PALO VERDE

NUCLEAR GENERATING STATION

SUPPLEMENT TO

TRANSMISSION SYSTEM

ENVIRONMENTAL ANALYSIS

PROJECT NO. 4

PREPARED BY

SOUTHERN CALIFORNIA EDISON COMPANY

JANUARY 1976

INTRODUCTION

Pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA), Southern California Edison Company (SCE) submitted its Transmission System Environmental Analysis, Project No. 4 for the Palo Verde Nuclear Generating Station to the Nuclear Regulatory Commission on October 20, 1975.

In conformance with the requirements of Arizona Revised Statutes Section 40.360, et seq., SCE also submitted an application for a Certificate of Environmental Compatibility for its Project No. 4 transmission line to the Arizona Power Plant and Transmission Line Siting Committee on October 28, 1975.

During hearings before the Arizona Power Plant and Transmission Line Siting Committee on December 5, 1975, the Committee recommended that SCE investigate an alternate routing of a segment of the Preferred Transmission Line Route (Red Lake Canyon - Mohave) (to be known in this document as the Original Route). The affected segment of the Preferred Transmission Line Route is located near Seligman, Arizona between Rim Rock and the Cottonwood Mountains, a distance of approximately 42 miles. In this area the Original Route passes through a subdivided area known as Bridge Canyon Country Estates. The Siting Committee deferred action on SCE's application for 90 days to give SCE an opportunity to investigate and propose alternate route segments which would not impact the Bridge Canyon Country Estates.

After a thorough review of the environmental impacts of alternate segments and the Original Route, SCE concludes that the Original Route has the least overall environmental impact and remains the applicants' preferred transmission line route.

DESCRIPTION OF ALTERNATE SEGMENTS NOS. 1, 2 AND 3

Using the study techniques and criteria upon which the original application was based,(1) applicants identified a study area encompassing the affected segment of the Original Route to identify potential alternative route segments bypassing the Bridge Canyon Country Estates. To avoid sharp angle departures from the Original Route, the study area covered an area between Rim Rock and the Cottonwood Mountains. The study area consists primarily of alternating sections of state and private lands. No federal lands are involved.

Three feasible alternative segments were identified, Segments 1, 2, and 3. The information following provides a description of the alternate segments and their environmental impacts. (See also Figure 1 and Tables 1 and 2).

ALTERNATE SEGMENT NO. 1

Segment 1 begins at Rim Rock (point A on Figure 1) and proceeds approximately 3 miles west along the Oringinal Route to mile 40 (point B). The route then turns almost due south and proceeds for approximately 8 miles to an angle point approximately 1 mile south of Interstate 40 and 3 miles southeast of Seligman

(angle point C). This route segment crosses old Highway 66, an Atchison, Topeka and Santa Fe (AT & SF) railroad right of way, Interstate Highway 40, the Arizona Public Service Round Valley-Seligman 230 kV transmission line, and 3 pipeline rights of way enroute to the angle point C.

The route then turns to the west and proceeds approximately 23 miles where it rejoins the Original Route and the coal slurry pipeline at mile 66 (angle point D). Segment 1 then continues along the Original Route to point F. In the area west of point C, this segment generally parallels a Transwestern pipeline for approximately 14 miles. Interstate 40 is crossed again approximately 16 miles west of the point C and the Round Valley-Seligman 230 kV line is crossed again two miles further west.

Alternate Segment 1, will increase the length of the Original Route by 3.7 miles.

ALTERNATE SEGMENT NO. 2

At approximately mile 37 of the Original Route (angle point A), this alternate breaks from the original routing and proceeds due west over hilly terrain for approximately 11 miles to the Aubrey Cliffs overlooking the Aubrey Valley. The route proceeds down the cliffs and into the broad valley to a major angle point (F) located approximately 3.5 miles west of U. S. Highway 66 and an AT & SF railroad right of way. The highway and railroad crossings are approximately 4 miles west of the base of the Aubrey Cliffs.

The route turns from angle point F and proceeds southwesterly for approximately 13 miles over mostly flat terrain to an intersection with the Original Route and the coal slurry pipeline at approximately mile 66 (angle point D). From this point (D) the remainder of the segment is identical to the Original Route segment.

