traffic to and from the Wendel Transfer Station (Class III)	**T-1**, below **L-17** Notify the Lassen County Public Works Department of the schedule for constructing Alternative Segment M.	Alternative Segment M (On Wendel Road near the Wendel Transfer Station)	BLM CPUC	Review copy of mailed notice to Lassen County Public Works Department.	Timely and detailed notice.	Notice mailed at least 30 days prior to project construction near the Wendel Transfer Station

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
NOISE						
Impact on sensitive noise receptors (Class II)	**N-1** Conduct construction activities between 7 a.m. and 7 p.m. (Monday through Saturday), or for a shorter period if so stipulated in the applicable noise ordinance.	All Proposed and Alternative Segments	BLM CPUC USFS	Applicant/ construction contractor shall include the schedule in all construction plans.	Periodic inspections; no complaints received	Develop schedule prior to construction; monitor complaints
	N-2 Maintain proper mufflers on all internal combustion and vehicles engines used in construction to reduce noise to the maximum feasible extent.		BLM CPUC County Public Works Depts. USFS	Periodic checks of equipment and its operation, or use of noise measurements	Logs of inspections, findings, repairs, and reinspections, showing compliance	Modify equipment prior to construction; inspect during construction
	N-3 Notify by mail sensitive receptors potentially subject to construction noise impact.			Document and review all mailings, calls, and correspondence received. Check against list of expected sensitive receptors.	Periodic check of Applicant's logs, showing effective communication and consideration for the public	Provide 10-day prior notice to receptors to be impacted by construction activities
PUBLIC SAFETY AND HEALTH						
Potential for induced currents and voltages on conducting objects that are not properly grounded and are located near the proposed 345 kV and 230 kV transmission lines (Class II)	**P-1** In order to reduce the potential for induced currents and voltages, identify objects that have the potential for induced voltages and work with the affected parties to determine proper grounding procedures. Notify property owners of date line is to be energized, name and phone number of Applicant contact person, and guidelines for future activities within ROW.	All Proposed and Alternative Segments	BLM CPUC	Ensure that Applicant has identified potential current-inducing objects and that proper grounding procedures are formulated.	All objects located within the ROW are properly grounded.	30 days prior to energizing line
Potential for public safety hazards and accidents, such as shock hazard, fuel ignition, and fire hazard (Class II)	**P-2** In order to minimize the potential for public safety hazards and accidents, the Applicant will incorporate CPUC General Order 95 and National Electric Safety Code requirements into Project Design and Construction Plans.	All Proposed and Alternative Segments	BLM CPUC	Verify incorporation of CPUC GO95 and NESC requirements into project design and construction plans. Verify compliance with CPUC General Order 95 and NESC requirements.	Ensure that CPUC GO95 and National Electric Safety Code (NESC) requirements are incorporated into project design and construction plans. Confirm compliance with CPUC GO95 and NESC requirements.	Incorporate codes during design process; verify compliance after construction