Alternate Segment No. 2 will increase the Original Route length by 2.1 miles.

ALTERNATE SEGMENT NO. 3

Alternate Segment No. 3 breaks from the Original Route at mile 37 (angle point A) and proceeds along the same alignment as that previously described for Alternate Segment 2 over the Aubrey Cliffs to the major angle point (F) located 3.5 miles west of U. S. Highway 66, a distance of 18.5 miles.

At this angle point (F), this alternate takes a flatter angle to the southwest than Alternate Segment No. 2 and then rejoins the Original Route at approximately mile 79 near the Cottonwood Mountains (angle point E). This portion of the route, which is approximately 24 miles, crosses the flat Aubrey Valley for 14 miles before crossing 10 miles of mountainous terrain heavily covered with pinyon-juniper woodland.

Alternate Segment No. 3 is approximately the same length as the Original Route and, therefore, will not add to the line mileage.

ENVIRONMENTAL ANALYSIS OF THE ALTERNATE SEGMENTS

Alternate Segments Nos. 1, 2 and 3 were analyzed based upon their impact on various environmental parameters[2] and compared against the same section of the Original Route.

Generally, all segments in this area cross very similar terrain, soils, wildlife and vegetation. Alternate Segment No. 1 would increase the Original Route segment by the most mileage, 3.7 miles, while Alternate Segment No. 3 is about the same length as the Original Route segment. Alternate Segment No. 3 would require the most additional new access road construction (an additional 24 miles more than the Original Route segment). Alternate Segments 1 and 2 both parallel existing pipelines for part of their routing, thus requiring less additional new access roads than for Segment 3. No subdivided areas are crossed by any of the three alternate segments. Alternate Segment No. 1 crosses a major Highway, Interstate 40, twice while Alternate Segments Nos. 2 and 3 cross only U. S. Highway 66 and a railroad, as does the Original Route in this area. Due to the additional line lengths required for Alternate Segments 1 and 2, a few additional miles of State and private lands would be crossed by these segments.

Alternate Segments 2 and 3 pass through an area recognized by the U. S. Bureau of Land Management and the Arizona Department of Game and Fish as an antelope kidding ground

(see following sections concerning biological impact). All Alternate Segments pass through areas previously unimpacted by utility corridors, however, Segments 2 and 3 pass through longer stretches of unimpacted areas.

BIOLOGICAL ENVIRONMENT OF THE ALTERNATE SEGMENTS

The ecological characteristics of the geographical region around Seligman, Arizona, which includes the Original Route and three alternate segments, consists of pinyon juniper woodlands and plains grassland communities with ecotones of these two. Impact to the area from domestic stock grazing varies from light to heavy. Additional impact to the biotic communities is a consequence of the activity of the town of Seligman, development of the Bridge Canyon Country Estates, construction of Highway Interstate 40, underground pipelines and various other recreational uses.

ALTERNATE SEGMENT NO. 1

This segment is 46.1 miles in length. There are two natural vegetative communities along this corridor, pinyon-juniper woodland and plains grassland. One small shrub-grassland community is present where pinyon-juniper trees have been removed for accommodation of a greater stock grazing capacity.

Of the 46.1 miles of this alternate segment, the line will traverse approximately 11 miles of pinyon-juniper woodland,

31 miles of plains grassland, 3 miles of shrub-grassland (converted from pinyon-juniper by anchor chaining) and about 1.5 miles of pinyon-juniper - plains grassland ecotone.

Pinyon-Juniper Woodland

This community occurs along the first 4.5 miles of Alternate Segment 1 west of angle point A (Figure 1).

The pinyon-juniper woodland communities vary from a moderately light to dense overstory canopy of trees. In the majority of cases, the understory cover is moderate and consists of snakeweed (Gutierrezia sp.), barberry or algerita (Berberis fremontii), rabbitbrush (Chrysothamnus spp.), buckwheat (Eriogonum sp.), prickley pear cactus (Opuntia sp.), blue grama (Bouteloua gracilis), side oat grama (B. curtipendula) and ring muhly (Muhlenbergia torreyi).

Plains Grasslands

There are four communities of plains grassland along this corridor. They occur in the following locations; between mile 6.0 and mile 14, between mile 16.5 and 17.5, between mile 23.5 and 24.5 and the remaining area between mile 26 and the interception of this Alternate Segment 1 and the coal slurry line (Original Route).

The grassland communities generally correspond with a decrease in elevation which usually have concurrent decreases in annual precipitation. Livestock grazing intensities and

associated management activities since the late 1800's are also major factors in determining the species composition of the grasslands. Snakeweed and a low growing species of cholla (Opuntia sp.) are indications of possible overgrazing. Dominant grasses are blue grama (Bouteloua gracilis) and ring muhly (Muhlenbergia torreyi). Other grasses present but less dominant include big galleta (Hilaria rigida), three awn (Aristida fenleriana) and red three awn (A. longiseta).

The discussion of the faunal observations and data presented along the Original Route are applicable to this alternate segment. Two observations made to date along this alternate segment are worthy of note. A herd of approximately 20 antelope have been observed repeatedly in this area. Additionally, there is a moderately dense population of the white-tailed or gunnison prairie dog (Cynomys gunnisoni) that inhabits an area along this segment from approximately 1 mile north of Highway 66 to approximately 2 miles west of the angle point (point C). This angle point is approximately 1 mile south of Highway 66.

ALTERNATE SEGMENTS NOS. 2 and 3

Alternate Segment No. 2

Alternate Segments 2 and 3 have a common corridor from the point where they breakaway from the coal slurry line (Original Route) at point A to a point approximately 18.5 miles due

west (point F). This segment of these two alternates crosses Aubrey Cliffs and the southern end of Aubrey Valley.

About 4.5 miles of the above-mentioned 18.5 mile segment is vegetated with pinyon-juniper woodland, 7.0 miles of plains grassland, 5.5 miles of pinyon-juniper - plains grassland ecotone and about 1 mile of pinyon-juniper woodland converted to shrub-grassland for use as rangeland.

Between points F and D on Alternate Segment 2, it is estimated that there are about 5 miles of plains grassland, 7.5 miles of pinyon-juniper woodland, and about 1 mile of pinyon-juniper and plains grassland ecotone. Vegetation from point D to point E, a distance of 13 miles, is basically plains grassland with a few pinyon and juniper trees occurring along the western terminus.

The faunal community and its characteristics along this alternate segment are not significantly different from those of the other segments with the following exceptions. The Aubrey Cliffs area has a high population of deer. The cliffs offer excellent habitat for mountain lions, bobcats, as well as nesting areas for various species of raptors. Aubrey Valley has a moderately high density of white-tailed prairie dogs.

Alternate Segment No. 3

The section of this alternate segment from point A to point F has been discussed above. The floral communities from point F to point E in the Cottonwood Mountains are as

follows: the grassland present on the western end of Sections A-F continues along Sections F-E for about another 1 mile. The next 3 miles consists of pinyon-juniper woodland followed by another 4 miles of plains grassland. There exists a pinyon-juniper - grassland ecotone for the next 2 miles. This ecotone is then followed by 1 mile of plains grassland, 1 mile of pinyon-juniper and then by 2.5 miles of pinyon-juniper converted to shrub-grassland community. The remainder of this alternate segment, to its terminus with the preferred alignment, consists of plains grassland, for a distance of about 9 miles.

The faunal community along Alternate Segment 3 from Points F to E is not significantly different from that which is present along the other alternate segments.

A large geographic area encompassing the southern end of Aubrey Valley to several miles west of point F is an established antelope kidding ground. Because of the Nation's dwindling populations of antelope and their delicate status, the kidding grounds are important to this area's antelope reproductive success and is, therefore, an area sensitive to perturbation.

BIOLOGICAL IMPACTS OF THE ALTERNATE SEGMENTS

Impacts to the biotic communities around the Seligman, Arizona area includes loss of habitat, loss of some less mobile animals, displacement of territorial animals into

adjacent areas with a resulting competition for establishment of territories. Disruption of important behavioral activities, during transmission line construction, such as breeding, nesting and fauning would probably also take place.