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
	P-3 In order to minimize the potential for public safety hazards and accidents, prepare a Fire Prevention and Suppression Plan acceptable to the BLM, USFS, and Counties. At a minimum, the Plan should meet the guidelines set forth in the State of California, Department of Forestry, Industrial Operations Fire Prevention Guide and be consistent with the approved Tuscarora Natural Gas Pipeline Project Fire Contingency Plan. In addition, the plan must include procedures for de-energizing the line in the case of fire.	All Proposed and Alternative Segments	BLM CPUC CDF Counties USFS	Ensure preparation of adequate Fire Prevention and Suppression Plan (FPSP). During construction, conduct weekly site inspections to verify compliance with FPSP.	Ensure preparation of, and adherence to, Fire Prevention and Suppression Plan.	Prepare Plan during design & review process (prior to construction); ensure adherence to Plan during construction
	P-4 In order to minimize the potential for public safety hazards and accidents, equipment vehicles, gas-powered equipment and flues with Lead USFS-approved spark arresters.	All Proposed and Alternative Segments	BLM CPUC USFS CDF	Conduct regular site inspection to verify use of USFS-approved spark arresters.	Ensure use of USFS-approved spark arresters.	Equip vehicles prior to construction; monitor during construction and maintenance
	P-5 In order to minimize the potential for public safety hazards and accidents, maintain both a fire watch and fire fighting equipment at locations specified.			Conduct weekly site inspection to verify maintenance of fire watch and availability of fire fighting equipment.	Verification that fire watch is maintained and fire fighting equipment is available.	During construction
	P-6 In order to minimize the potential for public safety hazards and accidents, fire fighting equipment and operators are to be made available for fighting fires in the vicinity of the Project.	All Proposed and Alternative Segments	BLM CPUC USFS CDF	Conduct weekly site inspection to verify maintenance of fire watch and availability of fire fighting equipment.	Verification that fire watch is maintained and fire fighting equipment is available.	During construction
	P-7 In order to minimize the potential for public safety hazards and accidents, during conditions of extreme fire danger when fire restrictions are in effect, limit or suspend construction and maintenance, unless Applicant obtains a hazardous fire condition special use permit.	All Proposed and Alternative Segments	BLM CPUC USFS CDF	Suspend construction and/or maintenance during extreme fire hazard.	Verify compliance with order through periodic site inspections.	During construction and maintenance
Excess generation of waste and/or consumption of energy (Class III)	**P-8** To enhance waste minimization and energy conservation, prepare a Waste Minimization and Energy Conservation Plan.	All Proposed and Alternative Segments	BLM CPUC USFS	Review, approve, and monitor Waste Minimization and Energy Conservation Plan.		Prepare Plan prior to construction

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
			SOCIOECONOMICS AND PUBLIC SERVICES			
Property values could be adversely affected by the Proposed Project (Class II)	S-1 Avoid proximity to neighboring residential parcels; relocate structures, reduce structure heights, provide screening.	Those locations on Proposed and Alternative Segments subject to a Class I land use or visual impact	BLM CPUC	Review design of project structure locations, heights, and screening	Minimum number of properties incur reduced property value.	During and after construction
Fires could be caused during construction (Class II)	S-2 Fire Prevention and Suppression Plan (see P-3, above) shall include measures addressing safety/training, response strategy, interagency coordination.	All Proposed and Alternative Segments	BLM CPUC Local fire departments USFS	During Project Design Review process, ensure preparation of adequate Fire Prevention and Suppression Plan (FPSP). During construction, conduct weekly site inspections to verify compliance with FPSP.	Ensure preparation of, and adherence to, Fire Prevention and Suppression Plan.	Develop plan during design review process; monitor during construction
			TRANSPORTATION AND TRAFFIC			
Increased accident risk for motorists, pedestrians, and bicyclists during construction (Class II)	T-1 Prepare, obtain approval for, and implement detailed Transportation Management Plans.	All Proposed and Alternative Segments	BLM CPUC County Sheriff State Highway Patrol Transportation Agencies	Review and approve Transportation Management Plan	Increased accident rates, risk exposure, or congestion, as determined by affected public agencies.	Prepare and obtain approval for Plan prior to construction; implement during construction
Roadway blockages and traffic congestion during construction (Class II)	T-2 Avoid lane closures or blockages where possible, minimize duration of closures, provide detours, and avoid peak period lane closures.	All Proposed and Alternative Segments	CPUC BLM County Sheriff State Highway Patrol Transportation Agencies	Review and approve Transportation Management Plan, and conformance to all required conditions.	Level of additional congestion, delay, or inconvenience caused by construction activities, as determined by affected public agencies.	Prior to and during construction
Blocked access to properties adjacent to construction zone (Class II)	T-3 Advance notification to property owners and tenants who would have restricted access during construction. Provide alternative access if feasible.	All Proposed and Alternative Segments	CPUC BLM County Sheriff State Highway Patrol Transportation Agencies	Verify notification and coordination efforts with all affected owners and tenants.	If access and parking needs of the adjacent land uses are met.	Provide notice 72 hours prior to construction; provide alternative access during construction
Obstructed pedestrian or bicycle routes and reduced safety during construction (Class II)	T-4 Provide alternative pedestrian/bicycle routes where blockages occur and use appropriate signs/markings.	All Proposed and Alternative Segments	CPUC BLM County Sheriff State Highway Patrol Transportation Agencies	Verify coordination with affected public agencies and preparation of detour signing and plans.	Construction activities do not block or unreasonably impair pedestrian or bicycle movements or safety.	Prior to and during construction

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Restricted access for emergency response units during construction (Class II)	T-5 Advance notification and coordination with emergency service providers. Remain prepared to immediately provide emergency access for any property isolated by construction activities.	All Proposed and Alternative Segments	BLM CPUC County Sheriff State Highway Patrol Transportation Agencies	Verify notifications and coordination with emergency service providers; verify capability to provide immediate access across construction zone.	Construction activities do not preclude access to emergency vehicles.	Provide notice 1 week prior to construction; maintain access during construction
Increased traffic volumes generated by construction activity (Class III)	T-6 Use approved staging areas and shuttle employees to work site in crew trucks or buses. Sufficient off-street parking for contractor and private vehicles shall be provided at staging areas.	All Proposed and Alternative Segments	BLM CPUC Affected Jurisdictions	Verify receipt of approval for staging areas and provision of shuttles to the work zone.	Unacceptable traffic congestion or impacts on public street, as determined by affected jurisdictions.	Develop staging areas and shuttle plans prior to construction; monitor during construction
Increased parking demand for vehicles and equipment during construction and temporary loss of existing parking spaces (Class III)	T-7 Provide off street parking for construction vehicles and equipment. Post advance signs and notify nearby businesses/residents and public agencies if spaces will be displaced. Provide alternative spaces if needed.	All Proposed and Alternative Segments	BLM CPUC Affected Jurisdictions	Verify provision of signage at locations where public parking spaces would be displaced.	No parking hardships are created for nearby residents/businesses.	Coordinate schedules prior to construction
Possible encroachment and safety conflicts with rail operations during construction (Class III)	T-8 Coordinate construction activity with railroads and arrange to have railroad representatives on site while working within active rail ROW.	All Proposed and Alternative Segments where construction is in railroad ROW	BLM CPUC	Verify coordination with railroad companies and demonstrated compliance with railroad and CPUC safety procedures.	Rail operations are maintained without disruption or decreased safety for trains or workers.	Coordinate schedules prior to and during construction
Interference with navigable airspace and decreased safety for aviation activities during construction and operation (Class II)	T-9 Design and construct the structures and wires so that no object will penetrate the navigable airspace around a public or military airport, as defined by the FAA. T-10 Notify the Western-Pacific Region of the FAA if any feature of the project will exceed an obstruction standard or encroach upon navigable airspace, as defined by the FAA. Use high-visibility markings and lighting to improve visibility to pilots, as directed by the FAA. T-11 Position structures at locations that would prohibit wires from extending more than 200 feet above the ground, where feasible.	Proposed Segments C,E,K,O,Q,X Alternative Segment B	BLM CPUC Federal Aviation Administration (FAA).	Verify notification of FAA of temporary or permanent features exceeding obstruction standards or encroaching upon navigable airspace. Notification shall be made on FAA Form 7460-1, "Notice of Proposed Construction or Alteration."	FAA finds that an encroachment is acceptable and that the appropriate markings and lighting features are installed to the satisfaction of FAA.	Finalize design prior to permit issuance. Lighting and markings to be installed during construction & maintained for the life of the project.