Alternate Segment 1 will have greater ecological impact than will the Original Route as it will require the pioneering of a new corridor in certain areas and will require additional new access road. However, it will have less impact than will Alternate Segments 2 and 3 because it parallels and/or traverses areas of existing moderately high impact, (i.e. it traverses Interstate 40 twice, Highway 66 and the railroad once, and parallels several pipelines and areas heavily impacted by ranching activity).

Alternate Segment 2 to point D and Segment 3 to point E will pioneer new corridors and may significantly impact important wildlife habitat in and east of the Aubrey Cliffs. The white-tailed prairie dog towns in Aubrey Valley would be impacted. This Valley is being studied by the Arizona Game and Fish Department[3] for possible reintroduction of the endangered black-footed ferret. Construction and maintenance activities of a major transmission facility across this Valley may adversely impact the results of this study and possible ferret reintroduction. Alternate Segments 2 and 3 have a significant potential for impacting the critical antelope kidding grounds in and west of the southern portions of Aubrey Valley.

In addition to requiring a new corridor for its entire length, Alternate Segment 3 would require approximately 5 more miles of access roads than would Alternate Segment 2 due to its more rugged terrain.

Although Alternate Segment 3 is virtually the same length as the Original Route, it would require opening a new corridor, thus having a greater impact on resident wildlife and would significantly impact the antelope kidding grounds, discussed above.

ARCHAEOLOGY AND HISTORY

ALTERNATE SEGMENT NO. 1

An aerial reconnaissance of this segment did not reveal any archaeological or historical resources in addition to the one minor archaeological and one historical site previously found on the Original Route between points D and E. (See Figure 1 and reference 4). Based on terrain, availability of water and the faunal and floral resources in the area, it is predicted that there is a moderate probability of archaeological resources occurring in the portion of the segment located north of Highway 66, at the crossing of Railroad Canyon Wash and in the westernmost 23 miles of the segment. There is a low probability of archaeological resources occurring in the remainder of this segment. There are no properties listed in the National Register of Historic Places[5] in the vicinity of Alternate Segment 1.

ALTERNATE SEGMENT NO. 2

An aerial reconnaissance of Alternate Segment 2 did not reveal any archaeological resources. Three coursed stone dams were noted in the area east of the Aubrey Cliffs. These dams are most likely associated with early agriculture and stock grazing ventures and may be of historical interest. This alternate will also pass near the archaeological and historical sites previously noted on the Original Route between points D and E. Based on the physical parameters discussed above, it is predicted that there is a moderate to high probability of archaeological resources occurring in and adjacent to this segment in the area between Rim Rock, where the corridor departs from the coal slurry pipeline, and the west side of the Aubrey Cliffs, and a moderate probability of archaeological resources occurring in the 13 miles between points D and E. There is a low probability of archaeological resources occurring in the remainder of the route. There are no properties listed in the National Register of Historic Places[5] in the vicinity of Alternate Segment 2.

ALTERNATE SEGMENT NO. 3

An aerial reconnaissance of this segment did not reveal any archaeological resources. The archaeological and historical sites between points D and E on the Original Route are bypassed by this alternate segment. However, the eastern

portion of this segment traverses the same archaeologically and historically sensitive area between Rim Rock and the west side of the Aubrey Cliffs as Alternate Segment 2. Based on the physical parameters discussed previously, the western 20 miles of this segment traverses an area with a predicted moderate probability of archaeological resources occurring. The remainder of the segment traverses areas of predicted low archaeological sensitivity. There are no properties listed in the National Register of Historic Places[5] in the vicinity of Alternate Segment 3.

Once a segment is selected, a detailed archaeological and historical survey of route will be conducted by the Museum of Northern Arizona. Their data will be utilized in selecting the final alignment of the transmission line within the approved corridor. Any impact to archaeological and historical resources will be mitigated - in the same manner as indicated in the original application[6].

HUMAN ENVIRONMENT RELATED TO THE ALTERNATE SEGMENTS

SCENIC AREAS

There are areas of high, moderate and low scenic value within the three alternate segments. High scenic value areas are traversed by three miles of Alternate Segments 2 and 3 as they traverse the Aubrey Cliffs. The Aubrey Cliffs are a distinctive visual feature that rises abruptly from the broad flat surface of the Aubrey Valley. Softened with

occasional patches of sparse vegetation, the cliffs are marked by shear faces of stratified colored rock outcroppings and deep canyons. The Cliffs begin at Chino Point and extend more than 30 miles to the north. As a result of the wide flat Aubrey Valley, the cliffs can be seen for 10 to 20 miles distance by motorists on Route 66. Currently, the visual condition of the cliffs is relatively unmarked by man-made features.

An area of moderate scenic value is traversed by Alternate Segments 1, 2 and 3 as they pass through the Coconino Plateau. This area is adjacent to Mount Floyd, Round Mountain, Trinity Mountain, and the plateau above the Aubrey Cliffs.

Alternate Segments 2 and 3 traverse 9 miles of this type of territory, whereas Segment 1 traverses 2 miles. This terrain is marked by deeply eroded valleys leading to Chino Wash that have created many visually diverse canyons and exposed layers of different colored sedimentary rocks. The plateau above these canyons is a gently undulating grazing area with pinyon-juniper woodlands. The three mountains rise from the plateau and offer panoramic views of northern Arizona. The area, however, is remote, since no paved roads enter nor have any recreation facilities been established.

The terrain through which the remaining segments pass may be considered of low scenic value. With few exceptions, they traverse grazing lands and pinyon-juniper woodlands common to northern Arizona.

TRANSIENT POPULATION

Alternate Segment No. 1

Alternate Segment 1 will cross Interstate 40 in two locations. One crossing is located 2 miles east of Seligman (1 mile east of the Seligman interchange). Interstate 40 is not presently open to the west of the interchange and, therefore, all traffic must use U. S. Route 66. The average daily traffic on Interstate 40 is similar to the traffic count on Route 66, which was 6,800 vehicles per day in 1973. The State of Arizona has determined that there are on the average 1.7 occupants per vehicle, resulting in the potential exposure of the line to 11,660 individuals per day. Over 60 percent of the traffic on this road is from out of state. The transmission line will form an approximate 90 degree angle with Interstate 40, thereby providing a long view exposure of the line. Close in, however, optimum advantage can be taken of the undulating terrain to achieve a crossing which is relatively shielded from the view of passing motorists.

Alternate Segment 1 also crosses Interstate 40, 14 miles west of Seligman. This section of Interstate 40 is not completed and is scheduled to open in 1976-77. Estimates of average daily traffic are not available, but can be assumed to be similar to the 6,000 vehicles per day experienced on other portions of Interstate 40. It is estimated that approximately 10,000 individuals will view the line daily. The line will cross Interstate 40 at about a 30 degree angle, resulting in an extended view of the line to westbound motorists. The flat narrow valley in which the crossing

occurs will limit viewing times since the line will not be in view as it passes into the hills on the western side of the valley. On the eastern side of the valley the line also passes into the hills, but Interstate 40 curves and parallels 0.5 to 1 mile north of the line. In this area, the line will be intermittently visible to motorists for approximately 6 miles.

Alternate Segments Nos. 2 and 3

Alternate Segments 2 and 3 will cross Route 66 in the Aubrey Valley approximately 6 miles north of Chino Point. In 1973, this road had an average daily traffic of 6,800 vehicles. The opening of Interstate 40 will attract many of these vehicles to the quicker routing of the new highway. Estimates regarding the anticipated level of traffic on Route 66 after opening are not available. It is assumed average daily traffic will be approximately 1,000 vehicles per day, since there are few origins or destinations to the north of the crossing. The crossing forms approximately a 40 degree angle with the road and will be visible to the east and west due to the flat terrain.

RESIDENT POPULATION

There are only a few residences within the four mile corridor of Alternate Segments 1, 2 or 3. Alternate Segment 1 passes 2 miles east, and 2.5 miles south of Seligman. As the segment bypasses Bridge Canyon Country Estates the line

will be located approximately three miles south of the developed areas and 1 mile south of undeveloped areas, near Interstate 40.