Impact	Mitigation Measures		Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
An accident or structural failure could potentially result in blockages of highways and/or rail facilities (Class I)	T-12	Prepare an Emergency Response Plan which addresses disruptions to the transportation system in case of a major accident or failure. Maintain constant readiness to implement plan if necessary.	All Proposed and Alternative Segments	BLM CPUC Local law enforcement agencies CHP, NHP Caltrans, NDOT, local public works depts., and fire depts.	Review plan; verify preparedness on an annual basis.	Plan is deemed acceptable and would be effective in the event of an accident.	Plan shall be prepared prior to operation, then updated and tested annually for the life of the project.
Cumulative impact of simultaneous construction projects (Class II)	T-13	Maintain coordination with agencies responsible for encroachment permits on each affected roadway and with utility companies.	All Proposed and Alternative Segments	BLM CPUC Affected local jurisdictions	Responsible agencies coordinate regarding timing of project construction and road closures	Roadway closures have minimal effect on local or regional transportation systems	Coordinate schedules before and during construction
VISUAL RESOURCES							
Short-term visual impact due to construction activities (Class III)	V-1	In order to reduce the short-term visual impact due to construction activities, store construction materials and excavated materials away from highly visible route segments along US 395 and State Route 299.	All Proposed and Alternative Segments	BLM CPUC Local jurisdictions	Lead Agency-approved Monitor conducts weekly site inspections during Project Construction to confirm adherence to contract specifications regarding storage of construction materials.	Ensure that construction materials and excavated soils are minimally visible from adjacent travel corridors.	During project construction
	V-2	In order to reduce the short-term visual impact due to construction activities, confine construction activities and materials storage to within substation sites, staging areas, designated access roads, and specified areas within the transmission line ROW and require full cleanup of all construction sites, ROW, and adjacent lands.	All Proposed and Alternative Segments	BLM CPUC Local jurisdictions USFS	Lead Agency-approved Monitor conducts weekly site inspections during Project construction to confirm adherence to contract specifications regarding confinement of construction activities and storage of construction materials.	Ensure that construction activities and material storage are confined within substation sites, staging areas and ROW.	During and after project construction
	V-3	In order to reduce the short-term visual impact due to construction activities, prohibit the construction of access or spur roads for transmission line construction in highly scenic areas or areas of known public concern, if such activities result in strong levels of visual contrast.	All Proposed and Alternative Segments	BLM CPUC USFS Local jurisdictions	BLM and USFS identify prohibited areas and incorporate into Construction Operation & Maintenance Plan approval process prior to construction. Compliance to be monitored weekly by a Lead Agency-approved monitor.	Ensure that access or spur roads do not encroach upon designated prohibited areas.	Prohibited area identification prior to permit issuance; avoidance of prohibited areas during construction

Impact	Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
	V-4 In order to reduce the short-term visual impact due to construction activities, whenever possible, construct access or spur roads at appropriate angles from the originating, primary travel facilities to minimize extended, in-line views of newly graded terrain.	All Proposed and Alternative Segments	BLM CPUC USFS Local jurisdictions	BLM and USFS to review design of access and spur roads for appropriate alignments during Construction Operation & Maintenance Plan review and approval process, prior to construction. Compliance with construction plan specifications to be monitored weekly by Lead Agency-approved monitor.	Ensure that views of newly graded terrain are minimally visible from primary and/or adjacent travel corridors.	Design review prior to permit issuance; monitoring during construction
Excessive visual access to Alturas Substation and transmission line structures resulting from the clearing of juniper adjacent to Crowder Flat Road as part of access road construction (Class II)	**V-2** and **V-4**, above **V-5** In order to minimize the visual access to the Alturas Substation site, limit structure heights to 70 feet between Milepost MP-1 and Angle Point HSØ1 and maintain a sufficient density of juniper between the proposed substation site and Crowder Flat Road immediately west of the substation site.	Milepost MP-1 to Angle Point HSØ1 and proposed Alturas Substation (Crowder Flat Road, immediately adjacent to Proposed Segment A)	BLM CPUC USFS	Review and approve structure design for 70-foot height limitation prior to permit issuance. Monitor adherence to the approved structure design. Determine juniper density requirements and incorporate into project construction plans prior to site preparation. Monitor compliance weekly during site preparation and construction.	Ensure that structures are limited to 70-foot maximum height between milepost MP-1 and Angle Point HSØ1. Ensure that visual access to Alturas Substation and Proposed Segment A are minimally visible from that portion of Crowder Flat Road immediately adjacent to the substation.	Tower design review prior to permit issuance; monitoring during construction. Juniper density requirements determined prior to construction; monitoring during construction
Excessive visual access to Alturas Substation as viewed along substation access road from Crowder Flat Road (Class II)	**V-6** Construct the Alturas Substation access road with appropriate angles and curves to prevent a direct line of sight to the substation from the intersection with Crowder Flat Road. No juniper shall be removed adjacent to Crowder Flat Road.	Proposed Alturas Substation site	BLM CPUC USFS	Review access road design, including appropriate angles and curves, prior to permit issuance. Monitor adherence to the approved plans weekly.	Ensure that direct line-of-sight views to Alturas Substation are not available to motorists on Crowder Flat Road.	Design review prior to permit issuance; monitoring during construction
Potential to view light and glare from night-time illumination of Alturas Substation, Border Town Substation, and the Alternative Alturas Substation (Class II)	**V-7** Ensure that all lighting structures for night-time illumination of the substation are fitted with appropriate lamp shields to minimize light scatter and glare outside the substation sites.	Proposed and Alternative Substation sites	BLM CPUC OSHA	Review and approve lamp shield design as part of the construction plan submittal process. Monitor adherence to the approved lamp shield design will be determined.	Ensure that excessive light and glare are not visible to motorists on Crowder Flat Road (Alturas Substation); the Upper Long Valley access roads (Border Town Substation); or motorists on State Route 299, Mill Street and Fourth Street, or nearby residents (Alternative Alturas Substation).	Design review prior to construction; Night-time inspection following Substation construction completion