Alternate Segments 2 and 3 pass 1 mile north and west of undeveloped sections of Bridge Canyon Estates.

LAND USE

There are no conflicts with existing land uses along Alternate Segments 1, 2 or 3, as there are no commercial, industrial or organized recreational uses in these corridors.

INCOME

Construction Costs

The overall cost of the transmission line will be increased if one of the alternate segments is required. (See Table 2).

TAXES

Property Tax Revenues

The property tax revenues received by Coconino and Yavapai Counties may increase by as much as 1 to 2 percent due to the increased investment.

AESTHETIC IMPACT OF THE ALTERNATE SEGMENTS

The aesthetic impact of Segments 1, 2 and 3 is related to those areas considered to be of scenic value as well as to those transient and resident populations affected.

The aesthetic impact of Segments 2 and 3 on areas of high scenic value occurs in the Aubrey Cliffs area. This impact will occur because the line establishes a new corridor in an undisturbed area and because the cliffs are a highly visible aesthetic resource. The transmission towers will be skylined as they drop from the heights of the Coconino Plateau to the Aubrey Valley.

Impacts to the moderate scenic value area are caused by Segments 1, 2 and 3. In this area on the Coconino Plateau near Mount Floyd and Rim Rock, the lines will establish a new corridor. However, the remoteness of the area will minimize this impact.

The impact of Segment 1 on transient population will result from the two crossings of Interstate 40. Because of the lightly undulating terrain at one crossing and the flat valley at the other, both are long view crossings. The approximate number of observations of the line as a result of these crossings would be about 22,000 per day. These individuals would also be able to view the line as it parallels Interstate 40 for 8 miles (since the line is located 0.5 to 1.5 miles south of the highway and is partially shielded by topography). The Arizona Department of Transportation, Highways Division, Roadside Development Services, has proposed a roadside rest area on Interstate 40 approximately 1.5 miles north of the line. Since a specific roadside area site has not been selected nor a site plan proposed, it is not known if the line will result in visual impact.

The impact of Segments 2 and 3 on transient population will occur in the area where the line crosses Route 66 in the Aubrey Valley. This would be a long view crossing visible to approximately 1,700 individuals per day.

SUMMARY

Summarizing the environmental impact of the alternate segments compared to the Original Route, we find that Alternate Segment 1 will require the pioneering of new utility corridors for approximately one-third of its length, impact a moderately dense white-tailed prairie dog town, increase major road crossings, and increase long views to motorists.

Alternate Segment 2 will pioneer a new utility corridor to the point that it rejoins the Original Route, and Alternate Segment 3 will pioneer a new utility corridor for its entire length. Alternate Segments 2 and 3 will impact the critical antelope kidding grounds, traverse the white-tailed prairie dog towns under study by the Arizona Game and Fish Department, and will impact the highly scenic Aubrey Cliffs.

All 3 alternate segments will increase the area removed from biological activity, will require more miles of access road and incur additional construction costs.

In conclusion, review of the environmental impact of the alternate segments compared to the Original Route demonstrates that selection of an alternate segment will result in greater environmental impact in the Seligman area.

REFERENCES

(1) Palo Verde Nuclear Generating Station, Project 4 Transmission System Environmental Analysis, Sections 1.3 and 3. October 1975.

(2) Palo Verde Nuclear Generating Station, Project 4 Transmission System Environmental Analysis, Sections 2.2, 2.3. October 1975.

(3) Martin, W. Arizona Game and Fish Department, personal communication with D. W. Stevens, Southern California Edison Company, January 1976.

(4) Palo Verde Nuclear Generating Station, Project 4 Transmission System Environmental Analysis, Section 2.3.3.2 and Figure 2.3-2. October 1975.

(5) National Register of Historic Places as published in the Federal Register, February 4, 1975 (Vol. 40, No. 24) and monthly updates through December 2, 1975 (Vol. 40, No. 232).

(6) Palo Verde Nuclear Generating Station, Project 4 Transmission System Environmental Analysis, Section 5.2.3.1. October 1975.