Impact		Mitigation Measures	Location (Segment)	Responsible Agency[1]	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Structure skylining would occur for that portion of Proposed Segment A crossing the upper end of Daggert Canyon and the plateau in the vicinity of Angle Points ANPØ2-AØ3+ (Class III)	V-8	Reduce structure heights to the maximum extent feasible to lessen the skylining effect created by the transmission line structures as the route crosses upper Daggert Canyon and the plateau south of Angle Point AØ3+.	Proposed Segment ANPØ2-AØ3+	BLM CPUC USFS	Review and approve structure designs prior to permit issuance. Monitor adherence to the approved structure design.	Ensure that skylining of Proposed Segment ANPØ2-AØ3+ is minimized as viewed from Crowder Flat Road, State Route 299, and North Alturas.	Design review prior to permit issuance
Proposed Route Segment O would encroach into Skedaddle Wilderness Study Area and be inconsistent with WSA applicable BLM VRM Class I management objectives (Class II)	V-9	Relocate Angle Point OØ1 further south in order to avoid encroachment into the Skedaddle WSA.	Route Segment O in the vicinity of Angle Point OØ1	BLM CPUC	During the EIR/S and project review and approval process, approve an acceptable relocation of Angle Point OØ1	Ensure that Proposed Segment O does not encroach into the Skedaddle WSA.	During project review and approval process
Long-term visual impact due to presence of Border Town Substation (Class I)	V-10	Prepare and implement a Landscaping Plan for the Border Town Substation.	Border Town Substation	BLM CPUC	Review and approve Landscaping Plan. Monitor adherence to Plan requirements.	Renderings of expected results shall be provided for each sensitive viewshed.	Final Landscaping Plan to be approved prior to substation construction

[1] Agency Acronyms

BLM	Bureau of Land Management
CPUC	California Public Utilities Commission
APCD	Air Pollution Control District
CCES	County Cooperative Extension Service
CDFG	California Department of Fish and Game
CDF	California Department of Forestry
CDWR	California Department of Water Resources
CDMG	California Division of Mines and Geology
CHP	California Highway Patrol
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Administration
OSHA	Occupational Safety and Health Administration
NBMG	Nevada Bureau of Mines and Geology
NHP	Nevada Highway Patrol
NDOT	Nevada Department of Transportation
SHPO	State Historic Preservation Officer
RWQCB	Regional Water Quality Control Board
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USFS	U.S. Forest Service (Modoc and/or Toiyabe National Forest implied, depending on location of impact)

+ Indicates a starting or ending point beyond the referenced Angle Point.