TABLE 1

DIFFERENTIAL COMPARISON OF ALTERNATE SEGMENTS 1, 2, AND 3
WITH ORIGINAL ROUTE

	Route Designation	Alternate Segments Around Bridge Canyon Country Estates (Differential Compared To Original Route)** Segment 1	Segment 2	Segment 3
1.1	Approximate length of line miles	+3.7	+2.1	-0.1
1.2	Width of proposed right-of-way, feet	0	0	0
1.3	Area of proposed right-of-way, acres	+108	+61	-6
2.1	Natural biotic communities traversed, miles			
	Plains grasslands	+3.4	-2.4	-16.8
	Mixed pinyon-juniper-grassland	-2.5	+0.5	+5.3
	Pinyon-juniper woodland	+2.8	+4.0	+11.5
2.2	Erosion hazard (distance through areas of erosion hazard)			
	Slight to moderate, miles	0	0	0
	Moderate, miles	0	0	0
	Moderate to severe, miles	0	0	0
	Severe, miles	0	0	0

**Table presents differential values only, i.e, positive figures indicate values greater than the Original Route and negative figures indicate values less than the Original Route.

Route Designation	Alternate Segments Around Bridge Canyon Country Estates (Differential Compared To Original Route) Segment 1	Segment 2	Segment 3
2.3 Access roads			
Estimated total length of access road construction, miles	+11	+19	+24
2.4 Area removed from biological productivity			
Structures - permanent, acres*	+ 0.1	+ 0.1	0
Structures - temporary, acres	+ 2.2	+ 1.3	0
Access roads, acres+	+19	+32	+41
2.5 Agronomy			
Distance traversed through cropland, miles	0	0	0
Area permanently removed from agricultural productivity, sq. ft.++	0	0	0
2.6 Land ownership			
Distance traversed over state land, miles	+1.8	+1	0
Distance traversed over private land, miles	+1.9	+1.1	0
Distance traversed over federal land, miles	0	0	0
2.7 Use of existing utility corridor			
Right-of-way length parallel to existing right-of-way, miles	-3	-6	-12

Route Designation	Alternate Segments Around Bridge Canyon Country Estates (Differential Compared To Original Route) Segment 1	Segment 2	Segment 3
3.1 Relative scenic values			
Right-of-way length in high scenic area, miles	0	+6	+6
Right-of-way length in moderate scenic areas, miles	0	+3	+3
3.2 Highways			
Primary highways:			
Number of crossings	+1	0	0
Parallel exposure length, miles	+8	0	0
Secondary highways:			
Number of crossings	0	0	0
4.0 Archaeological sensitivity			
Distance traversed through areas of sensitivity			
High, miles	0	+15	+15
Medium, miles	0	0	+7
Low, miles	+4	-13	-22

Route Designation	Alternate Segments Around Bridge Canyon Country Estates (Differential Compared To Original Route) Segment 1	Segment 2	Segment 3
5.0 Historic sensitivity			
High, miles	0	0	-1
Medium, miles	0	+5	+5
Low, miles	+4	-3	-4

*Figure calculated on assumptions of four foundations per structure, and 4 structures per mile of route.

+Figure calculated on assumption of average access road width of 14 feet and variable number of miles of access road per mile of right-of-way.

++Figure calculated on assumptions of a square 5 feet on a side per foundation (25 square feet) being removed from agricultural productivity, four foundations per structure and 1600 feet between structures.

TABLE 2

DIFFERENTIAL COST COMPARISON OF ALTERNATE SEGMENTS 1, 2, AND 3
WITH ORIGINAL ROUTE

Alternate Segments Around
Bridge Canyon Country Estates
(Differential Cost Compared to Original Route)*

Route	Engineering and Construction	Right-of-Way	Total
Segment 1	+1,500,000	-$330,000	+$1,170,000
Segment 2	+1,000,000	- 360,000	+ 640,000
Segment 3	+ 800,000	- 375,000	+ 425,000

*Note: Engineering and construction costs are escalated to 1982 while right-of-way costs are escalated to 1980. Table presents differential costs only, i.e., positive figures indicate costs greater than the Original Route and negative figures indicate costs less than the Original Route.